

An Overview and Assessment of Archeological Resources, Cape Krusenstern National Monument, Alaska

RESOURCES REPORT NPS/ARORCR/CRR-93/20



United States Department of the Interior

**National Park Service
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Cover photograph by Dale Vinson: An *inuksuk* at NOA-145, Cape Krusenstern National Monument.

AN OVERVIEW AND ASSESSMENT OF ARCHEOLOGICAL RESOURCES,
CAPE KRUSENSTERN NATIONAL MONUMENT, ALASKA

By Patricia L. McClenahan

NATIONAL PARK SERVICE - Alaska Region
Resources Report NPS/ARORCR/CRR-93/20

U.S. Department of the Interior
National Park Service
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Dear Colleague:

Enclosed is a copy of An Overview and Assessment of Archeological Resources, Cape Krusenstern National Monument by Patricia L. McClenahan. This report summarizes the status of archeological resource knowledge within Cape Krusenstern National Monument and includes recent data collected by NPS archeologists. It is hoped that this report will prove useful to archeologists and cultural resource managers. If you have questions or comments, please contact me at 257-2665.

Sincerely,

Gary Somers
Regional Archeologist
Division of Cultural Resources

Enclosure



Figure 1. A beach along the Chukchi Sea.

ABSTRACT

The prehistoric and historic archeological resources within the Cape Krusenstern National Monument are the focus of this overview and assessment. It consists of a synthesis of data on the broad spectrum of known archeological resources within the monument, an assessment of those resources within a regional context, and recommendations for managing the archeological resources within the monument boundaries as well as for planning future research.

Information has been included from 218 archeological sites, 147 of which were newly identified, recorded, analyzed, and reported by National Park Service archeologists in a recent three-year research project.

The first part of this six-part volume consists of background data on the modern physical environment of the monument. The second part presents an overview of the region's prehistory, accounts for the known archeological resources present within the monument, reviews and evaluates the previous archeological research in the region, and gives a brief overview of the ethnographic and historic research. The third part presents data about the known cultural resources in Cape Krusenstern National Monument within a thematic construct. The fourth part assesses our current knowledge of the data within the same thematic construct. The fifth part presents the archeological data in a completely different way, in a series of historic contexts. Finally, Part Six provides recommendations for managers of the cultural resources within the monument and the National Historic Landmark.

The appendixes consist of tables listings archeological sites and archeological field projects. They also contain information on the locations of archeological collections, field records, and reports for Cape Krusenstern National Monument.

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Figure 2. Archeological site NOA-145 overlooking Kilikmak Creek.

INTRODUCTION

Cape Krusenstern National Monument is located on the Chukchi Sea coast of northwest Alaska. The internationally significant archeological resources that are located there are focal to the creation of the monument, established in 1978, and to the Cape Krusenstern National Historic Landmark (NHL), designated in 1973. Many of the cultural resources within these areas were, however, unknown at the time of the creation of the monument and NHL, and are still little known.

NPS-28, the Cultural Resources Guideline for the National Park Service (USDI National Park Service 1985a:1), requires the park manager to

locate, identify, evaluate, preserve, manage, and interpret qualified cultural resources in every park in such a way that they may be handed on to future generations unimpaired...

Documents prepared as part of the cultural resources management planning process include archeological identification studies, archeological evaluation studies, and an archeological overview and assessment. One of the most important components of an overview and assessment is the set of recommendations for the future management of the archeological resources.

Management issues and concerns for the monument include what approach and methods will be best to manage the nationally and internationally significant archeological resources that are located within the monument. Areas of specific concern are management and protection of the archaeological resources in remote locations of the monument, on private land or on potential conveyances, in areas used for subsistence and recreation, or are in the path of development associated with the Red Dog Mine.

This overview and assessment was written just after the National Park Service completed a three-year project to identify and evaluate the archeological resources in the monument. The study consisted of a two-year reconnaissance-level survey of parts of the monument, followed by a one-year laboratory analysis, archival research, and writing phase (McClenahan and Gibson 1990).

Keeping in mind the needs of the National Park Service for the management of the archeological resources in the monument, this overview and assessment accomplishes four major tasks. First, it reviews and summarizes the available information on the prehistoric archeological record, based on a comprehensive review of all of the publications, reports, archival and museum records and collections; and it provides information about the location of these reports, records, and archeological collections. Secondly, it evaluates the current levels of knowledge about the archeological resources in the monument and the status of past research with respect to its adequacy and completeness in terms of today's agreed-upon professional standards for archeological research; additionally, it critically assesses this knowledge and research in terms of context and validity. The primary goal of this assessment is the production of a summary of data for

the manager, to provide projections about the quantity, character, distribution and potential research significance of the cultural resources within the monument.

The overview and assessment will address the research potential and the management concerns and needs of the archeological resources within the monument in the context of major research themes. Recommendations for directions of future research will be made within the thematic construct.

An area to which this overview and assessment will give only cursory attention is ethnographic research within the monument. A brief review of ethnographically reported Inupiat lifeways is included here, but the reader is encouraged to consult the recent in-depth ethnographic study of this area by Ellanna and others (in preparation).

Little historic archeological research has been accomplished that applies directly to the monument. Snow and others (1985) prepared an Historic Structure Report on two Alaska Road Commission mail shelter cabins in the monument. Subsequently, Gleeson (1988) conducted archeological testing in the vicinity of one of the cabins located at Aniyak, an historic Inupiat village. The 1987-1988 National Park Service survey identified several historic-era archeological sites and standing structures and revisited others, which are discussed in this overview and assessment. However, no List of Classified Structures (LCS) exists.



Figure 3. Early summer at the edge of the Chukchi Sea.

PART ONE: THE PHYSICAL ENVIRONMENT

Description of the Monument

General Description. Cape Krusenstern National Monument is located in the northwestern area of North America just above the Arctic Circle, in the northwest region of the state of Alaska. The monument is just north of the Bering Strait and is approximately 200 miles east of the Chukchi Peninsula of Northeast Asia (Figure 4). It comprises 659,807 acres of land along the coast of the Chukchi Sea west of the Noatak River, north of Kotzebue and south of Kivalina (Figure 4). Physiographic characteristics of the monument include foothills that run roughly the length of the monument, dividing the drainage systems into those that run into the Chukchi Sea and those that drain into the Noatak. Coastal lowlands are located to the west of the foothills, and are dotted with a series of large and small lagoons. Five small arctic rivers cross these lowlands.

While the Chukchi Sea makes up the western edge of the monument, the foothills mark the eastern boundary. From the eastern slopes of the foothills, tributary streams flow into the Noatak River Valley, situated in the Noatak Lowlands physiographic region (Figure 4, 5).

The entire monument contains prehistoric cultural resources of international significance, but of particular note are the series of prehistoric habitation sites located on the sequential beach ridges of Cape Krusenstern. These sites contain a record of some 6,000 years of prehistory. Other sites that are located at higher elevations inland are the remains of even earlier people. The archeological record in the monument continues through historic times. Of additional interest are the glacial features left behind when part of what is now the monument was covered by glaciation some 250,000 years ago.

History of the Establishment of the Monument. By the end of the 1960s and the beginning of the 1970s, efforts were underway to make a comprehensive survey of potential national parks in Alaska. The Park Service initiated an inventory of the existing National Park System to evaluate the degree to which the areas already within the system were representative of the nation's cultural and natural history. Prepared by the National Park Service's Richard Stenmark for use by the Alaska Parks and Monuments Advisory Committee, the list included Cape Krusenstern, among some 23 historical areas proposed as set-asides. Additionally, the Alaska area office in Anchorage had amassed the existing knowledge on Alaska's prehistory and archeological resources in an effort to identify areas meeting the criteria for inclusion in the National Park System (Williss 1985:50-52; 59).

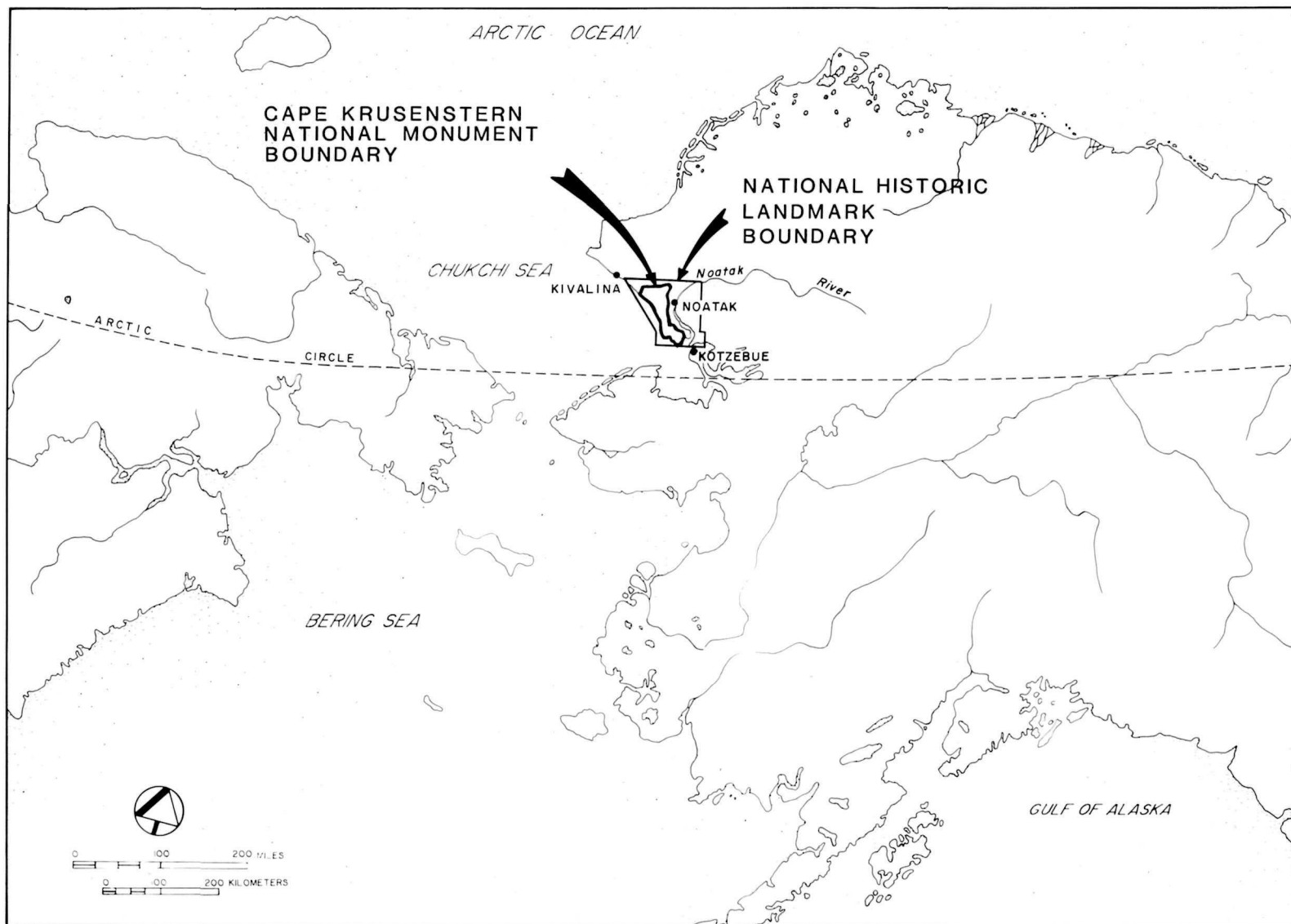


Figure 4. Regional map showing the location of Cape Krusenstern National Monument and National Historic Landmark.

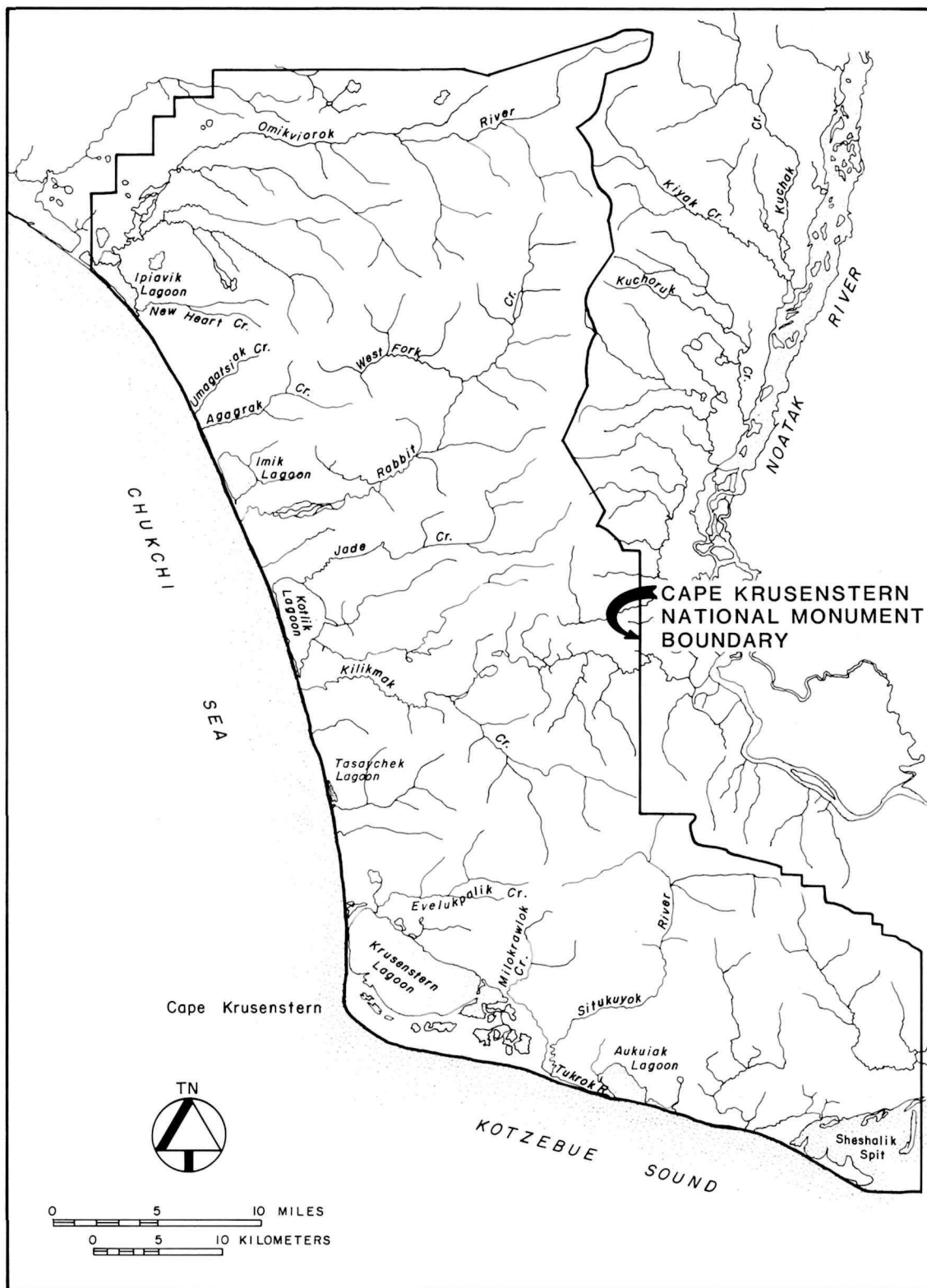


Figure 5. Boundary of Cape Krusenstern National Monument.

Passage of the Alaska Native Claims Settlement Act (ANCSA) of December 18, 1971, provided the means by which Cape Krusenstern National Monument, as well as a number of other parks and monuments, would be established. According to Williss (1985:92)

Section 17 (d) (2) permitted the secretary to withdraw land for possible inclusion in one of the conservation systems, established timetables for withdrawals, study, and congressional action on recommendations.

Original 1972 ANCSA land withdrawal plans for Cape Krusenstern included it as part of a large block of land, comprising 9,003,000 acres, designated "Noatak", that included the entire Noatak River drainage system. In September 1972, the total area of the Noatak withdrawal was revised downward to 8,357,000 acres, but added to it were areas of the DeLong Mountains and Kotlik Lagoon (Williss 1985:115).

In December 1972, Interior Secretary Morton put forward proposed legislation to Congress for preservation of lands that included Cape Krusenstern and adjacent areas comprising 400,000 acres, as an entity separate from Noatak. A series of amendments to Morton's proposal followed that included boundary adjustments to the Cape Krusenstern withdrawal. Finally, H.R. 39 was passed by the House of Representatives on May 19, 1978. As passed, it provided for a withdrawal of 540,000 acres for Cape Krusenstern National Monument (Williss 1985:115, 178, 185, 190, 203).

On December 1, 1978, President Jimmy Carter applied the Antiquities Act, designating Cape Krusenstern among 17 National Monuments in Alaska. It was not until August 18, 1980, that the Senate passed the Alaska National Interest Lands Conservation Act (ANILCA, 16 USC 3101), which was signed into law by Carter on December 2, 1980 (Williss 1985:235,237).

Section 201(3) of ANILCA specifies that

The monument shall be managed for the following purposes, among others: To protect and interpret a series of archeological sites depicting every known cultural period in arctic Alaska; to provide for scientific study of the process of human population of the area from the Asian Continent; in cooperation with Native Alaskans, to preserve and interpret evidence of prehistoric and historic Native cultures...

History of the Establishment of the National Historic Landmark. Cape Krusenstern National Monument is located within the much larger, 2,300,000 acre Cape Krusenstern National Historic Landmark. Cape Krusenstern was placed on the National Register of Historic Places as an Archeological District with National Historic Landmark (NHL) status in September 1973 (Figure 4).

The nomination was based primarily on the presence of a record of 5,000 or more years of prehistory represented in abundant, internationally significant archeological sites on the 114 uniquely well-preserved former beach ridges adjacent to Krusenstern Lagoon (Giddings 1967; Giddings and Anderson 1986). These beach ridges contain the remains of villages, habitations, and camps of the Native people of two cultural traditions. Evidence of the most recent tradition is located on the seaward beach ridges; and the farther inland one searches, the earlier are the archeological features. The earliest date to around 4,500 years ago.

The archeological sites on the Cape Krusenstern beach ridges are a vital part of Northwest Alaskan prehistory. They do not contain, however, the whole story of the prehistoric peoples, who doubtless used much larger territories than just the beach ridges in their seasonal pursuits. Not only that, but archeologists discovered the remains of people belonging to two other, older cultural traditions in the hills inland from the beach ridges and the Krusenstern Lagoon. (They are the Northern archaic and the Paleoarctic traditions.)

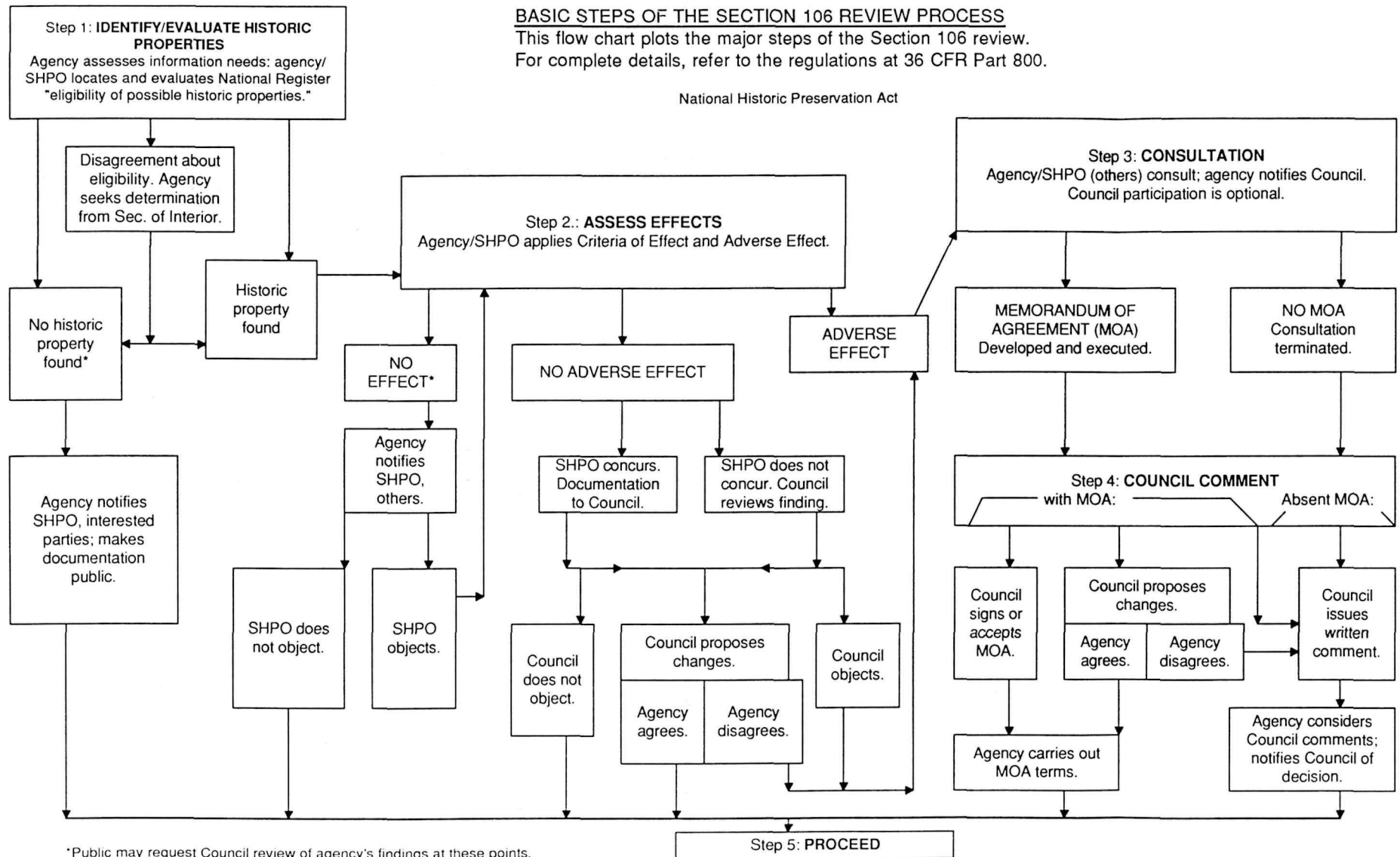
The National Historic Landmark (NHL) nomination (October 3, 1973) states that the NHL boundary was set to provide for the preservation and study of the full range of archeological remains left by the seasonal round of activities carried out by the "Western Alaskan Mainland" people and their precursors, dating "as far back as the existence of the Bering Land Bridge" some 12,000 years ago and earlier.

When an archeological site is newly located in a National Historic Landmark, it must be evaluated to determine whether it does or does not contribute to the significance of the NHL. Since Cape Krusenstern National Historic Landmark's themes are very broadly drawn, all of the prehistoric archeological sites and most of the historic sites are considered to be contributing properties.

The National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 *et seq.* (48 FR 4655, Feb. 2, 1983) is in place to protect the cultural resources on federal lands and within Cape Krusenstern National Historic Landmark, an area that has been identified and set aside on the basis that it contains cultural properties of "exceptional value as commemorating or illustrating the history of the United States." This law is particularly important with respect to Cape Krusenstern National Monument, in which cultural resources should be considered the primary resource, based on the stated purpose for which this monument was created.

Section 106 of the National Historic Preservation Act (16 USC 470f) requires consideration of the effect of any proposed federal or federally funded undertaking on any cultural property eligible for the National Register of Historic Places, prior to funding or permitting of that undertaking. Figure 6 illustrates the steps required in the Section 106 review process.

Figure 6. Steps in the Section 106 review process.



Section 110 of the National Historic Preservation Act (53 FR 4727-46) charges the head of the responsible federal agency to "undertake such planning and actions as may be necessary to minimize harm to [any National Historic Landmark], and ...afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking" under consideration.

Physiographic Region

The monument encompasses 659,807 acres of land and water; and the National Historic Landmark is 2,300,000 acres, located on the Chukchi Sea and Kotzebue Sound. It is situated north of the Arctic Circle in Northwest Alaska.

The area consists of seven major physiographic provinces that figure prominently in our understanding of how the Native people have used this region over time (Figure 7). The Wulik Lowlands are part of the coastal plain where it intersects the lower Wulik River in the northeastern corner of the NHL.

The Mulgrave Hills are foothills of the westernmost extent of the Brooks Range and are in the northern half of the monument. The bedrock geology of the area includes rock of dolomite, sandstone, shale, and limestone from the Devonian to Mississippian periods (Figures 8, 9).

The Coastal Lowlands are a part of the broad, relatively flat coastal plain that runs the extent of the west side of the monument and the NHL and beyond. Soils are silt to loam, covered by moist tundra. The lowlands are generally poorly drained and are dotted with numbers of lakes and ponds (Figure 10).

The Noatak Lowlands and the Noatak River basin occupy much of the eastern portion of the NHL, as well as the central area of the monument between the Mulgrave Hills and the Igichuk Hills. The area between the foothills is believed to have been the former outlet of the Noatak River sometime before the last glaciation of the area (Figure 11).

The Igichuk Hills are located east of Cape Krusenstern. The bedrock geology of this area includes rocks of Precambrian to Devonian ages, and contains abundant limestone, dolomite, chert, and phyllite (Figure 12).

Coastal features include a series of barrier bars that contain lagoons, the largest of which is Krusenstern Lagoon, known for its series of beach ridges that have been inhabited sequentially for the past 4,000 years. The smaller lagoons also have beach ridge complexes, some of which have been inhabited prehistorically and historically.

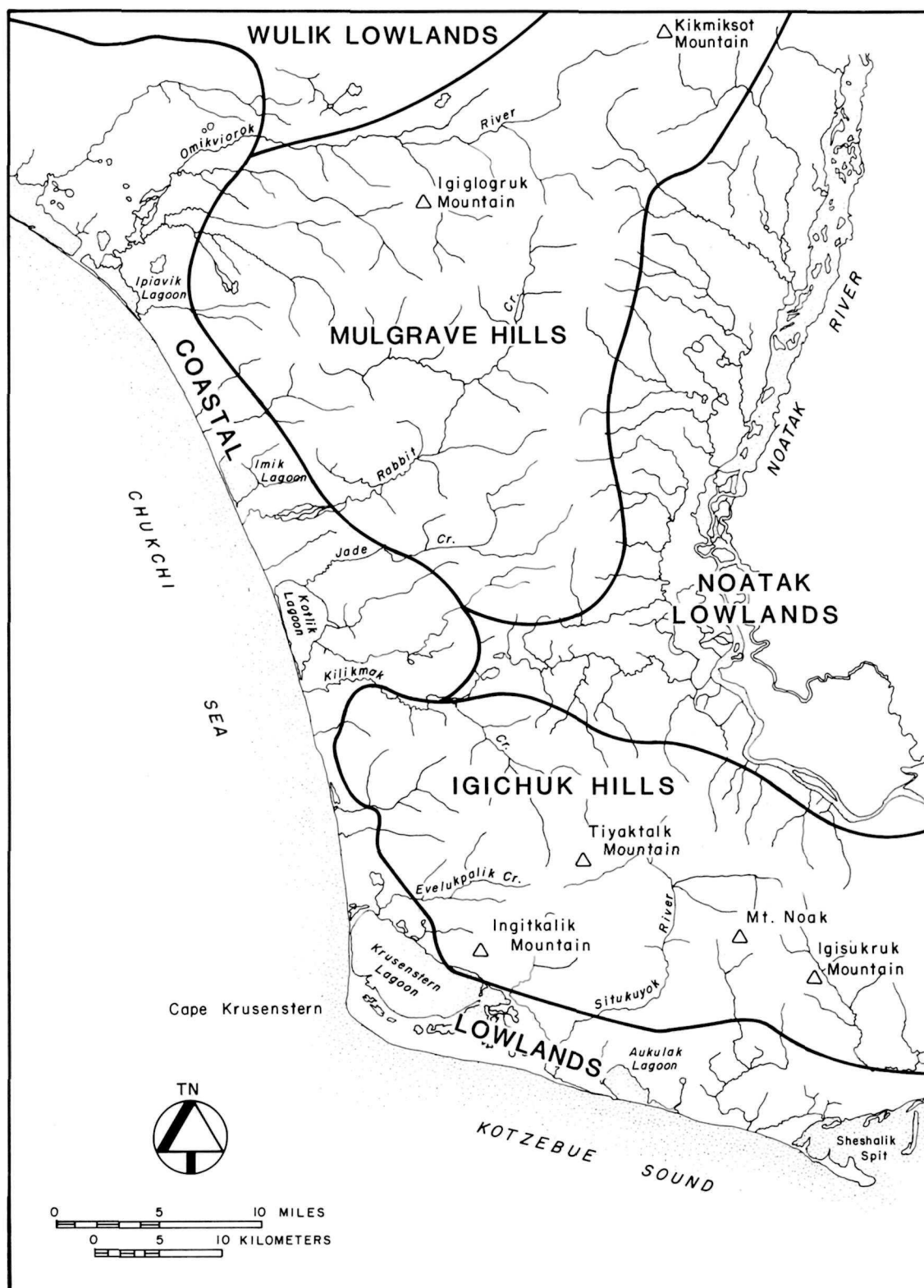


Figure 7. Major physiographic divisions of Cape Krusenstern.



Figure 8. The Mulgrave Hills.



Figure 9. Bedrock formations in the Mulgrave Hills.



Figure 10. The Coastal Lowlands.



Figure 11. The white spruce forest of the Noatak Lowlands.

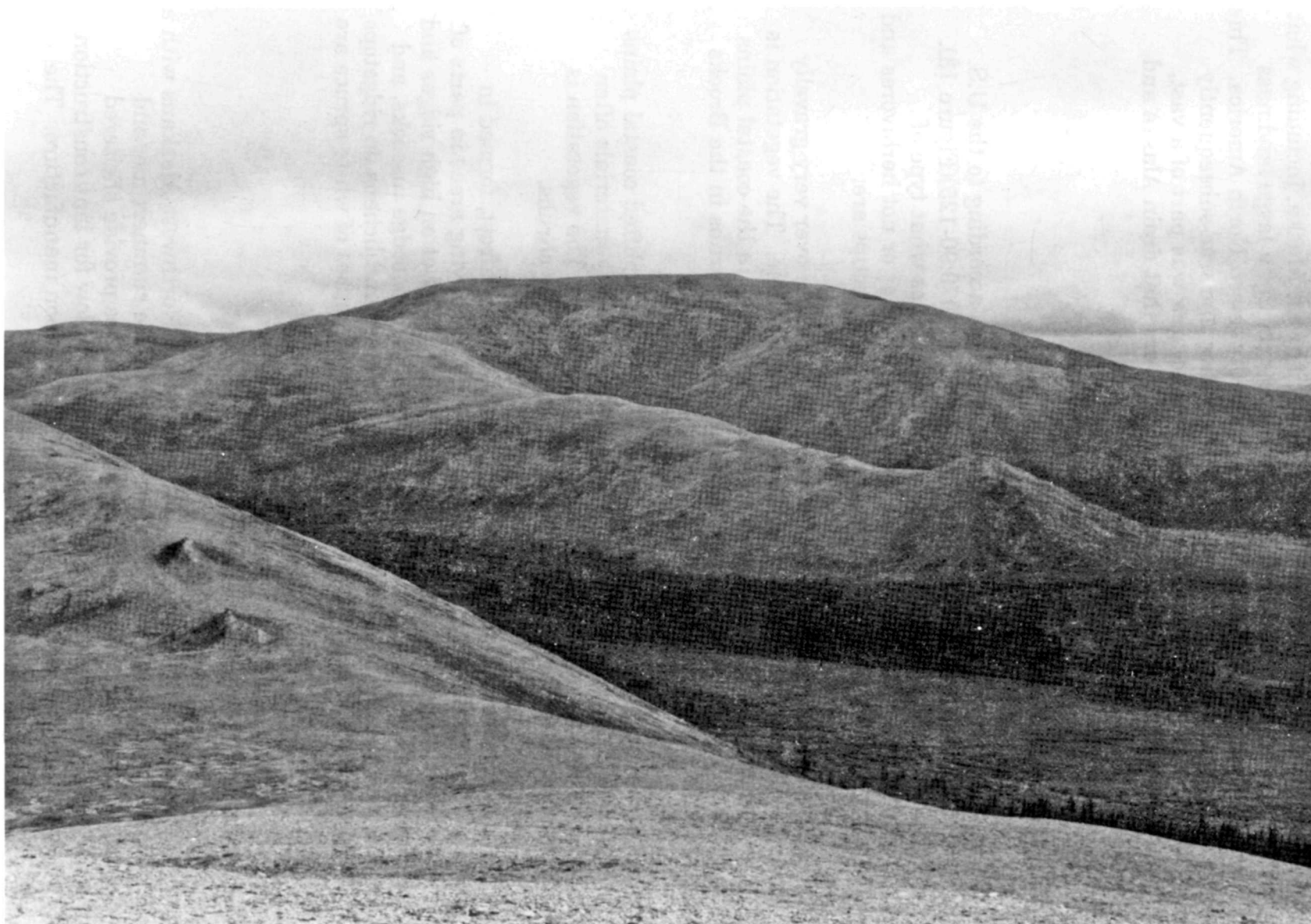


Figure 12. The eastern slopes of the Igichuk Hills.

Some of these modern physiographic features are much changed from late Pleistocene times. Prior to around 15,000 B.P., Northwest Alaska, including what is today Cape Krusenstern National Monument, was part of a large landmass called Beringia that joined Northeast Asia and northwestern North America. This landmass was exposed during the periods of glaciation and was subsequently submerged when the glacial ice melted. Much of the area was part of a vast, coastal plain, crosscut by extensions of the major rivers that drain Alaska and Siberia today.

Soils Within the Monument

There are three major soil groups within the monument, according to the U.S. Department of Agriculture's Soil Conservation Service (1979:90-125)(Figure 13). Along with several other factors, the type of soil determines what type of vegetation will be present. In turn, that influences whether or not herbivores and other animals will use a particular area or not. The soil groups are:

IQ 2, developed in silty material of variable thickness over very gravelly glacial drift, most with a very shallow permafrost table. The vegetation is tundra dominated by sedges, mosses, and low shrubs in the coastal plains and deltas, and by sedges, mosses, lichens, and low shrubs in the Brooks Range and arctic foothills.

IQ 7, occupying broad valleys, piedmont plains, and uplifted coastal plains and consisting of poorly drained, shallow, very gravelly materials often covered with silty sediment, resting over permafrost. The vegetation is tundra dominated by sedges, mosses, lichens, and low shrubs.

IQ 24, poorly drained or well-drained soils with permafrost, formed in colluvial material from local rock or glacial till, occupying areas in parts of the Brooks Range, at elevations from 1,500 to 6,000 feet on high ridges and in narrow valleys. Vegetation consists of low shrubs, sedge tussocks, and mosses on ridge slopes, low shrubs, *Dryas*, grasses and lichens on ridgetops, hilltops, and steep southfacing slopes. Two small copses of white spruce are located in this zone.

Major Drainages Within the Monument

Drainage systems provided prehistoric and historic-era Northwest Alaskans with a number of important things, including fresh water in the summertime, and freshwater resources such as a variety of fish. Drainages provide sheltered locations for camps, dwarf deciduous species such as willow for tent construction and for fires, and chert stream cobbles for tool and weapon manufacture. The

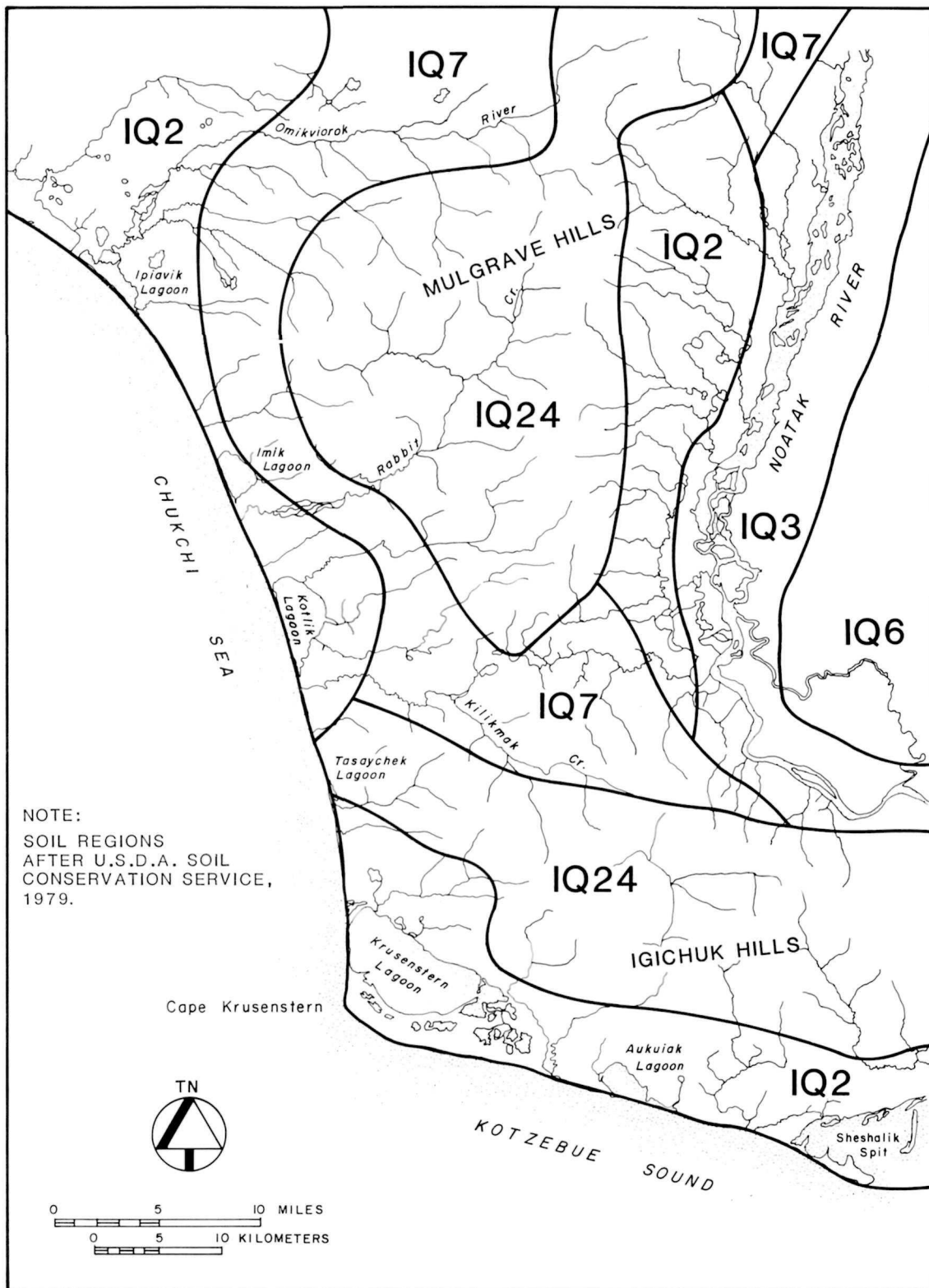


Figure 13. Major soil types found in the Cape Krusenstern National Monument.

Cape Krusenstern drainages provided a topography favorable for caribou drives. They probably were also good locations for hunting musk ox and Dall sheep.

Rabbit Creek and the Omikviorok River are the major drainages for the Mulgrave Hills in the northern part of the monument. Smaller drainages located there include Jade Creek, New Heart Creek, Agagrak Creek, and Umagatsiak Creek (Figure 5). All of these drainages flow westward, ultimately into the Chukchi Sea; and many of them provide good access to the foothills, as well as easy travel corridors across the Mulgrave Hills to the Noatak River.

The Noatak River is not located within the Cape Krusenstern National Monument boundaries. However, Hopkins (1977) identified a relict river course of the Noatak that lies between the Mulgrave Hills and the Igichuk Hills. Rank one and two streams originating on the east side of the Mulgrave Hills and the Igichuk Hills within the monument flow into the Noatak River.

Kilikmak Creek, Evelukpalik Creek, Milokrawlok Creek, the Tukrok River, and the Situkuyok River are the major drainages for the Igichuk Hills in the southern portion of the monument. The Situkuyok River joins Milokrawlok Creek and the Tukrok River before flowing into the Chukchi Sea.

The Omikviorok River and its branches and relict meanders crisscross the Wulik Lowlands in the northwest corner of the monument. Channels of the river drain into Ipiavik Lagoon, as well as into the Chukchi Sea.

The Modern Arctic Environment

The arctic ecosystem is affected by a unique physical environment resulting from the small amount of effective thermal or solar radiation received during a relatively brief summer season (Stager and McSkimming 1984:27). Because it lacks a long enough period of summer warmth, the arctic is an area of unrelenting permafrost, and the ground thaws only to a certain depth in varying degrees in different areas. Subsurface, the frozen soil prohibits surface drainage, causing numerous temporary thaw lakes and ponds to form at lower elevations. The arctic also lacks boreal forests because of the short period of warmth and sunlight. Vegetation is characterized by tundra communities, and deciduous growth is limited to shrub varieties of willow, alder, and birch that can most often be found adjacent to streams and rivers.

Climate

The climate in the Cape Krusenstern region is maritime during the part of the year that it is dominated by the influence of Kotzebue Sound and the Chukchi

Sea. At that time, it is usually cloudy and frequently foggy. (USDI-National Park Service 1986a:28-29).

Summer is confined to a brief three-month period (June, July, August), during which temperatures vary between 43 F and 53 F, with extreme highs in the mid 80s and extreme lows in the 20s. Freezeup comes in October, when the climate becomes more continental. Winter months are October through April, with breakup occurring in late May or early June. Winter temperatures average from -40 to 0 F, with an extreme low of -52 F recorded for February 1980. Wind chill pushes winter temperatures even lower (USDI-National Park Service 1986a:28-29).

Annual precipitation measured at Kotzebue amounts to only about nine inches. Most of it falls between July and September as a result of marine influences and warm, moist air being carried into the area by winds from the southwest. Annual snowfall averages less than 50 inches, and snow can occur ten months of the year. Due to the winds, snow tends to drift deeply in some locations, such as along river drainages, leaving other areas relatively snow-free (USDI-National Park Service 1986a:28-29). The modern yearly prevailing winds at Cape Krusenstern come from the east, except from May through August, when they come from the west, and in December, when they come from the northeast (NOAA 1982:2).

The Nature of the Resource Base

In order to understand the relationships of Native Northwest Alaskans with their natural environment, it is helpful to know something about arctic ecosystems. The ecosystems of high latitudes have several unique characteristics (Freeman 1984:). Some scientists regard these ecosystems as relatively recently established, since the final retreat of the glaciers only took place around 10,000 years ago. They believe it is the reason that relatively few species are represented in the Arctic.

Other scientists argue that the relative lack of species diversity may be due to the relative infertility of the arctic soil, aridity, short growing seasons, and high winds, resulting in a rather homogeneous shrub vegetation. A lack of variation in plant species results in a lack of diversity among animal habitats and thus a low number of animal species in the arctic. As a consequence, the ecosystem is unstable and population levels, especially among terrestrial mammals, fluctuate (Freeman 1984:).

Freeman (1984:) has defined three ecological subsystems: terrestrial, marine, and freshwater.

1. Characteristics of the terrestrial subsystem include a low availability of nutrient supplies, which represents the primary limiting factor to

production of plant and animal material in the arctic terrestrial environment during the growing season. First, arctic soils are impoverished and underdeveloped because soils do not become warm enough to sustain the activity of soil-producing decomposers. Second, arctic climates are extremely arid. Third, the amount of arctic thermal radiation is extremely variable seasonally.

Within the terrestrial arctic environment, as elsewhere, there is geographic variation in productivity. Additionally, there is year-to-year variation in the numbers of organisms present at any given locality. These factors result in an unstable faunal resource base. Some of the contributing elements include variability of food available, variation in ice or snow cover, variable mortality rates, and for land mammals, variability in predator numbers and behavior. Arctic animals tend to have broad tastes in food, making them more highly adaptable to areas of sparse resources (Freeman 1984:42). The caribou, for example, appears to be a most plastic animal that has been present for thousands of years. Caribou bone was found in Trail Creek Caves in a late Pleistocene stratum that has been radiocarbon dated to 7120 B.C. (Larsen 1968:71,74).

2. One characteristic of the marine subsystem is the occurrence of seasonal migrations of often substantial numbers of sea mammals and fish into the region's seas. Another is that marine food chains in arctic regions are short, with huge sea mammals such as baleen whales feeding on plankton. Additionally, many species grow slowly and reproduce at a relatively low rate, thereby requiring no greater food base than species that mature quickly and have high reproductive rates. While there is less diversity among faunal species than in temperate zones, there are often large numbers of individuals in the species represented in the arctic. At the same time, most animal species grow to be larger and live longer than those found elsewhere. Finally, sea mammals replace anadromous and ocean-dwelling fish in relative abundance, in comparison to subarctic marine ecosystems (Freeman 1984:39).

3. The freshwater subsystem is comparatively lower in productivity than it is in the temperate areas. It probably has been the least important of the three subsystems to humans living in the Cape Krusenstern region over time. However, there is ethnographic and archeological evidence that inhabitants and seasonal visitors in the region have used this subsystem. Fishing for freshwater fish in the region of Cape Krusenstern has been pursued historically and prehistorically (Freeman 1984:40-41; Giddings and Anderson 1986).

Vegetation

Modern plant communities within the monument and the NHL have been generalized into four broad categories for the purposes of this study. Today they consist of moist tundra, wet tundra, patchy alpine tundra, and closed spruce hardwood forests (Viereck and Little 1972) (Figure 15).

1. Alpine tundra communities are found in the mountainous areas of the monument, including the Kakagrak, Igichuk, and the Mulgrave Hills, on well-drained, rocky ridges where the soils are usually coarse, stony, and dry. Vegetated areas are interspersed with widespread areas of barren soil and rock debris. Sometimes these bare areas are the product of cryoturbation. Plants common to this windswept environment include mountain avens, willows, and heather (Viereck and Little 1972). Lichens, true mosses, grasses, sedges, and a few herbs are also common. Cushion plants appear to be more typical of the drier, more rocky areas (Figures 16, 17).
2. The wet tundra plant community occurs as a mat, rather than as tussocks, and is commonly associated with many small thaw lakes and ponds. Several species of grasses and sedges dominate. Woody and herbaceous plants may often occur in drier localities such as the rims of low-centered polygons or the centers of high-centered polygons. Associated species include cotton grass, lousewort, and buttercup in wetter locations, and purple mountain saxifrage in drier locales (Viereck and Little 1972).
3. Moist tundra is the most extensive vegetational type within the monument. This plant community is particularly common to foothill areas and varies from an area of almost continuous and uniformly developed cotton grass tussocks to areas where dwarf shrubs dominate. Plants commonly associated with cotton grass include dwarf arctic birch, willows, Labrador tea, mountain avens, bistort, saxifrages, and lichens and mosses (Viereck and Little 1972). In addition, the moist tundra community includes tidal flat, coastal beach, and dune salt-adapted species, as well as stream-mouth vegetation. Former beach ridges typically have a thin mat of crowberry with scattered patches of dwarf arctic birch or low shrub willow. Lyme grass is common to the sandy coastal dunes of the monument. Saltgrass meadows are found near stream mouths and across tidal flats. Such meadows are dominated by halophytic sedges and grasses (Figures 14, 18, 19).
4. Closed spruce-hardwood forests or white spruce forests are found adjacent to the Noatak River and in the southwestern part of the monument on southfacing slopes where drainage is good and permafrost is not severe. These stands may also contain shrubs of rose, alder, and willow. The forest floor is usually carpeted with a thick moss mat (Figure 20).



Figure 14. Coastal dune vegetation.

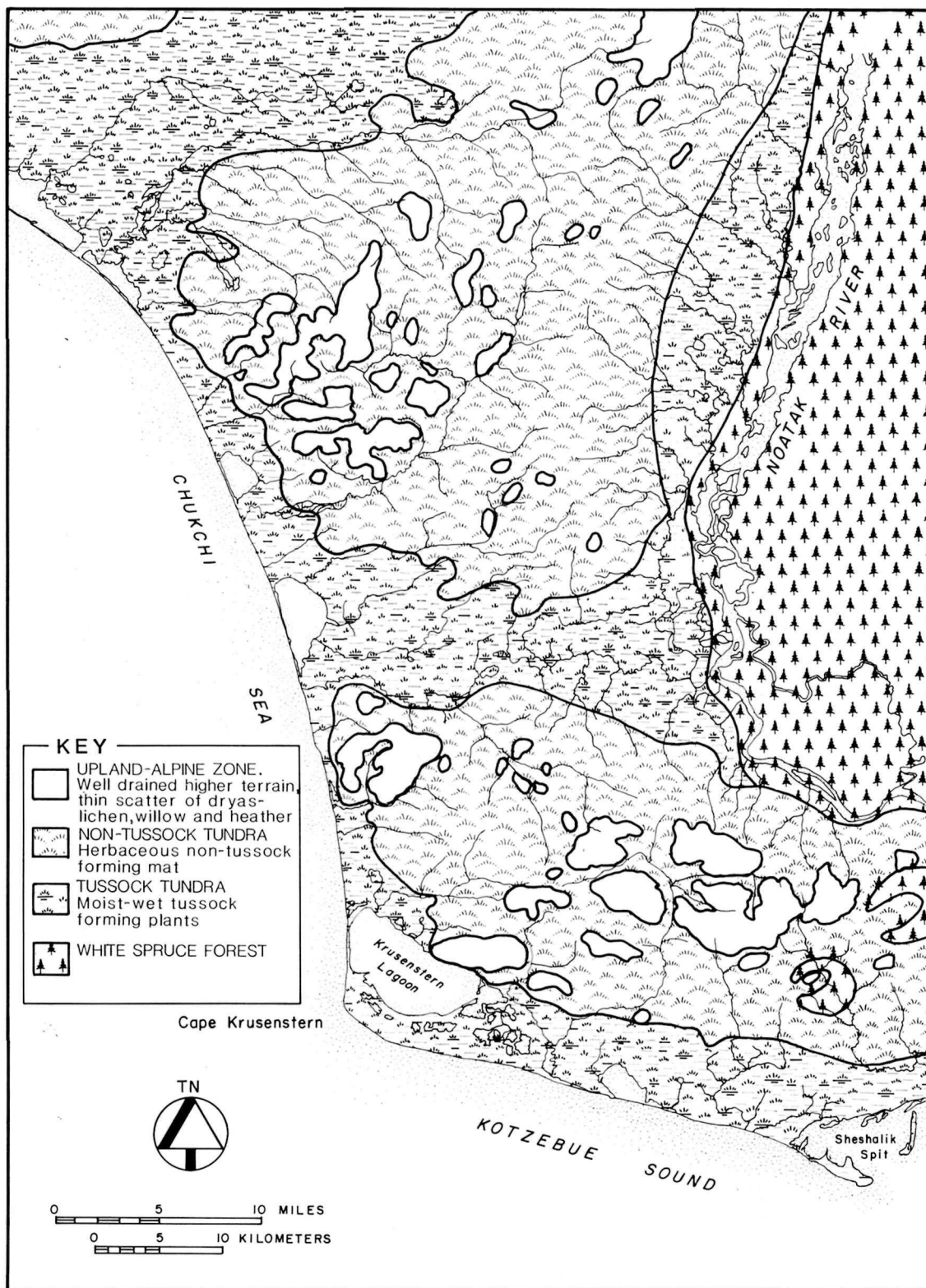


Figure 15. Vegetation zones in Cape Krusenstern National Monument.



Figure 16. Upland Alpine *Dryas*-lichen community.



Figure 17. Alpine mat and cushion tundra.



Figure 18. Coastal tussock tundra vegetation.



Figure 19. Coastal tussock tundra vegetation.



Figure 20. East slope of the Igichuk Hills. White spruce forest covers the hill flanks.

Modern Fauna

Animal life of the monument includes many terrestrial, marine, and freshwater species that are important in the subsistence economies of local Natives today. Terrestrial mammals include, but are not limited to, caribou, grizzly bear, musk ox, moose, Dall sheep, wolf, fox, weasel, and wolverine. Few are considered to be "resident" species, due to the migrant nature of some and population fluctuations of others based on the seasonal availability of food resources from year to year (Erikson and Hettinger 1983; Uhl and Uhl 1977:43).

Caribou in the monument are part of the Western Arctic herd that ranges over the entire northwest Alaska region. During recent years, as many as 60,000 caribou have been recorded moving through the monument, with many wintering along the Wulik and Kivalina drainages and in the Mulgrave Hills (USDI-National Park Service 1986). Caribou movements are widely varying and unpredictable. During their migration, herds might be deflected by large wolf concentrations or other factors; or numbers of animals may not take part to the fullest extent in the larger portion of the herd's movements (Hemming 1971:8; Uhl and Uhl 1977:45-47). Consequently, the annual routes of migration are irregular.

The caribou, which, according to the archeological record, has always been a primary resource of the Native people, declined sharply in the mid-1800s (Uhl and Uhl 1977:44). Reasons given for their disappearance vary. Some argue that the introduction of firearms to the Eskimos was an important factor (Dall 1870; Ray 1975:174; Skoog 1968; Powers et al. 1982; Harritt 1988:14). Others have suggested that normal mechanisms such as shifts in migration routes or cyclic fluctuations in population sizes may account for the depopulation (Ray 1975:174; Uhl and Uhl 1977:45-47).

The moose population has expanded its range into the monument in recent years. Before that, moose were rare or completely absent. Uhl and Uhl report that moose were generally not there until 1947 (Uhl and Uhl 1977:51). Moose bone was found in prehistoric-era cultural deposits at Trail Creek Caves, evidence of their prehistoric presence on the Seward Peninsula (Schaaf \1988:11).

In 1946 the archeological investigation of a cave in the Kivalina area yielded some recent-appearing faunal remains that included the skull of a young musk ox, documenting their presence in that vicinity. Unfortunately, the remains were never dated. The indigenous musk ox became extinct in Alaska in 1865. They were reintroduced in the Cape Thompson area, 60 miles northwest of the monument, in 1970 and again in 1977 (USDI-National Park Service 1985b:2-33). Today musk ox are present in the monument in small numbers and appear to have established their winter range in the Rabbit Creek drainage. A solitary musk ox was recently seen on upper Rabbit Creek in June.

Dall sheep probably inhabited the mountainous regions of the monument during prehistoric times. The remains of Dall sheep, specifically a horn core and a horn attached to a portion of the skull, were identified from two late prehistoric houses at site NOA-002, located at Cape Krusenstern. No date is available. The fact that the horn was still attached to the skull suggests that the animal probably was taken locally rather than gotten through trade from another area (D.D. Anderson, personal communication 1989). Sheep horn was used prehistorically to make implements, and ethnographic reports document the traditional value placed on Dall sheep skins for use in making parkas and inner clothing (Uhl and Uhl 1980).

The absence of Dall sheep was noted during historic times, but herds recently have re-established themselves in the eastern part of the monument. Their presence during modern times is also documented for the Baird and De Long mountains (USDI-National Park Service 1985b:2.34).

Grizzly bears are not plentiful, but commonly are found along the drainages and the shoreline. Wolves inhabit the major drainages. Red fox and arctic fox are present in large grassy areas, where they prey on an abundant population of voles and arctic ground squirrels. Snowshoe hares are found in timbered areas of the Igichuk Hills and among large patches of willow near the coast. Porcupines are reportedly numerous in timbered areas or occasionally along beaches. Wolverines have been noted, but their population is limited (USDI-National Park Service 1986a).

Marine mammals that live in the coastal waters surrounding Cape Krusenstern National Monument include the polar bear, spotted seal, ringed seal, bearded seal, harbor seal, Stellar sea lion, walrus, bowhead whale, finback whale, gray whale, beluga whale, and harbor porpoise (USDI-National Park Service 1986a). From 1848 until 1885, American whaling ships in the Bering Sea took up to 10,000 right and bowhead whales and from 1848 to 1885, killed more than 100,000 Pacific walrus. Today, bowhead, gray, and finback whales are seen in the waters of the Chukchi Sea; but walrus were still uncommon off Cape Krusenstern in the 1960s (Foote 1964a:18, USDI-National Park Service 1986a:48).

The Bering Straits region is an important flyway through which many species of waterfowl migrate and along which numbers of them nest. Waterfowl hunting and egg gathering are important subsistence activities in the monument. Species at Cape Krusenstern include a variety of ducks, the Canada goose, snow goose, American widgeon, American pintail, horned and red-necked grebes, and three types of loon. The tundra swan and tundra sandhill crane are the largest birds in the monument. Other bird species include the long-tailed jaeger, common murre, arctic tern, willow and rock ptarmigan, goshawk, snowy owl, golden eagle, and arctic peregrine falcon (USDI-National Park Service 1986a).

The coastal and inland waters of the monument support a large variety of fish. Four species of whitefish appear to be the most important to subsistence users



Figure 21. An adult caribou skull.

today (Uhl and Uhl 1977:10-11). The species that is second in importance is arctic char, which is at Sheshalik Spit and in several creeks of the monument. Arctic grayling are common in many creeks. Kotzebue Sound has all five species of salmon, but only chum salmon have been reported in significant numbers. King, pink, red, and chum salmon are in both the Wulik and Noatak rivers. Rabbit Creek has small runs of chum and pink salmon (Resource Analysts 1983). Northern pike are present in streams south of Krusenstern Lagoon and east to Sheshalik Spit, while burbot may occasionally be found in the same areas (Alaska Department of Fish and Game 1978). Dolly Varden are known to spawn in Rabbit Creek, and herring spawn in Krusenstern Lagoon and in the shallow coastal waters north of Sheshalik Spit. Sheefish overwinter in the same waters. Cod, smelt, flounder, sculpin, and stickleback are present off the coast of the monument.

Pleistocene Faunal Assemblage

Paleontological and archeological sites in the region have established that a number of extinct species of Pleistocene animals were present. Some of them were present on Beringia, and some of them were ancestors of modern species living in the area today (Guthrie and Matthews 1971; Péwé 1975; Guthrie and Guthrie 1990).

Mammal species, documented by fossil remains in paleontological and/or archeological sites, included caribou, bison, mammoth, the American mastodon, horse, saiga antelope, two species of extinct musk oxen and the modern tundra musk oxen, camel, Dall sheep, stag moose, wapiti, beaver, short-faced bear, badger, lynx, a yak-like bovid, ground sloths, and possibly brown bear. The earliest appearance of woolly mammoth is uncertain, though it appears they were extinct throughout North America by about 10,000 years ago (Harington 1980; Larsen 1968).

Bison may have lived in Alaska from middle Pleistocene times until some 500 years ago, according to Guthrie and Guthrie (1990). Early Pleistocene deposits near Cape Deceit have yielded the earliest remains of caribou in North America, as well as the remains of wapiti and horse (Guthrie and Matthews 1971; Harington 1980). Guthrie and Stoker (1990) have presented evidence for the presence of large numbers of horses on the North Slope of Alaska during the Duvanny Yar Interval, ca 17,000 years ago, in an environment that provided them excellent winter forage. According to Hopkins (1983), horses disappeared from the region during an unnamed late Pleistocene-early Holocene interval that Hopkins calls the Birch Zone (ca 14,000 B.P.). The caribou population increased during the same time period.

NOA-160 contains the remains of mammoth, caribou or moose, and giant bison or horse. It is the only site of its kind known to exist within Cape Krusenstern

National Monument and National Historic Landmark. While there are no known cultural remains associated with the animal bones, the site has not been tested, and may offer a rare opportunity for archeologists and paleontologists.

Paleoenvironment

Several lines of evidence (for example, linguistic, osteological, and artifactual) point to Northeast Asia as the place Native American people originated and to Beringia as their area of entry into North America. The major question remaining for New World archeologists concerning the arrival of Native Americans is the timing of their entry into the Americas. In order to give this question due consideration, it must be studied against the backdrop of a late Pleistocene-early Holocene environment.

The Pleistocene is a geological epoch, the first one in the Quaternary period of the Cenozoic era. The Pleistocene is characterized by the great expansions and contractions of the continental ice sheets, and it is also the epoch during which modern people emerged. The Holocene is the most recent geological epoch, during which environmental conditions became essentially those of today.

Hopkins (1982:4-11) provided data for the glaciated and unglaciated parts of Beringia during the Wisconsin climatic cycle, the last periods of glaciation during the Pleistocene. There are four major environmental phases, referred to as intervals, during the Wisconsin period. A glacial interval refers to an environmental phase in an unglaciated area of Beringia:

1. Happy Interval (to 60,000 or 80,000 B.P.). Between 75,000 and 60,000 B.P. there was corresponding major glaciation and a dramatic lowering of global sea level.

During the periods when glaciers were at their greatest extent, the landmass known as Beringia was exposed. In addition, the response of the sea level and of coastal elevations may have been further complicated due to tectonic and isostatic movements throughout Beringia. Tectonic movement is attributable to movements of the plates under the earth's crust, causing earthquakes and volcanic eruptions. Isostatic movements include uplifting or rebounding of the earth's crust after heavy glaciers have melted away. A measure of some geomorphological changes has been given by Hopkins (1967), who indicates that a lowering of the sea level by 50 m would have exposed two narrow land connections between Siberia and Alaska, while a lowering of the sea level by 100 m would have exposed a 1280-1600 km-wide landmass.

2. Boutellier Interval (80,000 or 60,000 to 30,000 B.P.) This period was an interstadial, or a lengthy period of climate in the middle range. Glaciation

in Beringia was generally less than in previous periods. Much of Beringia was inundated by rising seas. Radiocarbon dates for the Boutellier interval range from 29,600 \pm 460 (GSC-779) to more than 49,000 years (Y-148) (Hopkins 1982:7).

3. Duvanny Yar Interval (30,000 to 14,000 B.P.). The corresponding Walker Lake Glaciation in the Brooks Range began with extensive ice buildup that slowly receded by the end of the interval. Around 30,000 B.P. the climate was predominantly cold and arid, according to some researchers (Ritchie and Cwynar 1982; Ritchie 1984). They suggest that the pattern may have persisted until 14,000 B.P. or later.

Guthrie and Stoker (1990) presented data from horse remains recovered from the unglaciated North Slope of the Brooks Range dating to Duvanny Yar times. The remains suggest very favorable environmental conditions for horses there, offering high winter range quality at the height of the glacial period (Guthrie and Guthrie 1990).

Once again, world sea levels were significantly lower during this period, and Beringia was exposed at the beginning of the interval. Around 18,000 B.P. summers were cooler and drier in Eastern Beringia than in the west, and they were cooler and drier than at present (P. Anderson 1988:274-275).

During the Duvanny Yar Interval in what is today Alaska, spruce became extinct, but cottonwood and perhaps aspen may have survived in limited distribution (Hopkins 1982:9). The vegetational regime for eastern Beringia during the Duvanny Yar Interval has been described by Anderson as a complex mosaic of tundra types, featuring a mesic tundra in Northwest Alaska. Toward the end of the interval, sea levels gradually rose for a final inundation of Beringia.

4. Unnamed Interval (14,000 to 8,500 B.P.). During this period, glaciers continued to melt and there was a transition to climatic and geomorphological conditions as we generally know them today. The end of the Pleistocene saw a rapid change in environment.

At the end of the Duvanny Yar Interval, there appears to have been a period when erosional processes dominated the scene. Silt deposited in what is now central Alaska by 30,000 years ago became gullied, and alluvial fans formed. The earliest thaw lake deposits appeared; and river terraces were established at this time, probably indicating an increase in precipitation, including rain and snow. At this time glaciers apparently retreated rapidly, perhaps due to increasingly warm summers (Hopkins 1982:9).

Around 12,000 B.P., the summer temperatures and precipitation in Beringia increased, as indicated by a replacement of herb tundra by *Betula* shrub tundra. Eastern and Western Beringia were less varied than previously, but the eastern portion was probably cooler and drier than the western portion (P.Anderson 1988:274-275).

The Bering Sea was flooded finally by around 15,500 B.P., at which time only a narrow isthmus remained of Beringia. Final inundation and separation of Northeast Asia and western North America took place by 14,400 B.P. By 12,000 B.P., St. Lawrence Island was separated from the Alaska mainland, and the sea level continued to rise for at least 2,000 years more (Hopkins 1982:14).

By 9,000 B.P., summer temperatures were slightly warmer and precipitation was lower than today in Eastern Beringia (P. Anderson 1988:274-275). *Picea* migrated to western Alaska between 9,000 and 4,000 B.P., while *Alnus* migrated eastward across the foothills of the Brooks Range between 9,000 and 6,000 B.P. (P. Anderson 1988:274).



Figure 22. An *inuksuk* at NOA-143, Cape Krusenstern National Monument.

PART TWO: THE CULTURAL ENVIRONMENT

Overview of Existing Models of the Region's Culture History and Cultural Chronology

This overview follows the cultural sequence recently presented by J.L. Giddings and D.D. Anderson (1986), which is based on their extensive work in and around the monument. Reference is also made to the synthetic summaries of Dumond (1987a; 1980; 1990), and relevant recent research by Hall, Gerlach, Gal, McClenahan and Gibson, and a few others. Meanings of the terms "tradition, cultural complex, and cultural period" closely follow those used by Giddings and Anderson (1986) unless otherwise indicated. Figure 23 depicts the cultural and environmental history of Northwest Alaska.

The First Inhabitants of the New World. The timing and circumstances of the appearance of humans in the New World have been important issues to archeologists for many years; and they continue to be key research topics (D.D. Anderson 1984:80-81; Jennings 1983:25-43; Dumond 1983:72). Archeological data from Northeast Asia, combined with knowledge of the existence of the Beringian landmass during extended periods of the Wisconsinan glaciation, suggest that humans could have been present in northwest arctic North America by at least 20,000 B.P. Knowing the details of Native North American people's arrival is important for a complete picture of their culture history from a pan-global perspective.

Current research suggests that the New World was peopled sometime between 12,000 and 40,000 years ago (Bryan 1978; Irving 1985; Dillehay and Collins 1988). However, few firmly dated, well-documented archeological sites exist in the Americas that have pre-12,000 B.P. dates. Archeological excavations at Meadowcroft Rockshelter in Pennsylvania have yielded materials from which the most credible series of early radiocarbon dates in North America have been derived. Datable samples comprised of materials from a hearth and a carbonized fragment of plaited birch bark basketry have provided dates of 19,650 +/- 2,400 B.P. and 19,150 +/- 800 B.P. for stratum IIA. Found in the same stratum were three prismatic flakes, one chipped biface and one flat prismatic flake that has been modified (Adovasio et al. 1975). Challenges of the data include arguments that the radiocarbon samples were contaminated by groundwater and that the environmental data have yielded pollen and sedimentary evidence for the existence of a Holocene rather than a Pleistocene environment at the time of the cave's earliest occupation (Dincauze 1984).

The Monte Verde site in Chile, excavated by Dillehay and Collins (1988) provided data suggesting human occupation of South America 13,000 years ago and possibly as early as 33,000 years ago. Preliminary findings reported by Dillehay (1989:11-18) describe the site as "a planned settlement" on the banks and terraces of

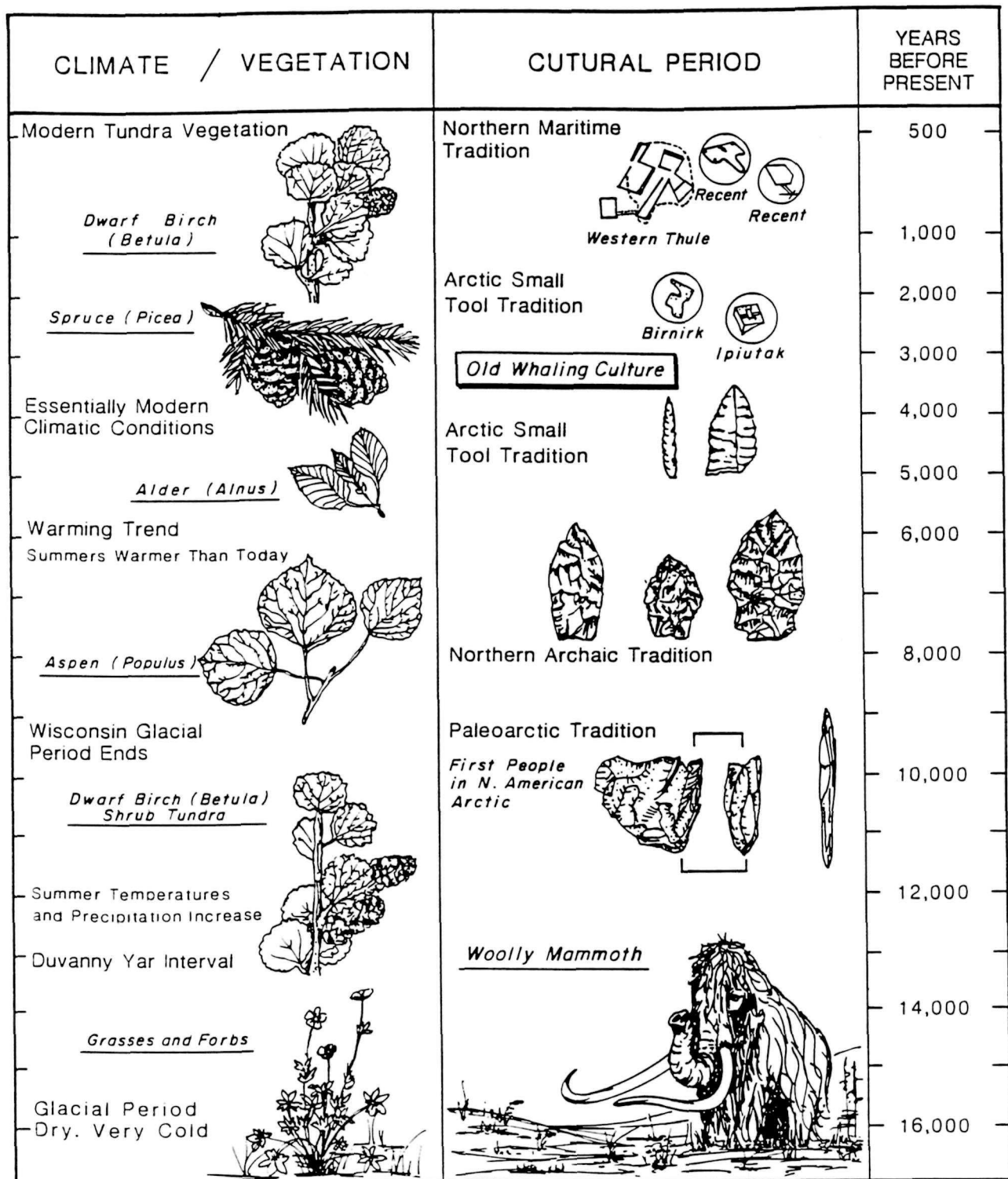


Figure 23. A cultural and environmental history of Northwest Alaska.

Chinchihuapi Creek in central Chile. Excavators located four distinct zones of buried cultural remains and estimate that the site covers some 800 m². The site includes 11 or 12 rectangular foundations and the fallen pole-frames of residential huts. Internal features include shallow, clay-lined cooking pits. Artifactual remains consist of organics, including hide fragments and plant remains, and chipped, pecked and ground stone tools.

Recently Lynch (1990:26-27) voiced skepticism that the site is really pre-Clovis in age or that it is even a site. His objections are based on several considerations. First, he claimed that the site has produced few artifacts. Many of the lithic items show little evidence of modification. Lynch had questions regarding the depositional history of the cultural materials. Additionally, he considered the site to be in an unfavorable location. Finally, Lynch did not consider the site to meet the requirement of replication. That is, no other sites of the same age and type are known for this region.

Dillehay and Collins (1991:333-341) responded to Lynch's concerns, providing plausible arguments for the validity of the 13,000 B.P. cultural component. Dillehay and Collins agree that many questions remain unanswered about the 33,000 B.P. component. Nevertheless, the archeological community awaits a final report of results on Monte Verde.

A Pre-Paleoarctic tradition? (30,000-11,500 B.P.). There is as yet no conclusive evidence for the presence of humans in the Alaskan arctic before 12,000 years ago. A number of arctic sites offer archeological evidence that suggests an early human presence.

Four sites located in the Nenana Valley were radiocarbon dated between 11,000 and 12,000 B.P. They are Dry Creek (HEA-005), Walker Road (HEA-130), Moose Creek (FAI-206), and Owl Ridge (FAI-091). The Nenana complex was identified and described from the data derived from these sites. Taken together, the sites are characterized as possible occupations by PaleoIndian populations with a toolkit that most closely resembles Clovis assemblages, belonging to early people who inhabited temperate North America some 10,000-11,500 years ago. All these sites are similarly situated on high, well-drained southfacing terraces affording excellent views of streams, especially of tributary stream confluences (Goebel and Powers 1989; Powers and Hoffecker 1989).

Characteristic artifacts of the Nenana complex assemblages include a variety of projectile points, including lanceolate bifaces with concave bases, small triangular points, and teardrop-shaped points referred to as Chindadn points (Cook 1969). Additionally, the assemblages include modified flakes and blades, cobble tools, perforators, and wedges (Goebel and Powers 1989). The most striking way that the Nenana complex assemblages differ from those of Clovis assemblages is the lack of the characteristic Clovis fluted points.

Trail Creek Cave number nine, located on the Seward Peninsula, is another site offering evidence that might support an argument for the early presence of people. From the lower or clay layer just outside cave number nine came a horse scapula and a bison calcaneus that were dated to 13,800 B.C. +/- 350 (K1210) and 11,120 B.C. +/- 280 (K1327) (Larsen 1968:62-63). Larsen has suggested that the calcaneus was broken by humans to extract fat and marrow. No features or diagnostic artifacts were found in association with the bones. However, a low stratum located outside cave two at Trail Creek has yielded a fragmentary, crude chalcedony projectile point. The two strata are thought to be of approximately the same age (Larsen 1968:75). Some evidence that may also argue for the presence of a pre-Paleoarctic cultural tradition at Trail Creek is found in the occurrence of stemmed projectile points that have analogs in a similar Paleolithic assemblage in northeast Asia (Dikov 1985:176).

A number of fluted projectile point finds in arctic Alaska have prompted some researchers to argue for the inclusion of these sites in a big game hunting tradition that existed over most of temperate North America between 12,000 and 8,000 B.P. (Dumond 1980, 1983:75). Other Arctic specialists disagree, arguing that they are more closely related to Arctic cultures (D.D. Anderson 1984:81). In spite of these intriguing threads of data, there is no evidence of any people living in the monument before approximately 11,500 B.P.

The Paleoarctic tradition (11,500-8,000 B.P.). The American Paleoarctic tradition is the oldest well-documented archeological tradition in Northwestern Alaska, first identified among the Akmak and Kobuk assemblages from the Onion Portage site on the Kobuk River (D.D. Anderson 1968, 1970b). Lifeways of the Paleoarctic tradition people are known in Alaska primarily from ephemeral hunting camps (Figure 24). The most important stratified archeological site containing Paleoarctic tradition cultural materials and a possible habitation site is at Onion Portage. Narrow, wedge-shaped microblade cores located in the Akmak tool assemblage dated to 9,570 +/- 150 B.P. and microblades at Trail Creek caves in strata dating to between 800 and 10,000 B. P. have been the basis for arguing that a single late Pleistocene-early Holocene cultural tradition spanned broad expanses of northern Alaska (Larsen 1968; D.D. Anderson 1968, 1970a), where their lifeway is interpreted as that of hunters of late Pleistocene-early Holocene terrestrial mammals, especially grazing herbivores such as bison, mammoth, and horse (Dumond 1983). Some have also suggested that Paleoarctic tradition people used boats for getting ocean and fresh water resources as well (Fladmark 1979).

The "campus-type" cores characteristically produced microblades that are less than 5 cm long (Figure 25). Besides the narrow, wedge-shaped microblade cores (called campus-type microblade cores), characteristic artifacts found in Paleoarctic tradition assemblages include microblades, core tablets (flakes removed from the core's platform to rejuvenate it), unmodified and backed microblade segments, burins, burin spalls, organic projectile points (bone, antler, or wood) fashioned with slots along the sides (in which were set microblade sections), large blades



Figure 24. View from NOA-200, a Paleoarctic tradition site in Cape Krusenstern National Monument.

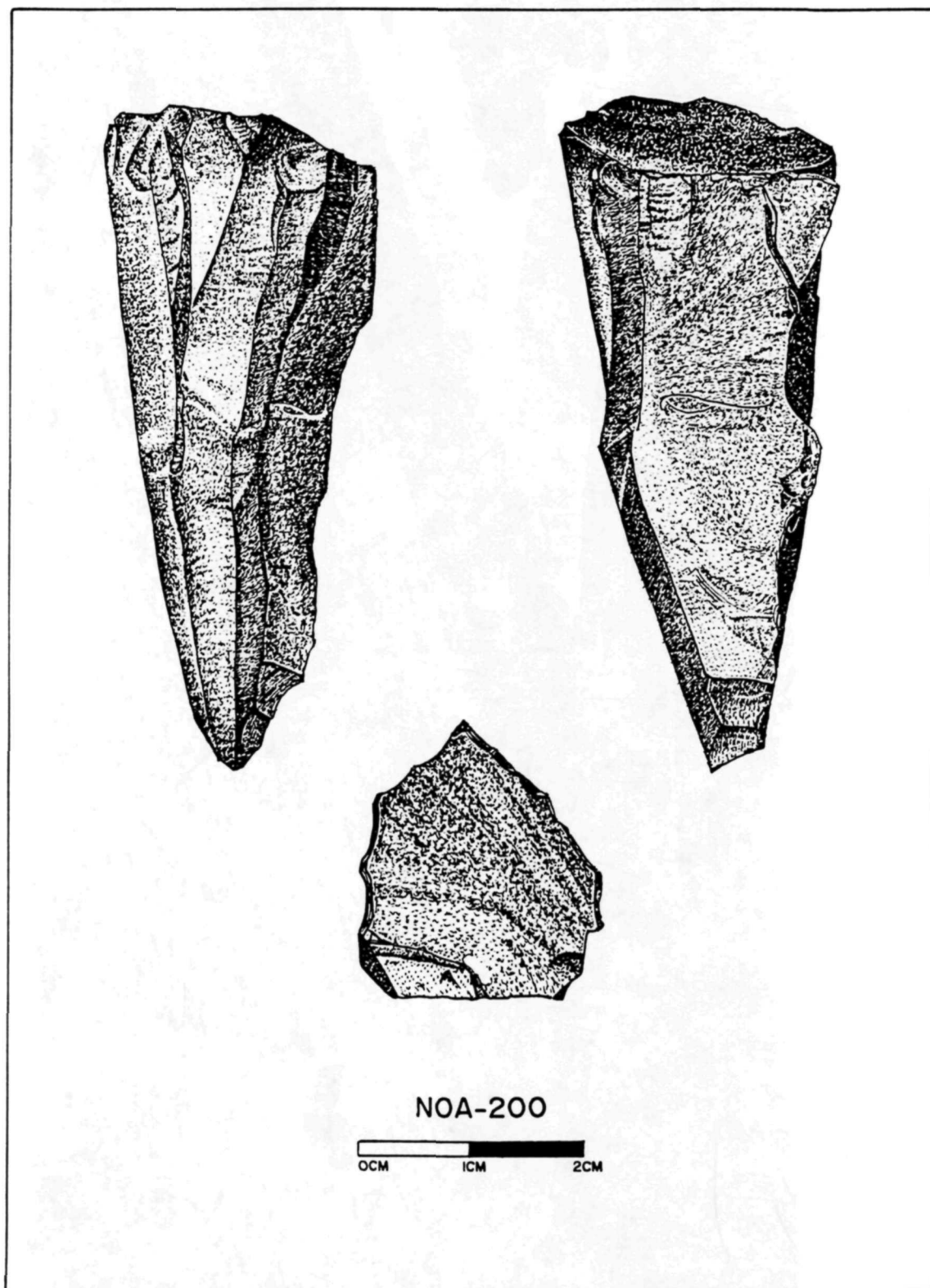


Figure 25. Paleoarctic tradition core from NOA-200.

struck from polyhedral cores, and leaf-shaped or ellipsoidal bifaces (D.D. Anderson 1970b). The Onion Portage site is the only known site with a possible Akmak period habitation. Other known Paleoarctic tradition sites are apparent short-term campsites of caribou hunters or special-use sites, all characterized by broad lithic scatters but no cultural features (Figure 26).

McClenahan and Gibson (1990) and Douglas D. Anderson (1989 personal communication) consider the core illustrated in Figure 25 to be an exhausted campus-type core.

Ackerman (1992 personal communication) identifies it, however, as a core belonging to a "somewhat later tradition intermediate between the Paleoarctic and Northern Archaic traditions." In Southwestern Alaska he calls it the Kagati lake Complex. Core reduction techniques are similar to those employed at Anangula and elsewhere in Alaska.

Several of the techniques for chipping stone tools that can be found in northern Alaska in Akmak have been identified in other parts of Alaska as well. The Ugashik Narrows phase, located on the Upper Ugashik River of the Alaska Peninsula, dates to about 9,000 B.P. and contains wedge-shaped microblade cores, microblades, burins, and leaf-shaped bifaces (Henn 1978; Dumond 1983). Component II at the Dry Creek site (Powers 1983) and some early Denali complex assemblages (West 1975) also appear to belong to this cultural tradition (Dumond 1977, 1983).

Additionally, a number of possible variants that still include diverse elements of the same blade technology from approximately the same time include the Gallagher Flint Station (Dixon 1975), the Anangula site in the Aleutians (Aigner 1978), and the Chindadn complex at Healey Lake (Cook 1969). Dennis Stanford found Akmak-like materials at the Kahraok site near Walakpa, south of Point Barrow (Stanford 1976:16).

Affinities of Paleoarctic tradition assemblages with late Pleistocene northeast Asian cultural assemblages as reported by Dikov (1968), Mochanov (1970), and others led Dumond to propose a Siberian-American Paleoarctic tradition (Dumond 1977). This is one of several schemes. Other researchers have proposed different formulations, for example, Frederick Hadleigh West's Beringian tradition (West 1981) and Douglas D. Anderson's American Paleo-Arctic tradition (Anderson 1970b:69). The cultural tradition was present in northeast Asia before 10,000 B.P., and a cultural interaction sphere existed in northeast Asia and Alaska around 10,000 B.P. or perhaps earlier. Diuktai culture, part of the Paleoarctic tradition in northeast Asia, persisted until 10,600 B.P. in eastern Siberia. Diuktai Cave in the Aldan Valley yielded the remains of mammoth and musk ox, bifacial stone spear and dart points, burins, blades, very specialized wedge-shaped cores, disc-shaped cores, and skreblos. The site was dated at 13,070 +/- 90 and 12,090 +/- 120 B.P. (Chard 1974; Mochanov 1977).

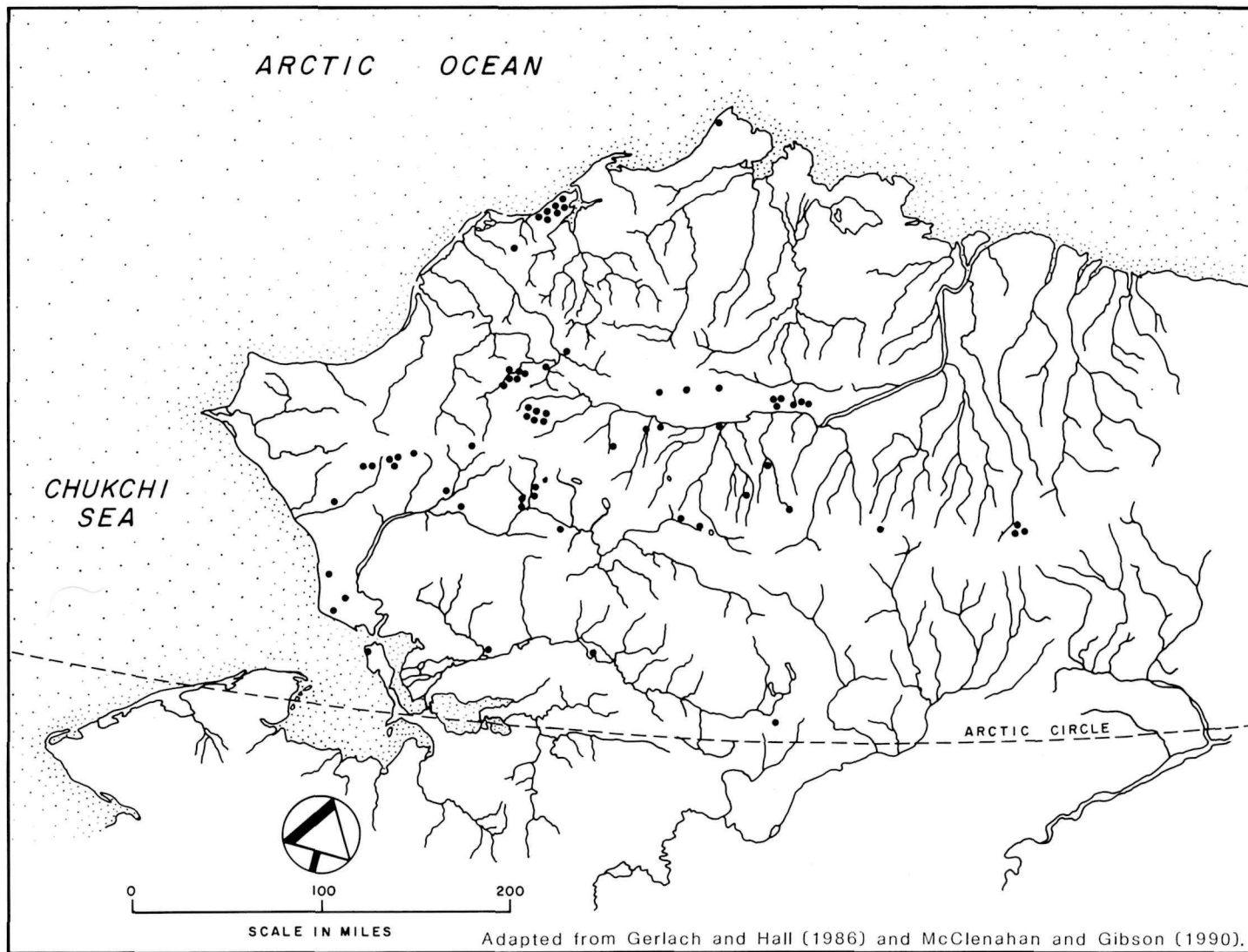


Figure 26. Known Paleoarctic tradition sites in Northwest Alaska.

Concerning typological considerations, the earliest people present in the monument were people of the Paleoarctic tradition. These people were believed to have been nomadic hunter-gatherers who probably gathered wild vegetable foods and hunted land mammals, including the megafauna present in the region at the end of the Pleistocene era. Evidence exists in the form of lithic technology, and researchers draw analogies with related cultures in northeast Asia.

The tradition does not appear to extend eastward into the region that is now Canada, however, due to the massive extent of continental glaciation during that period. Several researchers have attempted to argue for a connection with PaleoIndian cultures of the North American temperate zones, largely based on the fluted points in Paleoarctic tradition collections; but no conclusive evidence for this position exists.

At present, archeologists are unable to explain what appears to be at least a 1,000 year-gap in the archeological record between the disappearance of the Paleoarctic tradition and the first appearance of the Northern Archaic tradition. At present, we know that Northern Archaic people were present around 6,500 years ago at Anaktuvuk Pass in the Brooks Range. The archeological record also places Northern Archaic people at Onion Portage around 6,000 B.P.

A Post-Paleoarctic tradition? A very important archeological site, DEL-166, is north of and adjacent to the monument and the NHL. It was recently excavated by Gerlach and Hall (1986) in conjunction with the cultural resource site mitigation for the development of the Red Dog Mine. DEL-166 has yielded numbers of microblade cores of several different forms, the larger number of them campus-type cores. A near-neighbor, DEL-168, has also yielded cultural materials that typologically may be considered to belong to the Paleoarctic tradition. However, Gerlach considers that some of these materials may represent a post-Paleoarctic cultural manifestation that has not yet been well defined. Other researchers (D.D. Anderson 1970a, 1972; Gal 1982; Schoenberg 1985; Betts 1987) have also addressed this question. However, cryoturbation-affected buried deposits and surface lithic scatters make up the overwhelming majority of cultural deposits that have been available for study of this question to date.

Northern Archaic tradition (6,000-4,000 B.P.). A post-Pleistocene warming trend and post-glacial environment occurred by 6000 B.P. Vegetation achieved close to its modern aspect during this time. At the end of the glacial period, important environmental changes took place that included unalterable changes in the tundra vegetation regime and the subsequent extinction of the megafauna that were dependent on it for food (Guthrie and Guthrie 1990). Pollen data (P.M. Anderson 1985, 1988) and macrofossil data (Hopkins et al. 1981) show a trend toward east-to-west migration of spruce across northern Alaska at about the same time.

Archeological data indicate that some time after 6,550 B.P. the Northern Archaic tradition appeared in the record in Northwest Alaska. Artifactual materials belonging to this cultural tradition were first located by Giddings at the Palisades site (NOA-138) (Figure 27), located in the monument in 1958 (Giddings 1967). In 1959, J.M. Campbell located a related assemblage in Anaktuvuk Pass (Campbell 1961). D. D. Anderson was able to date to 6,000 B.P., by means of radiocarbon dating, a cultural component belonging to this tradition that he recovered from stratified contexts at Onion Portage (Giddings and Anderson 1986:306-310). Other sites belonging to this cultural tradition are found throughout interior Alaska and the southwestern Yukon (Anderson 1988:73; Workman 1978).

Characteristic implements of the earliest complex, called the Palisades complex, include asymmetrical projectile points with deep, wide side notches and generally convex bases, large unifacially modified knives, and flaked endscrapers. Certain changes in some artifact forms took place over time. Some shorter projectile points and notched cobbles that may have served as axes were added to the assemblage. Later, side-notched points were replaced by corner-notched points, and probable net sinkers and some slate tools appeared. Around 4,600 B.P., leaf-shaped points, as well as stemmed points, became part of the assemblage. The Portage complex is recognized around 4,500 B.P., when leaf-shaped points, but no stemmed points were used (Dumond 1983:77).

Rather than being a cultural tradition that has recent ties with Northeast Asia, the Northern Archaic tradition is considered to be a subarctic cultural tradition that was a regional variant of Archaic traditions found over most of temperate North America during the hypsithermal (D.D. Anderson 1988:87; Irving 1953; Mac Neish 1964; Dumond 1976). Anderson concluded that the tradition was one adapted to the boreal forests, which may have reached the coast of the Chukchi Sea in the monument at the time the people of the Palisades site (NOA-138) were present (D.D. Anderson 1968; Giddings and Anderson 1986).

The artifactual materials recovered from the cultural layers at the Onion Portage site that date to the Northern Archaic period do not include microblades. They do have notched, bifacially chipped projectile points, large bifacial knives, thin scrapers, notched stone sinkers, and cobble choppers. During the early period of the Northern Archaic tradition at Onion Portage, projectile points were first notched, then stemmed during the middle period, and straight-based during the latest period of the tradition.

Other assemblages otherwise identified as belonging to the Northern Archaic tradition also contain microblades. Two such sites are Ugashik Knoll (Henn 1978) and Tuktu in Anaktuvuk Pass, previously mentioned (Campbell 1961).

Arctic Small Tool tradition (ca. 4,250 - 1,050 B.P.). In 1948, J.L. Giddings discovered and excavated a stratified site at Cape Denbigh that contained microblades, burins, insets, and other materials in its lowest stratum called the

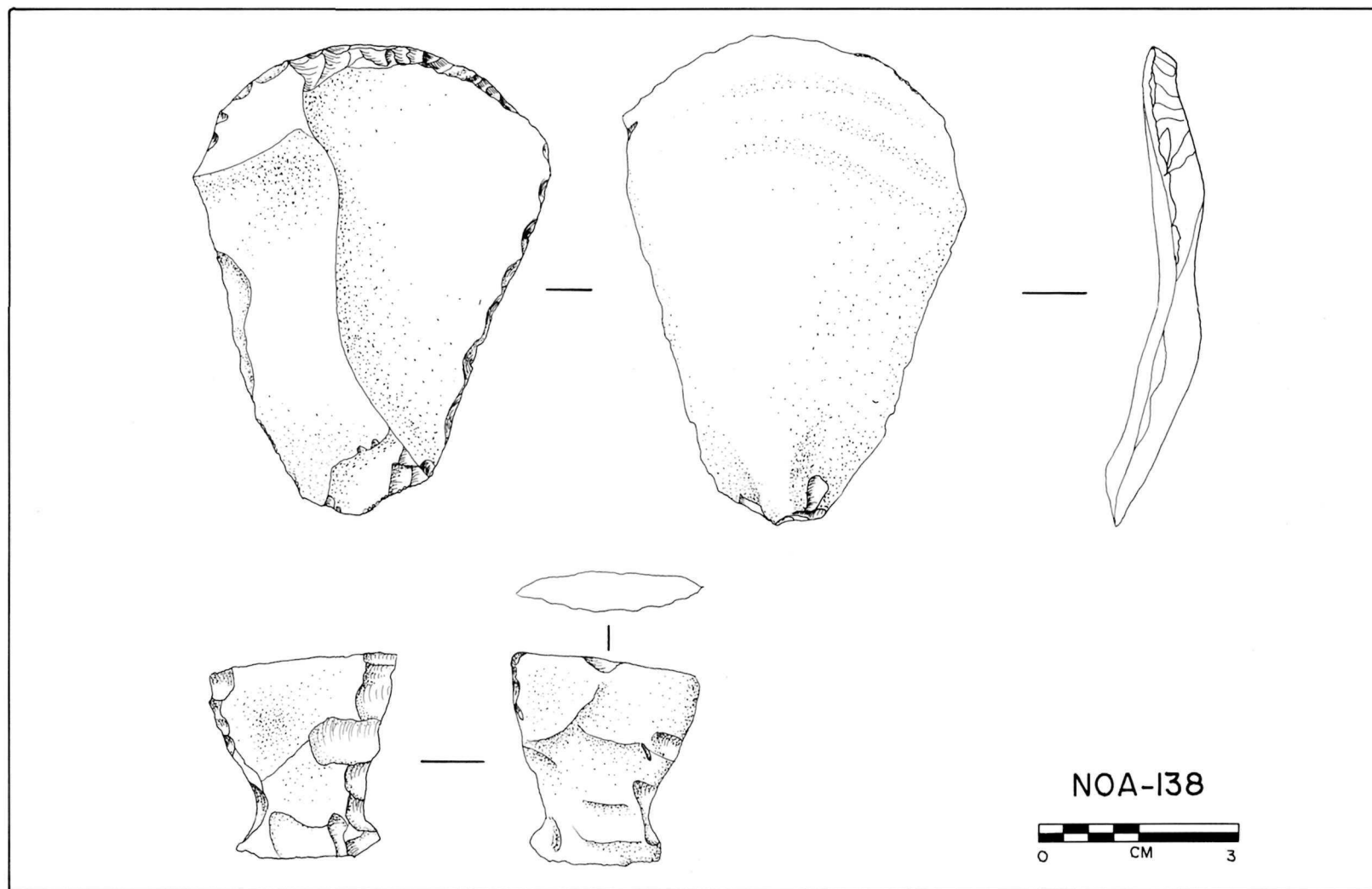


Figure 27. Northern Archaic tradition artifacts from NOA-138, the Palisades site.

Denbigh Flint complex (Giddings and Anderson 1986). Denbigh materials were subsequently identified in a number of other Alaskan sites from the Brooks Range and Northwest Alaska to Southwest Alaska, and in related complexes as far away as Greenland. In 1957 Irving proposed that the designation "Arctic Small Tool tradition" (ASTt) be applied to all Denbigh-like complexes that included remains of this type found at Etivluk Lake in the Brooks Range and in arctic Canada and Greenland.

The ASTt is well represented in the archeological record of Northwest Alaska and has received a substantial amount of study, particularly at Cape Krusenstern. Subsequent usage of the designation has been consistent with the idea "of local expressions of a widespread tradition which is restricted to a specific period (Harritt n.d.b:46; Dumond 1981)." Dumond has offered dates of 4,200-3,100 B.P. for the tradition in its narrow definition (Dumond 1983:78). The cultural tradition features a wide range of tool types, indicating an efficiency and an adaptability to the North American arctic coastal and adjacent tundra environment unknown in the preceding cultural traditions.

ASTt people are the first in the North American far north known to have used consistently both coastal and inland resources. In Alaska, Early Arctic Small Tool tradition sites (those that were originally called Denbigh Flint complex) are found in the interior, where the remains of semisubterranean houses have been located. It appears that terrestrial mammals, particularly caribou, were the subsistence focus of these inland dwellers. Temporary campsites in coastal settings that date to this cultural period have also been identified. The cultural remains at these sites suggest that small sea mammals, particularly seals, were hunted seasonally (Giddings and Anderson 1986).

Anderson advanced dates of from 4,200 B.P. to 3,600 B.P. for the Denbigh Flint complex (Giddings and Anderson 1986). However, Denbigh or Denbigh-related complexes have been dated to as late as 3,100 B.P. or later (Dumond in press). Diagnostic elements of the Denbigh Flint complex include finely made, small implements, including special types of burins, retouched burin spalls, small biface side and end blades, and microblades struck from conical cores. Absent are ground or polished slate implements and pottery. Constructed semisubterranean houses were in the Kobuk River area, the Brooks Range, and the Alaska Peninsula.

The origins of the ASTt are uncertain, but it shares elements of its technology with that of the Siberian "Neolithic." Arctic Small Tool people were adapted to the seasonally frozen arctic coasts, and were the first to use consistently New World coastal resources, expanding across the North American arctic to Greenland and extending in Alaska to the Alaska Peninsula (Dumond 1987b:51).

D.D. Anderson (1978b, 1980) placed Denbigh, Choris, Norton, and Ipiutak cultures within the ASTt, based on what he sees as a cultural continuum throughout, but

with variations in the presence or absence of particular cultural traits from period to period (Giddings and Anderson 1986:292-300). Dumond and others, however, argued for varying degrees of dissimilarity among Denbigh, Choris, Norton, and Ipiutak (Dumond in press; McGhee 1976; Clark 1976). Dumond set Norton culture aside as a separate cultural tradition, pointing out the greater continuity between the ASTt, as it was originally defined, and Norton culture than between either of them and Choris culture (Dumond 1982:39-51).

Choris culture emerged around 3,600 B.P. The beginning of the Choris period generally is marked by the loss of bipointed arrowhead endblade insets, triangular endscrapers that have been shaped bifacially on the proximal end, mitten-shaped burins, microblades, and the characteristic Denbigh fine flaking techniques. At the same time, along with the Asian-derived pottery, a new form of arrowhead endblade insets, large flake burins, and burin spall cores appeared (Giddings and Anderson 1986:230; 293). Some new techniques of slate working also appeared at this time, that are believed to reflect influence from southern Alaska (Giddings and Anderson 1986:187). Choris houses were unlike any other prehistoric Northwest Alaskan house remains, except those of the Old Whaling culture, in that they were large, shallowly semisubterranean, and oval in outline. In a sense, they more closely resembled *iccellik* or *ivrulit*, small, comparatively temporary hide or sod-covered structures that had a light bent-pole frame.

Choris culture occurred in diverse locations that include a village site on the beach ridges of the Choris Peninsula, where it was first identified (Giddings 1967; Giddings and Anderson 1986); the interior riverine setting of Onion Portage where the remains of house and semi-permanent tent structures were situated (D.D. Anderson 1988); and the high, mountainous location of Trail Creek caves (Larsen 1968). A number of campsites were located on the beach ridges at Cape Krusenstern (Giddings and Anderson 1986), near Point Barrow (Stanford 1970), the Noatak River (Anderson 1972), the Utukok River (Schoenberg 1979), the Sagavanirtuk River (Dixon 1971; Cook 1977), and the Kobuk River (D.D. Anderson 1968; Clark 1974a).

Old Whaling culture, a unique arctic coastal culture with no apparent progenitors or successors, occurred at Cape Krusenstern contemporaneously with Choris culture, around 3,150 B.P., based on Giddings and Anderson's (1986) interpretation of its position on beach ridge 53 at Cape Krusenstern. It is considered to be outside the developments of the ASTt, and archeologists have looked elsewhere around the north Pacific Rim for its origin. Similarities between Old Whaling culture artifacts and cultural remains from the Chërtov Ovrage (Devil's Ravine) site on Wrangell Island have been noted (Dikov 1977). Old Whaling culture, however, also exhibits some similarities in material culture with Choris culture in house forms; large, heavy butchering tool styles; a particular unifacial notching technique used on side-notched bifaces; and possibly grinding techniques used to fashion tools from nonsilicified slate (D.D. Anderson 1989, personal communication; Giddings and Anderson 1986:317). Recent reassessment

of the geomorphology of the beach ridges at Cape Krusenstern by Mason and Ludwig (1989) has raised questions regarding the relative dating of beach ridge 53 as it was previously understood.

Around 2,500 B.P. patterns of culture changed. A greater number of settlements appeared along the coast, and there was a marked subsistence shift toward marine mammals. Norton culture, like that of Choris, appears to have a number of similarities with those to the south. Anderson used the term "Norton-Near Ipiutak" to delineate all assemblages in the Bering Strait region having technological affinities with Norton culture as it was originally defined by Giddings (1964) based on his 1948 work at Cape Denbigh. Norton-Near Ipiutak culture is evident at Cape Krusenstern from a burial at Battle Rock and from seal hunters' camps at the Cape. Artifacts but no cultural features have been located.

Characteristic Norton assemblages include end- and side-blade insets, notched pebbles for fish-net sinkers, bifacial knives, scrapers, burin-like tools, oil lamps of stone and clay, and pottery with linear- or check- stamped designs and feather and plant-fiber temper.

Ipiutak culture is well represented on the beach ridges at Cape Krusenstern, where at least eight settlements and numbers of additional individual houses were identified by Giddings and Anderson (1986:116-160) and temporary tent and campsites were located on the seaward side of the Ipiutak settlements by Giddings and Anderson (1986:116). An additional settlement probably dating to this period was located on the north shore of Krusenstern Lagoon during the 1987-1988 National Park Service survey (McClenahan and Gibson 1990). During the survey period, caribou hunting, sealing, some whaling, and fishing were subsistence activities at Cape Krusenstern.

Northern Maritime Tradition (ca 1550 B.P.- early 19th c.). An explication of the Northern Maritime tradition can be found in Collins (1964:91). He characterizes it as one of four principal traditions of the American north,

a series of closely related, sequential culture stages---Okvik-Old Bering Sea-Birnirk-Punuk-Thule-Inugsuk---forming a cultural continuum that began in northeastern Siberia near Bering strait more than 2,000 years ago and later spread eastward to Greenland, to form the principal basis for modern Eskimo culture in northern Alaska, Canada, and Greenland...

Dumond presents a variant scheme, in which Thule is delineated as a separate cultural tradition, with Punuk and Birnirk as separate stages within it (Dumond 1987b). Giddings and Anderson (1986) depart from Collins's scheme by delineating a cultural continuum divided into three cultural periods within the Northern Maritime tradition. They are the Birnirk period (1,550-1,050 B.P.), the Western Thule period (1,050-600 B.P.), and the Kotzebue period (600 B.P. - early 19th century). In Giddings and Anderson's interpretation, Okvik, Old Bering Sea,

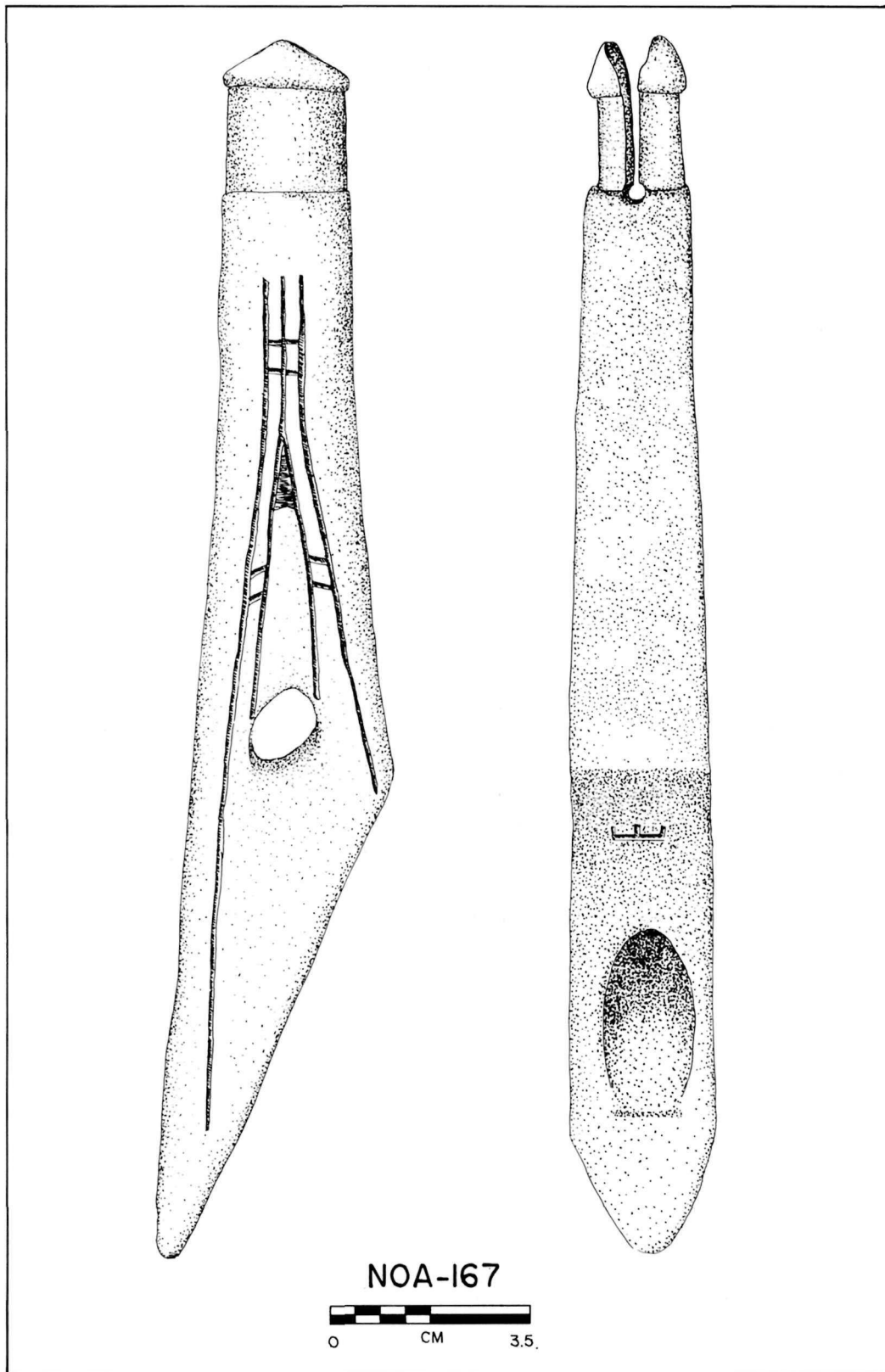


Figure 28. Western Thule whaling harpoon part from NOA-167.

and Punuk are recognized as being related, but they remain outside the regional cultural continuum. The existence of so many variant schemes underscores the existence in the north Pacific Rim region of a large, dynamic interaction sphere of considerable complexity during Northern Maritime tradition times.

At Cape Krusenstern, the earliest cultural period in the Northern Maritime tradition is called the Birnirk period. It is poorly represented in the archeological record of the monument. Two Birnirk-period houses investigated there lacked many of the artifacts characteristic of Point Barrow Birnirk assemblages. Rather, researchers recovered a mix of Ipiutak, Birnirk and Western Thule artifact types. The Cape Krusenstern assemblages and other Birnirk sites in the region have pottery with curvilinear-stamped decorations, common ground slate tools, and similar house styles.

Western Thule may have first developed in the area of St. Lawrence Island as opposed to indigenously with the Birnirk people of mainland Northwest Alaska. Western Thule culture has been located at Cape Prince of Wales, Point Hope, and Point Barrow, but it is best differentiated at Cape Krusenstern.

During the Western Thule period there was an increase in the use of specialized tools along with an expansion of the economic base. At this time, populations increased in some coastal Northwest Alaska settlements. A warming climatic trend and a decrease in the amount of offshore ice may have led to new sea mammal hunting techniques in the open sea. At this time, whale hunting increased at some coastal locations. There is some question regarding the importance of whaling at Cape Krusenstern in any part of the Northern Maritime period. Along with sea mammal hunting, pursuing caribou and other land mammals and fishing also accounted for significant portions of the subsistence regime. By late Western Thule times, Western Thule people were easily recognizable as the direct ancestors of the Eskimo people. All items of material culture that we know belonged to the ethnographically reported Eskimo were present during Western Thule times.

The Kotzebue period began in the late Northern Maritime tradition during a long period of climatic deterioration. In this period whale hunting in Northwest Alaska declined. Plentiful remains of Kotzebue culture are located extensively at Kotzebue Sound and in areas south of there to the southern Seward Peninsula (Harritt n.d.a, Giddings and Anderson 1986; Schaaf 1988). Giddings and Anderson describe Kotzebue culture at Cape Krusenstern as definitely being an outgrowth of Thule culture, marked only by the absence of all whaling-related artifacts during the Kotzebue period (Giddings and Anderson 1986:113). Kotzebue culture has been described as inhabiting the coastal and nearby inland areas of Northwest Alaska (Harritt n.d.; Giddings and Anderson 1986).

The historic era at Cape Krusenstern is marked by the arrival of Europeans beginning in the mid 1700s and then by Euro-Americans. Impact to traditional Inupiat lifeways, however, was slight during the period before 1850. The

concentration of Native populations near missions and the change to a cash economy from a subsistence-based way of life are two major factors that were instrumental in powerful changes after 1850.

Overview and Assessment of Archeological Research in the Cape Krusenstern Region

Preliminary Research. J. Louis Giddings was the first to conduct archeological investigations around Kotzebue Sound when he initiated tree-ring research in Kotzebue. He was seeking a means of dating arctic archeological sites, and matching the growth rings of the trees used as structural members in semisubterranean habitations with a known tree-ring chronology seemed a likely approach. In 1940 and again in 1947 Giddings excavated house pits at the west end of the beach ridges where modern-day Kotzebue is located. He applied his dendrochronological approach and was able to assign the house remains to two cultural periods that he named Old Kotzebue (A.D. 1400) and Intermediate Kotzebue (A.D. 1550) (Giddings 1952). These two periods fall into the Northern Maritime tradition in the modern cultural chronology worked out for Northwest Alaska by D.D. Anderson (Giddings and Anderson 1986). Anderson's complete cultural chronology is in Table 1 and Figure 29 of this volume.

James VanStone was the next to excavate at Kotzebue. He investigated semisubterranean houses that belonged to the same clusters Giddings had studied. Many of the houses VanStone excavated also dated to the AD 1400 and AD 1550 periods (VanStone 1955:134).

No other formal archeological excavation was done in or around Kotzebue until the National Park Service performed an archeological clearance in conjunction with construction of NPS quarters and a parking lot during the 1989 and 1990 field seasons. NPS archeologists excavated one sideroom of a house that dated to early Kotzebue period times (Giddings's Old Kotzebue, ca A.D. 1400)(T. Smith 1990). The artifactual materials located during the excavation were of the Kotzebue-period type, but the house structure is of particular note because it appears to be exactly like the late Western Thule houses with its separate adjoining room. It is nothing like the single-room rectangular Kotzebue period houses. This is the only example of its kind known from the vicinity to date.

Giddings continued his research by excavating in Norton Bay at Nukleet and Iyatayet in 1948. There he recorded the presence of a Norton horizon (ca 550 B.C.-1200 B.C.) that consisted of the remains of sea mammal hunters whom, he recognized as obvious precursors of the Eskimo people. He also discovered the Denbigh Flint complex (2250 B.C.-1600 B.C.), that included a microblade and blade core industry Giddings saw as having parallels with the Old World Mesolithic (Giddings 1951; 1964; Harp 1984).

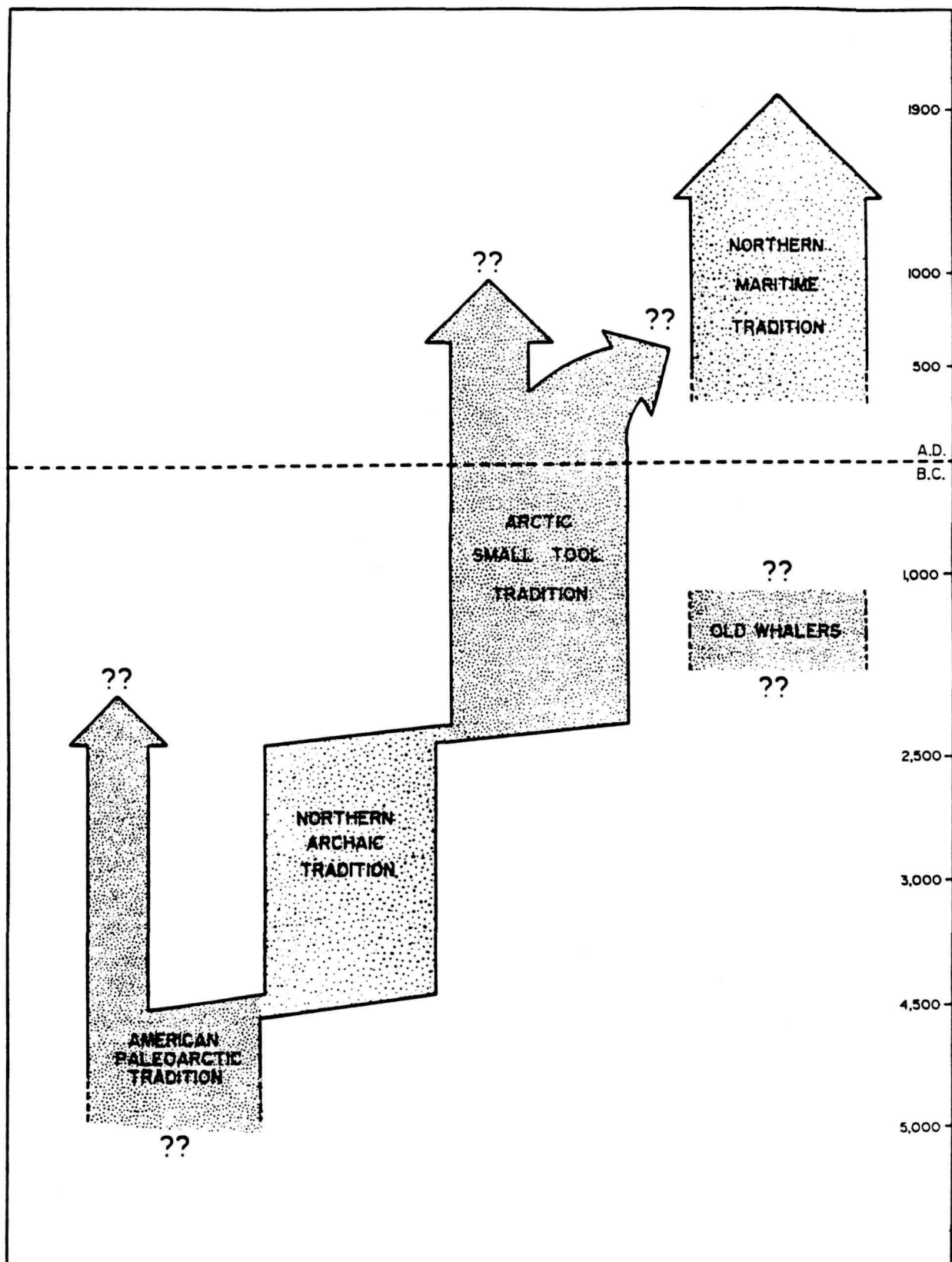


Figure 29. Cultural traditions of the Kotzebue Basin region (adapted from Anderson 1981).

Table 1. Comparison of Cultural Designations and Cultural Chronology for the Krusenstern Region.		
Giddings	D.D. Anderson (Giddings and Anderson 1986)	Standard Chronology
Denbigh related	Early Microblade (everything before Denbigh Flint times; American Paleoarctic)	American Paleoarctic Tradition (11,500-8,000 B.P.)
Palisades	Palisades	Northern Archaic Tradition (6,000-4,000 B.P.)
	Proto-Denbigh	
Denbigh Flint Complex Denbigh related, Denbigh derived, pre-Choris Choris Late Choris, Early Norton, Battle Rock Norton or Near Ipiutak Ipiutak Middle Kotzebue	Arctic Small Tool Tradition Denbigh Flint Early Choris Choris Norton-Near Ipiutak Battle Rock Northern Maritime Tradition	Arctic Small Tool Tradition (2250 B.C.-A.D. 950) Denbigh Flint Choris Norton-Near Ipiutak Ipiutak Northern Maritime Tradition (A.D. 800-A.D.1400)
	Birnirk	Birnirk
	Western Thule	Western Thule
Old Kotzebue	Kotzebue	Kotzebue
Middle Kotzebue		

Helge Larsen and Froelich Rainey described hundreds of Ipiutak (ca 50 A.D.-950 A.D.) houses, many clustered into four settlements, at Point Hope in 1948. In 1949, Larsen excavated the Ipiutak site at Deering. Then in 1949 and 1950 Larsen excavated at Trail Creek caves, where he uncovered a stratified sequence from historical times that extended back to a human presence predating the Denbigh Flint complex (Larsen 1951, 1953, 1962, 1968).

William Irving conducted investigations in Anaktuvuk Pass in the Brooks Range, Northern Alaska in the early 1950s, identifying Denbigh Flint complex materials there. Based on his findings, he proposed a cultural chronology for the region and proposed a hypothesis for an ASTt, which he described as being the foundation of the early coastal arctic cultures of North America (Irving 1962, 1964).

In 1956, Giddings investigated archeological remains on the series of beach ridges on the Choris Peninsula, where he discovered Choris culture (1200 B.C.-550 B.C). Giddings placed the Choris people in the line of development of the Eskimo people between the Denbigh Flint complex and the Norton culture.

Giddings's 1958 and 1959 work at Sheshalik and at Cape Krusenstern yielded evidence of the broad spectrum of coastal cultures from Denbigh Flint complex times. All are located on the 114 beach ridges on the seaward side of Krusenstern Lagoon. In addition to the cultures belonging to the ASTt and the Northern Maritime tradition, Giddings identified the anomalous Old Whaling culture (ca 3,150 B.P). Excavations on the beach ridges yielded artifactual remains and cultural features that were ordered by means of relative dating, and to a great extent, by their relative locations with reference to the beach ridge sequence. Those beach ridges farthest inland were interpreted as being the earliest, while those closest to the sea were assumed to be the most recently formed (Giddings 1966, 1967).

Additionally, Giddings located an early microblade culture (Paleoarctic tradition) at the Lower Bench site and the early interior-oriented culture (the Northern Archaic tradition) at the Palisades site. Based on this work and the work he accomplished in 1962 combined with radiocarbon dates, Giddings was able to refine the cultural chronology for the Kotzebue Sound region (Giddings 1966) (Table 1).

Giddings discovered Onion Portage in 1940 as he was carrying out an archeological survey of the Kobuk River. He first excavated at the site in 1941 (Giddings 1962, 1967). Excavations continued during a number of subsequent field seasons, and in 1964 Douglas D. Anderson joined Giddings in his work there. After Giddings's death in 1964, Anderson carried on with the investigations from 1965 through 1973, ultimately providing a series of radiocarbon dates and a fully stratified cultural sequence dating from Anderson's newly proposed "American Paleoarctic tradition" times through the Arctic Woodland period, and including the Northern Archaic tradition that paralleled the Palisades and Portage complexes at

Cape Krusenstern (D.D. Anderson 1968, 1988). The Onion Portage site yielded confirmation of the entire cultural sequence at Cape Krusenstern except for the Old Whaling culture (Giddings 1966; Giddings and Anderson 1986). Because of its completeness the Onion Portage chronology is used as the basic cultural chronology for Northwest Alaska.

Reflecting on the resemblances among Northeast Asian archeological collections and Anderson's American Paleoarctic tradition cultural materials, Don E. Dumond subsequently proposed a Siberian-American Paleoarctic tradition (Dumond 1977). It recognized a sphere of influence that once existed in the circum-Beringian region around 11,000 years ago in Northwest Alaska and earlier in Northeast Asia.

Anderson's 1977 Survey. Douglas Anderson conducted a limited site survey of the proposed Cape Krusenstern National Monument in 1977 for the National Park Service (D.D. Anderson 1977). During this survey, he visited the Kakagrak Hills and the Kakagrak Knolls, a series of outcrops immediately east of Battle Rock, but he did not find evidence of sites in the area. Anderson then surveyed the lower Rabbit Creek drainage and discovered NOA-256, the Rabbit Creek Knoll site overlooking Rabbit Creek, where lithic artifacts were located that include microblades and a microblade core tablet dating to an early prehistoric period. Anderson judged them to date from 8,000 to 4,500 years B.P. Also located at the site was a "T-shaped" stemmed projectile point of a type commonly associated with recent prehistoric-era people and ethnographically known Inupiat (D.D. Anderson 1977).

From his aerial surveys of the Tahinichok Hills, Anderson recognized which specific locales were likely to yield additional archeological sites. These locales include some uplands that provide broad views of the Coastal Lowlands, immediate access to a freshwater stream, and proximity to the sea (D.D. Anderson 1977:14). One area that fits this description is the lower drainage of New Heart Creek. There at NOA-137 Anderson recovered archeological materials that suggest at least three different cultural components, based on the types of artifacts present at the site. No radiocarbon dates are available, however. A fragment of a stemmed spear point resembling a Choris point and two chalcedony biface fragments suggested to Anderson that this site had a Choris component. Chalcedony is a material type used more commonly by Choris people than by others in the area. Another find, a notched biface, Anderson tentatively assigned to the Palisades complex, Northern Archaic tradition. A third artifact, a single small gray chert microblade midsection, he assigned to the broad period (8000-4500 B.P.) during which a number of microblade traditions existed. All were recovered from nonstratified contexts (D.D. Anderson 1977:14-15).

Anderson mapped numerous features that included the remains of winter houses, fish camps, fish racks, and cache pits at the village site of Aniyak, NOA-003, located at the mouth of the Tukrok River. The site was first noted by Jarvis in

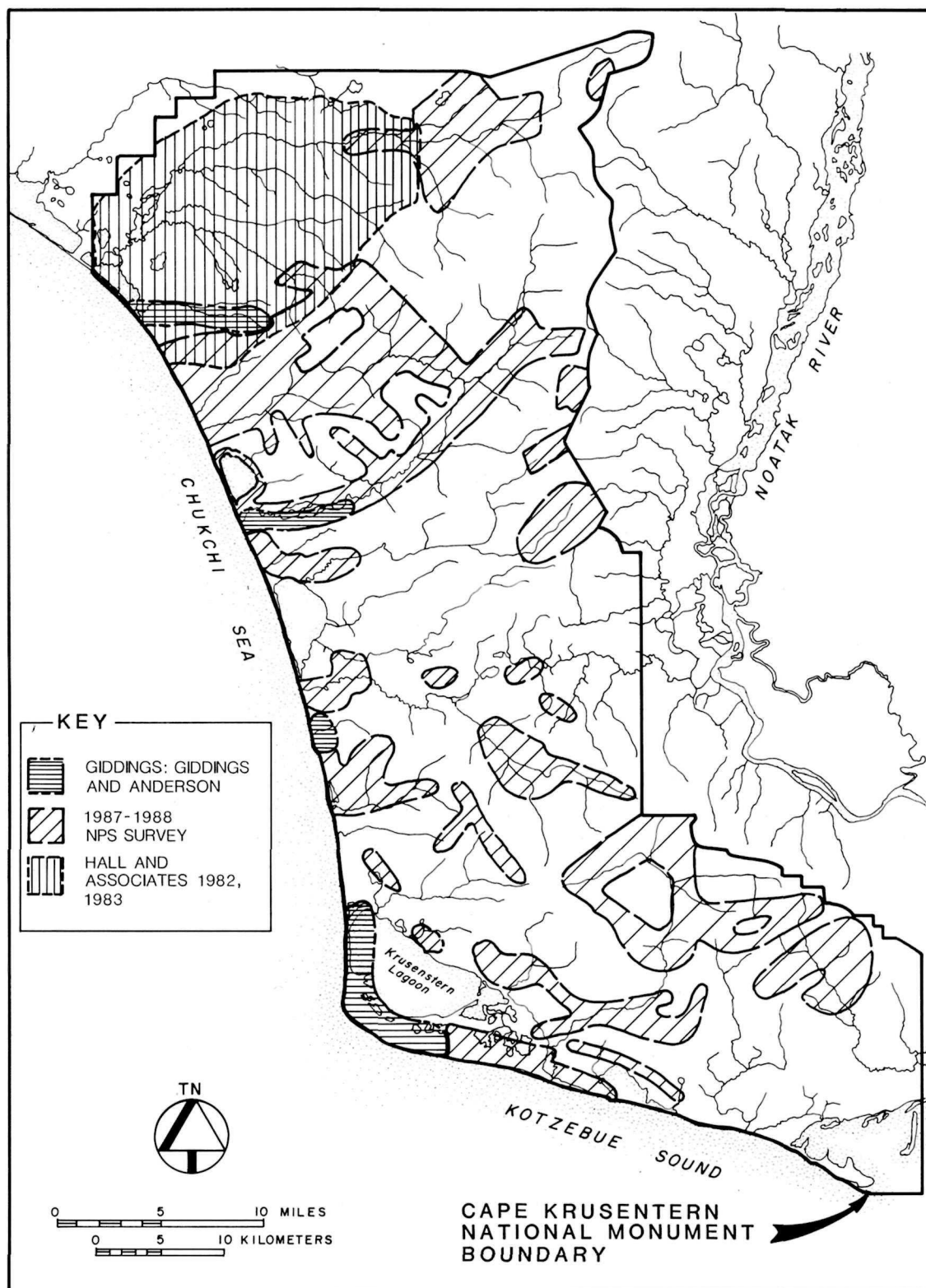


Figure 30. Approximate areas of archeological survey in Cape Krusenstern National Monument.

1898 and later by J.L. Giddings. Anderson (1977) recognized its importance as a summer and fall fishing locale during modern and historic times, but the time depth of the site is unknown.

Anderson used aerial reconnaissance to assess the likelihood of finding archeological sites along the northern coastal strip of the monument. It was his opinion that few old sites would be found along the coast, except for the southern portion between Shesaulik and Cape Krusenstern; any rocky cliffs adjacent to the sea (such as Battle Rock); and the barrier beaches of some of the lagoons in the monument (D.D. Anderson 1977:17). A map and description of the transects covered by Anderson's surveys are unavailable, so it is impossible to indicate here the total number of square miles or the exact areas covered by his study (Figure 30).

In 1986, Anderson published all findings from his and J.L. Giddings's research on the Cape Krusenstern beach ridges and immediately adjacent uplands. The book includes a discussion of Sisualik, Choris Peninsula, Cape Espenberg, Lopp Lagoon, and several other sites outside Cape Krusenstern proper, placing them in suitable context in their interpretation of the region's prehistory.

The work of Giddings and Anderson in Northwest Alaska is remarkable for its contribution of a cultural chronology for the region, and for a substantial look at the lifeways of the people of the ASTt and the Northern Maritime tradition during the particular time of the year that they were using coastal resources. The evidence for two earlier cultural traditions from the uplands of the monument permitted the inclusion of the Paleoarctic tradition and the Northern Archaic tradition, based on typological considerations, in the regional cultural chronology, and provided a base on which to plan further research. Among a number of research topics needed is information for the area about the full round of seasonal activities for all four cultural traditions, and the location, in a datable stratified context, of cultural components from the Paleoarctic and Northern Archaic traditions.

D.C. Foote's Surveys. Archeological research within the monument and the NHL has included an ethnographic and archeological survey of portions of the Eli River, the lower Noatak River, the Kukpuk River, the Wulik River, and Kivalina by Don C. Foote from 1959 through 1961, initially in conjunction with the Atomic Energy Commission's Project Chariot (Foote 1965; Foote and Williamson 1966).

A part of Foote's work consisted of recording numerous geographical features and archeological sites in and around the monument and the Inupiat names associated with them. The thrust of Foote's studies was largely ethnographic, but much of his valuable work was used in research by archeologists such as Edwin S. Hall and Douglas D. Anderson, as well as other ethnographers.

Research Conducted by Greg Zimmerman. Greg Zimmerman conducted a remote sensing archeological research project contracted by the National Park Service to field test a model based on the photointerpretation of certain cultural and natural features located on the beach ridges at Cape Krusenstern. In conjunction with the project, Earth Science Consulting and Technology was contracted by the National Park Service to produce a topographic map of Cape Krusenstern in 1978. 1:8000 color and color-infrared and black-and-white photographs were produced for the project at that time.

Zimmerman created a map based on the identification of soil markings thought to be cultural features. He differentiated among disturbed areas, probable sites, and possible sites. Ground truthing showed that more than 31% of the features Zimmerman had identified on aerial photos were cultural. From his study Zimmerman concluded that utilizing aerial photographs to locate and map cultural features and then field check them by surface examination and subsurface testing is a fast, reliable, and cost-effective way of surveying prior to initiating field projects. This type of survey tends to bias toward the most recent cultural features because they are most visible on the surface, but color infrared may yield certain vegetational "signatures" that indicate probable subsurface cultural remains (Zimmerman 1978, 1981).

Beyond Zimmerman's ground-truthing, his study has not been used by others to date. Anderson is currently recording the Krusenstern beach ridge archeological sites he and Giddings identified in ground survey and excavation on aerial photographs. In the future, Anderson's data may be cross-referenced with Zimmerman's. Schoenberg (personal communication 1991) proposed that the Cape Krusenstern Resources Management Plan (RMP) include a correlation study to put Anderson's and Zimmerman's data in GIS, and to ground-truth the results. National Park Service archeologists conducting the 1987-1988 survey in the monument were denied access to much of the beach ridge area by private landholders. For this reason and because a project goal was to locate as many new sites as possible, the NPS archeologists spent most of their time investigating areas outside Zimmerman's project area.

Cultural Resources Inventories Conducted by Other Federal Agencies.

The Bureau of Land Management (BLM) initiated cultural resource surveys in the middle Wulik River area in 1979 before mining activities began in the Kivalina region. BLM accomplished three field seasons of studies that yielded 37 new cultural resources sites, of which 36 are prehistoric-era lithic scatters (H. Smith 1982).

BLM and the Bureau of Indian Affairs conducted a limited number of site investigations in the monument related to the conveyance of land to Native claimants, including NOA-116, previously investigated by Edwin S. Hall and Associates (1983b).

The BIA ANCSA office investigated a reported site, Agiagruaq, in the New Heart Creek drainage, between New Heart Creek and Umagatsiak Creek. The results of the archeological investigation were negative for evidence of a historic burial in that location (BIA ANCSA 1987).

BIA ANCSA investigated the Anigaaq site (NOA-003), located on the Tukrok River. Extensive cultural features, in the form of the remains of semisubterranean houses, storage structures, and graves, were documented (Pittenger 1985; BIA ANCSA 1989).

Research Conducted by Edwin S. Hall and Associates. Since 1962, Edwin S. Hall has been conducting archeological research in the Noatak River region. In his 1973 and 1974 publications, he presented archeological site data on 24 sites in the monument or NHL that are located in the Noatak River drainage system and in the Igichuk Hills. He had investigated these sites from 1962 through 1965, in 1967, and in 1972, drawing site data from re-surveying previously documented sites, surveying new areas, testing, and excavation. In 1967, Hall conducted another survey of the Noatak and Eli rivers, adding 11 new sites to the cultural resources inventory of the monument and the NHL (Hall 1975a).

A series of cultural resources investigations were carried out by Edwin S. Hall and Associates between 1982 and 1989 in conjunction with development of the Red Dog Mine, that included areas in and adjacent to the northern part of the monument and the NHL. Figure 30 indicates the portion of the region Hall covered by helicopter in 1982 and 1983. (Hall, personal communication to Ken Schoenberg, February 26, 1984). The areas that he covered by pedestrian survey during those field seasons consisted of sites that looked promising from the aerial reconnaissance view---"all dry, stabilized areas as well as stream crossings...dry lake margins, etc." Certain areas that included potential borrow pit areas were checked on foot. A limited number of areas thought to have low potential for archeological sites were also checked. All pedestrian transects that were reported for the 1982-1983 field season have been measured and added to the information on survey and site density in the appendixes of this report. As of 1987, researchers had documented 124 new cultural sites (Hall and Bowers 1987).

During the 1983 field season, Edwin S. Hall and Associates surveyed a number of Northwest Alaska townships for NANA Regional Corporation in preparation for a land exchange between NANA and the National Park Service, also in connection with developments at the Red Dog Mine (Hall 1983a; 1983b).

In general, the investigators practiced a non-collection policy with respect to the removal of cultural materials from archeological sites. Limited collections were made at thirteen sites, however. Test excavations conducted in 1982, 1985, and 1986 at 12 sites led to the conclusion that impacts from mining and construction activities would unavoidably damage the sites (Hall 1983b; Gerlach and Hall 1986;

Hall and Gerlach 1987; Gerlach et al. 1988). During the 1987 field season, eight sites were tested archeologically to assess their significance (Ream 1988).

Edwin S. Hall and Associates have made several important contributions to the prehistory of the region. First, the investigators were able to look at areas inland and upland of the beaches and the coastal plain. These areas had received little previous investigation, but they hold the potential to reveal the archeological remains of portions of the seasonal round of activities of the people of four cultural traditions, dating back to the first human arrivals in the region.

Furthermore, the excavation of DEL-182, which lies outside the boundaries of the monument and the NHL, yielded valuable data about a late historic-era tent ring in the form of lithic artifacts, rifle shell casings, metal, cut wood, and caribou bones (Gerlach et al. 1988). The association of lithic artifacts with obviously historic-era Euro-American cultural artifacts in this single-component site cautions the archeologist against automatically assigning a site in this region that has lithic tools and debitage to the prehistoric era, or assigning more than one cultural component to mixed assemblages based solely on the presence of these artifacts.

Additionally, study of a number of the lithic sites has given further opportunity to consider the question of whether or not variability in microblade core forms may signify cultural or temporal differences, or whether this variability is related to some other factor or factors. Gerlach and Hall (1986) advanced the concept of a post-Paleoarctic tradition, a concept that has been suggested by several arctic archeologists, based on the recognition of the frequent co-occurrence of certain characteristic traits in a number of different sites in the region. Unfortunately, while the co-occurrence of the traits is frequent, they have been found in nonstratified or mixed contexts, where no radiocarbon dates are available.

Finally, a number of the sites that were investigated yielded cultural materials that could be assigned to specific time periods. A number of the sites contained microblades and/or microcores and a burin spall that could tentatively be assigned either to the Paleoarctic tradition or the ASTt, based on the present interpretation of the material culture of those two traditions. Four sites were more or less tentatively assigned to the Choris complex, in some cases based only on overall morphology, manufacturing technique, and flaking style of the artifacts studied, since many of them were unfinished or incomplete specimens. These sites, if they are Choris sites, are important in that they represent an inland focus and a heretofore unknown segment of the Choris culture seasonal round in the Cape Krusenstern region.

One of these sites, NOA-081, requires particular mention. This site was situated in the northeastern corner of the monument, in the pathway of construction of a borrow pit for the Red Dog Mine-to-port-site road. It was selected for testing in

1987, based on the presence of two surface lithic scatters described as flake concentrations (Hall 1988:8). Of the site, Hall (1988:13) remarks that

NOA-081 would not be deemed significant in the light of the many similar sites already known in northern Alaska that have produced a definitively diagnostic artifact amongst numerous flakes that may or may not represent the same occupation

particularly since it appeared to him to be completely disturbed (Hall 1988:8). Outside evaluation is difficult because stratigraphic profiles and excavation unit plan maps are not included in the report.

This site does appear to be different, however, in that it had a substantially greater number of lithic materials than the preponderance of surface lithic scatters identified throughout the region, it had plentiful buried cultural materials, and it had some faunal remains that are rare for this type of site and this region. Hall's Schematic 5 in the report indicates that subsurface testing stopped short of its full potential at test square N1-2/E7-8. The subsurface excavation in that test square yielded more than 100 lithic items. In spite of the density of archeological materials, the adjacent test squares were not excavated. In this case testing was inadequate to support the investigator's conclusions that the site was not a major site and that it had little to tell us.

Ancillary Studies by Mason and Ludwig. Owen Mason and Stephanie Ludwig recently conducted research into the depositional history of the beach ridges at Cape Krusenstern. Mason and Ludwig differ somewhat in their interpretation of the relative ages of the beach ridges from that presented by Giddings (1967) and Giddings and Anderson (1986). This reassessment may be important with respect to the temporal position of the Old Whaling culture in Northwest Alaskan prehistory. A correlation of Mason and Ludwig's data with Anderson's specific site location information is needed before a final judgement about the significance of Mason and Ludwig's contribution can be made.

Research Conducted by the National Park Service. Some research undertaken by National Park Service (NPS) was related to compliance requirements in conjunction with construction and operation of the Red Dog Mine. "Compliance" means that a professional, qualified archeologist must provide an assessment of an area's potential for yielding information on its historic or prehistoric cultural resources prior to carrying out any ground-disturbing activities associated with construction or development. This requirement is based on Section 106 and Section 110 of the National Historic Preservation Act (16 USC 470f). Such research in the monument includes work accomplished in 1981 by Harvey Shields of the Cooperative Park Studies Unit, University of Alaska Fairbanks, and more recently by Edwin S. Hall and Associates, whose activities are discussed above.

NPS conducted an archaeological clearance project in 1985 to assess the impacts on prehistoric and historic, cultural properties of the development of the Tukrok River Ranger Station (Figure 31). An intensive pedestrian survey of the locale yielded 197 cultural features, including house pits, cache pits and other features associated with the historic-era village of Aniyak, and possibly other prehistoric-era features. Testing in the vicinity of Shelter Cabin #1 yielded the remains of sea mammals and possibly birds, in association with historic-era cultural artifacts connected with historic-era Inupiat subsistence practices. At the same time, Shelter Cabins #1 (NOA-003) and #2 (NOA-283) were evaluated for their historic significance (Snow, Brown, Pittinger, and Gleeson 1985). The researchers determined that Cabin #1 was built around 1925 as part of a newly established Kotzebue-to-Point Barrow mail trail, a component of a communication system operating from the mid-1920s until around 1950 (Snow, Brown, Pittinger, and Gleeson 1985).

NPS conducted a reconnaissance-level survey in 1987 and 1988 within the monument to identify prehistoric and historic, cultural resources in previously unsurveyed areas (McClenahan and Gibson 1990). Figure 30 shows the extent of survey conducted to date within the monument. Appendix A provides the details of this survey. Segments of the survey covered portions of areas previously surveyed by Anderson in 1977 and by Edwin S. Hall and Associates in the 1980s to check the condition of known archeological sites. In particular, the NPS survey concentrated on the middle and upper reaches of the drainage systems that drain the western portion of the monument and flow into the Chukchi Sea.

The survey is important because it provided new data pertaining to certain periods of each of the prehistoric cultural traditions previously documented by Giddings and Anderson and others for the Cape Krusenstern region. It also provided new data on parts of the previously unknown or little known seasonal round of activities for the people of each tradition. Additionally, it documented several types of historic sites, including temporary and permanent habitations and herding corrals related to the reindeer industry in the Cape Krusenstern region that will provide interesting domains for future research. Of particular importance is the documentation of a large number of prehistoric archeological sites in the interior of the monument, especially in the upland areas.

The survey had certain drawbacks as well. Because it was a reconnaissance level survey that adhered to a non-collection policy, included essentially no subsurface testing, and gathered no materials to be radiocarbon dated, the data are largely descriptive, and the preponderance of the new sites that were recorded cannot be definitely assigned to a particular cultural period or periods. The sites were not all recorded in the same standardized way, so that frequently site data were not comparable among sites. The area surveyed was not stratified nor was it a statistically based sample. The surveyors did not "look everywhere," but they looked in the same kinds of places where sites had been found.

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 31. Site NOA-003 at Tukrok.

In spite of these drawbacks, the survey data and all the work of previous researchers provide a broad base from which cultural resource managers will be able to specify what is unknown about a particular cultural period in the monument. They can project the potential locations, types and extent of prehistoric cultural resources in the monument, and from the available data investigators can plan future studies (Appendixes).

History and Overview of Ethnographic Research

Early Euro-American Exploration and Contact. The earliest European accounts of Northwest Alaska came via the Russians who traveled to the Chukchi Peninsula of Siberia in the early 1600s to trade with the Chukchi Natives. In turn, these Natives had a well-established trade with Northwest Alaskans much earlier than 1750 (Foote 1965:1,102,103, 106; Muller 1761:4; Nelson 1899:228-229).

Among the earliest explorers was Captain Vitus Bering, who in 1741 was the first to sail as far north as latitude 60 degrees 18 minutes. He was able to establish that Asia and North America were separate continents (Foote 1965:6). Captain James Cook surveyed the Alaska coastline from East Cape to Cape Prince of Wales in 1778, sighting the coast near the present village of Kivalina (Foote 1965:16,18,19). Otto von Kotzebue (1821), on his 1816 voyage aboard the *Rurick*, was the first to land at Kotzebue Sound and make contact with the Natives there. He found that the Eskimos had Russian trade goods, including blue beads, iron knives and blades, copper and iron articles of decoration, and tobacco (Foote 1965:40).

Early European explorations were stimulated by a desire for direct trade with the Alaskans, by concern over control of Northwest Alaska, and by the search for a northwest ocean passage from the Pacific to the Atlantic Ocean.

In response to competition with the British and Americans for trade and territorial claims, the Russians sent the Vasiliev and Shishmaref expeditions to Northwest Alaska. Their dual purpose was to carry on continuing exploration and charting, and to strengthen Russia's territorial claims. Up to the time of the expeditions, Russia had been unsuccessful in attempts to establish trading posts in the Northwest Alaska region. The expeditioners carried out a survey at Kotzebue Sound in 1820 (Foote 1965:55-63).

The impact to Native Northwest Alaskan lifeways by these early explorations and brief meetings before 1850 is considered to have been slight. In spite of early acquisition of European trade goods via the Chukchi and later the Russians, British, and Americans, traditional subsistence practices and social organization were apparently little affected up to the mid-nineteenth century (Burch 1984:313; Ray 1975:87).

Early Ethnographic Accounts of Cape Krusenstern. Baseline cultural information on traditional Native culture in the immediate area of the monument is in the early reports of some of the first Euro-American explorers and government officials.

Captain Frederick William Beechey, aboard HMS *Blossom*, discovered Hotham Inlet and charted the north shore of Kotzebue Sound in 1826. He was among the first of these explorers to report detailed information about the Native population (VanStone 1955:75-76; Beechey 1831).

Ethnographic data gathered after 1848 reflected changes in traditional Eskimo lifeways. Steam whalers began to winter-over in Kotzebue Sound, resulting in more extensive contact between the Inupiat and Euro-Americans. Lieutenant George M. Stoney, USN, aboard the U.S. Revenue steamer *Corwin* recorded information about the coastal and inland areas around Kotzebue Sound from 1883 to 1886, chronicled some ethnographic details, and documented relations with the Eskimos in regard to the illegal sale of firearms, ammunition, and alcohol. His report included details of the annual trade fair at Hotham Inlet, listing items of trade most valued by Euro-Americans and Eskimos at that time (VanStone 1962:126-128; Stoney 1900). J.C. Cantwell, also aboard the *Corwin*, recorded the Eskimo tent community at the trading site in some detail, noting the presence of conical, caribou-skin-covered tents, tents covered with colored drilling (fabric woven with a threefold thread), and commercially made canvas wall tents (Cantwell 1889:71; VanStone 1962:126). Other sources of ethnographic and historical data include Cook and King (1784), Berkh (1823), Healy (1887, 1889), Hooper (1881), and Sherwood (1965).

At the end of the nineteenth century the Inupiat of Northwest Alaska were contacted by missionaries of the Congregational, Episcopal, and Presbyterian faiths, who opened schools and missions at several locations. Their records and accounts are a valuable source of ethnographic data. Ethnographers feel that missionaries had a greater impact on the Inupiat than previous Euro-American contacts because the services the missions offered brought about relocation and disruption of traditional Inupiat lifeways (VanStone 1984).

The most important individual to record baseline information on traditional Native culture in the 1800s was E. W. Nelson, who conducted ethnographic research and collected items of material culture from the Bering Strait Eskimo, including those at Kotzebue Sound. Details touching upon such topics as population distribution, subsistence practices and seasonal movements, comparisons of items of material culture, burial customs, trade relations, and warfare are recorded in his publication (Nelson 1899).

Contemporary Ethnographic Research. The primary ethnographic studies for the region were carried out by Anderson (1974-1975), Burch (1970a; 1970b; 1971; 1972; 1974; 1975a; 1975b; 1976a; 1976b; 1984; 1988), Burch and Correll (1972),

Ray (1964; 1975; 1983; 1984), Foote (1964; 1965), Foote and Williamson (1966), Hall (1975b), Heinrich (1960), and VanStone (1955; 1962). Current research is underway by Ellanna and others (1989). All these studies are products of a series of ethnographic reconstructions based on early historical accounts such as those cited above, and on archeological and linguistic evidence. Modern informants are also used. The "ethnographic present," or the time in which the ethnographic reconstructions of the traditional Inupiat lifeways of this region are fixed, is the early nineteenth century (Burch 1984; Foote 1965; Ray 1964).

Archeologists use ethnographic data in the form of ethnographic analogy to reconstruct aspects of former societies. In this approach, observations of living cultures are used to explain the cultural artifacts and features recovered archeologically (Ascher 1961; Gould 1980; Binford 1978a; 1978b). The method is used most successfully in instances of long-term environmental and cultural stability that is well documented historically, and that can be traced to prehistoric time (Griffin and Chesmore 1988, with references; Burch 1988; Steward 1942). The limitations in attempting to project the ethnographic pattern into the past must be considered, however. One consideration is the degree to which ethnographically documented cultures reflect prehistoric populations. It is impossible to discuss in a comparative way archeologically recovered artifacts or features that are the consequence of behaviors for which no ethnographic analog exists (Trigger 1984). Additionally, the archeological record is often much less complete than the picture of the ethnographically recorded lifeways of a given people (Schiffer 1976; Ascher 1968). Another consideration is that a given archeological form may have been produced from one of a number of different behaviors (Dunnell 1985; Trigger 1984; Sabloff, ed. 1981). Nonetheless, the lifeways described in the ethnographic present for this region had, generally speaking, probably persisted from the late prehistoric cultures, documented archeologically and designated the Kotzebue period of the Northern Maritime tradition (Giddings and Anderson 1986:107-108; Burch 1988).

The Nature of Traditional Northwest Alaska Society. For the early nineteenth century Northwest Alaska region, Don Foote assigned existing groups local names according to the geographical regions they inhabited during the winter months (Foote 1965). Based on informant data and on early ethnographic accounts, for example Kashevarov's account, edited by VanStone (1977), Ernest S. Burch argued for the existence in early nineteenth century Northwest Alaska of

several named, bounded, autonomous socio-territorial units, each made socially distinctive by its adaptations to its unique ecological setting... to the regional variation in resources (Burch 1980).

For the region of the monument and the NHL, Burch identified three ethnographically recorded autonomous social systems comprised of Inupiaq-speaking people. These were the Qikiqtagrunmiut, the Napaaqtugmiut, and the Kivalingmiut (Burch 1984).

For the nineteenth century pre-European Bering Strait inhabitants, Dorothy Jean Ray categorized social groups on the basis of subsistence patterns. She recognized three principal patterns for the Seward Peninsula, based upon the relative importance of each animal: 1) Whaling pattern---whale, walrus, seal, and fishing; 2) Caribou hunting pattern---caribou, fishing, seal, beluga; and 3) Small sea mammal pattern---seal, beluga, fishing, caribou. Ray noted that these subsistence patterns did not correlate with any single dialect or language group (Ray 1964:62). Differences among the groups were not especially due to the taking of different animals, according to Ray, but to the relative importance of each animal in the seasonal round, and to the location and timing of subsistence activities, trade, and travel for obtaining products (Ray 1964:62).

Ray highlighted three important aspects of these subsistence patterns. Because of the nature of the resource base, discussed in greater detail in a previous section, arctic subsistence requires of hunter-gatherers 1) seasonal mobility for obtaining products, 2) flexibility in the search for food and a corresponding variety of primary foods used within a given subsistence area, and 3) a great number of alternatives available in all their subsistence patterns (Ray 1964:62). A fourth important factor to consider is that, because of all the above conditions, a number of kinship and trading partnership ties were maintained in other villages and sometimes spanned a considerable distance (Burch 1970a; Burch and Correll 1972).

According to Burch, while the concept of the ownership of bounded territories was strong, territories did change through time. Researchers have also stressed that at certain times of the year, neighboring groups used each other's territory for subsistence purposes, and that through time these territories often changed as populations shifted because of illness, famine, accidental food poisoning, or deterioration of the environment (Ray 1964:63-64; Burch 1980:275; Giddings 1961; McClenahan and Sprott 1988; D.D. Anderson, personal communication 1989; Hall 1975b).

PART THREE: KNOWN ARCHEOLOGICAL RESOURCES

Introduction

This section presents a summary of the known archeological resources in the Cape Krusenstern National Monument. The summary, however, is based on pedestrian surveys that, combined, covered only less than 1% of the total area in the monument. Thus, these resources are only a very small part of all of the cultural resources present in the monument. Figure 30 shows the extent of survey accomplished in the monument, and Figures 32 and 33 show the distribution of the known archeological sites in the monument.

The archeological remains identified in the monument were recorded by archeological site. "Site" means any location where physical evidence of past human activity is found, including evidence of effects on the natural environment by prior human activity.

The inventory that is used to record archeological sites in Alaska is called the Alaska Heritage Resource Survey (AHRs). It is maintained by the Division of Parks and Outdoor Recreation, Office of History and Archeology, Alaska Department of Natural Resources. All prehistoric and historic-era archeological sites in Cape Krusenstern National Monument have been assigned AHRs numbers. This is an important method of organizing the data, particularly since no Cultural Sites Inventory (CSI) or List of Classified Structures (LCS) for historical sites exists for the monument.

In addition to the AHRs number, it is customary for archeologists to assign field site numbers to newly discovered archeological sites. The researcher will find that these numbers, instead of the AHRs numbers, are used to designate sites in the field notes and sometimes in reports and publications. Usually the AHRs files also refer to the original field number as a means of cross-referencing. This report primarily uses AHRs numbers, but original field numbers are also included in the site summaries, located in the appendix.

There are 173 recorded archeological sites and one recorded paleontological site in the Cape Krusenstern National Monument. Of this number, 142 sites have definite or possible prehistoric components (Figure 32), 36 have or are thought to have historic components (Figure 33), and 11 sites are believed to be multicomponent. Those with an historic and a prehistoric component are included on both the prehistoric site summary and the historic site summary, provided in tables in Appendix A. In addition, summary information on the prehistoric and historic archeological sites that are in the Cape Krusenstern National Historic Landmark, but outside the monument, is included in Appendix A as background information for the monument.

Landsat Thematic Mapper Imagery

Scene Date - 20 July 1985

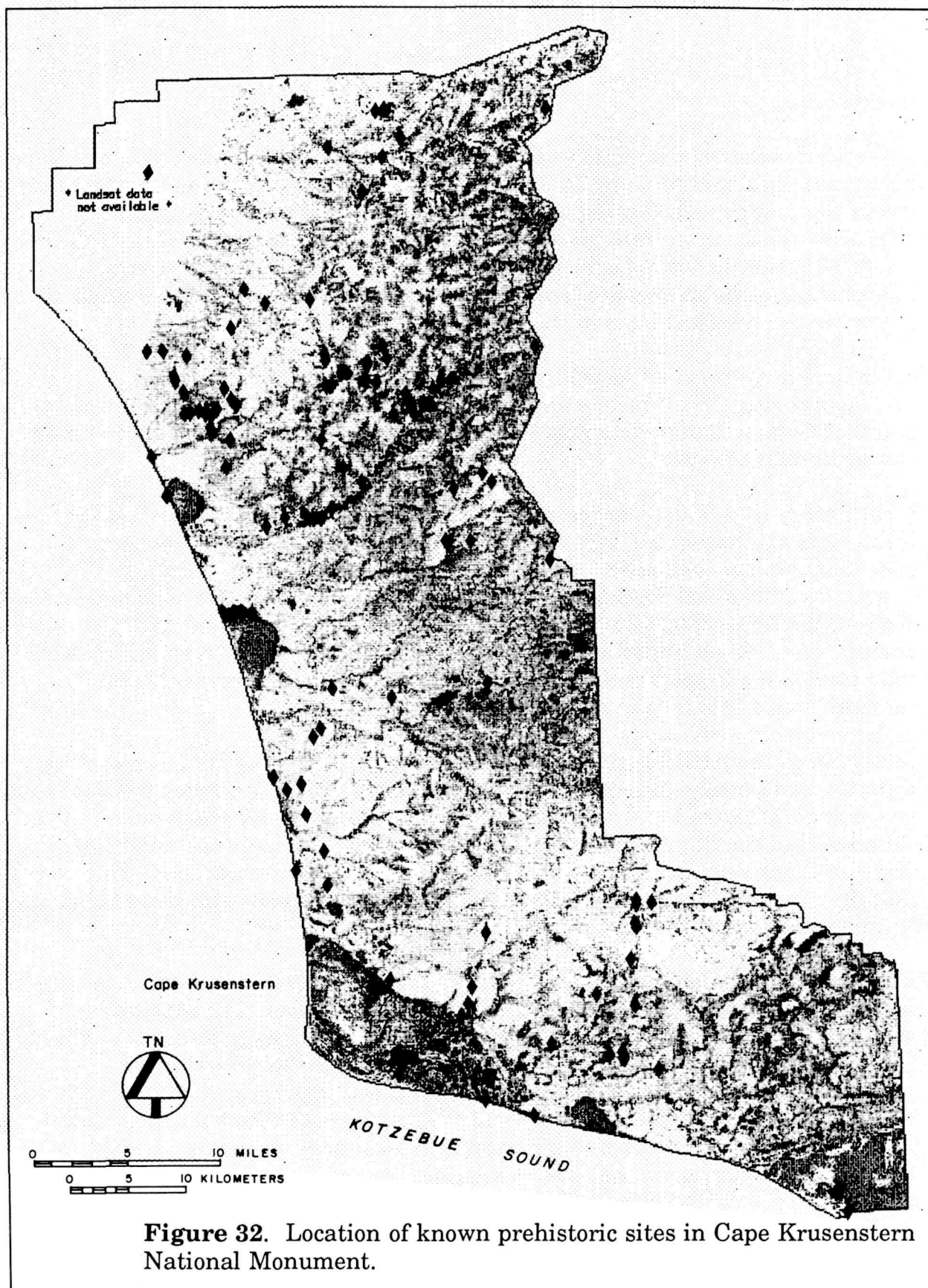
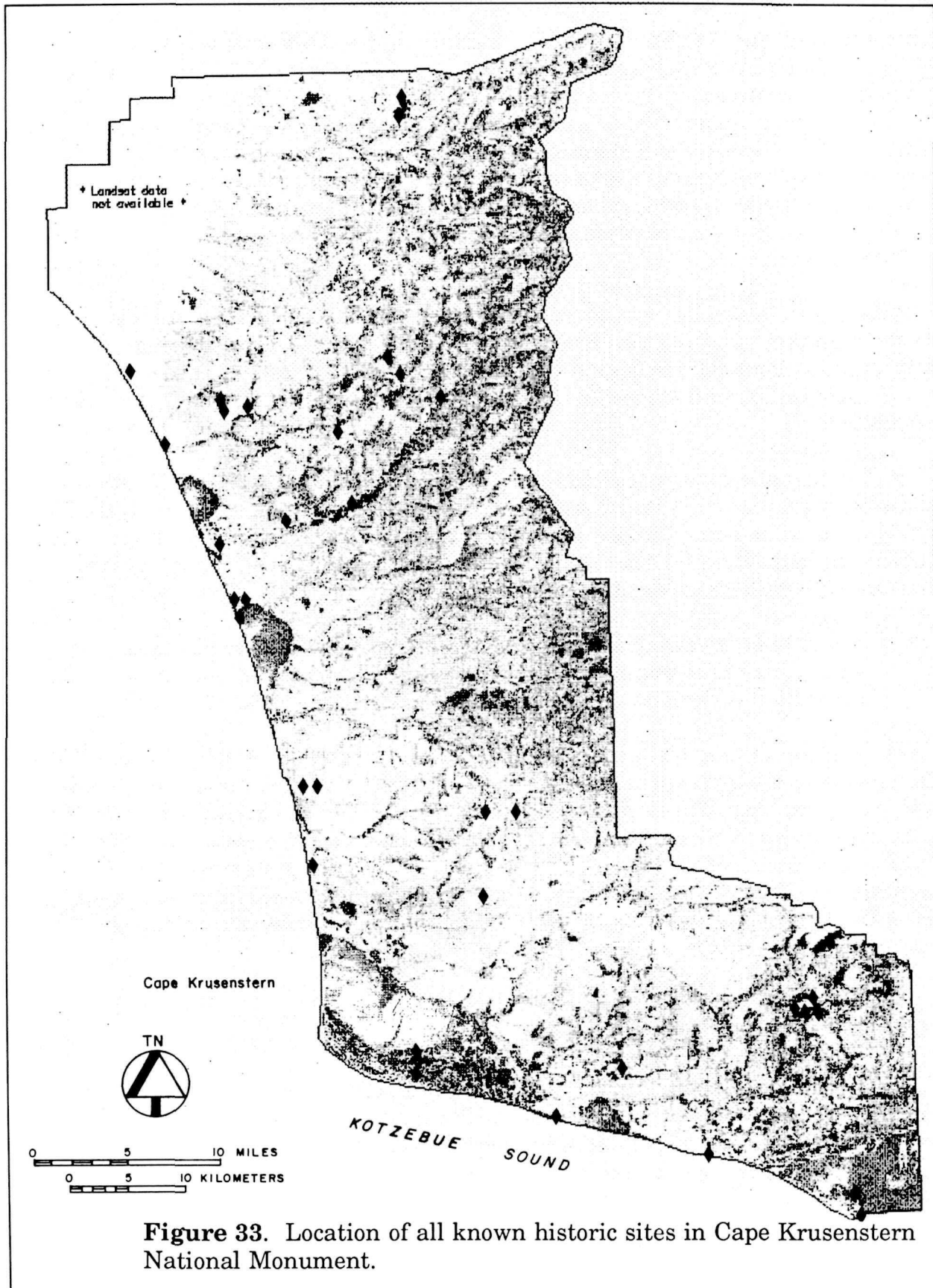


Figure 32. Location of known prehistoric sites in Cape Krusenstern National Monument.

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Historic Context as the Basis for Evaluating Significance

This overview and assessment uses a thematic approach in keeping with the spirit of the National Park Service's guidelines for classification of our historic and prehistoric resources. A theme may be one or more events or activities, patterns of community development, or associations with the life of a person or group that influenced the destiny and character of a region. A theme may speak to a stage of physical development, such as a house form. It may be a research topic or site type that will add to our knowledge of an area's development, past cultural affiliations, or human activities and interaction (USDI National Park Service 1986b:7).

Theme, place, and time are the basic elements that define historic contexts. An historic context is a fully developed narrative. It is a way of organizing information about related historic properties, based on a well-defined topic, geographic limits, and a specific chronological period (USDI National Park Service 1986b:7).

Use of a thematic construct is based on the understanding that classification of these cultural resources is necessary to allow for their comparative analysis. Such analysis must be accomplished in order to assess the significance of the resources (USDI National Park Service 1987). Not everything that is old is necessarily considered significant. What is significant

can only be determined in relationship to the historic development from which it emerged and in relationship to a group of similarly associated properties (USDI National Park Service 1986b:6).

Table 2 presents four historic contexts, five themes, and seven subthemes. Within this framework all previous archeological research in the monument is analyzed and assessed. Part Three gives an in-depth analysis of the known archeological resources within a thematic construct. Part IV assesses the extent to which the data contribute to each theme. Part V then looks at the prehistoric data in a somewhat different way, within four fully developed historic contexts. Finally, Part VI gives specific management recommendations for the archeological resources in the monument.

Prehistoric Cultural Resources

The assignment of archeological sites to the prehistoric period is generally based on the absence of historic-era cultural artifacts and on the recognition of cultural materials or features belonging to an aboriginal cultural tradition known to have existed before European contact. Frequently, archeologists associate the presence of bone artifacts, lithic artifacts or stone chipping debris in a site with the prehistoric era.

Table 2. HISTORIC CONTEXTS FOR CAPE KRUSENSTERN NATIONAL MONUMENT

THEME	DATE	SUBTHEME	CONTEXT
Native Americans: Prehistoric Cultural Change	11,500 B.P. to Contact	Prehistoric Culture Chronology Prehistoric Settlements and Settlement Patterns Prehistoric Utilization of Environmental Resources	
Paleoarctic Adaptations	11,500 B.P. to 8,000 B.P.		Paleoarctic Adaptations in the Cape Krusenstern Region, Northwest Alaska between 11,500 B.P. and 8,000 B.P.
Archaic Adaptations	6,000 B.P. to 4,000 B.P.		Archaic Period Adaptations in the Cape Krusenstern Region, Northwest Alaska between 6,000 B.P. and 4,000 B.P.
Early Arctic Sea Mammal Hunting Adaptations	3,600 B.P. to 1,500 B.P.		Early Arctic Sea Mammal Hunting Adaptations in the Cape Krusenstern Region, Northwest Alaska Between 3,600 and 1,500 B.P.
Late Prehistoric Arctic Sea Mammal Hunting Adaptations	A.D. 450 to Early Nineteenth Century		Late Prehistoric Arctic Sea Mammal Hunting Adaptations in the Cape Krusenstern Region, Northwest Alaska between A.D. 450 and the Early Nineteenth Century.
Native Cultural Adaptations at Contact	to 1850	Aboriginal Use of the Cape Krusenstern Region	
Native American Lifeways	after 1850	Interactions with Euro-Americans; Cultural Change	
The Natural Environment	after 1850	Environmental Change in the Region: Euro-American Whaling Caribou Hunting	(Table 2 continued on next page)

Table 2. HISTORIC CONTEXTS FOR CAPE KRUSENSTERN NATIONAL MONUMENT			
THEME	DATE	SUBTHEME	CONTEXT
(Table 2 continued)			
Establishing Intercultural Relations	after 1892	Reindeer Herding; Change to a Cash Economy	
Transportation and Communication	after 1920	Alaska Road Commission's Extension of Territorial Overland Communications and Transportation Facilities (Mail Trail)	

In the case of the tentative assignment of the new sites or cultural components located during the 1987-1988 National Park Service survey, such a practice was followed (McClenahan and Gibson 1990). However, a single component site just north of the monument dated to the historic era by means of radiocarbon dating was excavated and found to contain both lithic tools and rifle casings. Evidence from the site suggests that unless we have cultural remains diagnostic of a particular cultural tradition or radiocarbon dates from a secure context within a site, the assignment to the prehistoric or historic era must remain tentative (Gerlach et al. 1988). Sometimes archeologists use the term "protohistoric" to refer to that period during which native Americans were in contact with Euro-Americans and their material culture, but native American lifeways remained little changed by that contact. Figures 34 through 44 show the distribution of the sites in the monument believed to be prehistoric or protohistoric.

Of the 142 archeological sites listed as probably dating to the prehistoric era, 138 sites were chosen for study with respect to a number of environmental associations, modeled after an approach utilized by David G. Anderson in his cultural resource investigations at Fort Polk, Louisiana (D.G. Anderson et al. 1988). The important differences existing between the survey samples from the two regions are discussed in Appendix D of this overview and assessment.

The Cape Krusenstern analysis was carried out to establish a foundation for projecting prehistoric site occurrence in the monument, not only to aid future research, but to help the National Park Service's cultural resource planners (Appendix D). The study was to determine whether or not the data suggest any major similarities or differences in environmental factors among sites assigned to different cultural periods and to compare the latter with the many sites that remain unassigned to any cultural tradition.

Some of the 138 prehistoric archeological sites mentioned above have more than one cultural component. That is, within the layers of an archeological site on and beneath the ground surface, separate units of homogeneous cultural materials may be found. Each unit corresponds to a different cultural presence at the site. Archeologists refer to each separate unit as a cultural component. Of the 150 cultural components identified at the 138 prehistoric archeological sites mentioned above, 112 cultural components (or 75%) are nondiagnostic. That is, they contain no artifacts that we recognize as belonging to a particular time period or culture, which limits us in our ability to interpret them.

Archeologists assume that artifacts are not randomly distributed, but have distributional patterns that are directly connected to the types of activities for which they were used, and the types of resources being used. Based on this assumption, and on the assumption that different cultural systems may use the environment and natural resources differently, one can expect, for example, that a temporary hunting stand from which caribou were being hunted will differ in size, length of occupation, and type of cultural remains from a winter house. One can

also expect that a Paleoarctic tradition site for hunting land mammals might differ from a Northern Maritime tradition sea mammal hunting site. Similarly, nondiagnostic lithic sites and undated rock features might show patterning in their distribution across the land and in their composition. If these patterns can be recognized and understood, they can provide additional important information about the seasonal rounds and settlement patterns of the various people known to have inhabited the region prehistorically.

This analysis addresses these concerns. The methods and results of this analysis of the Cape Krusenstern data are included in Appendix D of this volume.

Descriptive Site Typology. The Archeological Site Summary of Prehistoric Sites (Appendix A) attempts to summarize the type of cultural deposit present at each site. However, it should be noted that surface remains are frequently poor indicators of subsurface materials and features and that unless subsurface testing is done, the extent and kind of subsurface deposits cannot be known. This is especially true of the 1987-1988 National Park Service reconnaissance level survey, during which a large number of archeological sites were found, but essentially no subsurface testing was accomplished (McClenahan and Gibson 1990). The following information is based on the best judgment of the recording archeologist, but may not reflect the actual composition of the sites.

Table 3. KNOWN PREHISTORIC OR PROTOHISTORIC SITES		
Category	Number of Sites	Percent of Total Sites
1 - Isolated artifact located on the surface	20	14
2 - Lithic deposit exposed on surface	27	19
3 - Surface and subsurface lithic deposit	15	11
4 - Surface cultural feature(s) with or without artifacts	59	42
5 - Surface and subsurface cultural deposit(s), one or more components	20	14
6 - Other	1	0.7
* Result of rounding individual percents	TOTAL	142
		100.7*

Table 3 has six categories of mutually exclusive descriptive site types that are based only on the physical characteristics of the archeological deposit. Category one consists solely of isolated artifacts found singly, unassociated with any other cultural materials, on the surface of the ground. Of the known prehistoric or protohistoric sites in the monument, 14 % are in this category.

Category two includes lithic deposits of two or more artifacts located on bedrock exposures or in areas where the soil is no longer present, leaving all the artifacts completely exposed. This category is 19% of the known prehistoric or protohistoric sites in the monument.

Category three consists of surface and subsurface lithic deposits, that is, cultural deposits made up of lithic materials exposed on the surface by deflation of the soil or by frost heave, that also appear to have buried lithic materials. Category three is 11% of the monument's known prehistoric or protohistoric sites.

Category four is composed of surface features, such as rock cairns and above-ground stone caches, that may or may not have lithic or other artifacts nearby, but which do not appear to have any subsurface cultural deposits associated with them. Category four comprises 42% of the known prehistoric or protohistoric sites in the monument.

Category five consists of both surface and subsurface cultural deposits that may include a variety of cultural materials and/or features, consisting of one or more cultural component. An example of this type of site would be a village site. Category five makes up 14% of the known prehistoric or protohistoric sites in the monument.

Category six consists solely of an isolated human femur that rests on the surface in a disturbed context. It does not fit into any of the other categories and comprises 0.7% of the known prehistoric or protohistoric sites in the monument.

Functional Site Typology. Based on the level of prior studies in the monument, a classification of site types according to function is also possible (Table 4). In many cases, the assignment of a site to a functional category is based on what is observable on the surface. Because 75% of the known prehistoric or protohistoric sites are comprised of surface features and artifacts, much of the data are readily available for study. However, subsurface testing might reveal that the site had additional functions not apparent on the surface, or it might reveal data requiring modification of the original assignment.

Where more than one cultural component exists in a site, the site might be given more than one functional classification. For example, NOA-002 appears to have consisted of a series of campsites during early and middle Arctic Small Tool tradition (ASTt) times, but a series of village sites were identified at that site during late ASTt times and Northern Maritime tradition times.

This classification is essentially that presented by Giddings and Anderson (1986:xxviii) with the addition here of new categories based on the results presented in McClenahan and Gibson (1990). It is based on all of the known types of prehistoric or protohistoric sites in the monument, but may not represent the full range of variation actually present in the monument.

Definitions of these functional types are taken from Giddings and Anderson (1986) and from McClenahan and Gibson (1990):

Village. A group of semipermanent prehistoric or protohistoric semisubterranean houses presumed to be contemporaneous, in proximity to other associated features.

House. A single habitation consisting of a semipermanent, semisubterranean house pit and other associated features.

Camp. A temporary occupation that may be marked by a tent ring, a hearth, fire-cracked rock, a lithic scatter, and/or faunal remains. The cultural remains might indicate a single, relatively brief stay or a repetitive series of brief stays.

Hunting blind. Purposefully-arranged stones from which to spot and shoot game. Cairns, caches, hearths, and/or tent rings along with artifactual remains are sometimes found in association.

Special-purpose site. A site that is used for a specific single purpose, such as a site to quarry stone, a solitary stone marker or *inuksuk*, or an above-ground stone structure to store meat.

Isolated cultural artifact. A single artifact that is not apparently associated with any other cultural materials or features.

Function unknown. An artifact or feature that is humanly made, but the purpose of which cannot presently be determined.

Prehistoric/protohistoric Archeological Site Distribution in Cape Krusenstern National Monument. This overview and assessment intends to provide a good picture of the extent of archeological survey carried out to date in the monument. It also considers as many different kinds of variation as possible in the study of the distribution and relative density of prehistoric/protohistoric sites in the monument. In order to accomplish these two goals, several strata were delineated that correspond to different ecological or geomorphological zones. The first such division was accomplished using soil types as set forth by the USDA Soil Conservation Service (1979). Table 39, Appendix D, presents the results of this analysis, providing the acreage in the monument for each soil type, the total number of known prehistoric/protohistoric sites by each soil type, and the approximate acreage and percentage covered by archeological survey in each soil type. Finally, it gives the density of prehistoric/ protohistoric sites per 100 acres for each soil type.

A second type of stratification was accomplished using the five physiographic provinces outlined by Wahrhaftig (1965). The results of this analysis are

Table 4. FUNCTIONAL PREHISTORIC OR PROTOHISTORIC SITE TYPES		
Type	Number of Sites	Percent
1. Village Cluster of houses	7	5
2. House Single house	10	7
3. Camp Tent ring(s) Above-ground stone features Formal hearth(s), FCR scatter, or concentration	20	14
4. Hunting-related Stone blind	8	6
5. Other special-purpose site One or more of these attributes may be present: Burial Pits Butchering remains Flintknapping debris Hunting tools and tool fragments Processing tools and tool fragments Stone cairn (marker or <i>inuksuk</i>) Stone cache (above-ground storage) Hearth or FCR scatter (fireplace or campfire)	77	53
6. Isolated cultural artifact	20	14
7. Function unknown	2	1

presented in Table 41, Appendix D, providing the same type of data as in the previous table, but for the physiographic provinces.

A third means of stratifying the area in the monument was by delineating the areas lying within and outside of the drainage systems in the monument, using a USGS topographic map (Table 42). This was an effective way to illustrate the archeological survey strategies used in the monument. The total acreage in the 10 major drainages in the monument under consideration (that excludes the Noatak River) comprises 49% of all the acreage in the monument. To date, approximately 98% of all archeological survey has been carried out within these drainages, and 75% of the known prehistoric sites are located in them. Table 42 presents the

results of this analysis of archeological surveys carried out in the major drainages.

Managers considering site density data will want to keep another factor in mind. That is the definition and use of the term "archeological site." In this overview and assessment the term is applied to anything ranging from a single, isolated lithic flake to a multi-component village site. In the case of NOA-002, it is known to apply to a multi-component, multi-village site. An example follows. While the site density for the Mulgrave Hills province is figured at 12 sites per 100 acres as compared to five sites per 100 acres for the combined Lowlands, when we compare the types of sites in the respective physiographic provinces we see that large and small, long-and-short term, single or multi-component, temporary campsites and rock features predominate in the Mulgrave Hills province; but the sites in the Lowland provinces are most frequently large, multi-component, long-term semipermanent villages or single dwelling sites (Table 41). This fact should be considered when studying the data presented in these tables.

Research Themes Addressing the Prehistoric Era

RESEARCH DOMAIN I: Native Americans: Prehistoric Cultural Change.

Research Issues: What peoples were present in the monument prehistorically? What was the extent of their use of the monument? During what time periods did they inhabit the monument?

Presence of Humans before 11,500 B.P. There is no evidence that people inhabited the Cape Krusenstern region before around 11,500 B.P. It is possible, however, that such evidence may be found in the future.

Paleoarctic Tradition (11,500-8,000 B.P.). Five cultural components, or 3% of the prehistoric cultural components under study here, belonging to the Paleoarctic tradition have been identified in the monument, based on typological considerations. The sites (NOA-139, NOA-182, NOA-200, NOA-256, NOA-266) are all composed of surface lithic scatters and are undated. In each case, they have been assigned to the Paleoarctic tradition because of the presence of diagnostic lithic artifacts in the artifact assemblages (Giddings and Anderson 1986: 301-304; D.D. Anderson 1977; McClenahan and Gibson 1990). Based on the small number of sites presently known for this cultural tradition in the monument, it is impossible to address the question of the full extent of humans' use of it or the exact periods of time during which they were present.

Northern Archaic Tradition (6,000-4,000 B.P.). In the monument, there are only three known Northern Archaic tradition cultural components (at NOA-080, NOA-138, NOA-264). They make up 2% of the prehistoric cultural components included in this study (Hall 1982, Giddings 1964, McClenahan and Gibson 1990). The assignment of these components to the Northern Archaic tradition is based on

the presence of diagnostic lithic artifacts identified in undated surface lithic scatters at the sites (Giddings and Anderson 1986; McClenahan and Gibson 1990).

The present site sample is too small to consider the questions of the full extent and time of occupation of the monument by Northern Archaic tradition people.

Arctic Small Tool Tradition (4,200 B.P. \pm 50 - 1,000 B.P. \pm 50 B.P.). The ASTt has been subdivided into four cultural periods by Douglas D. Anderson's classification, and all of these periods are present in the remains at NOA-002, the Cape Krusenstern beach ridges. NOA-002, as Giddings originally conceived it, takes in around 9,900 acres. Included in NOA-002 are no doubt numerous sites representing at least three cultural traditions, in many cases so difficult to delineate that Giddings and Anderson (1986) decided to treat them all as one site. Because of this situation, it is impossible to know how many sites or cultural components are actually present. This has a biasing effect in any attempt to quantify the remains at NOA-002 or to compare them in numerical terms with sites and components in the rest of the monument.

Denbigh Flint complex (DFC) sites are represented in cultural components at five sites in the monument (NOA-002, NOA-256, NOA-278, NOA-280, NOA-282). They make up 3% of the components being studied (if we count NOA-002 as having a single DFC cultural component). These surface components were assigned to the Denbigh Flint complex based on their formal descriptions and location on beach ridges known to have been inhabited by Denbigh people.

At Cape Krusenstern, Choris culture is identified from a series of late spring-early summer temporary seal hunting campsites on beach ridges at the Cape (Giddings and Anderson 1986:209-222). All of these campsites are subsumed under the single site designation, NOA-002.

Norton culture components were identified at two sites in the Coastal Lowlands (NOA-002, NOA-078) and make up 1% of the components under consideration here. The identification was based on artifact typology in the case of the Battle Rock site and the beach ridge site, and on the placement of the campsites on beach ridges 36-43 in the case of NOA-002.

Ipiutak cultural components were found at three archeological sites in the monument (NOA-002, NOA-078, NOA-277) and make up 2% of the components in this study.

The intrusive Old Whaling culture was identified only at NOA-002 in the monument and makes up just 0.6% of the total cultural components.

Northern Maritime Tradition (ca. 1,550 B.P.-early nineteenth century). Birnirk culture is found at NOA-002 in the monument and makes up 0.6% of the

known cultural components there.

Western Thule cultural components were located at six sites in the monument (KTZ-005, NOA-002, NOA-078, NOA-161, NOA-167, NOA-274) and make up 5% of the monument's total known cultural components.

Kotzebue period cultural components were recorded at seven sites in the monument (NOA-002, NOA-140, NOA-162, NOA-163, NOA-188, NOA-256, NOA-284) and make up 5% of all the known cultural components in the monument.

RESEARCH DOMAIN II: Prehistoric Settlements and Settlement Patterns

Research Issues: How did the prehistoric inhabitants of the Cape Krusenstern region distribute themselves across the land? What are the settlement patterns typifying each cultural tradition and what differences exist among them?

Paleoarctic Tradition. All five known sites of this tradition in the monument are located on prominences more than 200 feet above sea level (ASL) in the Mulgrave Hills or the Igichuk Hills, on landforms that have a predominantly southerly aspect. The sites are located within 1/2 meter (0.5 m) of a stream or river, at elevations between 50 and 100 feet above the water (Appendix D). Based on the level of data available, at present, it is too early to make specific statements regarding the total variability that might be found in Paleoarctic tradition settlement patterns in the monument and the region.

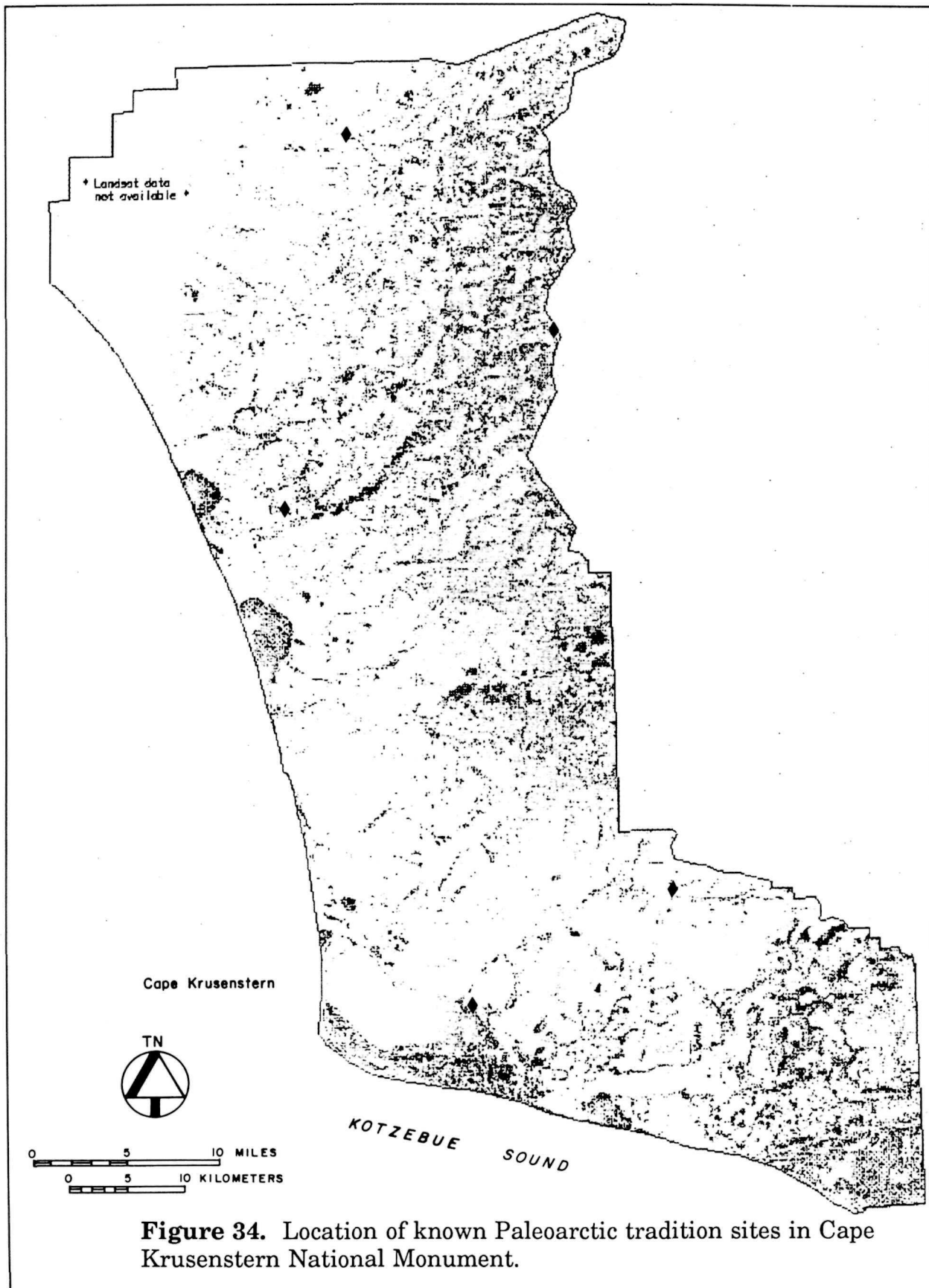
Northern Archaic Tradition. All three known sites lie within the Mulgrave Hills and the Igichuk Hills. They are situated on landforms with southerly or southeasterly aspects, on gravelly prominences overlooking tributary streams. One is situated on a lakeshore. All are located at elevations above 125 feet ASL, with the majority ranging between 300 feet ASL and 600 feet ASL (Appendix D). NOA-253 is a possible fourth Northern Archaic tradition site.

No habitation sites of a more permanent nature are known for the monument. While these data suggest the distribution of sites during Northern Archaic tradition times, such a small sample cannot give the full spectrum of site types, nor does the sample provide us with a full picture of site distribution in the region.

Arctic Small Tool Tradition. Remains of the Denbigh Flint people were located at four sites on beach ridge segments five and six at Cape Krusenstern (Giddings and Anderson 1986; McClenahan and Gibson 1990). Giddings and Anderson (1986) described the Denbigh artifact scatters they located as being distributed in "unusually tight clusters" measuring less than 2 m in diameter, situated around fire-reddened areas that are the remains of hearths. This configuration suggested

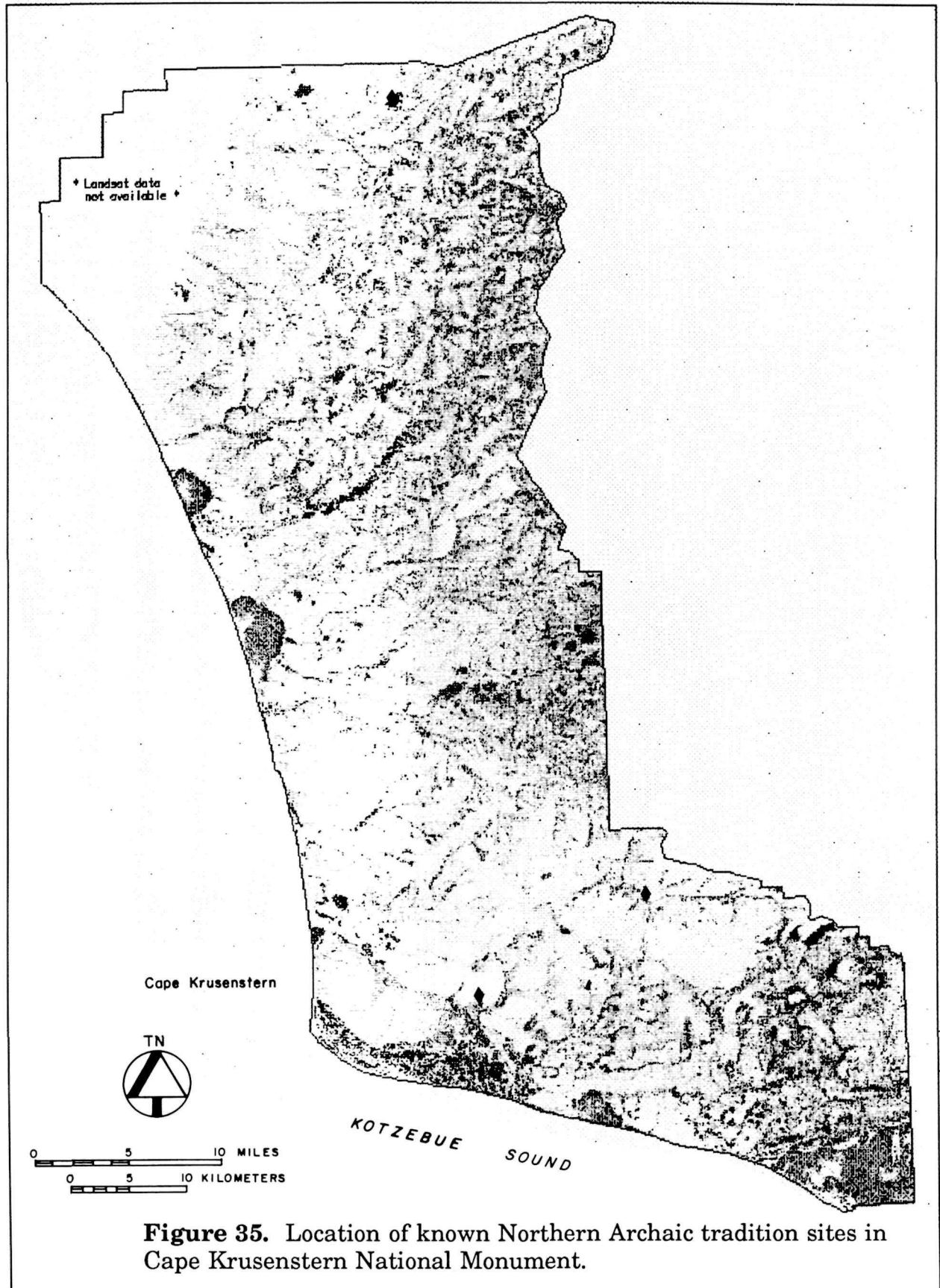
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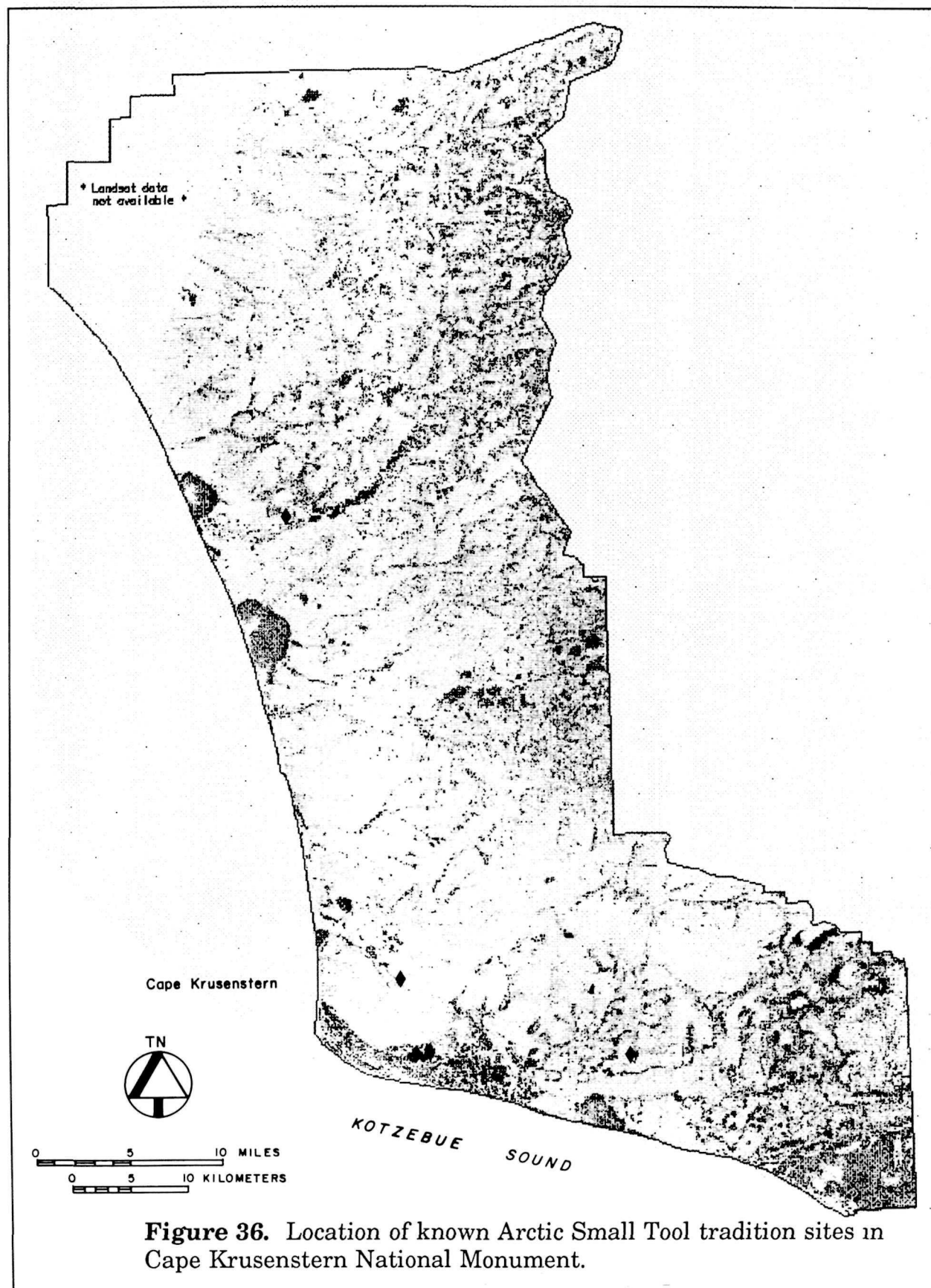
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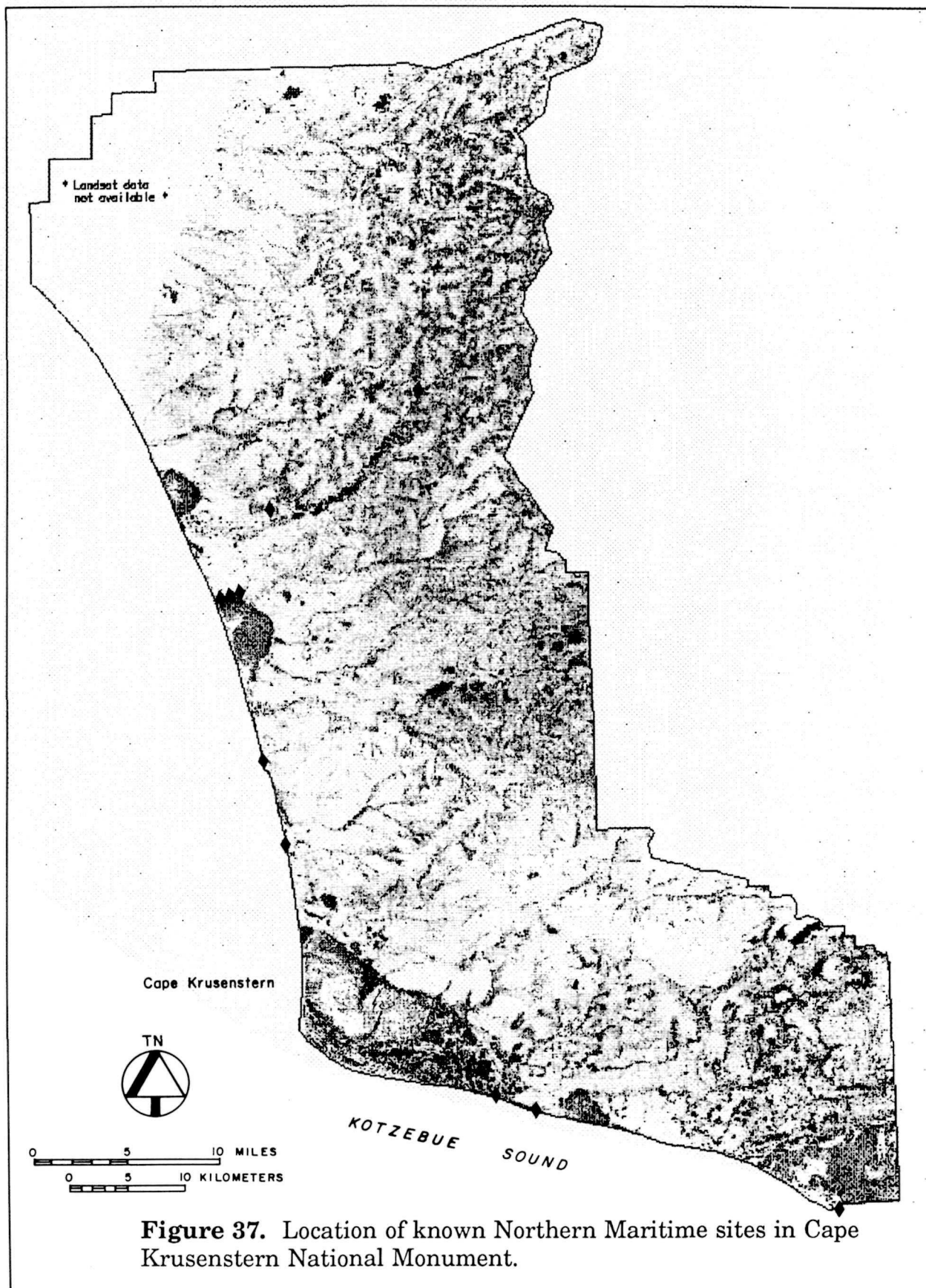
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the former presence of small tents. No evidence for structures is present, however, nor were any stone tent rings found at any of these sites located on Denbigh-age beach ridges. No diagnostic artifacts were in the surface remains of the nearby sites identified during the 1987-1988 National Park Service survey, but the sites seem to be analogous based on their appearance and location on the Denbigh-age beach ridges.

Four additional sites, located on prominences at higher elevations scattered along the western edge of the foothills of the monument, may also have Denbigh Flint complex cultural components. All of these sites are on prominences overlooking water. The first, a multicomponent site, is an extensive surface lithic scatter that contains a classic "mitten" burin, considered to be a diagnostic artifact of the early ASTt (Giddings and Anderson 1986; McClenahan and Gibson 1990). The second contains one bifacially prepared obsidian burin and a burin spall and may also be Denbigh Flint complex sites (McClenahan and Gibson 1990). Two other sites contain Denbigh-like burins. One of the latter sites also has a rock cairn, which may or may not be contemporaneous (McClenahan and Gibson 1990).

Permanent houses of this cultural tradition have been found at only four locations in Alaska, including the site at Onion Portage, Howard Pass in the Brooks Range, and in the upper Naknek and Ugashik river drainages of the Alaska Peninsula (Dumond 1987b). No permanent house remains belonging to Denbigh people have been identified in the monument to date. Considered with the small sample of early ASTt sites thus far located in the monument, it is probable that the full spectrum of Denbigh site types has not yet been identified for the area of the monument. Likewise, the full distribution of Denbigh Flint complex sites is not yet known.

In the monument, Choris period people are only documented at campsites on the beach ridges of segment three at Cape Krusenstern. They appear to be the campsites of people who were practicing sealing, primarily in the late spring and early summer. Hearths circumscribed by cobbles that contain beach pebbles and scattered artifacts are characteristic of the sites. No evidence of structures has been located (Giddings and Anderson 1986). One other site in the monument contains nondiagnostic lithic artifacts that nevertheless suggest a Choris presence. It is located on a promontory overlooking a creek at the westernmost edge of the Mulgrave Hills. These sites resemble Denbigh sites in their locations, but they are insufficient to permit any conclusions about the full spectrum of Choris culture site types or settlement patterns in the vicinity of the monument.

The Norton-Near Ipiutak period in the monument is represented only by campsites on beach ridge segment three, consisting of scattered artifacts described as seal-hunters' camps, and in burials at the Battle Rock site. No features such as tent rings have been found, nor have more permanent structures been located at Cape Krusenstern for this period (Giddings and Anderson 1986). Sites of this period have been located elsewhere in the region that include campsites, rare

houses, and gravesites. However, the data available for the monument do not permit any conclusions about the full variability of Norton-Near Ipiutak site types or settlement patterns in the monument.

Ipiutak settlements on the beach ridges at Cape Krusenstern are represented by a minimum of eight compact settlements of between five and fourteen houses each, and some thirty-five isolated houses, reported by Giddings and Anderson (1986:120). An additional site located on the north shore of Krusenstern Lagoon contains probable Ipiutak-period house remains (McClenahan and Gibson 1990). Of further interest are the remains of Ipiutak tent and campsites that are located over large areas on the seaward side of the Ipiutak settlements (Giddings and Anderson 1986:116). Giddings and Anderson excavated one such camping area. It consisted of a large area of fire-cracked and -reddened beach pebbles, most of which were found in 1-m clusters. Other concentrations of oil-soaked gravel were present (Giddings and Anderson 1986:120).

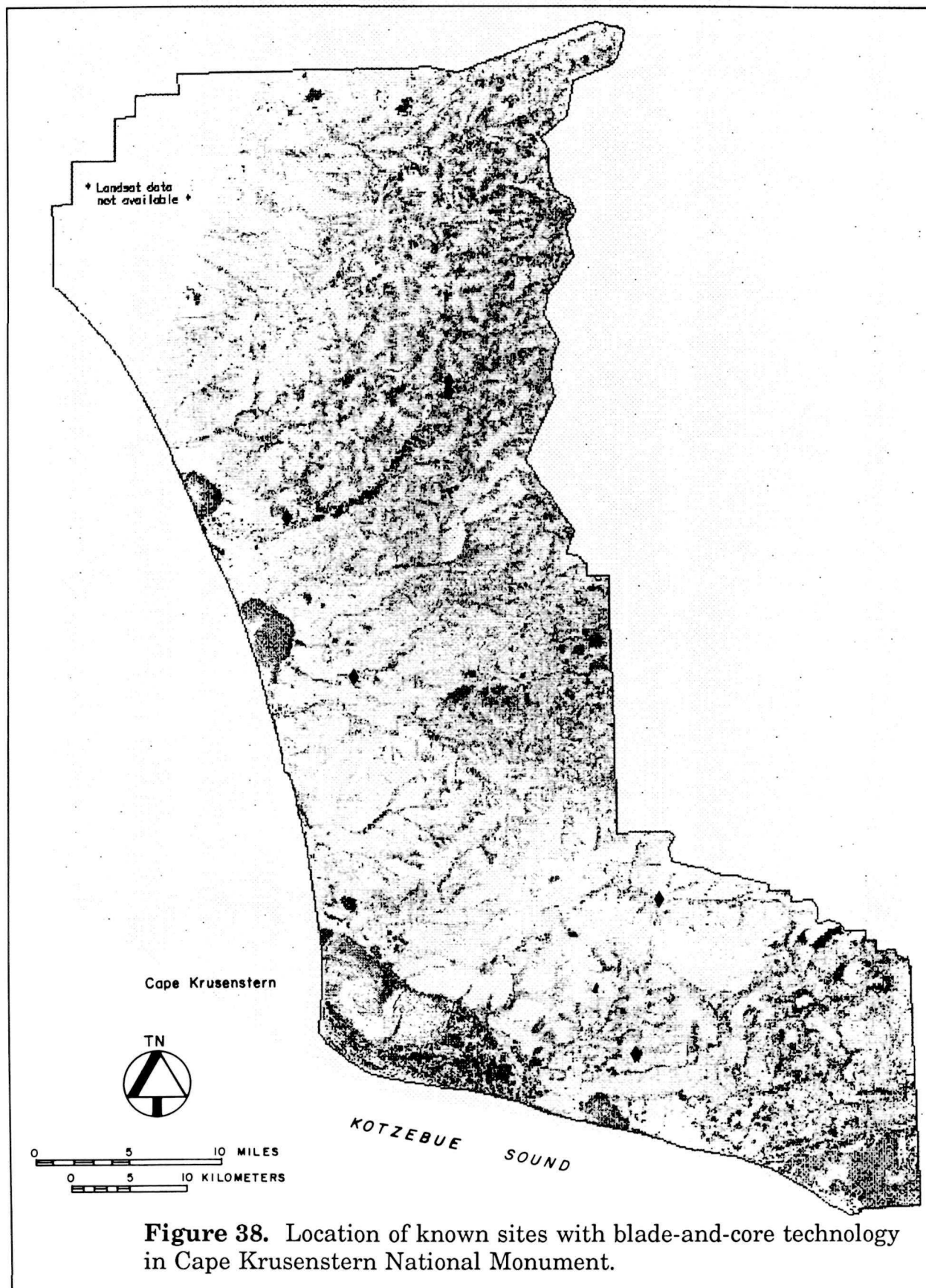
Ipiutak culture is well known from more than 600 house sites at Point Hope, and is also documented from other parts of Northwest Alaska, including Deering, Point Spencer, and Feniak Lake. Relationships with earlier ASTt cultures and with the succeeding Northern Maritime tradition cultures are little understood.

Northern Maritime Tradition. Birnirk period culture is only known from the identification of three semisubterranean houses on beach ridge segment two at Cape Krusenstern, occupied from fall until April or May. Of these three, two were excavated, yielding a mixture of Ipiutak, Birnirk, and Western Thule style artifacts (Giddings and Anderson 1986:92-110). Each house was only large enough for a single family. The scant data indicate that perhaps lifeways at Cape Krusenstern were different from those of the Birnirk people at Cape Prince of Wales, Point Hope, and Point Barrow, who had different artifact categories and who apparently had a different subsistence regime. The settlements at Point Hope and Point Barrow appear to have been larger than the three small houses at Cape Krusenstern; and there is evidence that whales, as well as seals and caribou, were hunted from them. At Cape Krusenstern, there is no evidence for whaling for Birnirk times.

For Cape Krusenstern National Monument, the Western Thule culture is apparent from habitation sites along the coast near the Tukrok River (McClenahan and Gibson 1990), on beach ridge segment two at Cape Krusenstern (Giddings and Anderson 1986), and from the northern beach ridges of Kotlik Lagoon (McClenahan and Gibson 1990). Houses at Cape Krusenstern are grouped in several clusters of up to six houses each. One house in each group appears to be preeminent, with smaller single-roomed houses assembled around it (Giddings and Anderson 1986). At Kotlik Lagoon the surface indications suggest a cluster of three houses and other cultural features. The remaining sites are composed of at least one house, based on surface indicators (McClenahan and Gibson 1990).

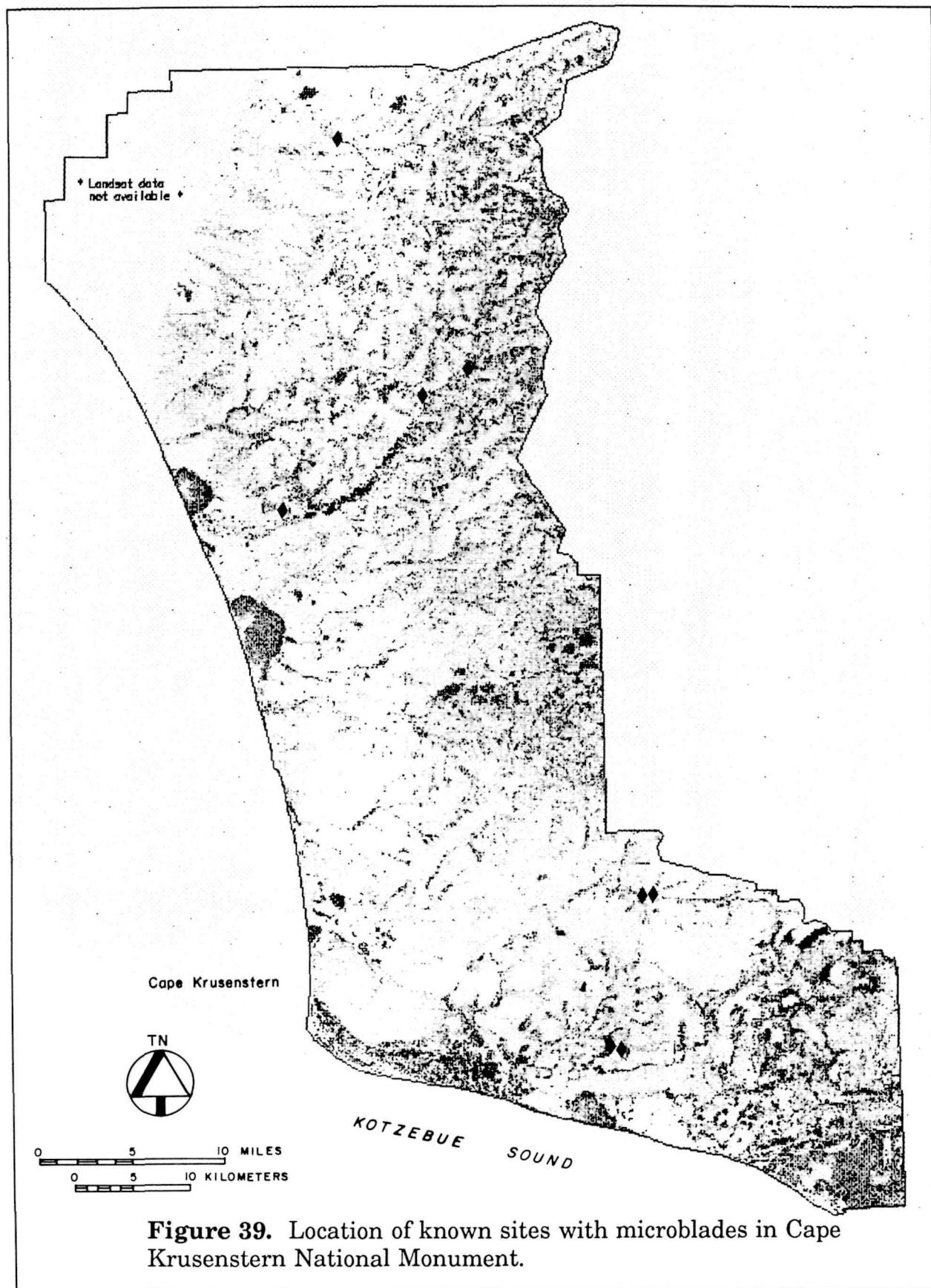
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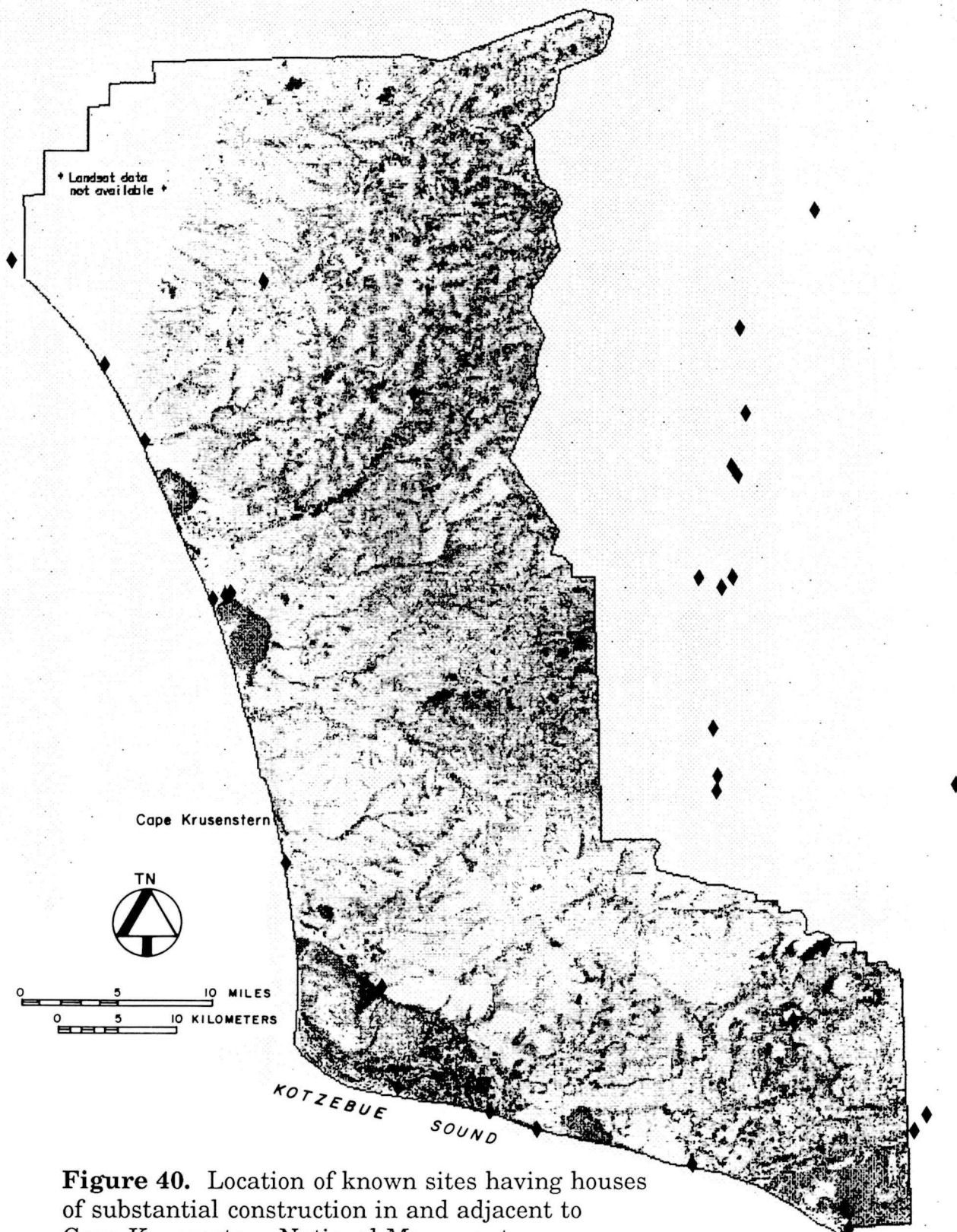


Figure 40. Location of known sites having houses of substantial construction in and adjacent to Cape Krusenstern National Monument.

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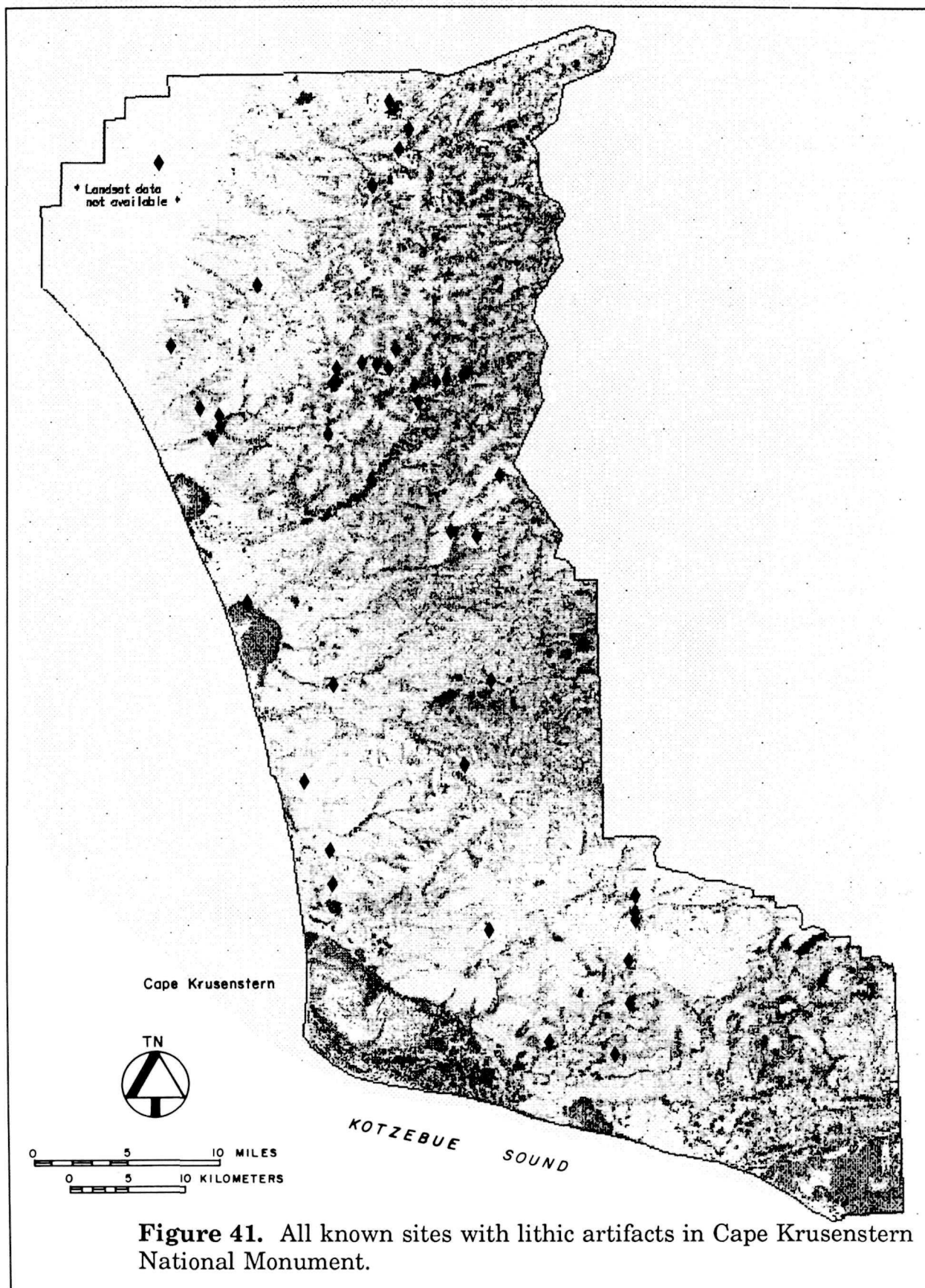


Figure 41. All known sites with lithic artifacts in Cape Krusenstern National Monument.

The cultural period is also evident from burials at two sites adjacent to the coast at Battle Rock (Giddings and Anderson 1986) and near Kotlik Lagoon (McClenahan and Gibson 1990). In the monument, no Western Thule sites have been identified inland.

Kotzebue period sites in the monument have been located on the beach ridges of Cape Krusenstern (Giddings and Anderson 1986), on the beach ridges of Kotlik Lagoon, in coastal sites at the mouths of rivers, and at one unique setting in the Mulgrave Hills on upper Rabbit Creek (McClenahan and Gibson 1990). Only those sites at Cape Krusenstern have been excavated, revealing houses that are smaller than those of the Western Thule period. Arrangements varying from single houses through groupings of up to eight houses have been recorded on the Cape Krusenstern beach ridges (Giddings and Anderson 1986). Sites located elsewhere in the monument contained groupings of up to four houses, some of which are not contemporaneous (McClenahan and Gibson 1990). Kotzebue period sites can be found in most of the same general areas of the monument as Western Thule sites. The house pit and tent ring (believed to be in association) located on Rabbit Creek and the temporary-use site overlooking Rabbit Creek, consisting of a scatter of lithic tools, represent an inland focus, a heretofore unknown facet of Kotzebue period settlement patterns in the monument (McClenahan and Gibson 1990).

At least 33.7%, or 50, of the total prehistoric cultural components thus far identified in the monument are lithic scatters or isolated lithic artifacts unassignable to any cultural tradition. Because they are nondiagnostic lithic scatters, there is no way to tell how many cultural components are present. Of the estimated 50 components, 4% contain blades and/or microblades that, while nondiagnostic, may be assigned to the Paleoarctic tradition, the Northern Archaic tradition, or the Denbigh Flint complex, ASTt, based on the existing cultural chronology for the region. Such placement brackets the dates for the artifacts from about 12,000 B.P. to 3,600 B.P. in this region. One single component, or 0.7% of the total, contains nondiagnostic ground slate, which is found in the region after around 3,150 B.P.

Twenty-eight such components, or 65% of the nondiagnostic lithic scatters, are located within 0.5 m of fresh water streams (the majority being tributaries, second- and third-order streams). Thirty-four components, or 79% of the nondiagnostic lithic scatters, are found in the Mulgrave Hills. Most (40, or 93%) are located in areas of sparse or no vegetation cover in upland alpine or non-tussock tundra vegetation zones (Appendix D).

Twenty-four archeological sites, or 17% of the prehistoric sites under consideration, consist of undated stone cairns. Cairns frequently appear to be placed at hill summits, located relatively equidistant between two, three, or four tributary headwaters of streams. Their locations above water tend to vary predominantly between 100 and 500 feet (Appendix D).

Twelve archeological sites, or 9%, have stone tent rings thought to be prehistoric or protohistoric. All sites are located in non-tussock tundra or upland alpine vegetational zones and are usually situated adjacent to lower-order streams, but may be located at some distance from running water. Most known sites with tent rings (7%) are located in the Mulgrave Hills, while the rest (2%) are found in the Igichuk Hills (Appendix D).

Six archeological sites believed to be prehistoric or protohistoric, or 4%, are identified as hunting stands or hunting blinds. Five are located in the Mulgrave Hills, and one is located in the Igichuk Hills at elevations of 250 to 600 feet above the nearest water, in each case a first-order, non-tributary, stream. All are located on slopes of 20% or more.

RESEARCH DOMAIN III: Utilization of Environmental Resources

Research Issues: How did the prehistoric populations interact with the local environment? What resources affected use of the area in the monument and site locations? Can the environmental setting and the distribution of known resources be associated with functional site types or chronological periods?

American Paleoarctic Tradition. Paleontological and archeological sites in the region have yielded the remains of now extinct species of Pleistocene fauna, some of which were forebears of present species living in the area. Some of them were present when Alaska was a part of the Beringian landmass. Known mammal species include bison, mammoth, the American mastodon, horse, saiga antelope, musk ox, camel, Dall sheep, stag moose, wapiti, beaver, short-faced bear, caribou, badger, lynx, and several other species. Some of these species became extinct in North America around 10,000 B.P., whereas the bison only became extinct around 500 years ago. The caribou, Dall sheep, and bears live on today. Based on the food requirements of some of the large grazing herbivores living in the monument 10,000 years ago, the environment is thought to have been drier and colder than that of today, resembling an arctic steppe dominated by *Artemesia* and grasses (Guthrie and Guthrie 1990). Much of western Alaska remained unglaciated during the final Wisconsinan glaciation.

Many of the sites in the monument believed to be American Paleoarctic tradition sites are located on prominences with southerly or southwesterly aspects affording a broad view of a river valley, on both middle- and upper-river drainages. All these sites are located at or above 200 feet ASL, where the terrain is hilly to steep, where the site surface is comprised largely of gravels, and drainage is good. While the sites are broadly dispersed throughout the monument, and some are associated with neither rivers nor streams, all are located in "edge" environments or ecotones, generally between what is non-tussock tundra or alpine- and tussock-tundra vegetational zones. These zones likely presented very different vegetation

regimes during Paleoarctic tradition times (Appendix D). All the sites are lithic scatters, and tools and debitage produced there represent the manufacture of microblades that were probably intended as insets for composite weapon heads used in hunting land mammals. The environmental setting suggests that Paleoarctic tradition people were using these sites as overlooks for terrestrial game attracted to these particular vegetational or geomorphological settings, as temporary campsites, and as sites for manufacturing or repairing hunting tools (D.D. Anderson 1977; Giddings and Anderson 1986; McClenahan and Gibson 1990). The presence in all of the sites of chert lithic artifacts, and in two sites of primary reduction flakes, argues for quarrying of local cherts, probably in the form of river cobbles at nearby streams. None of the sites has yielded buried cultural materials nor any organic remains, making it impossible to speculate about seasonal use of each site, utilization of animal and plant resources, and the involvement of these sites in the total seasonal round of activities.

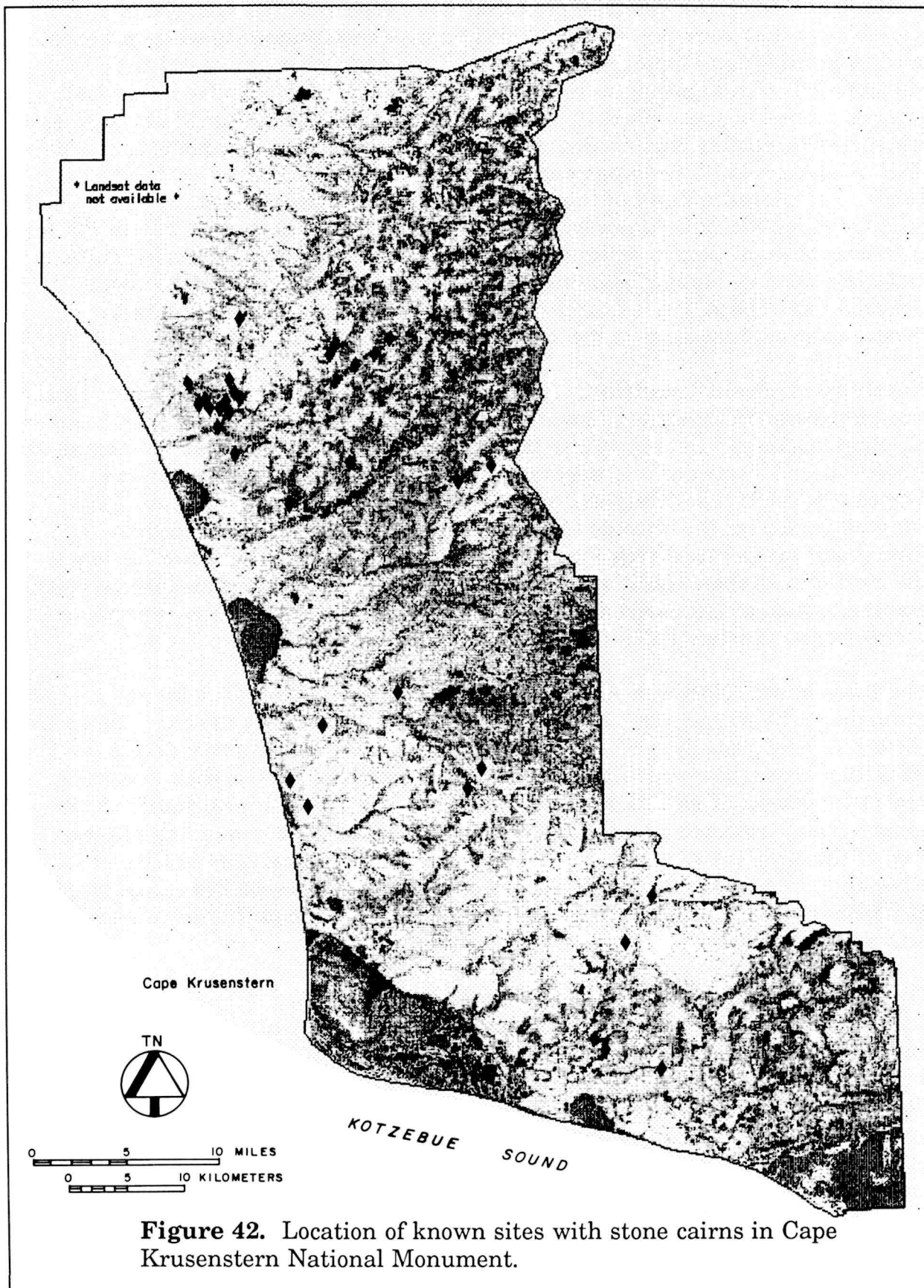
Northern Archaic Tradition. At the end of the Pleistocene, the glaciers receded and temperatures continued to warm to a point that it was warmer than today in Northwest Alaska. In response to this warming, it is believed that the boreal forests spread westward and northward, and in the area of the monument, all the way to the coast. The Northern Archaic tradition is seen as a subarctic forest-adapted version of the Archaic tradition that was widely distributed then throughout temperate North America. Some scholars argue that the bearers of the Northern Archaic tradition, people fully adapted to hunting modern terrestrial mammals such as the caribou, expanded northward along with the expanding boreal forests (Dumond 1984; Giddings and Anderson 1986).

The three known Northern Archaic tradition sites are broadly scattered throughout the monument. At these sites, the terrain is hilly to steep, the ground surface is very gravelly, and the drainage is excellent. All are situated in transition zones, between what is non-tussock or alpine and tussock tundra vegetation zones, at elevations above 300 feet. The sites all have southerly or southeasterly aspects and provide broad overviews of the surrounding terrain. Two of the sites are situated in proximity to a river or lake. At the time of its occupation, the third site (the Palisades site) may have overlooked a coastal plain as opposed to the Krusenstern Lagoon beach ridges of today (Giddings and Anderson 1986:306).

The Northern Archaic sites in the monument are composed of tools and lithic debitage that were produced by a bifacial tool industry. Only one site (NOA-264) contains microblades. Since the site is a scattering of surface lithic artifacts, however, it cannot be determined whether or not the microblades are part of this Northern Archaic tradition assemblage. All three sites that have Northern Archaic tradition cultural components contain obsidian in the form of primary and secondary flakes. Obsidian is considered an exotic material, the nearest known source being the Little Indian River south of the monument (D.D. Anderson, personal communication 1989). In addition, another exotic, chalcedony, is present

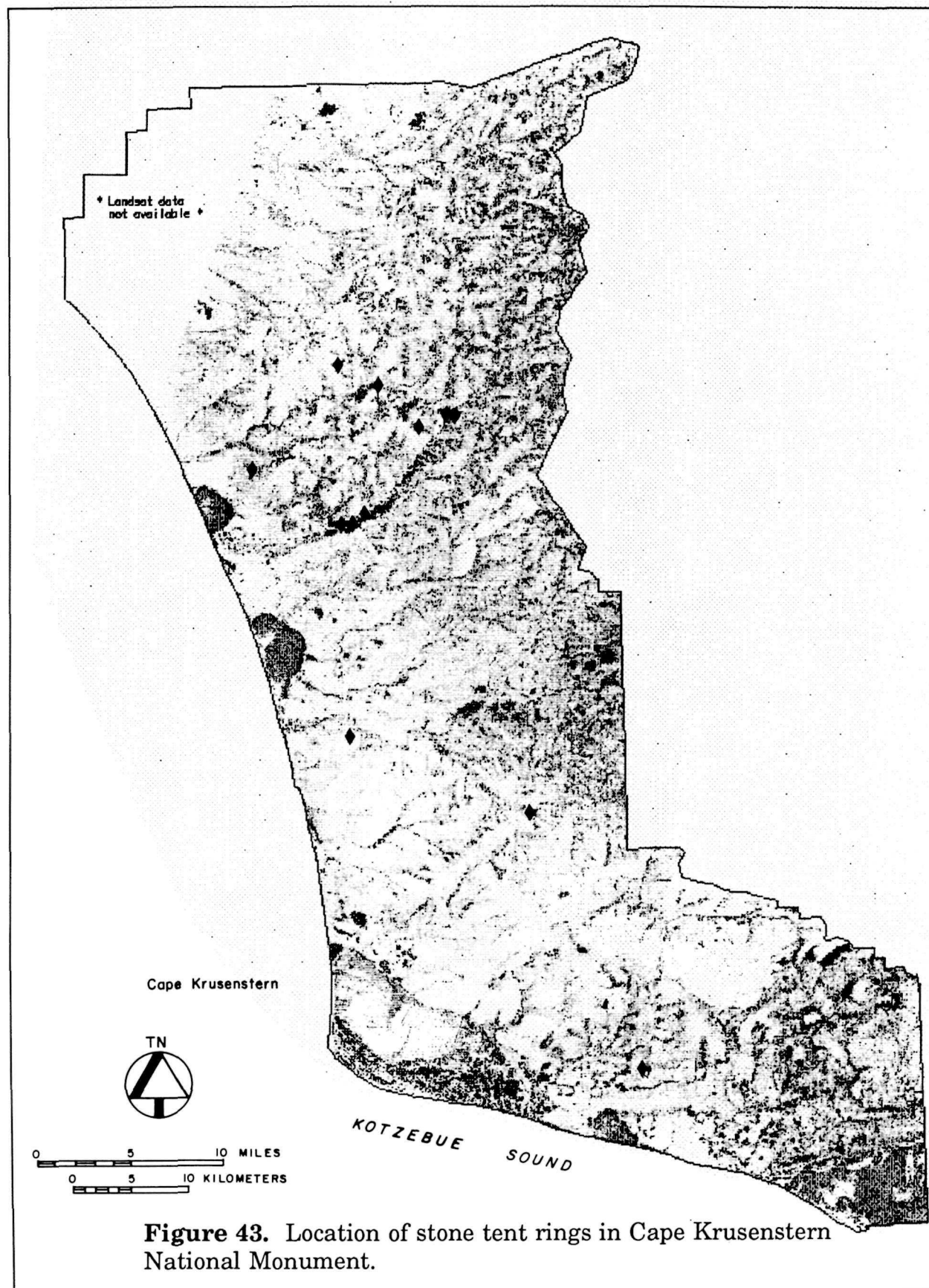
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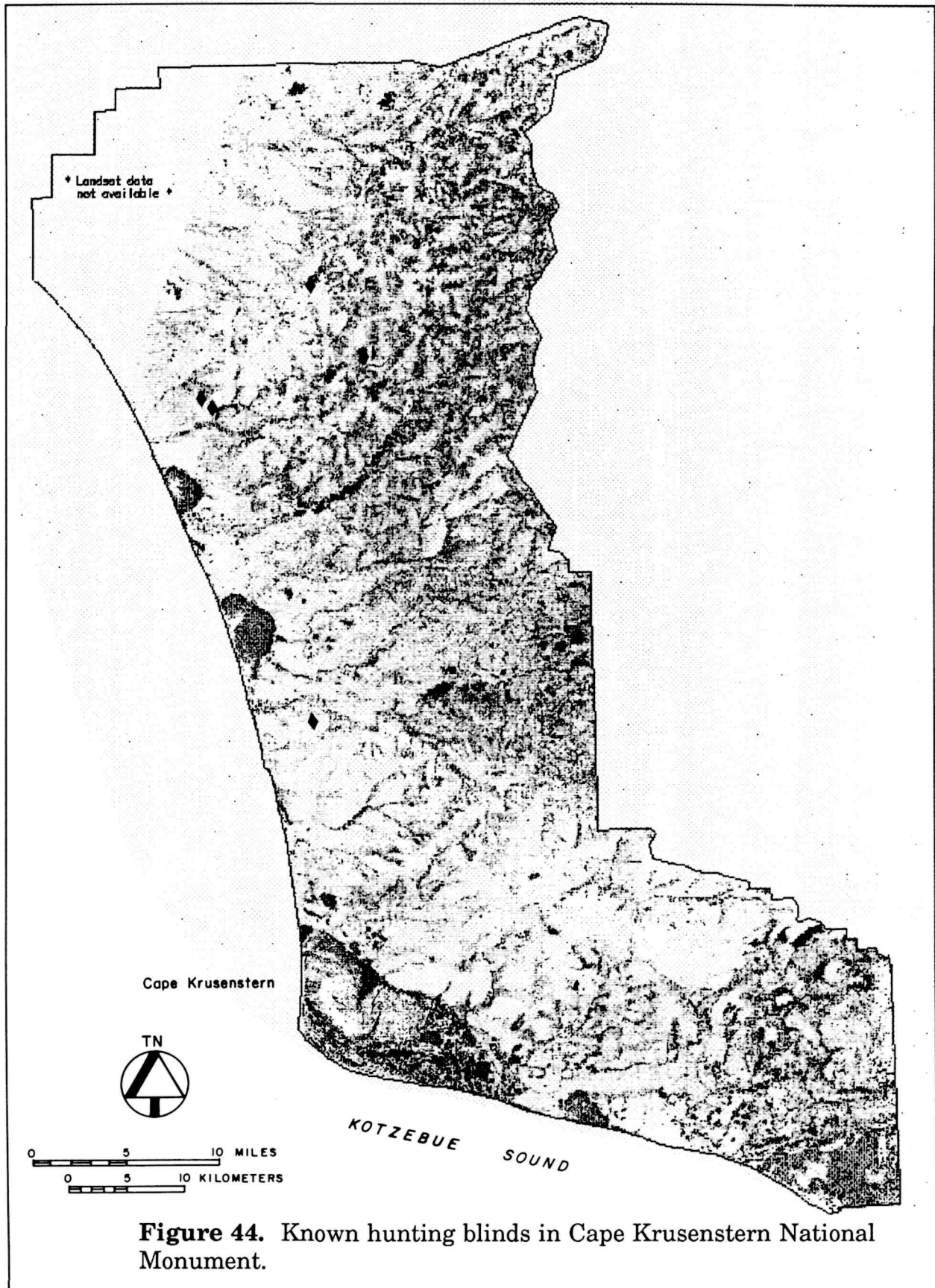
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at NOA-264, but its source is unknown. Locally available cherts were the primary source of lithic materials during Northern Archaic tradition times in the monument.

The presence at the sites of whole and fragmentary bifacially chipped projectile points, scrapers, and used flakes, in addition to primary and secondary lithic flakes located on prominences, suggests that Northern Archaic tradition people were watching for and hunting large terrestrial mammals such as caribou, processing hides and foodstuffs, and manufacturing lithic tools at these locations. Because so few sites belonging to this cultural tradition are known for the monument, and because no stratified sites, no habitation sites, nor any organic remains have been recovered, it is certain that there is much to be learned about the seasonal round of activities and subsistence regime of the Northern Archaic tradition peoples who inhabited the area

Arctic Small Tool tradition. Details regarding the environment of Cape Krusenstern during ASTt times have not yet been well worked out. During the Hypsithermal, climate and vegetation approached those of modern times. Some 4,000 to 7,000 years ago, the Krusensternian marine transgression of 8+ m was supposed to have taken place (Lewellen 1972:167-168), after which the sea level returned to approximately its present level, where it has remained in general for the past 3,000 years (Hopkins 1967:85; Moore 1960). A cooling trend took place sometime between 8,000 and 3,000 B.P., and the treeline once again retreated around 3,500 B.P.

Faunal remains have not yet been recovered from the Denbigh Flint complex sites in the monument; and any suggestions regarding what natural resources the Denbigh people were using are based on lithic artifacts, features, and site locations. The four sites known at the Denbigh beach ridges at Cape Krusenstern may represent spring and early summer seal hunting campsites, based on their positions at suitable spring or early summer sealing locales, and on the absence of semisubterranean structures usually identified with winter habitations. Additionally, triangular endblade insets similar to those used in more recent sealing harpoons were located in one site (Giddings and Anderson 1986:290). Located in the same site, however, were endblade insets for arrow or spearheads that have been interpreted as caribou hunting implements (Giddings and Anderson 1986:290).

Of the four upland sites thought to belong to the Denbigh Flint complex, only one contains a truly diagnostic "mitten" burin. All four sites are surface lithic scatters, located at or above 200 feet ASL on prominences with generally southerly aspects that provide a broad view. The other three contain Denbigh-like burins but no diagnostics. Two of these sites also contain microblades that may be part of the same cultural component and that may have been intended for use as insets in projectiles for caribou hunting. The lithic material most commonly used was the locally available chert, but a small percentage of lithic items are obsidian,

considered to be exotic. These upland sites are broadly dispersed along the extent of the monument, and all are situated in transitional zones at the far western edge of the foothills, overlooking the coastal plain. Three of the four also overlook drainages, and one overlooks a lagoon (Appendix D) (McClenahan and Gibson 1990). This pattern has been noted for early ASTt site locations elsewhere in Alaska (Dumond 1987:83). The fact that many of the streams on which the remains of Denbigh camps are located now receive substantial runs of salmon has prompted the suggestion that Denbigh people were also taking salmon at certain times of the year (Dumond 1987b:83).

Neither the full spectrum of site types nor the full round of seasonal activities for the Denbigh Flint complex people is known for the monument. Additionally, we know little of the broad range of natural resources the people used.

Choris culture is known at only one site in the monument, the beach ridges of Cape Krusenstern, where Choris campsites have been located. Found in association with hearths were seal bones, pottery, and tools that included burins, burin spall artifacts and an adz blade. Also located were an endblade inset, possibly for use in a sealing harpoon, and a straight-based endblade inset that may have been used for caribou hunting. One other site, located on Agagrak Creek in a setting closely similar to that of the Denbigh western foothill sites in the monument, has nondiagnostic artifacts that nonetheless resemble Choris artifacts (Appendix D). The site may have been a location from which land mammals, such as caribou, were hunted (McClenahan and Gibson 1990). An apparent Choris site north of the monument but within the NHL yielded a well-made chalcedony side blade inset and several projectile point fragments. The site is thought to be an inland hunting site (Gerlach and Hall 1986). Together, the two sites merely hint at a subsistence pattern that resembles that of the earlier Denbigh culture. Choris culture is so poorly represented by the current sample of known sites in the monument, however, that it is difficult to talk about potential relationships between Choris and its progenitors or its descendants. Nor can anything definitive be said about the broad distribution of sites or the full spectrum of site types of this time period in the monument.

Norton-Near Ipiutak culture is known only at two sites in the monument. Grave goods located at the Battle Rock site included tools for hunting land mammals, fishing, and manufacturing. Campsites on the beach ridges of Cape Krusenstern are the remains of those of seal hunters (Giddings and Anderson 1986). Just as for Choris culture, nothing definitive can be said about the full seasonal round of activities or the full range of site types that might be found in the monument for the Norton-Near Ipiutak people.

Known locations of Ipiutak sites in the monument thus far include coastal and near-coastal beach ridge sites, where numerous semisubterranean houses and campsites have been identified. The location of the sites at Cape Krusenstern and the presence of sealing harpoon heads and one whaling harpoon head in the

settlements argues for sea mammal hunting during at least part of the year. However, evidence is still scant that Ipiutakers did hunt whales. Giddings and Anderson (1986) suggest that there is little artifact variation over time and from site to site throughout the Ipiutak period.

Present also are land mammal hunting tools, probably for hunting caribou, and fishing gear. A tabulation of all faunal remains taken from the excavated Ipiutak-period settlements at Cape Krusenstern includes seal, whale, caribou, walrus, dog, polar bear, and fox, with seal making up the greatest percentage of the remains (Giddings and Anderson 1986:154). Comparisons of subsistence-related artifact types from the Cape Krusenstern excavations indicate that 86% of these artifacts were related to caribou hunting, however. This suggests that we have yet to identify all of the types of Ipiutak sites and that we do not yet have data for the complete seasonal round of activities for the Ipiutak people.

Northern Maritime Tradition. Artifact counts from excavations at Cape Krusenstern, classified according to subsistence activities, seem to indicate that land mammal hunting superseded sea mammal hunting in importance throughout Northern Maritime tradition times (Giddings and Anderson 1986:108). At this time, there was an apparent shift toward colder temperatures that reach their maximum extent in the sixteenth century.

Evidence of hunting equipment and faunal remains at the Birnirk site on the Cape Krusenstern beach ridges reveals that the Birnirk people were hunting seals and caribou. While seal bones outnumbered caribou bones in the sites investigated, caribou hunting equipment parts outnumbered those for seal hunting (Giddings and Anderson 1986:98). Based on these data, it appears that the houses were occupied briefly in the early spring for ugruk, or bearded seal, hunting, then abandoned until fall and winter. This leaves the question of what other types of sites remain to be identified that will fill out the picture of the Birnirk peoples' seasonal round of activities.

All of the known Western Thule sites are on the Chukchi Sea coast, some adjacent to a lagoon and one near the lower reaches of a river. Settlements comprise semisubterranean houses, burials, and caches, suggesting habitation during the colder months of the year. Some evidence of whaling was found at Cape Krusenstern for early Western Thule times; and whaling seemed to continue throughout that period, ceasing abruptly in the late fourteenth century. The extent, however, to which it was practiced within the region of the monument is not clear. Given that the ratio of tool types for hunting land mammals to that of sea mammals is greater than 2-to-1 in Western Thule sites that have been excavated at Cape Krusenstern, it appears that a large portion of the settlement pattern for Western Thule times remains unknown. While land mammals are known to have been hunted during Western Thule times, such related hunting, camping, and processing sites have not been positively identified in that time period of the monument.

Apparent Kotzebue period sites make up only 5% of the total cultural components thus far recorded in the monument. From this small sample, three site types have thus far been identified.

The predominant site type comprises a sample of six cultural components and is the semisubterranean house pit located on a coastal or lagoon beach ridge or barrier bar. In one case, such a habitation is on a river bluff near the seacoast. In the majority of these presumed winter or early spring habitations, water may have been immediately available in the form of snow, making proximity to a river or stream drainage relatively unimportant. Rather, emphasis appears to have been on coastal and lagoon animal and plant resources. Four houses excavated at NOA-002 by Giddings and Anderson (1986) yielded cultural remains that include seal (represented in faunal remains that make up 60% of the total collection), fish (represented in fishing gear that makes up 43% of the total hunting-related artifact inventory), and birds (represented in faunal remains that make up 10% of the total faunal collection). Land mammals (represented in faunal remains that comprise 24% of the total collection and in land mammal hunting equipment that makes up 18% of the total artifact inventory) seem to have been of relatively lesser importance to the inhabitants of these houses.

A second site type is represented by a multicomponent site that has a Kotzebue period component, located on a southfacing terrace above lower Rabbit Creek. It consists of a dense lithic scatter that includes two projectile points or fragments assignable to this cultural period. The presence of primary and secondary lithic flakes suggests that tool manufacturing was taking place, as well as hunting. Fauna that have been observed on Rabbit Creek during modern times include caribou, musk oxen, Dall sheep and anadromous and fresh water fish.

One probable Kotzebue period site that consists of a semisubterranean house, a tent ring, and cache pits is located in a unique setting on fluvial gravel deposits adjacent to the confluence of the east and west forks of Rabbit Creek, in the Mulgrave Hills. The features suggest both summer and winter habitation. The focus of subsistence activities in this locale might have been land mammals and fish, including salmon. The site has not been dated or tested, however.

Historic Archeology

Ethnographically used or inhabited sites. Foote (1965), Burch (no date), Loon (in preparation), and Ellanna and others (in preparation) recorded regional Inupiat place names for sites that were reportedly occupied during the ethnographic period. Hall and several others subsequently used these data to investigate archeologically a number of the sites (Hall 1973, 1974).

Known Historic Resources. Historic archeologists study the people represented by traces of human activity that form archeological sites from that period when

people began to keep written records about a particular area. Those records are another available source of data available for study with the archeological record, that is, all those physical remains produced by past human activities that are recovered, studied, and interpreted by archeological methods.

Thirty-six of the known archeological sites in the monument, or 21%, have historic, cultural components. A list of these sites and an additional list of known historic sites that are outside the monument, but that lie within the National Historic Landmark, are provided in the Archeological Site Summary in Appendix A of this report. Figure 33 shows the distribution of known historic sites.

Based on a review of ethnographic reports, historic records, and an archeological assessment of artifactual remains, the known historic sites in the monument are here assigned to a functional site typology:

<u>Site Type</u>	<u>Number of Historic/ Cultural Sites</u>	<u>Percent of Total Historic/ Cultural Sites</u>
Inupiat village	5	14
Campsite	14	39
Subsistence related		
Reindeer herding		
Reindeer corral and associated		
features	3	8
Euro-American style log cabin	4	11
Cemetery	3	8
Other subsistence-related site		
Hunting stand, blind, or		
shelter	2	6
Ice fishing?	1	3
Lithic scatter	1	3
Caches	1	3
Isolated artifact or feature	<u>2</u>	<u>6</u>
TOTAL	<u>36</u>	<u>101*</u>

* Result of rounding individual percents

The definitions of the site types follow those used in the previous work of Giddings and Anderson (1986), Hall and Gerlach (1983), and McClenahan and Gibson (1990):

Inupiat village. A grouping of houses comprising traditional semisubterranean habitations, campsites, caches, and special activity areas

occupied by Inupiat people during the historic era.

Inupiat-style house. A traditional semisubterranean habitation along with its associated features and artifacts, occupied by Inupiat people during the historic era.

Historic campsite. A temporary habitation site that may consist of a stone tent ring, structural members, a hearth or hearths, fire-cracked rock, faunal remains, and historic debris. Two types of campsites appear to be present in Cape Krusenstern National Monument. One type is related to subsistence hunting and the other is related to reindeer-herding activities. It may be possible to differentiate them by the structural remains, the amount and kind of artifactual materials, and the locations of the sites. A comparison of these two types can be found in McClenahan and Gibson (1990:114,121-123).

Reindeer corral and associated features. These sites are remains of historic-era domestic reindeer herding activities. They comprise one or more reindeer corrals that may or may not be associated with one or more houses, wall-tents, graves, caches, and other features and artifactual materials.

Euro-American-style log cabin. This structure is completely above ground and has a pitched roof, at least one room, and four log walls in a square or rectangular configuration.

Cemetery. These historic sites comprise one or more burials in the European or American style.

Subsistence-related historic site. These sites existed for resource procurement or storage. They include but may not be limited to hunting stands, blinds, or shelters, ice fishing sites, lithic scatters, and caches.

Isolated historic artifact or feature. Sites that fall into this category include a solitary kayak frame and an isolated wooden bowl.

Figure 33 shows the distribution of the known historic sites in the monument.

Research Themes Addressing the Historic Era in the Monument

Based on our current knowledge of historic documents and records, oral tradition, and the historic archeological record for the monument, several themes suggest themselves and are presented in Table 1.

RESEARCH DOMAIN IV. Establishing Intercultural Relations.

Research Issues: How and when did EuroAmerican contact affect the Inupiat? Is there a change from the traditional Inupiat settlement patterns? If so, how does this change manifest itself in the archeological record?

Historic documents place the landing of the first Europeans in the Cape Krusenstern region in 1816 with the arrival of Otto von Kotzebue's ship, even though the Russians had been aware of the Native people of northwest Alaska for some time through the Chukchi, who had a well-established trade in Alaska before 1750. That time period, designated the Kotzebue period, spans the late prehistoric and early historic periods in the Cape Krusenstern region (A.D.1400-early 1800s)(Giddings and Anderson 1986:41).

Archeological excavations carried out at NOA-002, on the beach ridges of Cape Krusenstern, suggest the following changes in settlements and settlement patterns:

- late fifteenth century-early nineteenth century A.D., one or two small winter houses
- mid-nineteenth century, settlements seem to consist of four or five houses; apparent corner-post pattern used.
- 1880s to 1950s, no winter houses. Many spring and summer campsites.

(Giddings and Anderson 1986:56)

Anderson notes that many habitations of this period appear to be located in previously unoccupied areas. A total of around 30 house pits found singly, in pairs, and in clusters were identified on the outer beach ridges of Cape Krusenstern. In 1816, von Kotzebue recorded winter settlements at Cape Krusenstern. Anderson suggests they might be his house, cluster #87-94. By the early 1900s no winter habitations were being recorded by visitors to the area, and Anderson suggests that only camping sites were utilized there between the 1880s and the 1950s (Giddings and Anderson 1986).

Documented historic Inupiat village sites in the monument are KTZ-005, NOA-002, NOA-003, NOA-007, and NOA-140.

Sites thought to be hunting campsites in the monument include NOA-080, NOA-154, NOA-194, and NOA-255. Subsistence-related historic sites in the monument are NOA-166, NOA-196, NOA-207, NOA-209, and NOA-256.

Log cabins can be found in the monument at NOA-109, NOA-111, NOA-257, and

NOA-283. Historic cemeteries in the monument include NOA-157, NOA-171, and NOA-217. A single historic-era grave is located at the reindeer herding facility at NOA-074.

RESEARCH DOMAIN V. Environmental Change in the Region.

Research Issue: What effects on the environment did EuroAmerican whaling and large sea mammal hunting have during early contact times? What effects on the aboriginal population did the dramatic decline in the caribou herds after around 1850 have?

Few seventeenth and eighteenth century coastal habitation sites have been excavated around Kotzebue Sound, and the full seasonal round of activities for nineteenth and early twentieth century Inupiat are not yet fully understood. While historic records document a decline in whales, walrus, and caribou during the 1800s (Bockstoe 1977; Foote 1965; Ray 1964, 1975; Skoog 1968), insufficient archeological data addressing these questions have been recovered for the area of the monument to adequately respond to them.

RESEARCH DOMAIN VI. Introduction of Domestic Reindeer Herds and Herding Practices.

Research Issue: What changes were brought to the region with the introduction of domestic reindeer herds as a cash crop? What archeological manifestations of reindeer herding activities exist in the monument?

Historians and ethnographers suggest that during the period from 1850 to 1890 the aboriginal population declined and changed its subsistence-settlement regimes (Stern et al.1980; Burch 1984; Ray 1964, 1975). Along with the decline of the caribou herds, some of the changes in the seasonal round of activities discussed in Research Domain IV, above, may be attributable to a rescheduling of activities to accommodate the needs of the reindeer herds, first imported in 1891. Anderson notes that in the mid-1900s, people were camping at Cape Krusenstern in the spring for seal hunting, in the summer and winter for reindeer herding, and in the fall for berry picking (Giddings and Anderson 1986:38) (Figure 45).

A wide variety of archeological sites in the monument are known to be sites of activities associated with historic-era reindeer herding. Campsites believed to be related to reindeer herding are NOA-184, NOA-191, NOA-204, NOA-236, NOA-242, NOA-243, NOA-252, NOA-255, NOA-271, NOA-272, and NOA-275. Reindeer corrals in the monument can be found at NOA-074, NOA-108, and NOA-110.

Figure 45. Historic reindeer corral at NOA-110.

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

RESEARCH DOMAIN VII. Transportation and Communication after 1920.

Research issue: What evidence of the expansion of Alaska Road Commission facilities across Northwest Alaska exists in the historic archeological record of the monument?

NOA-283 and NOA-140 are Alaska Road Commission cabins, built in the 1920s on the mail trail that runs along the coast of the monument (Figures 46, 47, 48, and 49) (Snow et al. 1985).

Curatorial Concerns

Prehistoric Archeological Resources. At present, the National Park Service's curatorial collection of prehistoric artifacts for Cape Krusenstern National Monument consists of only one artifact, a wedge-shaped microblade core. Other prehistoric artifact collections from the monument exist and are housed at a number of university museum or department facilities. The locations of these collections are given in the Archeological Field Work Summary, included in the appendix of this report.

Historic Archeological Resources. The curatorial collection kept by the National Park Service holds 641 historic, cultural artifacts, all from the test excavations at NOA-140 (Tukrok). The following artifact categories are used to describe the contents of that collection. Quantities of individual artifacts are in parentheses:

Aluminum foil fragments (13)	Flashlight (1)
Aluminum trade token (1)	Glass fragments (95)
Bolt (1)	Hook (1)
Buckle (1)	Jar lid (14)
Button (2)	Jar ring (1)
Can and can fragments	Leather fragments (2)
Aluminum (1)	Lithic fragment, slate (2)
Ferrous metal (48)	Luggage tag (2)
Can key (3)	Metal fragments (80)
Cartridge (39)	Nail (52)
Cast iron fragment (4)	Paper jar lid liner (3)
Chain (1)	Plastic fragments (2)
Cigarette filter (2)	Product package
Coal (95)	Aluminum (8)
Elastic fragment (2)	Aluminum and plastic (1)
Faunal material	Aluminum and cellophane (5)
Bone (121)	Plastic (1)
Fish scales (2)	Cellophane (1)
Shell (15)	Roofing fragment (5) (cont., page 117)

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 46. Historic Alaska Road Commission shelter cabin at NOA-283.

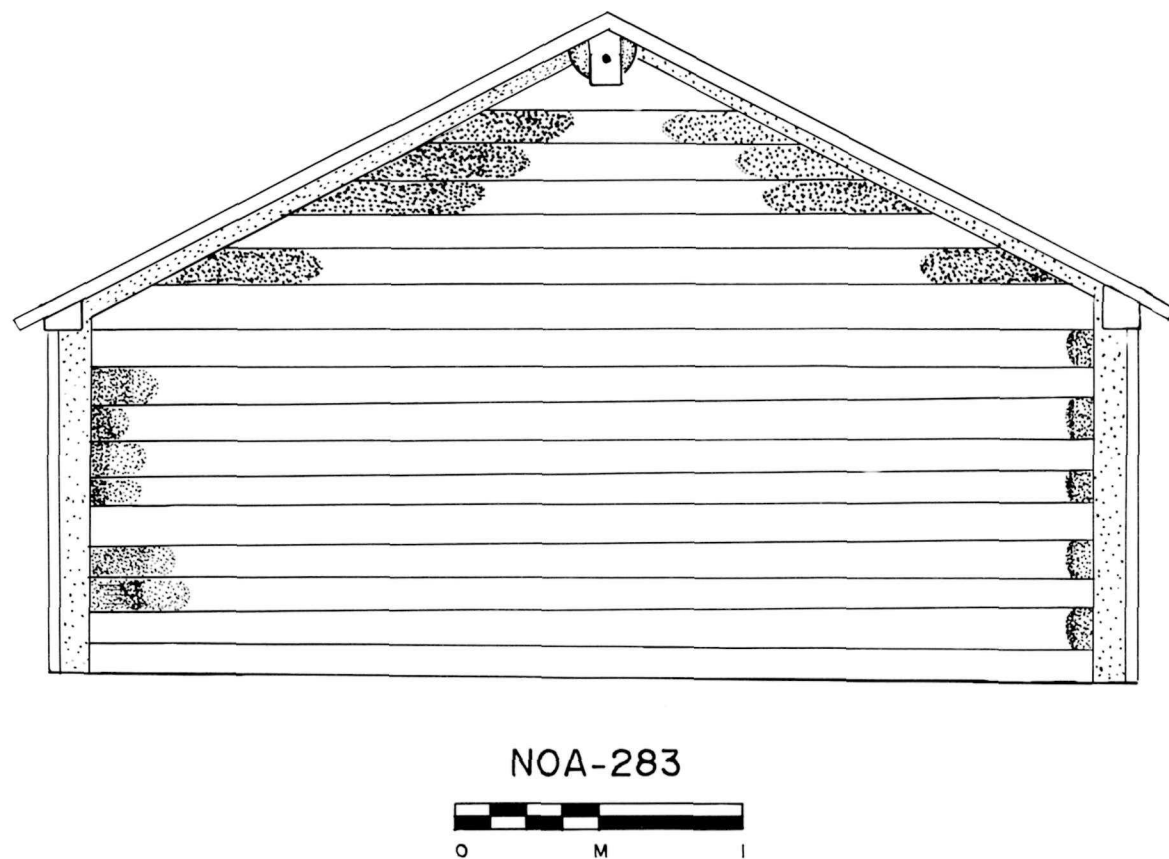


Figure 47. Historic Alaska Road Commission shelter cabin at NOA-283.

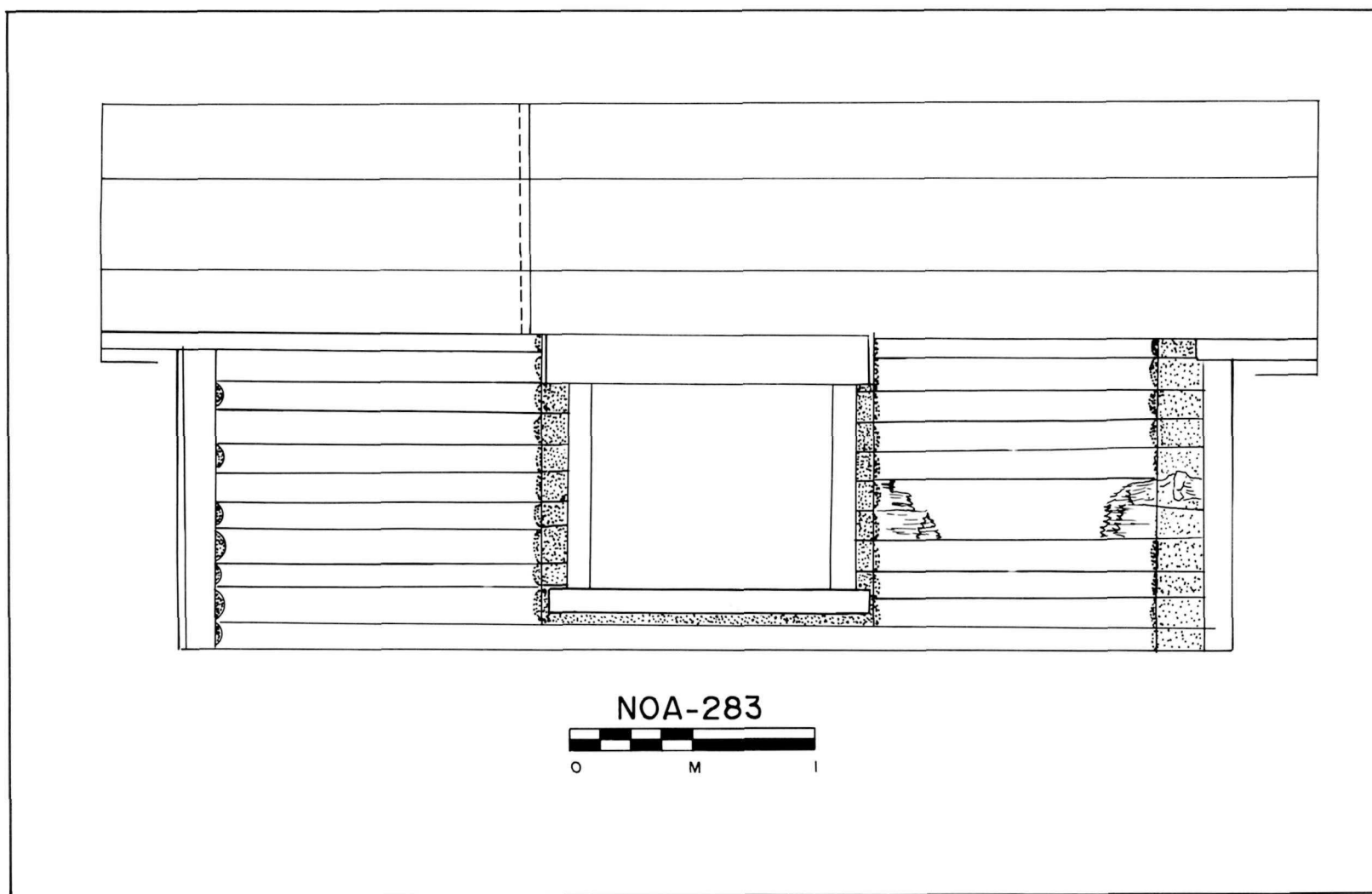


Figure 48. Historic Alaska Road Commission shelter cabin at NOA-283.

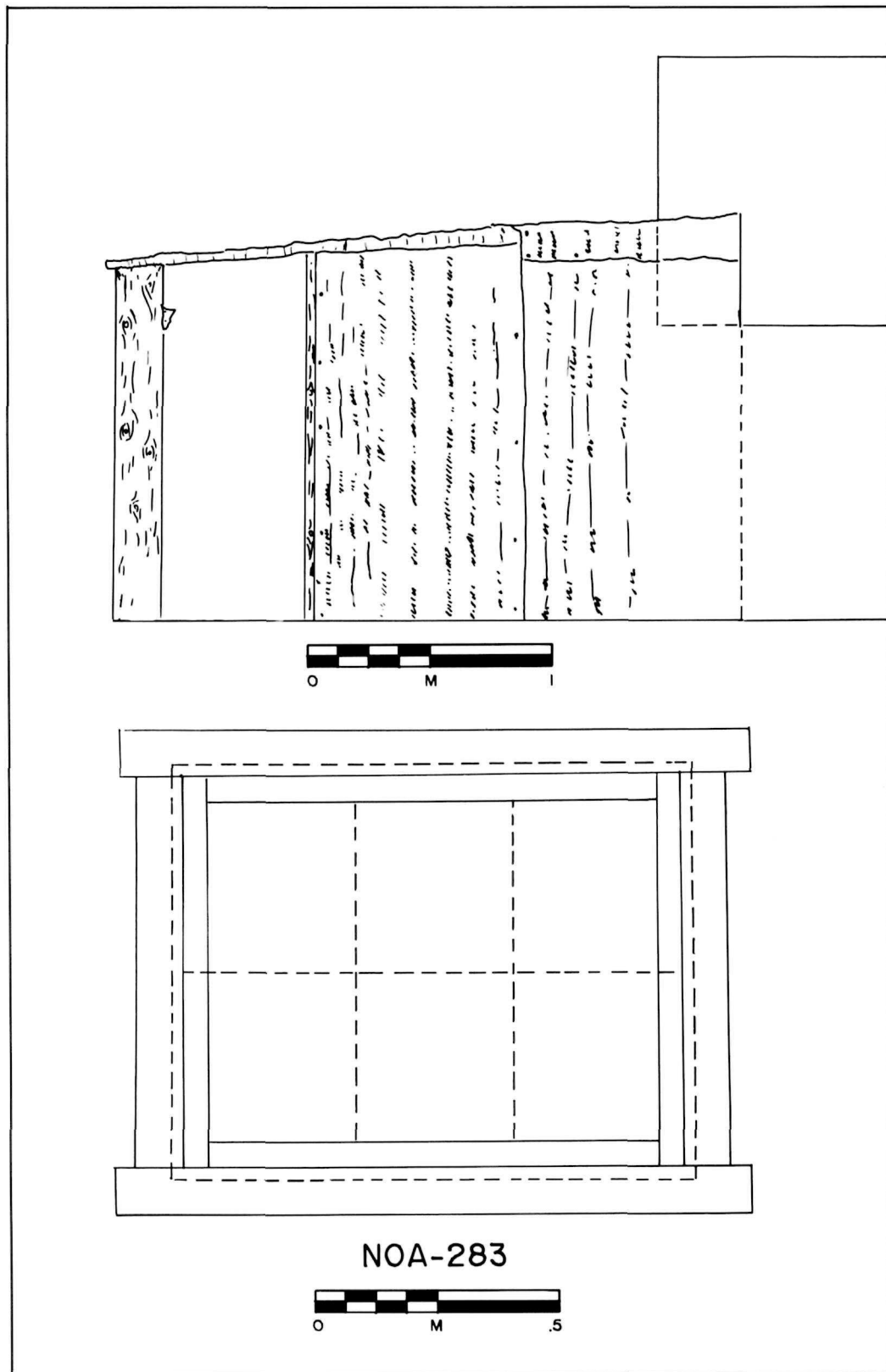


Figure 49. Historic Alaska Road Commission shelter cabin at NOA-283.

(cont. from page 112)

Rubber fragment (2)

Rubber gasket (3)

Sample (1)

Screw (1)

Seed (1)

Textile fragment (2)

Wire (2)

All other historic items are located in collections at the institutions of the principal investigators of the archeological field projects in the monument. Data on the locations of these collections are included in the Archeological Field Work Summary of Historic Sites in Cape Krusenstern National Monument, in Appendix C of this report.

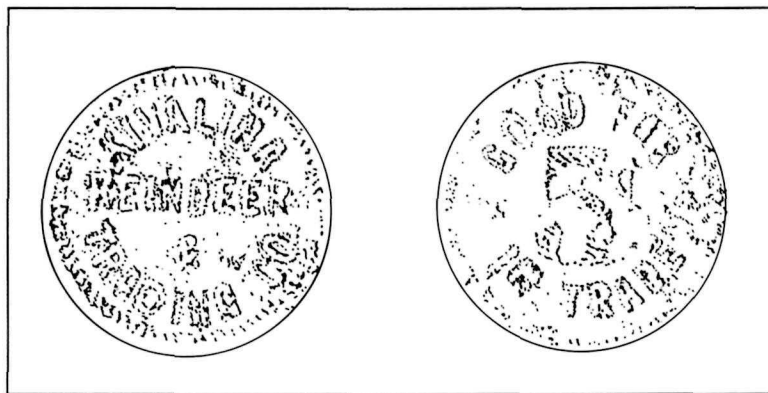


Figure 50. Historic trade token from the Kivalina Reindeer and Trading Company. Token was found in the excavation of NOA-140 at Tukrok.

PART FOUR: ARCHEOLOGICAL RESOURCE ASSESSMENT

Introduction

Part Two of this report included an assessment of the work of the principal investigators who conducted archeological research in Cape Krusenstern National Monument. This section, Part Four, considers the degree to which the existing archeological database can meet the needs of managers and researchers as they are called upon to analyze, protect, preserve, interpret, and assess the research potential (significance) of the monument's cultural resources. It offers some issues of concern regarding future research in the monument, which include, but are not limited to, the following topics.

Discussion

RESEARCH DOMAIN I: NATIVE AMERICANS: PREHISTORIC CULTURAL CHANGE

To what extent did prehistoric people use the area in the monument? Insufficient data gathered cannot fully answer that question. Even though a basic cultural chronology has been worked out for the Northwest Alaska region, facts are not completely clear about the exact time periods when certain groups were present; nor are the cultural affiliations known for the people of the various cultural traditions. Generally lacking are an adequate archeological survey sample of the monument, cultural remains in stratified contexts, and radiocarbon dates for archeological sites, particularly for Paleoarctic tradition and Northern Archaic tradition sites and for inland and upland sites.

Based on diagnostic artifacts, we know that Paleoarctic tradition people were present in far-flung areas of the monument. While the northeast Asian cultural affinities of the Paleoarctic tradition people are well recognized, it is not known when they arrived in the monument. To answer other questions about the Paleoarctic tradition, a much larger site sample is needed, as well as diagnostic cultural remains *in situ* and organic material that is datable by radiometric methods.

Research questions include:

- What are the bracketing dates for Paleoarctic tradition people in the monument?
- What is the extent of the remains of Paleoarctic tradition people distributed across the monument?

- What is the relationship between the Paleoarctic tradition and subsequent cultural traditions in Northwest Alaska?

The presence of Northern Archaic tradition people in the monument was detected at very few sites broadly scattered in the monument. Archeologists' needs are the same for the Northern Archaic tradition as for the Paleoarctic tradition.

Rather than representing a cultural tradition that has recent ties with Northeast Asia, like the Paleoarctic tradition, the Northern Archaic tradition is considered to be a subarctic cultural tradition and a regional variant of Archaic traditions that could be found over most of temperate North America during the hypsithermal (D.D. Anderson 1988:87; Irving 1953; MacNeish 1964; Dumond 1977; 1983). Anderson concluded that the tradition was one adapted to the boreal forests, even though he lacked a clear idea at that time of the tool types or site types that would suggest forest adaptations (D.D. Anderson 1988:87). Since 1958, many Northern Archaic tradition sites have been found well beyond the modern forest limits (D.D. Anderson 1988:87; Cook 1977; Davis et al. 1981; Hall and Gal 1982; Lobdell 1984, 1985). Two explanations have been offered for their distribution. First, it is possible that the Northern Archaic tradition advanced with the advance of the spruce forests during the altithermal warming (D.D. Anderson 1988:88). Second, forest-adapted people of subarctic Alaska and the Yukon may have spread into the adjacent tundra and coastal regions (Ackerman 1980; Henn 1978; Lobdell 1984). The argument for a subarctic origin for Northern Archaic tradition people is bolstered by the probability that a large percent of obsidian in Northern Archaic tool assemblages may have come from the Koyukuk River area, south of Cape Krusenstern (D.D. Anderson 1988:88; Clark 1972; Patton and Miller 1970).

While it is possible that, due to cryoturbation and deflation, some sites such as the ones located in the monument that contain both diagnostic Northern Archaic artifacts and microblades may represent post-depositionally mixed assemblages, several researchers have suggested that they are part of a post-American Paleoarctic manifestation. Several scenarios present themselves. Paleoarctic people and Northern Archaic people may have been present at the same time in parts of Alaska and may have used the same sites at different times of the year. People bearing a Paleoarctic culture may have come into contact with more southerly Northern Archaic people, adopting some aspects of their technology, or perhaps Northern Archaic people took on some characteristics of Paleoarctic people that may have persisted in parts of Alaska. A third explanation may be that the Northern Archaic tradition developed out of the Paleoarctic tradition (Gal 1982; D.D. Anderson 1981, 1989, personal communication; Schoenberg 1985).

Research questions include:

- What are the bracketing dates for Northern Archaic tradition people in the monument?

- To what extent are the remains of Northern Archaic tradition people to be found in the monument?
- Is there a post-Paleoarctic cultural tradition? Is it related to the Northern Archaic tradition? In what way?
- What is the best explanation for the presence in some nonstratified sites of microblades and diagnostic Northern Archaic tools in apparent association?
- What is the relationship between Northern Archaic tradition people and people of later cultural traditions in the region?

While we follow Giddings' and Anderson's (1986) definition of the ASTt, questions regarding the relationships among the four cultural periods and their relationships with the enigmatic Old Whaling culture persist.

Research questions include:

- To what extent are the remains of each of these cultural periods distributed in the monument?
- What is the relationship of the Old Whaling culture with the ASTt in the monument?
- How are the Denbigh Flint complex, Choris culture, Norton culture, and Ipiutak culture related?
- How are cultural developments during ASTt times on the coast and in the interior of the monument related to developments elsewhere in the Northwest Alaska region and the North Pacific rim?
- How can we best account for the presence during Ipiutak times of stylized decorative motifs on bone implements similar to those of Okvik and Old Bering Sea cultures?
- How is the ASTt related to the Northern Maritime tradition?

The distribution of Birnirk period sites in the monument is the least well known of the three cultural periods making up the Northern Maritime tradition. The existing radiometrically derived dates for Birnirk culture in Northwest Alaska are being questioned, and future archeological excavation of any datable Birnirk sites in Cape Krusenstern will no doubt play a vital role in settling attendant questions.

A research question is:

- To what extent are the remains of Northern Maritime tradition people to be found in the monument?

RESEARCH DOMAIN II: Prehistoric Settlements and Settlement Patterns

We have insufficient archeological data to form a complete picture of the locations and distributions of prehistoric settlements and settlement patterns for each of the prehistoric cultural traditions. Because of ethnographic and historic records and reports, we know slightly more about the Kotzebue period than about preceding time periods. The full settlement patterns for each cultural period and settlement patterns for the overall area of the monument are little known, however.

Some research questions:

- What is the total variability in settlements and settlement patterns to be found in the monument for each of the prehistoric cultural traditions?
- What major changes in the monument between Norton and Ipiutak culture times account for the significant differences between the two? Before Ipiutak times, there are few known remains of substantial habitations, but during Ipiutak times substantial settlements are present on the coast. Each of the Ipiutak settlements comprises the remains of a number of houses.
- What is the total variability to be found in Northern Maritime settlements and settlement patterns within the monument? How does it differ from the preceding ASTt? What changes are apparent among the settlement patterns of the three cultural periods of the Northern Maritime tradition, particularly the Kotzebue period, after the arrival of the missionaries in the mid-1800s?
- How can researchers best account for the large number of undated sites composed of surface rock features and lithic scatters located in the interior of the monument?

RESEARCH DOMAIN III: Use of Environmental Resources.

Based on the current level of knowledge about the monument's prehistory, we have several good indicators of some of the environmental resources that people of particular time periods used. Some types of data archeologists have recovered include animal bones and other animal products, resource procurement and processing tools, and information about the location of procurement and processing sites and the cultural features found in them. In some cases, analogs in the

ethnographic or historic record have provided us with plausible models of prehistoric lifeways. We lack sufficient data, however, to delineate the full seasonal round of activities or all of the major economic resources for any of the cultural traditions. The Kotzebue period is the best known cultural period, but we are unable to address the question of how the arrival of the Euro-Americans changed the existing subsistence regime.

Some research questions:

- In what seasonal round of subsistence activities did the people of each cultural tradition participate? What natural resources formed the basis of their subsistence strategy?
- Based on what we know of the archeological record for the monument, there seems to have been a major shift in subsistence practices after the Norton period. What changes took place in the subsistence strategies of the people who inhabited the monument in Ipiutak period times?
- To what extent did the Western Thule people in the monument depend on whaling as a subsistence strategy? What changes in exploitative strategies took place at the end of the Western Thule period and the beginning of the Kotzebue period? A period of climatic change resulting in colder temperatures took place during Northern Maritime tradition times, perhaps peaking around the sixteenth century (but the timing is debated). What are the implications for concomitant cultural change during this period? How is it related to the practice of whaling during this time period?
- In what ways did the arrival of Euro-Americans affect the subsistence practices of the people in the area of the monument?

RESEARCH DOMAIN IV: Establishing Intercultural Relations.

Historic, ethnographic, and archeological data confirm that changes of outstanding significance came about for the Inupiat with the Euro-American missionization process. Some of these changes included rescheduled seasonal rounds and subsistence practices and changed demographics as people aggregated in mission centers, as suggested by the nature and locations of the known archeological sites dating to this period and the archeological assemblages.

Some research questions:

- How did intensified intercultural contact affect changes in traditional Inupiat demographic patterns?
- What changes were brought about in traditional Inupiat lifeways?

RESEARCH DOMAIN V: Environmental Change in the Region.

Historic documents suggest that Euro-Americans may have had a great impact on the animal resources of the region during the 1800s. Some research questions to ask of the archeological record include:

- Did the intensive whaling and walrus hunting practices of the early eighteenth century affect traditional Inupiat subsistence practices?
- What changes were brought about in the Inupiat seasonal round of activities in the region of the monument by the dramatic decline in the caribou herds after around 1850?

RESEARCH DOMAIN VI: Introduction of Domestic Reindeer Herds and Herding Practices.

Reindeer herds were first imported by Euro-Americans under the rationale of filling the void in the Inupiat subsistence regime by the disappearance of the native caribou herds around 1850. Most of the herds were first owned by Euro-Americans, however, not Inupiat, and were managed by Lapps who had been brought in for that specific purpose. A research question is

- How did the importation of domestic reindeer herds change traditional land-use practices in the monument and the region?

RESEARCH DOMAIN VII: Transportation and Communication after 1920.

A research question is:

- What can the Alaska Road Commission cabins and the associated mail trail located on the coast of Cape Krusenstern National Monument, along with historic records and reports of local residents tell us about the history of transportation and communication in the region of the monument?

PART FIVE: HISTORIC PRESERVATION PLANNING

Introduction

Preservation planning is the basis for the conservation of archeological sites within our monuments, parks and preserves. For the National Park Service's preservation planners, the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* serves as the basic guiding document (Birkedal, personal communication 1991).

The concept of "historic context" is key to the planning process. A historic context is a tool used to organize information about the archeological record in a meaningful way. The goal of developing a historic context is to provide direction for the preservation of the archeological resources being addressed. The development of historic contexts is an ongoing process that continuously seeks to incorporate the latest data and provide a broad, comprehensive view of all of the diverse resources that make up the archeological record (Birkedal, personal communication 1991).

A historic context is defined as "an organizational format that groups information about related historic properties, based on a **theme**, **geographic limits**, and a **chronological period**" (Birkedal, personal communication 1991).

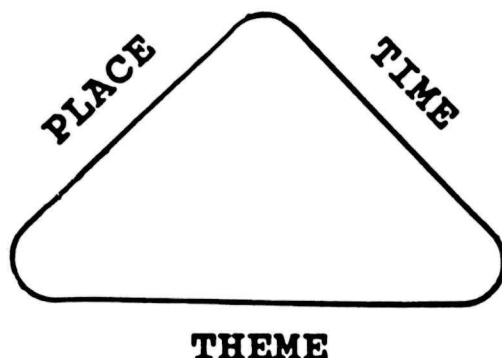


Figure 51. The Historic Context.

Historic contexts are written narratives that:

1. Identify the culture concept, time period, and geographical limits for the context (using thematic geographical, and chronological approaches).
2. Synthesize all relevant information about the context.
3. Define the known and expected property types associated with the context.
4. Characterize the locational patterns of the identified property types.
5. Characterize the current condition of the property types.
6. Establish the criteria for determining the significance of properties associated with the context.
7. Set goals and priorities for the resources.
8. Develop management strategies for achieving the goals.

Historic Contexts Addressing the Prehistoric Era (Table 1)

HISTORIC CONTEXT I: Paleoarctic Adaptations in the Cape Krusenstern Region, Northwest Alaska between 11,500 B.P. and 8,000 B.P.

Theme:	Paleoarctic Adaptations
Time:	11,500 B.P. - 8,000 B.P.
Place/Area:	Cape Krusenstern Region, Northwest Alaska

This context addresses the adaptations of late Pleistocene -early Holocene people to their environment in the region of the Cape Krusenstern National Monument in Northwest Alaska from prior to 11,500 B.P. until 8,000 B.P. These people belonged to the Siberian-American Paleoarctic tradition, the earliest well-documented cultural tradition thus far identified in the North American Arctic. The Northwest Alaska Paleoarctic people were bearers of a Paleolithic-like cultural tradition they shared with the inhabitants of Northeast Asia living in Beringia at the same time and earlier.

Around 18,000 years ago, in a time period referred to as the late Pleistocene geological epoch, huge glaciers in the northern latitudes locked up vast quantities of the earth's waters. In North America this last major glacial episode is known as the Wisconsin glaciation. This glacial period produced a natural environment

that was much different from any on earth today. Climatic conditions were much cooler and drier, and sea levels were lowered dramatically from those of present times. Plants and animals consisted of varieties that are now extinct or are substantially changed in appearance from those of glacial times.

Geomorphologically, Alaska was a much different place. Eastern and southern portions of Alaska were burdened by extensive glaciation that, except for a postulated corridor southward between the two major ice fields, presented an ice barrier to movement into the heart of North America (Figure 52). At the same time, the northwest portion was part of a relatively newly exposed landmass called Beringia. This broad, dry coastal plain connected Alaska with Northeast Asia and included what is now the Chukchi Peninsula. The part of Eastern Beringia that is now under water was criss-crossed by lower extensions of the rivers that dominate Alaska today. A much longer Kobuk River and its tributaries drained into the Arctic Ocean, and the extended Yukon-Kuskokwim River complex drained into the Bering Sea.

The Beringian landscape presented a dry, treeless, plain vegetated with vast quantities of tundra-steppe species dominated by grasses and forbs, prime forage for numerous large herd mammals such as the mammoth, horse, and steppe bison, saiga antelope and caribou. Dry, cold winters with little snow cover and very warm summers are suggested for the time period, based on the palynological record, and on paleontological evidence that rich winter forage for grazers was available.

The archeological record as we know it suggests that Beringia might not have been inhabited until late Pleistocene glacial times, around 15,000 B.P. Dikov's (1977:52) report of the late Paleolithic Ushki I archeological site, located in Kamchatka in Western Beringia, has information that bears on this question. Horizon VII, the earliest stratigraphic level containing cultural materials, yielded charcoal that provided radiocarbon dates of 14,300 ± 200 B.P. and 13,600 ± 250 B.P. Levels V and VI of another site, Diuktai Cave on the Aldan River in Northeast Asia, provided the material from which Soviet archeologist Mochanov (1969, 1970, 1972, 1973, 1976, 1977) defined the late Pleistocene Paleolithic Diuktai culture. Diuktai people lived at the site from around 13,000 B.P. and up to around 10,000 B.P. in the dry Beringian tundra-steppe environment. They hunted mammoth, woolly rhinoceros, bison, horse, musk ox, and reindeer, using weapons tipped with bifacially chipped, leaf-shaped or lanceolate points and composite hunting tools, implements made of several parts and armed with small, sharp microblades removed from carefully prepared disc-shaped and wedge-shaped stone cores. The microblades fit into grooves cut into the sides of prepared tips that were probably made from ivory, bone or antler. Diuktai people apparently also processed the hides of their prey with very large stone scraping tools called skreblos.

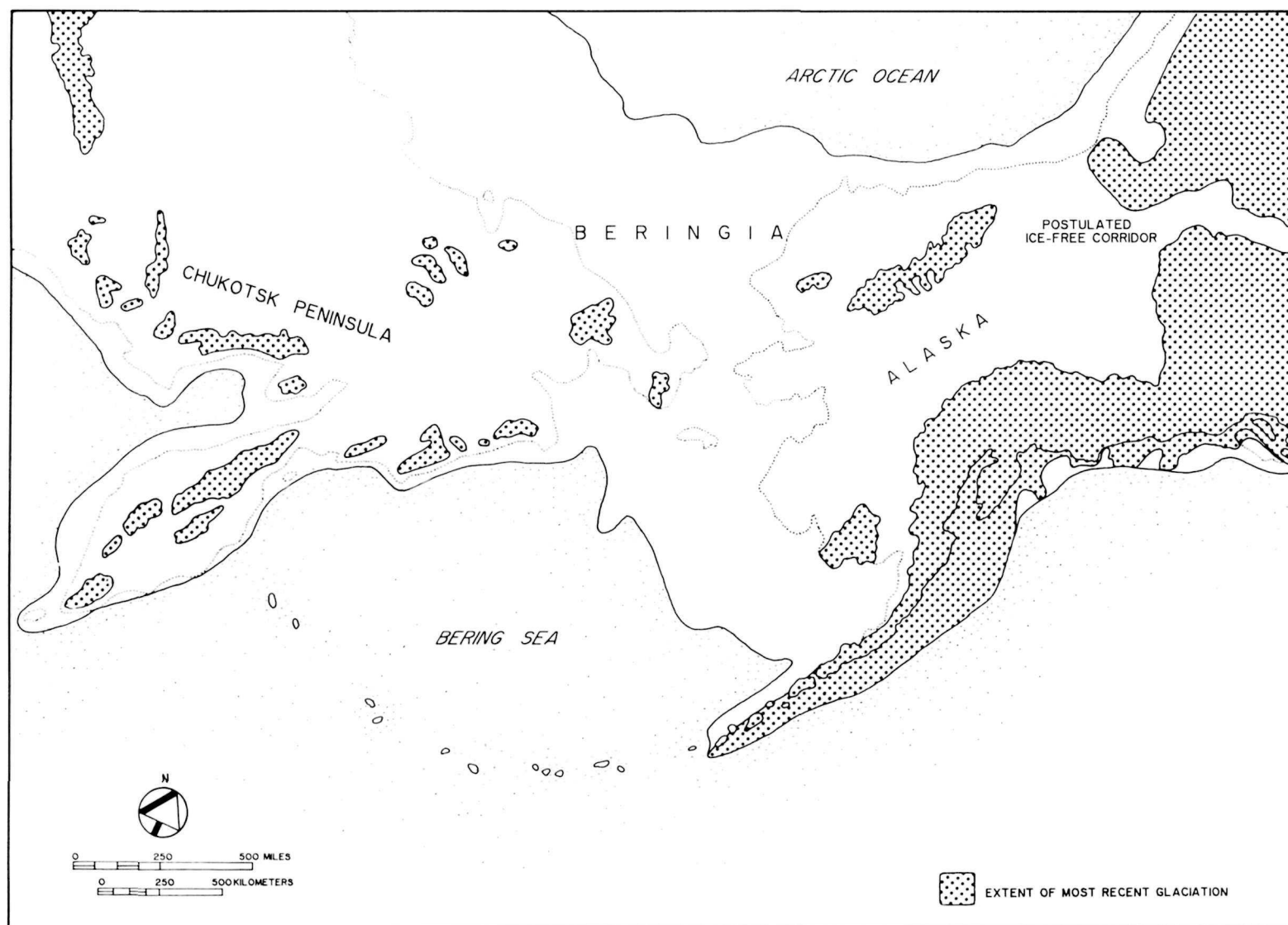


Figure 52. Probable extent of glacial ice during the Late Wisconsin glacial advance and the geography of Beringia (after Hamilton, Reed, and Thorson 1986).

Possibly by 12,000 B.P. but certainly by 10,000 B.P. hunting and gathering people of this same Paleolithic cultural tradition were also living and seasonally moving about possibly large territories in a late-Pleistocene - early-Holocene environment in the unglaciated or newly deglaciated portions of Eastern Beringia that today make up Northwest Alaska. Parallels in cultural traits between the people of Eastern Beringia and those of Western Beringia suggest that they may have continued to be in close communication throughout this period (D.D. Anderson 1988). The Akmak and Kobuk complexes, excavated at the Onion Portage site on the Kobuk River in Northwest Alaska, are two eastern components of this cultural tradition, termed the Siberian-American Paleoarctic tradition (Dumond 1977; 1987b:45).

These people of the Siberian-American Paleoarctic tradition may not have been the first entrants into the Americas, however. Archeological excavations at Meadowcroft Rockshelter in Pennsylvania have unearthed cultural materials and radiocarbon dates of over 19,000 B.P. from hearth debris and a bit of burned, plaited birch bark basketry (Adovasio et al. 1975). Radiocarbon dates from another archeological site, the Monte Verde site in Chile, provided well-documented evidence for the presence of people at 13,000 B.P. (Dillehay and Collins 1988).

In Central Interior Alaska, components from several archeological sites, Dry Creek component I, Walker Road, Moose Creek, and Owl Ridge, are tentatively named the "Nenana complex." Dates for the components fall at between 11,000 and 11,800 B.P. (Powers and Hoffecker 1989). The stone tools left by the Nenana people include small projectile points and larger bifaces without any truly distinctive features, microblades, and scrapers. They are very similar to those of the Paleo-Indians, the earliest well-documented people living in temperate North America from around 11,500 B.P. The major differences between the tools of the two peoples are that none of the large, distinctive, fluted, bifacial projectile points used by the Paleo-Indian people has been found in Nenana sites; and the Paleo-Indian people did not make microblades. The relationships between the two cultures are at present unclear.

The Siberian-American Paleoarctic tradition is the first well-documented cultural tradition in Alaska, however; and the Paleoarctic component of the Onion Portage site is the most firmly dated such component in Northwest Alaska. Akmak hunting-gathering people still lived in a grassy tundra environment, even though by 12,000 B.P. the climate already had begun to warm and the glacial period was rapidly ending. The large Pleistocene grazers like the mammoth were probably headed toward extinction, or like the bison, were changing to smaller forms. Some might still have been present in the area, but data to confirm this one way or the other are lacking. A caribou scapula recovered at Onion Portage from the stratum containing Akmak artifacts confirmed the date of the occupation and the presence of caribou in the area at 9,570 ± 150 B.P. (K1583) (D.D. Anderson 1988:55).

The setting of the Onion Portage site is a large meander of the middle Kobuk River, on a generally south-facing, 7- to 8-meter- high ancient river terrace formed during the Pleistocene era. The site provides a well-drained location for a camp, a good view of the river, and fresh water readily at hand. Copses of poplars (*Populus balsamifera*) may have stood adjacent to the river at the time the site was occupied. The main seasons of occupation may have been summer and especially early fall, if caribou were a primary source of food and materials for the Akmak people. Caribou are in their prime with respect to both their fat content and the condition of their hides in the fall season and are on the move in herds at that time. During modern times, large autumn herds of migrating caribou have congregated annually at or near the Onion Portage site before crossing to the south side of the Kobuk River.

Akmak was possibly a habitation site, the only one thus far reported for the American north during this period (D.D. Anderson 1984:82). A great variety of kinds of tools are present in the Akmak assemblage, suggesting that the site may have been a relatively permanent living place where a wide variety of domestic activities were undertaken. The tools located in this stratum include wedge-shaped microblade cores; large, wide blades sometimes used as scrapers; burins used for graving bone and antler; grooved stones ground to be used as shaft smoothers; and large bipointed bifaces used as knives. They indicate such activities as hide preparation, butchering, manufacturing composite tools and weapons, and woodworking at the site during the Akmak occupation (D.D. Anderson 1988:55-72). Akmak complex tools exhibited technological similarities to those in Siberian late Pleistocene sites. They were also generally larger and heavier than those of later Alaskan complexes. Anderson (1988:72) noted that the same is true in Eastern Siberia, where tools of late Pleistocene cultures are also larger and heavier than those of early Holocene cultures.

The Kobuk complex was identified from cultural materials lying in three layers located immediately above the Akmak artifacts at the Onion Portage site. The Kobuk people's use of the site, between 8,500 B.P. and 8,000 B.P., commenced 1,500 years after the Akmak occupation of the site. By that time marked environmental changes had occurred, and the area was vegetated by an alder-birch tundra. The replacement of poplars by alder (*Alnus*) indicates a change to cooler, wetter summers and a greater marine influence (P. Anderson 1982; D.D. Anderson 1988:70).

The Kobuk people's tools include plentiful microblade midsections that probably were worn from use, or were being prepared for use in composite hunting tools, and microblade debris from microblade production. Several of the stone artifacts are burins. A microblade core, cobble choppers used for heavy cutting and chopping tasks like butchering, and stone flakes that had been used for cutting or scraping are also part of the assemblage. These tools were found near small hearth areas suggesting the presence of small groups of people, perhaps hunters, on short-term stays at the site. The small fragments of calcined bone located

around the hearths could be interpreted as the remains of bone pulverized for grease rendering, generally considered a domestic activity undertaken at a long-term living site (D.D. Anderson 1988:72) However, other explanations including cosmological ones for the presence of the burned bone fragments are possible. The changes in the environment, function of the site, and technology may signal significant transformation in subsistence-settlement strategies between the Akmak and Kobuk periods; but lacking a larger site sample and a full sample of all site types, it is not possible to detail exactly what those changes were.

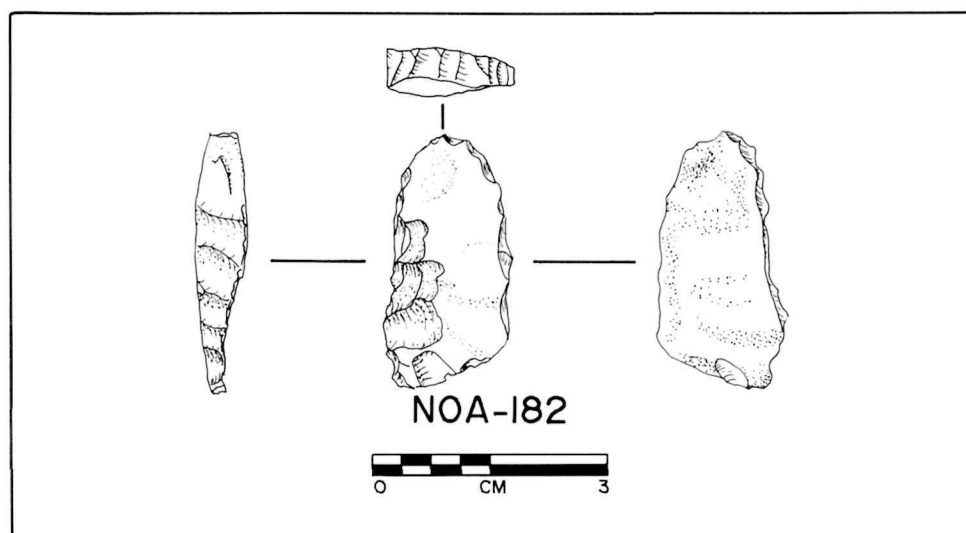


Figure 53. Core tablet from a wedge-shaped microblade core.

Based on what we know about the lifeways of the Paleoarctic people and their adaptation to their particular environment, we would expect to find a number of different functional types of archeological sites associated with their seasonal round of activities, shown in Table 5.

Thirty-one North and Central Alaskan archeological sites that lie outside the borders of the monument and that were assigned by researchers to the Paleoarctic tradition were selected for comparison of their physical characteristics (Harritt n.d.a; C.W. Davis et al. 1981; Humphrey 1966, 1970; Cook 1970; Hall 1977; Gal 1978, 1982; Hall et al. 1979; Gal et al 1980; Kunz 1985, 1986)(Table 6). This sample represents a little less than half of the sites designated as Paleoarctic tradition sites by the AHRS files.

All of the sites included in this sample are located on prominences described as ridges, bluffs or river terraces, hilltops, and glacial kames. Many overlook the upper or middle reaches of rivers or tributary streams located at higher elevations.

All of the sites were readily identifiable by the presence of lithic artifacts exposed on the ground surface, but only eleven sites, or 35%, also are known to have

Table 5. Expected Functional Site Types for the Paleoarctic Cultural Tradition in Northwest Alaska.				
Functional Site Type	Village	House	Camp	Special Purpose
Group of cold season houses	X			
Single cold season house		X		
Temporary campsite			X	
Hearth		X	X	X
Burial				X
Quarry				X
Storage pits	X	X	X	X
Food processing	X	X	X	X
Toolmaking	X	X	X	X
Hunting-related	X	X	X	X
Isolated artifact				X

subsurface cultural deposits. Of those, only one site has yielded radiocarbon dates (10,540 ± 160 and 970 ± 160) that place it chronometrically within the time range of the Paleoarctic tradition.

All of the sites were places where toolmaking activities were carried out. Twenty-nine of the sites, or 94%, showed evidence that tools probably were being repaired. Thirty sites, or 97%, had materials that are used in the manufacture of composite tools using microblade insets. Seventeen sites, or 55%, had tools that suggested some sort of processing activities (hide preparation, for example). Based on their locations and on the tool assemblages present at the site, 30 of the sites, or 97%, are considered to be hunting lookout sites. Because of their proximity to water, two of the sites, or 6%, would appear to have made good campsites. Because of the presence of tools and cultural materials that suggest certain domestic activities, however, 22 other sites, or 71%, might have been temporary campsites, as well as hunting lookouts.

All of the possible or probable Paleoarctic tradition sites thus far identified in Cape Krusenstern National Monument are lithic scatters exposed on the surface. They are assigned to the Paleoarctic tradition based strictly on the general appearance of the site and on the identification of particular artifact types located

at the sites (Giddings and Anderson 1986: 311; McClenahan and Gibson 1990: 41-42).

With respect to the known sites within the monument, bias exists in the present sample due to the nature of the surveys that have been conducted to date. Surveyors generally looked for sites in locations where sites had been found before, and relied on surface indicators to identify them. Such an approach is good for locating more sites of the same type, but not for locating sites having different functions.

Several of the known Paleoarctic tradition sites in the monument have the potential of buried cultural resources but only one has been tested. No radiocarbon dates are available for any of the known sites. The cultural sequence that is currently in use for Cape Krusenstern is the one proposed by Anderson (1984) for Onion Portage (Table 1). That sequence is based on a series of radiocarbon dates derived from materials found in controlled contexts.

All of the known sites in the monument that are thought to belong to the Paleoarctic tradition are scatters of lithic artifacts associated with tool making, hunting terrestrial mammals, or processing. They are located on prominences above 200 feet ASL in the Mulgrave Hills or the Igichuk Hills, on landforms that have a predominantly southerly aspect. The sites are located within 0.5 m of a stream or a river, at elevations between 50 and 100 feet above the water (Appendix D). Based on the level of data available at present, it is too early to make specific statements regarding the total variability that might be found in Paleoarctic tradition settlement patterns in the monument and the region.

NOA-139, the Lower Bench site, is an area of exposed soil on a wave-cut bench about 200 feet ASL that overlooks the eastern shore of Krusenstern Lagoon. It was first investigated by J.L. Giddings in 1959 (1966; Giddings and Anderson 1986: 301-304). He collected over 100 lithic artifacts that were primarily microblades. Composite tools made of microblades set into bone or antler were used as projectiles to hunt caribou and other land mammals. Two other items of special interest that were described in the field notes were a thin, diagonally flaked, crescent-shaped sideblade inset and a beach pebble with slight grooves discernible across the middle portion, that could have been a net sinker. All of these items were lost at sea the year they were collected.

In 1960, Giddings and his crew collected additional materials at the site that included more chert microblades, a straight-based endblade inset, and two microblade core tablets. One core tablet is from a broad, oval-platformed core with one wedge-shaped end. It is not clear whether the wedge shape was created intentionally, however. The other tablet had also been removed from an oval-platformed core. In addition to the lithic artifacts, a few bone fragments of caribou or other ungulate were present. Giddings and Anderson (1986:303) argue

Table 6. Known Functional Site Types for a Sample of Paleoarctic Tradition Sites in North and Central Alaska.				
Functional Site Type	Village	House	Camp	Special Purpose
Group of cold season houses				
Single cold season house				
Temporary campsite			X	
Hearth			X	X
Burial				
Quarry				X
Storage pits				
Food processing			?	X
Toolmaking			?	X
Hunting-related			?	X
Isolated artifact				X

that the setting of the Lower Bench site has changed since late Pleistocene times. At the time of its use, it may have immediately overlooked the sea; or if it were used at a time prior to the highest sea-level stand, it may have been a good lookout from which to hunt game from a tundra-covered plain below.

In 1988, the site was revisited by a crew of National Park Service archeologists, who observed a cortical flake of chert and two chert microblade fragments. At that time the archeologists noted that the site was probably undergoing the effects of frost action. It is possible that subsurface cultural materials are present.

NOA-182, documented in 1987 by National Park Service archeologists, is located at 572 feet ASL on a hilltop in a pass that separates the drainages of the Noatak River and Rabbit Creek. The site is 0.2 km from the source of an unnamed stream, and provides panoramic views of the Noatak River basin with its many lakes and oxbows, the east fork of Rabbit Creek, large areas of the tundra-covered hills to the south, and more immediately a large area of wet tundra. The site is itself well drained and partly vegetated with Mountain avens (*Dryas*) and lichen, with a few patches of dwarf arctic birch (*Betula*) and low shrub willow (*Salix*).

The site consists of a small lithic scatter made up of seven unmodified chert flakes with criteria that are indicators of heat treatment. Also present is an oval microblade core tablet probably diagnostic of a Paleoarctic blade and core technology (McClenahan and Gibson 1990:151).

NOA-200 is a small lithic scatter located at 350 feet ASL on the edge of a bluff overlooking the Omikviorok River. The site provides good views of the river floodplain and the river to the south of the site. Today, it is the only dry, elevated terrain in the area that provides any kind of view. From it, caribou can be seen grazing on the tundra. The surface of the site is barren of vegetation and is covered with siltstone fragments and colluvium that are unstable and subject to downslope movement.

Table 7. Known Functional Site Types for the Paleoarctic Cultural Tradition in Cape Krusenstern National Monument.				
Functional Site Type	Village	House	Camp	Special Purpose
Group of cold season houses				
Single cold season house				
Temporary campsite			?	?
Hearth				
Burial				
Quarry				
Storage pits				
Food processing			?	X
Toolmaking			?	X
Hunting-related			?	X
Isolated artifact				

Table 8. Sites in Cape Krusenstern National Monument that Have Been Assigned to the Paleoarctic Tradition.	
Sites	Site types
NOA-139	Lithic scatter (Lower Bench Site)
NOA-182	Lithic scatter
NOA-200	Lithic scatter
NOA-256	Multi-component lithic scatter
NOA-266	Lithic artifact

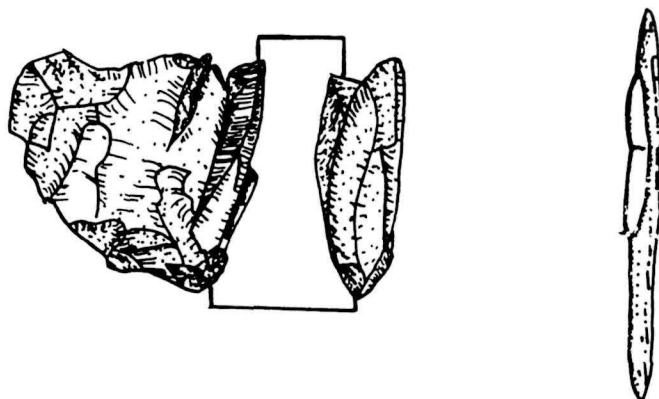


Figure 54. A sketch of the Akmak wedge-shaped microblade core from the Onion Portage site (Anderson 1988) and a composite projectile point with microblade insets.

The lithic scatter consists of two primary reduction flakes and a narrow, wedge-shaped microblade core (Figure 24), evidence of the procurement of chert material for making tools and the manufacture of microblades. The exhausted microblade core very closely resembles the specimens in the Akmak assemblage from the Onion Portage site and is representative of the Paleoarctic tradition. No subsurface cultural materials were encountered in a small subsurface probe at the locus of the lithic scatter, but the bluff area offers the potential for yielding other buried cultural remains.

NOA-256, Rabbit Creek Knoll, was first located by D. D. Anderson during his 1977 survey. The site is located at 200 feet ASL on a hill terrace on the north side of Rabbit Creek and offers a good view to the northeast, east, and west, of Rabbit Creek valley and the coastal plain. The terrace is well drained, and the soil consists of angular limestone fragments and loamy silt that has some depth and probably contains buried cultural materials. More than half of the site surface is covered with vegetation consisting of Mountain avens (*Dryas*), lichen, and dwarf birch (*Betula*).

This multicomponent site consists of a widely-dispersed lithic scatter on the terrace. Anderson collected materials and tested the site in 1977. Possible and probable Paleoarctic tradition artifacts recorded by Anderson from his investigations included one microblade core tablet from an oval-platformed, wedge-shaped microblade core, numerous microblades, and one large biface fragment. Additional artifacts that included plentiful microblades were recorded at the site but not collected in 1988 by National Park Service archeologists. The site has been used from Paleoarctic tradition times until modern times as a station to make tools and to watch for and hunt land mammals, based on its location and on the presence of abundant lithic debitage, microblades, and other hunting and processing tools.

NOA-266 consists of two lithic artifacts located prior to 1988 by a monument ranger and recorded in 1988 by National Park Service archeologists. The site is located at 350 feet ASL on a tundra-covered ridge with tops some 350 m north of the east fork of the upper Situkuyok River. It provides an excellent view of the surrounding limestone ridges, tundra covered slopes, and the Situkuyok River valley. The site is very well drained, with a sparse growth of Mountain avens (*Dryas*) and lichen that covers rocky outcrops and dark brown loam. Modern wildlife observed from the site include large arctic land mammals and birds.

The lithic artifacts observed at the site include one flake and one black chert core in the early stages of preparation. The core is wedge-shaped and is most likely a Paleoarctic tradition core. The site itself is in an excellent location for hunting game.

In addition to the sites in the monument that have been assigned to the Paleoarctic tradition, some 50 other components, or 33.7% of the total prehistoric

cultural components identified thus far in the monument, are lithic scatters or isolated lithic artifacts that are unassignable to any cultural tradition based on what we know about them. It is probable that at least some of these are Paleoarctic sites.

All of the known sites in the monument belonging to this tradition are exposed on the surface due to lack of soil formation, erosion, deflation, or frost action in situations that make them a fragile resource. The relatively remote locations of the sites have protected them from human disturbance, but increasing visitation to the monument and all-terrain vehicle use are two potential sources of human impact to this type of site.

Significance

The known Paleoarctic tradition sites and other small surface lithic scatters within Cape Krusenstern National Monument that are potentially assignable to the Paleoarctic tradition are significant under National Register criterion D, in that they are likely to yield important information about the seasonal round of subsistence activities and systems of settlement of the Paleoarctic tradition people.

It is only with a full representation of site types that we will be able to flesh out the subsistence-settlement strategies of these people and more fully elaborate on their adaptive responses to their environment. Information from some of the known sites in the monument has already broadened our knowledge and understanding of Paleoarctic tradition people's occupation of the Northwest Alaska region. The sites are especially important because so little is known about the Paleoarctic tradition in the region, and because so few sites (in **any** condition) belonging to this cultural tradition are known for the monument.

With reference to typological considerations, the earliest people yet documented in the monument were people of the Paleoarctic tradition. These people were believed to have been nomadic hunter-gatherers who probably gathered wild vegetable foods and hunted land mammals, including the megafauna present in the region at the end of the Pleistocene era. Evidence exists in the form of lithic technology, and researchers draw analogies with related cultures in Northeast Asia.

Insufficient data exist to address the duration of the Paleoarctic tradition in this area of Northwestern Alaska. Some researchers argue that certain characteristic traits, such as wedge-shaped microblade cores, persist past the terminal dates offered for the Paleoarctic tradition based on the Kobuk complex, around 8,000 B.P. Based on evidence from lithic technology, they have proposed a post-Paleoarctic tradition (D.D. Anderson 1970a, 1972; Gal 1982; Gerlach and Hall 1987; Schoenberg 1985).

Actually only one type of site has been identified in Cape Krusenstern National Monument so far. That is, morphologically speaking, the lithic scatter. Functions of these sites most certainly include that of a hunting overlook where tools were also made. Some of the known sites in the monument also may have served as temporary campsites and quarry sites.

Other types of sites belonging to the Paleoarctic tradition reasonably should be expected to be found within the region of the monument with future research. Some functional site types we currently lack, but can expect to see in the archeological record include long-term habitation sites constructed for occupation during the cold seasons; storage facilities associated with winter occupation; grave sites (not necessarily subsurface, however); and special-purpose sites such as resource procurement sites, kill sites, and processing sites (Table 7).

Goals

The foregoing discussion and Tables 5, 6, 7, and 8 illustrate that serious gaps exist in our knowledge about the archeological record for the Paleoarctic period.

Less than one per cent of the monument has been covered by reconnaissance-level archeological survey. An additional survey should be planned. It must be based on models incorporating the latest knowledge of known site characteristics including site environmental correlates and on our expectations for the discovery of particular site types (Appendix D). Researchers might now wish to consider strategies different from the previously used opportunistic site discovery method; for example, they may wish to conduct problem-oriented surveys to obtain a wider range of site types. A stratified random sample of a particular area of the monument may be useful for the discovery of site types expected but not yet identified there (Table 7).

Additional data on the Paleoarctic tradition that have been archeologically excavated from secure radiocarbon-dated contexts is vitally needed. Researchers must use the means necessary to detect stratified, datable sites beneath the surface that may not show surface indicators that a site is present. When a larger inventory of known Paleoarctic tradition sites exists for the monument, a sample of sites of each descriptive site type should be chosen for testing or excavation in order to get a better idea of what comprises each of the site types belonging to this cultural tradition. Some of these strategies may help us to assign sites that are presently considered nondiagnostic to a particular cultural tradition.

During the planning process for any of the above endeavors, it is valuable as one of the first steps for the project archeologist to study existing archeological collections and site reports from work accomplished in other areas of Northwest Alaska to get a good idea of what types of cultural artifacts and features may be present in monument sites.

A number of important environmental studies addressing the Cape Krusenstern region have been published in the past ten years. The National Park Service should continue to encourage and financially support multidisciplinary approaches that provide for better modeling of the late Pleistocene-early Holocene environment and the monumental changes that took place during that time.

Additionally, the methods used to record sites must be comprehensive and uniform among sites in order to allow for their systematic comparison. A recording simply indicating the presence or absence of a site is no longer very useful. The five known sites and any newly discovered sites in the monument should be completely mapped and, since the National Park Service practices a non-collection policy, all artifacts (not just a sample) should be recorded, drawn, photographed and described in detail. It is necessary to confirm the presence or absence and the depth of subsurface cultural materials as well as their horizontal extent. A consequence of this approach will be fewer new sites located, but all new sites located will be better recorded. A good example of a site recording form and a list of the minimum data that should be recorded for each site can be found in Appendix E of this report.

As more Paleoarctic tradition sites are identified and described, the criteria for defining the context and evaluating the sites will have to be further developed and refined. At the same time, more refined locational models can be developed based on the new site and environmental information.

The known Paleoarctic tradition sites in the monument should be monitored periodically for the effects of natural and human agents. They should be evaluated with respect to the need for site stabilization or data recovery, since they tend to be erosional in nature. One method of site stabilization is revegetation of the site with plants that will have little adverse impact on the site itself but will hold the soil.

The future planning process should involve a wider base of interested parties, including interested scholars and members of the Native community. Public education and outreach should also continue to be National Park Service goals.

HISTORIC CONTEXT II: Northern Archaic Period Adaptations in the Cape Krusenstern Region, Northwest Alaska between 6,000 B.P. and 4,000 B.P.

Theme:	Archaic Adaptations
Time:	6,000 B.P. - 4,000 B.P.
Place/Area:	Cape Krusenstern Region, Northwest Alaska

This context addresses the adaptations of early Holocene people to their environment in the region of the Cape Krusenstern National Monument in Northwest Alaska from 6,000 B.P. until 4,000 B.P. These people belonged to the Northern Archaic tradition, a cultural tradition that, according to the radiocarbon dates presently available to us, post-dated the Paleoarctic tradition by 1,000 years in this region. Northern Archaic tradition people had an Archaic-period adaptation that they shared not with Northeast Asian peoples but with people of the North American subarctic and temperate zones of approximately the same time period.

By 10,000 B.P. or 11,000 B.P., the world had entered the early Holocene geological epoch. World ocean levels had risen due to a global warming trend that brought about massive melting of the glacial ice of the Wisconsin glaciation. Central Beringia, that low portion of the landmass exposed between North America and Northeast Asia, was finally inundated by rising seas. The seas lapping at the new shorelines of eastern Beringia created an ameliorating marine climate, probably producing less severe winters. By around 9,000 B.P. summer temperatures were slightly warmer than they are today.

During this time period, spruce forests spread northward and westward into new areas of what is today Northwest Alaska, reaching the coast of present-day Cape Krusenstern National Monument. The dry, grassy tundra or mammoth tundra-steppe that had existed in Beringia several thousand years earlier was replaced by these forests and a more mesic shrub-tundra that probably more closely resembled vegetation in our modern environment.

Corresponding to the changes in vegetation were changes in the animals. The four animals that had dominated Pleistocene Beringia were grazers: the bison, horse, mammoth, and caribou. As the Pleistocene came to an end, the mammoth and the horse became extinct in Eastern Beringia, the bison grew smaller in a declining population, and the caribou thrived, becoming the most plentiful of the four.

Archeologists have offered several theories, but we do not know the fate of the Paleoarctic tradition people or why there is at least a 2,000 year gap in the radiocarbon dates derived from the archeological record before the appearance of the Northern Archaic tradition people. Some researchers argue that certain tools in Northern Archaic toolkits suggest that the two cultures were related. We do know that Northern Archaic people were present about 6,500 years ago 500 years (Giddings and Anderson 1986; Long 1965) at a glacial terrace site at Anaktuvuk Pass in the Brooks Range, and intermittently at the Onion Portage site on the Kobuk River from around 6,000 years ago to 2,300 years ago (Giddings and Anderson 1986; Lawn 1975). Other sites that have been identified as belonging to the Northern Archaic tradition are distributed about arctic and subarctic interior Alaska and the southwest Yukon. Some are found near the coast, but none is an apparent coastal site. Rather, all of the sites suggest a focus

on terrestrial, riverine, or lacustrine resources, including caribou and perhaps Dall sheep, fish, small mammals and birds.

The late Paleoarctic tradition people in Eastern Beringia may already have depended primarily on an essentially modern set of animal species for their subsistence by around 10,000 B.P. In spite of the fact that the Northern Archaic people were also nomadic hunter-gatherers who stalked large herding animals like the caribou, they left some cultural remains that were distinctively different from those of their Paleoarctic tradition-bearing predecessors of Northwest Alaska and Siberia. The tools Northern Archaic people made and used are most similar to those of the Archaic cultures of the subarctic and temperate zones of North America of approximately the same time.

The setting of the Tuktu site is just north of the 2,100-foot (637 m) summit of Anaktuvuk Pass, on a well-drained glacial kame terrace overlooking a broad, north-south-trending glacial valley. The site is located approximately 80 feet (25 m) above the wet valley floor, a small stream, and the shores of Cache Lake. The Anaktuvuk River lies one-half mile northeast of the site. The Northern Archaic component of the Tuktu site consists of the remains of a dwelling, a series of associated hearths, and a substantial number of lithic artifacts that the investigator judged to be in association with these features.

The structure was located on the ground surface, was 10 feet (3 m) in diameter, and was subcircular in its outline. Approximately 20 river cobbles, some measuring up to 14 inches (35.5 cm) in diameter, made up the perimeter of the habitation. They were half overgrown with the vegetation mat when they were located by archeologists. The door of the dwelling was discernable by cobbles that were placed on either side, but there was no apparent elaborate entryway. A central, 14-inch (35.5 cm) diameter fireplace in diameter had no hearth stones but exhibited a charcoal lens. A second charcoal lens occupied part of the entry, and a third fireplace was located outside the dwelling, nine feet (2.73 m) away, directly in front of the entry. Excavations of the dwelling floor and the area adjacent to it yielded a series of tools that included chipped pebble sinkers, projectile points, scrapers, biface fragments, blades, microblades, and microcores, and an abundance of lithic debitage.

The Tuktu assemblage, the Healy Lake assemblage, and the Ugashik Knoll assemblage contain Northern Archaic tools associated with microblades and microcores (Campbell 1961; Cook 1969; Henn 1978; Davis et al. 1981). On the basis of the field data, it cannot be determined whether the microblades in the Tuktu and Healy Lake assemblages are part of a Northern Archaic assemblage, or represent one of the other microblade-bearing traditions: the earlier Paleoarctic tradition (11,500-8,000 B.P.) or the later Arctic Small Tool Tradition (2,400-1,300 B.P.). The Ugashik Knoll phase blade technology clearly belongs, however, to the Ugashik Knoll assemblage, and distinctly differs from the earlier Ugashik Narrows assemblage, located nearby (Dumond 1992, personal communication).

Based on the diagnostic projectile points and on the presence in the site of a wide variety of hunting and fishing tools along with tools used in daily domestic activities, the investigator interpreted this site as the long-term temporary seasonal living site of at least one family and perhaps several families of the Northern Archaic tradition. These people were engaged in hunting large terrestrial mammals such as caribou and Dall sheep and in fishing. It is, however, possible that this is a multi-component site at which the people of several cultural traditions repeatedly stayed over a very long span of time and that the cultural components became mixed over time due to frost action, animal burrowing, or some other type of disturbance.

The Onion Portage site is located overlooking a large meander of the middle Kobuk River. The site is on a southfacing river terrace of Pleistocene age, approximately 8 m above the river's rocky edge. It is a favorable location for a campsite or a habitation because of its well-drained soil, its view of the river, and its readily available supply of fresh water. Eighteen separate stratigraphic levels yielded cultural remains belonging to Northern Archaic occupations, indicating that the site had been used intermittently over a period of more than 3,000 years. Clustered closely around a series of hearths were numerous artifacts of a wide variety.

Included in the tool assemblages associated with the hearths were projectile points, an assortment of scraping and cutting implements, chopping tools, an axe, an abrader, assorted cobble tools, notched pebbles that were probably used for sinkers, and large numbers of utilized flakes. Nearly all of the hearths contained fragments of burned caribou bone. The appearance of the bone suggested that it may have been boiled first, as in the ethnographically-reported practice of boiling crushed bone to render fat, then using the bone for fuel. These artifacts suggest that fishing, hunting large terrestrial mammals, and a wide variety of domestic chores associated with daily home life were carried out at the site or in the area of the site. The season of this occupation could have been autumn based on the presence of caribou bone in the site. Caribou are in their prime in autumn, and are easiest to take in large numbers at that time. During modern times, large autumn herds of migrating caribou have gathered annually at or near the Onion Portage site before crossing to the south side of the Kobuk River.

A special feature of the Onion Portage site is that the stratigraphic level called Band 5, Level 2, contained house floors. They suggest the presence of a substantial dwelling and a relatively long-term occupation, probably during the late fall and winter months. Radiocarbon dates for the house floors are between 4,250 B.P. and 4,100 B.P. The cultural remains associated with this period are referred to as the Portage complex.

Based on what we know about the lifeways of the Northern Archaic people and their adaptation to their particular environment, we would expect to find a

Table 9. Known Functional Site Types for a Sample of Northern Archaic Tradition Sites in North and Central Alaska.				
Functional Site Type	Village	House	Camp	Special Purpose
Group of cold-season houses				
Single cold-season house		X		
Temporary campsite			X	
Hearth			X	X
Burial				
Quarry				X
Storage pits			?	
Food processing			X	X
Toolmaking				X
Hunting-related				X
Isolated artifact				

Table 10. Known Functional Site Types for the Northern Archaic Cultural Tradition Sites in Cape Krusenstern National Monument.				
Functional Site Type	Village	House	Camp	Special Purpose
Group of cold season houses				
Single cold season house				
Temporary campsite			?	?
Hearth				
Burial				
Quarry				
Storage pits				
Food processing			?	X
Toolmaking			?	X
Hunting-related			?	X
Isolated artifact				

number of different functional types of archeological sites associated with their seasonal round of activities, shown in Table 9.

Nine north and central Alaskan archeological sites that lie outside the borders of the monument and that were assigned by researchers to the Northern Archaic tradition were selected for comparison of their physical characteristics (Davis 1981; Hall 1975a, 1970b; Bowers 1982; Schoenberg 1985; D.D. Anderson 1972). This sample represents only 25% or less of the sites listed in the AHRS files as having a Northern Archaic tradition component.

The majority of the sites being referred to are located at higher elevations on geomorphological features that have various aspects and are described as ridges, stream terraces, or hill tops, near the heads of small tributary streams. Elevations range from 500 feet in the foothills to over 3,000 feet in the Brooks Range. These sites are well-drained and are vegetated by upland alpine vegetation. Archeological remains at these sites generally consist of artifact scatters exposed on the surface that contain lithic tools that suggest hunting, in some cases camping, tool making and tool repair (Table 9).

Several of these Northern Archaic sites are located on prominences along the middle reaches of rivers and near lakes. Those situated on third- or fourth-order streams at generally lower elevations (around 500 feet ASL or below) have artifacts that suggest not only hunting activities, but a range of daily domestic activities at the site. Eight of the nine sites under discussion here are multi-component sites in erosional situations, making it difficult to isolate what artifactual materials belong to what components.

All three known Northern Archaic tradition sites in the Cape Krusenstern National Monument lie within the Mulgrave Hills and the Igichuk Hills. They are NOA-080, NOA-138, and NOA-264. A fourth Northern Archaic tradition component may be present at NOA-253, but definitive diagnostic artifacts are lacking (Table 11).

The three known Northern Archaic tradition sites are broadly scattered throughout the extent of the monument. At these sites, the terrain is hilly to steep, the ground surface is very gravelly, and the drainage is excellent. All are situated in transition zones, or ecotones, between what is non-tussock or alpine and tussock tundra vegetation zones, at elevations above 300 feet. All of the sites have southerly or southeasterly aspects and provide broad overviews of the surrounding terrain. Two of the sites are situated in proximity to a river or lake. At the time of its occupation, the third site (the Palisades site) may have overlooked a coastal plain as opposed to the Krusenstern Lagoon beach ridges of today (Giddings and Anderson 1986:306).

The Northern Archaic sites in the monument are comprised of tools and stone debris produced by making bifacially worked stone tools (Table 10). That is, the

toolmakers worked on or modified both sides of the piece of stone they were shaping into a tool. Only one site, NOA-264, contains microblades. Since the site is a scattering of surface lithic artifacts, however, it cannot be determined whether the microblades are part of this Northern Archaic tradition assemblage or represent a separate occupation by people of another cultural tradition.

All three of the sites in the monument that have Northern Archaic tradition cultural components contain obsidian in the form of primary and secondary flakes. Obsidian is considered an exotic material in the monument, as the nearest known source is the Little Indian River south of the monument (D.D. Anderson, personal communication 1989). In addition, another exotic, chalcedony, is present at NOA-264, but its source is unknown. Locally available cherts were the primary source of lithic materials during Northern Archaic tradition times in the monument.

Table 11. Sites in Cape Krusenstern National Monument that Have Been Assigned to the Northern Archaic Tradition.

Sites	Site Types
NOA-808	Tuktu side-notched projectile point, possible tent rings
NOA-138	Lithic scatter (Palisades site)
NOA-264	Lithic scatter

NOA-080 is located on a point of land on the north shore of Mud Lake, north of the upper Omikviorok River. The site is situated on alluvium. Vegetation at the site consists of an 85% coverage of moss, lichen, dryas, and thick dwarf birch and willow growth that may obscure the cultural features at the site (Hall 1982c:43-44; 1986:43-44).

Hall observed a number of cultural artifacts and one possible feature on the site's surface. One artifact is a Tuktu side-notched projectile point fashioned from black chert. Additionally, Hall noted a number of chert flakes and several rocks, partially obscured by vegetation, that may be part of a tent ring.

NOA-080 may have as many as three prehistoric and historic cultural components, including a component that belongs to the Northern Archaic tradition. The presence of a projectile point suggests that land mammal hunting took place in the area. Today Mud Lake is a ready source of fresh water for humans and terrestrial animals, is attractive to ducks and geese, and may have a fish population. The cobbles suggest that this was a tent site at one time, and the lithic debitage indicates stone tool manufacture and/or maintenance.

NOA-138 is located on a limestone-littered bench on the southern periphery of Ingitkalik Mountain. The bench is oriented north-south, and is 200 m long. The site is only 300 m east of Krusenstern Lagoon, and affords views of the Tukrok River lowland to the southeast and Krusenstern Lagoon to the west and south. The surface of the site is well drained and covered with gray, weathered limestone rubble and yellowish-brown silt. Vegetation below the site consists of tussock tundra and willow thickets, and the hillside above the bluff is sparsely vegetated by *Dryas* and lichen. The nearest source of fresh water is an unnamed stream 0.4 km northwest of the site.

NOA-138 was first investigated in 1958, 1959, and 1960, and lithic artifacts painstakingly surface collected from the site were reported by J.L. Giddings (Giddings 1964; Giddings and Anderson 1986:306-310).

During their 1988 field season, the National Park Service archeological reconnaissance team revisited the site. They found that additional artifacts consisting of a broken side-notched biface of chert, a rounded chert endscraper, and thirteen chert and obsidian flakes were scattered across the surface of a 40 x 55 m area, probably brought to the surface by frost action. NOA-138 probably served as a flaking station and as an overlook for game (Figure 55).

NOA-264 is located at the edge of a broad river terrace north of and overlooking the confluence of the east and west forks of the Situkuyok River. The terrace is located in an intermontane basin that consists of broad, open, rolling tundra surrounded by rounded, barren limestone hills. The terrace is approximately 20 m above the river floodplain and is 1 km north of the bank of the river. The site provides a good view of the river basin and of the surrounding tundra-covered upland slopes and barren limestone hills (Figure 55).

The terrace is well drained. The ground surface at the site consists of well-rounded gravels in a silty soil that has some depth. Frost action is vigorous at the site, and abundant frost boils reveal subsurface soils and buried cultural materials. Approximately 65% of the site is vegetated with a patchy cover of *Dryas*, low shrubs, and grasses.

The site consists of a large lithic scatter along the edge of the river terrace. Lithics are found singly or in concentrations of more than 150 flakes in a single 200 x 50 m locus. Lithic materials include locally available cherts, some less common cherts, chalcedony, and two types of obsidian unavailable in the area. Stone chips representing all stages of stone tool manufacture were observed. No evidence of hearths or structures were noted. The highest concentration of lithics was found along the edge of the terrace, most within 20 m of the terrace's edge.

At least one component, belonging to the Northern Archaic tradition is present at the site. Immediate analogs exist between some artifacts at this site and the assemblages belonging to the Northern Archaic tradition, based on the presence at

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Figure 55. Map of the Palisades site. A lithic scatter assigned to the Northern Archaic tradition was located there.

NOA-264 of a diagnostic black chert side-notched point with a convex base and wide neck, on a single, irregularly shaped obsidian flake that appears to have been used as a spokeshave (D.D. Anderson 1972:70; Plate 1, 24) and on the presence of microblades (Campbell 1961; Dumond 1984). This style of projectile point is also found at Onion Portage in phase I of the Palisades complex, dating to between 4,800 and 5,200 B.P. No cultural features were located on the surface of the site.

In addition to the sites in the monument that have been assigned to the Northern Archaic tradition, 50 other cultural components, or 33.7%, of the total prehistoric cultural components identified to date in the monument are lithic scatters or isolated lithic artifacts not yet assigned to any cultural tradition, based on our present knowledge of them. Some of these probably are Northern Archaic tradition sites.

The presence at the sites in the monument of stone tools, including whole and fragmentary bifacially chipped projectile points, scrapers, and used flakes, in addition to stone chips located on prominences, suggests that Northern Archaic tradition people were watching for and hunting large terrestrial mammals such as caribou, processing hides and foodstuffs, and manufacturing lithic tools at these locations. Because so few sites belonging to this cultural tradition are known in the monument, and because no stratified sites, no habitation sites, nor any organic remains have been recovered, it is certain that much remains to be learned about the seasonal round of activities and subsistence regime of the Northern Archaic tradition people who inhabited the area that is now the monument.

All of the known sites in the monument that belong to this cultural tradition are exposed on the surface due to lack of soil formation, erosion, deflation, or frost action in situations that make them a fragile resource. The relatively remote locations of the sites generally have protected them from human disturbance, but increasing visitation to the monument and all-terrain vehicle use are two potential sources of human impact to this type of site.

Significance

The Northern Archaic tradition represents the first appearance of North American Archaic adaptations this far north. This cultural tradition is well known and was widespread throughout continental North America following the end of the glacial period, during the early Holocene warming trend. The Northern Archaic people emphasized terrestrial resources. Northern Archaic people represent a culture with affinities to the people living in the heart of North America as opposed to the contemporaneous cultures of Northeast Asia.

Information from the few Northern Archaic sites thus far located in the monument has already provided us with valuable knowledge about the Northern Archaic tradition people and their lifeways in Northwest Alaska. Because very little is

known about the tradition in this region, the sites in the monument are especially important.

The known Northern Archaic tradition sites and other small surface lithic scatters in Cape Krusenstern National Monument that are potentially assignable to the Northern Archaic tradition are significant under National Register criterion D because they are likely to yield important information about the seasonal round of subsistence activities and systems of settlement of the Northern Archaic tradition people.

We lack adequate data to address the question of how long Northern Archaic tradition people were present in this area of Northwest Alaska. None of the known sites in the monument has been radiocarbon dated, and it is only based on typological comparisons of similar projectile point styles between those located in the monument and those excavated at the Onion Portage site on the Kobuk River that a date of occupation is tentatively assigned for the monument.

The types of sites known for the Northern Archaic tradition are indicated in Table 11. Morphologically speaking, the lithic scatter is the only type thus far positively identified for the monument. It is possible that one site in the monument may have a rock feature that is associated with the Northern Archaic presence, but it has not been adequately dated. Not until we have all of the site types represented will we be able to reconstruct the subsistence-settlement strategies of the Northern Archaic tradition people and be able to more fully discuss their environmental adaptations.

As future research takes place, other types of Northern Archaic tradition sites may be found in the region of the monument. Some functional site types we have not yet identified in the monument but can expect to see in the archeological record include long-term habitation sites constructed for occupation during the cold seasons; storage facilities associated with winter occupation; grave sites; and special-purpose sites such as resource procurement sites, kill sites, and processing sites (Table 9).

Goals

The foregoing discussion and the information provided in Tables 9, 10, and 11 show that we lack key information about the archeological record for Northern Archaic tradition times.

The combined efforts of all the researchers who have worked in the monument to date have yielded only less than a one per cent reconnaissance-level survey sample. Additional survey sampling is recommended. It must be based on models incorporating the latest knowledge of known site characteristics, including site environmental correlates, and on our expectations for the discovery of particular

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effort to protect sensitive cultural resources.

Figure 56. NOA-264, a Northern Archaic tradition site.

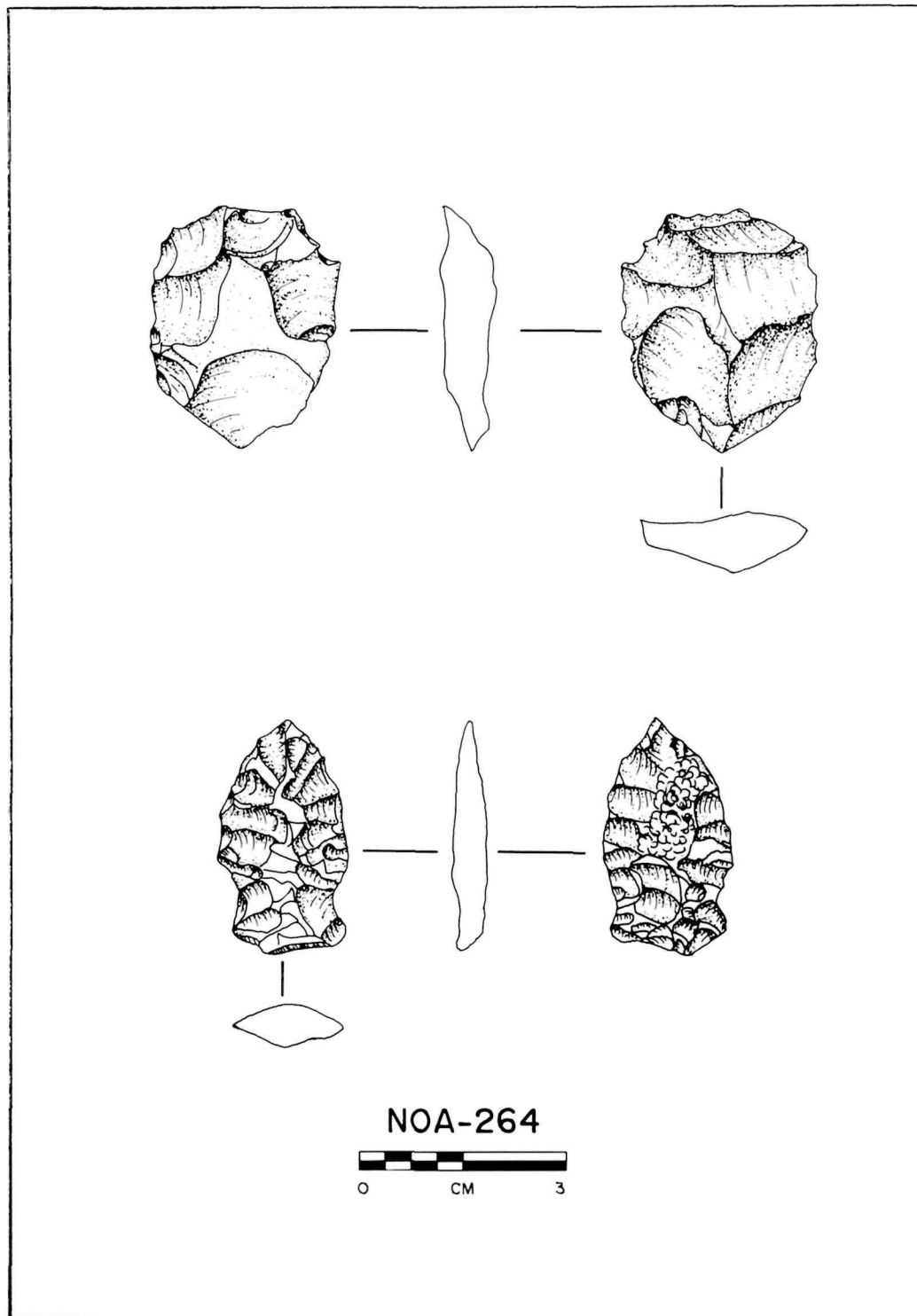


Figure 57. Northern Archaic tradition lithic artifacts.

site types (Appendix D). It is recommended that researchers consider strategies different from the opportunistic site discovery methods used previously. For example, one approach is the problem-oriented survey. One goal is to obtain a wider range of site types. A stratified random sample of a particular area of the monument may be useful for the discovery of site types expected but not yet identified there (Table 9). Subsurface cultural materials and features do not always have surface indicators that an archeological site is present. Means must be used to locate subsurface remains.

When a larger inventory of Northern Archaic tradition sites exists for the monument, a sample of stratified sites that promises to yield radiometrically datable cultural materials from Northern Archaic tradition occupations should be tested. Additionally, a sample of sites of each descriptive site type should be chosen for testing or excavation to get a better idea of the exact contents of each site type. Data derived by these means may help us to assign known sites now considered unassignable to any cultural tradition.

This overview and assessment provides the names of the repositories for existing archeological collections from the monument. Before conducting the field portion of any archeological project, it is important for the project archeologist to study existing Northwest Alaska collections and site reports to have a good idea of the types of artifacts and features thought to be present in monument sites.

One of the most important areas of consideration for our understanding of the Northern Archaic tradition is that of the environment during the Holocene warming trend that took place at about the same time as the Northern Archaic occupation of the monument. It is strongly recommended that the National Park Service continue to foster and financially sponsor multidisciplinary approaches to interpreting the prehistoric environment of the region.

Sites must be completely mapped, site recording methods need to be complete and thorough, and the same type of data must be recorded in the same manner for each site. In this way, sites may be systematically compared. Because a non-collection policy is practiced by the National Park Service, all artifacts must be completely mapped, recorded, drawn, photographed, and described in detail in the field. Not only does the horizontal extent of the site need to be recorded, but the presence or absence and the depth of subsurface cultural materials needs to be established. An example of a thorough site recording form and a list of minimum data that should be recorded for each site is included in Appendix E of this report. As a result of using this approach, fewer new sites may be located, but all new sites will be much better recorded.

As new types of Northern Archaic sites are identified and described, these criteria for defining the context and for evaluating the sites will need to be elaborated and refined. At the same time, based on new site information and better environmental data, more efficient locational models can be developed.

Because of the nature of the known Northern Archaic tradition sites in the monument, they should be monitored periodically with regard to the effects of natural and human forces. Because these sites are erosional, they need to be evaluated for possible site stabilization or data recovery. Revegetation is one relatively nonintrusive method to stabilize a site.

It is recommended that future planning for the management of the monument's cultural resources involve a wide spectrum of interested people, including scholars and members of the Native community. It is also recommended that the National Park Service continue its community education and outreach efforts.

HISTORIC CONTEXT III: Early Arctic Sea Mammal Hunting Adaptations in the Cape Krusenstern Region, Northwest Alaska between 2250 B.C. and A.D. 950.

Theme:	Early Arctic Sea Mammal Hunting Adaptations
Time:	2250 B.C. - A.D. 950
Place/Area:	Cape Krusenstern Region, Northwest Alaska

This context addresses the adaptations of the first people in the region whose subsistence routine included the systematic pursuit of both sea mammals and a variety of terrestrial resources, including large land mammals, on and adjacent to the arctic coasts of North America. Their particular lifestyle is evident in the archeological record they left on the arctic coastline and adjacent inland areas. The earliest people of this cultural tradition inhabited the area from the Alaska Peninsula in the west, across the top of the North American continent, to Greenland, where their subsistence lifestyle consisted of hunting for land and sea mammals, fishing, and birding. This region is remarkable for its frozen winter coastlines and for its predominantly moist, tussock tundra inland vegetation.

These people belonged to a culture whose remains archeologists have given the designation the ASTt. The distribution of these remains is interesting because it is very similar to the distribution patterns of the ethnographically-known North American Eskimo people. Many archeologists have come to think of ASTt people as somehow ancestral to the Eskimos.

Basing their theory on similar technologies, archeologists also have remarked on likenesses between the ASTt and the Mesolithic cultures of Northeast Asia, Siberia, and Mongolia. Additionally, archeologists have noted that the ASTt technology shows links with the earlier Paleolithic cultures of Eurasia and North America, but the exact spatial and temporal connections have not been determined.

By the time of the arrival of the first ASTt people, the environment in the Cape Krusenstern region was essentially that of today. Climatic conditions of that period produced cold winters with near-shore ice, and brief, mild summers. Sea mammals, caribou, Dall sheep, musk ox, and anadromous fish were all present for human exploitation.

The ASTt is technologically different from the previous cultural tradition in the region, the Northern Archaic tradition (6,000 - 4,000 B.P.). These dissimilarities emphasize that the ASTt lifeway represents a new and different environmental adaptation from that of earlier cultural traditions. There appears to be no connection between the ASTt and the earlier Northern Archaic tradition. Northern Archaic people were gone from the Cape Krusenstern region for a long period before the appearance of the ASTt people as early as 2250 B.C., but continued on in other areas of Alaska. There is no explanation for the disappearance of the Northern Archaic people from this region. One probable explanation, however, is a change in the distribution of the major resources upon which the Northern Archaic people depended.

ASTt tools and material remains suggest to us that the people of this culture were seasonally sedentary, and that they traveled during certain times of the year to procure various resources through hunting, fishing, and probably trading. A certain degree of permanency is indicated by the presence of substantially-made semisubterranean houses that took considerable energy to build. Extreme winter weather conditions require a certain degree of sedentism as well as plentiful stored food resources readily at hand. Sedentism is also indicated by a proliferation of material possessions, including heavy items such as pottery.

The ASTt people followed a seasonal round of activities that included at a minimum taking large land mammals, fresh water and anadromous fish, birds, and sea mammals in varying quantities through time and from area to area, depending on the favored foods of a particular people and the variation in relative availability of specific food resources. Of these, caribou and seal appear to have been the most important to them.

ASTt people spent their winters in single habitations generally large enough for a nuclear family or a small extended family, or in clusters of habitations comprised of sturdily built, warm, semisubterranean houses, some with entryways and some without. Sometimes these houses were clustered around a single large house. Their construction consisted of poles or heavier timbers with wall planks and support posts, and a roof that may have been made of skin insulated by snow, sod or soil. Such winter habitations of this time period in Northwest Alaska have been located both on the coast and inland on lakes and rivers or streams.

More temporary housing may have consisted of a structure similar to the ethnographically known *ivrulit*, a round or oval habitation constructed of a series

of bent poles covered by skins or sod. They are also found both on the coast and inland in lakeside or riverine settings.

Much of the ASTt peoples' time must have been taken up in the pursuit, dressing, and storage of food; in the manufacture of tools and weapons; and in the preparation of hides and clothing. Time spent on a given task varied depending on the season.

Based on their work at Cape Krusenstern, J. L. Giddings and D.D. Anderson (1986) divided the ASTt into five cultural periods:

Table 12. Cultural Periods of the Arctic Small Tool Tradition.	
Cultural Period	Dates Before Present, Based on MASCA-corrected Dates of Sites in Northwest Alaska
Denbigh Flint	2250 B.C. - 1600 B.C.(50)
Early Choris	1650 B.C. - 1250 B.C.(50)
Choris	1200 B.C. - 550 B.C.(50)
Norton-Near Ipiutak	550 B.C. - 1200 B.C.(100)
Ipiutak	A.D. 50 - A.D. 950 (50)

The researchers divided the tradition into these units based on the changes through time that they observed in the material culture of the ASTt people. The Denbigh Flint complex (2250-1600 B.C. 50) is recognizable in the archeological record by its small, delicately made tools for hunting; its tools for graving on bone in the process of making composite microblade weapons and implements; and its polished adzes. The types of sites that have been discovered for this period include coastal sealing campsites that are marked by small, tight circles of lithic artifacts and small clusters of thermally-altered beach pebbles that were probably used for cooking. The site types also include inland caribou hunting campsites and inland winter settlements made up of one or more semisubterranean houses of distinctive design (Giddings and Anderson 1986:273-291).

Choris culture (1650-550 B.C. 50) artifactual remains show continuities with Denbigh, as well as some differences. Choris people also used graving tools that they made from thick flakes or that they removed from the edges of prepared bifaces. Pottery appeared for the first time in Alaska, and microblades and Denbigh-style graving tools were no longer made. Coastal campsites with stone-lined hearths existed in this period. Inland hunting sites were also recorded, as well as distinctive oval, deeply excavated, semisubterranean houses of substantial

construction (Giddings and Anderson 1986:187-230). The Choris tradition is evident from sites on the Choris Peninsula, Cape Espenberg, and Cape Krusenstern in Northwest Alaska.

Norton culture (550-50 B.C. 100) also has a number of material elements that show its connections with Denbigh and Choris cultures. The population in the region of the monument during this time was stable or may have decreased. Pottery bore a check-stamped design during this period. The Norton tradition has been found in the south on the Southern Alaska Peninsula, north to North Alaska at Point Hope and Point Barrow, and east to the northwesternmost corner of Canada (Dumond 1983:81). Locally, Norton culture is apparent from a campsite on a Cape Krusenstern beach ridge, a burial, and a few winter house sites in Northwest Alaska.

By contrast, Ipiutak culture (A.D. 50-950 [50]) is substantially represented by a settlement of houses of semisedentary use and of square construction on the Cape Krusenstern beach ridges. Ipiutak culture is well known for its elaborately carved ivory objects. Ipiutak artifact styles are most similar to those of Denbigh. Among the material items recovered from these sites are the earliest iron implements in Arctic Alaska. Ipiutak sites have been found only in Northwest Alaska at such coastal locations as Deering, Cape Krusenstern, Battle Rock, and Point Hope, and at inland locations including Feniak Lake, Tuluak Lake, and Itkillik Lake.

The ASTt in Northwest Alaska coastal sites ended with the dramatic appearance of Birnirk culture, the first cultural stage of the Northern Maritime tradition as it has been outlined by Anderson (1984:90). Some archeologists have suggested that Birnirk was the result of new populations entering the region from the Asian coast or the vicinity of Bering Strait. Others have argued that Birnirk represented the introduction of a new sea-mammal hunting technology that originated in the Bering Strait area. Interior Ipiutak culture persisted to as late as Birnirk times, and the two cultures coexisted in Northern Alaska for several centuries.



Figure 58. Young walrus. Ipiutak ivory carving.
(Source: Larsen and Rainey 1948:125)

A number of property types are known or expected to be present in the North American Arctic for this time period. The expected functional site types are listed

in Table 13, and their presence in the archeological record of Northwest Alaska is noted. Of the expected site types, those that thus far have been observed for all periods of the ASTt in the Cape Krusenstern region are indicated by the information in Table 14.

Table 13. Known Functional Site Types for the Arctic Small Tool Tradition in Northwest Alaska.				
Functional Site Type	Village	House	Camp	Special Purpose
Group of cold season houses with a large, central house	X			
Group of cold-season houses	X			
Single cold-season house		X		
Temporary campsite			X	
Hearth	X	X	X	X
Burial				X
Quarry				X
Storage pits	X	X	X	X
Food processing	X	X	X	X
Toolmaking	X	X	X	X
Hunting-related	X	X	X	X
Isolated artifact				X

Description of Site Types

Group of cold-season houses with a large, central or community house; group of cold-season houses that lack a community house; single cold-season house. Well-constructed semisubterranean houses built for habitation during the coldest periods of the year have been located in Alaska during all periods of the ASTt. Archeologists identified large structures intended for community use in the late ASTt period. The large structures were generally central to a cluster of small contemporaneous houses. It should be noted that the well-constructed semisubterranean house might not have been the only type of winter habitation used by people of the ASTt.

For the early ASTt period, archeologists discovered cold-season houses at Onion Portage, Howard Pass, and the Naknek and Ugashik river drainages on the Alaska Peninsula. For Brooks River and Howard Pass, Dumond (1987b:83; Irving 1964) described squarish houses measuring 4 m x 4 m, excavated into the earth to depths ranging from just below the sod to 50 cm below surface. These houses had sloping tunnel entryways and central fireplaces. Some had hearths constructed with stones and some had box-like structures formed of vertical slabs. At Onion Portage, Anderson (1984:85) investigated several round structures that may have resembled the ethnographically-reported *ivrulit*. The structures were in shallowly excavated ground and had large stone-lined central hearths.

For the Choris period, houses were evident on the Choris Peninsula and at Onion Portage (Anderson 1984:86-87; Giddings and Anderson 1986:187-194). On the Choris Peninsula houses varied in size from 9 m to 13 m at their widest point, were oval, and were in shallowly excavated ground. No entryways were apparent to the excavators, and only one of the structures had a central hearth. The presence of thick clay-and-stone pot sherds suggested to the investigators that cooking may have been done over lamps. No single habitation stands out as serving as a community house.

At Onion Portage, Choris habitations consisted of a series of tentlike structures with large, central hearths of stone, located next to a larger oval, semisubterranean house with a short entrance passage and a centrally-located hearth lined with stones. While the floors of the smaller structures were littered with butchering and hide scraping tools, the large structure contained tools and parts for making composite weapons, adze blades and other implements for woodworking. The excavator called the larger structure the community house or men's workshop.

Archeologists discovered Norton-Near Ipiutak houses at Point Hope, Iyatayet, Kugzruk, Lopp Lagoon, and Cape Krusenstern. House plans were quite varied during this period and were unlike the preceding Choris house forms. Houses were semisubterranean, tended to be square with central fireplaces, and had substantially long entry tunnels. Residence patterns at Point Hope, Cape Krusenstern, Kugzruk Island, and Onion Portage tended toward isolated winter houses rather than larger groups of houses.

In contrast, the Ipiutak period left the substantial remains of sometimes extensive settlements at a number of coastal sites. For example, 575 house pits were evident on the site's surface alone at the Point Hope Ipiutak village site described by Larsen and Rainey (1948:45). There they uncovered houses with square floor plans with generally rounded corners, excavated on the average 50 cm into the existing surface. The houses resembled those known as the common Alaska type from the ethnographic literature. That is, Ipiutakers had a semisubterranean house with a square floor plan with rounded corners, side entryway, mid-floor hearth, platforms along the walls, and four roof-supporting posts. It is the most

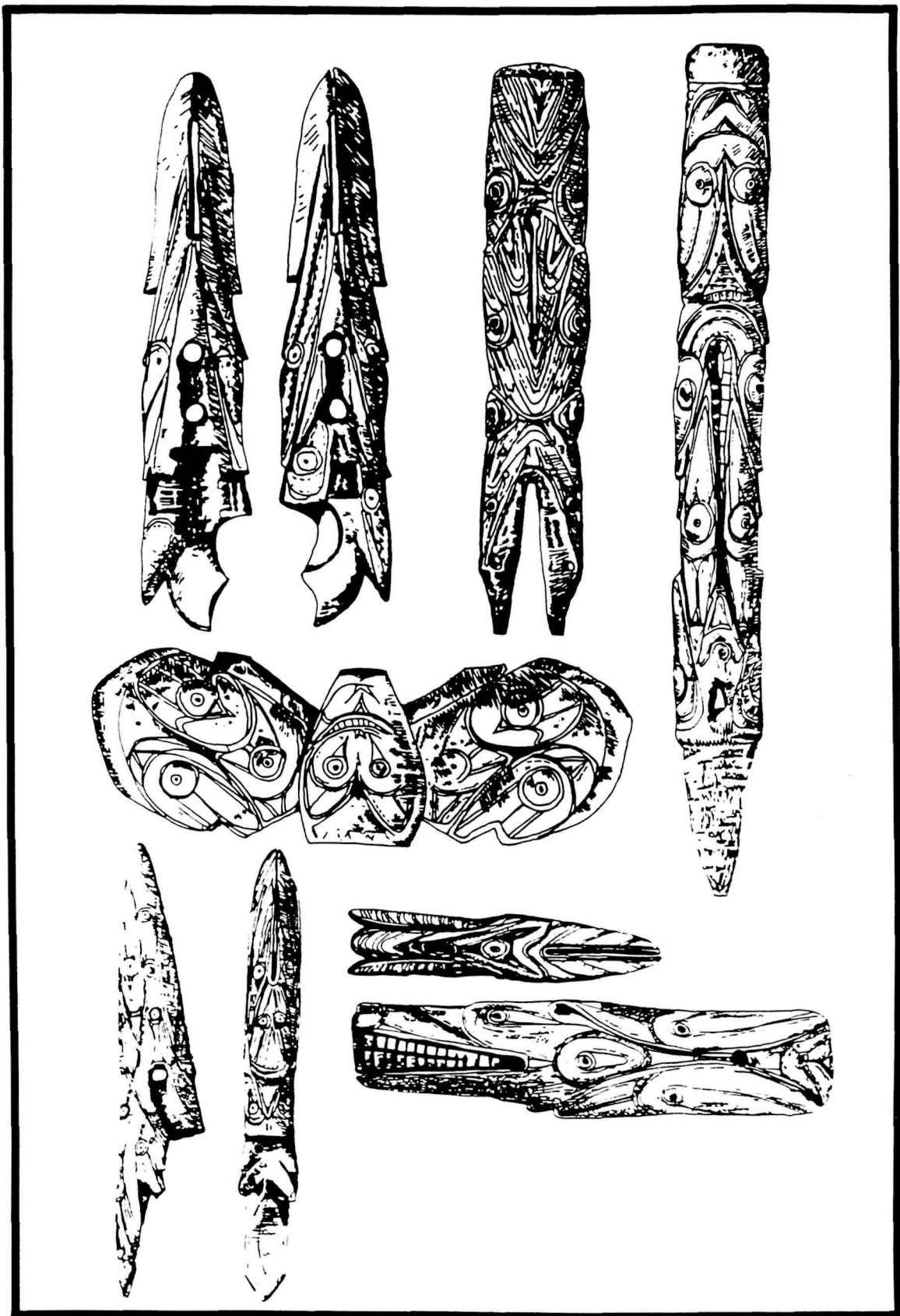


Figure 59. Examples of Old Bering Sea art (Source: Ackerman 1984; from page 111, *Handbook of North American Indians*, Vol. 5, *Arctic*).

widespread house type in Alaska. Two of the houses at Point Hope were somewhat larger than the rest, had a rectangular floor plan, and contained woodworking refuse. The investigators suggested that these may have been men's houses (Larsen and Rainey 1948:45).

The most vividly impressive aspect of Ipiutak culture is the beautifully carved ivory objects (Figure 58). Larsen and Rainey (1948:38,39,69) compared some implements with Okvik and Old Bering Sea cultures discovered at Wales, the Diomed Islands, Point Hope, Point Barrow, and St. Lawrence Island. Archeologists see in the Ipiutak art motifs and animal carvings a close similarity to those found in the Scytho-Siberian art of Northern Eurasia (Larsen and Rainey 1948:126). The objects have been located in burials, as well as in habitation sites, and apparently have cosmological significance that seems to be intricately connected with the sea mammal hunting complex and hunting magic, based on the fact that many objects are representations of animals (Figure 59).

The Ipiutak people at Cape Krusenstern left the remains of seven settlements of from three to twelve small houses surrounding one or two large houses. Tools in the large structures suggested that they were community activity houses for both men and women (D.D. Anderson 1984:89; D.D. Anderson 1962:80). A similar community activity house was found in a large Ipiutak house in Deering.

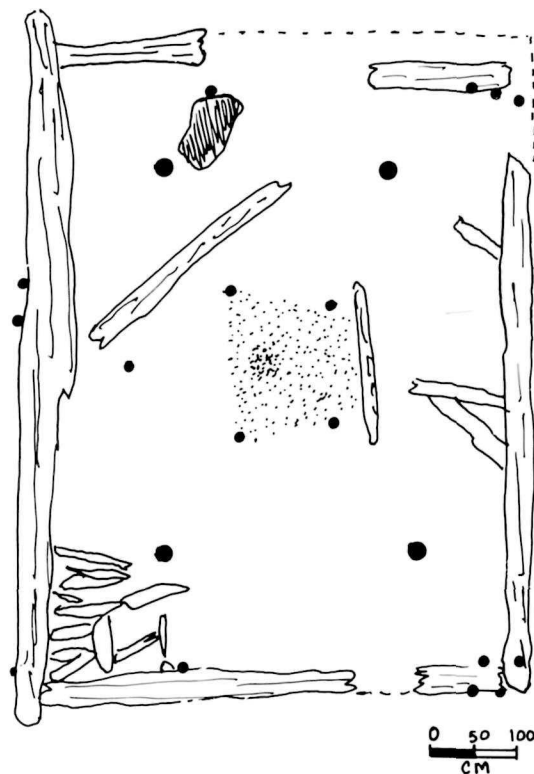


Figure 60. Example of Ipiutak houses
(Giddings and Anderson 1986:122).

The Ipiutak period is also present in the archeological record of the Alaska interior. At Itivlik Lake a small square-floored winter house that lacked platforms was located; and at Feniak Lake, a house with a round floor plan and a short entryway was documented (D.D. Anderson 1986:89; Hall 1974).

Temporary campsite. A camp is a temporary occupation that may be marked by a tent ring, a hearth, fire-cracked rock, a lithic scatter, faunal remains, and tools that perhaps indicate special use or uses, or special seasons of use. The site may represent one or two brief stays by a single people, or a repetitive series of brief visits over a very long period of time, perhaps by people of more than one cultural tradition.

A temporary campsite may be distinguished from a residence of more permanence by using several lines of evidence. Generally speaking, the amount of effort and building materials that have gone into the habitation suggest the degree of permanence at the site. Frequently, the archeological remains at campsites suggest the use of a tentlike structure constructed on the existing ground surface. The presence of an artifact scatter tightly clustered around a hearth area suggests that it may have been the former site of a tent or other enclosure. If the occupation has been brief, relatively few artifacts will be present, both in the area of former habitations and in surrounding activity areas.

Most of the known early ASTt sites in Alaska are the remains of temporary camps. They can be found along the coast as well as inland, where they appear to be in or near ecotones, and are often located on tundra lakes or streams. Anderson (1984:84) reports that early ASTt people on the Northwest Alaska coasts had campsites with three to six hearths clustered together, with artifacts located around the hearths for a radius of about three feet, suggesting the presence of tents. Burned seal bones, charred wood, and the stain of sea-mammal fat were located in and adjacent to the coastal campsites. Present also were weapon-heads for hunting both seal and caribou. Spring, summer, and fall camps were located at Punyik Point and at Onion Portage. Hall (1975a) reported stone rings ten to twelve feet in diameter in the Brooks Range and North Slope that are the remains of tent structures of early inland-dwelling ASTt people.

Choris culture left a pattern of temporary coastal campsites similar to that of the early ASTt at Cape Krusenstern. The campsites have single hearths or a group of two or three hearths, with Choris period artifacts tightly clustered around them as if tents had formerly stood there. The hearths, which are round and paved with limestone cobbles, contain charred seal bones, seal fat, and charcoal, as well as the fragments of pottery cooking pots. Inland Choris sites suggest a very temporary, transient lifeway of a people who hunted caribou.

The Norton period is relatively little known. Temporary campsites existed at Point Hope, Cape Krusenstern, Cape Espenberg, and Lopp Lagoon. Those at Cape Krusenstern and Lopp Lagoon are the remains of seal hunters' camps. Anderson

(1988:122) reported winter-spring hunters' tentsites at Onion Portage, where 53 unlined hearth areas, five lined hearth areas, chip concentrations, and ocher stains were located. Associated with the unlined hearths was calcined bone. They may have been late spring-early summer campsites, when potential hearthstones were still frozen into the ground and unavailable for use. Bone grease rendering may have been carried on there. In contrast, the stone-lined hearths were surrounded by widely-scattered, unburned caribou bones, suggesting fall campsites of caribou hunters who may not have been using tents.

The known Ipiutak period sites include spring-summer campsites along the northwest coast and apparent caribou-hunting camps inland. At the coastal sites, archeologists located a few hearths, and scattered artifacts including seal bones covering large areas. Camping areas of caribou hunters were at Anaktuvuk Pass, and apparent short-term camps composed of hearths and associated scattered artifactual remains were present at Onion Portage. In general, Ipiutak-period campsites are similar to those of the rest of the ASTt period.

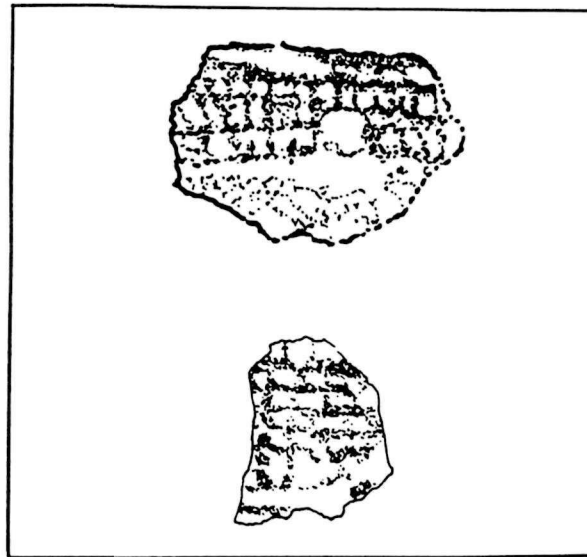


Figure 61. Norton pottery sherds from NOA-002 (Giddings 1967).

Special purpose site. A number of activity-specific types of sites are present in the archeological record for the ASTt tradition. Aside from construction of

shelters, activities that have left material remains in the archeological record include disposal of the dead, quarrying, food processing, food preparation, food storage, manufacture of clothing, construction of equipment, toolmaking, gathering vegetable foods, hunting for land mammals, hunting for sea mammals, and fishing. Some of these activities were carried out in the living community, some in temporary camps, and some took place at isolated sites or special purpose sites.

Description of Known Functional Site Types for the Arctic Small Tool Tradition in Cape Krusenstern National Monument

Table 14. Summary Table of Known Functional Site Types for the Arctic Small Tool Tradition in Cape Krusenstern National Monument.				
Functional Site Type	Village	House	Camp	Special Purpose
Group of cold season houses with a large, central house	X			
Group of cold-season houses	X			
Single cold-season house		X		
Temporary campsite			X	
Hearth	X	X	X	X
Burial				X
Quarry				
Storage pits	X	X	X	
Food processing	X	X	X	X
Toolmaking	X	X	X	X
Hunting-related	X	X	X	X
Isolated artifact				

Table 14 clearly shows that nearly all of the functional site types known to exist for the ASTt in Northwest Alaska are represented in the monument. However, not every site type is known for every cultural period of the ASTt. Also, it should be noted that the boundaries of the monument probably do not enclose the entire territory used by the local ASTt people in their seasonal round of subsistence activities.

Early ASTt sites in the monument are all temporary campsites connected with either maritime or terrestrial hunting activities. One site provides an excellent caribou lookout from its location at the edge of the non-tussock tundra zone overlooking Rabbit Creek. The others are temporary campsites on the beaches, from which seals were hunted.

Table 15. Known Functional Site Types for the Denbigh Flint Period, Arctic Small Tool Tradition, in Cape Krusenstern National Monument.				
Functional Site Type	Village	House	Camp	Special Purpose
Group of cold season houses with a large, central house				
Group of cold-season houses				
Single cold-season house				
Temporary campsite			X	
Hearth			X	X
Burial				X
Quarry				
Storage pits				
Food processing			X	X
Toolmaking			X	X
Hunting-related			X	X
Isolated artifact				

Choris sites in the monument are also all temporary campsites, the majority of which are temporary seal-hunting tentsites on the beach ridges at Cape Krusenstern. One upland caribou hunting site in the foothills of the monument may be a Choris site, as well.

The presence of Norton culture in the monument is marked by the remains of campsites that have a distinct hearth, an associated cache, and walrus and whale bone. However, it is not clear whether Norton people at Cape Krusenstern were hunting whales. At Battle Rock, Norton remains were found in a subsurface rock-lined burial.

Ipiutak culture in the monument takes an entirely different form from the preceding cultures. Adjacent to Krusenstern Lagoon at least 70 substantially-built habitations, most of them grouped into eight settlements, were recorded by Giddings and Anderson (1986) and one habitation site was recorded by McClenahan and Gibson (1990). Not all of the habitations were contemporaneous, however. Associated with the settlements are artifacts, middens, cache pits, drying and storage rack areas, and burials. In the same vicinity on the Krusenstern beach ridges a number of spring seal hunters' campsites were recorded that consisted of concentrations of fire-cracked rock and sea-mammal-soaked gravels.

Table 16. Known Functional Site Types for the Choris Period,
Arctic Small Tool Tradition, in Cape Krusenstern National Monument.

Functional Site Type	Village	House	Camp	Special Purpose
Group of cold season houses with a large, central house				
Group of cold-season houses				
Single cold-season house				
Temporary campsite			X	
Hearth			X	X
Burial				
Quarry				
Storage pits				
Food processing			X	X
Toolmaking			X	X
Hunting-related			X	X
Isolated artifact				

Table 17. Known Functional Site Types for the Norton Period,
Arctic Small Tool Tradition, in Cape Krusenstern National Monument.

Functional Site Type	Village	House	Camp	Special Purpose
Group of cold season houses with a large, central house				
Group of cold-season houses				
Single cold-season house				
Temporary campsite			X	
Hearth			X	X
Burial				X
Quarry				
Storage pits			X	
Food processing			X	
Toolmaking			X	X
Hunting-related			X	X
Isolated artifact				

Table 18. Known Functional Site Types for the Ipiutak Period, Arctic Small Tool Tradition, in Cape Krusenstern National Monument.

Functional Site Type	Village	House	Camp	Special Purpose
Group of cold season houses with a large, central house	X			
Group of cold-season houses				
Single cold-season house		X		
Temporary campsite			X	
Hearth	X	X	X	X
Burial	X			X
Quarry				
Storage pits	X	X	X	
Food processing	X	X	X	X
Toolmaking	X	X	X	X
Hunting-related	X	X	X	X
Isolated artifact				

Unexpectedly in 1958 and 1959, Giddings and Anderson uncovered the remains of a significant new culture, termed the Old Whaling culture, at Cape Krusenstern. They did not consider Old Whaling to belong to the Arctic Small Tool tradition, but they established it as having been present during ASTt times based on the presence of Old Whaling culture houses on beach 53 at Cape Krusenstern (Giddings and Anderson 1986:231).

The Old Whaling culture seems to have appeared suddenly around 3,150 B.P., making it contemporaneous with Choris culture. However, Mason and Ludwig (1989) questioned dates Giddings and Anderson assigned to the Old Whaling culture at Cape Krusenstern based on the position of the archeological remains on the beach ridges. Mason and Ludwig suggested an alternative interpretation of the formation of the beach ridges.

The Old Whaling culture seems to have disappeared just as quickly as it appeared; and in spite of its fleeting presence, it is being included in this discussion.

Giddings and Anderson (1986) point to individual Old Whaling artifact types that are similar to ASTt (particularly Choris) types. The relative frequencies of specific artifact types present in the two cultures are reversed, however. Remains from

the Old Whaling sites also are similar to those from the Chërtov Ovrag (Devil's Ravine) site on Wrangell Island, investigated by Dikov in 1975.

In addition to the sites in the monument that have been assigned to the ASTt, another 50 cultural components, or 33.7% of the total prehistoric cultural components recorded in the monument, are lithic scatters or isolated lithic artifacts that are unassignable to any cultural tradition based on what we presently know about them. Another 42 components, or 30% of the total prehistoric cultural components recognized in the monument, are undated rock features, including six hunting stands, 12 stone tent rings, and 24 undated stone cairns. Nearly all of these sites are located in the foothills of the monument. It is probable that at least some are ASTt sites.

Of the known sites belonging to this cultural tradition, the habitation sites, the temporary campsites, and other cultural features that are located on the Cape Krusenstern beach ridges are at greatest risk of disturbance from a variety of sources. They include

1. Construction and other activities on sites conveyed to private parties.
2. Traffic to and from private dwellings and camps, particularly by all-terrain vehicles (ATVs).
3. Purposeful looting of sites.
4. Coastal erosion.

The present condition of many of these sites is unknown because permission to visit privately-held parcels was denied NPS archeologists during their 1987-1988 field survey.

The remainder of the sites that are located in the foothills of the monument are exposed on the surface because they consist of above-ground features or because the sites lack soil formation, or suffer from erosion, deflation, or frost action in situations that make them a fragile resource. They are located in comparatively remote situations which serves to provide them some protection from human disturbance; however, increasing use of the monument by visitors and the use of all-terrain vehicles for caribou hunting are two potential sources of human impact to this type of site.

Significance

The Arctic Small Tool people were the first people in the American north to consistently use Arctic marine as well as inland tundra resources. The ASTt sites in Cape Krusenstern document the beginnings and evolution of the Arctic Small Tool people in Northwest Alaska. Their specific adaptation to the arctic

environment was widespread across all of coastal arctic North America. In fact, Arctic Small Tool people were the first to systematically utilize all of the areas of Arctic North America that would later be inhabited by the ethnographically reported Eskimo people.

Table 19. Sites in Cape Krusenstern National Monument That Have Been Assigned to the Arctic Small Tool tradition.

Site	Site Type
NOA-002	Denbigh Flint Complex sea-mammal hunting camps Choris seal-hunting camps Norton sea-mammal hunting camps Ipiutak winter settlements; Ipiutak campsites; burials
NOA-078	Norton burial
NOA-256	Denbigh Flint Complex Caribou hunting camp
NOA-277	Ipiutak habitation site
NOA-278	Denbigh Flint Complex Seal hunting camp
NOA-280	Denbigh Flint Complex Seal hunting camp
NOA-282	Denbigh Flint Complex Seal hunting camp

During ASTt times, semipermanent villages developed at Cape Krusenstern along with maritime hunting techniques. In conjunction with the new technology complex art styles developed that were a part of sea mammal hunting magic, based on the recovery of elaborately carved figures of animals. This seasonal focus on marine resources is balanced by an equally important seasonal tundra hunting focus about which little is known for the monument. The ASTt sites at Cape Krusenstern are key to our understanding of ASTt relationships with contemporaneous Neolithic people of the North Pacific Rim. Certain tools, house styles, and art work suggested to some early scholars cultural affiliations with those of Northern Eurasia of about the same period and earlier.

Cape Krusenstern's ASTt sites are also pivotal to our understanding of the successors of the ASTt people, throughout the prehistory of Northwest Alaska's

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 62. Ipiutak habitation site.

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 63. Denbigh Flint complex seal hunting camp.

Image removed from the electronic edition in an
effort to protect sensitive cultural resources.

Figure 64. Denbigh Flint complex seal hunting camp.

maritime adapted people up to the time of the ethnographically reported Northwest Alaska Eskimos. Additionally, the ASTt sites in the monument can help us understand how the ASTt adaptations to the Cape Krusenstern region compare and contrast with the adaptations of people of other arctic and subarctic regions that belong to the same era.

The known ASTt sites and other sites in Cape Krusenstern National Monument that are potentially assignable to the ASTt are significant under National Register criterion D since they have yielded and are further likely to yield important information about the seasonal round of subsistence activities and systems of settlement of the ASTt people.

In spite of the fact that many more ASTt sites are known in the monument than those of the previous traditions and that information from some of these sites has already broadened our knowledge about ASTt people's occupation of the Northwest Alaska region, a great deal still is not understood about the tradition. Particular periods of the tradition are poorly represented. Neither all of the site types nor the full seasonal round of the Denbigh Flint people is known for the monument. Nor do we know the broad range of natural resources that they were using. The monument has only very sketchy evidence of the Choris culture from campsites at Cape Krusenstern. Nothing definitive can be said for either the Choris or Norton cultures about the seasonal round of activities or the full range of Choris and Norton site types to be found in the monument. Evidence suggests that we have not yet identified all the types of Ipiutak sites in the monument nor do we have a clear picture of the complete seasonal round of activities for the Ipiutak people. Other questions that remain unanswered include those that address cultural change through time. Examples are the sudden appearance of pottery during the Choris period and the sudden proliferation of permanent habitations at coastal locations during the Ipiutak period.

Goals

The previous discussion suggests that even though we have recorded archeological sites assignable to each period of the ASTt, gaps still exist in our knowledge about the lifeways of the ASTt people.

Less than 1% of the monument has been covered by reconnaissance-level archeological survey. An additional survey is needed, based on models incorporating the latest knowledge of known site characteristics, including site environmental correlates and our expectations for the discovery of particular site types (Appendix D). Researchers may wish to consider strategies different from the previously used opportunistic site discovery method; for example, they may wish to conduct problem-oriented surveys to obtain a wider range of site types. A stratified random sample of a particular area of the monument may be useful for the discovery of site types expected but not yet found (Table 13).

Research questions include, but are not limited to:

1. In what locations and to what extent are the remains of each of these cultural periods distributed within the monument?
2. What is the relationship in the monument and in Northwest Alaska of the Arctic Small Tool tradition and Old Whaling culture?
3. How are the four cultural periods of the Arctic Small Tool tradition related? How do we account for the differences?
4. How is the early Arctic Small Tool tradition related to preceding cultural traditions in North America?
...in Northeast Asia?
5. How is the late Arctic Small Tool tradition related to the succeeding Northern Maritime tradition?
6. How are cultural developments during Arctic Small Tool tradition times on the coast and in the interior of the monument related to developments elsewhere in the Northwest Alaska region and the North Pacific rim?
7. How do the stylized decorative motifs of the Cape Krusenstern Ipiutak people relate to very similar designs attributed to the Okvik and Old Bering Sea cultures of St. Lawrence Island and the Bering Strait region?

Archeologists need more data on ASTt sites that have been excavated from secure radiocarbon-dated contexts. In particular, this type of information is needed from the numerous undated upland sites. With respect to the above-ground stone features, in some cases lichenometry may provide the data required.

When an expanded inventory of ASTt sites exists for the monument, archeologists should excavate a sample of sites from each descriptive site type to get a clearer picture of what each site type looks like. In this way, sites that are presently considered nondiagnostic may be assigned to a particular cultural tradition.

Excellent archeological collections exist from previous archeological survey and excavation of ASTt sites in the monument and in other parts of Northwest Alaska. For the monument, these collections are located in several university museum repositories that are listed in Appendix C of this volume. During the planning stages of any future archeological field work, studying these collections along with the project notes and reports will provide a good idea of the types of cultural artifacts and features that might be present in monument sites.

A firm understanding of the natural environment as it existed during ASTt times is key to our understanding of cultural adaptations and cultural change through

time in Northwest Alaska. A number of important environmental studies published during the past ten years have enhanced our understanding of the environment of this period. Nevertheless, there is a great deal left to learn. The National Park Service should continue to encourage and financially support multidisciplinary approaches that provide for better modeling of the environment of this period as well, as changes that have taken place over the longer span of time.

The methods used to record sites must be comprehensive and uniform among sites to allow for their systematic comparison. A recording that indicates only the presence or absence of a site is no longer very useful. Several things are recommended:

1. Completely map all new sites.
2. Because of our non-collection policy, record, draw, and photograph in detail in the field all artifacts and features (not just a sample).
3. Confirm the presence or absence of subsurface cultural materials and their depth below surface.
4. Determine the surface and subsurface horizontal extent of the site.

A good example of a site-recording form and a list of the minimum data that should be recorded for each site can be found in Appendix E of this volume. A consequence of this approach will be that fewer new sites will be located, but all new sites located will be better recorded.

It is important to keep in mind that as more ASTt sites are investigated, the criteria for defining the context and for evaluating the sites will have to be further developed and refined. At the same time, more refined locational models can be developed based on the new site and environmental information.

ASTt sites in the monument are especially sensitive, and those that can be should be monitored regularly for the effects of natural and human agents. They should be evaluated with respect to the need for site stabilization or data recovery, due to known human impacts such as development and natural impacts such as coastal erosion.

The future planning process should involve a wider base of interested parties, including interested scholars and members of the Native community. Public education and outreach should also continue to be National Park Service goals.

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effort to protect sensitive cultural resources.

Figure 65. Site map of NOA-272, a multi-component lithic scatter.

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Figure 66. Site map of NOA-146, a nondiagnostic lithic scatter.

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 67. Site map of NOA-180, a stone cairn.

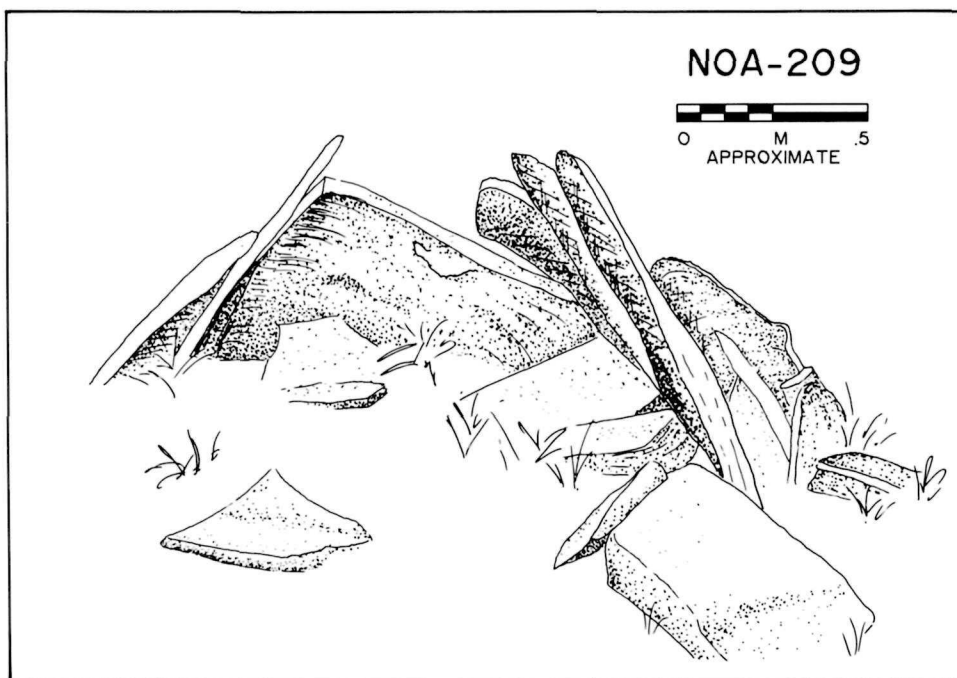


Figure 68. A hunting blind at NOA-209.

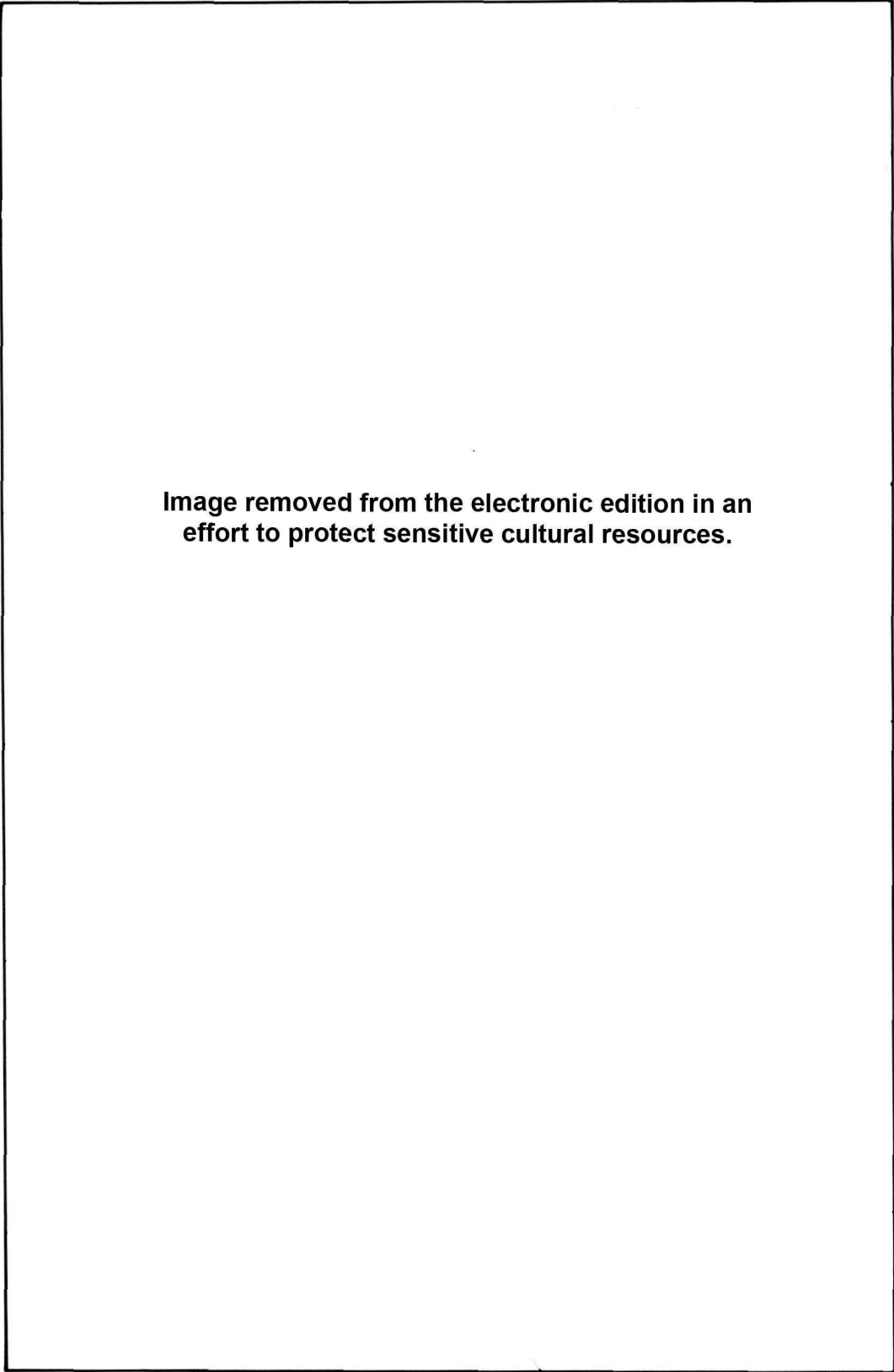


Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 69. Site map of NOA-209, a hunting blind.

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 70. Site map of tent ring at NOA-178.

HISTORIC CONTEXT IV: Late Prehistoric Arctic Sea Mammal Hunting Adaptations in the Cape Krusenstern Region, Northwest Alaska between A.D. 450 and the early nineteenth century.

Theme: Late Prehistoric Arctic Sea Mammal Hunting Adaptations.

Time: A.D. 450 - Early Nineteenth Century

Place/Area: Cape Krusenstern Region, Northwest Alaska

This context addresses the adaptations of the late prehistoric people in the Northwest Alaska region who were the obvious direct ancestors of the modern Eskimo people. They regularly hunted both sea mammals on the Arctic seacoast and terrestrial mammals at near-shore and inland tundra sites. In Northwest Alaska they are differentiated from the people who came before them, the ASTt people, by broadening their sea mammal hunting to include whales taken in open seas, and by the development of an ever-increasing variety of specialized tools.

These people left behind remains that archeologists called the Northern Maritime cultural tradition. By middle Northern Maritime times this culture was present from Northwest Alaska, across northern Canada to Greenland. In addition, early Northern Maritime people left cultural remains that exhibited some similarities with Punuk culture of St. Lawrence Island and Northeast Asia. Some archeologists believe that the dramatic appearance of the Northern Maritime tradition in Northwest Alaska represents new groups of people arriving in arctic North America from Northeast Asia. Others think that the people who were here prior to Northern Maritime times acquired a new sea-mammal hunting technology that spread quickly and led to rapid changes in subsistence-related technologies.

The general outlines of climatic conditions in Northwest Alaska during this period are somewhat better understood than those of the previous cultural traditions. During the late stages of the ASTt, temperatures cooled. During the early Northern Maritime period prior to AD 1000, however, temperatures warmed considerably and remained warm until around AD 1200 when the climate once again deteriorated. By the fourteenth century, the climate was dramatically cooler; and the cooling trend continued, culminating in the sixteenth century during a period called the Little Ice Age. During this period different areas of the North American arctic were affected differently, and we see an interesting variety of human responses to the climatic changes of the period (Dumond 1987b:140-147).

Beginning in the Norton period of the ASTt, the people of Northwest Alaska participated in a large and dynamic interaction sphere that took included the North Pacific Rim and the people of the Bering and Chukchi seas. This interaction sphere has continued through modern times. The interaction resulted in several simultaneous cultures with a number of parallel cultural traits, but

which at the same time were distinctive in their specialized adaptations to their particular environmental settings.

For the Northern Maritime tradition in Northwest Alaska, Anderson (Giddings and Anderson 1986) outlined four cultural periods:

Table 20. Cultural Periods of the Northern Maritime Tradition in Northwest Alaska.	
Cultural Period	Dates based on MASCA-corrected dates of sites in Northwest Alaska.
Birnirk	A.D. 450 - A.D. 950 50
Early Western Thule	A.D. 950 50 - A.D. 1300
Late Western Thule	A.D. 1300 - A.D. 1400
Kotzebue	A.D. 1400 - Early Nineteenth Century

Anderson divided the tradition into the above units based on his perception of the changes through time in the archeological record of Northwest Alaska. A simultaneous culture that also belongs to the Northern Maritime tradition is the Punuk culture of St. Lawrence Island, roughly dating to the same time as Birnirk culture, Northern Maritime tradition (Fitzhugh 1984:25). Punuk culture developed locally, and was characterized by an art style with likenesses similar to those of Okvik and Old Bering Sea cultures, the preceding cultures of St. Lawrence and adjacent Islands, and the Northeast Asian coast. Punuk culture also exhibited similarities with Birnirk culture of Northwest Alaska. Punuk was essentially a continuation of previous lifeways that, with a few changes, became those of the late prehistoric Eskimo people of St. Lawrence Island (Dumond 1984:87).

Archeologist James Ford (1959) concluded that Birnirk culture derived most of its art and artifact styles from Old Bering Sea-Okvik culture of St. Lawrence Island and the Northeast Asian coast (Dumond 1984:87). Old Bering Sea-Okvik art was produced from around A.D. 100 to A.D. 500 (Dumond 1984:85). Old Bering Sea-Okvik hunters pursued seal, walrus and whale along the sea ice edge, using toggling harpoon heads, and hunted land mammals, including caribou and bear (Ackerman 1984:108).

At the same time, Birnirk material culture exhibits similarities with Ipiutak culture in its bifacially-flaked chert tools. Whether or not Birnirk culture represents an influx of new people from Northeast Asia or the introduction of a new sea-mammal hunting technology is not yet clearly understood.

Birnirk people hunted land and sea mammals (that in some localities included whales) and lived at least part of the year in small settlements on the coasts. The houses generally were built on substantial middens accumulated through long years of habitation at the site. The coastal houses were semisubterranean with sleeping platforms, entry tunnels, and an open hearth. Cooking was done in the central room or in a separate room. Lamps were present and may have been used for cooking, as well as for light.

Anderson (1984:91) noted that no interior Birnirk sites are known, but that a number of interior sites assigned to the Ipiutak culture date to Birnirk times. It is not clear whether our lack of evidence for any Birnirk use of the interior is due to survey bias, to actual competition from the people of a separate cultural tradition, or to some other factor.

The archeological record revealed that on the Kobuk River around A.D. 500 three co-traditions existed more or less simultaneously. They were an interior form of Ipiutak culture of the ASTt, Birnirk culture of the early Northern Maritime tradition, and a phase of the Northern Archaic tradition (D.D. Anderson 1984:90).

The Western Thule period, middle Northern Maritime tradition, saw an increase in the use of specialized tools, a broadening of the economic base, the increase in size of some coastal Northwest Alaska settlements, and a spread of the Thule culture from Northwest Alaska across Northern Canada to Greenland.

The early Western Thule period corresponds with a relatively warm climatic trend, when enough offshore ice might have melted to render less effective the traditional ice-lead sea-mammal hunting techniques. This may have been the incentive for hunters at this time to seek new locations and to adopt new techniques useful for pursuing sea mammals on the open sea (Dumond 1984:140). At the same time that Western Thule people were expanding along the Arctic coastlines, they were also utilizing the interior arctic woodlands, where caribou hunting and fishing were important pursuits. The remains of Thule coastal habitations suggest that the people were sedentary during at least part of the year. They used temporary seaside campsites, as well as semipermanent structures. They also probably made use of temporary inland campsites during other parts of the year while pursuing caribou, an important element in their diet.

By the late Western Thule period, all of the elements associated with ethnographically reported Eskimo culture were in place. They included kayaks, umiaks, dog traction, semisubterranean houses with deeply excavated entryways, and an ever-widening variety of specialized tools. Sea and land mammal hunting, birding and fishing were among the subsistence pursuits (Dumond 1984:89). There were regional variations, but it is clear to archeologists that a cultural continuum existed. Particular locales on the coast provided evidence of continuous occupation throughout late Western Thule times. The fact that styles of art and tool-manufacturing techniques evolved together throughout the Northwest Alaska

region indicates continuing interaction among the various Western Thule groups present in Northwest Alaska at that time.

There was a general climatic deterioration after approximately A.D. 1200 during terminal Western Thule times. By the Kotzebue period, late Northern Maritime tradition, around A.D. 1400, the climate was decidedly cooler. By the start of the Kotzebue period, and perhaps earlier, there was a general decline in whale hunting. Kotzebue-period settlements were smaller than those of the Western Thule period. Changes took place in seal hunting techniques as offshore ice once more increased. By the sixteenth century, there were extreme climatic changes to much colder temperatures and by the seventeenth century there was a dramatic increase in the number of sites located in Interior Alaska (Dumond 1987b:145; D.D. Anderson 1984:92). Favored interior locations included lake shores. Except for the changes in material culture that corresponded to these shifts in subsistence and settlement patterns, Kotzebue people in Northwest Alaska continued to live much as their Western Thule ancestors had.

The historic period began with the landing of Captain James Cook in northern Alaska in 1778, during the Kotzebue period. The Northwest Alaskan technology was remarkably conservative, however, and much traditional technology, including chipped stone tools, continued to be used into the twentieth century.

A number of property types have been recognized in the North American Arctic for the Northern Maritime period. The known functional site types are listed in Table 21, and their presence in the archeological record of Northwest Alaska is noted. Table 22 indicates which of the expected site types have been located for all the periods of the Northern Maritime tradition in the Cape Krusenstern region.

Description of Site Types

Group of cold-season houses with a large, central or community house; group of cold-season houses that lack a community house; single cold-season house. Well-constructed semisubterranean houses built for habitation during the coldest periods of the year have been located in Alaska during all periods of the Northern Maritime tradition.

Archeologists located Birnirk-period habitations at several locations, including Safety Sound, Cape Prince of Wales, and Cape Krusenstern. Generally, Birnirk settlements consisted of one, two, or three small single-family houses (Giddings and Anderson 1986:107).

Western Thule sites include those located at Cape Prince of Wales, Walakpa, Point Hope, Point Barrow, Onion Portage, and Ahteut. At Point Hope and Point Barrow there was a steady increase in the size of the settlements and the number of houses in each settlement. In other areas of coastal Alaska, two to four houses ranging in size from small to large were located in each settlement. In some

Table 21. Known Functional Site Types for the Northern Maritime Tradition in Northwest Alaska.				
Functional Site Type	Village	House	Camp	Special Purpose
Group of cold-season houses with a large, central house	X			
Group of cold-season houses	X			
Single cold-season house	X	X		
Temporary campsite				
Hearth	X	X	X	
Burial	X			X
Quarry				
Storage pits	X	X		
Food processing	X	X		
Toolmaking	X	X		
Hunting-related	X	X		
Isolated artifact				

settlements one house in the group had several rooms, which some archeologists interpreted as having a workshop or community activity area (D.D. Anderson 1984:91-92; Giddings and Anderson 1986:110).

During the early Kotzebue period, there were one or two single-family houses grouped together at Cape Krusenstern, and archeologists found larger settlements at Kotzebue. Late Kotzebue period settlements consisted of two to five houses. During the seventeenth century, interior sites increased. Large numbers of semisubterranean houses were located around lakes in the Brooks Range. In the Kobuk River valley, deep semisubterranean houses with long entryways evolved into shallowly excavated houses of basically the same style with short tunnels. The size of Kobuk River settlements decreased eventually; and by the beginning of the twentieth century, habitations situated on the upper Kobuk were found to occur singly or in pairs.

Temporary campsite. A camp is a temporary occupation that archeologists recognize by a tent ring, a hearth, fire-cracked rock, a lithic scatter, faunal remains, and tools that might indicate a special use or uses, or special seasons of use. The site might be the remains of one or two brief occupations by one group, or it might be the result of a repetitive series of brief visits over a very long period of time, perhaps by people of more than one cultural tradition.

Table 22. Summary Table of Known Functional Site Types
for the Northern Maritime Tradition in Cape Krusenstern National Monument.

Functional Site Type	Village	House	Camp	Special Purpose
Group of cold-season houses with a large, central house	X			
Group of cold-season houses	X	X		
Single cold-season house	X	X		
Temporary campsite				
Hearth	X	X	X	
Burial	X			X
Quarry				
Storage pits	X	X		
Food processing	X	X		
Toolmaking	X	X	x	
Hunting-related	X	X	X	
Isolated artifact				X

Generally speaking, campsites are distinguished from more permanent habitations by several characteristics. Those characteristics are the amount of effort and the kinds of building materials that have been used in the construction, whether or not the structure is semisubterranean, and the amount and kind of artifactual remains located in and around the structure.

Temporary campsites in Northwest Alaska, assignable to the Northern Maritime period, appear to be lacking from the archeological record. This could be explained in two ways. One way is to argue for a sudden change in subsistence-settlement patterns to a fully sedentary way of life in permanent coastal or inland villages. Another, better, explanation appears to be a bias on the part of researchers toward the plentiful and well-preserved remains of Northern Maritime burials, the more substantial and permanent Northern Maritime semisubterranean houses, and the cultural features and artifacts that accompany them.

Evidence to support this explanation is the fact that ASTt, temporary campsites of the previous cultural tradition exist in the archeological record. Some of the campsites persist into Northern Maritime tradition times. While there was an apparent change in emphasis toward marine mammals taken in open waters during Northern Maritime times, there nevertheless appear to be many parallels

between Northern Maritime and ASTt lifeways, including the seasonal pursuit of land mammals and fish.

Additionally, there are ethnographic reports of Kotzebue period, Northern Maritime tradition temporary campsites from a period when Native Northwest Alaskan life was still relatively unchanged by EuroAmerican contact. One such report was made by Captain Frederick William Beechey (1831), aboard HMS *Blossom*. Beechey reported a large tent village of Native people gathered on Kotzebue Sound from August to September 1826. Two types of tents were reported ethnographically for Kotzebue Sound. They were the *iccellik*, a round or oval dome-shaped tent of bent willow poles and hides, and the cone-shaped tent.

Hall (1976) summarized the findings of his 1967 survey and subsequent excavations in North Alaska, noting several late prehistoric-early historic sites that contain the remains of what appear to be temporary campsites marked by the remains of prior tent locations. At Tukuto Lake in addition to a large number of substantially built habitations, Hall located former tent sites, some with shallowly excavated floors and some with surface level floors. A tent ring was found in association with a late village site on the largest lake in the Swayback Lakes group. An historic site assigned to the Nunamiut, located on Itkillik Lake in the Philip Smith Mountains has a number of stone tent rings.

Beyond this information, it is difficult to characterize Northern Maritime campsites or to place them more accurately in time.

Special purpose sites. Activity-specific types of sites are expected in the archeological record of the Northern Maritime people but are not well known. Activity-specific sites include formal treatment of the dead, quarrying, food processing, food preparation, food storage, manufacture of clothing, construction of equipment, toolmaking, gathering vegetable foods, hunting for land mammals, hunting for sea mammals, fishing, and birding. Some of these activities were carried out in the living community, some in temporary camps, and some took place at isolated sites or at special-purpose sites.

Table 22 indicates that all of the functional site types that have been recognized for the Northern Maritime tradition in Northwest Alaska have also been located in Cape Krusenstern. Based on present archeological and ethnographic evidence, however, it appears that the boundaries of the monument probably enclose less territory than the total area used by the Northern Maritime people in their annual subsistence rounds.

Birnirk culture in the monument existed only on the beach ridges at Cape Krusenstern, where single-family semisubterranean houses are located. Some of the houses have attached kitchens. Archeological evidence found in the site suggests that the people apparently spent about half of their time hunting seals from their seaside location and the other half hunting land mammals, especially

caribou. No temporary campsites were located for the Birnirk period in the monument; but it is possible that Birnirk people hunted caribou, Dall sheep, and musk ox from temporary campsites located in inland and upland locations.

The use of coastal settings in the monument by Western Thule people is well-documented. Houses are located both singly and in clusters of two or more single-roomed houses with kitchens. One house in each cluster is larger and has several rooms in addition to a kitchen. In the ethnographic literature, large public houses known as *kazigi* were reported. Giddings and Anderson (1986:91) indicated that the public houses known from North Alaska had no kitchens. However, he suggests that the large house may have belonged to the community's important person around whom the rest grouped. Caches are associated with the groups of houses. Several burials also are located adjacent to the habitation sites, but they may or may not belong to the same era. Burials-during this period also are found by themselves in locations away from the villages. One such burial was located in the monument. It was found to have a decorated whaling harpoon head exposed on the ground surface. Similar burials located in North Alaska are those of whale hunters.

Table 23. Known Functional Site Types for the Birnirk Culture, Northern Maritime Tradition in Northwest Alaska.

Functional Site Type	Village	House	Camp	Special Purpose
Group of cold-season houses with a large, central house	X			
Group of cold-season houses	X			
Single cold-season house	X	X		
Temporary campsite				
Hearth	X	X		
Burial	X			
Quarry				
Storage pits	X	X		
Food processing	X	X		
Toolmaking	X	X		
Hunting-related	X	X		
Isolated artifact				

Table 24. Known Functional Site Types for the Western Thule Culture, Northern Maritime Tradition in Cape Krusenstern National Monument.				
Functional Site Type	Village	House	Camp	Special Purpose
Group of cold-season houses with a large, central house	X			
Group of cold-season houses	X			
Single cold-season house	X	X		
Temporary campsite		X		
Hearth				
Burial	X			X
Quarry				
Storage pits	X	X		
Food processing	X	X		
Toolmaking	X	X		
Hunting-related	X	X		
Isolated artifact				

Evidence of tools and faunal remains located in archeological sites suggests that the Western Thule people in the monument were using sea mammals, perhaps including whales, land mammals, birds, and fish. Indications of where and how the people hunted land mammals during Western Thule times are lacking.

During Kotzebue period times, Kotzebue people were living at a number of coastal locations around Kotzebue Sound. The Cape Krusenstern beach ridges have the remains of approximately 30 Kotzebue period houses. They were all small, single family dwellings arranged in clusters or singly. Sea mammals, probably mostly seal, caribou, and fish, were the basis of early Kotzebue period subsistence. Between the fifteenth and nineteenth centuries, settlements were reduced in size to only one or two small winter houses. During the last period of occupation at Cape Krusenstern, people stopped building the mid-wall post type of house and instead used the corner post-rear platform type of construction. At this time, fishing technology became more elaborate. Habitation sites from all periods had several caches adjacent to them, and one village site had the remains of what appears to be a historic wall tent. Only one inland habitation site was found for the Kotzebue period. A semisubterranean house is situated on upper Rabbit Creek next to a tent ring, caches, and unidentified stone features.

In addition to the sites in the monument that have been assigned to the Northern Maritime tradition, another 50 cultural components, or 33.7% of the total prehistoric cultural components recognized to today in the monument, are lithic scatters or isolated lithic artifacts that are unassignable to any cultural tradition. Another 42 components, or 30% of the total prehistoric cultural components located in the monument, are undated rock features, including six hunting stands, 12 stone tent rings, and 24 undated stone cairns. Nearly all of these sites are located in the foothills of the monument. It is probable that at least some are Northern Maritime tradition sites.

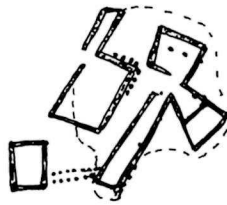


Figure 71. Western Thule House at NOA-002, Cape Krusenstern.
(Source: Giddings and Anderson 1986:60).

Table 25. Known Functional Site Types for the Kotzebue Period, Northern Maritime Tradition in Cape Northwest Alaska.				
Functional Site Type	Village	House	Camp	Special Purpose
Group of cold-season houses with a large, central house				
Group of cold-season houses	X	X		
Single cold-season house		X		
Temporary campsite	X	X	X	
Hearth	X	X	X	
Burial	X			X
Quarry				
Storage pits	X	X		
Food processing	X	X		
Toolmaking	X	X	X	
Hunting-related	X	X	X	
Isolated artifact				X

Table 26. Sites Within Cape Krusenstern National Monument that Have Been Assigned to the Northern Maritime Tradition.

Site	Site Type
KTZ-005	Western Thule winter settlement; burials.
NOA-002	Multi-component site. Birnirk, Western Thule, and Kotzebue winter settlements.
NOA-008	Western Thule winter settlement.
NOA-078	Western Thule burials.
NOA-140	Kotzebue period settlement; graves.
NOA-161	Western Thule winter settlement.
NOA-162	Kotzebue period habitation.
NOA-163	Kotzebue period habitation.
NOA-167	Western Thule winter settlement.
NOA-170	Northern Maritime habitation.
NOA-188	Kotzebue period habitation.
NOA-256	Multi-component lithic scatter. Possible Kotzebue period campsite.
NOA-274	Western Thule winter settlement.
NOA-284	Kotzebue period winter settlement.

Site Conditions and Threats

The majority of the sites belonging to this cultural tradition are habitation sites and graves that are located on the coastal beaches of the monument. They are at greatest risk of disturbance from a number of natural and cultural sources, including:

1. Construction and other activities on sites conveyed to private parties.
2. Traffic to and from private dwellings and camps, particularly by all-terrain vehicles (ATVs).
3. Purposeful looting of sites.
4. Coastal erosion.

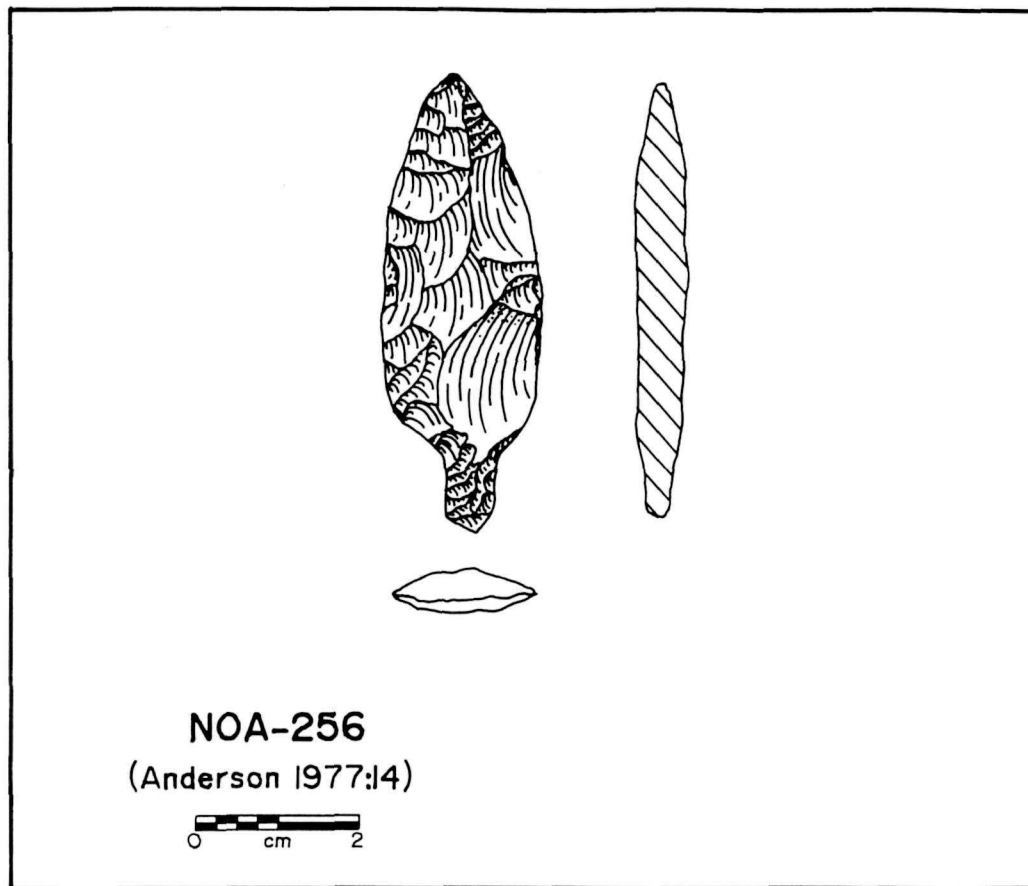


Figure 72. Kotzebue period projectile point from NOA-256.

NOA-161 includes a possible house pit feature that has undergone severe disturbance by ground squirrel activity. NOA-167 is a collapsed burial platform, now a mound on the ground surface. NOA-170, a village site, is now part of a storm-cut beach ridge that is undergoing continued erosion from storm wave action. NOA-284, a village, is also located on the beach nearest the Chukchi Sea and is seriously affected by both the erosional and depositional processes of storm tides.

The present condition of the majority of sites is well known because of the recent archeological surveys in the monument. The present condition of many of the cultural features at NOA-002 is unknown, however, because permission to visit privately-held parcels was denied NPS archeologists during their 1987-1988 field survey.

The remainder of the sites that belong to this cultural tradition are located in the foothills of the monument. One site is exposed on the surface by a lack of vegetation cover, erosion, deflation, or frost action. The site was minimally tested and still contains artifactual materials. Its exposed situation makes it a fragile resource. The fact that the site is fairly remotely located affords it some protection from human disturbance. However, increased visitor use of the

monument and the use of all-terrain vehicles for caribou hunting are two potential sources of human impact this type of site might undergo.

The significance of the Northern Maritime archeological remains located in Cape Krusenstern National Monument lies in the fact that they are associated with the immediate ancestors the modern Inupiat people, and thus the cultural connection or feeling of affinity is much stronger than it might be with older sites. During Northern Maritime times, we see a dramatic shift to open-ocean hunting and the systematic pursuit of whales, and then a decline in whaling and a population shift at the end of the Northern Maritime period. Northern Maritime people took part in a very dynamic interaction sphere that included the entire North American Arctic and the North Pacific Rim, particularly St. Lawrence Island and the coast of Siberia.

The archeological sites of this period at Cape Krusenstern have the potential to yield information necessary to our understanding of the evolution of the new sea-mammal hunting techniques of hunting large mammals in ocean waters, even though whaling does not appear to have taken on the importance at Cape Krusenstern that it did in the North Alaskan sites of this period. Certainly these same sites can yield information on regional adaptations of this widespread cultural tradition, its responses to changing environment, and its evolution through time to ethnographically reported Inupiat lifeways. Cape Krusenstern sites of this period have yielded, and have the potential to yield, information about how the Northern Maritime tradition in Northwest Alaska is related to cultural events taking place at about the same time on St. Lawrence Island and on the Siberian coast.

The known Northern Maritime tradition sites and other sites within the monument that have the potential to one day be assigned to the Northern Maritime tradition are significant under National Register criterion D, in that they have yielded, and are likely to yield, future information of significance to our understanding of the subsistence and settlement patterns of the Northern Maritime people.

Surface indicators of cultural features at NOA-002 and archeological sites elsewhere in the monument are more plentiful for the Northern Maritime tradition than for any other tradition. Only a few have been excavated in the monument, however. We still do not have a complete understanding of the full seasonal round and settlement patterns for each cultural period within this tradition. No temporary campsites dating to either the Birnirk or the Western Thule periods are known in the monument, and only two sites that may represent temporary campsites have been located for Kotzebue period times. Few special-purpose sites other than burials are known in the monument for the Northern Maritime tradition. We do not have a complete picture of how Northern Maritime cultures changed through time.

Goals

It is clear that our understanding of Northern Maritime tradition lifeways in the monument is far from complete. Less than 1 % of the monument has been investigated by a reconnaissance-level archeological survey. More such surveying is needed. Such a survey should be planned, incorporating the latest knowledge of known site characteristics, including site environmental correlates and our expectations for the discovery of particular site types (Appendix D). Survey strategies different from those previously used to investigate the monument are recommended. One example is a problem-oriented survey to obtain a wider range of site types. A stratified random sample of a particular area of the monument might be used for the discovery of site types expected but not yet located (Table 21).

Some research questions that are apparent from this study are:

1. What are the origins and cultural affinities of Birnirk culture?
2. What are the relationships among Ipiutak Arctic Small Tool tradition, Birnirk culture, Northern Maritime tradition, and the Northern Archaic tradition?
3. To what extent was whaling pursued in the vicinity of the monument during Northern Maritime times?
4. Does the lack of information about temporary campsites belonging to the Northern Maritime tradition represent research bias, or can it be otherwise explained?

Archeologists should plan excavations of a sample of site types from each descriptive site type. In this way they can get a better idea of what each site type looks like. With the additional data that such a sample provides, sites that are considered to be nondiagnostic may be assigned to a particular cultural tradition.

Excellent archeological collections in museum repositories exist for the monument and elsewhere in Northwest Alaska. Those keeping monument collections are listed in Appendix C of this volume. The National Park Service, Alaska Regional Office, Division of Cultural Resources is presently curating a small collection of historic artifacts from a site on the Tukrok River. Principal investigators and project directors of future archeological studies in the monument should consult these collections to learn what the monument sites may contain.

While our understanding of environmental conditions as they relate to cultural adaptations and cultural change through time is better for the Northern Maritime tradition than it is for prior cultural traditions, environmental studies are nonetheless valuable to every archeological field project. National Park Service

and contracting archeologists in the monument should make every attempt to integrate environmental studies into archeological research projects.

The methods used to record sites must be comprehensive and uniform among sites to allow for their systematic comparison. A recording that indicates only the presence or absence of a site is no longer very useful. Several things are recommended:

1. Completely map all new sites.
2. Because of our non-collection policy, record, draw, and photograph in detail in the field all artifacts and features (not just a sample).
3. Confirm the presence or absence of subsurface cultural materials and their depth below surface.
4. Determine the surface and subsurface horizontal extent of the site.

A consequence of this approach will be that fewer new sites will be located, but all new sites located will be better recorded.

As more Northern Maritime tradition sites are investigated, the criteria for defining the context and for evaluating the sites will have to be further developed and refined. At the same time, more refined locational models can be developed based on the new site and environmental information.

Some of the Northern Maritime tradition sites in the monument are especially sensitive, and those noted above should be monitored regularly for the effects of natural and human agents. Because of known human impacts such as development, and natural impacts, such as coastal erosion, those sites should be evaluated with respect to the need for site stabilization or data recovery.

The future planning process should involve a wider base of interested parties, including interested scholars and members of the Native community. Public education and outreach should also continue to be National Park Service goals.

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 73. NOA-170, a Northern Maritime tradition site.

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 74. NOA-274, a Western Thule settlement.

Image removed from the electronic edition in an
effort to protect sensitive cultural resources.

Figure 75. NOA-161, a Western Thule settlement.

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 76. NOA-188, a Kotzebue period habitation situated in a unique inland setting.

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 77. NOA-163, a Kotzebue period habitation.

Image removed from the electronic edition in an
effort to protect sensitive cultural resources.

Figure 78. NOA-140, a Kotzebue period settlement.

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

Figure 79. Kotzebue period winter settlement at NOA-284.

PART SIX: MANAGEMENT RECOMMENDATIONS

Treatment of Monument Resources

Cape Krusenstern National Monument was set aside **primarily** to interpret and preserve its internationally significant archeological resources. Even though the monument's managers have many other pressing concerns, each manager has a congressional mandate to treat the monument's cultural resources at least equally with its natural resources and to afford them a high priority.

Historic Preservation Planning

As stated previously, the process of preservation planning is the foundation for archeological site conservation in our national monuments, parks, and preserves. Historic contexts are the basic tools of planners, providing a meaningful way to organize information about the archeological record. Fully developed historic contexts provide a broad extent of information about the property types that are covered by a specific theme at a particular time and location. They provide information about the locational patterns and the current condition of these property types in a well-structured format. Contexts establish the criteria used to determine the significance of these property types. From the historic context, goals and priorities must be set for the resources, and management strategies must be devised for achieving those goals. Management begins by writing action statements for the goals that have been identified.

Part Five of this report presents historic contexts for four prehistoric time periods. This section, Part Six, presents the priorities and action statements for the archeological properties addressed in the contexts.

Placing the Archeological Record in Context

If archeologists are to study archeological remains in the contexts of their individual cultures, they must be able to assign sites to time periods. Dating is also essential to the determination of site significance. In the case of the monument, some 64% of the known prehistoric archeological sites are undated neither by radiometric means nor through the presence of diagnostic cultural artifacts or features. Several remedial measures can be taken.

First, it is recommended that site location data be used with data from additional surveys that provide information about where sites are not found, as well as where they are found to formulate a predictive site location model. Data from documented sites in the monument, along with selected environmental variables

have been included in this overview and assessment as a first step toward such a study (Appendix D).

Predictive models are hypotheses or interpretive schemes that are used by archeologists in attempts to predict site location. Cultural resources managers are using predictive models as tools to help make informed resource management decisions, and can be useful in a number of ways such as guides in selecting alternative project area locations. Other uses are as aids in

- estimating comparative resource management costs when making planning decisions,
- providing bases for sample stratification, and
- providing bases for non-proportional sampling within sampling strata in instances where models have been field tested for their accuracy.

Valid concerns about the execution and use of predictive models have been voiced by the members of the archeological community, however. In 1986, the Society for American Archaeology's Regional Conferences in Archaeology targeted as an important problem or issue the use of predictive models in cultural resources management (Irwin-Williams and Fowler, eds. 1986). Their concerns were for the

1. use of predictive models by other than qualified professional archeologists.
2. use of predictive models as a replacement for on-ground inspection of sites.
3. use of predictive models to write off or routinely exclude from reconnaissance level survey the areas that the models suggest are low potential.
4. poor design of predictive models: validity and accuracy of the theoretical and empirical bases; testability of the predictive model; heavy dependence upon ethnographic patterns as a source of bias against early sites.
5. high cost of developing a statistically-based predictive model.
6. failure to test a model or to update and revise it as new data are acquired.

With these concerns in mind, a second step toward dating these sites should include archeological testing and in some cases excavation at selected sites that have the potential to provide organic materials from secure contexts for radiometric dating, associated diagnostic artifacts, or features for relative dating.

The predictive model should be tested against the results of these chronological studies and should be revised accordingly.

Representativeness of the Sample of Known Archeological Sites within Cape Krusenstern National Monument. As discussed in the preceding section, the total of all archeological surveys in the monument accounts for less than 1% of the total land area in the monument. The tables in Appendix D provide a characterization of the degree to which different subareas of the monument have been surveyed. Based on this amount and kind of survey, it is very possible that the full range of archeological sites in the monument is not known. To a certain extent, known site locations could reflect the sample biases rather than cultural patterns. The stratification of the monument by various natural components has been accomplished and makes explicit the types of biases that presently exist in the sample. This type of stratification can be used to plan future surveys that will then provide a more representative sample. Geographic Information Systems (GIS) will prove to be very useful to archeologists and to monument managers when it becomes available for practical applications. Examples of some uses for GIS are found in the tables in Appendix D and in Figures 32 through 43. It is strongly recommended that GIS specialists, time, and money be committed for archeological applications of GIS.

Regional Approaches to Research Planning and Execution. The National Park Service and other agencies and institutions should continue to develop and use historic contexts as a means to evaluate and interpret the prehistoric and historic cultural resources in the monument and the NHL within a regional context. Future archeological research in the monument would benefit from focusing on certain specific questions. The historic contexts that were presented earlier in this document can serve to focus future research efforts.

Evidence exists that Northwest Alaskan people of different cultural traditions probably wandered beyond the confines of a single drainage system in their seasonal round of procurement activities. They may have ranged beyond the confines of the western watershed of the Mulgrave and Igichuk hills as well. The ethnographic record, in fact, indicates such movements. The implications of this situation are that archeologists must look beyond monument boundaries to the broader Northwest Alaska region in order to study the full spectrum of peoples' seasonal movements for subsistence purposes. The "region" naturally will be defined differently in the case of different research questions, depending on the requirements of the research.

Impacts to Cultural Resources in the Monument

Natural Impacts. Members of the professional community of anthropologists in Alaska have expressed the fear that many of the federally protected archeological resources that are undergoing attrition due to natural causes will be lost before they can be adequately studied and recorded (Hopkins, Arundale and Slaughter

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Figure 80. NOA-217, a Northern Maritime tradition settlement threatened by coastal erosion.

1990). During the 1987-1988 archeological survey in the monument, a large number of newly located sites were documented. Of these, several were observed to be deteriorating from the effects of cryoturbation (caused by the freeze-thaw cycle) and subsequent erosion. Others showed the effects of storm-driven coastal erosion.

In September 1990 a major storm caused further damage to coastal sites in the monument. Archeologist Ken Schoenberg submitted a cultural resources project statement in the winter of 1990 recommending mitigation of the threat. It was recommended that data recovery be accomplished by means of a multi-year archeological testing and excavation program involving the most significant sites that are most seriously threatened. For other such sites in less immediate danger, a program of site monitoring and site stabilization is recommended.

Scientists in the social and natural sciences are well into studying the effects of the recently recognized global warming trend. One of the consequences of continued global warming will be substantial melting of the northern glaciers and polar ice packs, resulting in rising sea levels. For the monument, that will probably mean the partial or total erosion and/or inundation of the coastal beach ridges and some of the most archeologically significant sites in the world. Scientists and managers should immediately begin to take this possibility into account in any future planning.

Animal activity is another source of impact to archeological sites. In Alaska, many animals have been observed disturbing sites. Ground squirrels tend to choose them in which to burrow. Bears and wolves digging for the ground squirrels cause additional damage. Caribou and other animals have been reported digging in sites in order to retrieve bone and antler to consume, ostensibly for the mineral properties. Musk ox are known to push over rock features such as cairns. Problems such as these must be recorded and evaluated at the discovery of each new site and then monitored or mitigated on a site-to-site basis, no small task in an area as vast as the monument.

Human Impacts. The second class of impacts are those that humans cause. One type is inadvertent disturbance caused during construction and/or commercial activities such as mining, shipping, conveying by land, and so forth. In the monument such disturbance might be expected as a result of operation of the Red Dog Mine, for example. In the case of such disturbance in the monument and the National Historic Landmark, full Section 106, Section 110 compliance requirements must be met prior to the commencement of any ground-disturbing activities.

Another type of impact is the purposeful looting of archeological sites to obtain prehistoric cultural artifacts for private collections or for sale to collectors. The unauthorized collection of prehistoric artifactual materials on federal lands is unlawful under the Archeological Protection Act (ARPA). A looting incident to

procure artifacts was reported to have occurred at Cape Krusenstern on the Ipiutak beach ridge in July 1986. The person was known to National Park Service managers as someone who had advertized in Kotzebue to buy artifacts, but the managers were unable to apprehend him during the looting incident (Robert Gal, personal communication 1990; Warren Rigby, personal communication 1990). Looting incidents have also been reported recently at the Ahteut site, located on the Kobuk River; at a habitation site near Selawik; and at a late prehistoric coastal site near Deering (Robert Gal, personal communication 1990).

Several approaches are required to address this problem. Cultural resources located within the monument must be regularly monitored and offenders apprehended and prosecuted. The general public must be educated to viewing cultural resources as a public trust to be valued and protected by them, as a means of viewing and interpreting their prehistoric and historic past. The public must be involved as a partner in making decisions and taking actions to preserve this cultural trust. Members of the academic and local Native community have expressed interest in and concern about increased opportunities for their involvement in the process of planning and conducting research on federally protected lands (Hopkins, Arundale, and Slaughter, eds. 1990).

Many important archeological resources also rest on privately-owned lands and newly conveyed Native allotments. With regard to lands within the monument that contain significant cultural resources, the National Park Service should make efforts to obtain ownership of such private land, interests in the private land, or cooperative agreements for management of the private land. At the same time, the rights of the landholders to use and pass their land on to their heirs needs to be protected (General Management Plan USDI-National Park Service 1986:72). Future study to identify such significant areas within the monument is recommended.

Two other important sources of disturbance must be discussed here. National Park Service managers and local residents have expressed concern over the ground-disturbing effects of all-terrain vehicles that are being driven in the monument, particularly in conjunction with subsistence activities. Monitoring of the effects of ATV use and some sort of cooperative agreement with regard to use of the vehicles in the monument are suggested. Use of designated trails for ATV use also may be required.

The number of campers and hikers in the monument is increasing, and with it the probability that ancient campsites will be reused by modern visitors. Some type of plan for recreational use of the monument that will avoid impact to known archeological sites is recommended. Visitor orientation sensitizing them to ways in which they can help protect the monument's cultural resources may be helpful.

National Historic Landmark Concerns

Cape Krusenstern National Historic Landmark is a cultural resource of national significance that possesses exceptional value in interpreting the prehistory and history of the American Arctic, and possesses a high degree of archeological integrity. The prehistoric, protohistoric, and historic archeological sites in Cape Krusenstern National Historic Landmark have the potential to yield information of major scientific importance by revealing the details about the as-yet little understood lifeways of the peoples of four cultural traditions. The importance of a property's designation as a National Historic Landmark is that all ground-disturbing activities within the NHL must be evaluated for their effects on the integrity of the cultural properties comprising the NHL. Each site must be evaluated to determine whether it contributes or does not contribute to the significance of the National Historic Landmark.

Cape Krusenstern National Historic Landmark's themes are very broad in scope. They speak to the entirety of Eskimo adaptation, throughout prehistory and history. Because of these broadly drawn themes, all of the prehistoric archeological sites and most of the historic sites in the NHL are accepted as contributing properties.

A review of Cape Krusenstern National Historic Landmark's boundary is planned (S. Morton, personal communication 1992). The NHL is larger than the monument, and it is difficult to provide the level of protection expected for an NHL. However, the advantages offered by its size are hopefully made evident by the data presented in McClenahan and Gibson (1990) and in the analytical portion of this report.

Arctic hunter-gatherers often utilized very broad areas of a region to meet their subsistence requirements. One advantage the present size of the NHL offers is the opportunity to study the ecology of ancient hunter-gatherers. That is, the area within the existing NHL is much more likely to provide an advantageous situation to study whole seasonal subsistence rounds of the various prehistoric people than a smaller area would be. A second advantage is that we are now more aware of the potential of the interior regions of the NHL to provide prehistoric cultural resources for study, based on the results of the 1987-1988 National Park Service survey and archeological research conducted in conjunction with construction at the Red Dog Mine facilities.

These factors should be seriously considered prior to effecting any NHL boundary change. It is also recommended that the existing National Historic Landmark nomination be rewritten to reflect current scientific knowledge and to incorporate the appropriate themes and contexts.

Research and Management Goals and Priorities

This overview and assessment presents a large number and a wide variety of pressing research interests, problems and management concerns. This section recommends a number of management objectives. The order in which they are presented suggests research and management priorities based on this assessment of the resources and the justifications that follow.

The following research and management priorities are recommended. In addition to these recommendations, the General Management Plan, the Resources Management Plan, the Interpretive Prospectus, and other park documents should be consulted.

1. Set priorities for action.

Goal: Prioritize goals in a meaningful and proactive way.

Justification: With limited personnel and funding, it is imperative to prioritize goals, addressing the most urgent issues first.

Recommended Action: Use the Resources Management Plan as a means to clarify goals and set priorities. Review them yearly and modify and update them as required.

2. Develop a procedural plan for surveying and testing in the monument.

Goal: Have in place specific guidelines to be followed by contractors and NPS staff before undertaking any archeological endeavor.

Justification: Before beginning any archeological activities in the monument, it is essential to establish a plan that will guide all survey, testing, and excavation in the monument and that provides on-ground priorities to be followed in every case.

Recommended Action: The Monument Archeologist should draw up or contract to have written a plan that includes guidelines for all archeological surveying, testing, and excavation in the monument and that provides on-ground priorities to be followed in every case.

Recommended Action: This overview and assessment is designed to provide data on which to base such a plan. It will also be necessary to identify any additional data required to write the plan.

3. Develop cooperative relationships with educational institutions.

Goal: Bring the balance and academic expertise that colleges and universities can provide the monument by developing cooperative relationships between the monument and appropriate educational institutions.

Justification: The monument's Cultural Resources Management Specialist may wish to collaborate with colleagues and foster research by other area experts and their students. Universities with staff that have area expertise are the ideal place to seek such collaboration.

Recommended Action: Develop cooperative relationships with educational institutions that have area expertise to encourage beneficial research in the monument.

4. Provide good archeological site documentation.

Goal: Improve documentation of the archeological record in Cape Krusenstern National Monument.

Justification: Poor documentation will afford less than adequate data about the makeup of a site and will not provide archeological evidence that can be compared across sites and result in accurate determinations of site significance and condition.

Recommended Action: Revise and expand previously-used archeological site recording forms and standardize the methods of recording sites.

5. Record lithic scatters in a comparable way.

Goal: Record lithic scatters consistently, with sufficient detail that comparisons may be made among them.

Justification: Lithic scatters are one of the most common site types in the monument. Little more than a simple presence-absence is recorded for some sites. Homogeneous data do not exist for known lithic scatters, making it impossible to use certain approaches for comparison. As new scatters are identified, they can add valuable knowledge if they are recorded appropriately.

Recommended Action: Decide what specific data need to be recorded at each site of this type in order to permit comparisons. Provide surveyors and other personnel who will be documenting sites with a detailed form that indicates what information to provide.

6. Expand survey efforts.

Goal: Identify known and expected property types and their geographic distribution.

Justification: The foregoing discussion points out that archeological survey covered less than 1% of the monument. Neither the full range of property types for each cultural period nor their distribution is known. Knowledge about archeological resources within the monument is inadequate for making fully-informed cultural resources management decisions.

Recommended Action: Design additional surveys to determine the type and extent of the remains for each cultural tradition in the monument. Areas not previously surveyed should be identified. A stratified archeological survey, a survey that uses geographic features or units such as soil types, physiographic regions, or vegetation zones, might give a more balanced view of the region's patterns of archeological site distribution.

Goal: Obtain a complete picture of all site types belonging to each cultural tradition.

Recommended action: Locate stratified subsurface cultural remains and excavate an example of each site type. Based on our present understanding, the majority of known sites in the monument are not assignable to a particular culture. With such examples, many of the known, undated sites might be assignable to particular cultural traditions.

Goal: Provide comparability and reliability in the archeological data. Produce archeological site reports that present the data in a standard format.

Justification: Archeologists are having difficulty determining the relationships of the archeological data from one site with other sites in the region. Frequently, recording methods vary from researcher to researcher and from site to site, making the data incomparable. A similar problem exists in the recognition of correspondences with artifactual materials in published data. Different archeologists have classified Northwest Alaskan artifacts in different ways, making it difficult to compare artifacts from area to area, based on the descriptions and classificatory schemes in published reports (Harritt, personal communication 1990).

Recommended Action: Standardize recording procedures for archeological survey, testing, and excavation in Northwest Alaska so that sites can be compared in a meaningful way.

Recommended Action: Create a complete regional classificatory system for all prehistoric artifacts presently in collections, one that all researchers doing Northwest Alaska archeology are willing to use.

7. Protect archeological resources.

Goal: Acquire ownership of private land or interests in private land or obtain cooperative agreements for management of private land within the monument that contains significant cultural resources, while protecting the rights of landholders to use and pass on their land to their heirs, according to the Cape Krusenstern National Monument General Management Plan.

Justification: Cape Krusenstern National Historic Landmark has been placed on the endangered landmark list. There are several sources of threats including coastal erosion, activities of the Red Dog Mine, and looting.

Recommended Action: Plan a future study to identify such significant areas (Figures 82 and 83).

Goal: Protect archeological resources on monument lands.

Recommended Action: Design and implement a plan to monitor known archeological sites for the impacts of natural and human agents.

Recommended Action: Monitor and evaluate for stabilization or mitigative action archeological sites threatened by erosion where the sites are deemed significant and would benefit from the treatment or data recovery. Recommended sites include lithic sites exposed on the surface by erosion or frost action.

Recommended Action: Mitigate impacts to coastal sites presently undergoing serious erosion from wave action.

Table 27. Coastal Sites in Cape Krusenstern National Monument Damaged by Storm Wave Action.	
Site	Significance
NOA-170	Substantial Northern Maritime tradition habitation site. The site requires further evaluation to determine its total size and the percentage that has been damaged.
NOA-284	Probable Kotzebue period, Northern Maritime tradition habitation site. Two house pits appear to have been damaged thus far.
NOA-217	Multicomponent historic and prehistoric habitation site with historic-era burials, early to mid-Northern Maritime tradition houses, and a possible Arctic Small Tool tradition occupation.

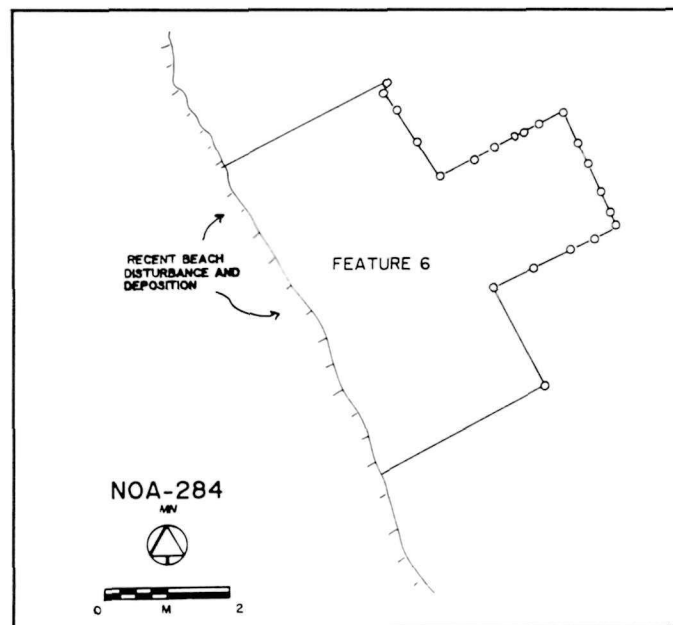


Figure 81. Site map of NOA-284 showing the damage to the site caused by coastal erosion.

Goal: Protect the archeological data in key coastal Northern Maritime tradition sites from loss.

Justification: Surface indicators of cultural features at archeological sites in the monument are more plentiful for the Northern Maritime tradition than for any other tradition. However, not a large number have been excavated in the monument. We still do not have a complete understanding of the full seasonal round and settlement patterns for each cultural period within this tradition. No known temporary campsites dating to either the Birnirk or the Western Thule periods are known for the monument, and only two sites that may represent temporary campsites have been located for Kotzebue period times. Few special-purpose sites other than burials are known for the Northern Maritime tradition for the monument. We do not have a complete picture of how Northern Maritime cultures changed through time.

Recommended Action: Evaluate for mitigative action or stabilization the following sites presently undergoing moderate to severe damage from ground squirrel activity:

Table 28. Sites Undergoing Moderate to Severe Damage from Ground Squirrel Activity.	
Site Number	Site Type
NOA-158	Probable early Western Thule habitation site
NOA-161	Probable early Western Thule habitation site
NOA-164	Habitation site of unknown age

Recommended Action: Consult with local Native groups to determine what treatment they would prefer for NOA-140 and NOA-157, historic grave sites. The sites are currently undergoing moderate to severe damage from ground squirrel activity.

8. Research data gaps.

Goal: Acquire bracketing dates for all cultural periods represented in the monument.

Justification: The initial objective of archeologists in any region, studying any time period, is to construct a cultural chronology. To do this,

archeologists must date the archeological remains and assign archeological sites accordingly. At present, we do not know exactly when the people of every cultural tradition represented in the monument arrived and how long they were present. Many of the dates assigned to cultural periods in the monument are based on typological similarities of cultural materials from monument sites with the dated cultural materials from Onion Portage. Additionally, we are uncertain about the relationships among cultures at Cape Krusenstern and elsewhere through time. Finally, based on our present knowledge, we are unable to place more than half of the known archeological sites in the monument in a cultural chronology.

Recommended Action: Detect datable stratified sites and plan excavations of select ones.

Goal: Assign archeological sites to specific cultural traditions.

Recommended Action: Procure radiocarbon, tree-ring or lichenometric dates for known but undated sites that contain datable organic remains. In particular, the various known tent ring sites in the uplands should be considered top priority for such dating.

Goal: Focus future archeological research on identified areas of weakness or deficiency.

Recommended Action: Incorporate into future research designs some specific research questions. Table 29 presents some proposed questions for future research.

9. Develop and refine evaluation criteria.

Goal: Expand and revise historic contexts.

Justification: Historic contexts establish the criteria on which significance of the property types being evaluated is determined. Only four historic contexts have been developed for the Cape Krusenstern National Monument. Even those contexts lack complete data. Goals and priorities for resource management are derived from the contexts.

Recommended Action: Provide ongoing critical review of existing historic contexts.

Recommended Action: Develop an historic context addressing the Old Whaling culture in Cape Krusenstern.

Recommended Action: Develop historic contexts for the historic era. Four contexts for which there are relevant archeological data or the potential for archeological data include:

- a. Establishing Intercultural Relations after 1850 in the Cape Krusenstern National Monument area.
- b. Changes in Inupiat Seasonal Round and Settlement Patterns at Cape Krusenstern National Monument after 1850.
- c. Domestic Reindeer Herding in Cape Krusenstern National Monument during the Historic Era.
- d. Transportation and Communication in Cape Krusenstern National Monument after 1920.

Recommended Action: Begin registering historic properties. Initiate a List of Classified Structures and add to the existing Classified Structures Inventory (CSI) files.

10. Foster environmental research.

Goal: Conduct and support environmental research that can shed light on the archeological record of Cape Krusenstern National Monument.

Justification: It is only with a better understanding of environmental changes through time that we will be able to fully understand the changes we see in the archeological record.

Recommended Action: Plan environmental studies that will give additional data about the late Pleistocene-early Holocene in the region of the Cape Krusenstern National Monument.

Recommended Action: Plan environmental studies that address the dramatic climatic changes during a brief glacial advance in Northern Maritime tradition times in the region of Cape Krusenstern National Monument.

11. Involve other agencies and Native people in historic preservation planning.

Justification: The advancement of our knowledge about the archeological record is closely associated with that of the environmental sciences and ethnology. Our research efforts urgently require additional data on paleoenvironments, pleistocene flora and fauna, geomorphological processes, and many other topics. They also require additional knowledge about the

history and ethnology of the Inupiat people who inhabited the region of the Cape Krusenstern National Monument.

Goal: Incorporate a wider base of people in the historic preservation planning process.

Recommended Action: The maintenance of good rapport, close communication, and interdisciplinary collaboration in research are called for and are strongly recommended (Hopkins, Arundale, and Slaughter, eds. 1990). Involve a broader spectrum of the public in the planning process, including representatives of the scientific community and local and regional Native groups and individuals.

Recommended Action: Provide for ongoing public education and outreach to foster positive attitudes about the conservation of archeological resources.

12. Use technological aids in archeological research.

Goal: Use remote sensing and Geographic Information Systems to aid in archeological research and data management.

Justification: The oldest and most common archeological reconnaissance method is by means of visual inspection of the ground during a pedestrian survey. However, several types of remote sensing techniques are now available to aid in archeological research. Aerial reconnaissance techniques include the use of aerial photographs, which are useful in several ways. Aerial photography provides data to archeologists for preliminary analysis of the local environment and its resources, it yields data on the location of sites by their features that are visible on the surface and provides information about subsurface archeological remains (Sharer and Ashmore 1987:146-151). A good example is Zimmerman's (1978, 1981) study of cultural features on the Cape Krusenstern beach ridges, discussed in Part Two of this report.

Recommended Action: The increased use of remote sensing technology in cultural resources inventory is recommended as the cost-effective aid. Results of such studies should be tested by ground-truthing.

Recommended Action: Use the NPS Geographic Information System to identify and graphically display natural strata on which to base a stratified archeological survey in Cape Krusenstern National Monument. This information is not currently available.

Recommended Action: Commit Geographic Information System (GIS) specialists, time, and money for archeological applications of GIS.

13. Improve the public's knowledge, understanding, and appreciation of the archeological resources of the monument.

Goal: Gain a wide base of support from Native people and the general public for the protection of archeological resources.

Justification: Archeological resources are probably in greater danger today from human impacts than at any time in the past.

Recommended Action: Identify and implement necessary resources to make Native people and the general public beneficiaries of scientific archeological findings.

Recommended Action: Use interpretive tools such as museum exhibits based on the format and presentation of existing popular exhibits. One such showcase is the Smithsonian's "Crossroads of the Continents" exhibit. Involve Native people and the public in their sponsorship, planning, and presentation.

Table 29. Some Proposed Questions for Future Research in the Region of Cape Krusenstern National Monument	
Period of Reference	Research Question
General	<ol style="list-style-type: none"> 1. Are there any particular environmental correlates for sites associated with different time periods and different activities? 2. Is the area of the monument used more intensively during certain time periods than others?
Paleoarctic tradition	<ol style="list-style-type: none"> 1. In what seasonal round of activities did the Paleoarctic tradition people take part? 2. What parts of the monument did Paleoarctic people use?
Northern Archaic tradition	<ol style="list-style-type: none"> 1. Is there a Post-Paleoarctic tradition? 2. Is the tradition present in the monument? 3. Did Northern Archaic tradition people manufacture and use microblades, or are the known Northern Archaic sites with microblades products of mixing cultural components due to cryoturbation, deflation, or erosion? 4. In what seasonal round of activities did the Northern Archaic people take part? 5. What parts of the monument did Northern Archaic people use?

(continued)

(continued) Table 29. Some Proposed Questions for Future Research in the Region of Cape Krusenstern National Monument	
Period of Reference	Research Question
Arctic Small Tool tradition	<ol style="list-style-type: none"> 1. What is the relationship between ASTt and the Old Whaling culture in the monument? 2. What are the relationships among the four cultural periods of the Arctic Small Tool tradition? 3. How is Denbigh related to preceding cultural traditions in North America and Northeast Asia? 4. What are the relationships between cultural developments in the Arctic Small Tool tradition and other cultures of Northwest Alaska and the North Pacific Rim? 5. What are the relationships between Ipiutak culture at Cape Krusenstern and Okvik and Old Bering Sea cultures of Northeastern Siberia and North Alaska? 6. In what seasonal round of subsistence activities did the Arctic Small Tool tradition people take part? 7. What changes in subsistence strategies and settlement patterns took place between the Norton and Ipiutak periods?
Northern Maritime tradition	<ol style="list-style-type: none"> 1. What seasonal round of subsistence activities did the Northern Maritime people take part in? 2. What changes in these activities took place during Northern Maritime times, and how can the changes be accounted for? 3. To what extent did Western Thule people in the Cape Krusenstern area hunt whales? 4. What were the origins and cultural affinities of Birnirk culture? 5. What are the relationships among early Arctic Small Tool culture, Ipiutak culture, and Birnirk culture?

(continued)

(continued) Table 29. Some Proposed Questions for Future Research in the Region of Cape Krusenstern National Monument	
Period of Reference	Research Question
Historic Era	<ol style="list-style-type: none"> 1. How did intensified intercultural contact affect changes in traditional Inupiat seasonal rounds and settlement patterns? 2. What is the archeological evidence demonstrating the impact on traditional Inupiat subsistence practices of intensive Euro-American whaling and walrus hunting in the Cape Krusenstern vicinity? 3. What evidence exists in the archeological record documenting changes in the Inupiat seasonal round due to the dramatic decline of caribou herds around 1850? 4. What is the archeological evidence in the monument that documents the change in traditional land-use patterns at the time of the introduction of domestic reindeer herds and herding practices? 5. What archeological data exist regarding the history of the development of the Alaska Road Commission cabins and the mail trail?

APPENDIXES

APPENDIX A

Table 30. ARCHEOLOGICAL SITE SUMMARY: RECORDED PREHISTORIC SITES WITHIN THE MONUMENT

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
KTZ-005 D-2	Sheshalik	Multi-component, multi-functional, surface and sub-surface deposits	Summer tent sites, house pits, numerous cache pits, burials. Western Thule culture through modern times
NOA-002 A-3, A-4	Original Cape Krusenstern District	Multi-component, multi-functional, surface and sub-surface deposits	A great number of individual sites. Features include house pits, cache pits, and a wide variety of cultural artifacts, many diagnostic. Remains are from the Arctic Small Tool tradition, Old Whaling culture, and the Northern Maritime Tradition.
NOA-007 A-2	Sheshalik Spit; Gidding's #36	At least one component, surface and subsurface deposits	House pits on a series of beach ridges, cache pits, and "tipi" burials
NOA-008 A-2	Sheshalik Spit; Hall's #2	Single component, surface and subsurface deposits	Semi-subterranean house pit of the Western Thule tradition
NOA-013 A-1	Little Noatak Site; Anderson's LN-1; Hall's #5	Surface and subsurface lithic deposit	Numerous obsidian flakes and chert flakes, end scrapers, side scrapers, "turtle-backed" unifaces, hand drills, and utilized flakes
NOA-042	Cape Krusenstern Archeological District		
NOA-078 B-4	Battle Rock, Ochrorurok	Surface and subsurface stone features and artifacts	Rock-lined burials, at least three human skeletons, over 300 artifacts that include antler weapon points, chert end blades and side blades, and art pieces of early Norton age; burial goods of the Ipiutak period, and Western Thule graves
NOA-080 D-4	Hall's NOA-82/14	Surface lithic deposit	Tuktu side-notched point, chert flakes, a possible sod tent ring, and three .270 cartridge cases

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-081 C-4	Hall's NOA-82/15	Surface lithic deposit	Two black chert flakes and a small flake scatter
NOA-082 C-4	Hall's NOA-82/16	Surface lithic deposit	Gray and black chert debitage and a broken tool
NOA-97 C-4	Hall's NOA-83/10	Surface and subsurface deposits	A small pile of stone that may have been a cairn, a semisubterranean house pit with a stone wall and long entrance passage, and a rock pile that may be a grave
NOA-098 C-4	Hall's NOA-83/7	Isolated lithic artifact on surface	A single gray chert flake located in an erosional setting
NOA-102 C-4	Hall's NOA-83/6	Surface and probably subsurface lithic deposit	Thirty gray, red, and dark red chert spalls
NOA-103 C-4	Hall's NOA-83/9	Surface lithic deposit	One dark gray chert spall and one end blade fragment
NOA-112		Surface and subsurface	One well-made cairn, one depression with rock slabs characterized as a cache or a hunting blind, and four lithic scatters made up of black or dark gray chert debitage
NOA-113 C-3		Surface lithic deposit	One black and one light gray chert flake; one .222 cartridge
NOA-114		Surface and possibly subsurface lithic deposit	Four black, medium gray, and dark gray pieces of lithic debitage
NOA-115 C-3		Surface and possibly subsurface lithic deposit	Two flake scatters of small dark gray or greenish-gray flakes and one possible microblade
NOA-116 B-3		Isolated lithic artifact on surface	One well-made, thick, narrow biface of medium gray chert

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-138	Palisades Site	Surface and probably subsurface lithic deposit	Twenty-nine side or corner-notched projectile points, bifaced knife blades, end scrapers, unifaced knives, cores, and lithic debitage
NOA-139	Lower Bench Site	Surface and probably subsurface lithic deposit	More than 100 artifacts, largely microblades, 1 sideblade inset, 1 grooved beach pebble, 1 endblade inset. Two microblade core tablets. Several caribou (?) bone fragments
NOA-140 A-3	CAKR-87-043	Surface and subsurface deposits	Five semisubterranean houses and four graves
NOA-141 B-3	CAKR-87-032	Isolated lithic artifact on surface	One modified chert flake in an erosional setting
NOA-142 B-3	CAKR-87-033	Isolated lithic artifact on surface	One chert flake
NOA-143 B-3	CAKR-87-034	Surface features	One rock cairn and one hearth
NOA-144 B-3	CAKR-87-102	Surface and possibly subsurface lithic deposits	Three chert flakes
NOA-145 B-3	CAKR-87-104	Surface features	Two rock cairns
NOA-146 B-4	CAKR-87-001	Surface and possibly subsurface lithic deposits	One lithic scatter of 50 chert flakes, including primary reduction and thinning flakes
NOA-147 B-4	CAKR-87-002	Surface and subsurface lithic deposits	One lithic scatter of 30 chert flakes
NOA-148 B-4	CAKR-87-007	Surface feature	One tent ring-like feature
NOA-149 B-4	CAKR-87-008	Surface features	Six stone tent ring features

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-150 B-4	CAKR-87-009	Surface features	One shallow depression and one hearth
NOA-151 B-4	CAKR-87-010	Surface and possibly subsurface deposits	One lithic scatter of chert flakes and one biface fragment; one cairn
NOA-152 B-4	CAKR-87-011	Surface features	One stone tent ring and two hearths
NOA-153 B-4	CAKR-87-012	Surface features	One stone tent ring, one hearth, and a shallow depression
NOA-155 B-4	CAKR-87-014	Surface features	Two large hearths containing large cobbles
NOA-156 B-4	CAKR-87-016	Surface feature	One large, circular depression that may have been a cache pit
NOA-158 B-4	CAKR-87-067	Surface features	One possible semisubterranean house and two cache pits
NOA-159 B-4	CAKR-87-069	Isolated surface deposit	One isolated adult human femur
NOA-161 B-4	CAKR-87-073	Surface and subsurface deposits	Two semisubterranean houses and two cache pits. A third house, badly disturbed, may be present.
NOA-162 B-4	CAKR-87-074	Surface and subsurface deposits	One semisubterranean house
NOA-163 B-4	CAKR-87-075	Surface and subsurface deposits	Twelve cache pits and one possible semisubterranean house
NOA-164 B-4	CAKR-87-076	Surface and subsurface deposits	Two possible semisubterranean houses and four cache pits

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-165 B-4	CAKR-87-076	Surface and subsurface deposits	One possible cache pit
NOA-166 B-4	CAKR-87-077	Surface and subsurface deposits	Seven cache pits
NOA-167 B-4	CAKR-87-079	Surface and subsurface deposits	Collapsed burial platforms and one whaling harpoon point
NOA-169 B-4	CAKR-87-084	Isolated lithic artifact on surface	One utilized blade-like flake of chert
NOA-170 B-4	CAKR-87-086	Surface and subsurface deposits and features	One prehistoric era semisubterranean house floor, two storage pits, and a hearth
NOA-172 B-4	CAKE-87-101	Surface lithic deposit	A lithic scatter of chert flakes, chert bifaces, biface fragments, preforms, and two chert blades
NOA-173 B-4	CAKR-87-103	Surface features	Seven stone features that appear to be collapsed cairns
NOA-174 C-3	CAKR-87-020	Surface and probably subsurface lithic deposits	Scatter of over 100 lithic artifacts, consisting of primary and secondary flakes of gray, dark gray, reddish brown, weak red, and black chert, and one gray chert blade fragment
NOA-175 C-3	CAKR-87-021	Surface feature	One stone tent ring and charcoal
NOA-176 C-3	CAKR-87-024	Surface feature	One stone cairn
NOA-177 C-3	CAKR-87-025	Surface lithic deposit	Lithic scatter of primary and secondary chert flakes; one obsidian flake
NOA-178 C-3	CAKR-87-026	Surface features and deposits	One possible stone tent ring, one hearth, and three cache pits; historic debris

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-179 C-3	CAKR-87-041	Surface lithic flakes	Two black chert primary reduction flakes
NOA-180 C-3	CAKR-87-083	Surface feature and deposit	One stone cairn
NOA-181 C-3	CAKR-87-085	Isolated lithic artifact on surface	One gray chert flake
NOA-082 C-3	CAKR-87-098	Surface lithic deposit	Lithic scatter of seven chert flakes and one microblade core tablet
NOA-183 C-4	CAKR-87-003	Surface feature	One stone cairn
NOA-185 C-4	CAKR-87-005	Isolated lithic artifact on surface	One cortical chert flake, modified
NOA-186 C-4	CAKR-87-006	Surface lithic deposit	Lithic scatter of one large chert biface preform and two chert primary reduction flakes
NOA-187 C-4	CAKR-87-015	Isolated lithic artifact on surface	One utilized gray chert flake
NOA-188 C-4	CAKR-87-017	Surface and subsurface deposits and features	One house pit, five caches, a stone tent ring, and two unidentified stone features
NOA-189 C-4	CAKR-87-018	Surface deposit and feature	Two chert flakes and one unidentifiable stone feature
NOA-190 C-4	CAKR-87-019	Surface lithic	Scatter of 27 chert flakes and one chert microblade fragment
NOA-192 C-4	CAKR-87-022	Surface lithic deposit and feature	Lithic scatter of some 33 black chert flakes, including primary flakes; one stone tent ring

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-193 C-4	CAKR-87-029	Surface and subsurface lithic deposit	Lithic scatter of more than 55 chert pressure retouch flakes; black light gray, gray, dark reddish brown, and light red
NOA-195 C-4	CAKR-87-031	Surface lithic deposit	Lithic scatter of dark gray chert shatter and one anvil stone
NOA-197 C-4	CAKR-87-035	Surface lithic deposit	Two gray chert flakes and one cobble manuport
NOA-198 C-4	CAKR-87-038	Surface lithic deposit	Six primary and secondary chert flakes, dusky red and gray
NOA-199 C-4	CAKR-87-039	Surface and possibly subsurface lithic deposit	One chalcedony secondary flake, one dark brown chert secondary flake, and 1 exhausted chalcedony flake core
NOA-200 C-4	CAKR-87-040	Surface lithic deposit	Lithic scatter of one greenish-gray microblade core and two primary flakes
NOA-201 C-4	CAKR-87-042	Surface lithic deposit and feature	One unifacially modified dark gray chert flake and one blue-gray chert biface fragment
NOA-202 C-4	CAKR-87-044	Surface feature	One rock cairn
NOA-203 C-4	CAKR-87-045	Surface features	One stone tent ring and one collapsed stone cairn
NOA-205 C-4	CAKR-87-047	Surface feature	Stone cache or hunting blind
NOA-206 C-4	CAKR-87-048	Surface feature	One stone cairn
NOA-207 C-4	CAKR-87-049	Surface feature	One collapsed stone cairn

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-208 C-4	CAKR-87-050	Surface feature and surface deposit	One collapsed stone cairn; three .30 rifle cartridges, one .30 rifle bullet, and one chert biface fragment
NOA-210 C-4	CAKR-87-052	Surface feature	One collapsed cairn
NOA-211 C-4	CAKR-87-052	Isolated lithic artifact on surface	One bifacially modified chert flake
NOA-212 C-4	CAKR-87-054	Surface features	Three collapsed rock cairns
NOA-213 C-4	CAKR-87-055	Surface features	Three stone cairns and a stone hunting blind
NOA-214 C-4	CAKR-87-056	Surface features	Two stone cairns
NOA-215 C-4	CAKR-87-057	Surface features	One stone cairn and three stone hunting blinds
NOA-216 C-4	CAKR-87-0058	Surface lithic	One blade-like chert flake, one primary chert flake, and one secondary chert flake
NOA-217 C-4	CAKR-87-059	Surface and subsurface deposits and features	Two graves, two semisubterranean houses, caches, lithic tools including one endblade fragment, several chert flakes, faunal remains, and potsherds
NOA-218 C-4	CAKR-87-060	Surface feature	One collapsed stone cairn
NOA-219 C-4	CAKR-87-061	Surface lithic deposit	Four thinning flakes in a variety of colors of chert and one blocky chert fragment
NOA-220 C-4	CAKR-87-062	Surface features	One stone cairn and one possible stone cache

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-221 C-4	CAKR-87-064	Surface feature	One stone cache or burial
NOA-222 C-4	CAKR-87-066	Surface features	Four stone cairns, one hunting blind, and a cache or shelter
NOA-223 C-4	CAKR-87-068	Isolated lithic artifact on surface	One chalcedony biface fragment
NOA-224 C-4	CAKR-87-078	Surface feature	One stone feature of unknown function
NOA-225 C-4	CAKR-87-080	Surface features	One collapsed cairn and a rock slab shelter or cache
NOA-226 C-4	CAKR-87-082	Surface feature	One collapsed stone cairn
NOA-227 C-4	CAKR-87-087	Surface features	One stone cairn and a stone tent ring
NOA-228 C-4	CAKR-87-089	Surface lithic deposit	Lithic scatter of more than 27 primary and secondary chert flakes, one biface fragment, and an edge-modified flake
NOA-229 C-4	CAKR-87-090	Surface and possible subsurface lithic deposit	Lithic scatter of 10 black or gray chert thinning or edge retouch flakes
NOA-230 C-4	CAKR-87-091	Surface feature	One collapsed stone cairn
NOA-231 C-4	CAKR-87-092	Surface feature	One stone cairn
NOA-232 C-4	CAKR-87-093	Surface feature	One collapsed stone hunting blind

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-233 C-4	CAKR-87-094	Surface features	One stone tent ring and one collapsed stone cairn
NOA-234 C-4	CAKR-87-095	Surface feature and lithic deposits	One stone cairn and two scatters of chert flakes. Most of the flakes are chert thinning flakes.
NOA-235 C-4	CAKR-87-096	Surface lithic deposit	Three black chert primary flakes
NOA-237 C-4	CAKR-87-099	Surface feature	One stone hunting blind
NOA-238 C-4	CAKR-87-100	Isolated lithic artifact on surface	One black chert biface roughout
NOA-239 D-4	CAKR-87-036	Isolated lithic artifact on surface	One gray chert primary flake
NOA-240 C-4	CAKR-87-070	Surface feature	One stone hunting blind or shelter
NOA-241 C-4	CAKR-87-072	Surface and possibly subsurface lithic deposit	Three unmodified chert flakes and one burinated chert flake
NOA-244 B-3	CAKR-88-006	Surface features deposits	One stone tent ring surrounding a slight depression, two lithic scatters of unmodified secondary chert flakes, and two bone fragments
NOA-246 B-3	CAKR-88-008	Isolated lithic artifact	One dark gray chert biface fragment
NOA-247 B-4	CAKR-88-001	Surface feature	One stone cairn
NOA--248 B-4	CAKR-88-002	Surface feature	Two stone cairns and a stone hunting blind

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-249 B-4	CAKR-88-003	Surface feature and artifact	One stone tent ring and one cut large mammal long bone fragment
NOA-250 B-4	CAKR-88-033	Isolated lithic artifact	One broken ground slate knife
NOA-251 B-4	CAKR-88-035	Surface feature	One stone cairn
NOA-253 B-4	CAKR-88-038	Surface and probably subsurface lithic deposit	Artifact scatter of nine lithic flakes, one biface, one burinated biface fragment, and two rifle cartridges
NOA-254 B-4	CAKR-88-043	Surface feature	One collapsed stone cairn
NOA-256 B-4	CAKR-88-045 Anderson's Rabbit Creek Knoll site	Surface and subsurface lithic deposits	A widely dispersed lithic scatter containing over 150 chert and obsidian artifacts. Anderson tested this site in 1977 and recorded microblades, a microblade core tablet from a wedge-shaped microblade core, and a Kotzebue period projectile point. The NPS survey recorded microblades, a Denbigh-type burin, and a Kotzebue period projectile point fragment.
NOA-258 A-3	CAKR-88-009	Surface lithic deposit	Two pieces of chert debitage and one utilized bladelike flake with possible burin spall removals
NOA-259 A-3	CAKR-88-010	Surface feature	One collapsed stone cairn
NOA-260 A-3	CAKR-88-011	Surface and possibly subsurface lithic deposit	Six chert flakes
NOA-261 A-3	CAKR-88-012	Surface lithic deposit	Lithic scatter of 15 chert flakes, one crude biface and one flake core of a translucent material that may be chalcedony
NOA-262 A-3	CAKR-88-013	Isolated lithic artifact on surface	One gray chert end scraper

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-263 A-3	CAKR-88-014	Surface feature	One collapsed stone cairn
NOA-264 A-3	CAKR-88-015	Surface and probably subsurface lithic deposit, at least two components	Lithic scatter of several concentrations of over 150 items each. Noted were a Tuktu point, microblades, primary chert flakes, one utilized obsidian flake, and one blade
NOA-265 A-3	CAKR-88-016	Surface and probably subsurface lithic deposits	More than 85 lithic artifacts, including one biface fragment and one exhausted cobble flake core of black chert
NOA-266 A-3	CAKR-88-017	Isolated lithic artifact on surface	One black chert microblade core
NOA-267 A-3	CAKR-88-018	Surface and probably subsurface lithic deposit	Lithic debitage of eight chert flakes and one modified black chert flake
NOA-268 A-3	CAKR-88-020	Surface and probably subsurface lithic deposit	Lithic scatter of more than 100 flakes, including a blade fragment, and one utilized flake
NOA-269 A-3	CAKR-88-021	Surface feature	One stone cairn
NOA-270 A-3	CAKR-88-023	Surface feature and lithic deposit	One collapsed stone cairn and a lithic scatter that includes one microblade, one bladelike flake, and chert debitage
NOA-272 A-3	CAKR-88-027	Surface feature; surface and probably subsurface multi-component deposits	Historic-era rectangular stone tent feature and scatter of over 300 prehistoric lithic artifacts that includes primary and secondary chert flakes, one large modified obsidian blade fragment with one burinated edge, one Denbigh-like burin, two endscrapers, one burin spall, one chert core fragment, and one retouched flake graver. The lithic artifacts are found in three separate concentrations, and a fourth comprises historic-era debris.
NOA-273 A-3	CAKR-88-027	Surface feature	Pile of stones of unknown function

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-274 A-3	CAKR-88-031	Surface and subsurface features and deposits	Three or four semisubterranean house pits, one probable grave, and nine other features that include probable house pits
NOA-276 A-3	CAKR-88-040	Isolated lithic artifact located on the surface	One obsidian flake, modified along two lateral edges
NOA-277 A-4	CAKR-88-022	Surface and subsurface features and deposits	One semisubterranean house, two caches, a hearth, and a cobble alignment
NOA-278 A-4	CAKR-88-026	Surface feature	Probable hearth containing fire-cracked rock and fire-reddened cobbles; possibly a Denbigh Flint complex site
NOA-280 A-4	CAKR-88-030	Surface feature	Concentration of fire-cracked rock that may be a Denbigh Flint complex hearth
NOA-281 A-4	CAKR-88-032	Isolated lithic artifact on surface	One large whalebone fragment, placed upright
NOA-282 A-4	CAKR-88-034	Surface feature	Fire-cracked rock scatter and one unmodified chert flake. This may be a Denbigh Flint complex hearth.
NOA-284 A-4	CAKR-88-041	Surface and subsurface features and deposits	Features include a possible wall tent site, a semisubterranean house, two sets of log posts, a hearth, and three caches.
NOA-285 A-4	CAKR-88-049	Surface and probable subsurface lithic deposit	Lithic scatter of primary and secondary chert flakes, one utilized chert bladelike flake, and one chert endscraper
NOA-286 C-4	CAKR-87-006	Surface lithic deposit flakes	Lithic scatter of 21 black chert flakes

Table 31. ARCHEOLOGICAL SITE SUMMARY: RECORDED HISTORIC SITES WITHIN THE MONUMENT
Cape Krusenstern National Monument

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-001 A-3	Gidding's #37	Semisubterranean house pits	Two houses, ca 1899, were noted to be of a three-lobed type.
NOA-002 A-3, A-4	Original Cape Krusenstern Archeological District	Semisubterranean house pits and campsites, burials, and caches	Continuous occupation from at least 4,500 years ago through modern times
NOA-003 A-3	Aniyak	Village	Inupiaq village noted by Jarvis in 1898. Site of a shelter cabin built around 1925 that was used as a mail run cabin
KTZ-005 D-2	Sheshalik	Village and summer camp	Inupiaq village recorded by Beechey in 1831
BLM-F22278	n.d.	n.d.	n.d.
NOA-074 C-5	Hall's NOA-82/9	Habitation, reindeer corral	George Onalik's semisubterranean house, a grave, and reindeer herding facilities used in the early 1930s
NOA-080 D-4	Hall's NOA-82/14	Campsite	Prehistoric lithic artifacts, a stone tent ring of unknown age, and three .270 cartridge cases
NOA-108 A-2		Reindeer corral	Corral constructed of spruce logs and heavy-gauge wire. Has a frame marking chute.
NOA-109 A-2		Collapsed log cabin	Has an external storage rack, metal debris, and other historic debris. Cabin is located in a man-made clearing in a white spruce forest.
NOA-110 A-2		Reindeer herding facility	Remains of a reindeer corral, three collapsed cabins, and a cache pit or well surmounted by a winch structure of logs
NOA-111 A-2		Cabin	One cabin and a 55-gallon drum

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-140 A-3	Anigaaq	Habitation cluster and gravesites	Five semisubterranean house pits and four graves. The site may have been occupied through 1925.
NOA-154 B-4		Campsite	The axe-hewn wooden tent stake and cut caribou bone suggest a historic date for the stone tent feature.
NOA-157 B-4		Cemetery	Historic-era cemetery consisting of three or four graves marked by inscribed wooden crosses or grave markers
NOA-166 B-4		Caches	Seven circular-to-rectangular pits that may have been used as cache pits during historic times
NOA-168 B-4		Kayak frame	An historic-era kayak frame
NOA-171 B-4		Cemetery	Seven historic-era graves, marked by wood crosses or head markers
NOA-184 C-4		Campsite	One rectangular stone tent feature that probably anchored a wall tent, six .222 rifle cartridges, and five .243 rifle cartridges
NOA-191 C-4		Campsite	One stone ring, the remains of a metal stovepipe, remains of a sheet metal stove, and the bones of moose and caribou were found along with historic-era debris.
NOA-194 C-4		Campsite	One stone tent ring and well-preserved wood shavings
NOA-196 C-4		Possible ice fishing site	Four axe-cut spruce poles and a fragment of braided cotton rope near a thaw lake
NOA-204 C-4		Campsite	Stone alignment that may have served as an anchor for a wall tent
NOA-207 C-4		Hunting stand	One collapsed cairn and a single caribou metatarsal fragment with butcher marks that were probably produced by a metal knife

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-209 C-4		Hunting blind or shelter	One stone hunting blind or shelter, one hearth, and historic-era debris
NOA-236 C-4		Campsite	One subrectangular stone feature that probably served as an anchor for a wall tent, wood chips, burned and unburned bone chips, and a fruit pit
NOA-242 B-3		Campsite	One oval stone tent ring and a scatter of historic artifacts
NOA-243 B-3		Campsite	Rocks and poles that are probably the remains of a tent site, a hearth located within the tent feature, and a scatter of historic artifacts
NOA-252 B-4		Hunting camp	The site comprises stone features that appear to be the former sites of two wall tents, one stone hunting blind, and four cairns or caches. Historic debris consists of .223 caliber rifle shell casings, wood fragments, and one fragment of white cotton.
NOA-255 B-4		Campsite	One stone tent ring, one hearth, three burned bone fragments, and an axe-cut branch
NOA-256 B-4		Lithic scatter	Two T-shaped, stemmed projectile points of the kind used by the Western Inupiaq. The scatter also contains diagnostic artifacts from at least two other, prehistoric, cultural traditions
NOA-257 A-2		Log cabin	Historic-era one room cabin in a man-made clearing, with historic metal and glass debris, a drum stove, a pole rack, and an elevated cache. The cabin has a built-in bed, shelves, and a spruce log stool.
NOA-271 A-3		Campsite	One stone tent ring, one possible hearth, and a scatter of historic artifacts, including a handmade violin and a handmade mandolin
NOA-275 A-3		Campsite	One subrectangular stone tent feature, an internal hearth, and one small fragment of paper

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-279 A-4		Isolated artifact	One carved wooden artifact fragment resembling a bowl or a large spoon
NOA-283 A-4		Log Cabin	Historic Alaska Road Commission shelter cabin, built in the 1920s or 1930s. The cabin has an arctic entry, plank floors, and a large wood stove manufactured by Gary and Dudley, Nashville, Tennessee. Other historic artifacts include several 55-gallon oil drums, an aluminum cooking pot, and a red-and-white enamel cooking pot.

Table 32. ARCHEOLOGICAL SITE SUMMARY: RECORDED PREHISTORIC SITES WITHIN CAPE KRUSENSTERN NATIONAL HISTORIC LANDMARK, BUT OUTSIDE CAPE KRUSENSTERN NATIONAL MONUMENT

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-010 A-1	Qipisungnik, Hall's #4	Multi-component, multi-functional surface and sub-surface deposits	Summer tent sites, semisubterranean houses
NOA-013 A-1	Little Noatak Site; Anderson's LN-1; Hall's #5	Single-component, surface and subsurface lithic deposits	Lithic scatter of obsidian and black chert flakes, end scrapers, side scrapers, "turtle-backed" unifaces, hand drills, and utilized flakes. Anderson proposed that this was a Northern Archaic tradition site.
NOA-014 A-1	Anderson's LN-2; Hall's #6	Surface and subsurface lithic deposits	Lithic scatter of numerous flakes, a discoidal scraper, and a burin-like artifact. These artifacts suggested to Anderson an Ipiutak or Near Ipiutak culture.
NOA-015 A-1	Gidding's #33; Hall's #7	Surface and subsurface features and deposits	This historic site may have a prehistoric component.
NOA-018 B-2	Invisisaaq; Hall's #9	Surface and subsurface features and artifacts	Lithic scatter of unknown composition and an historic-era grave
NOA-020 B-2	Gidding's #34; Hall's #10	Surface and subsurface features and deposits	Ethnographically reported prehistoric village site
NOA-024 B-2	Arviriaq; Hall's #13	Surface and subsurface features and deposits	More than 30 semisubterranean houses and more than 52 cache pits. Historic artifacts were recovered from two houses that were tested by Hall. Prehistoric houses are believed to be located at a greater distance from the river.
NOA-032 D-2	Sukkuk; Hall's #21	Unknown	No data on the type of site

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-037 A-2	Dr. Rabeau's cabin; Hall's #137	Multi-component multi-functional surface and subsurface features and deposits	One historic cabin and an unknown number of caches and semisubterranean houses that are thought to be prehistoric.
NOA-038 A-2	Hall's #138	Multi-component multi-functional surface and subsurface features and deposits	Twenty semisubterranean houses and more than 52 circular caches scattered along a two-mile stretch of beach. Hall's tests recovered glass, chert, cut antler, and ground slate.
NOA-039 A-2	Hall's #139	Surface lithic deposit	Lithic scatter of three chert spalls
NOA-041 A-1	Hall's #141	Surface lithic deposit	Lithic scatter of an unknown number of spalls
NOA-048 B-2	Tununaaq; Hall's #74N6; #14	Multi-component, multi-functional surface and sub-surface features and deposits	Historic-era features and six probably prehistoric semisubterranean houses
NOA-061 A-2	Tulaagiuq, Henry site	Subsurface features and deposits	Reported Near Ipiutak-Ipiutak-era burial of two children. More than 500 artifacts including 236 arrowhead shafts, 182 endblades, six sideblades, and 10 small points; skeletal remains of two individuals
NOA-069 D-4	Hall's NOA-82/4	Surface lithic deposit	Lithic scatter comprises 12 black and gray chert flakes. A single biface fragment was located some distance away.
NOA-073 D-4	Hall's NOA-82/8	Isolated lithic artifact on surface	One large, heavy biface
NOA-079 D-3	Hall's NOA-82/13	Surface lithic deposit	Three greenish-gray chert flakes and three cartridge cases
NOA-099 C-5		Multi-component, multi-function surface and subsurface features and deposits	Two semisubterranean houses, several cache pits, and two possible graves

Table 33. ARCHEOLOGICAL SITE SUMMARY: RECORDED HISTORIC SITES WITHIN CAPE KRUSENSTERN NATIONAL HISTORIC LANDMARK BUT OUTSIDE CAPE KRUSENSTERN NATIONAL MONUMENT

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-009 A-2	Kitiqlikquriaq; Hall's #3	Unknown	Ethnographically reported fall concentration zone for Inupiaq from Kotzebue
NOA-017 A-2	Saniniq; Hall's #8	Unknown	Ethnographically reported fall concentration zone for Inupiaq from Kotzebue
NOA-018 B-2	Invisisaaq; Hall's #9	Burial Unknown	A white grave marker. Ethnographically reported fall concentration zone for Inupiaq from Kotzebue
NOA-021 B-3	Nauyoazag; Hall's #11	Unknown; tipi grave	Ethnographically reported fall concentration zone for Inupiaq from Kotzebue; one tipi grave
NOA-023 B-2	Auliq; Hall's #12	Unknown	Ethnographically reported fall concentration zone for Inupiaq from Kotzebue
NOA-024 B-2	Arviriaq	Campsite, semisubterranean houses	More than 30 semisubterranean houses; more than 52 caches . Historic artifacts were recovered by Hall in tests of two houses, including rifles shells, a musket ball, a flint, a kaolin pipe stem, cut antler, seal and caribou bone, beads, metal items, and a felt hat.
NOA-026 B-2	Maratuq; Hall's #15	Semisubterranean houses, log cabins	Ethnographically reported fall concentration zone for Inupiaq from Kotzebue. Seven house features include log cabins and house depressions. Also present are cache pits and historic debris. Cabins date around 1900 and 1949.
NOA-027 C-2	Uninyuaq; Hall's #16	Unknown	Ethnographically reported fall concentration zone for Inupiaq from Kotzebue

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-028	Napaktusugruk; Hall's #17, 74N4	Historic cabin, semisubterranean houses	One collapsed historic-era log cabin with axe-cut logs and a 2-meter-long entrance passage; historic debris; ethnographically reported fall concentration zone for the Inupiaq from the lower Noatak
NOA-029 C-2	Inilaq; Hall's #18	Unknown	Ethnographically reported fall concentration zone for Inupiaq from Kotzebue
NOA-030 C-2	Kiiziq; Hall's #19	Unknown	Ethnographically reported fall concentration zone for Inupiaq from Kotzebue
NOA-031	Kakiaq; Hall's #20	Semisubterranean houses	Tests revealed a spruce log house floor and .44 caliber shells.
NOA-033	Kamanik; Hall's #22a	Semisubterranean houses	The houses of a winter village believed to belong to the historic-era Inupiaq
NOA-034 D-2	Shuquck; Hall's #22b	Unknown	Stoney (1886) reported an archeological site in this vicinity
NOA-037 A-2	Dr. Rabeau's cabin; Hall's #137	Cabin, semisubterranean houses	Historic cabin, semisubterranean houses and cache pits. One above ground burial box
NOA-038 A-2	Hall's #138	Semisubterranean house	Twenty semisubterranean houses, more than 52 circular cache pits, and historic-era artifacts including glass, and cut antler
NOA-040 A-1	Hall's #140	Burial	One above ground burial box
NOA-044 C-2	Hall's #74N2	Historic artifacts	Two logs with squared-off ends, with two embedded .44 leads and one round headed nail driven in. Historic cabins were reported to be nearby.
NOA-045 C-2	Hall's #74N3	Cache pit	One 1.5 x 1.5 m cache pit with log walls

Site # Map Quad	Other Designations	Type of Deposit	Cultural Material, Features
NOA-047 B-2	Tununaaq; Hall's #74N5, 14	Cache pit	One 2 x 1.5 m cache pit with vertical posts and horizontal log walls
NOA-048 B-2	Tununaaq; Hall's #74N6	Log Cabin, house depressions	One log cabin, six semisubterranean houses, and caches. Ethnographically reported fall concentration zone for Inupiaq from the lower Noatak
NOA-049 B-3	Charlie Henry's Cabin; Hall's #74N7	Cabin	One collapsing log cabin made of axe-cut spruce logs, one possible cache pit, and historic debris. The cabin was occupied around 1944.
NOA-050 B-2	Hall's #74N8	Cabin	One collapsed 3.5 x 4 m cabin of axe-cut and peeled spruce logs, and historic debris
NOA-054 C-2	Hall's #74N12	Wall tent site	A probable fish camp consisting of cut spruce logs, spruce poles and a floor frame of a tent, several cache pits and historic debris
NOA-056 B-3	Hall's #74N14	Cache pits	Two cache pits
NOA-057 B-3	Nauyoaruk; Hall's #74N15	Cabin	One shelter cabin that is a two-room structure, with a bench, stove, and dog stalls. Built by the CCC in the 1930s.
NOA-058 B-2	Hall's #74N16	Campsite	Tent sites and historic debris. Historically reported camp for muskrat hunting by Inupiaq families from Noatak in the 1940s and 1950s
NOA-059 B-3	Hall's #74N17	Cabins	The foundation remains of two log cabins, caribou bone and historic artifacts. One possible tent site and cache pit. One structure may have been an historically reported trading post.

APPENDIX B

**Table 34. CAPE KRUSENSTERN ARCHEOLOGICAL FIELD PROJECT SUMMARY:
PREHISTORIC ARCHEOLOGICAL SITES WITHIN THE MONUMENT**

? Site has not been dated. * Site was previously archeologically investigated.

PROJECT, REFERENCE		DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
J.L.Giddings	1952	Excavation, Survey	NOA-007	Sheshalik Spit
J.L.Giddings	1960	Excavation	NOA-002	Cape Krusenstern
J.L.Giddings	1962	Excavation	NOA-078	Chukchi Sea coast
	1967		NOA-138	Ingitkalik Mountain
			NOA-139	Ingitkalik Mountain
J.L.Giddings	1967	Excavation	KTZ-005	Sheshalik Spit
J.L.Giddings	1967	Excavation	NOA-008	Sheshalik Spit
E.Hall	1974	Survey		
D.D.Anderson	1972	Survey	NOA-013*	Little Noatak River
D.D.Anderson	1977	Survey	NOA-137 NOA-256	New Heart Creek Rabbit Creek
B.L.M.	n.d.	Inventory	BLM-F22278	

PROJECT, REFERENCE		DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
E.Hall	1974	Survey, Inventory	NOA-007*	
E.Hall	1982	Survey, Inventory	NOA-080 NOA-081 NOA-082	Mulgrave Hills Omikviorok River Omikviorok River
E. Hall	1983	Survey, Inventory	NOA-097 NOA-098 NOA-102 NOA-103 NOA-111 NOA-112 NOA-113 NOA-114 NOA-115 NOA-116	Mulgrave Hills Mulgrave Hills Omikviorok River New Heart Creek Igichuk Hills Omikviorok River Mulgrave Hills Rabbit Creek Rabbit Creek Alutunitok Hills
Gleeson	1987	Excavation	NOA-003	Tukrok River

PROJECT, REFERENCE		DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
P.McClenahan and D.Gibson	1990	Survey	NOA-078*	
			NOA-114*	
			NOA-115*	
			NOA-138*	
			NOA-139*	
			NOA-140	Tukrok River
			NOA-141	Jade Creek
			NOA-142	Jade Creek
			NOA-143?	Alutunitok Hills
			NOA-144	Coastal Lowlands
			NOA-145?	Kilikmak Creek
			NOA-146	Rabbit Creek
			NOA-147	Rabbit Creek
			NOA-148?	Rabbit Creek
			NOA-149?	Rabbit Creek
			NOA-150	Rabbit Creek
			NOA-151	Rabbit Creek
			NOA-152?	Rabbit Creek
			NOA-153?	Rabbit Creek
			NOA-155?	Rabbit Creek
			NOA-156	Rabbit Creek
			NOA-158	Kotlik Lagoon
			NOA-159?	Imik Lagoon
			NOA-160	Imik Lagoon
			NOA-161	Kotlik Lagoon
			NOA-162	Kotlik Lagoon
			NOA-163?	Kotlik Lagoon
			NOA-164?	Kotlik Lagoon
			NOA-165	Kotlik Lagoon
			NOA-167	Kotlik Lagoon
			NOA-169	Kotlik Lagoon
			NOA-	

PROJECT, REFERENCE		DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
P.McClenahan and D.Gibson	1990	Survey	NOA-170	Kotlik Lagoon
			NOA-172	Kotlik Lagoon
			NOA-173?	Noatak Lowlands
			NOA-174	Rabbit Creek
			NOA-175	Rabbit Creek
			NOA-176?	Rabbit Creek
			NOA-177	Rabbit Creek
			NOA-178?	Rabbit Creek
			NOA-179	Omikviorok River
			NOA-180?	Alutunitok Hills
			NOA-181	Alutunitok Hills
			NOA-182	Rabbit Creek
			NOA-183?	Agagrak Creek
			NOA-185	Rabbit Creek
			NOA-186	Rabbit Creek
			NOA-187	Rabbit Creek
			NOA-188	Rabbit Creek
			NOA-189	Rabbit Creek
			NOA-190	Rabbit Creek
			NOA-192	Rabbit Creek
			NOA-193	Rabbit Creek
			NOA-195	Rabbit Creek
			NOA-197	Omikviorok River
			NOA-198	Omikviorok River
			NOA-199	Igigloruk Mountain
			NOA-200	Omikviorok River
			NOA-201	Agagrak Creek
			NOA-202?	Agagrak Creek
			NOA-203	Imik Lagoon
			NOA-205	Agagrak Creek
			NOA-208	Umagatsiak Creek

PROJECT, REFERENCE		DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
P.McClenahan and D.Gibson	1990	Survey	NOA-210? NOA-211 NOA-212? NOA-213? NOA-214? NOA-215? NOA-216 NOA-217 NOA-218? NOA-219 NOA-220? NOA-221? NOA-222 NOA-223 NOA-224? NOA-225? NOA-226? NOA-227? NOA-228 NOA-229 NOA-230? NOA-231? NOA-232? NOA-233? NOA-234 NOA-235 NOA-237? NOA-238 NOA-239 NOA-240?	Tahinichok Mountains Agagrak Creek Tahinichok Mountains Umagatsiak Creek Agagrak Creek Umagatsiak Creek Agagrak Creek Agagrak Creek Umagatsiak Creek Umagatsiak Creek Umagatsiak Creek Umagatsiak Creek Agagrak Creek Umagatsiak Creek New Heart Creek Omikviorok River Rabbit Creek Rabbit Creek Mulgrave Hills Mulgrave Hills Mulgrave Hills Omikviorok River Rabbit Creek Mulgrave Hills Rabbit Creek Rabbit Creek Rabbit Creek Mulgrave Hills Umagatsiak Creek

PROJECT, REFERENCE		DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
P. McClenahan and D. Gibson	1990	Survey	NOA-241	Agagrak Creek
			NOA-244	Kilikmak Creek
			NOA-246	Kilikmak Creek
			NOA-247?	Kilikmak Creek
			NOA-248?	Kilikmak Creek
			NOA-249?	Kilikmak Creek
			NOA-250	Kagagrak Hills
			NOA-251?	Kakagrak Hills
			NOA-252?	Kakagrak Hills
			NOA-253	Kakagrak Hills
			NOA-254	Kakagrak Hills
			NOA-255	Tasaychek Lagoon
			NOA-256*	
			NOA-258	Situkuyok River
			NOA-269?	Situkuyok River
			NOA-260	Situkuyok River
			NOA-261	Situkuyok River
			NOA-262	Situkuyok River
			NOA-263?	Situkuyok River
			NOA-264	Situkuyok River
			NOA-265	Situkuyok River
			NOA-266	Situkuyok River
			NOA-267	Situkuyok River
			NOA-268	Situkuyok River
			NOA-269?	Igichuk Hills
			NOA-270	Igichuk Hills
			NOA-272	Igichuk Hills
			NOA-273?	Kislowrut Hills
			NOA-274	Chukchi Sea coast
			NOA-276	Igichuk Hills
			NOA-277	Krusenstern Lagoon
			NOA-278	

PROJECT, REFERENCE		DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
P. McClenahan and D. Gibson	1990	Survey	NOA-278	Krusenstern Lagoon
			NOA-280	Krusenstern Lagoon
			NOA-281?	Krusenstern Lagoon
			NOA-282	Krusenstern Lagoon
			NOA-284	Chukchi Sea coast
			NOA-285	Tulilik Lake
			NOA-286	Rabbit Creek

**Table 35. CAPE KRUSENSTERN ARCHEOLOGICAL FIELD PROJECT SUMMARY:
PREHISTORIC ARCHEOLOGICAL SITES OUTSIDE THE MONUMENT
BUT WITHIN THE NATIONAL HISTORIC LANDMARK**

* Site was previously archeologically investigated.

PROJECT, REFERENCE		DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
J.L. Giddings	1952	Excavation Survey	NOA-010 NOA-015 NOA-020	Noatak River Noatak River Noatak River
J.L. Giddings	1962	Excavation	NOA-013	Little Noatak River
D.C. Foote	1965	Survey	NOA-024 NOA-032	Eli River Noatak River
D.D. Anderson	1972	Survey	NOA-013* NOA-014	Little Noatak River
B.L.M.	1977	Inventory	NOA-061	Noatak River Delta
E. Hall	1974	Survey, Inventory	NOA-010* NOA-014* NOA-015* NOA-018 NOA-020* NOA-024* NOA-032*	
		Survey, Tests	NOA-037	Noatak River Delta
		Survey, Tests	NOA-038	Noatak River Delta
E. Hall	1974	Survey, Inventory	NOA-039 NOA-041	Igichuk Hills Noatak River

PROJECT, REFERENCE		DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
J.L. Giddings	1952	Excavation Survey	NOA-010 NOA-015 NOA-020	Noatak River Noatak River Noatak River
E. Hall	1975	Survey, Inventory	NOA-048 NOA-061	Eli River Noatak River Delta
E. Hall	1982	Survey, Inventory	NOA-069 NOA-073 NOA-079	Wulik River Wulik River Tutlak Creek
E. Hall	1983	Survey, Inventory	NOA-099	Chukchi Sea coast

**Table 36. CAPE KRUSENSTERN ARCHEOLOGICAL PROJECT SUMMARY:
HISTORIC ARCHEOLOGICAL SITES WITHIN THE NATIONAL HISTORIC LANDMARK
AND INSIDE THE MONUMENT**

? Historic status of site has not been confirmed.

PROJECT, REFERENCE	DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
J.L. Giddings 1952	Excavation Survey	NOA-001	Chukchi Sea coast
J.L. Giddings 1960	Excavation	NOA-002	Cape Krusenstern
J.L. Giddings 1967	Excavation	KTZ-005	Kotzebue
D.D. Anderson 1977	Survey	NOA-256	Rabbit Creek
E. Hall 1982	Survey, Inventory	NOA-074 NOA-080 NOA-108 NOA-109 NOA-110 NOA-111	Chukchi Sea coast Mulgrave Hills Igisukruk Mountain Igisukruk Mountains Igisukruk Mountain Igichuk Hills
P. Gleeson 1987	Excavation	NOA-003 NOA-140	Tukrok River Tukrok River

PROJECT, REFERENCE	DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
P. McClenahan and D. Gibson 1990	Survey	NOA-143?	Alutunitok Hills
		NOA-145?	Kilikmak Creek
		NOA-148?	Rabbit Creek
		NOA-149?	Rabbit Creek
		NOA-151?	Rabbit Creek
		NOA-152?	Rabbit Creek
		NOA-153?	Rabbit Creek
		NOA-154	Rabbit Creek
		NOA-157	Kotlik Lagoon
		NOA-159?	Kotlik Lagoon
		NOA-163?	Kotlik Lagoon
		NOA-166	Kotlik Lagoon
		NOA-168	Kotlik Lagoon
		NOA-171	Rabbit Creek
		NOA-173?	Noatak Lowlands
		NOA-174	Rabbit Creek
		NOA-176?	Rabbit Creek
		NOA-178?	Rabbit Creek
		NOA-180?	Omikviorok River
		NOA-183?	Rabbit Creek
		NOA-184	Agagrak Creek
		NOA-188?	Rabbit Creek
		NOA-189?	Rabbit Creek
		NOA-191	Rabbit Creek
		NOA-192	Rabbit Creek
		NOA-194	Rabbit Creek
		NOA-196	Omikviorok River
		NOA-201?	Agagrak Creek

PROJECT, REFERENCE	DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
P. McClenahan and D. Gibson 1990		NOA-202?	Agagrak Creek
		NOA-203	Imik Lagoon
		NOA-204	Agagrak Creek
		NOA-205?	Agagrak Creek
		NOA-206?	Agagrak Creek
		NOA-207	Umagatsiak Creek
		NOA-208?	Umagatsiak Creek
		NOA-209	Agagrak Creek
		NOA-210?	Tahinichok Mountains
		NOA-212?	Tahinichok Mountains
		NOA-213?	Umagatsiak Creek
		NOA-214?	Agagrak Creek
		NOA-215?	Umagatsiak Creek
		NOA-217	Agagrak Creek
		NOA-218?	Umagatsiak Creek
		NOA-220?	Umagatsiak Creek
		NOA-221?	Umagatsiak Creek
		NOA-222?	Umagatsiak Creek
		NOA-224?	Umagatsiak Creek
		NOA-225?	New Heart Creek
		NOA-226?	Omikviorok River
		NOA-227?	Rabbit Creek
		NOA-230?	Mulgrave Hills
		NOA-231?	Mulgrave Hills
		NOA-232?	Omikviorok River
		NOA-233?	Rabbit Creek
		NOA-234?	Mulgrave Hills
		NOA-236	Rabbit Creek
		NOA-237?	Rabbit Creek
		NOA-240?	Umagatsiak Creek
		NOA-242	Kilikmak Creek
		NOA-243	Kilikmak Creek

PROJECT, REFERENCE	DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
P. McClenahan and D. Gibson 1990		NOA-240?	Umagatsiak Creek
		NOA-242	Kilikmak Creek
		NOA-243	Kilikmak Creek
		NOA-245	Kilikmak Creek
		NOA-247?	Kilikmak Creek
		NOA-248?	Kilikmak Creek
		NOA-249?	Kilikmak Creek
		NOA-251?	Kakagrak Hills
		NOA-252	Kakagrak Hills
		NOA-253?	Kakagrak Hills
		NOA-254?	Kakagrak Hills
		NOA-255	Kakagrak Hills
		NOA-257	Igisukruk Mountain
		NOA-259?	Situkuyok River
		NOA-263?	Situkuyok River
		NOA-266	Situkuyok River
		NOA-269?	Igichuk Hills
		NOA-270	Igichuk Hills
		NOA-271	Igichuk Hills
		NOA-272	Igichuk Hills
		NOA-273?	Kislowrut Hills
		NOA-275	Igichuk Hills
		NOA-279	Krusenstern Lagoon
		NOA-281?	Krusenstern Lagoon
		NOA-283	Chukchi Sea coast

**Table 37. CAPE KRUSENSTERN ARCHEOLOGICAL PROJECT SUMMARY:
HISTORIC ARCHEOLOGICAL SITES OUTSIDE THE MONUMENT BUT WITHIN THE NATIONAL HISTORIC LANDMARK**

* Site has been previously archeologically investigated.

PROJECT, REFERENCE		DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
D.C. Foote	1965	Survey	NOA-024	Eli River
			NOA-028	Noatak River
			NOA-031	Noatak River
			NOA-033	Noatak River

PROJECT, REFERENCE		DESCRIPTION OF WORK	SITES INVESTIGATED	AREAS SURVEYED
E. Hall	1974	Survey, Inventory	NOA-009	Noatak River Delta
			NOA-017	Noatak River Delta
			NOA-018	Noatak River
			NOA-021	Noatak River
			NOA-023	Eli River
			NOA-024*	
			NOA-026	Eli River
			NOA-027	Noatak River
			NOA-028*	
			NOA-029	Noatak River
			NOA-030	Noatak River
			NOA-031*	
			NOA-033*	
			NOA-034	Noatak River
			NOA-037	Noatak River Delta
			NOA-038	Noatak River Delta
			NOA-040	Noatak River
			NOA-044	Noatak River
			NOA-045	Noatak River
			NOA-047	Eli River
			NOA-048	Eli River
			NOA-049	Noatak River
			NOA-050	Eli River
			NOA-054	Noatak River
			NOA-056	Noatak River
			NOA-057	Noatak River
			NOA-058	Noatak River
			NOA-059	Noatak River
E. Hall	1983	Survey, Inventory	NOA-009	Chukchi Sea coast

APPENDIX C

**Table 38. CAPE KRUSENSTERN ARCHEOLOGICAL FIELD WORK SUMMARY:
CAPE KRUSENSTERN NATIONAL MONUMENT AND NATIONAL HISTORIC LANDMARK**

* Site was revisited. ** Artifacts were collected.

RESEARCHER, REFERENCE	AREAS SURVEYED, DATES OF FIELDWORK	RECORDED OR VISITED SITES, LOCATION OF COLLECTIONS
J.L. Giddings 1952 <u>The Arctic Woodland Culture of the Kobuk River</u> . University of Pennsylvania Press, Philadelphia.	Two house pits were excavated at Ikpikauruk in 1941. Sites were tested at the mouth of the Noatak, at Sheshalik, and at Kimmik. A fifth site was reported near the confluence of the Noatak and Agashashok Rivers.	NOA-001, NOA-007, NOA-010, NOA-015, NOA-020 ** University of Pennsylvania
J.L. Giddings 1960 First Traces of Man in the Arctic. <u>Natural History</u> . 69(9): 10-19.	Excavations in 1958 and 1959 at Sheshalik and Cape Krusenstern revealed a 4,500 year cultural continuum in the Krusenstern beach ridges.	NOA-002 **Haffenreffer Museum
J.L. Giddings 1967 <u>Ancient Men of the Arctic</u> . Alfred Knopf, New York.	Excavations at Cape Krusenstern and the adjacent foothill region added Northern Archaic and Paleoarctic traditions to the cultural chronology. Excavations at Kotzebue. 1958-1961.	NOA-013, NOA-078, NOA-138, NOA-139, KTZ-005 ** University of Pennsylvania and Haffenreffer Museum
D.C. Foote 1965 Exploration and Resource Utilization in Northwestern Arctic Alaska before 1855. Unpublished Ph.D. thesis, Department of Geography, McGill University, Montreal, Quebec.	Survey and inventory of cultural resources sites along the Eli and Noatak Rivers in 1961.	NOA-024, NOA-028, NOA-031, NOA-032, NOA-033
D.D. Anderson 1972 An Archaeological Survey of the Noatak Drainage, Alaska. Arctic Anthropology 9(1):66-117.	Survey and excavations on the Noatak River in 1961, 1964, 1965, and 1966.	NOA-013* NOA-014 ** University of Pennsylvania and Haffenreffer Museum
Bureau of Land Management 1977	Inventory of a cultural site on the Noatak River Delta	NOA-061

RESEARCHER, REFERENCE	AREAS SURVEYED, DATES OF FIELDWORK	RECORDED OR VISITED SITES, LOCATION OF COLLECTIONS
D.D. Anderson 1977 Archaeological Surveys of the Proposed Cape Krusenstern and Kobuk National Monuments, Alaska. USDI-National Park Service.	Survey and testing along New Heart Creek and Rabbit Creek.	NOA-137, NOA-256 ** Haffenreffer Museum
Bureau of Land Management n.d.	Inventory	BLM-F22278
E. Hall 1973 Archaeology of the Noatak River Basin. USDI-National Park Service. 1974 Archaeological Investigations in the Noatak River Valley: Summer 1973. In The Environment of the Noatak River Basin, Alaska, edited by S.B. Young, pp. 460-527. Contributions of the Center for Northern Studies No. 1.	Hall surveyed and inventoried a number of sites along the lower, middle, and upper Noatak River, along the Eli River, and in the Igichuk Hills in 1962, 1963, 1964, 1965, 1967, and 1972. Some sites were tested or excavated	NOA-007* NOA-009* NOA-010* NOA-014* NOA-015* NOA-017* NOA-018* NOA-020* NOA-021* NOA-024*,** NOA-026* NOA-027* NOA-028* NOA-029* NOA-030* NOA-031* NOA-032* NOA-033* NOA-034* NOA-037** NOA-038** NOA-039 NOA-040 NOA-041 ** SUNY Brockport

RESEARCHER, REFERENCE	AREAS SURVEYED, DATES OF FIELDWORK	RECORDED OR VISITED SITES, LOCATION OF COLLECTIONS
E. Hall 1975 An Archaeological Survey of Interior Northwest Alaska. Anthropological Papers of the University of Alaska, 17(2): 13-30.	This survey of the Noatak and Eli Rivers was conducted in 1967.	NOA-044 NOA-045 NOA-048 NOA-049 NOA-050 NOA-054 NOA-055 NOA-056 NOA-057 NOA-058 NOA-059
E. Hall 1982 A Cultural Resource Reconnaissance performed in Conjunction with Development of the Red Dog Mine, Northwestern Alaska. Technical Memorandum #1. Edwin Hall and Associates, Brockport.	This survey was conducted along the Wulik River and the Omikviorok River, and in the Mulgrave Hills.	NOA-069 NOA-073 NOA-074 NOA-079 NOA-080 NOA-081 NOA-082
E. Hall 1983a Project specific cultural resource site inventory: the Red Dog Project. Technical Memorandum #3. Edwin W. Hall and Associates, Brockport.	The survey and inventory covered parts of the Omikviorok River, New Heart Creek, the Mulgrave Hills, the Alutunitok Hills, the Igichuk Hills, and the Chukchi Sea coast. The survey was conducted during the 1983 field season.	NOA-097 NOA-098 NOA-099 NOA-102 NOA-103 NOA-108 NOA-109 NOA-110 NOA-114 NOA-115 NOA-116

RESEARCHER, REFERENCE	AREAS SURVEYED, DATES OF FIELDWORK	RECORDED OR VISITED SITES, LOCATION OF COLLECTIONS
<p>P. Gleeson 1987 Compliance Report 85-001. On file with the Division of Cultural Resources, Alaska Regional Office, National Park Service.</p>	<p>Archeological testing was conducted in conjunction with developing an historic shelter cabin as a ranger station.</p>	<p>NOA-003*, ** National Park Service, Alaska Regional Office</p>
<p>E. Hall 1988 Test Excavations at Noa-081: Cultural Resource Site Investigations in Association with the Development and Operation of the Red Dog Mine, Northwestern Alaska. Technical Memorandum #27. Edwin S. Hall and Associates, Brockport.</p>	<p>This excavation was conducted as a result of the development of the Red Dog Mine.</p>	<p>NOA-081*, **</p>

RESEARCHER, REFERENCE	AREAS SURVEYED, DATES OF FIELDWORK	RECORDED OR VISITED SITES, LOCATION OF COLLECTIONS
P. McClenahan and D. Gibson 1990 Cape Krusenstern National Monument: an Archeological Survey, Volumes I and II. Research/Resources Management Report AR-17. USDI-National Park Service, Anchorage.	This reconnaissance-level survey was conducted in 1987 and 1988 by the National Park Service to provide a more adequate database with which to develop a resource management plan.	NOA-078* NOA-108* NOA-109* NOA-110* NOA-114* NOA-115* NOA-138* NOA-139* NOA-140 NOA-141 NOA-142 NOA-143 NOA-144 NOA-145 NOA-146 NOA-147 NOA-148 NOA-149 NOA-150 NOA-151 NOA-152 NOA-153 NOA-154 NOA-155 NOA-156 NOA-157 NOA-158 NOA-159 NOA-160 NOA-161

RESEARCHER, REFERENCE	AREAS SURVEYED, DATES OF FIELDWORK	RECORDED OR VISITED SITES, LOCATION OF COLLECTIONS
P. McClenahan and D. Gibson 1990	Survey	NOA-162 NOA-163 NOA-164 NOA-165 NOA-166 NOA-167 NOA-168 NOA-169 NOA-170 NOA-171 NOA-172 NOA-173 NOA-174 NOA-175 NOA-176 NOA-177 NOA-178 NOA-179 NOA-180 NOA-181 NOA-182 NOA-183 NOA-184 NOA-185 NOA-186 NOA-187 NOA-188 NOA-189 NOA-190 NOA-191 NOA-192 NOA-193 NOA-194

RESEARCHER, REFERENCE	AREAS SURVEYED, DATES OF FIELDWORK	RECORDED OR VISITED SITES, LOCATION OF COLLECTIONS
P. McClenahan and D. Gibson 1990	Survey	NOA-192 NOA-193 NOA-194 NOA-195 NOA-196 NOA-197 NOA-198 NOA-199 NOA-200** NOA-201 NOA-202 NOA-203 NOA-204 NOA-205 NOA-206 NOA-207 NOA-208 NOA-209 NOA-210 NOA-211 NOA-212 NOA-213 NOA-214 NOA-215 NOA-216 NOA-217 NOA-218 NOA-219 NOA-220

RESEARCHER, REFERENCE	AREAS SURVEYED, DATES OF FIELDWORK	RECORDED OR VISITED SITES, LOCATION OF COLLECTIONS
P. McClenahan and D. Gibson 1990	Survey	NOA-221 NOA-222 NOA-223 NOA-224 NOA-225 NOA-226 NOA-227 NOA-228 NOA-229 NOA-230 NOA-231 NOA-232 NOA-233 NOA-234 NOA-235 NOA-236 NOA-237 NOA-238 NOA-239 NOA-240 NOA-241 NOA-242 NOA-243 NOA-244 NOA-245 NOA-246 NOA-247 NOA-248

RESEARCHER, REFERENCE	AREAS SURVEYED, DATES OF FIELDWORK	RECORDED OR VISITED SITES, LOCATION OF COLLECTIONS
P. McClenahan and D. Gibson 1990	Survey	NOA-249 NOA-250 NOA-251 NOA-252 NOA-253 NOA-254 NOA-255 NOA-256*,** NOA-257 NOA-258 NOA-259 NOA-260 NOA-261 NOA-262 NOA-263 NOA-264 NOA-265 NOA-266 NOA-267 NOA-268 NOA-269 NOA-270 NOA-271 NOA-272 NOA-273 NOA-274 NOA-275 NOA-276 NOA-277 NOA-278

RESEARCHER, REFERENCE	AREAS SURVEYED, DATES OF FIELDWORK	RECORDED OR VISITED SITES, LOCATION OF COLLECTIONS
P. McClenahan and D. Gibson 1990	Survey	NOA-279 NOA-280 NOA-281 NOA-282 NOA-283 NOA-284 NOA-285 NOA-286 Haffenreffer Museum National Park Service, Alaska Regional Office

APPENDIX D

Environmental Correlates of Prehistoric Archeological Sites in Cape Krusenstern National Monument. Of the 142 archeological sites in Cape Krusenstern National Monument listed as probably dating to the prehistoric era, 138 were chosen for study with respect to a number of environmental associations, modeled after an approach utilized by David G. Anderson in the analysis of cultural resources at Fort Polk, Louisiana (D.G. Anderson et al. 1988). The important differences that exist between the survey samples from the two regions are discussed in the following paragraphs.

The Fort Polk study was chosen as a model because, somewhat like Fort Polk, the majority of known prehistoric or protohistoric archeological sites at Cape Krusenstern National Monument comprise nondiagnostic cultural materials found on the surface. Based on the limited amount of cultural remains or on limited site investigation, these sites are unassignable to a cultural period and sometimes are difficult to assess as to function. Included here are tables showing component occurrence by site environmental attributes. The tables provide baseline data for describing the occurrence of particular types of sites in Cape Krusenstern National Monument.

It is important to note that the Fort Polk study and this study differ dramatically in their predictive power in that the Fort Polk study sampling procedure was probabilistic in nature, while the same type of sample is not available at this time for the Cape Krusenstern analysis. However, the analysis does quantify the survey biases inherent in the Cape Krusenstern surveys and can be used as a starting place for planning future research.

Cultural Components and Their Environmental Associations.

Prehistoric sites and the artifactual assemblages and cultural features on the surface of the ground, and which were apparent to and recorded by surveyors, were placed into major temporal subdivisions. These subdivisions were based on Giddings and Anderson's (1986) cultural chronology. When one or more artifacts or features assignable to a given cultural period were noted, the presence of a cultural component dating to that period was counted for that site. Sites that were assigned as "possibles" were not included in the count.

Tables 43 through 49 show component occurrence by site environmental attributes, using the following environmental factors: distance above water, landform aspect, type of nearest water, stream rank of nearest stream, distance to nearest water, elevation of nearest water, and percent of slope.

Tables 39 through 42 show site data that were stratified according to soil type, vegetation type, physiographic region, and major drainage systems. Soils data were derived from the USDA Soil Conservation Service's Exploratory Soil Survey of Alaska (1979). The physiographic regions are those delineated by Wahrhaftig

(1965), vegetation zones were derived from aerial photographs and from site notes, and the parameters of the drainage systems were determined using USGS topographic maps, as illustrated by Bloom (1978:202).

Stream order was assigned in the manner set forth by Chow (editor, 1964). Total acreage and acreage surveyed were determined by using a standard acreage grid with USGS 1:63,360 topographic maps, and by planimeter. The areas surveyed were measured three times to assure the closest approximation.

Sample environmental data with respect to nonsite locations (such as that used by D.G. Anderson et al. 1988) are not available at this time. Therefore, the charts only present quantified descriptive data for the known archeological sites that were included in this analysis. In order to document whether observed distributions of cultural resources were reflections of cultural factors or chance factors, such random nonsite data would have to be gathered and applied here in a comparative framework.

**TABLE 39. KNOWN PREHISTORIC CULTURAL COMPONENTS
IN CAPE KRUSENSTERN NATIONAL MONUMENT:
OCCURRENCE BY SOIL TYPE**

CULTURAL TRADITION	IQ2	IQ7	IQ24	TOTAL
PALEOARCTIC		1	4	5
NORTHERN ARCHAIC			4	4
ARCTIC SMALL TOOL				
UNDIFFERENTIATED				
DENBIGH	4	1		5
CHORIS	1			1
OLD WHALING	1			1
NORTON	1		1	2
IPIUTAK	2		1	3
NORTHERN MARITIME				
UNDIFFERENTIATED	1			1
BIRNIRK	1			1
EARLY WESTERN THULE	2			2
LATE WESTERN THULE	3			3
UNDIFFERENTIATED	2		1	3
KOTZEBUE	5	1	1	7
UNDIFFERENTIATED PREHISTORIC	6	4	4	14
NONDIAGNOSTIC LITHIC SCATTER	4	9	30	43
NONDIAGNOSTIC BLADE AND CORE	1	2	3	6
NONDIAGNOSTIC GROUND SLATE			1	1
UNDATED ROCK FEATURES				
CAIRNS		7	17	24
STONE HOUSE			1	1
TENT RINGS	2		10	12
BLIND OR SHELTER		1	5	6
ROCK FEATURES AND LITHICS		3	2	5
TOTAL CULTURAL COMPONENTS	36	29	85	150
% OF TOTAL CULTURAL COMPONENTS	24	19	57	100
TOTAL DIAGNOSTIC COMPONENTS	23	3	12	38
% OF TOTAL DIAGNOSTIC COMPONENTS	60.5	7.8	31.5	100
TOTAL NONDIAGNOSTIC COMPONENTS	13	26	73	112
% OF TOTAL NONDIAGNOSTIC COMPONENTS	11.6	23	65	100
TOTAL ACREAGE IN MONUMENT	187719.7	162628.4	309458.7	659,807
% OF TOTAL ACREAGE IN MONUMENT	28	25	47	100
TOTAL PREHISTORIC SITES	26	29	83	138
TOTAL ACREAGE SURVEYED*	510	307	1,590	2407
% TOTAL AREA SURVEYED	21	13	66	100
SITE DENSITY PER 100 ACRES	5	9	5	6

*National Park Service survey only. Data from other pedestrian surveys not available.

**TABLE 40. KNOWN PREHISTORIC CULTURAL COMPONENTS IN CAPE KRUSENSTERN
NATIONAL MONUMENT: OCCURRENCE BY VEGETATION TYPE**

CULTURAL TRADITION	UA	NTT	TT	WSF	TOTAL
PALEOARCTIC	3	2			5
NORTHERN ARCHAIC	1	3			4
ARCTIC SMALL TOOL UNDIFFERENTIATED					
DENBIGH		1	4		5
CHORIS			1		1
OLD WHALING			1		1
NORTON			2		2
IPIUTAK			3		3
NORTHERN MARITIME UNDIFFERENTIATED			1		1
BIRNIRK			1		1
EARLY WESTERN THULE			2		2
LATE WESTERN THULE			3		3
UNDIFFERENTIATED			3		3
KOTZEBUE		3	4		7
UNDIFFERENTIATED PREHISTORIC	4	4	6		14
NONDIAGNOSTIC LITHIC SCATTER	16	24	3		43
NONDIAGNOSTIC BLADE AND CORE		4	2		6
NONDIAGNOSTIC GROUND SLATE	1				1
UNDATED ROCK FEATURES					
CAIRNS	14	8	2		24
STONE HOUSE		1			1
TENT RINGS	6	6			12
BLIND OR SHELTER	5	1			6
ROCK FEATURES AND LITHICS	4	1			5
TOTAL CULTURAL COMPONENTS	54	58	38	0	150
% OF TOTAL CULTURAL COMPONENTS	36	39	25	0	100
TOTAL DIAGNOSTIC COMPONENTS	4	9	25	0	38
% OF TOTAL DIAGNOSTIC COMPONENTS	10.5	23.7	65.8	0	100
TOTAL NONDIAGNOSTIC COMPONENTS	50	49	13	0	112
% OF TOTAL NONDIAGNOSTIC COMPONENTS	11.6	23	65	0	100
TOTAL ACREAGE PER SOIL TYPE	95764.3	340007.1	219642.8	4392.8	659807
% TOTAL ACREAGE IN MONUMENT	14.5	51.5	33.3	0.67	100
TOTAL PREHISTORIC SITES	54	56	28	0	138
TOTAL ACREAGE SURVEYED*	645	1007	651	104	2407
% TOTAL AREA SURVEYED*	27	42	27	4	100
SITE DENSITY PER 100 ACRES	8.37	5.56	4.3	0	5.7

*National Park Service survey only. Data from other pedestrian surveys not available.

**TABLE 41. KNOWN PREHISTORIC CULTURAL COMPONENTS IN CAPE KRUSENSTERN NATIONAL MONUMENT:
OCCURRENCE BY PHYSIOGRAPHIC PROVINCE**

PREHISTORIC CULTURAL TRADITION	WULIK LOWLANDS	MULGRAVE HILLS	COASTAL LOWLANDS	NOATAK LOWLANDS	IGICHUK HILLS	TOTALS
PALEOARCTIC		3			2	5
NORTHERN ARCHAIC		1			3	4
ARCTIC SMALL TOOL						
DENBIGH		1	4			5
CHORIS			1			1
OLD WHALING			1			1
NORTON			2			2
IPIUTAK			3			3
NORTHERN MARITIME						
UNDIFFERENTIATED			1			1
BIRNIRK			1			1
EARLY WESTERN THULE			2			2
LATE WESTERN THULE			3			3
UNDIFFERENTIATED			3			3
KOTZEBUE		2	5			7
UNDIFFERENTIATED PREHISTORIC		7	6		1	14
NONDIAGNOSTIC LITHIC SCATTER		34	2		7	43
NONDIAGNOSTIC BLADE AND CORE		4	1		1	6
NONDIAGNOSTIC GROUND SLATE					1	1
UNDATED ROCK FEATURES						
CAIRNS		17	1		6	24
STONE HOUSES		1				1
TENT RINGS		10			2	12
BLINDS OR SHELTERS		5			1	6
ROCK FEATURES AND LITHICS		5				5
TOTAL CULTURAL COMPONENTS		90	36		24	150
% OF TOTAL CULTURAL COMPONENTS	0	60	24	0	16	100
TOTAL DIAGNOSTIC COMPONENTS	0	7	26	0	5	38
% OF TOTAL DIAGNOSTIC COMPONENTS	0	18.4	68.4	0	13	100
TOTAL NONDIAGNOSTIC COMPONENTS	0	83	10	0	19	112
% OF TOTAL NONDIAGNOSTIC COMPONENTS	0	74	8.9	0	16.9	100

PREHISTORIC CULTURAL TRADITION	WULIK LOWLANDS	MULGRAVE HILLS	COASTAL LOWLANDS	NOATAK LOWLANDS	IGICHUK HILLS	TOTALS
ACREAGE IN EACH PROVINCE	13291.02	204112.94	165189.08	253479.77	23734.05	659806.86
% OF TOTAL ACREAGE BY PROVINCE	2	30.9	25	38.4	3.6	100
TOTAL PREHISTORIC SITES BY PROVINCE	0	88	26	0	24	138
*TOTAL ACREAGE SURVEYED BY PROVINCE						
% TOTAL ACREAGE SURVEYED BY PROVINCE	NO DATA	733	559	52	1063	2407
	NO DATA	30.4	23.2	2.2	44	100
SITE DENSITY PER 100 ACRES		12	4.7	0	2.3	6

*National Park Service survey only. Data from other pedestrian surveys are not available.

**TABLE 42. KNOWN PREHISTORIC CULTURAL COMPONENTS IN CAPE KRUSENSTERN NATIONAL MONUMENT:
OCCURRENCE BY DRAINAGE**

DRAINAGE	TOTAL ACREAGE	ACRES SURVEYED	% DRAINAGE SURVEYED	PREHISTORIC SITES	SITE DENSITY*
Noatak River	n/a	n/a	n/a	n/a	n/a
Omikviorok River	79,941	**208.8	0.26	12	6
Rabbit Creek	71,089.9	**538.56	0.76	39	7
Situkoyuk and Tukrok Rivers, Milokrawlok Creek	69,701	965.12	1.4	9	1
Kilikmak Creek	36,085	201.6	0.6	7	3
Jade Creek	22,424.7	178.6	0.8	9	5
Evelukpalik River	17,964	92.16	0.5	0	<1
Agagrak Creek	8,449.9	120.96	1.4	12	10
New Heart Creek	7,981.6	34.56	0.4	3	9
Ququqsogvik Creek	6,586	5.76	0.09	0	<1
Umagatsiak Creek	4,251	25.92	0.6	7	27
TOTALS	324,474.1	2372.04	0.7	98	4

* Site density per 100 acres ** National Park Service survey only. Data from other pedestrian surveys are not available.

**TABLE 43. KNOWN PREHISTORIC CULTURAL COMPONENTS IN CAPE KRUSENSTERN NATIONAL MONUMENT:
OCCURRENCE BY TYPE OF NEAREST WATER, STREAM RANK OF NEAREST WATER, AND DISTANCE IN METERS TO NEAREST WATER**

CULTURAL TRADITION	TYPE OF NEAREST WATER		STREAM RANK OF NEAREST WATER				DISTANCE IN METERS TO NEAREST WATER		
	STREAM	LAKE/POND	R1	R2	R3	R4	MIN	MAX	AVG
PALEOARCTIC	5	0	2		2	1	0.15	0.5	0.32
NORTHERN ARCHAIC	3	1	2	1			0.0	0.0	1.09
ARCTIC SMALL TOOL UNDIFFERENTIATED									
DENBIGH	1	4	1				0.0	0.6	0.2
CHORIS		1					0.0	0.0	0.0
OLD WHALING		1					0.0	0.0	0.0
NORTON	1	1	1				0.0	0.5	0.25
IPIUTAK	1	2	1				0.0	1.0	0.5
NORTHERN MARITIME UNDIFFERENTIATED		1	1				1.2	1.2	1.2
BIRNIRK		1					0.0	0.0	0.0
EARLY WESTERN THULE		2							
LATE WESTERN THULE	1	2							
UNDIFFERENTIATED	1	2		1					
KOTZEBUE	3	4			1	2	0.0	4.2	0.78
UNDIFFERENTIATED PREHISTORIC	9	5	3	3	3		0.0	2.4	0.84
NONDIAGNOSTIC LITHIC SCATTER	41	2	7	19	10	5	0.0	1.9	0.52
NONDIAGNOSTIC BLADE AND CORE	6		1	2	1	2	0.2	1.2	0.45
NONDIAGNOSTIC GROUND SLATE	1		1				1	1	1
UNDATED ROCK FEATURES									
CAIRNS	24		19	5			0.0	1.6	0.85
STONE HOUSE	1			1			0.2	0.2	0.2
TENT RINGS	12		4	3	5		0.0	1.0	0.38
BLIND OR SHELTER	6		6				0.0	1.6	0.76
ROCK FEATURES AND LITHICS	5		2	2	1		0.5	1.6	1.22

TABLE 44. KNOWN PREHISTORIC CULTURAL COMPONENTS IN CAPE KRUSENSTERN NATIONAL MONUMENT: OCCURRENCE BY ELEVATION ABOVE NEAREST WATER, IN FEET

CULTURAL TRADITION	STREAM	LAKE OR POND	TOTAL	MIN	MAX	AVG	SD
PALEOARCTIC	5		5	50	100	84.4	20.3
NORTHERN ARCHAIC	2	1	3	36	100	62	27.5
ARCTIC SMALL TOOL							
UNDIFFERENTIATED							
DENBIGH	1	4	5	0	100	20	0
CHORIS		1	1	0	0	0	0
OLD WHALING		1	1	0	0	0	0
NORTON	1	1	2	0	25	12.5	12.5
IPIUTAK	1	2	3	0	25	8.33	17.7
NORTHERN MARITIME							
UNDIFFERENTIATED		1	1	0	0	0	0
BIRNIRK		1	1	0	0	0	0
EARLY WESTERN THULE		2	2	0	0	0	0
LATE WESTERN THULE	1	2	3	0	0	0	0
UNDIFFERENTIATED	1	2	3	0	50	16.7	23.6
KOTZEBUE	3	4	7	0	100	32.1	29
UNDIFFERENTIATED							
PREHISTORIC	9	5	14	0	550	110	172
NONDIAG. LITHIC SCATTER	41	2	43	0	606	168	136
NONDIAG. BLADE & CORE	6		6	50	250	125	69
NONDIAG. GROUND SLATE	1		1	350	350	350	0
UNDATED ROCK FEATURES							
CAIRNS	24		24	25	760	255	162
STONE HOUSE	1		1	.2	.2	.2	0
TENT RINGS	12		12	.01	.5	.37	.43
ROCK FEATURES & LITHICS	5		5	8	2	1	.54

TABLE 45. KNOWN PREHISTORIC CULTURAL COMPONENTS IN CAPE KRUSENSTERN NATIONAL MONUMENT:
OCCURRENCE BY DISTANCE TO NEAREST WATER IN INTERVALS OF 0.50 METERS

CULTURAL TRADITION	0.00- 0.49 m	0.50- 0.99 m	1.00- 1.49 m	1.50- 1.99 m	2.00- 2.49 m	2.50- 2.99 m	3.00 m & MORE	TOTAL
PALEOARCTIC	4	1						5
NORTHERN ARCHAIC	2		1				1	4
ARCTIC SMALL TOOL UNDIFFERENTIATED								
DENBIGH	4	1						5
CHORIS	1							1
OLD WHALING	1							1
NORTON	1	1						2
IPIUTAK	1	1	1					3
NORTHERN MARITIME UNDIFFERENTIATED	1							1
BIRNIRK	1							1
EARLY WESTERN THULE	2							2
LATE WESTERN THULE	2	1						3
UNDIFFERENTIATED	2	1						3
KOTZEBUE	4	1	1				1	7
UNASSIGNABLE PREHISTORIC	5	3		4	2			14
NONDIAGNOSTIC LITHIC SCATTER	28	5	6	4				43
NONDIAGNOSTIC BLADE AND CORE	4	1	1					6
NONDIAGNOSTIC GROUND SLATE			1					1
UNDATED ROCK FEATURES								
CAIRNS	8	3	9	4				24
STONE HOUSE	1							1
TENT RINGS	8	2	2					12
BLIND OR SHELTER	3		2	1				6
ROCK FEATURES AND LITHICS	1	3	1					5
								(cont.)

CULTURAL TRADITION	0.00- 0.49 m	0.50- 0.99 m	1.00- 1.49 m	1.50- 1.99 m	2.00- 2.49 m	2.50- 2.99 m	3.00 m & MORE	TOTAL
(Table 45 continued)								
	84	24	25	13	2	0	2	150
TOTAL CULTURAL COMPONENTS	56	16	16.7	8.7	1.3	0	1.3	100
% OF TOTAL CULTURAL COMPONENTS	26	7	3	0	0	0	2	38
TOTAL DIAGNOSTIC COMPONENTS	68	18	7.8	0	0	0	5.3	100
% OF TOTAL DIAGNOSTIC COMPONENTS	58	17	22	13	2	0	0	112
TOTAL NONDIAGNOSTIC COMPONENTS	52	15	20	12	1	0	0	100
% TOTAL NONDIAGNOSTIC COMPONENTS								

**TABLE 46. KNOWN PREHISTORIC CULTURAL COMPONENTS IN CAPE KRUSENSTERN NATIONAL MONUMENT:
OCCURRENCE BY DISTANCE ABOVE WATER, MEASURED IN 50-FOOT INTERVALS**

CULTURAL TRADITION	0- 49	50- 99	100- 149	150- 199	200- 249	250- 299	300- 349	350- 399	400- 449	450- 499	500- 549	550- 599	600- 649	650- 699	700- 749	750- 799	UNKNOWN
PALEOARCTIC		2	3														
NORTHERN ARCHAIC	1	1	1		1												
ARCTIC SMALL TOOL																	
UNDIFFERENTIATED	4		1														
DENBIGH																	
CHORIS	1																
OLD WHALING	1																
NORTON	2																
IPIUTAK	3																
NORTHERN MARITIME																	
UNDIFFERENTIATED	1																
BIRNIRK	1																
EARLY WESTERN THULE	2																
LATE WESTERN THULE	3																
UNDIFFERENTIATED	2	1															
KOTZEBUE	7		1														
UNDIFFERENTIATED PREHISTORIC	9		1	1			1		1			1					
NONDIAG. LITHIC SCATTER	6	8	9	3	6	3	1	1	4		1		1				
NONDIAG. BLADE & CORE		2	1	2		1											
NONDIAG. GROUND SLATE								1									
UNDATED ROCK FEATURES																	
CAIRNS	1	3		5	2	2	5	2	1	2						1	
STONE HOUSES		1															
TENT RINGS	6	1		1	1		1	2									
BLINDS OR SHELTERS						1	3				1	1					
ROCK FEATURES & LITHICS			1				2	2									
TOTAL CULTURAL COMPONENTS	50	19	18	12	10	7	13	8	6	2	2	2	1	0	0	1	
% TOTAL CULTURAL COMPONENTS	33	13	12	8	7	5	9	5	4	1	1	1	.6	0	0	.6	
TOTAL DIAGNOSTIC COMPONENTS	28	4	5	0	1	0	0	0	0	0	0	0	0	0	0	0	
% TOTAL DIAGNOSTIC COMPONENTS	74	11	13	0	2	0	0	0	0	0	0	0	0	0	0	0	
TOT. NONDIAGNOSTIC COMPONENTS	22	15	12	12	9	7	3	8	6	2	2	2	1	0	0	1	10
% TOTAL NONDIAGNOSTIC COMPONENTS	20	13	10.7	10.7	8	6	2.7	7	5	1.8	1.8	1.8	.9	0	0	.9	8.9

**TABLE 47. KNOWN PREHISTORIC CULTURAL COMPONENTS IN CAPE KRUSENSTERN NATIONAL MONUMENT:
OCCURRENCE BY DISTANCE IN METERS TO NEAREST CONFLUENCE, STREAM RANK BELOW NEAREST CONFLUENCE**

CULTURAL TRADITION	WATER TYPE		STREAM RANK			
	STREAM	THAW LAKE/POND	R1	R2	R3	R4
PALEOARCTIC	5		1	1	1	2
NORTHERN ARCHAIC	3		1	1	1	
ARCTIC SMALL TOOL UNDIFFERENTIATED						
DENBIGH	1	4				1
CHORIS		1				
OLD WHALING		1				
NORTON	1	1	1			
IPIUTAK	1	2	1			
NORTHERN MARITIME UNDIFFERENTIATED		1				
BIRNIRK		1				
EARLY WESTERN THULE		2				
LATE WESTERN THULE	1	2	1			
UNDIFFERENTIATED	1	2	1			
KOTZEBUE	3	4			1	2
UNDIFFERENTIATED PREHISTORIC	9	5		6	3	
NONDIAGNOSTIC LITHIC SCATTER	41	2		20	12	9
NONDIAGNOSTIC BLADE AND CORE	6		1	2	1	2
NONDIAGNOSTIC GROUND SLATE	1		1			
UNDATED ROCK FEATURES						
CAIRNS	24		10	10	4	
STONE HOUSE	1			1		
TENT RINGS	12			5	7	
BLIND OR SHELTER	6			4	2	
ROCK FEATURES AND LITHICS	5			3	2	

(continued)

CULTURAL TRADITION	WATER TYPE		STREAM RANK			
	STREAM	THAW LAKE/POND	R1	R2	R3	R4
TOTAL CULTURAL COMPONENTS	121	28	18	53	34	16
% OF TOTAL CULTURAL COMPONENTS	81.2	18.8	14.8	43.8	28	13
TOTAL DIAGNOSTIC COMPONENTS	16	21	6	2	3	5
% OF TOTAL DIAGNOSTIC COMPONENTS	13.2	75	33.3	3.8	8.8	31.3
TOTAL NONDIAGNOSTIC COMPONENTS	105	7	12	51	31	11
% TOTAL NONDIAGNOSTIC COMPONENTS	86.8	25	66.7	96.2	91.2	68.7

**TABLE 48. KNOWN PREHISTORIC CULTURAL COMPONENTS IN CAPE KRUSENSTERN NATIONAL MONUMENT:
OCCURRENCE BY PERCENT OF SLOPE**

CULTURAL TRADITION	LEVEL	< 5%	5-10%	11-15%	16-20%	21-30%	31-40%	> 40%	TOTAL
PALEOARCTIC			1	3		1			5
NORTHERN ARCHAIC		1	2	1					4
ARCTIC SMALL TOOL UNDIFFERENTIATED									
DENBIGH	4			1					5
CHORIS	1								1
OLD WHALING	1								1
NORTON	2								2
IPIUTAK	3								3
NORTHERN MARITIME UNDIFFERENTIATED	1								1
BIRNIRK	1								1
EARLY WESTERN THULE									
LATE WESTERN THULE UNDIFFERENTIATED									
KOTZEBUE	6			1					7
UNDIFFERENTIATED PREHISTORIC	6		1	3		4			14
NONDIAGNOSTIC LITHIC SCATTER		3	11	10	9	7	3		43
NONDIAGNOSTIC BLADE AND CORE		2		2		2			6
NONDIAGNOSTIC GROUND SLATE						1			1
UNDATED ROCK FEATURES									
CAIRNS			1	7	4	7	5		24
STONE HOUSE				1					1
TENT RINGS		4	1	3	2	1	1		12
BLIND OR SHELTER						4	2		6
ROCK FEATURES AND LITHICS	8		1	1	2	1			13
TOTAL CULTURAL COMPONENTS	33	10	18	33	17	28	11		150
% OF TOTAL CULTURAL COMPONENTS	22	6.7	12	22	11.3	18.7	7.3		100
TOTAL DIAGNOSTIC COMPONENTS	19	1	3	6	0	1	0		30
% OF TOTAL DIAGNOSTIC COMPONENTS	63	3	10	20	0	3	0		99
TOTAL NONDIAGNOSTIC COMPONENTS	14	9	15	27	17	27	11		120
% TOTAL NONDIAGNOSTIC COMPONENTS	11.7	7.5	12.5	22.5	14	22.5	9.2		99.9

**TABLE 49. KNOWN PREHISTORIC CULTURAL COMPONENTS IN CAPE KRUSENSTERN NATIONAL MONUMENT:
OCCURRENCE BY LANDFORM ASPECT**

CULTURAL TRADITION	LEVEL	NW	N	NE	E	SE	S	SW	W	TOTAL
PALEOARCTIC							4	1		5
NORTHERN ARCHAIC					1	1	2			4
ARCTIC SMALL TOOL			1				2	2		5
UNDIFFERENTIATED								1		1
DENBIGH										1
CHORIS	1									1
OLD WHALING	1									1
NORTON	1								1	2
IPIUTAK	1							1	1	3
NORTHERN MARITIME										
UNDIFFERENTIATED	1									1
BIRNIRK	1									1
EARLY WESTERN THULE	2									2
LATE WESTERN THULE	2							1		3
UNDIFFERENTIATED	1								1	2
KOTZEBUE	5						2			7
UNDIFFERENTIATED PREHISTORIC	5	2				1	4		2	14
NONDIAGNOSTIC LITHIC SCATTER	2	5	1	2	6	2	14	6	5	43
NONDIAGNOSTIC BLADE AND CORE		2	1	1		1	1			6
NONDIAGNOSTIC GROUND SLATE									1	1
UNDATED ROCK FEATURES										
CAIRNS	1	2	3	1	1	3	7		6	24
STONE HOUSE									1	1
TENT RINGS		3	1	1	2	2	2		1	12
BLIND OR SHELTER		2	2		1		1			6
ROCK FEATURES AND LITHICS						1	1	3		5
TOTAL CULTURAL COMPONENTS	24	16	9	5	11	11	40	15	19	150
% OF TOTAL CULTURAL COMPONENTS	16	10.7	6	3.3	7.3	7.3	27	10	12	100
TOTAL DIAGNOSTIC COMPONENTS	16	0	1	0	1	1	10	6	3	38
% OF TOTAL DIAGNOSTIC COMPONENTS	42	0	2.6	0	2.6	2.6	26.3	15.8	7.9	99.8
TOTAL NONDIAGNOSTIC COMPONENTS	8	16	8	5	10	10	30	9	16	112
% TOTAL NONDIAGNOSTIC COMPONENTS	7.1	14.3	7.1	4.5	8.9	8.9	26.8	8	14.3	99.9

BEACH RIDGE CRESTS AND ASSOCIATED ARCHEOLOGICAL SITES
CAPE KRUSENSTERN, ALASKA

Image removed from the electronic edition in an effort to protect sensitive cultural resources.

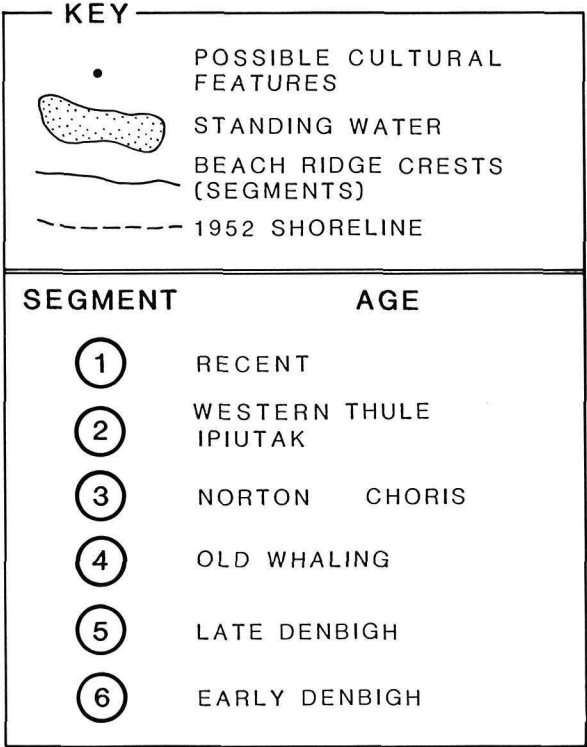
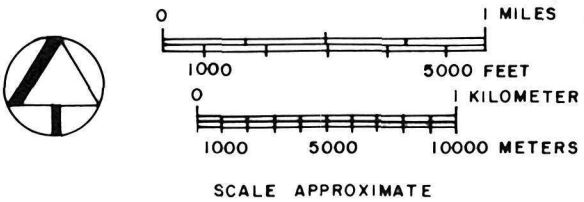


Figure 82. Beach ridge crests and associated archeological sites at NOA-002, Cape Krusenstern, after Giddings and Anderson (1986) and Zimmerman (1978, 1981).



APPENDIX E

SAMPLE ARCHEOLOGICAL SURVEY SITE FORM

SITE DESIGNATION

Park Unit:_____ Prehistoric_____ Historic_____ Other_____

AHRS No.:_____ NPS Field Site No.:_____ Date_____

Recorders:

(PLEASE PRINT LEGIBLY.)

SITE SUMMARY (short, concise, descriptive statement of what site consists of):

LOCATIONAL INFORMATION

SITE LOCATION (general-to-specific description of site location with reference to major geographic features on USGS map):

AIR PHOTO REFERENCE:_____ SITE ELEV.(ft/m)_____

USGS MAP:_____ QUAD:_____
SERIES:_____

LEGAL DESCRIPTION: T R SEC. , 1/4 1/4 1/4

UTM: Zone 3 EASTING NORTHING

LATITUDE: ' " LONGITUDE: ' "

SITE ENVIRONMENT

TOPOGRAPHY/PHYSICAL SETTING:

(Include surrounding area, site microenvironment, type of land form, degree of drainage, slope, orientation, view, nearby water, distance to rivers/lakes;
DESCRIBE THE SITE'S PHYSICAL SETTING TO A BLIND PERSON.)

VEGETATION:

(Start with general area description, then site specific detail. use recognized regional plant communities.)

WILDLIFE:

SOIL/STRATIGRAPHY:

(Use separate sheet for detailed profiles.)

SITE DESCRIPTION

SITE SYNOPSIS:

(a general, descriptive statement of the site to provide context for the detailed site description that follows)

SITE DIMENSIONS:	LENGTH (m)	DIRECTION
	WIDTH (m)	DIRECTION

DETAILED SITE DESCRIPTION:

(Describe in detail the features outlined in the general site synopsis.)

SITE DESCRIPTION (continued)

CULTURAL MATERIALS:

(Describe in detail the artifacts outlined in the general site synopsis.)

DISCUSSION AND EVALUATION

POTENTIAL SITE SIGNIFICANCE:

ATTACHMENTS:

(site map, site notes, artifact drawings, area map, lithic data sheet, profile drawings)

GLOSSARY OF TERMS

GLOSSARY OF TERMS

A.D.

An abbreviation for Anno Domini; within the Christian Era.

AHRS

Alaska Heritage Resource Survey

ANCSA

Alaska Native Claims Settlement Act.

ASL

Above sea level.

Activity area

The site of a single activity or event.

Adz (Adze)

An axe-like tool with a chisel-type blade (beveled from one side only), generally hafted, and used for shaping wood.

Aeolian (eolian)

Relating to, transmitted by, or caused by the wind.

Affiliation

See cultural affiliation.

Alignment

A linear (line-like) arrangement of objects, in this context stone or other durable material.

Alluvium (alluvial)

Material deposited by rivers; the largest deposits of alluvium are flood plains and deltas. Build-up of alluvial material may occur where a river overflows its banks.

Altered flake

A lithic flake that shows signs of being changed chemically by natural agents, utilized, retouched or shaped for use. See also flake, retouch.

Amorphous

Literally, without form; often refers to artifacts with an irregular or undefinable shape.

Anomalies

Irregularities; uncommon occurrences.

Antiquity

The quality or state of being old or ancient; something dating from ancient times.

Anvil stone

A stone with a flat top used as a platform on which to rest objects that will be struck with a hammer or hammerstone. Often used as a rest for cores while flakes or blades are struck from them using a hammerstone or pressure flaking implement. The tops of anvil stones usually show some form of battering.

Archeological culture

The collection of artifacts, methods of doing things, and patterns of arrangements that characterize a group of people at a particular time and place.

Archeological resource

All evidence of past human activity that can be used to reconstruct the lifeways of past peoples. Such evidence includes sites, artifacts, and features as well as all other relevant information, including the contexts in which they occur. Archeological resources include material elements of both prehistoric and historic cultures.

Arris

A ridge formed by adjoining flake scars, resembling a crest or spine. Arrises are often used to help guide the flake or blade from the core.

Articulated

Objects that are placed together to form joints. Skeletal parts left in their original position (joints intact), and fire-cracked rock in which the broken pieces are still in contact with one another are examples of articulated objects.

Artifact

Any object made, modified or used by humans. Artifacts may range from a coarse stone used to flake lithic material to a tool representing high technical accomplishment and may be made from any material. Anything that exhibits physical attributes assumed to be the result of human activity.

Assemblage

A set of objects found in association with each other and therefore assumed to belong to one phase in time and one group of people. An assemblage can be made up of many different types of objects and differs from an industry in that the latter describes a set of objects in one medium (material type). Thus at a given site, an assemblage might include lithic, bone and shell artifacts while an industry might include just the lithic materials. An assemblage may reflect the full range of artifacts available to a particular group of people at one time.

Association

Objects are said to be associated when they are found together in a context that suggests simultaneous deposition. For example, the objects found in a single cache pit or on a single house floor are said to be 'in association' as it would seem they were deposited around the same time. Associations between artifacts are the basis for relative dating methods.

Attribute

An arbitrarily selected characteristic of an artifact used to divide artifacts into classes or types for easier description. Attributes may describe an artifact's form, function, context or association with other artifacts.

B.C.

Abbreviation for years before the birth of Christ.

B.P.

An abbreviation for before present used in age determinations. In calculating radiocarbon dates, "present" means 1950.

Backed blade

A blade which has been dulled along one lateral edge ("backed") to facilitate use.

Barrier dune

A long, narrow sand dune parallel to and relatively close to the coastline, separated from it by a lagoon. Barrier dunes are constantly shifting due to the forces of wind and water at the coastline.

Battering

Damage done to stone by a series of forceful blows.

Beachridge (beach ridge)

One of a series of ridges built up over time by deposition of sand, gravel, rocks, and debris by ocean waves.

Bedrock

The solid rock that underlies gravel, soil or other surficial material.

Beringia

An ancient land mass which occupied the region that now includes Western Alaska, Northeastern Siberia, and the shallow parts of the Bering and Chukchi seas. During the Pleistocene glacial maxima, this region was above sea level and is presumed to have been the avenue for human migrations between the Old and New worlds.

Berm

A narrow ridge or shelf. A mound of earth or sod that marks the edge of a collapsed semisubterranean house site, or tent site.

Biconvex

Refers to a bifacially flaked artifact which is convex on both sides or faces due to fluting or thinning.

Biface (bifacial)

A lithic tool class defined by the presence of flaking on both faces or sides. This class includes projectile points, hafted and non-hafted knives, as well as less specialized forms referred to as bifaces.

Biface base

The base (or proximal end) of a bifacially flaked tool. See also biface.

Bioturbation

Disturbance of sediments by animals (burrowing, trampling, etc.).

Blade

A long, thin flake with parallel or nearly parallel lateral edges, the length of which is equal to or greater than twice the width. Blades may be triangular or trapezoidal in cross section. See also microblade, blade-like flake.

Blade and core technology

The understanding of method and mastery of skill for making lithic tools from blades and specially prepared cores. A class of tools based on the production of blades from cores.

Blade core

The carefully pre-shaped core of parent material (stone) from which blades are struck (removed). Blade cores are typified by the presence of a large, flat striking platform. The core may be pyramidal, cylindrical, or wedge-shaped. Blades are removed from the core at right angles to the striking platform. The removal of one blade prepares the core for the removal of others, producing a fluted appearance on this surface of the core, often called the 'flute face.' See also microblade core, flute face.

Blade-like flake

A lithic flake which exhibits some of the characteristics of a blade but is not considered to be the product of a blade and core technology. See also blade and core technology, blade.

Blank

A usable piece of lithic material, large enough for making a lithic artifact. No indication of the artifact shape, style or function is apparent. Not to be confused with a preform, which bears the shape of the intended artifact. See also preform.

Blowout

An area of variable size from which the surface soils or sediments have been removed by wind, leaving a resistant lower level.

Bulb of percussion

One of the characteristic attributes of a flake, consisting of a thickened bulb-like protrusion on the underside of the flake produced by the force that detached the flake from the core.

Burial platform

An elevated wooden platform upon which a body is placed (the body may or may not be contained in a coffin) rather than buried in the ground.

Burin (burinated)

A chisel-like stone implement formed by the removal of a specialized flake (or spall), parallel or roughly parallel to the long axis of the tool, generally forming a right angle edge on one or both margins of the flake scar. The burin may be modified by the removal of other transverse or oblique burin spalls. A flake or core from which a burin spall has been removed is referred to as burinated (e.g. burinated blades, burinated flakes, etc.). See also burin spall.

Burin blow

A carefully calculated forceful blow applied to a tool to remove a spall and create a burin. See also burin, burin spall.

Burin preparation

Preparation of a stone for the removal of a burin spall; the process of manufacturing a burin. See also burin, burin spall, burin blow.

Burin spall

A specialized flake or blade removed from a burin. The spall is thick in relation to its length and is usually triangular or rectangular in cross section.

Cache

A storage place (often concealed or otherwise protected) for food, supplies, or valuables.

Cairn

A stack or pile of stones or an upright stone used to mark a specific location or in the hunting of caribou.

Calcareous

Made up of, or containing, limestone, calcium, or calcium carbonate.

Calcined

Heated to a high temperature causing loss of moisture, reduction, or oxidation.

Campsite

Any location where humans have camped in the past. The term implies that habitation was temporary. The presence of at least one hearth is implied.

Cancellous

Having a coarse net-like or spongy structure, such as the interior portion of a bone.

Canid (Canine)

Of, relating to, or typical of a member of the family Canidae, including dogs, wolves, and foxes.

Carbon-14 dating

See radiocarbon dating.

Carbonaceous

Composed of, containing, or yielding carbon.

Ccs

See Cryptocrystalline silicate.

Cenozoic

The last era of geologic time which includes the Tertiary and Quaternary periods and is marked by the evolution of mammals, birds, plants, modern continents, and glaciation.

Chalcedony

A translucent to transparent milky or grayish quartz with microscopic crystals arranged in slender fibers in parallel bands.

Check-stamped

A pottery decoration design of small, impressed squares produced by pressing the clay with a paddle or stamp.

Chemically altered chert or obsidian

Stone which is changed in some way through contact with chemical agents. At Cape Krusenstern, researchers discovered artifacts made of chert and obsidian which had been patinated or encrusted in a layer of limestone cement. This was the product of a natural process of chemical alteration.

Chert

A compact, siliceous rock with quartz particles that can be discerned either by the unaided eye or by magnification up to 14 times. Most varieties of chert are opaque, although some may be semitranslucent along thin edges. Variations in color and texture distinguish commonly used popular names for different types of chert: jasper, flint, etc.

Christian era

The period of time beginning with the birth of Jesus Christ and running through the present. Dates within this range of time are indicated by the designation "A.D." (Anno Domini).

Clast

A fragment of stone.

Cobble

An unmodified nodule of stone.

Coccyx

A bone at the base of the spinal column composed of several fused vertebrae.

Colluvial (colluvium)

A loose deposit of rock debris at the base of a cliff or slope.

Component

The manifestation of a given archeological focus at a specific site.

Concentration

A number of objects located in proximity to one another, as in an artifact concentration or lithic concentration.

Context

The spatial and chronological setting of an artifact or other element in a site; the relationship between the associated materials in a site.

Core

A stone artifact from which flakes are removed, leaving numerous flake scars or negative bulbs of applied force. It may be used as a tool or as a blank from which other tools are made. See also blade core, microblade core.

Core preparation flake

A flake removed from the core to give the core a specific form (shape), preparing the core for use. The shape of flakes removed from the core can be controlled by careful shaping or preparation of the core.

Core reduction

The process of removing excess material from a stone to create a core of the desired size and shape.

Core tablet

The tabular (tablet-shaped) flake removed from the striking platform of a core in the process of core rejuvenation. See rejuvenation.

Cortex

The natural surface or rind characteristic of many types of stone. The cortex is often pitted and rough, the product of hydration, chemical, and physical weathering. The surface of the cortex is called the cortical surface. See also cortical.

Cortical

Made up of cortex. Lithic flakes which retain cortex are called cortical flakes, chert with remaining cortex is often referred to as cortical chert. See also cortex.

Cranium

The anatomical term for the bones of the skull which enclose the brain.

Crescent

Similar in shape to a half-moon, with convex and concave edges terminating in points; a flaked stone tool of crescent shape.

Crustose

Relating to a lichen whose thallus (body) is crusty and thin.

Cryoturbation

The disturbance of sediments by freezing and thawing. Includes frostheaving, frostboiling, and solifluction.

Cryptocrystalline

Lithic material with crystals too small to be seen with the naked eye; indistinctly crystalline. Includes such materials as obsidian, chert, agate, and jasper. Commonly abbreviated as 'ccs'(cryptocrystalline silicate).

Cuboid

Cube-like in shape.

Cultural affiliation

A known, projected, or hypothesized cultural, ethnic or tribal group with whom archeological or historical items may be associated (e.g. Athapaskan, Eskimo, Aleut, Russian, European, etc.).

Cultural material

Any material preserved in an archeological site created by human activity in the past. Also referred to as cultural remains.

Cultural origin

The archeological culture to which an artifact, feature or site is thought to belong. See also cultural affiliation.

Cultural resources

Districts, sites, structures, objects, and evidence of importance to a culture, ethnic group, or subculture. Cultural resources and relevant environmental data are important for describing and reconstructing past lifeways, for interpreting human behavior, and for predicting future courses of cultural development.

Cultural tradition

See tradition.

Culture

The integrated sum total of learned behavior traits characteristic of the members of a society. See also archeological culture.

Culture history

The spatial and chronological framework for describing the development of human societies and cultures and the documented processes of cultural change involved in this development. Studies in culture history are primarily concerned with defining the geographical extent, relative age, and course of development of cultures.

Curated

Kept for later use; conserved. Archeologists curate artifacts. This type of curation includes accessioning (establishing a legal basis for possession), cleaning and preservation, assignment of a catalog number (to permit future access), and appropriate storage.

Datum

The arbitrary point in the grid lain over an archeological site chosen to represent 0m north, 0m east. All other points in the site are mapped/measured in relationship to the datum.

Deadfall trap

A type of trap constructed so that a weighted lever, rock, or ceiling drops on the victim when released by a trigger.

Debitage

In discussing the manufacture of stone tools, this term refers to one or more fragments of waste lithic material (flakes or chunks of stone); the material that results from either the manufacture or use of flaked stone artifacts. These lithic 'scraps' are also called flakes, waste flakes, unmodified flakes, debris, or detritus.

Debris

See debitage.

Decortication (decortication flake)

The process of removal of the often rough, pitted exterior of a stone (cortex), in preparation for stone tool manufacture. This process involves the removal of flakes of stone often called decortication flakes. See also cortex, cortical, core preparation.

Depositional (deposition)

The act of depositing. Archeologists are interested in the conditions under which the cultural material they are observing were deposited (depositional conditions) and the placement of artifacts in relation to other artifacts, cultural, and natural features (depositional context).

Desiccated

Thoroughly dried out; preserved by the removal of moisture.

Detritus

See debitage.

Diagnostic

An artifact which is, in its form, function or method of manufacture, indicative of a specific cultural or ethnic group, archeological phase or tradition, by which the age or cultural affiliation of a site may be hypothesized. Such artifacts are said to be diagnostic of a particular time period or cultural context.

Differential weathering

Showing signs of deterioration from such forces as wind, water, heat, cold, biological, or other chemical processes at differing rates. Different material types respond differently to the forces of weathering, as do items of the same material in different contexts (buried, exposed, inundated, dry, etc.)

Discoidal scraper

A scraper with a circular or disc-like shape. See also scraper.

Distal

The distal end of a flake is that which is farthest from the platform or bulb of percussion.

Dorsal

The underside of a flake, core, tool, or other object.

Edge damage

Evidence of crushing, chipping, or other damage to the edge of a flake through cultural or natural processes. See also use-wear.

Edge modification

Evidence of the intentional modification of the edge of a flake (usually involving pressure flaking) to make it a more effective tool for some purpose. Modification is visible as small flake scars along the edge of the flake. See also modified flake.

Encrust (encrustation)

To cover, as if with a crust.

End blade

A blade designed to fit into a slot at the end of a wooden or bone tool such as a harpoon head or other projectile. The end blade is easily replaced when broken or dull. See also side blade.

Endscraper

A scraper made by removing flakes from the end of a blade or flake to create a working edge. See also scraper.

Eolian

Material deposited by the wind, such as loess or dune sand. This term may also be used to describe wind-generated erosion.

Ephemeral

Lasting only a short time; transitory.

Erosion

The wearing away of soil and rock by weathering, mass wasting, or the actions of rivers, streams, glaciers, waves, wind, or underground water.

Esker

A serpentine ridge of roughly stratified gravel and sand deposited by a stream flowing in or below the ice of a stagnant or retreating glacier, which was left behind when the ice melted. Lengths may range from less than 3 kilometers to more than 500 km, with heights from 3 to more than 300 meters.

Ethnoarcheology

The use of ethnographic data in the interpretation of archeological materials or sites.

Ethnography

A division of anthropology devoted to the descriptive recording of living cultures; a descriptive study of a particular existing group.

Eustatic

Those changes that affect the volume of ocean water or the size of the ocean receptacle.

Exhausted core

A core from which so many flakes or blades have been removed that it is no longer of any use; a core from which all material suitable for lithic manufacture has been removed.

Exotic

A term used by archeologists to describe lithic materials or other items found in an archeological site which are not locally available; materials or items that had to have been brought in from another region through trade or long-distance transport.

Facial preparation

The preparation of the blade face of a core to produce blades of a specific desired size, shape or cross-section. See also core, core preparation, blade core, microblade core.

Faunal

Having to do with animals. Archeologists use the terms faunal material, faunal remains, faunal collection, and faunal assemblage to refer to the bones, teeth, or shells of animals found in archeological sites.

Feather termination

The feather-like distal end of a flake created by the diminishing force of the blow that removed it from the core. As the force passes through the stone, it is diffused, creating a thin edge with a feathery appearance at the end of the flake.

Feature

A feature is a non-portable cultural element of a site which is not classed as an individual artifact; or a distinct association of cultural elements. Hearths, floors, pits, post holes, concentrations of lithic debris, walls, and graves are all features.

Femur

The proximal bone of the lower or hind limb (located between the pelvis and the knee in humans).

Finishing flake

A small pressure flake removed in the process of finishing (final shaping and sharpening of) a flaked stone tool.

Fire-cracked rock (F.C.R.)

This term describes otherwise unmodified rock that has been broken, cracked or thermally altered (discolored, pitted) through exposure to heat or fire. Fire cracked rocks, though not formed tools, in many cases represent physical evidence of human activity at a site. Many archeologists collect and analyze (weigh, map, count) fire-cracked rocks as indicators of hearths and to identify specific activity areas within a site. In some contexts, it may be difficult to distinguish fire-cracked rock created through a process of human influence from naturally occurring fire-cracked rock (perhaps due to forest fires or other heat-producing natural processes). Other terms for fire-cracked rock include F.B.R. (fire-broken rock) and T.A.R. (thermally altered rock).

Flake

A piece of lithic material removed from a larger object using applied force.

Flake core

A piece of stone from which flakes have been removed. See also core, flake.

Flake knife

A stone knife or knife-type cutting tool formed through modification of a flake. See also edge modification, modification, flake.

Flake scar

The concave mark left on a core or other stone surface from which a flake has been removed. The size, shape and placement of flake scars can give information about the manufacturing technique and quality of material used to create a stone tool.

Flake scatter

A site composed of a group of flakes scattered across the ground surface. Scatters may range from only a few flakes, to more than 1,000 flakes. See also lithic scatter.

Flaked

An object that has been formed or intentionally modified through the removal of one or more flakes.

Flaking episode

An occurrence of stone tool manufacture involving flaking of stone, usually producing quantities of flakes and lithic debitage. See also flake, flaking station, debitage.

Flaking station

A site which suggests by its composition (lithic debitage, flakes, cores, etc.) that stone tool manufacture of some type was the major activity performed there in the past. See also flaking episode.

Flanged

Having a flange or protruding rib or collar, used to strengthen an object, hold it in place, or attach it to another object.

Floral

Having to do with plants (includes fibers, roots, stems, leaves, flowers, grains, pollen, etc.).

Flute face

The face of a blade core from which blades have been removed. The removal of one blade prepares the core for the removal of others, producing a fluted appearance on the side of the core, often called the 'flute face.' See also blade core.

Fluvial

Caused by the action of moving water; of or relating to a stream or river.

Frost boil

An upwelling and churning of the soil caused by the freeze-thaw cycle. See also cryoturbation.

Geomorphology (geomorphological)

The geologic study of the configuration (placement and shape), origin, and evolution of landforms.

Glacial

Having to do with glaciers.

Glacio-eustatic

Changes in ocean volume (and thus the sea level) caused by glacial activity.

Grinding

A process of lithic tool manufacture in which stone is shaped not by flaking but by grinding and smoothing away the undesired portions of the stone.

Habitation site

An archeological site representing a living area, house or houses, indicating its use as a residence for some period of time.

Hearth

A pit or other enclosure used to contain/control fire for cultural purposes (warmth, cooking, etc.).

Herbaceous

Vegetable matter, green and leaf-like in appearance or texture; herb-like plants, as opposed to woody plants.

Hewn logs

Logs which have been hand-shaped for construction.

Hinge fracture (hinge termination)

A fracture at the distal end of a flake or blade which prevents detachment of the flake at the intended detachment point. The break at the distal end is usually rounded or blunt in contrast to a step fracture, which produces a sharp, right-angle break.

Historic (historic time, historic era)

Refers to time for which there are written records. The span of historic time varies for different cultures and different areas of the world.

Hudson Bay Corner

A method of log cabin construction using grooved corner posts into which the ends of milled logs are fitted, or ungrooved corner posts to which milled logs are nailed with large spikes.

In situ

Generally means "in place" in natural, original or undisturbed position. Artifacts are said to be *in situ* when it is reasonably certain that they have not been moved, displaced, or rearranged since the time of deposition.

Incised

Engraved, grooved, or deeply notched with a sharp instrument; carved.

Indigenous

Living or naturally occurring in a specific area or environment.

Indirect percussion

Removal of excess material (in the form of flakes or blades) to form a stone tool by applying pressure to a punch, usually made of wood or bone, placed against the core. See also percussion, pressure flaking.

Industry

The set of objects of a single material type which are thought to correspond to one group of people at one point in time. All the stone tools of a single group at a single point in time are referred to as that group's "lithic industry."

Innomimates

Large flat bones forming the sides (lateral portion) of the pelvis.

Insert blade

Specialized blade made for insertion into a slot in the tip or side of a spear, arrow, harpoon, knife or other tool. The insert blade provides a sharp edge for cutting or penetration and is easily replaceable if lost or dull.

Interglacial

Used to describe the times between major glacial periods, often marked by warming and/or glacial retreat.

Interstadial

The period between glacial advances.

Inuksuit (pl.), inuksuk (sing.)

Tall cairns constructed to resemble standing humans used in driving reindeer or caribou.

Ivrulit

A round or oval habitation constructed of a series of bent poles covered by skins or sod and found on both the coast and inland in lakeside or riverine settings.

Kame

A mound or short, irregular ridge, composed of stratified sand and gravel deposited as a fan or delta at the margin of a melting glacier by a stream flowing under the glacier; or deposited in a low place or hole in the surface of a glacier by a stream flowing over it. A group of kames may be called a kame complex, kame field, or, if terrace-like, a kame terrace. Such features are commonly pitted with kettles and have an irregular surface. See also kettle.

Kayak

An arctic canoe with an enclosed cockpit, covered and decked with sealskin.

Kettle

A depression in glacial drift, especially in outwash or in a kame field, formed by the melting of a detached block of stagnant ice that was buried in the drift. Kettles often contain lakes (kettle lakes) or swampy areas.

Lateral

Pertaining to, or located at or on the side of something.

Lens

A dish or lens-shaped feature in the soil, often the product of human activity (hearths, house floors, etc.)

Lichenometry

Dating (defining the age) an object by calculating the age of the lichen growing on its surface.

Limestone

A shale-like or sandy sedimentary rock consisting mostly of calcium carbonate.

Lithic

Stone; made of stone.

Lithic scatter

A site consisting of a scatter of flakes, cores, tools, and lithic debris. Lithic scatters may be sparse or dense and may range from a few flakes to thousands of flakes and tools. See also flake, flake scatter, lithic.

Locus (plural: loci)

A discernible center of activity within an archeological site, often a concentration of artifacts or features.

Long bones

Any of the major bones of the forelimb and hindlimb.

Lumbar vertebrae

The section of the vertebral column below the ribs and above the pelvis; the vertebrae of the lower back.

Macrofossil

Large fossils; fossils easily seen and studied with the unaided eye.

Mammal

A member of the class Mammalia. Mammals are warm blooded vertebrates usually with body hair who give birth to live young. There are more than 15,000 species of mammals, including humans.

Mandible

The anatomical term for the bone of the lower jaw.

Manuport

Archeologists use this term to refer to stones which, although they may not show signs of being altered, are not local to the area in which they were found, and were probably carried to that spot by a human.

Margin edge

Used in the description of lithic artifacts, flakes, and blades.

Material culture

The collection of items, artifacts, and features generated by a living culture. These items may be preserved in the archeological record.

Matrix

The soil, gravel, rocks, and/or sand in which an artifact is embedded; a situation or surrounding substance. When a site is excavated, the matrix is removed. The potential for loss of valuable data exists if the matrix is disturbed by natural forces or vandalism.

Medial

Situated in, or extending toward the middle of something.

Megafauna

Large animals. This term is often used by archeologists to describe large Pleistocene fauna such as the mammoth, mastodon, and bison.

Metatarsal

Refers to several of the bones of the hind foot in four-legged animals and the bones of the instep of the human foot.

Microblade

A specific type of small, thin blade with roughly parallel sides and a prepared proximal end. Microblades are commonly defined as having a width of less than 10 millimeters. See also blade, blade core, microblade core.

Microblade core

The prepared (purposefully pre-shaped) core from which microblades have been removed. See also microblade, blade core, core.

Microchipping

Removal of a small (often microscopic) flakes from the edge of stone tools or flakes due to use or wear.

Midden

A deposit of occupation debris, rubbish, or other by-products of human activity.

Milled logs

Logs which have been smoothed or squared on the top and/or bottom using a saw or saw mill. This smoothing allows the logs to fit more snugly together for building log structures.

Modified flake

A flake which has been changed in form through use-wear or intentional reshaping. See also use-wear, edge modification, edge damage.

Molar plate

A section of a molar tooth of a mastodon.

Mosaic environment

An environment made up of many small segments or patches of varied vegetation types.

Multicomponent

Having one or more archeological components. See also component.

Obsidian

A volcanic glass (usually black, smokey, clear, red, or banded), with curved lustrous surfaces when fractured. Obsidian is valued as a raw material for lithic tool production.

Occupation

A discrete cluster of cultural material assumed to be the product of a single group of people at a particular locality and deposited over a period of continuous residence.

Ornament

An object used for decoration. Ornamentation may include items of personal adornment (earrings, labrets, etc.) as well as carved, painted or woven patterns on more functional items (knives, baskets, harpoons, etc.)

Overlook

An archeological site from which it is possible to observe areas frequented by game animals, often also a campsite or hunting blind. Sites of this type were important for hunting all types of game.

Ovoid

Oval or nearly oval in shape.

Oxidized stones

Stones which show signs of oxidation (coated with oxide) as a result of exposure to high temperature. See also fire-cracked rock.

Paleoenvironment

Ancient environment; encompasses all conditions that can be hypothesized for environments that existed long ago.

Paleontologist (paleontological)

One who studies fossils; that which is related to fossils. Paleontology involves the study of past life forms from fossilized remains of plants and animals.

Palynology (palynologist)

The study of past environments through analysis of pollen samples (fossil pollen).

Percussion (direct percussion)

A technique for lithic tool manufacture which involves removal of excess lithic material (in the form of flakes) by striking a core with a hammerstone or striking a core against a fixed stone or anvil (quick, sharp blows) to remove flakes. See also pressure flaking, indirect percussion.

Periglacial

Near glacial.

Petroglyph

A line drawing carved into stone.

Phalanges

The anatomical term for the bones of the fingers.

Platform

The flat portion of the top of the core; the surface onto which the blows which remove flakes/blades from the core are directed. Also called the striking platform. See also core, core preparation flake, platform preparation.

Platform preparation

Preparation of the platform of a core for removal of flakes/blades by grinding, polishing, faceting or beveling the portion of the platform to receive the applied force. See also platform, core, core preparation flake.

Pleistocene

The earlier of two geologic epochs of the Quaternary period, marked by the advance and retreat of northern glacial ice and the appearance of the first recognizable humans. Commonly referred to as the Ice Age. The Pleistocene epoch began 2,000,000 to 500,000 years ago and lasted until around 11,000 years ago.

Polishing

To make smooth by rubbing with fine abrasive material.

Pot lid (pot lid pockmark, pot lid scar)

A concave circular or near circular scar left as a result of a flake caused by the differential expansion and contraction of components of the stone. These are generally a natural occurrence, rather than man made.

Preform

The first shaping of a stone, a preform is the unfinished form of an artifact. It has the basic shape of the finished product, but is larger and thicker with irregular edges. See also blank.

Prehistory (prehistoric)

The time before written records, studied by archeologists through the remains of past human cultures.

Pressure flake

A small flake removed from a tool or core by application of pressure. See pressure flaking.

Pressure flaking

A technique for lithic tool manufacture in which flakes or blades are removed from a core by applying pressure against the core with a punch (usually made of wood or bone). Pressure flaking may be used to remove small flakes along the cutting edges of tools for forming, finishing or sharpening. See also retouch.

Primary flake

A flake which retains the cortex over all or most of its dorsal surface. Also called a primary decortication flake. See also primary reduction flake.

Primary reduction

The first step in stone tool manufacture in which the cortex is removed and a rough blank is formed. See also cortex, blank, core.

Primary reduction flake

A flake removed from a stone or core during the primary reduction process. See also primary reduction, primary flake.

Proboscidian

A mammal belonging to the order Proboscidea, typified by a trunk or proboscis. This class includes elephants as well as extinct Pleistocene forms such as the mammoth and mastodon.

Projectile head

See projectile point.

Projectile point

Spear point, dart point or arrow point; a point intended for attachment to a projectile.

Projectile point base

That part of the projectile point which is farthest from or opposite the tip or pointed end. The proximal portion of a projectile point.

Protohistory

A transition period between the prehistoric and historic eras. No complete written records are present, although some records exist.

Protruding

Jutting out.

Proximal

That portion of the blade or flake closest to the striking platform.

Quartzite

A metamorphic rock formed by the recrystallization of quartz sandstone.

Quaternary

The second geological period of the Cenozoic era, includes the Pleistocene and Holocene epochs.

Radial fracture

A pattern of bone breakage associated with human subsistence and hunting/processing activities.

Radiocarbon dating

A method of age determination based on measuring the decay of the radioactive isotope of carbon (^{14}C) to stable nitrogen (^{14}N), also commonly called carbon-14 dating.

Redeposited

Refers to sediments, stones, artifacts or other materials that have been disturbed from their original context of deposition, mixed, and deposited in a new position or location.

Refugia

Places providing safe haven or shelter, used by archeologists to describe areas where pockets of plants and/or animals are presumed to have survived despite adverse environmental conditions.

Rejuvenate

To restore or renew. Used to describe a process by which the ruined or exhausted platform of a core is removed as a tabular flake, establishing a new platform and allowing the continued use of the core.

Rejuvenation flake

A flake which is removed in the process of rejuvenating a core, usually tabular (tablet-shaped). See also rejuvenation.

Relict

Remaining, surviving.

Removal scar

See flake scar.

Retouch

The modification of a tool, after primary shaping, in order to refine, thin, sharpen, straighten, smooth or complete the tool. On a core tool (a tool formed from a core) retouch may consist of rough trimming, but on smaller, finer flake or blade tools (tools made from flakes/blades) retouch usually consists of pressure-flaking. See also pressure flaking.

Rhomboidal

Shaped like a rhomboid (a parallelogram with unequal adjacent sides).

Scapula

The anatomical name for either of the wide, flat triangular bones of the shoulder; the shoulder blade.

Scarp

A steep slope or cliff.

Scraper

A tool used for scraping. Scrapers may be minimally formed, perhaps a naturally sharp object such as a boulder spall, or they may be intentionally flaked. Scrapers can be unifacial or bifacial and are not bound to any single shape or medium.

Seal poke

A sealskin container used to hold or store seal oil.

Seasonal movement (seasonal round)

Movement of groups of people over the landscape in a culturally prescribed pattern which is cued by seasonal changes.

Secondary flake

A flake which retains cortex over a small portion of its dorsal surface. Also called secondary decortication flakes. See also primary flake, tertiary flake, cortex.

Sedimentation

The process of depositing sediment.

Semi-oval

Half of an oval.

Semilunate

Half-moon shaped.

Semisubterranean

Term meaning "half underground," used to describe house structures that are partially excavated into the ground.

Settlement

Any location at which people have resided or camped, including village sites, single house sites, and all campsites with one or more hearths.

Settlement pattern

The pattern by which people of a given culture arrange their dwelling areas over the landscape.

Shard/sherd

A fragment of broken pottery or glass.

Shatter

Lithic debris reduced into pieces having little or no regularity; no consistent form.

Side blade

A blade designed for placement in a slot along the side of a wooden or bone tool to provide a cutting edge. Side blades could be easily replaced when broken or dull. See also end blade.

Site

A site is any location in which surviving physical evidence of past human activity is found (including the record of the effect of that activity on the environment). For the purposes of the National Park Service, it is a resource for which decisions will be made, benign or active, for its management (preservation in place, benign neglect, interpretation or data recovery) as mandated by the National Park Service.

Snapping (snap break)

A method of producing a transverse sever of flakes or blades by applying force to one side; breakage of a blade, flake or tool in this fashion.

Soil horizon

A thin, distinctive layer of soil as seen in a stratigraphic profile.

Solifluction

Soil movement. See also cryoturbation.

Spall

A chip or fragment of a stone.

Staging area

Any location where people and supplies are gathered before taking some action (hunting, fishing, traveling).

Stained

Discolored due to exposure to charcoal, minerals or other agents with distinctive color.

Step termination

The premature termination of a flake or blade, characterized by a sharp right angle break.

Steppe

A vast, treeless, grass-covered, semiarid plain, often subject to extremes in temperature.

Stratigraphy

The visible layers in the soil distinguished by their color and composition, usually graphically represented in a stratigraphic profile drawing which depicts the layers, their depths, composition, and relationship to one another.

Striations

Stripes, grooves, or ridges.

Style (stylistic)

Non-functional attributes of an artifact. For example, within the functional class "knife," many styles exist. These styles may include variations in material type, shape, size, and ornamentation. Because different groups may prefer different styles of artifacts, style is an important factor in determining the cultural affiliation of some sites. See also attribute, cultural affiliation, diagnostic.

Subrectangular

Almost or nearly rectangular in shape.

Subsurface testing

Small excavations into an archeological site to determine its size and extent; any testing of an archeological site below the ground surface.

Sucroidal

Having a sugary appearance.

Swale

A low tract of marshy land.

Talus

A sloping mass of debris accumulated at the base of a cliff.

Taxonomy

Arrangement and classification of objects/types according to relationships between and among them.

Tectonic

Relating to, causing or resulting from structural deformations in the earth's crust.

Temper

A nonplastic substance such as sand, shell or feathers added to clay prior to pottery manufacture to reduce shrinkage and breakage during drying and firing.

Terminus

End; ending.

Tertiary flake

A flake which has no remnant of cortex on any surface. See also cortex, primary flake, secondary flake.

Thaw lakes

Pockets of meltwater which form in depressions in the ground surface during the warm months of the year. These arctic lakes do not drain because the ground below them is permanently frozen (permafrost).

Thinning flakes

Flakes removed from a preform by pressure or percussion to thin the piece for artifact manufacture. Thinning flakes may also be removed in the process of thinning a biface or uniface. See also biface, uniface, pressure flaking.

Thoracic vertebrae

The set of vertebrae located between the neck and ribs to which the ribs are attached.

Topography

The physical/geographic features of a place or region.

Tor

A high, craggy hill.

Tradition (archeological tradition)

A cultural unit in which a sequence of archeological complexes shows technological continuities. Archeologists realize that these continuities may not be due to genetic descent, but rather continuity in the material culture. See also material culture.

Transverse

Crosswise.

Tundra

A treeless plain that may be level or undulating and is characteristic of arctic regions, having a black muck soil and a permanently frozen subsoil.

Type

An arbitrary, intuitive class of objects sharing certain attributes. See also attribute.

Uniface (unifacial)

A tool with flakes removed from only one side to produce a cutting or scraping edge. See also flake, biface.

Use-wear

Physical evidence of a tool's use and or function, usually recognized as some form of damage, chipping, abrasion, crushing, or dulling. Use-wear may not be visible without the aid of magnification.

Utilized flake

A flake showing signs of use-wear. See also use-wear.

Veneer

A thin coating or covering layer over the surface of an artifact.

Ventral

The underside of an object; the surface of the flake which was closest to the core.

Vitreous

Glassy; similar to glass; glass-like.

Wall tent

An historic-era or modern tent that is square or rectangular with four walls perpendicular to the ground. These tents were generally made of canvas or another durable cloth.

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