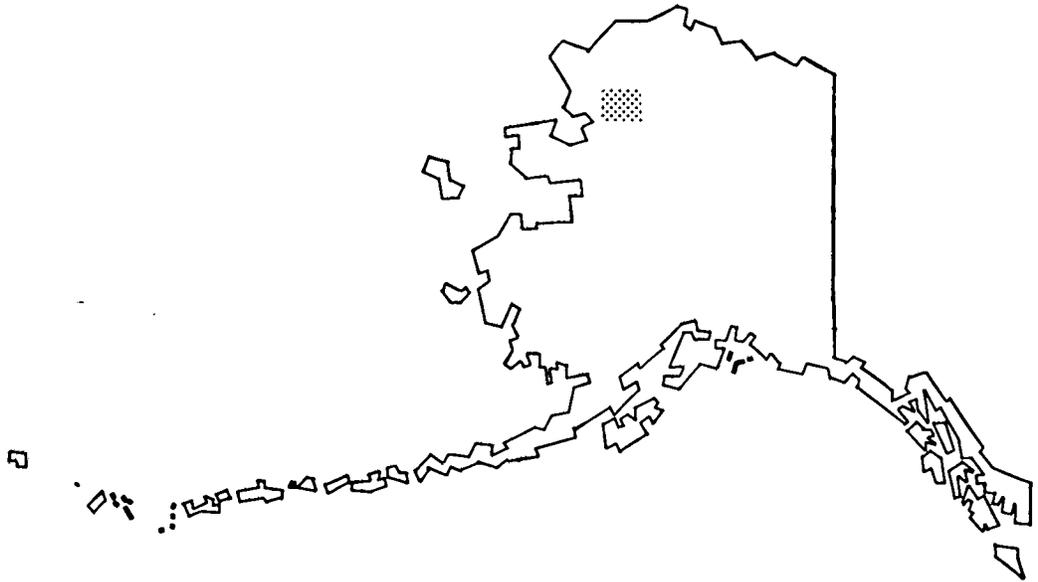


187/DES 73-88  
Kobuk Valley

## A PROPOSAL



# KOBUK VALLEY

## NATIONAL MONUMENT

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A L A S K A

**DES 73 - 88**

Draft

Environmental Impact Statement

AC 33908

Prepared by

Alaska Planning Group

National Park Service

U.S. Department of the Interior

December 1973

Theodor G. Swann  
Chairman, Alaska Planning Group

F 912 .K6 U541 1973  
Proposed Kobuk Valley National Monument, Alaska : draft environmental impact statement



The following agencies and organizations are being asked to comment on the draft environmental impact statement:

FEDERAL:

Department of the Interior  
Bureau of Sport Fisheries and Wildlife  
Bureau of Mines  
Bureau of Indian Affairs  
Bureau of Land Management  
Geological Survey  
Alaska Power Administration  
Bureau of Outdoor Recreation  
Office of Land Use and Water Planning

Department of Transportation  
Federal Aviation Administration  
Federal Highway Administration

Department of Defense  
Alaska Command  
Corps of Engineers

Department of Agriculture  
Forest Service  
Soil Conservation Service

Department of Commerce  
National Oceanic and Atmospheric Administration

Environmental Protection Agency

Advisory Council on Historic Preservation

STATE:

Governor of the State of Alaska (State Clearinghouse)  
Alaska State Historic Preservation Officer

OTHER AGENCIES:

City of Kotzebue  
Noorvik Village Council  
Kiana Village Council  
Ambler Village Council  
Shungnak Village Council  
Kobuk Village Council  
Selawik Village Council

NATIVE ORGANIZATIONS:

NANA Regional Corporation, Inc.  
Kotzebue Native Village Corporation  
Noorvik Native Village Corporation  
Kiana Native Village Corporation  
Ambler Native Village Corporation  
Shungnak Native Village Corporation  
Kobuk Native Village Corporation  
Selawik Native Village Corporation  
Alaska Federation of Natives  
Alaska Native Foundation  
Mauneluk, Inc.

OTHER ORGANIZATIONS:

Sierra Club  
Friends of the Earth  
The Wilderness Society  
National Parks and Conservation Association  
National Wildlife Federation  
National Audubon Society  
Alaska Historical Commission  
Alaska Conservation Society  
Alaska Wilderness Council  
Alaska Professional Hunters Association  
Sea Grant Program  
Alaska Sportsmen's Association  
Alaska Oil and Gas Association

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## I. DESCRIPTION OF THE PROPOSAL

The National Park Service, Department of the Interior, proposes:

(A) Legislative establishment of Kobuk Valley National Monument and designation of Salmon Wild River; and (B) Administrative action to adopt a conceptual master plan for management of the monument so established.

The proposal area includes approximately 1,850,000 acres in northwest Alaska. (See Proposal Boundaries map.) The western boundary of the proposal area, referred to hereafter as the monument, would extend within 70 airline miles of Kotzebue, on the coast. Kotzebue, the commercial center of northwest Alaska, is 185 miles northeast of Nome.

The National Park System contains no area with the scenic, biological, ecological, and human resources of this portion of interior and western Alaska. Extending 56 miles east-west and a maximum of 64 miles in a north-south direction, the monument would preserve nationally significant wilderness, wildlife, cultural, and historical values, including 81 miles of the Kobuk River and most of its tributaries.

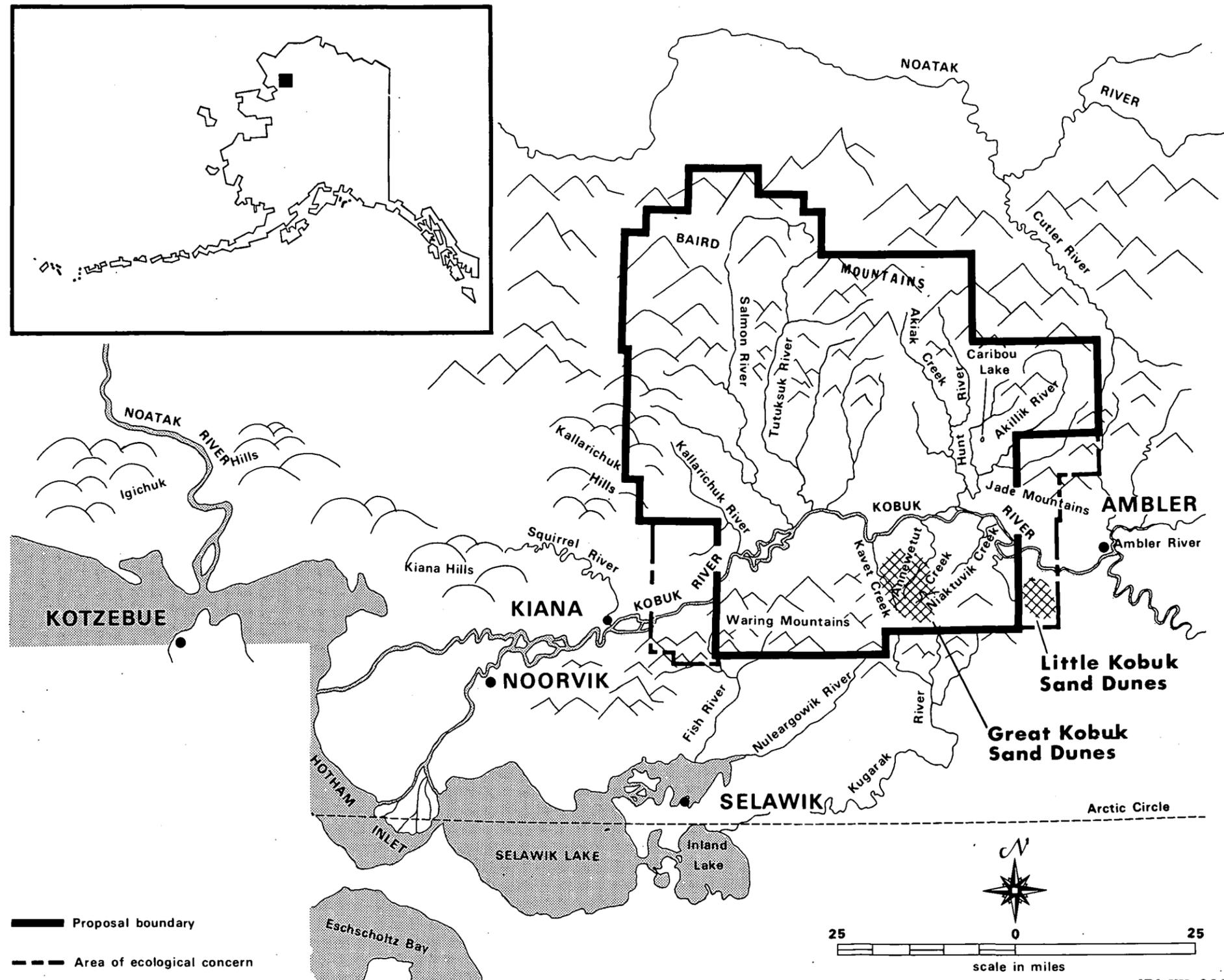
### A. LEGISLATIVE PROPOSAL

As a result of actions prescribed by the Alaska Native Claims Settlement Act (85 Stat. 688), the National Park Service proposes

Congressional establishment of a Kobuk Valley National Monument to be administered as a Natural Area of the National Park System, and designation of a Salmon Wild River to be included in the National Wild and Scenic River System.

Other proposed legislative provisions include: (1) That the area be withdrawn from appropriation or entry under the public land laws, including the mining and mineral leasing laws; (2) That, except as may be otherwise prohibited by law, existing traditional subsistence uses of renewable resources will be permitted until it is demonstrated that these uses are no longer necessary for human survival. If the subsistence uses may result in a progressive reduction of animal or plant resources which could lead to long-range alterations of ecosystems, the managing agency, following consultation with communities and affected individuals, shall have the authority to restrict subsistence activities in part or all of the monument; (3) That within 3 years after establishment, a study will be made and a report will be submitted by the Secretary of the Interior concerning the qualifications of any area within the monument for inclusion in the National Wilderness Preservation System. Any wilderness designation will be accomplished by legislation and in accordance with procedures stipulated in the Wilderness Act; (4) That the monument be closed to sport hunting; and, (5) That any lands that are within the Onion Portage Archeological District but not selected by a Native corporation pursuant to the Alaska Native Claims Settlement Act shall become part of the Kobuk Valley National Monument.

Proposal Boundaries



The purposes for which this proposal is made are:

1. To perpetuate, for public benefit and enjoyment, indigenous plant and animal communities, geological features, and scenic values, by means of the preservation of the ecological relationships and natural processes of this representative sample of arctic Alaska.
2. To preserve and protect the area's archeologic and historic sites, structures, and objects, and to encourage research of the area's cultures, which developed and continue to develop here.
3. To foster the continuation of the Alaska Eskimo culture by providing for traditional resource uses, such as hunting, fishing, and gathering, provided such uses are consistent with the preservation of primary resource values.
4. To provide for public use and enjoyment of the area in a way which will leave its resources unimpaired for future generations.
5. To provide for nonmanipulative research on Arctic ecosystems.

B. ADMINISTRATIVE ACTION

A conceptual master plan will be submitted with the legislative proposal for establishment of a Kobuk Valley National Monument. This plan is designed to guide the management of the monument after its authorization.

A conceptual master plan is not intended to be a definitive document covering every detail of development and management of an area. Particularly in the case of a newly established monument like Kobuk Valley, plans for construction, transportation, or similar matters must be delayed until intensive investigations of the wisdom and feasibility of alternative ways to meet the needs of resource values, management, and the public are completed. This approach will reduce the possibility that hasty or ill-conceived projects will threaten this irreplaceable resource.

The conceptual master plan outlines the general management philosophy for the area, specifies management problems, identifies questions for resolution, and establishes broad guidelines for future planning, management, and development so that the monument's resources are fully protected while providing for appropriate public use. The plan covers the next decade or so of the monument's administration, depending upon the speed of implementation. Master plans are reviewed frequently, and updated as new information is obtained and as changing conditions warrant.

The monument would be managed as a Natural Area as defined by the National Park Service, but with an important policy alteration to allow continuance of Native subsistence uses.



Easy access to many of the area's features encourages exploration.

A 25-square-mile sea of sand, the Great Kobuk Sand Dunes, laps at the base of the Waring Mountains.

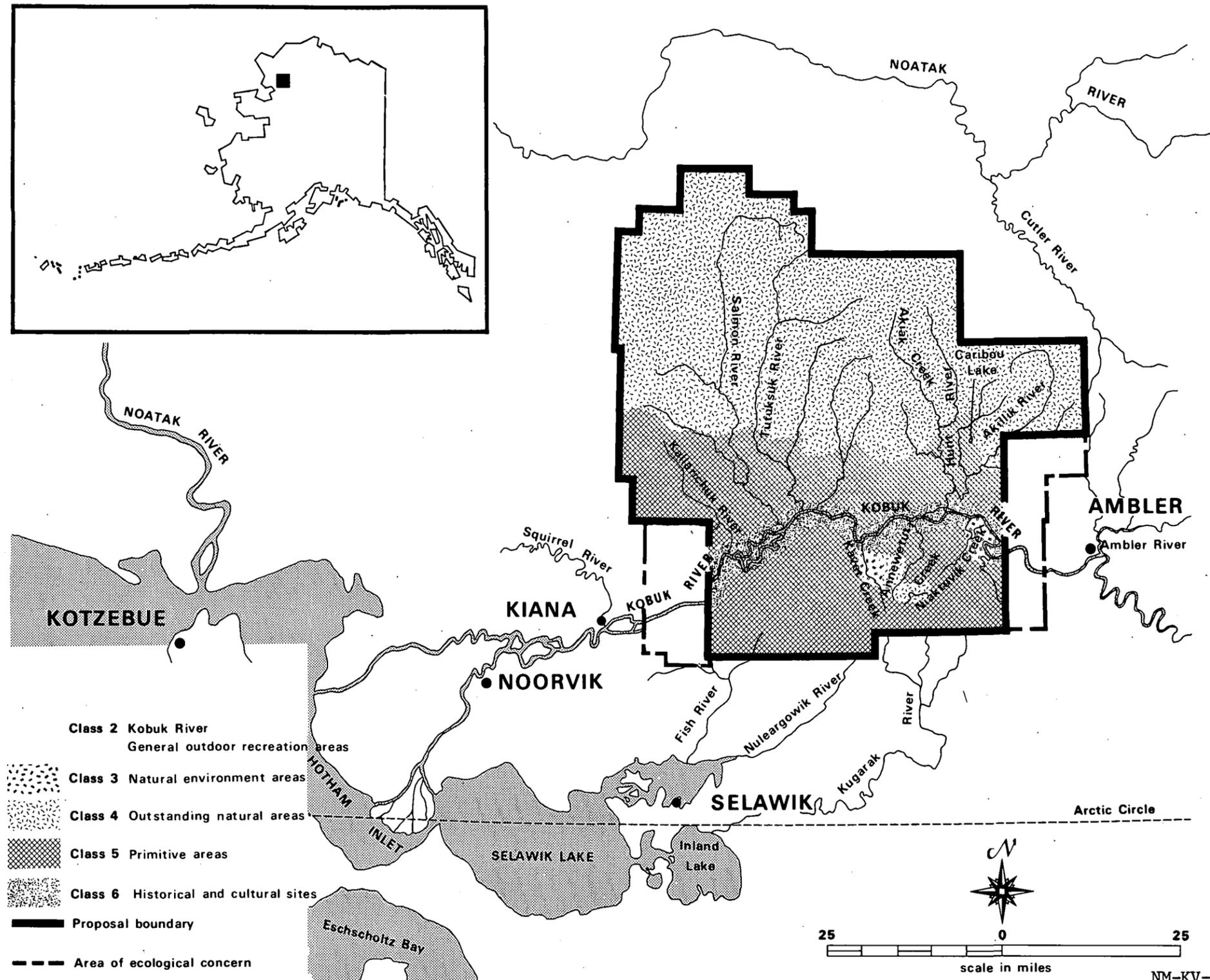


The management objectives of the plan are:

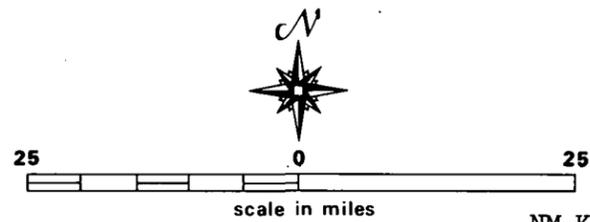
1. The Monument will be managed as a unit under the Alaska State Office in Anchorage as a natural and cultural area in accordance with appropriate administrative policies.
2. Based on information derived from a program of supporting research, the area will be managed as an ecological unit with management programs designed to maintain the integrity and diversity of natural features, natural environments, ecological processes, and cultural heritages characteristic of this region.
3. Indigenous wildlife populations will be protected from premature extirpation or extinction.
4. To the extent possible the natural fluctuation and equilibrium of self-regulating ecosystems will be allowed to continue unimpeded.
5. Visitor uses shall be directed toward the maximum appreciation of the intrinsic aesthetic, educational, cultural, and scientific values of the area in ways which will produce the least degradation of Monument resources and the highest quality of experience for the visitor.
6. Visitor uses shall be limited to those which are necessary and appropriate to the purposes of the Monument. The nature and extent of such uses shall be determined by definition and application of tolerable limits of natural resources degradation.
7. Provide an interpretive program designed to offer orientation, education, appreciation, inspiration, and reflection based upon primary natural and cultural resource values of the area.
8. Develop and implement a viable research program to provide basic information required for effective Monument management and visitor use programs.

9. Develop cooperative management programs with managers of adjoining lands as necessary to ensure the integrity and viability of all components of Monument ecosystems.
10. Undertake coordinated planning with other agencies and organizations to assure development of essential services and facilities on Federal, State, local, and private lands as necessary to adequately provide for visitor and management needs.
11. Cooperate with Federal, State, Native, and local agencies and private landowners to promote compatible and complementary use of lands within and adjacent to the Monument.
12. Cooperate with and provide assistance to the Native Corporations and villages in identifying and properly preserving the important elements of Native culture, both for their own use and benefit and for inclusion in the evolving culture of the United States.
13. Continue the opportunity for subsistence hunting, fishing, and harvesting based on defined limits of tolerable resource degradation and within historical amounts of such use.
14. Insure perpetuation of primary resource values by limiting activities and developments to those determined to have no significant impact upon those resources and by directing appropriate development and use to environments least vulnerable to deterioration from such uses.
15. Recognize the singular importance of transportation in sound land-use planning and cooperate with others in the development of an efficient and energy-conserving transportation system to serve the monument and the region.

Land Classification



- Class 2 Kobuk River  
General outdoor recreation areas
- Class 3 Natural environment areas
- Class 4 Outstanding natural areas
- Class 5 Primitive areas
- Class 6 Historical and cultural sites
- Proposal boundary
- Area of ecological concern



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The proposals contained within the plan include:

1. Management of the monument as a single ecological unit based on a program which maintains the integrity of the area's unique natural features, environment, ecological process, and characteristic cultural heritage. This requires the development and implementation of a research program to gather baseline data.

2. A land classification plan based on the system developed by the Outdoor Recreation Resources Review Commission and modified by the National Park Service. (See Land Classification map.)

3. A development and use concept for the area which provides for public access. This will include facilities and methods to enhance visitor use, enjoyment, and understanding of the resources of the monument. (See General Development map.) The use of boats and aircraft for transportation is stressed; no roads are proposed.

All appreciable alteration of the physical environment on NPS lands will be preceded by research, preparation of detailed plans, and associated environmental impact statements. Research also must determine the area's capacity to withstand visitor impact without unacceptable damage to resources.

Visitors to Kobuk Valley National Monument will arrive at Kotzebue. Information and interpretive services will be provided there. (Various interpretive methods will be used at Kotzebue; within the monument

itself, personal interpretation will be the only method used.) At Kotzebue, the visitor may transfer to smaller aircraft or boats and travel directly, or via Kiana or Ambler. Combination air and boat travel will offer a variety of low-impact transportation alternatives. Although float-equipped aircraft will offer the greatest mobility--with landing areas designated along the Kobuk River and at selected lakes--an airstrip will provide access to the upper Salmon River valley. Within the monument, then, transportation will be by foot, powerboats, canoes, and aircraft.

NPS interpretive programs will develop ideas and attitudes in an atmosphere conducive to personal discovery of park values by the visitor. Many educational opportunities will be available. The cultural importance of the area will, of course, be stressed; conditions encouraging the development of relationships will be created.

Administrative headquarters for Kobuk Valley National Monument will be located in Kotzebue. Staff functions will be combined with those for the other NPS areas authorized in northwest Alaska to insure coordinated park programs, liaison with interested parties and individuals, reduction of staff size, and economic and administrative efficiency.



Barge-mounted ranger stations and interpretive facilities at Ahteut, Akillik, and Onion Portage will be considered as a way to reduce construction and maintenance costs, and to avoid destruction of resources and habitats.

4. The development of cooperative planning and management programs with involved agencies and organizations. The purpose is to provide essential visitor services and facilities on Federal, State, borough, private, and other lands while ensuring the survival of wildlife species, scenic values, and biotic and other natural resources. Cooperative efforts are also proposed to promote compatible, complementary use of the lands and waters adjacent to the monument.

The plan stresses cooperation with and assistance to Native corporations. Again, if the preservation of Native culture is an important part of the proposal, regular cooperation with Native corporations is essential.

Continued research on the Onion Portage Archeological District is proposed through cooperation with the village of Ambler and the Northwest Alaska Native Association (NANA). In addition to the acquisition of Native cultural information and the provision for visitor use, the program will involve local Native people in the effort to deepen the understanding of the area's cultural heritage.

5. A vigorous program of identification, research, and interpretation of archeologic and historic sites. Anthropologists believe the proposal area includes many imperfectly identified historic, archeological, and architectural resources of great significance.

Upon identification and evaluation, cultural resources that qualify will be nominated to the National Register of Historic Places at the earliest opportunity. By virtue of their National Register listing, these resources will be accorded the procedural protection of section 106 of the National Historic Preservation Act of 1966. Cultural resources worthy of preservation but not yet listed in the National Register are accorded the procedural protection of section 2(b) of Executive Order 11693 (May 13, 1971).

Federal action affecting Kobuk's cultural resources will be developed in consultation with the Alaska State Historic Preservation Officer and the Advisory Council on Historic Preservation. Mutually agreeable practices will mitigate adverse effects whenever possible.

Qualified investigators will be permitted to research the monument's cultural resources in conformance with the procedures of the Antiquities Act of 1906. In addition, Antiquities Act sanctions against unauthorized appropriation or destruction of cultural resources will be enforced by area management.

The 16,000 acre Onion Portage Archeological District, which is listed in the National Register of Historic Places, will be affected by the proposal. About 3,200 acres of the District are within the proposed boundaries.

6. Administrative agreements with the State to manage and protect the submerged lands within the proposal area.

7. Two areas of ecological concern adjacent to the proposed monument boundaries. Areas of ecological concern are those lands and waters adjacent to but not proposed for inclusion in the monument which contain resources that are part of the total ecosystem, and which if compromised, would endanger resources within the proposal.

The Secretary of the Interior may, if such lands and waters within the area of ecological concern are not selected to satisfy Native or State selection rights, submit a report to the Congress on his findings together with his recommendations as to whether such Federal lands should be added to the monument. With respect to those lands within the area of ecological concern which are selected or are already in other ownership, the Secretary will request Congressional authorization to enter into cooperative agreements with the landowners to assure that those lands and waters are managed in a manner which will insure that the resource values are fully protected.

These areas are:

1. Approximately 126,000 acres of Native village withdrawal lands in the Ambler withdrawal, adjacent to the eastern boundary of the monument. This area includes the Little Kobuk Sand Dunes, the major portions of Onion Portage Archeological District, and the upper portions of two small watersheds which drain into the eastern portion of the monument.

2. Approximately 92,000 acres of Native village withdrawal in the Kiana withdrawal, adjacent to the western boundary of the monument. This area includes the upper portions of several small watersheds which drain into the monument.

The NPS will seek cooperative agreements, first, to guarantee watershed protection for both these areas, and second, to provide interpretation of Onion Portage. On the other hand, if these areas are not selected by the Native corporations, they should be added to the proposal area.

#### C. INTERRELATIONSHIPS WITH OTHER PROJECTS AND AGENCIES

This proposal is interrelated with other projects in the region. Important interrelationships are with Native village and regional corporations, the city of Kotzebue, State highway proposals, and other NPS and Federal Agency proposals. As noted, cooperative agreements should protect the areas of ecological concern within Native village withdrawal lands.

Plans for two highways proposed by the State Department of Highways which would cross monument lands conflict with this proposal. A map of these planned highway corridors appears in Chapter III. Alternative routings and modes of transportation should be investigated thoroughly in cooperation with the State Department of Highways.

The monument abuts the Bureau of Sport Fisheries and Wildlife proposal for the Selawik National Wildlife Refuge. The Bureau's management of the adjoining lands will enhance the NPS proposal; compatible adjacent land uses include preservation of waterfowl habitat and protection of a portion of the range of the Arctic caribou herd.

The proposal for a Kobuk Valley National Monument is also interrelated with the other NPS areas proposed within the region.

#### D. BACKGROUND

Criteria for lands meriting inclusion in the system of national parks have recently been clarified by the Department of the Interior:

The National Park System should protect and exhibit the best examples of our great national landscapes, riverscapes and shores and undersea environments; the processes which formed them; the life communities that grow and dwell therein; and the important landmarks of our history.

The proposed monument contains tangible natural resources and a significant cultural heritage. The National Park System lacks a

land unit representing the scenic, biologic, geologic, and human resources of this portion of interior and western Alaska and the Brooks Range. 5

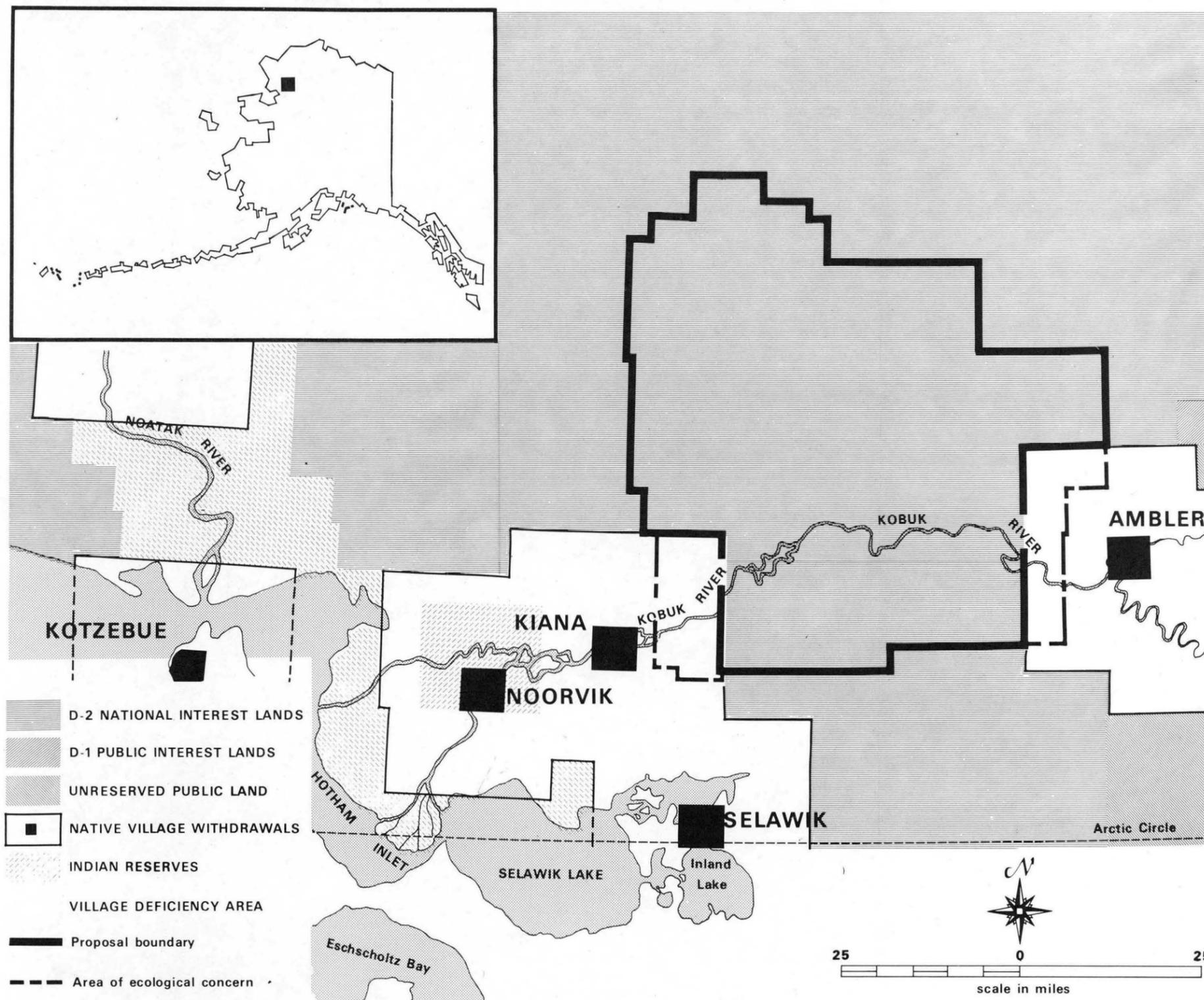
The Kobuk Valley National Monument would offer many types of back-country uses. Boating and canoeing on the Kobuk River and on the sloughs and oxbows of the lowlands will provide quiet water recreation opportunities. Float and canoe trips on fast, shallow waters are possible on the Salmon River.

Striking displays of nature's forces are displayed amid these features. Glacial debris creates a 25 square-mile Sahara of active sand dunes.

A rich record of early man in the arctic is preserved in the more than 30 cultural levels unearthed at Onion Portage, one of the most important archeological sites in arctic North America. Those who cross the frontier see contemporary ties with the past. The Kobuk valley today is a place where the old ways--subsistence hunting, fishing, and gathering--continue to be a way of life for the Eskimos; the Kobuk River remains their highway.

1. The Alaska Native Claims Settlement Act

This proposal is a result of investigations conducted by the National Park Service to identify areas suitable for inclusion as units in the



National Park System. These investigations are in accordance with the Alaska Native Claims Settlement Act of 1971 (ANCSA), Public Law 92-302. ANCSA directed the Secretary of the Interior to withdraw from all forms of appropriation up to 80 million acres of public lands in Alaska for possible additions to or creation of units in the National Park, National Forest, National Wildlife Refuge, and National Wild and Scenic Rivers Systems. The Secretary must make his recommendations on potential additions to the systems by December 18, 1973. The Congress has allocated itself five years in which to consider the proposals.

In addition to lands withdrawn for study for possible inclusion in the four systems, the Secretary has withdrawn lands for possible selection by Native groups and by the State of Alaska, and for additional Federal study. A brief description of the various land classifications involved in and adjacent to this proposal follows. (See Land Status map.)

## 2. National Interest Lands d-2

National interest lands d-2 are classified in section 17(d) of the ANCSA as lands withdrawn from all forms of appropriation under the public land laws (including the mining and mineral leasing laws, the Alaska Statehood Act, and from selection by Native corporations). The Secretary

of the Interior was directed to place up to 80 million acres in d-2 classification for possible inclusion into one or more of the four systems. The d-2 lands not included in the four systems or reclassified for Native or State selection will revert to d-1 status on December 18, 1973.

The entire area of the Kobuk Valley National Monument proposal is classified d-2.

Lands referred to as d-1 lands are withdrawn pursuant to Section 17 d(1) of the Act in the general public interest. This withdrawal reserves these lands pending further study and classification.

### 3. Native Village Withdrawal Lands

Native Village withdrawal lands are lands reserved for selection by village and regional corporations from lands withdrawn by the Secretary pursuant to section II of ANCSA. Under provision of ANCSA, each village will receive surface rights to all lands within the township in which the village is located, as well as rights to two to six additional townships depending upon the size of the village population. Sub-surface rights of village selected lands are reserved in ownership by the appropriate regional corporation (section 12(a) (1)0, except for lands selected by villages within the National Wildlife Refuge System of Naval Petroleum Reserve Number 4. In this latter case, the regional corporation for that region may select a subsurface

estate of equal acreage from other lands withdrawn within the region (subsection 11 (s)). ANCSA directed the withdrawal of each township which is contiguous to or corners on any of these lands. In general, this means that up to 25 townships have been withdrawn for each village.

#### 4. Native Allotment Lands

Native allotment lands are those lands to which individual Natives are given title. The Alaska Native Claims Settlement Act revoked Indian Allotment Authority in Alaska under the acts of February 8, 1887 (24 Stat. 389) and of June 25, 1910 (36 Stat. 363), and repealed the Alaska Native Allotment Act of 1906 (34 Stat. 197). Under these acts, a Native could secure title to 160 acres (in up to four separate tracts) of lands which he uses and occupies. ANCSA also provided that allotment applications which were then pending before the Department of the Interior could be processed. Natives with an allotment application covering their primary place of residence have the option of continuing their claim for certification under the acts of 1887, 1910, or 1906, as the case may be, or of obtaining title under subsection 14(h)(5) of ANCSA.

The Bureau of Land Management is now recording, examining, and processing the Native allotment applications throughout Alaska.

Within the proposed Kobuk Valley National Monument boundaries, there are 75 Native allotment applications filed under the terms of the Native Allotment Act.

## II. DESCRIPTION OF THE ENVIRONMENT

### A. THE EXISTING ENVIRONMENT

#### 1. General Description

Alaska is renowned for its scenic splendor, abundant wildlife, untamed rivers, and pristine forests and tundra. Before and since Alaska's purchase from Russia, commercial use of the fish, fur, mineral, and timber resources has been the mainstay of the economy. Agriculture, including reindeer husbandry, has been important locally. More recent uses of the natural resources -- tourism, recreational hunting, fishing, camping, and petroleum exploitation -- are increasing rapidly in dollar value. Alaska is not an industrial State because of the extreme weather, and because of the high costs of living, labor, and transportation.

Some uses of Alaskan natural resources are short-term, nonrenewable, and environmentally degrading; other, discrete uses may continue into the foreseeable future with little or no alteration of the environment. Often a variety of natural resources may be used or developed simultaneously and compatibly; but at other times, the uses can be in conflict, with some losing either their real or potential value at the expense of others.

The following is a description of the natural resources of the Kobuk valley. It includes a discussion of past uses of regional resources as well as suggestions for intelligent use in the future.

The proposed monument is located in northwest Alaska, north of the Arctic Circle. It includes the portion of the Kobuk River valley that lies

between the Baird Mountains on the north and the Waring Mountains on the south, and between the Salmon and Akillik valleys on the west and east respectively. The monument is generally bounded by latitudes 66°45' and 68°00' north, longitudes 160°30' and 157°00' west. Diverse biological, geological, and anthropological resources are located here; the natural ecosystem exists in a remarkably pristine state.

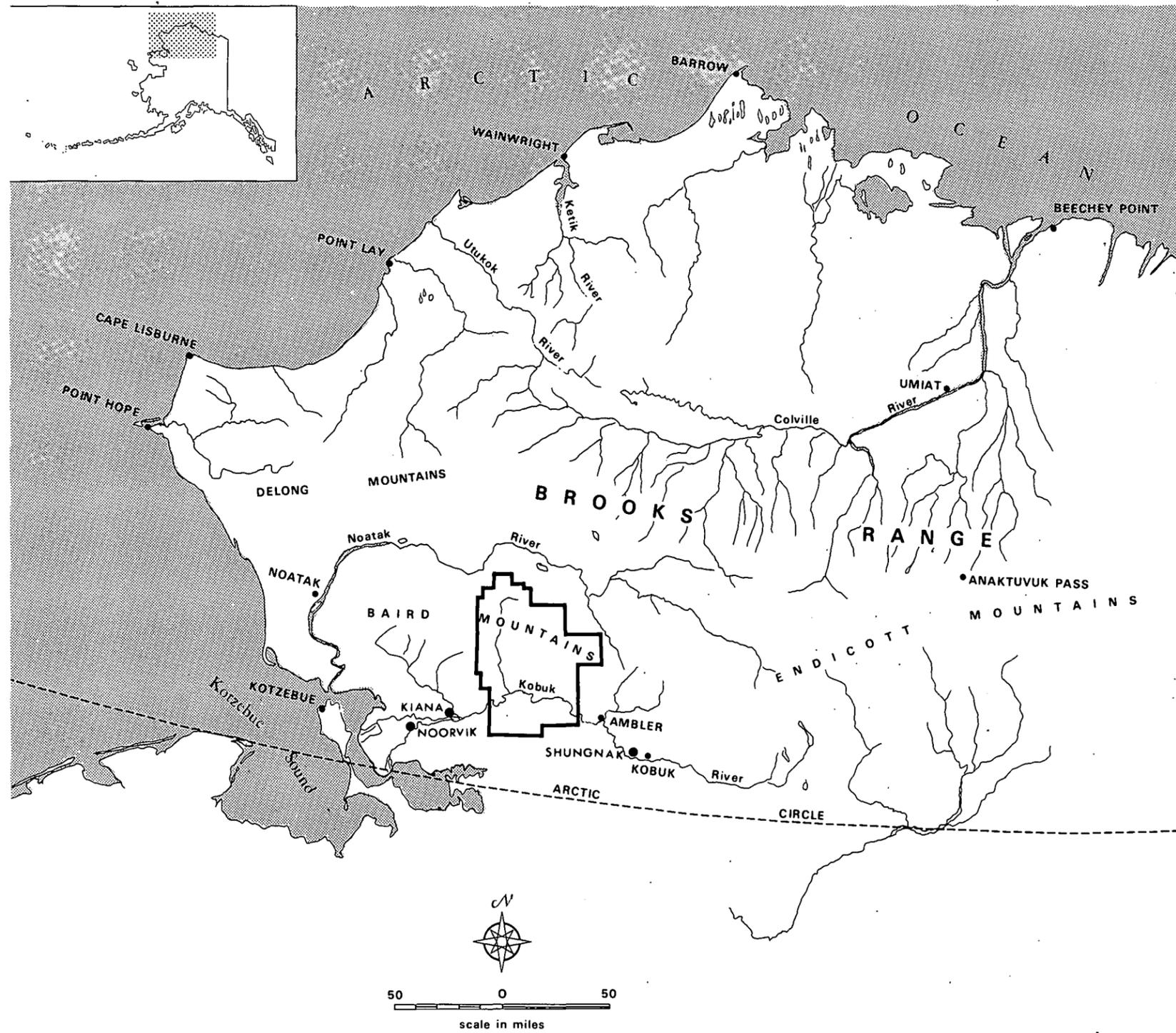
The total population of the monument and the interdependent surrounding area is 3,104. This total area includes five small villages -- Ambler, Kobuk, Shungnak, Kiana, and Noorvik -- and the community of Kotzebue. Kotzebue, with a population of 1,965, is the regional transportation and business hub. It is also the headquarters of the Northwest Alaska Native Association (NANA), the regional corporation within which the entire monument lies. (See The Region map.)

No other village in the region has a population exceeding 500. (See Figure 2 , Chapter II, section 7.) The economy and lifestyle throughout the region is primarily subsistence; over 80 percent of the people are Natives. Kotzebue has the greatest percentage of non-Native residents.

The monument is approximately 70 miles east of Kotzebue. Kiana, on the west, and Ambler, on the east, are just beyond the proposed boundaries. Both villages are on the Kobuk River, and both are served by air service from Kotzebue.

The Kobuk River flows westward on the south flank of the Brooks Range, draining a large area of the Brooks Range province and portions of the

The Region



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plateaus. The course of the river is more or less along the junction of the mountains with the plateaus. The Koyukuk Plateau subprovince, a series of generally flat-topped hills, lies south of the Kobuk River. This range of hills extends as far east as the John River and essentially lies north of the Koyukuk-Yukon River divide. The Lockwood and Zane hills and bordering uplands of the Waring Mountains are included in the Koyukuk Plateaus subprovince.

The hills are underlain with sandstone and shale rock. These formations are largely of Mesozoic age and offer only moderate resistance to erosion. The rocks weather somewhat rapidly, with the more resistant sandstone beds forming steep slopes as contrasted with the gentler slopes that result where the bedrock is shale. The sands of the Great and Little Kobuk Sand Dunes and other lesser dunes in the vicinity of Waring Mountains derive from this weathered sandstone.

The general topography is subdued and nowhere are the slopes too steep to be traversed or hold vegetation. Very little of the plateau remains undissected; it is separated into many closely spaced valleys. Elevations in the area do not exceed 3,000 feet (U.S. Army Corps of Engr., 1967).

The boreal forest extends to the mid-drainages of the Kobuk and Selawik River basins. Treeless tundra spreads westward to the coast at Kotzebue Sound.

During recent geologic times, when sea level was lower, the Noatak, Kobuk, and Selawik Rivers were joined. They now have separate deltas dotted

with many lakes and swamps, and intricate, webbed channel systems, with many meander scars. Together, they constitute a large delta region to the south and west of the Kobuk valley proposal. The Kobuk and the smaller Selawik now empty into Hotham Inlet, the easterly arm of Kotzebue Sound.

These deltas are composed of silt, sand, and gravel. The permanently frozen ground has numerous permafrost features. Subsurface investigations for military construction in the vicinity of Kotzebue revealed thick (50 feet or more) deposits of brown organic silt with huge masses or lenses of ice that in places constitute as much as 50 to 60 percent of the stratigraphic interval. Organic matter, in the form of peat, muskeg, and animal skeletons has been found. Subsurface temperatures taken below the active seasonal thaw zone range between 26° and 21° F.

The Great Kobuk Sand Dunes and the Little Kobuk Sand Dunes are on the north side of the Waring Mountains within the Kobuk watershed. The light, buff-colored sands of these two dunes cover about 25 and 5 square miles, respectively. They very slowly encroach upon the surrounding forest. Sand dunes are evident in other nearby areas but spruce, birch, and lichens hold the sand in place.

## 2. Climate

The mean annual temperature at Kotzebue is 21°F, with record extremes of -52°F and 85°F. Average annual precipitation is 8.2 inches, with cumulative snow depths averaging 46 inches, and ranging from 22 to 68 inches (U.S. Department of Commerce, National Oceanic and Atmospheric Administration).

Greater extremes in temperatures and precipitation occur inland along the Kobuk watershed than on the coast at Kotzebue. Generally, inland summer temperatures are higher and winter temperatures lower.

Average date for freeze-up is October 23 for Kotzebue Sound. Break-up of sea ice is May 31 (U.S. Department of Commerce, CGS, 1964). The Selawik River at Selawik and the Kobuk River at Noorvik freeze on the average by October 7 and 11, respectively, and break up by May 28 and 29 (U.S. Department of Commerce, CGS, 1964).

Inland seasonal precipitation maximums occur during late summer and early fall. Three inches or more per month can be expected during July, August, and September. Average annual precipitation is between 15 and 20 inches at lowest elevations and up to 25 to 30 inches at highest elevations. Average seasonal snowfall ranges from 45 inches at low elevations, to 100 or more inches at high elevations. The variation in terrain, both in elevation and orientation of valleys and ridges, causes large variations in precipitation amounts.

Surface winds along the coast are fairly strong during all months. The average annual wind speed at Kotzebue is 13 m.p.h. Through the Kobuk River valley winds are mostly east or west, but there are periods when north winds flow out of the Brooks Range valleys.

The only guide estimating cloud cover in the region is the statistics for Kotzebue, where average cloud cover, sunrise to sunset, is 6.6, on a scale of 0 for no clouds and 10 for overcast. In the valley and along the slopes, however, cover is substantially less than that found at the coast.

### 3. Geology

General: The monument lies within two major physiographic provinces. The Baird Mountains comprise a portion of the Arctic Mountains province (Brooks Range) of the Rocky Mountain system. The remainder of the area comprises the Kobuk-Selawik Lowland section of the Western Alaska province. The Waring Mountains are a subsection of the latter (Wahrhaftig, 1965).

The Brooks Range is a complex geanticline, or fold belt, over 600 miles long that may be considered to be a northward extension of the Rocky Mountains. Paleozoic marine rocks that have been thrust-faulted northward and folded into great flat folds overturned to the north form the backbone of the range (Wahrhaftig, 1965). North of the proposed area, rocks consist of Silurian, Devonian, and Mississippian limestones; quartzite, and metamorphic rocks; Permian, Triassic, Jurassic, and Cretaceous sandstones; conglomerates, and shales are also present (Gryc, 1958).

Within the monument, on the south flank of the Baird Mountains, is a belt of undifferentiated Paleozoic rocks with an east-west structural trend. The Paleozoic rocks are metamorphosed sediments of phyllite and quartz-mica schist, with greenstone and some calcareous schist and limestone present. Paleozoic rocks are exposed along the foothills of the Baird Mountains and in the core of the Cosmos Hills anticline.

Lower bedrock spurs of the Baird Mountains are underlain by altered basalt flows and diabase intrusive rocks with subordinate chert and

mudstone. Local bodies of serpentine occur in the Jade Mountains and Cosmos Hills. This Jurassic age rock unit contains asbestos and jade deposits.

A thick section of Cretaceous rocks underlie the Kobuk River valley. This sedimentary basis is bounded by the Baird Mountains on the north and by the southern foothills of the Waring Mountains, Hockley Hills, and Hotham Peak on the south. These southern hills divide the Kobuk and Selawik River lowlands. Cretaceous rocks are 13,500 to 17,500 feet thick, as measured from exposures in the Waring Mountains (Patton et al., 1968).

Three rock units ranging from early to late Cretaceous age have been mapped. The east-west band along the south side of the Kobuk valley consists of volcanic graywacke, mudstone, and conglomerates with interbedded calcareous graywacke and mudstone forms. This unit includes most of the south flanks of the Waring Mountains. Pebble-cobble conglomerate and poorly sorted and stratified basaltic or andesitic rocks, in a graywacke and mudstone matrix, form the upper slopes of the Waring Mountains. Quartz conglomerate, sandstone, and mudstone in a quartz and micaceous matrix of nonmarine origin occurs along the northern foothills of the Waring Mountains and underlies Ingrichuk Mountain and the Cosmos Hills. Well preserved plant fossils are abundant in this unit (Patton and Miller, 1968; Patton, et al., 1968). Probable Jurassic and Paleozoic rocks have been mapped on the north side of the Kobuk valley. The presence of small amounts of bituminous coal is indicated by the occurrence of float in the vicinity of the Kallarichuk and Kobuk Rivers.

The Waring Mountains are a broadly folded, northeast trending syncline. Faults on the northwest flanks of the syncline parallel the structure (Patton and Miller, 1968).

Small patches of high grade metamorphic rocks--impure marble, conglomeratic marble, and granitic rocks--occur in the Selawik Hills, about 38 miles south of the inferred limits of the Cretaceous basin.

Unconsolidated deposits of three principal kinds floor the Kobuk River valley. Flood plain silt, sand, and gravel deposits lie along major rivers and streams. The Kobuk River flood plain is 1 to 6 miles wide, except at the confluence of major tributaries and on the delta (Patton and Miller, 1968; Patton et al., 1968).

Glacial drift covers most of the remaining bottoms of the Kobuk-Selawik Lowlands. Sediment types are numerous, including sand and silt deposited by wind and water, clayey till, outwash gravel, sand and silt.

About 300 square miles of the central Kobuk valley is covered with sand which had been distributed by wind and water. A tongue of sand extends from the Kobuk valley, through the drainage divide east of the Waring Mountains, and into the upper Selawik valley. Two areas of active dunes lie to the north of the Waring Mountains and cover about 30 square miles. These are the Great and Little Kobuk Sand Dunes (Fernald, 1964). Except for a narrow dune field along the south bank of the Kobuk River opposite the mouth of Hunt River, and small, isolated flowouts of sand, the remainder of the sand unit is covered with forest and tundra vegetation.

Hundreds of lakes, mostly thaw ponds, cover the lowlands. Sand, silt, clay, and peat are exposed along lakeshore.

Glacial Geology: Five glaciations have been recognized in the Kobuk valley (Fernald, 1964). The greatest extent of glaciation occurred in Illinoian time when glaciers extended at least as far west as the Baldwin Peninsula, which is made of morainal sediments. Today, glacial drift covers much of the Kobuk River valley. Drift lies at altitudes of 800 feet above sea level in the Waring Mountains, indicating that the ice was at least that thick (Patton and Miller, 1968). No glaciers exist at present within the proposed monument.

The glaciations are as follows (Fernald, 1964):

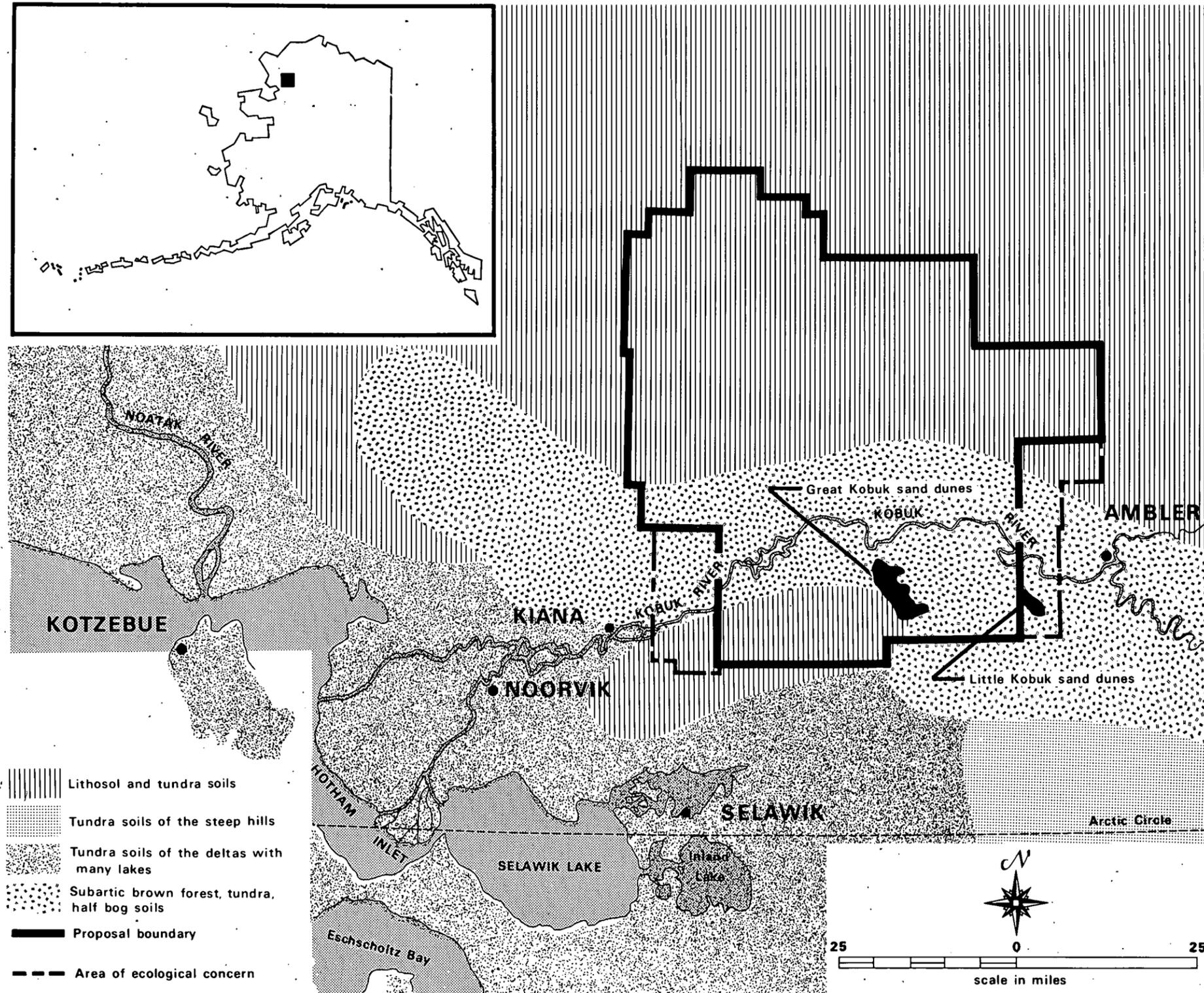
Modern glaciation	Modern moraines and drift in north-facing cirques of Schwatka Mountains.
Ulaneak Creek glaciation (Recent age)	Fresh moraines in higher parts of Schwatka Mountains.
Walker Lake glaciation (Wisconsin age)	Lobate moraines in the Schwatka Mountains; small moraines in the Baird Mountains.
Ambler glaciation (Wisconsin (?) age)	Subdued moraines along larger rivers draining the Baird and Schwatka Mountains. Glaciers reached the Ambler lowland but not the Kobuk River.
Kobuk glaciation	Eroded drift having no distinct morainal topography covers large areas of Kobuk valley.

Much of the silt and sands deposited by wind and water were emplaced during the interglacial period that followed the Kobuk glaciation and preceded the Ambler glaciation. During this time strong easterly winds blowing down the Kobuk valley reworked glacio-fluvial materials on the extensive river bars and outwash plains to form the dune fields. Subsequently, the wind-winnowed sediments were vegetated, except for the active areas of the present Great and Little Kobuk Sand Dunes.

Soils and Permafrost: The soils of this region are generally of the tundra and lithosol types. Some subarctic brown forest soils extend down the Kobuk River drainage from the interior forests. (See Map 5.)

Tundra soils have a tough, fibrous brown mat on the surface, and a few inches of dark-colored, humus-rich soil immediately below. This soil then fades to lighter colored gray or mottled soil beneath, and then down to permafrost or to the unaltered parent rock material. In summer, the soils beneath the surface are nearly always wet, or at least moist. Steep hills, of course, have better drainage. Due to low temperatures, the chemical reactions and biological processes of soil formation take place slowly. Physical processes, such as weathering, predominate (Kellogg and Nygard, 1951).

Lithosols are without zonation. They consist mainly of hard rock, covered, sometimes, by thin, irregular amounts of soil material. Lichens, mosses, and dwarf shrubs can grow in the patches of soil material that collect between rocks. This type of soil is found in the Waring Mountains between the Kobuk and Selawik Rivers (Kellogg and Nygard, 1951).



Subarctic brown forest soils resemble the podzol type, but blend with tundra soil types in places. They are well-drained soils with brown surface horizons that merge through gradual transitions to the present material beneath. They may be underlain by permafrost, but the lower soils are normally too cold for much growth of roots or micro-organisms (Kellogg and Nygard, 1951).

Permafrost is continuous in the Kobuk valley. Hundreds of thaw lakes cover the lowlands. Beaded streams are common. With the exception of the Kobuk River vicinity, patterned ground in the form of ice-wedge polygons is almost universally present.

A rectangular (rather than polygonal) gridwork on the unvegetated easternmost section of the Great Kobuk Sand Dunes is probably a manifestation of permafrost terrain. The grid pattern is accentuated by the black broken plates of cemented sand less than 1 inch thick.

The gridwork area on the eastern end of the Great Kobuk Sand Dunes (Sanchez, field observations, 1972) has principal ridges oriented about N. 19°W., spaced about 20 feet apart. Transverse ridges, which intersect these northerly trending ridges at right angles, are spaced about 40 feet apart.

In the Kobuk area, permafrost lies at depths of 1 to 5 feet. In areas covered by wet tundra, permafrost lies at depths of 1 to 2 feet. Permafrost thickness, however, is unknown (Fernald, 1964).

Solifluction features are common on the steep slopes of the Baird Mountains. Small turf-banked terraces have formed on the north slopes of the Waring Mountains. Bedrock exposures almost everywhere have been severely frost shattered.

Paleontology: As the Kobuk River erodes its banks the bones of mastadons and other Pleistocene mammals are occasionally exposed. It is certain that such relics will continue to be exposed within the proposed monument.

Kobuk Sand Dunes: Two large areas of active sand dunes, the Great Kobuk Sand Dunes and the Little Kobuk Sand Dunes, cover areas of about 25 and 5 square miles, respectively. The Little Kobuk Sand Dunes are outside the proposed boundary but within the area of ecological concern on the east. The active dunes fields are part of two larger fields of vegetation-stabilized sand dunes that cover more than 300 square miles of the central Kobuk River valley near Ambler.

The active dunes are bordered on the east by dune fields that are partly active and, further east, by dune fields that are stabilized by vegetation; a complete sequence of dune development is present. Dune forms show a complete transition from U-shaped, concave dunes to barachan dunes, in direct response to the westward increase in the amount of available sand, and the decrease in the vegetative cover (Fernald, 1964). At the western end of the field, barchan dunes, with edges pointing downwind, rise to heights of 100 feet.

The dune fields rise gently from the Kobuk Valley and thicken westward. The active dunes and sand mass terminate abruptly in a steep escarpment

Hundred-foot high waves of sand are sparsely vegetated. Dune building winds are westerly during summer, from the east (right) the remainder of the year.



The Brooks Range skyline forms the backdrop for the dunes and forests of Kobuk Valley.

Clean, golden yellow sands contrast sharply with the deep green spruce forest. Kavet Creek flows at the foot of high dunes.



Ahnewetut Creek has maintained its course through the Great Kobuk Sand Dunes. Other streams flow around the dunes.



against the Waring Mountains. Prevailing winds in the Kobuk valley are easterly except during summer months when they blow from the west or southwest. Dune forms clearly show that easterly winds were responsible for their construction. However, along crests of the higher barchan dunes in the western two-thirds of the Great Kobuk dunes, small secondary dune ridges, a few feet high, have formed in response to summer westerly winds (Sanchez, field observation, 1973).

The great volume of sand is derived from a glacial source -- drift and outwash from glaciers which originated in the Schwatka and, to a lesser extent, the Baird Mountains. The greatest dune-building activity probably occurred during glacial periods, when easterly winds were stronger and more frequent, and vegetative cover was sparse or absent. The age of the deposits is certainly Wisconsin and part of them may be as old as Illinoian. No radiocarbon dates are available from the sands, but, from peat deposits below dune sand, dates greater than 33,000 years are indicated (Fernald, 1964).

The dune sand ranges from very fine (0.05 to 0.1 mm.) to very coarse ~~(1 to 2 mm.)~~ sand sizes. Grains are well-rounded and frosted. Mineral composition is principally quartz, feldspar, and opaque minerals. Chlorite and chloritoid is abundant in the finer fractions (Fernald, 1964). The overall, golden-yellow color of the dunes contrasts vividly with the vari-colored light and dark greens of the surrounding spruce-birch-aspen forest and the streamside willows.

The Great Kobuk Sand Dunes affect the courses of two streams which rise in the Waring Mountains. Kavet Creek is crowded against these mountains by migrating dunes. That creek now flows at the base of the steep dune-edge escarpment along the southwestern and western margin of the dune field. Some water from Kavet Creek drainage probably flows beneath the high barchan dunes in this area. Several springs issue from the amphitheaters of the western base at the active dune front; the outflow then re-enters Kavet Creek (Sanchez, field observation, 1972).

Niaktuvik Creek similarly follows the active dune margin to the southeast, flows across a narrow area of stabilized sand, then over glacial drift to its confluence with the Kobuk River.

Ahnewetut Creek has maintained a course through the active dune field. The faces of 100-foot dunes form the east bank of Ahnewetut Creek. High dunes rise from the west bank, but the windward slopes are much gentler than the 31 degree slip face slopes. The three streams carry a heavy load of sand. Predictably, the streambeds are quicksand; one sinks almost to his knees when traversing these streams (Sanchez, field observation, 1972).

Water Resources: The wildlife, wildlife habitats, fisheries, mining, recreational opportunities, and demographic features within the Kobuk valley are interrelated with the type, quality, and quantity of the water resources.

The Kobuk River meanders across a flood plain nearly 8 miles wide. Meander scrolls and oxbow lakes abound.



Sand bluffs, 100-150 feet high, occur at river bends. Some bluffs contain permafrost ice wedges and Pleistocene mammal fossils.



The placid Kobuk River is 1,000-1,500 feet wide and falls only 2 - 3 inches per mile. The river lies 50 feet above sea level over 150 river miles inland from its mouth.



The Kobuk River is the main watercourse within the region. It flows in a confined course only in its upper reaches. In its lower section -- 50 miles or more above the mouth -- the river breaks and fans out into a dozen or more channels, so braided that the main stem is hard to find. The Kobuk River delta is 20 miles wide. At the delta, the banks rise only a few feet to a maze of small lakes, ponds, and sloughs which attract large numbers of waterfowl and shore birds. The Kobuk accumulates almost all its flow from tributaries originating above this marshy area. Figure 1 depicts the average daily discharge of the Kobuk River by month.

The Kobuk River heads on the south slopes of the Brooks Range and flows westward 280 miles, emptying into Hotham Inlet across a 32-mile-long delta. In the central Kobuk valley the river is 1,000 to 1,500 feet wide. The river is shallow and sand bars are numerous. Banks are low except at large bends where occasional bluffs are 50 to 150 feet high. The river follows a meandering course across a flood plain that varies from 1 to 8 miles in width. Sloughs and oxbow lakes are abundant along the wider parts of the meander plain.

The spring thaw brings flooding along the Kobuk. Melting snow pours water down the frozen river, lifting, breaking, and jamming the heavy ice. These ice jams back up water for miles and flood the lowlands. Eventually, the continuing onslaught of water raises or erodes the ice until the jams break. The ice flows down the river until a new supply of ice gathers and, again, jams. During this process, gravel bars and banks are scoured, a large amount of silt is deposited, lakes on

on the flood plain are recharged, and sometimes new sloughs and channels are established.

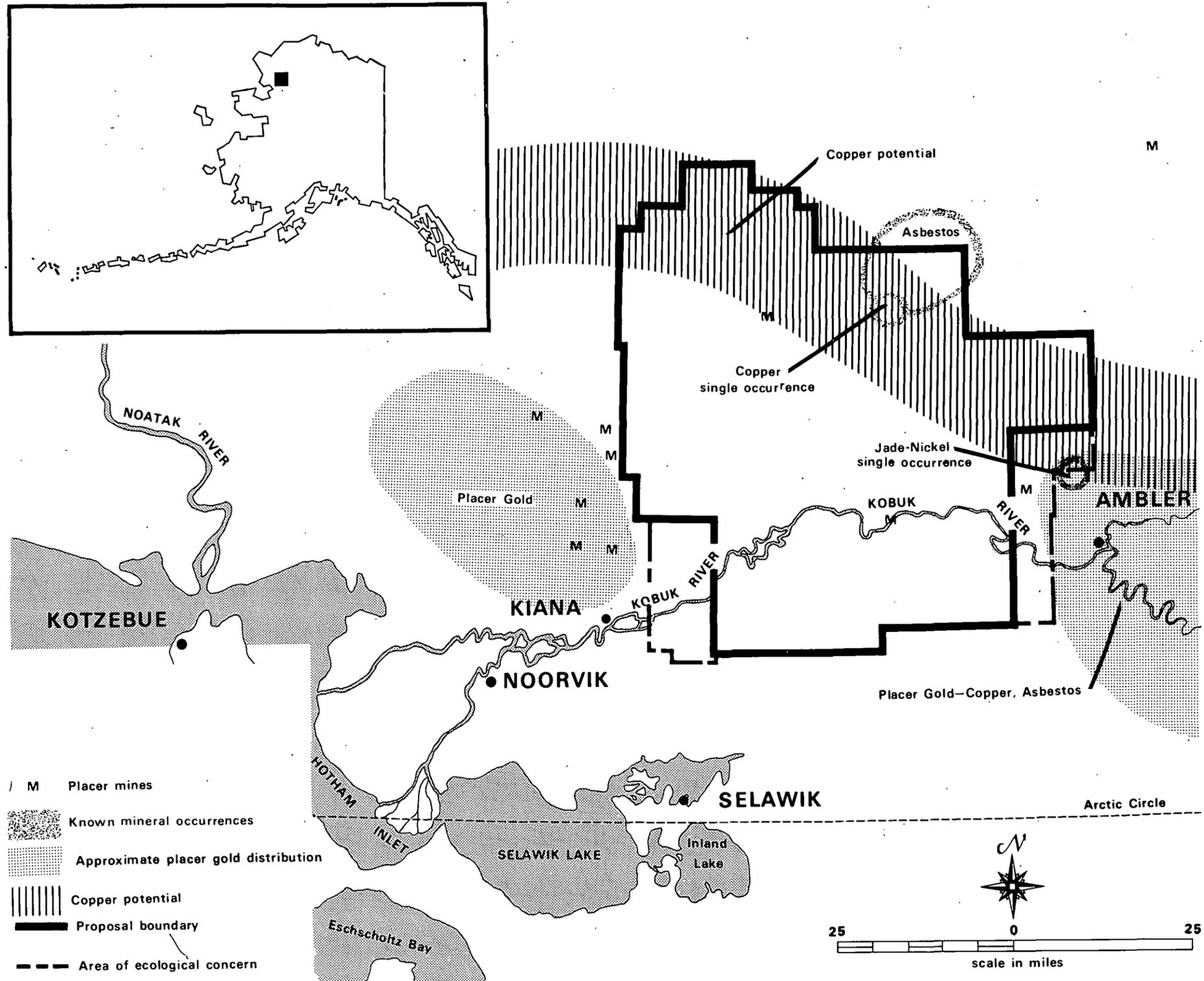
The heaviest rains of the year occur in the late summer. Occasionally, these rains again flood the Kobuk valley.

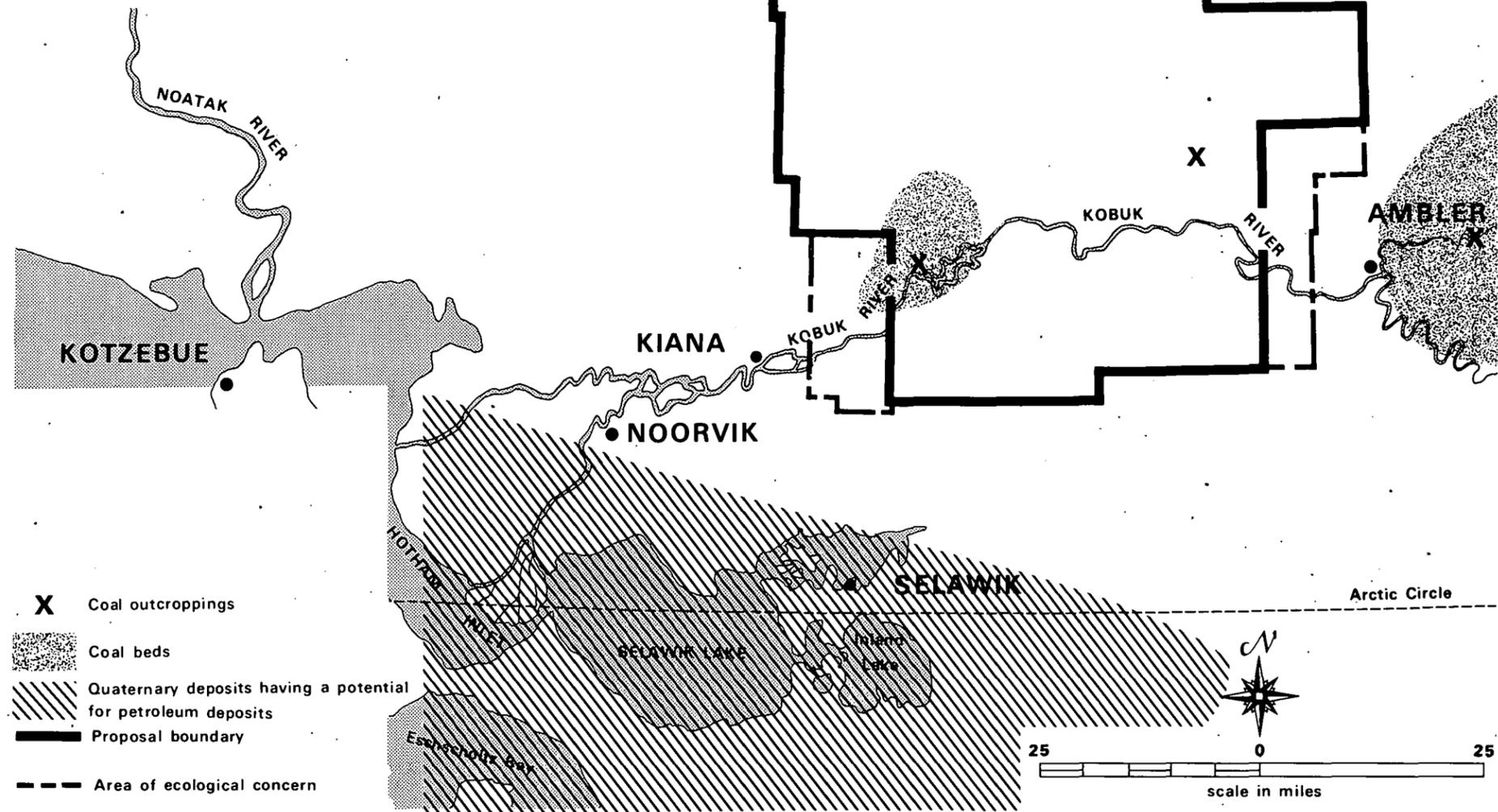
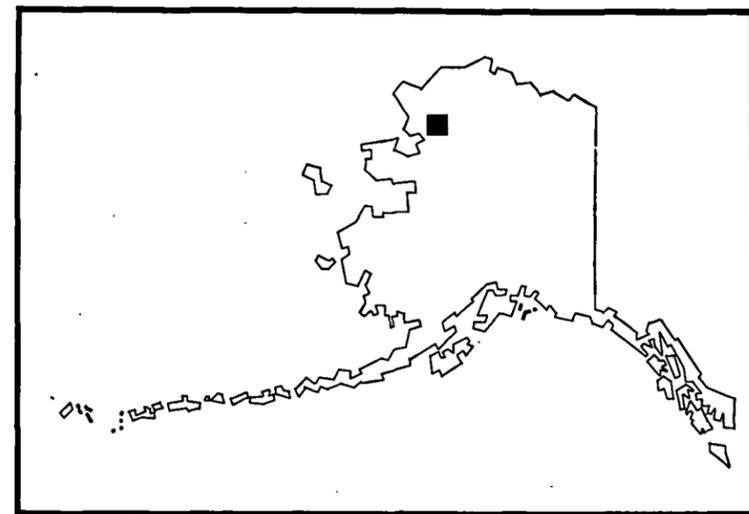
Minerals: Geologic mapping of the area suggests that the lowlands have a low metallic mineral potential. The area has a low to moderate petroleum potential, with a possible Tertiary sedimentary basin underlying the area (U.S. Department of the Interior, GS, 1972).

Reconnaissance of the upper Kobuk watershed is only partial, but it suggests the area has a moderate to high mineral potential, with the Baird Mountains having the best potential.

The known distribution and production of various metals and metalliferous minerals can give some indication of the likelihood of encountering these resources within an area. In Alaska, where mineral exploration is considered to be in an early stage, these indications may be misleading. The following maps show the location of known minerals within the region (Cobb, 1960-64).

Mineralized rock exists in and adjacent to the proposal area and reconnaissance sampling has discovered several geochemical anomalies. Outside the monument, placer gold has been produced sporadically from Klery Creek, and a copper prospect has been drilled. Copper prospects are best at Bornite between the Ambler and Kobuk Rivers where bornite, a sulfide of copper and iron, is found in marketable quantities. Here





there is an estimated 100 million tons of ore containing 1.2 to 1.6 percent copper. Potential copper resources may occur within the northern portion of the monument because the belt of mineralized marble and pelitic schist that forms the southern margin of the Brooks Range trends westward from Bornite through the monument area. (See Minerals I map.)

Chromite-and nickel-bearing ores are found in the upper Kobuk watershed, east of the monument.

At the present, fluorite appears to be the nonmetallic mineral in the region having the greatest potential for production. The following account of the occurrence of these minerals is taken from Plafker and Berg (1964).

Asbestos minerals occur in a linear zone that extends approximately 45 miles eastward from Jade Mountain to the eastern half of the Cosmos Hills in the upper Kobuk River. Deposits are judged sufficient to have economic potential for development.

Production of gem-quality jade has occurred in the vicinity of Jade Mountain near Ambler.

The Tertiary sedimentary basins, which underlie Kotzebue Sound and portions of the Selawik and the Kobuk, may contain petroleum deposits. Other portions of the region have little or no prospect for petroleum discovery. (See Minerals II map.)

Coal is found at a few scattered localities within the region and generally in association with Quarternary deposits. Coal outcroppings

and beds are known from several points along the Kobuk River (Barnes, 1967). Several thin coal beds (2 to 3 feet thick) are exposed on the lower Ambler River, on the Kogoluktuk River, and in the Lockwood Hills. All are adjacent to but outside the proposal area. An outcropping on Hunt Creek is within the Kobuk valley proposal; thin coal beds are exposed in bluffs on the north side of the Kobuk between Trinity Creek and the Kallarichuk River, just inside monument boundaries.

Two claim groups are within the monument area. There are no available production records.

#### 4. Vegetation

General: The vegetation of Kobuk valley is diverse. At least 368 species of flowering plants have been reported for this general area (Appendix D). Lichens and liverworts, although important elements of regional vegetation, have received no similar quantitative or qualitative study. Undoubtedly, many additional species of lichens and liverworts will be found within this region as botanical data are gathered.

During the late Tertiary and Pleistocene ages, the geological uplifting and the resulting climatic shifts within the region mark the beginning of modern vegetation (Johnson, 1969). These vegetation patterns continued to shift and differentiate in response to repeated glaciations. Two major sources of floral migration are especially significant to Alaska: the Bering Land Bridge, and unglaciated refugia (Hulten, 1968; Johnson, 1969). The Kobuk valley region was a principal element of both these sources. There is increasing evidence that major elements of today's

A caribou trail follows a lichen-covered ridge through black spruce woodland. The boreal forest reaches its northern limit in the Kobuk River valley.



Forest diversity in the Kobuk is great. Active sand dunes encroach upon white spruce trees near Kavet Creek (left). White and black spruces mixed with aspen and paper birch surround the Great Kobuk Sand Dunes (center). Paper birches stand on a bluff above the Kobuk River (right).



flora crossed the broad land bridge that spanned the Bering Strait during the Wisconsin glacial period. The Kobuk valley with the larger, surrounding region constitute an exceptionally valuable living workshop for scientists who are interested in plant evolution, genetics, distribution, redistribution, and migration.

The diverse vegetation found in the area is a mosaic related in part to growing season, soil, slope and aspect, water regime, presence of permafrost, and fire. The boreal forest, or taiga, is found throughout most of interior Alaska and extends along the south slope of the Brooks Range, and into the lowlands of the Kobuk valley. Tundra lies generally to the west in the uplands.

Vegetative Types: The classification of vegetation that follows is taken mainly from Viereck and Little (1972), with minor modifications adopted from Hopkins and Sigafos (1951), Hanson (1951), and Britton (1957). The vegetation map represents gross vegetative patterns and is not definitive. The map was extrapolated and drawn from a combination of information, including Viereck's (1972) vegetational map of Alaska, ERTS satellite (NASA) imagery, U.S. Geological Survey topographic maps, and aerial reconnaissance information obtained by the Bureau of Sport Fisheries and Wildlife. (See Vegetation map.)

Within the boreal forest in the monument area are several vegetation subtypes: closed spruce-hardwood forest; open, low-growing spruce forests; and shrub thickets. Although each subtype is comprised of a mixture of species, it is usually classified either by the dominant species, or by the morphology of the stand.

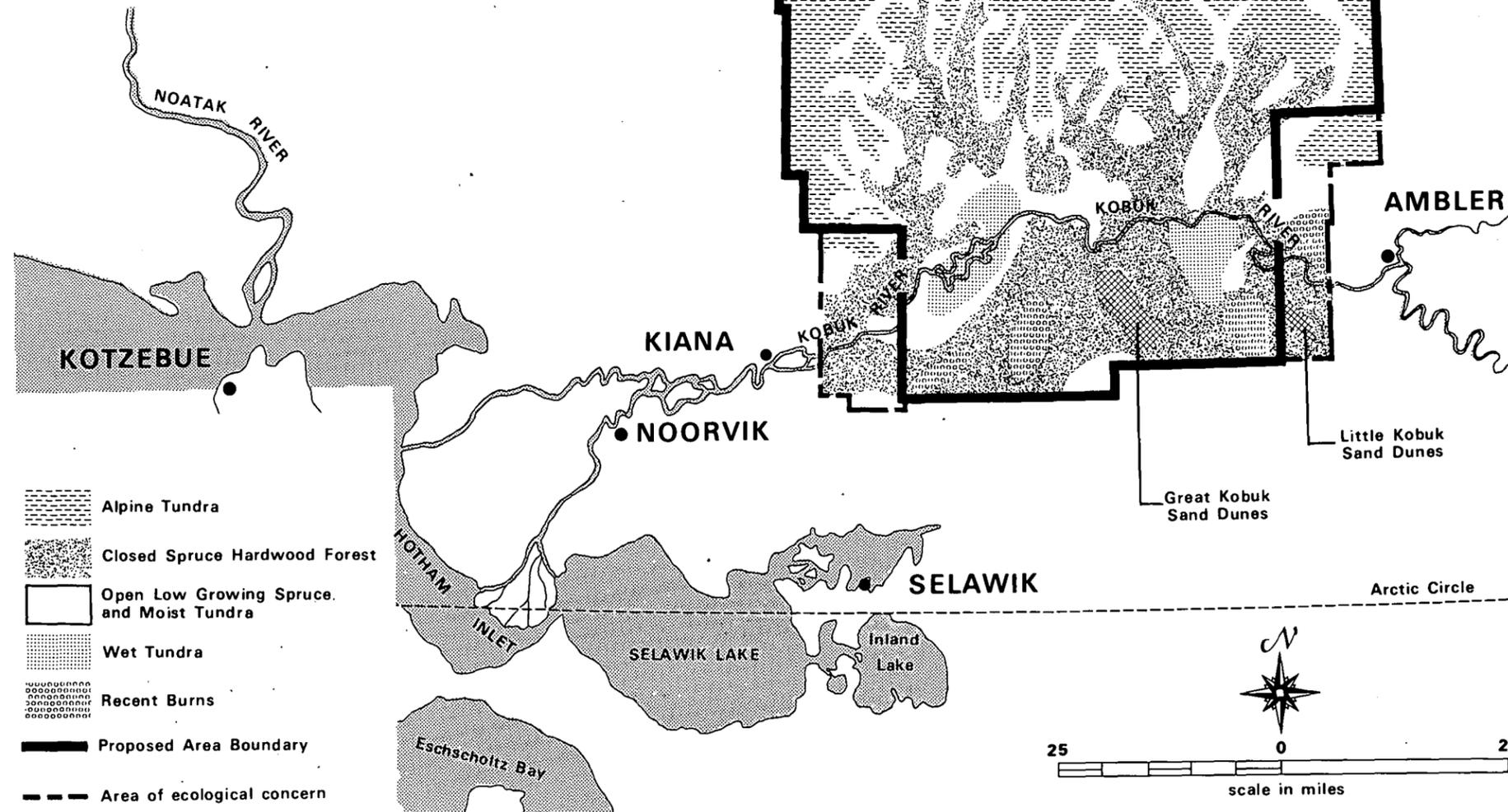
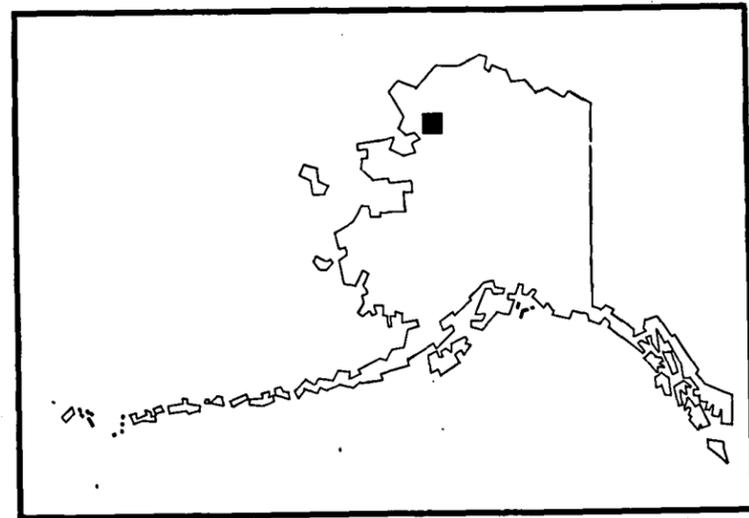
Because of repeated burns, large areas of the forests are in various stages of succession. In general, fires are followed by a forb and shrubby stage, then one of several hardwood stages, and last by a spruce stage. Recent forest and tundra burns within the area have been identified from ERTS satellite (NASA) imagery.

The best commercial stands of white spruce are generally found on the warm, dry, south-facing hillsides and adjacent to rivers where drainage is good and permafrost is absent. These stands are rather open under the canopy but may contain shrubs of rose, alder, and willow. The forest floor is usually carpeted by a thick moss mat. The most common trees and shrubs associated with this type are white spruce, paper birch, balsam poplar, bearberry, crowberry, Labrador tea, willow, and lingenberry.

Fires in closed white spruce-hardwood forests generally set plant succession back to a shrubby stage, consisting primarily of light-seeded willows with a ground cover of sedges, grasses, fireweed, Labrador tea, rose, blueberry, and lingenberry.

Fast-growing quaking aspen stands develop in upland areas on south-facing slopes following fire and willow stages. The aspen mature in 60 to 80 years and are eventually replaced by white spruce. Paper birch is the common invading tree after fires on slopes facing east and west. Occasionally it invades on north slopes and falt areas. Paper birch occurs either in pure stands or more often mixed with white spruce, aspen, or black spruce. Balsam poplar invades sandbars and achieves its greatest growth and abundance on flood plains.

Vegetation



-  Alpine Tundra
-  Closed Spruce Hardwood Forest
-  Open Low Growing Spruce and Moist Tundra
-  Wet Tundra
-  Recent Burns
-  Proposed Area Boundary
-  Area of ecological concern

On north-facing slopes and poorly drained lowlands, forest succession leads to open black spruce and bogs, usually underlain by permafrost. Black spruce is slow growing and seldom exceeds 8 inches in diameter. Usually it is much smaller. A tree 2 inches in diameter is often 100 years in age. Many black spruce invade after fire because fires cause its persistent cones to open, spreading seed over the burned areas. A thick moss mat, often of sphagnum mosses, sedges, grasses, and heath or other ericaceous shrubs, makes up the subordinate vegetation of the open black spruce stand. The woody plants of these low-growing spruce forests include black spruce, paper birch, white spruce, bearberry, crowberry, Labrador tea, willow, blueberry, lingonberry, rose, and many sedges, mosses, and lichens.

Two types of shrub thickets found in the proposed monument are the flood-plain thickets and the birch-alder-willow thickets. Flood-plain thickets are on the flood-plains of the rivers. This type forms on newly exposed alluvial deposits that are periodically flooded. It develops quickly and may reach heights of 5 to 15 feet. The main dominant shrubs of this type are willows and alders with a number of lower shrubs under the canopy. The shrubs of this type include mountain alder, several willows, and soapberry.

Birch-alder-willow thickets occur near tree line in interior Alaska. This type is a transition between boreal forest and tundra. It consists of dwarf birch, alder, and several willow species, usually forming thickets 3 to 10 feet tall. The thickets may be extremely dense, or they may be open and interspersed with reindeer lichens, low heath type shrubs, or patches of alpine tundra. The alders tend to occupy the wetter

sites, the birch the mesic sites, and the tundra openings the drier or wind-exposed areas. The type extends below tree line where it is often associated with widely spaced white spruce.

The three main types of low tundra vegetation are moist tundra, wet tundra, and alpine tundra. Within each of these major types is a mosaic of subtypes related to differences in topography, slope, aspect, and substrata.

Moist tundra occupies areas of upland. The type varies from almost continuous and uniformly developed cottongrass tussocks, with sparse growth of other sedges and dwarf shrubs, to stands where tussocks are scarce or lacking and dwarf shrubs are dominant. The type is often dissected by polygonal patterns created by underlying ice wedges, or it covers areas of solifluction where an undulating pattern to the landscape is apparent. Sedges, lichens, mosses, and dryas are abundant. Shrubs include dwarf birch, Labrador tea, willow, bog cranberry, lingenberry, and bog blueberry.

The wet tundra type is usually found in areas with many shallow lakes and little topographic relief. Of the three, it is the best waterfowl habitat. Standing water is almost always present in the summer and permafrost is close to the surface. Frost action and ice wedges provide the micro-relief of peat ridges and polygonal features. The vegetation is primarily a sedge and cotton-grass mat, usually not formed into tussocks. The few woody plants occur on the driest sites where micro-relief raises them above the standing water table. The shrubs in this type include dwarf birch, Labrador tea, willow, bog cranberry, blueberry, and lingenberry.

A zone of alpine tundra exists in all the mountain ranges of Alaska and on exposed ridges in the arctic and southwestern coastal areas. Much of this type consists of barren rocks but low mat plants, both herbaceous and shrubby, are interspersed between the bare rocks and rubble. Dominant in this type in northern areas are low mats of white mountain avens which may cover entire ridges and slopes, and many mat-forming herbs, such as moss campion, blackish oxytrope, sandwort, and several grasses and sedges. Shrubs here include bearberry, dwarf birch, cassiope, Lapland rosebay, willow, blueberry, lingenberry, and bog cranberry.

Active sand dunes are very sparsely vegetated. Grasses (Elymus arenarius and Bromos pumpellianus) and occasional forbs grow amid shifting sands. Interdune areas are more thickly vegetated and species diversity is greater. Dryas, legumes, and other pioneer plants are present along with several species of willow, shrubs, and forbs more commonly found in dry tundra sites. Balsam poplar grows locally along margins of the dunes, and even on sites where sand is mobile.

Eastward from active sand areas vegetation is more abundant and diverse. Stabilized dune fields support a boreal forest community.

Aquatic plants comprise an important component of the vegetation in the area. Many species of fish and wildlife depend upon them for shelter, and, either directly or indirectly, for shelter.

Distribution and abundance of aquatic plants is related to the interaction of many factors. They include water depth, turbidity, salinity, and water

level fluctuations. In general, most of the inland lakes and ponds are relatively shallow (5 to 10 feet average depth), turbid, and, except for the bigger lakes, without much surface water exchange.

Narrow-leaf pondweeds are the most common group of submerged aquatic plants in this area. They can be found growing from the lowest depths of light penetration, to the shallow waters only several inches deep. Yellow pond-lilies grow in association with pondweeds. Common bladderwort, water milfoil, and mare's tail grow in the shallower waters.

Bur-reeds grow still closer to shore where waters may recede by summer's end, leaving them an emergent plant.

Marsh marigolds, cinquefoil, buck bean, and pendent grass are common emergent plants of the pond edge, although some form a floating mat out into the water.

In the wet meadow zone just behind the border of emergent plants are sedges, spike-rushes, cottongrasses and horsetails.

Timber: The Kobuk valley is near the northwestern limits of the interior forest type. Much of the area is forested, and includes some white spruce of commercial size. Most tree and shrub species are of importance to the residents for a variety of subsistence purposes, such as sleds, firewood, boats, fish drying racks, and snowshoes.

If timber is to be harvested commercially within the region, it will likely take place along the Kobuk River above the delta. Although no estimates are available, timber stands within the Kobuk watershed are relatively

large, and barge transportation up or down the river is feasible. The increasing population at Kotzebue and the renewed mining interest at nearby Bornite could make locally manufactured lumber a profitable enterprise. With the State's proposed network of roads and decreasing local transportation costs, it is possible that timber from the Kobuk could become competitive with that brought from outside to villages from Kotzebue to Barrow.

Ecosystem Dynamics: On the Arctic Circle the few weeks of summer are a time of intense activity. Then, plants and animals alike must reproduce; the offspring must develop. All must store sufficient energy, either for migrations to distant, warm winter habitats, or for the long and severe arctic winter. As one moves north in the Arctic the list of plants and animals that can cope with the environment becomes progressively abbreviated. In an area like the Kobuk some species enjoy their version of optimum conditions while others are near the limit of their range and subject to periodic disasters.

Terrestrial mammals are few in number and kind; predators and scavengers are dependent directly or indirectly upon an abundance of small consumers of vegetation. The primary consumer's lack of diversity, coupled with the characteristic cycles of abundance and scarcity of arctic rodents, provides a highly unstable base for dependent predators. Generally drastic fluctuations of mammal populations are characteristic of this extreme environment.

Tundra lands are different from southern land. Occupying vast areas of the northern fringe of the continent, these lands nonetheless produce a

a small biomass. Due to long winters, the quality and quantity of winter forage determines the animal population levels supportable on the range. Lichens form a major portion of the winter forage for caribou and reindeer, yet possess characteristics quite unlike more conventional forage species. They have high energy value; the native grazers are specially adapted physiologically to use them. But lichens are also extremely slow growing, fragile, subject to damage from trampling, and readily destroyed by fire.

The very short arctic summers have resulted in the evolution of rapidly growing plants that yield high quality summer forage for grazing animals. The topographic variation and the long photoperiod during the arctic summer affect the plant growth rates as well as the availability of high quality forage.

The large native grazers have also evolved growth patterns consistent with the seasonal variations in food quality and quantity. During the summer these animals exhibit high rates of growth not normally encountered among ruminants. Characteristics of their feeding behavior enable them to select the highest quality forage available on the range. Low population density and opportunity to range over a large feeding area are essential for the well-being of these northern species (Klein, 1970).

Extreme seasonal fluctuations are a basic characteristic of this ecosystem. Animal biomass fluctuates enormously with the change of seasons; a large proportion of the animal population, principally birds and fish, is migratory. Caribou migrate to habitats better suited to them at a particular season. A factor of no small importance is that the habitat

The Baird Mountains (Brooks Range) lie along the northern boundary. Caribou migrate through canyon passes to and from the Noatak River valley.



The Kobuk River valley is an important fall and winter range for the Arctic caribou herd. A band of bulls and cows searches for a place to cross the Kobuk River in October.



of these migratory species extends far beyond the boundaries of the area, and for some beyond even international boundaries and continents.

Thus the welfare of this ecosystem is tied to habitats thousands of miles distant and beyond the effective realm of local management. For most species summer is a time of abundance of plant and animal foods, and winter, for resident species, a time of scarcity--at the precise time when energy requirements are most critical.

The low productivity in this arctic environment will dictate to a large extent the type and volume of acceptable public use.

#### 5. Wildlife

Birds: Observers have recorded 352 species of birds in Alaska. More than half of these have been recorded within the Seward Peninsula-Kotzebue Sound region. Perhaps most of the Asiatic vagrant species in northern and western Alaska came via the Bering Strait and across the Seward Peninsula, only to be "discovered" elsewhere. Of the 100 species recorded in the Kobuk valley and the immediately adjacent area, 77 are nesting migrants, 14 are year-round residents, 5 are non-nesting migrants, and 4 are vagrants or strays (Appendix A).

Situated at the crossroads of the Asiatic-North American flyway, the Kobuk valley-Kotzebue Sound region includes habitats used by nesting, summering, molting, and migrating birds. Birds that are raised within this area provided considerable recreational subsistence uses to people throughout the United States. Birds of this region also migrate to wintering areas throughout the Americas, and to most lands within the bordering on the Pacific Ocean.

Throughout this region, the National Park Service and the Bureau of Sport Fisheries and Wildlife are studying the wetland habitat of many species of nesting and migrating waterfowl, shore birds, and other water-related bird species.

Excellent wetland habitat is within Native village withdrawals and village deficiency areas. As can be readily understood, Native settlements were located in areas where fish and game were found in both abundant and dependable quantities. The wetlands within the village withdrawals for Kiana and Ambler are excellent examples.

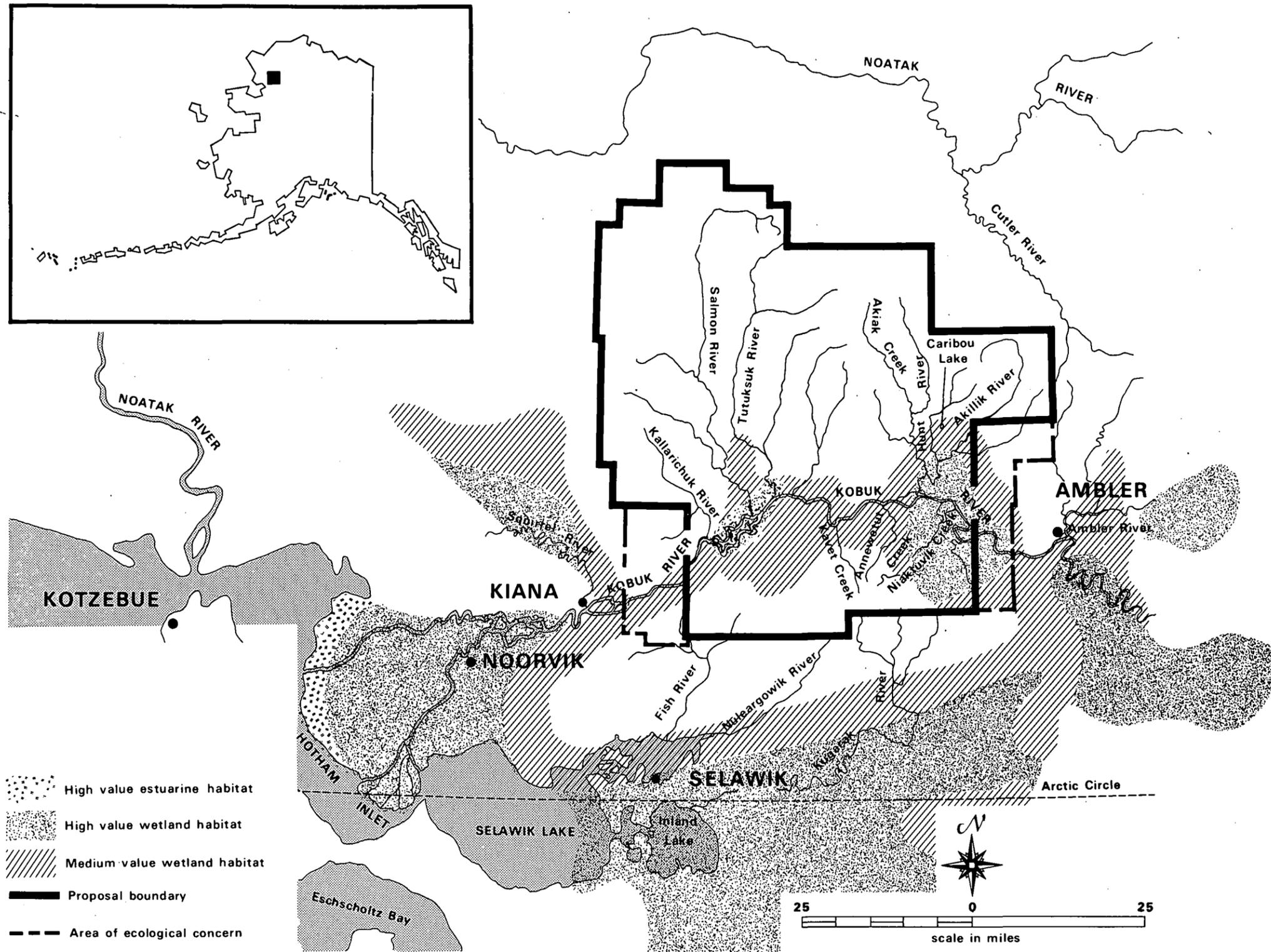
The Waterfowl Habitat map delineates the various wetland habitats within the proposed monument and adjacent areas. The values ascribed to them by the Bureau of Sport Fisheries and Wildlife are related to the density of lakes, ponds, and marshes, food productivity, and their known use by water birds. Both agencies recognize geologic, paleontologic, cultural, and other ecologic values as well.

Wetlands can be found bordering the Kobuk River; even the small, or isolated wetlands are valuable to birds.

The upland habitats, both forest and tundra, cover most of the study area and provide habitat for the 14 resident species of birds and a majority of the passerines.

Information on waterfowl populations and distribution is generally better than for any other group of birds, primarily because of data acquired to better regulate hunting harvest. Fourteen years of regional aerial surveys developed good information on ducks. The breeding population of

Waterfowl Habitat



about 234,000 ducks within the region averages about 44 ducks per square mile, or only slightly lower than densities on the Yukon delta. Goose populations are believed comparable with those in the better habitats throughout the State.

The large white whistling swans can be found throughout the Kotzebue-Kobuk region from spring through fall occupying a variety of wetlands. Adult birds nest near lakes in interior basins and along rivers.

The cackling Canada goose, is found in this region during summer and fall along with the somewhat larger and more numerous Taverner's Canada goose. Both of these species of small geese are prized game birds along their entire migration route, which terminates in Washington, Oregon, and California.

White-fronted geese are found within the proposed monument. These white-fronts migrate through the northern prairies of Canada and the United States to wintering grounds in Texas and vicinity.

Pintail ducks, the most abundant dabbling duck species, comprise more than three-fourths of the dabblers and a third of all ducks observed aerial survey of the Kotzebue-Kobuk region. American widgeon, green-winged teal, mallards, and shovelers comprise the majority of the other dabblers; they, along with the pintails, migrate principally down the Pacific flyway. The few blue-winged teal that have been observed in the Kotzebue Sound area are regarded as irregular, possibly non-breeding visitors. Their principal breeding grounds are in the prairie provinces of Canada and north-central United States.

Scaups are the most numerous diving ducks nesting in and adjacent to the Kobuk valley. Greater scaup that migrate to the Atlantic flyway probably constitute about 90 percent of the scaups in the area and are widely distributed. The lesser scaup constitute about 10 percent of the scaup and tend to be found in the inland forested habitat. Buffleheads and goldeneyes are not abundant; they nest in cavities in trees and are, therefore, restricted in nesting to timbered areas.

The colorful harlequin duck nests throughout the Kotzebue-Kobuk region, especially on swift, clear-water streams such as can be found in the Kobuk watershed. Also, red-breasted mergansers probably constitute a much greater proportion of the waterfowl population than survey data would indicate.

Because of the quantity of wetlands, water birds are a conspicuous part of the avifauna. The common loon, whose haunting cry has become synonymous with wilderness, reaches its northwestern limits in this region; the ponds and forested lakes make up its habitat.

The Eskimo curlew, which possibly is extinct, formerly was found in its greatest abundance within the Kotzebue-Kobuk region. If the species persists, it may well be found within the proposed monument.

Sandhill cranes--which migrate through the Central and Pacific flyways to wintering grounds in the southwest United States and Mexico--nest in the proposed monument in small numbers.

Nesting gyrfalcons are likely to be found in the Waring Mountains, and in the hills facing Hotham Inlet between the Kobuk and the Noatak Rivers. Ptarmigan are a principal prey of this falcon, but, in summer, ducks, gulls, and shorebirds are its source of food. Reports of the peregrine falcon have come from the general area, but few of these endangered predators seem to nest along the Kobuk or the other rivers flowing south from the Brooks Range (McGowan, 1973).

Rough-legged hawks, golden eagles, and short-eared owls can be found throughout the proposed monument. Boreal owls, hawk owls, and goshawks, are restricted to the forested areas. Snowy owls appear irregularly during any season in search of lemmings.

The passerines, both in population and species, far outnumber any other group of birds in the Kotzebue-Kobuk region. They range in size from the tiny warblers and redpolls up to the raven.

Some of these birds have astonishingly long annual migrations. The wheatear, for example, leaves its nesting grounds in northwest Alaska, crosses the Bering Strait, and then travels southeast across Asia to winter in central Africa. The Arctic warbler and the yellow wagtail nest in the Kobuk area, yet winter in the immense area from Borneo west to India and Africa. Most of the three species of swallows migrate to central South America.

Mammals: Thirty-one mammals are on record as part of the ecosystem of the proposed monument. A list of these species and accompanying taxonomic information appears in Appendix B. A simple classification system may be derived from mammalian distribution; the monument supports mammals of the

tundra -- e.g., arctic hare, arctic fox -- and mammals of the forest -- e.g., snowshoe hare, red squirrel, coyote, black bear, lynx, and marten.

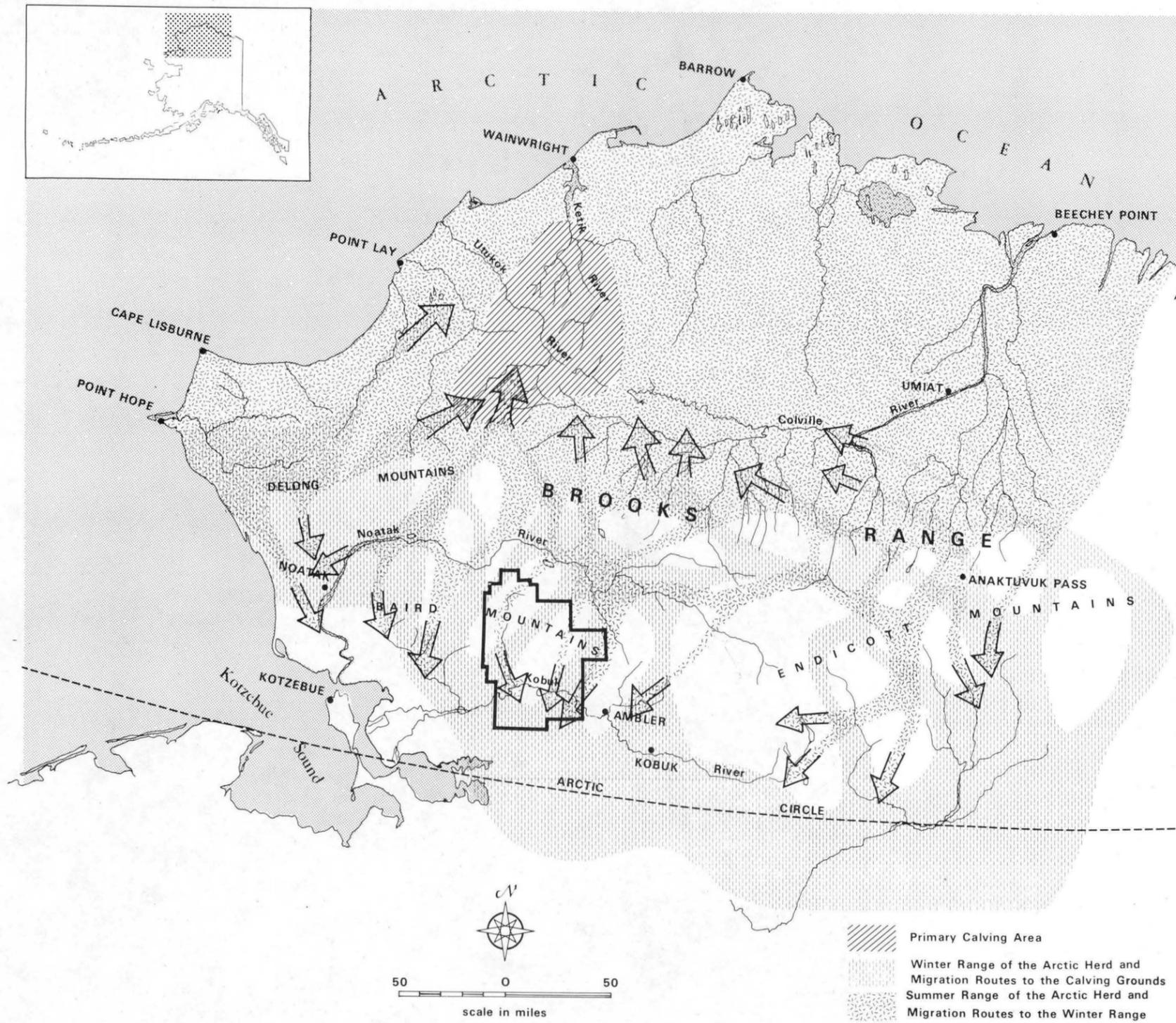
Big game and furbearers are particularly important in the proposed monument and throughout the State because of their economic (includes subsistence) and recreational value. While other mammals will not receive similar attention here, they are, of course, a significant part of the ecosystem.

The following discussion of mammals is taken mainly from information developed by the Alaska Department of Fish and Game (State of Alaska, ADF&G, 1973) which manages resident game. As such, it is important to note that the dividing lines between State game management units are drawn along the natural boundaries of principal river basins as a means of promoting comprehensive management. The proposed monument lies within game management unit 23, which encompasses the watersheds of the Buckland, Selawik, Kobuk, and Noatak Rivers. Information on population or harvest is seldom available for any isolated area under study, but generally is available for the comprehensive game management unit.

Grizzly bears presently live throughout the proposal area, with seasonal concentrations where salmon or berries are abundant. The population within game management unit 23 is regarded as moderate to high. Again, no specific information is available for the proposed monument, which comprises a small proportion of this unit.

Black bear tend to be restricted to the forest lands and the transitional lands between forest and tundra. A relatively high density of black bear is reported to exist in the vicinity of Kavet Creek.

Caribou Range



Wolves can be found throughout the Kobuk watershed area. Within this area they are dependent upon caribou of the Arctic herd, moose, and sheep.

Wolves are actively hunted by local residents and guided hunters. Within management unit 23, between 71 and 177 are killed annually since 1961-1962.

Wolverines are found scattered throughout the monument area.

Fox are found throughout this area, and coyotes extend westward to the limits of the forested lands.

Many of the 240,000 Arctic caribou herd winters along the northern fringe of the boreal forest within the Selawik and Kobuk watershed (Hemming, 1971). (See Caribou Range map.)

Moose were scarce in game management unit 23 until 50 to 75 years ago. Presently they are found throughout the unit, with concentrations on major streams. They are apparently expanding their range -- probably due to climatic change -- and increasing in number. Moose have become a source of meat in the fall, with probably between 100 to 150 animals harvested annually.

Dall sheep may be found in the divide between the Kobuk and Noatak Rivers, although they have become scarce in recent years (Nelson Walker, personal communication, 1972).

Furbearers are trapped by residents of game management unit 23 with most animals taken as an incidental feature of other objectives (Pegau, 1973). Although some furbearers were abundant in 1971 (e.g., lynx), there was very limited trapping pressure. Food stamps, welfare, and unemployment payments have somewhat supplanted furbearers as a winter cash source.

Fish: A large, clear river, the Kobuk, supports a good spectrum of fish of 23 species that supply nearly a million pounds of food to the local people each year (Appendix C). As scientific studies are lacking the best indication of fish abundance comes from figures gathered by the Northern Alaska Native Association in 1972. This survey pointed out that the sheefish is the single most important species to the Kobuk villagers. Sheefish provide 224 thousand pounds of food annually or about 23% of the poundage of the total fish catch. The 3 species of whitefish produce 429 thousand pounds (45%), 3 species of salmon 164 thousand pounds (17%), and 2 species of trout and one of pike 108 thousand pounds (11%) in the normal catch. The other 4% of the catch is from smelt, suckers, greyling burbot and blackfish.

The sheefish, the trout, the pike and the grayling are all superb sport fish, while salmon and whitefish of the river system are only rarely taken by anglers.

Stories of fishing in far north waters are legendary. In truth, however, they originate with explorers or others who have had an opportunity to fish in waters rarely visited by man. Fish, like other forms of life, may grow rapidly during the ice free period, but are relatively inactive during the long winter on the Arctic Circle. An abundance of fish can be badly damaged in an amazingly short period. Fish management on the Kobuk River system will have a high priority in monument development.

Amphibians: The wood frog (Rana sylvatica), one of the two amphibians in Alaska, is abundant in the Kobuk River valley. This area is the north-western limit of the species (Stebbins). The range of the wood frog closely follows that of the boreal forest biome.

## 6. Prehistory and History

Regional History and Historic Ethnography: Beginning with the voyage of Lt. Otto von Kotzebue of the Imperial Russian Navy in 1816, Europeans gradually became familiar with the Bering Sea coast of Alaska. They coursed the area first on voyages of exploration, and then with increasing frequency in search of wealth from furs and whales. Because the potential riches were limited, however, so was non-Native contact with the northern Eskimos. Western influence was felt primarily through the introduction of western goods and diseases; the serious Native smallpox epidemic of 1838-39 was a tragic consequence of the later.

Since the northwest interior was so far from the fur-bearing animals sought by the Russian hunters, the administration of Alaska by the Russian-American Company had little influence on the Kobuk valley. Similarly, the influence of whalers and others of the Bering Straits was felt mainly on the coast. As with other inland inhabitants, the Natives of the Kobuk valley were permitted to continue on their way, affected only indirectly by the advance of the whites into the Arctic. Yet even that indirect influence was noticeable.

The western world intruded for the first time upon the Kobuk valley in 1884. In that year, Capt. M. A. Healy, commanding the U.S. Revenue Cutter Corwin, visited several villages along the coast. He also sent Lt. John L. Cantwell to explore the Kobuk River and Lt. S. B. McLenegan to explore the Noatak River. Cantwell ascended the Kobuk nearly to the Pah River. At the same time Lt. George M. Stoney and his men explored

the Kobuk River country and other parts of the western Brooks Range. Stoney got all the way up the Kobuk to the Pah River, and spent the winter near Cosmos Creek (Fernald, 1964).

In 1901 W. C. Mendenhall of the U.S. Geological Survey descended the Kobuk River by canoe and constructed geologic maps of the region.

O. H. Hershey investigated glacial deposits in the valley as far as Shungnak River in 1906, and published his results in 1909. In 1910, P.S. of the U.S. Geological Survey crossed the valley by pack train (Fernald, 1964).

The sudden arrival of explorers was an exciting event for the residents of the Kobuk valley. Most of the Natives had never seen an outsider before; they remembered the experience long after. In 1940, J. Louis Giddings interviewed an elderly Native of the village of Shungnak who reflected how, when he was a boy, the information that non-Natives lived on the Yukon River had resulted in a trading expedition that introduced firearms to Kobuk valley subsistence pursuits. Later, non-Natives appeared in person:

Then, when I was about grown, Stoney came one spring about June time. We were camping down at Coal Mine fishing. We hear the gasboat coming. People dress up in their best parkees. And while waiting, we see that boat--people go down the river bank. And when they see that white man and smell that engine, they don't like it. They go around upwind. And they look at that white man. He has a native boy for interpreter from Unalik people. The white man asks about the Kobuk River. He gets a Kobuk man for pilot. They start out and go as far as they can with the gasboat; then they take a skin boat on up to Walker Lake. Stoney was not all, and he had a fat belly--stout. The next white people were missionaries. (Giddings, 1961)

The people of the Kobuk were by no means totally isolated before Stoney and his men arrived. Despite persistent traditions of active and violent hostility between Eskimos and Athapascan Indians around the Kobuk valley and elsewhere along the border between the Arctic and subarctic, none of Giddings' elderly informants could testify to clashes between Eskimos and Indians from personal observation. Such stories as existed were ordinarily wrapped in tales of morality or the supernatural. While some hostility--and certainly fear--was a characteristic part of Kobuk valley life, there is considerably more evidence of trading than of fighting between Indians and Eskimos. Most likely, the fighting that occurred, resulted from accidental contacts between hunting or trading parties (Giddings, 1961). Missionaries, then, brought no era of peace, nor did they encounter a "lost" people.

Trading prevented utter isolation. Giddings' informants outlined pre-contact trade patterns. Among the most important were routes to the Indian villages of the Koyukuk River, down the river to the coastal villages, and a long, arduous trail across the interior to the Russian settlement of St. Michael, the major source of European goods. The most prized trade item was Russian tobacco, which justified the hard trip to St. Michael, although some could be obtained at the coast. Pipes also were imported.

In addition to trading, total isolation from all outside peoples was prevented in other ways. The Kobuk people experienced a small amount of intermarriage with Indians and coastal or north-slope Eskimos. Also, some individuals migrated into or out of the Kobuk River valley (Giddings, 1961).

The changes wrought by the permanent presence of westerners since the turn of the century can best be understood by a comparison with Kobuk lifeways before that time. J. Louis Giddings, who spent several years conducting archeological and ethnographic research in the area in the 1940's, published his account of pre-contact Kobuk life in People of the Kobuk (1961). Much of the following is from that work.

Of settlement patterns, Giddings notes:

Groups of families formerly lived at stream mouths along the whole of the Kobuk River below the series of rapids near Walker Lake in the headwaters. A group of this sort was customarily designated by the name of the Kobuk tributary that entered nearest its traditional fishing grounds--i.e., Pah-me (Pah River people) and Kala-me. The place-name system gave ground occasionally, however, to abstractions such as Ichsinyagame ("many rules of conduct people") and Ekseavigme ("People who live in fear"). These were not, apparently, bands the territories of which required guarding, or even close delineation, but loosely organized compatible neighbors held together by intermarriage and the social obligations contingent on death and burial and bargaining with other groups.

The villages of the present day had no reason for existence earlier than the arrival of the traders, missionaries and teachers whose goods and benefactions could best be dispersed in a close-knit community. "Villages" referred to in the stories and accounts mean the people of an area rather than clusters of dwellings. These were "neighborhoods" of nuclear families with their dwellings spread out over several miles of both banks of the river. A summer neighborhood might be more concentrated than that of the winter, while during certain periods of the spring and fall all settlements dissolved into migratory family groups.

The Kobuk people felt a sense of kinship with the people of Hotham Inlet and those of the Selawik River. The "Arctic People" of the north slopes of the Brooks Range and those of the Noatak River valley, however, were regarded as outsiders, beyond any ceremonial obligation. The Indians of the Koyukuk River area were regarded even more as outsiders, even as enemies, albeit occasional trading partners.

A variety of habitations were characteristic of the old days. The only house that was in any sense permanent was the winter house, or ookevik. Access to the excavated house floor was through an entrance tunnel. The interior featured four center posts, separated by the width of the tunnel and supporting two strong roof timbers parallel to the line of the tunnel. The fireplace, rock-lined and oval or circular (sometimes rectangular, if made of logs), was in the center. Directly over the fireplace, suspended from the roof timbers, was a gut or oiled-skin membrane that provided light, and was removable to allow smoke to escape. There were four corner posts; roof beams were laid between them and between the corners and the center posts and overlaid with whole or split poles. The covering was sod blocks plastered with loose dirt from the house excavation. Beds often raised or outlined with logs, were on either side of the fireplace. Gear was stored at the back, opposite the entrance. Although similar houses along the coast featured a lowered "cold trap" in the entrance tunnel, archeological evidence indicates that this feature was discontinued along the Kobuk a few centuries ago. The more recent entrance tunnel, tall enough to walk through, proceeded at a regular incline from the house floor to ground level. Less than ten feet long in most cases, the tunnel was closed at either end by hanging skins. Although Giddings' informants asserted that winter houses were occupied for only one season, archeological evidence indicates that before the 17th century houses along the Kobuk were occupied in successive years, as were coastal houses. A temporary winter house was called an ovroolek, or moss house. It was a tent-like structure, built of upright poles laid against a single

rafter supported by a pair of posts. A skin-covered opening served as a door, and a roof hole was placed above the small fireplace.

The summer house, called an aurivik, was constructed of two end posts and four corner posts supporting rafters, walled with a willow wattle-work covered with spruce bark. The roof was overlapping spruce bark secured by poles lashed over the top. Cooking was done outdoors in the summers, so the only fire built within would be a smudge to repel mosquitoes.

During the spring, before the thaw, a tent, called a echellek, was used. It was constructed by draping six caribou skins--with the hair remaining--over a hemispherical willow frame. Giddings (1961) believes this to be an adaptation of the dome-shaped winter huts used on the Arctic slope.

Two other shelter types are the "quick tent" (auwayyuk)--a skin-wrapped pole tepee--and the "poor people's camp" (milyuk)--a tepee built of young spruces in foliage. A fire could be built in either of these tepee-style shelters.

While the above indicate the general styles of habitations, there was no rigid uniformity in construction, which depended mainly on the individual builder's notion of what a house ought to look like and what he felt would best serve his needs. Particularly in the case of temporary shelters, continual modification to meet changing weather or wind conditions or the deterioration of construction materials was the order. The types of emergency shelters, built with materials at hand, was limited only by the ingenuity of the builder. Giddings (1961) points out:

It is well to remember that just at the time of arrival of Europeans, Kobuk people had no conception of a dwelling as a thing of permanence. Their houses and camps must have seemed even less objects of property and sentiment than their canoes and their clothing. A dwelling was a temporary exploitation of natural resources and an expression of personality in a time of particular need.

The acquisition of food, of course, was the most important activity along the Kobuk River. For it, the people depended almost entirely upon the streams, lakes, forests, and mountains of their homeland. Certain items of subsistence could be obtained through trade with the peoples of the coast, but each trade item had a local substitute. Seal oil and seal-skin line were probably the most prominent items of trade, but they were not essential (Giddings, 1961).

Giddings summarizes the importance of the subsistence quest as a determinant of life-ways and habits:

The two most important bases for survival were the fish and the caribou. Success in the quest for these assured a comfortable existence. A bad salmon season, or a year in which the caribou varied their migration route, might, on the other hand, bring about hardship and even starvation. Food had to be secured in quantity. We cannot stress too much the emphasis that a hunting and gathering people places on group interprise in securing its food. The more colorful aspects of the hunt--those which are often best represented in archeological collection--such as hook and spear fishing, and stalking with bow and arrows, were strictly supplementary to game drives and salmon seining, and trapping.

During the summer, from mid-July through late August, the salmon are running the Kobuk River. During that period the women were occupied full time with seining, cutting, and drying the fish. Before European contact, fishing was almost exclusively the province of women; the men were obliged to hunt in the mountains while the fish were running. Today, fishing has more male participation, although the old division of labor is still evident along the river.

The fish were netted from passing schools; the heavy work of hauling a net precluded wasting effort on individual fish. Fish were cached after they were caught, and stored in covered holes on the bank for as much as a day after they were taken. Afterward, the women--usually in conversational groups--cut and cleaned the fish, separated the elements according to their needs for different preparation, and hung the flesh on racks for drying, tails up (the same pattern continues today). Roe were dried for later use and viscera were boiled for their oil. Heads were buried in the sand to rot, to be retrieved in the fall, when the men returned from the hunt, and served as a delicacy. The products were ordinarily stored near the winter houses in sturdy pole and bark caches constructed to remain secure against weather and animals (Giddings, 1961).

Caribou provided the other mainstay of the diet. While the rifle and snowmachines have simplified hunting and increased its efficiency today, their introduction helped to end some of the more adventurous--and trying--aspects of the caribou hunt. Formerly, as today, the caribou were hunted mainly during their semiannual migrations, when they could be taken in quantity through cooperative effort. Two methods prevailed.

The first was the land drive along routes marked by upright cairns--many of which can be seen today along the highlands bordering the river. According to Stoney, the cairn lines ran for miles in converging orders. He noted that:

At the outer ends of these lines, which are miles apart, the piles are built every thirty yards; the distance gradually lessening as

the lines converge, until at their inner ends, where the width is about forty yards, the piles occur every ten feet. Connected with the inner ends of these piles is a circular place marked out by bushes concealing a rope securely fastened at the ends and in other places along it. To this rope are made fast numerous laniards, having slip nooses at their ends, open, and held up properly in the bushes by small stakes. The natives then close in, shouting and frightening the deer, who, mistaking the stones for men, rush on and seeing the opening ahead dash at the brush and are caught in the nooses by the horns or legs when they are filled by spares. As many as 25 are caught at a time (Giddings, 1961).

When the hunt took place in narrow mountain passes, the catch could be higher.

The water drives in the fall and early summer were even more exciting and dangerous than the land drives. Large groups of people gathered at caribou crossing places along the river. The most famous was Onion Portage. Once camp was set up, the men built or repaired drive lines or fences intended to divert the caribou down slopes and into the water. When the caribou appeared, men, women, and children would harry them into the water, where they would be speared by men in boats. The carcasses would drift downstream to lodge on sand bars or against the bank, where they could be retrieved. The hunt lasted until all had fulfilled their needs (Giddings, 1961; Giddings, 1967).

Additional game was gathered through individual hunting and fishing. Bows and arrows were used, as were traps and snares. A variety of fish and vegetable foods were gathered.

Although there were some variations, the clothing of Kobuk Eskimos was similar to that of coastal Eskimos. Various skills and crafts were also similar, although certain items were specialized for the Kobuk way of

life. Overland travel was ordinarily pedestrian. Large dog teams were primarily a 20th century addition to the Kobuk area, and even then they were few compared to those in coastal areas. Previously, sleds were pulled by hand, sometimes with the assist of a dog or two. Because subsistence was always more difficult in the interior, dogs were not as numerous as on the coast, where their food was easier to obtain. Boats also varied from coastal styles, although smaller kayak types and larger boats were present. Some larger umiaks were imported from the coast. The double-bladed paddle, according to Giddings' informants, was absent on the river, where overhanging paddles and pairs of sticks were the most common forms of propulsion. Finally, goods were carried in a variety of packs or pouches (Giddings, 1961).

Social life and organization were as rich and varied as the demands of subsistence would allow. Social contact was increased by a broadly inclusive sense of kinship, and by the fact that many activities demanded communal efforts. The great social event of the year was the trading feast, which provided a great family reunion for people all along the Kobuk and neighboring rivers. Primarily, however, social life was centered around the immediate family, which saw to the upbringing of the children and much of interchange between individuals. Arts, including counting and geography, and amusements were well developed. Shamanism and other ritual demands and a rich oral literature reinforced the sense of cultural identity for Kobuk people (Giddings, 1961).

This Native culture was to change in many ways under the influence of non-Natives. While the culture of the Kobuk people is still basically Eskimo, so much has changed that Giddings commented:

The influx of prospectors after the gold rush of 1898, and the arrival of missionaries, traders and teachers, led the Eskimos quickly to adopt as much of our culture as seemed profitable, including a re-evaluation of morals. The English language has been spoken secondarily (since the turn of the century) by nearly everybody in the region, and, although many of the old social and religious traditions persist under the surface, none but the oldest individuals can remember how it was to live without the goods and creeds of the Europeans (Giddings, 1961).

Kotzebue was the access to the interior, including the Kobuk Valley. It early became the focus of much non-Native activity. In 1897 a reindeer station was established there in anticipation of the arrival of herds imported from Siberia by the Department of the Interior; the purpose was to found a livestock industry for the Eskimos who were faced with starvation due to the near extirpation of the caribou. A post office opened in 1899; a Society of Friends mission quickly followed. Kotzebue was the base for the extension of non-Native influence into the interior.

Around the turn of the century prospectors and miners entered the region. As the Klondike gold rush began to dwindle, they moved throughout Alaska in search of riches. About 20,000 poured into the Seward Peninsula--Koyukuk River region after 1898, following the discovery of gold at Nome. The Cosmos Hills, Klery Creek, and the Squirrel River basin were early mineral target areas. A small rush to the Kotzebue Sound area occurred in 1898, following a minor discovery of gold on the Noatak River. In all, mining persisted for about 20 to 30 years in western Alaska, but it was never important within the proposed monument.

Teachers, missionaries, merchants, and government agents brought about a pressure to conform to Western culture, which altered the older settlement patterns along the Kobuk River. Many Natives throughout the valley left some of their seasonal camps, and moved to more permanent settlements. Some summer subsistence camps, however, do still exist.

The present village of Kobuk--originally named Shungnak--was established in 1899 as a supply point for the Cosmos Hills mining activities. A post office was established there in 1903, and the name was changed to Kobuk in 1928. A trading post, school, and Friends mission were established early at Kobuk, and became the model features of all successive villages established along the river. The present village of Shungnak was established first in 1934 and again in 1946. Kiana originated as a supply center for Squirrel River placer mines about 1909. The most recent village, Ambler, was founded in the late 1950's, and received a post office in 1963. (Orth, 1967).

Between 1910 and 1940, before the Federal Government recognized the strategic importance of Alaska, life for the Eskimos was difficult. The processes of cultural change were at once aggravated and ameliorated by the influence of teachers, missionaries, and government agents, and it was nowhere easy for the peoples whose lifestyle was in transition. Exotic diseases had come in with the first Europeans; they continued to take their toll. The flu epidemic of 1917-18 was particularly severe in Native villages. Tuberculosis, endemic in the United States, spread into the Eskimo settlements with debilitating effect. The peoples of the

Kobuk valley both suffered and benefitted from isolation. The western pressures were not as severe upon them as upon the coast. They were accordingly able to maintain strong family and community ties. At the same time, the Kobuk peoples tended to receive fewer of the advantages of western society.

World War II brought sudden changes to the Eskimo people--not least of which was the opportunity to develop technical skills and learn new trades in defense construction activities. Fear of a Japanese invasion led to the establishment of the Eskimo Scout Battalions and a network of Alaska National Guard units in Eskimo villages--bringing with them two-way radio communication. But again, the isolation of the Kobuk valley tended to insulate its residents from a portion of these impacts.

World War II also spelled the temporary end of mining--particularly gold mining--in Alaska. Its influence had long since waned in the Kobuk area.

While some mining resurged in Alaska after the war, it proved of little benefit to Kobuk valley, despite the recent discovery of copper deposits at Bornite. Some jade has been mined near the Kobuk River in recent decades.

In 1955, the U.S. Public Health Service assumed responsibility for Native health care, launching a crash program to upgrade and construct medical facilities. Enlarged and improved schools led to the increasing Western acculturation of young Eskimos at the expense of the old ways. The Alaska Statehood Bill of 1958 guaranteed civil rights and liberties for all Alaskan Natives. Working to bridge the gap between the social, economic, and community conditions of the Eskimos and the rest of the State citizens, Eskimo men and women undertook responsibilities of leadership in these affairs.

These and other characteristics of Westernization are changing the Alaskan Native. In the Kobuk valley, still relatively isolated, these changes are less dramatic. Nonetheless, increasing transportation and communication are opening the area to the outside. The people of the Kobuk valley are more mobile; many go to other areas of the State for work or school. Significant, too, is the Alaska Native Claims Settlement Act of 1971, which brings to the Kobuk valley and the rest of Native Alaska the participation in public affairs and the involvement in the bureaucratic and political processes characteristic of the other parts of the United States.

Cultural Resources of the Proposed Monument in Summary: As noted, the pre-contact pattern of Native settlement along the Kobuk River was almost

uniformly spread along the entire course of the river, with concentrations near the mouths of tributaries. Accordingly, the banks of the Kobuk River are a continuous archeological zone. The archeological record of this zone is exceedingly rich. It contains remains of winter and summer houses, camp sites, work areas, artifacts and other evidence of hunting, fishing, and gathering, and other signs of human presence. The depth of most sites is not great, and those excavated seldom evidence continuous occupation over a very long time. Many sites indicate successive occupations as well as the impact of natural forces like floods and erosion.

The tree line between tundra and forest has been commonly regarded as the boundary between Arctic and subarctic--and between Arctic peoples (Eskimos) and subarctic peoples (Athapascan Indians). However, along the Kobuk River, just within the forested zone, is a population of Eskimo people with definite coastal affiliations who nonetheless evidence a culture with Athapascan traits. Furthermore, these Eskimos regard themselves as having always lived in the interior (Giddings, 1961). The area thus presents an exciting opportunity to study the dynamics of human movement and cultural development and interchange. And of course, the transition of a coastal hunting people to one that hunted and fished along interior riverways can teach us a great deal about human adaptation to the environment.

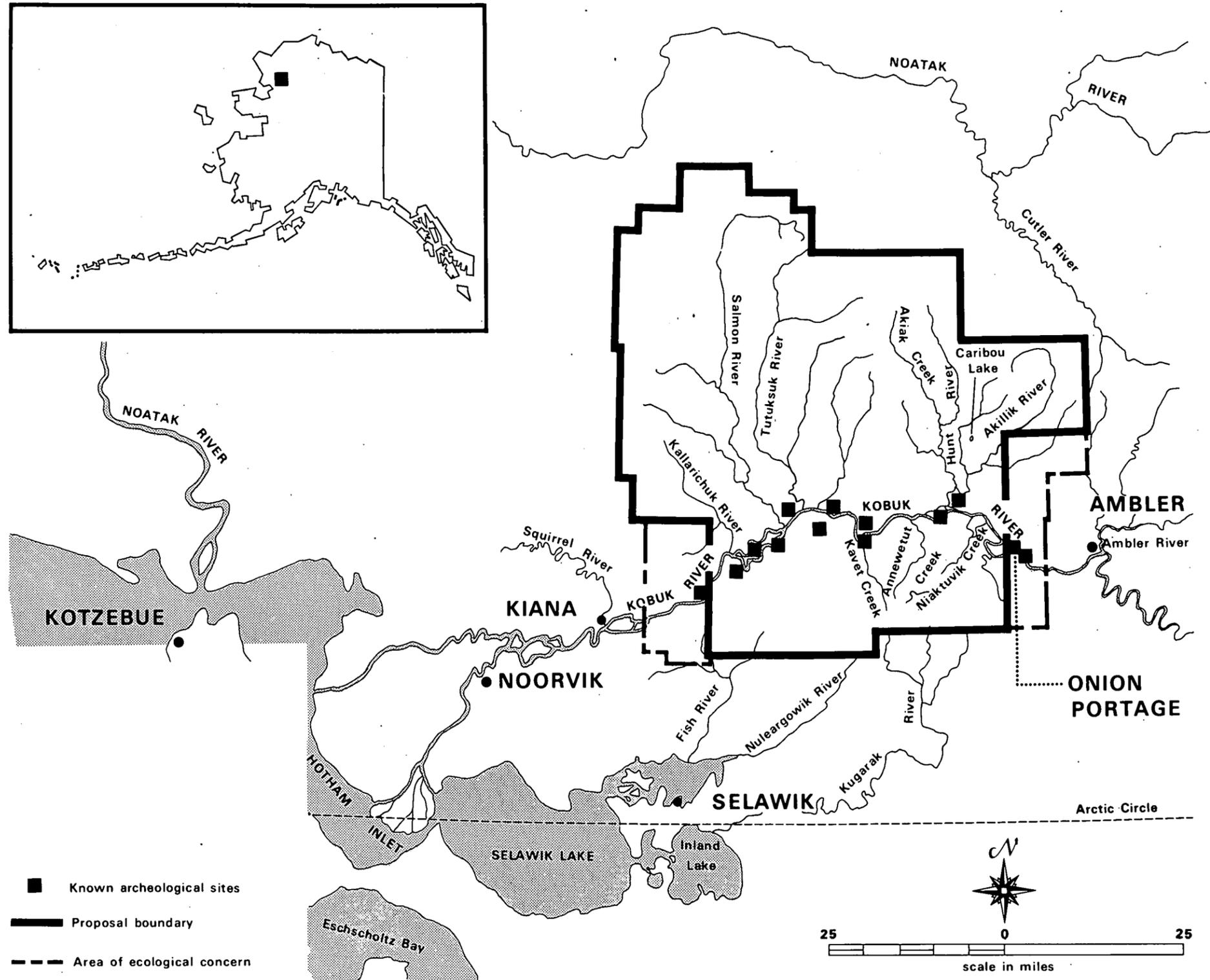
The most important archeological investigations along the Kobuk were undertaken in three seasons in the 1940's by J. Louis Giddings, who published his findings in considerable detail in The Arctic Woodland Culture of the Kobuk River (1952), from which most of the following information is derived. Additional data developed by Giddings can be found in two chiefly ethnographic

studies, People of the Kobuk (1961) and Forest Eskimos (1956), in the survey of his life's work, Ancient Men of the Arctic (1967), and in 20 scholarly papers. During his work along the Kobuk, Giddings excavated 12 different sites, which included 73 houses. He also established a chronology for the last thousand years of the area, based on tree-ring dating. In addition, Giddings accumulated volumes of ethnographic data.

Giddings discovered the Arctic Woodland Culture, which he divided into five major phases. His most important discoveries along the Kobuk were on the upper and middle reaches of the river, although he did some work near and around the river mouth. Giddings detected a variety of physical types of peoples who exhibited a pattern of scattered settlements along the riverbanks since about 970 A.D. He also noted the relationship between life-styles and the successive ecosystems along the river. The picture he presented is of a distinct, thousand-year-old cultural pattern, which was based on the Eskimo cultural tradition, was adapted to the interior woodland/riverine environment, had borrowed from Athapascan culture, but followed its own course of development.

Within the proposed Kobuk Valley National Monument, Giddings either excavated, identified, or received reports of 11 sites. (See Archeological Sites map.) The work took place during three seasons in the 1940's. Excavation took place at three sites within the proposed monument: Onion Portage, and two Ahteut sites near the mouth of Kavet Creek. Giddings identified four archeological sites within the proposed monument, and he received reports on the existence of four more.

Known Archeological Sites



Important archeological sites were also discovered in each Area of Ecological Concern. Of greatest significance is the Onion Portage Archeological District, which straddles the monument's eastern boundary. Although one-third of the District is within the proposed monument, the primary discoveries remain outside.

The excavated, identified, and reported sites do not represent the total archeological resources along the Kobuk River. Rather, they are the results of one man's work in three short seasons. While representative of the Arctic Woodland Culture archeological sites in the valley, the total number of sites may be in the hundreds or even thousands. The middle reaches of the Kobuk River, completely contained within the proposed monument, are a particularly rich storehouse since they experienced more intensive occupation and less natural destruction than the lower parts of the river.

Giddings summarized his analysis of the Arctic Woodland Culture he identified in the Kobuk Valley as follows:

The Arctic Woodland Culture, as represented by the sites and present Eskimo-speaking population of the Kobuk River drainage, is first of all defined by a remarkable adaptation to an environment which includes clear streams, rugged mountains, forests, and a bay of the sea. It is a culture that draws freely upon all of the natural resources of these surroundings, and yet retains a core of basic traits in which may be demonstrated more than 700 years of continuity and stability. River fishing is hardly second to caribou hunting as a means of livelihood, and both of these stand well ahead of harbor sealing as bases of economy. Exchange of the resources of these endeavors as well as materials such as the furs, tree barks and root fibers, and mineral substances, helps to minimize the special effects of local environment and makes possible the enrichment of the life of the individual without his having to move continually from one environment to another.

The Arctic Woodland Culture may be defined environmentally as one that has its roots along forested streams and that encompasses both the bare mountains and plateaus of river headwaters and the saltwater harbors of Arctic seas. It is distinct in these respects from either far-inland or coastal cultures, and it can exist only where forests approach the sea. It differs from a truly inland culture of the sort practiced by most northern Athapascans in that its food supply is threefold and insured in this respect against extreme seasonal scarcity. If shortage of caribou ensues, there is no need to follow diminishing herds into new pastures, but only to change emphasis to fishing and sealing. Greater permanence of residence is possible because both fish and seal are predictable as to place of appearance if not as to abundance. It differs from Arctic coastal cultures in that the meat and oil of sea mammals in great quantity is not required, rendering unnecessary special devices for hunting on sea ice and resisting the blizzards of barren coasts.

Residence is, however, somewhat less permanent than at peninsular and island localities such as Point Hope and St. Lawrence Island, and for this reason there is less opportunity for developing the artistic elaborations that may accompany leisure in rather large town-dwelling populations. With the exception of certain jade products, and a few other objects not yet identified, almost nothing exists in the materials recovered from Kobuk sites that cannot be readily understood in terms of comparatives from Alaskan sites of the present or past. Much of same has been said of Thule Culture as regards other Eskimo cultures. In the absence of elaborate ornamental styles and products of individual workmanship, we must examine the Arctic Woodland Culture in terms of emphases and groupings of elements.

The principal combinations that set this culture apart from most others are the following:

- (1) The house with four-post central construction, central fireplace, entrance passage, and an underground cache.
- (2) Extensive use of antler as the most important organic material other than wood.
- (3) Fish as a principal source of food, the fishing complex including the underground cache, the bast fiber net, stone and antler sinkers, the leister and three-pronged fish spear, the fish arrow, straight-shanked fish hooks and fish-shaped hooks, fish-shaped lures, the gorge, and the ice pick in addition to methods not archeologically indicated.

- (4) Extensive use of spruce, birch, and willow, archeologically represented by basket fragments, bark roofing, bast netting, root line, and many utensils and implements made of the stems of these trees.
- (5) Birch and spruce bark boats (largely by inference from historic times) and snowshoes with birch frames.
- (6) Stone-boiling in baskets, and roasting, as principal cooking methods (largely by inference from historic times).
- (7) Use of such implements as the beaver-tooth knife, the stone pick, and soft-stone axe or hatchet, and the splitting adze of pecked stone.
- (8) Skillful flaking of flinty materials, especially the fashioning of tips for end-socketed antler arrow heads.
- (9) A skin-working method involving use of the tci-tho scraper and probably powdered white limestone.
- (10) A tradition of pottery-making that includes hard firing, textile impressions on the inside of pots, paddled, curvilinear impressions on the outside, and a variety of vessel forms. This combination may have originated in the Kobuk area s distinct from neighboring coastal or inland regions.
- (11) Use of the local jadeite, and trade of this product, especially after extensive employment of the stone saw and center-hump grindstone (Giddings, 1952).

Giddings concludes that the Arctic Woodland Culture probably developed out of the mainlines of the Eskimo Cultural Tradition approximately 1,000 years ago. This would make its development contemporary with that of the classic coastal Eskimo culture, or Thule Culture.

While the research value of the archeological resources along the river is high, on-site interpretative potential can be limited by the difficulty of demonstration and the threat of vandalism. Therefore, only those sites with particularly evident, stabilized, and protected remains should be exposed to this kind of interpretation.

The state of preservation of the Arctic Woodland cultural resources along the Kobuk River is variable. Natural forces threaten sites in areas subject to erosion. Many sites become evident only when they are eroding away along river banks. Some excavated sites are extremely deteriorated.

Many other sites are more stable and more evident. Some excavated sites have simply settled and eroded only a little. Depressions marking house pits, signs of heaps or middens, or vegetative clues provide clear evidence of the archeological resource. The sites that do not feature house pits are difficult to detect, often because their seasonal occupation was so short.

The most significant archeological site on the Kobuk River requires additional description. Onion Portage takes its name from the many wild onions found in the area, and from the fact that a brief portage at that place saves a 7-mile upstream boat ride. The site has been important to people for so long because migratory caribou have crossed the river there for thousands of years. This produced the intensive human occupations that make it such a major discovery.

Cape Krusenstern and Onion Portage are the only two known places where nearly all the cultural phases so far identified in Alaska are represented in controlled, datable succession. At Cape Krusenstern the many sites are on a horizontal succession of over 100 relict marine beach ridges, each one occupied by marine-oriented peoples while it was the shoreline. In an area behind Cape Krusenstern, near the shorelines that existed before the beaches began to form, are evidences of peoples whose presence may go back to the

end of the Pleistocene. At Onion Portage, an equal span of time is represented in a vertical stratigraphy, each successive occupation on top of the remains of the former, separated by layers of soil. Considerable carbon-14 dating material is present.

Cape Krusenstern and Onion Portage comprise a uniquely compatible pair of archeological resources. Since both feature human occupation and cultural development over an extended span of time in a restricted area, they comprise a set of reference points that can help to establish a scale of cultural development in the Alaskan Arctic.

Archeological sites of any great depth are rare along arctic rivers, because the special conditions that create such sites are also rare. They must be places of human occupation through a long expanse of time. They must be places where new soil is continually deposited--not where existing soil is continually eroded. To ensure dependable dating, they must be sites of relatively stable soil conditions, as opposed to the areas of the Arctic where freeze-thaw processes twist, fold, or bend the ground, or even double it over itself. Onion Portage features all these qualities. And its environmental values--a major river portage, a perennial caribou migration crossing--made it a popular place for human occupation in the past. Today, it is still an important hunting area.

J. Louis Giddings discovered the archeological resources at Onion Portage in 1941. He excavated four houses of the Arctic Woodland Culture there, and identified the area as one of extremely high potential for early occupation (Giddings, 1952). Among his discoveries were three microcores

and a microblade that seemed to indicate the curious survival of traits inland that had disappeared on the coasts thousands of years before. Ultimately, this theory was refuted. Giddings discovered 20 years later that the microcores came to the surface because the Woodland peoples had sunk their houses and hearths into the remains of very ancient cultures below. This indicated that Onion Portage, like Troy, held a succession of vertically stacked cultural remains.

Giddings directed extensive investigations at the site in 1961, 1963, and 1964. After his death the work was undertaken by Douglas D. Anderson through 1967. Giddings described the discoveries at Onion Portage in Ancient Men of the Arctic (1967) and Anderson described them further in "A Stone Age Campsite at the Gateway to America" (1968). Both published other scholarly papers on the work, but neither the excavations nor the analysis of retrieved data and materials have yet been completed, so the full information value of the site has not yet become available. Much of the following description of the Onion Portage discoveries is based on the two works mentioned above.

Over thirty culture-bearing layers have been discovered at the site. The cultural layers have been divided, top to bottom, into eight bands, each indicative of a different major culture. They are as follows:

Band 1 exhibits the occupation of the area by peoples of the Arctic Woodland Culture, generally between A.D. 1000 and 1700. As noted, this culture is part of the Eskimo Cultural Tradition; its characteristics are described above. For the past 250 years, the site does not appear to have supported

permanent habitations. However, seasonal use, up to the present, is indicated. Surface artifacts of seasonal hunting include recent rifle cartridge cases.

Band 2 exhibits signs of occupation between A.D. 400 and 800. The more recent layers manifest interior cultures, possibly Indian, while the early layers manifest the Norton and Ipiutak. The former featured hearths containing bone meal from burned bone fragments, and opaque obsidian artifacts. The latter included large flake knives, opaque obsidian artifacts, thin bifaced points, small inset blades, and discoidal scrapers. Their affiliation is primarily Ipiutak, with late Norton traits in the earlier layers, and they indicate considerable coastal influence on Kobuk peoples. The association is undeniably Eskimo, and their displacement in the uppermost layers of the band appear to indicate the temporary displacement of Eskimo peoples by Indians.

Coastal influence is also apparent in Band 3. It was occupied about 1500 B.C. to 500 B.C. by people of the Choris Culture. This is indicated by the presence of lanceolate projectile points, boldly flaked artifacts and scrapers, and other tools. The earlier layers particularly are similar to the Old Whaling Culture identified at Cape Krusenstern; Giddings tentatively named it Old Hearth.

From the Ipiutak and Norton manifestations in Band 2, down through the Denbigh Culture artifacts in the upper part of Band 5, Onion Portage was occupied by peoples of the Arctic Small-Tool Tradition the mother tradition of the Eskimo cultures. Band 4 and the upper layers of Band 5

indicate the presence between 2200 B.C. and 1800 B.C. of the Denbigh Culture, the epitome of the Arctic Small-Tool Tradition. It is expressed primarily in excellent flint works, including tiny, diagonally flaked inset blades, burins, spalls, microcores, and microblades. The microcores and microblades of this culture are what sparked Giddings' interest in Onion Portage in the first place.

The remainder of Band 5, occupied between 2600 B.C. and 2200 B.C., indicates, according to Anderson, that a 300-year period of rapid cultural change took place in the Kobuk Valley, paralleling the end of the Northern Archaic Cultural Tradition. The artifacts in these levels, called the Portage Complex, indicate the definite diffusion north of the archaic cultural traditions characteristic of the interior, and reflect the northward movement of Indians who followed the northward movement of forests during the warming spell that had begun long before. New tool types are apparent, including high-shouldered projectile points, and artifacts featuring large flaking.

Just as Band 5 marked the last flowering of the Northern Archaic Tradition, the pronounced shifting of peoples, and finally the rise of the Arctic Small-Tool Tradition, Bands 6 and 7 unfold the development of the Northern Archaic Tradition. The upper layers of Band 6 are dated at about 2600 B.C., while the lowest layers of Band 7 appear to be about 6000 years old. This was the period of the infusion of the major warming spell, mentioned above, that later had such repercussions during the time of Band 5. Previously unoccupied areas became populated. Onion Portage became the home of peoples

for the first time in 2000 years. The cultural complex of these people is called Palisades II, after its first discovery at the Palisades area of Cape Krusenstern.

This culture persisted in remarkable continuity for some 1400 years, leaving evidence in the form of sidenotched projectile points, large bifaced knives, and large flake scrapers. The discovery of these materials at Onion Portage demonstrated conclusively the infiltration into the north of artifact types that were characteristically American, having developed largely in the interior of the lower United States.

Band 8 is buried beneath a wide layer of soil which contains no evidence of human habitation. This indicates a period of 2000 years during which no people lived at Onion Portage. Band 8, characterized as the American Paleo-Arctic Cultural Tradition, may provide information on the very early history of man in the New World.

The two upper layers of the band, revealing camping by peoples between 6200 B.C. and 6000 B.C. contain stone artifacts that probably represent a much larger assemblage. Anderson called it the Kobuk Complex. Most of the materials discovered are rectangles made from microblades, a few fragmentary microcores, an obsidian scraper, and flakes. Their affinity to Paleo-Arctic discoveries made in the Brooks Range and elsewhere identify them as representative of a later period of the tradition.

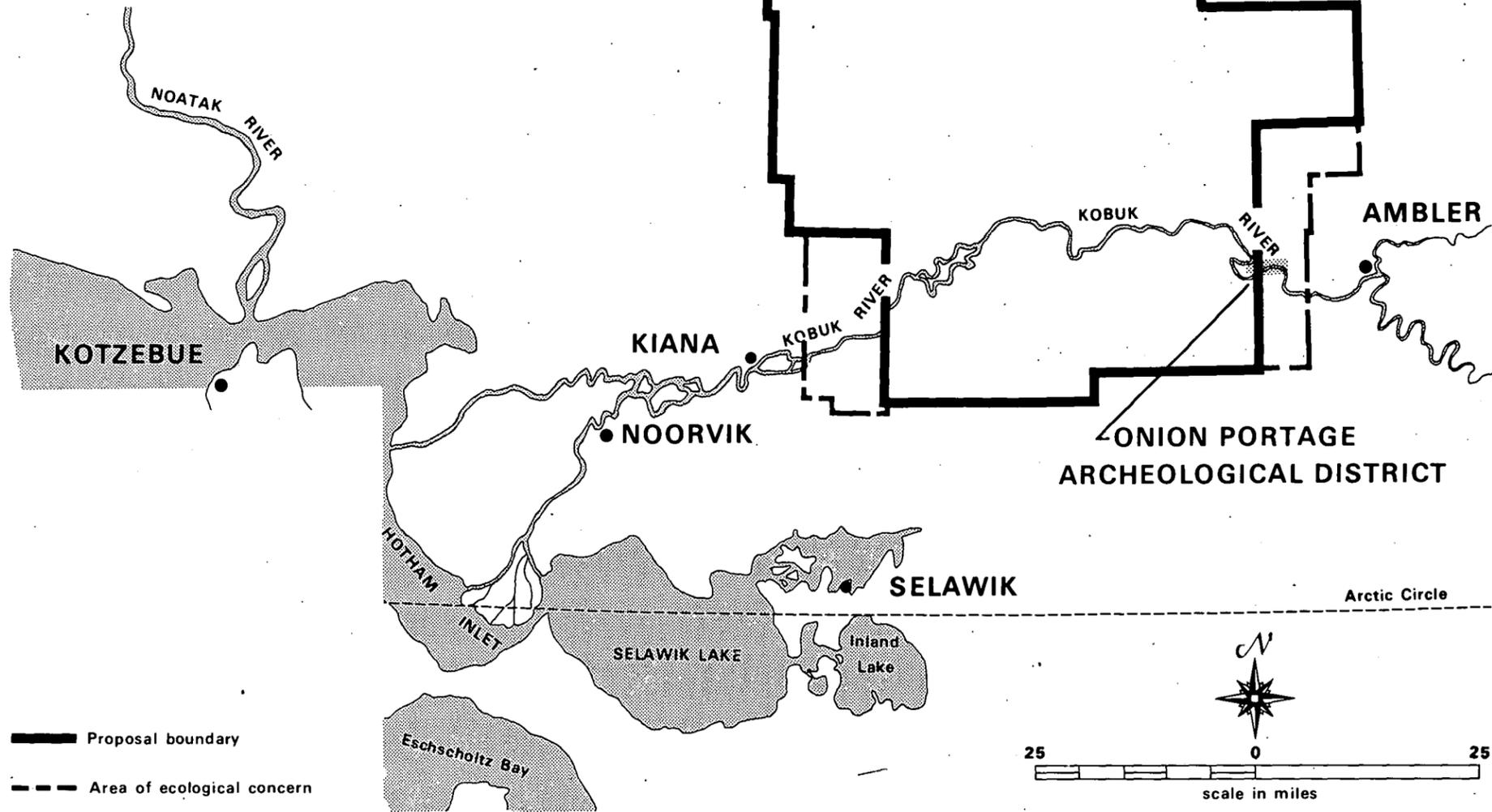
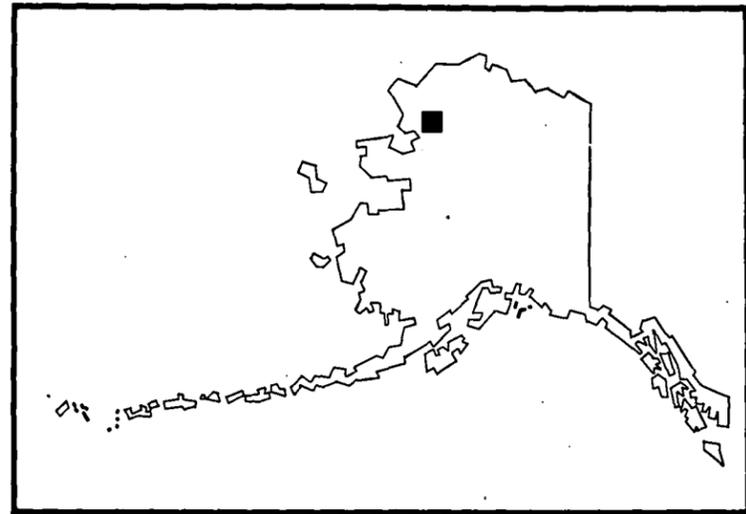
Of more interest are the primarily chert artifacts of the Akmak Complex, which dates at least 6500 B.C., and, like the Palisades I discovery at

Cape Krusenstern, possibly much earlier. A wide variety of stone artifacts, blades and bifaces, and microblades have been unearthed, but unfortunately no reliably datable carbon-14 samples have yet been uncovered. The Akmak artifacts have definite affinities with artifacts discovered in northeastern Asia, and in a few other places in Alaska, and may upon further investigation throw light on some of the earlier occupations of the New World. Some of the disk bifaces, microblades, burins, and other implements found in the Akmak deposits at Onion Portage have never been detected in Alaska before, but they are nearly identical to artifacts in Siberia, Kamchatka, and northern Japan. It seems highly likely that further research at Onion Portage, when correlated with discoveries made elsewhere in Alaska, may demonstrate the existence of Asian peoples in Alaska at the time of the Bering Land Bridge.

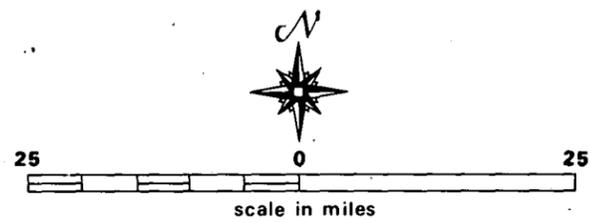
Because of a variety of causes, research at Onion Portage has been temporarily halted, but it may begin again in 1974. While the site has lain fallow, it has deteriorated somewhat. An inspection in the summer of 1973 indicated that the basically sandy soil of the area is quite subject to erosion. While the spalling and washing of the excavated area have not yet hurt the research potential of the site, it will do so if it remains unprotected for many more years. It is to be hoped, then, that work will proceed.

While the interpretive potential of the site itself is rather limited, interpretation of archeological research in progress at the site would be an important educational program for visitors. Giddings built a reconstruction of an Eskimo house for the benefit of accidental visitors.

Onion Portage Archeological District



— Proposal boundary  
- - - Area of ecological concern



Should the national monument be established, visitation may increase. Onion Portage, while excavation is underway, has a high potential as an important visitor interpretation area.

The most significant excavation at Onion Portage is in an approximately 1-acre area at the foot of a bluff. The site is located within the Onion Portage Archeological District, which totals about 16,000 acres. The district is listed in the National Register of Historic Places. Part of the Onion Portage Archeological District is located within the proposed monument; 12,800 acres are beyond the boundary, although within the proposed Area of Ecological Concern east of the monument. (See the Onion Portage Archeological District map.)

## 7. Social and Economic Considerations

Population: Five small villages of the Kobuk River valley, and the interdependent community of Kotzebue comprise the important units of the human environment which will affect and be affected by the proposed Kobuk Valley National Monument. The estimated total population of these six places is 3,104. The people are predominantly Northern Eskimos, or, as they call themselves, Inupiat. In the small villages of the area-- Ambler, Kobuk, Shungnak, Kiana, and Noorvik--the population is overwhelmingly Native, varying from 92 to 97 percent. A significant non-Native minority lives at Kotzebue. Kotzebue contains half the population of this six-village area.

The settlements of the area vary in size, and in the character of community life. Farthest upstream on the Kobuk River are the villages of Kobuk with about 65 people and Shungnak with 159. Here, the pattern of life is closely related to traditional subsistence pursuits. Potential developments at nearby Bornite mines promises radical change for these small villages in the future.

Further downstream the villages become progressively larger. There is Ambler (pop. 180), Kiana (pop. 290), Noorvik (pop. 445) and finally, at the coast on the tip of Baldwin Peninsula, the town of Kotzebue with almost 2,000 people. Kotzebue serves as the communication, transportation, and service center for the entire northwest region. The community is included in the discussion here because of its importance to the people of the Kobuk River villages.

FIGURE 2

CURRENT POPULATION ESTIMATE AND NATIVE ENROLLMENT

VILLAGE	NATIVE	NON-NATIVE	TOTAL	PERCENT	NATIVE
	ENUMERATION	POPULATION	CURRENT		ENROLLMENT <sup>1</sup>
	July 1973	U.S.CENSUS 1970	POPULATION	NATIVE	July 1973
			ESTIMATE		
Ambler	170	10	180	94%	168
Kiana	280	10	290	97%	346
Kobuk	60	5*	65	92%	64
Kotzebue	1,587	378	1,965	81%	1,997
Noorvik	426	19	445	96%	491
Shungnak	154	5	159	97%	165
Bornite	0	0	0	--	1
TOTALS	<u>2,677</u>	<u>427</u>	<u>3,104</u>	<u>86%</u>	<u>3,232</u>

1 Native must enroll at a particular village to receive benefits under ANCSA. Enumeration figures indicate only Natives actually residing in the village at the time of enrollment. There has been some duplicate enrollment and enumeration which BIA will correct by December 1973.

\* Federal Field Committee estimate, 1969.

Sources: P.C. Lin, "Alaska's Population and School Enrollments," Review of Business and Economic Conditions, Dec. 1971 Vol. VIII, No. 5. Institute of Social, Economic and Government Research, University of Alaska.

Alaska Native Enrollment-Summary Listing, July 1973. Department of the Interior, Bureau of Indian Affairs, Anchorage.

The population of the area increased rapidly after 1950, as modern medicine and health care became more available. Since 1966, however, birth rates have declined as a result of the introduction of improved birth control methods. The following figures indicate the number of children of all races in each age bracket for the Kobuk census division, which includes the Kobuk River villages and others in the northwest region surrounding Kotzebue:

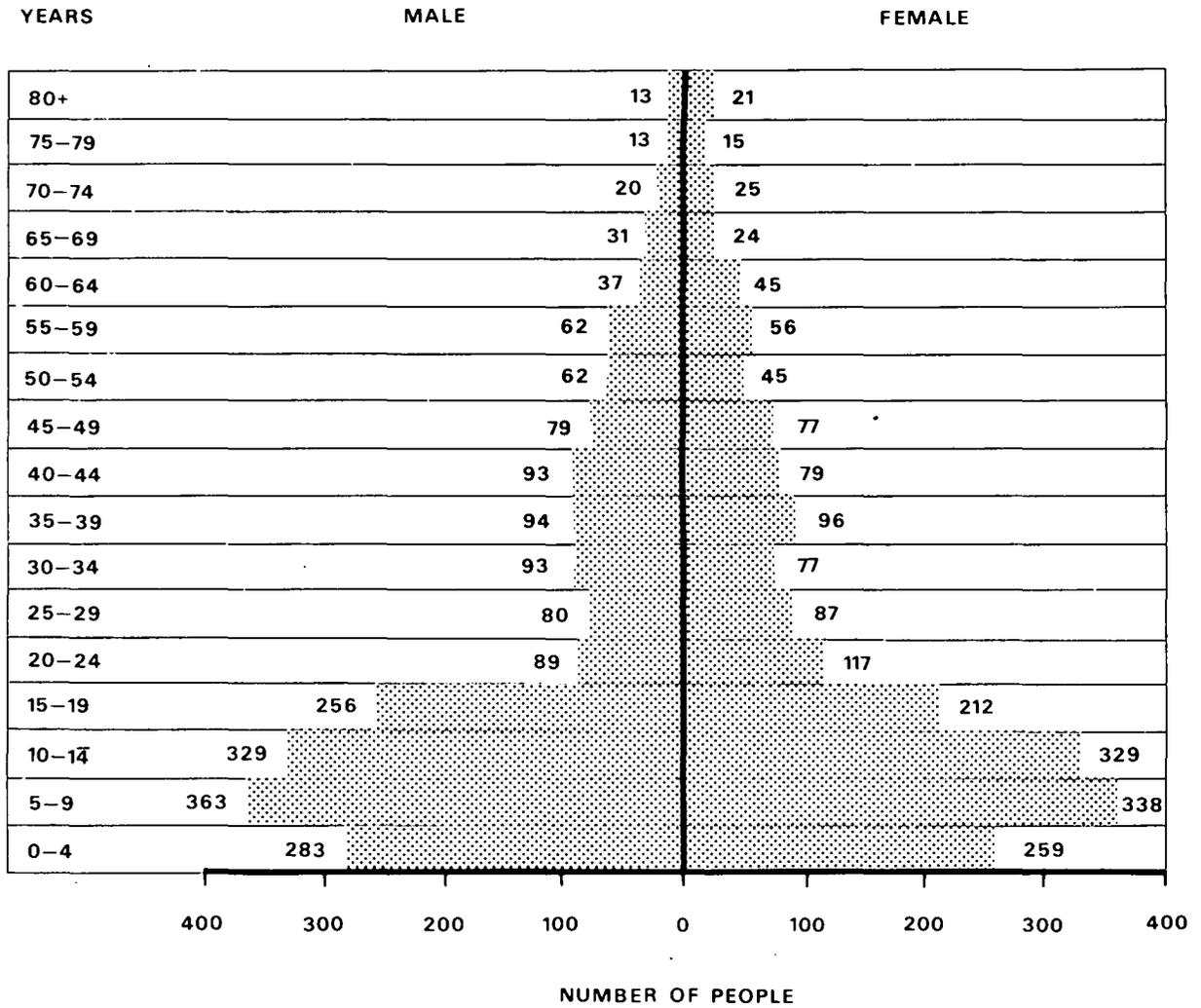
<u>Age</u>	<u>Number of Individuals</u>
4-5	388
3-4	395
2-3	343
1-2	330
0-1	313

Between 1960 and 1970, the Native population of the entire Kobuk census division increased from 3,205 to 3,858, an increase of 653 people or 20 percent. During the same period the number of Native births exceeded the number of Native deaths by 1,119, showing that there was a net out-migration of 466 Native people from the area during the period.

Judging from the nature of the age-sex distribution in the area, the number of births will continue to exceed the number of deaths each year for several years to come. Barring a sudden increase of numbers of people leaving the area, the area's population will probably continue to increase for an indefinite period. (See Figure 3.)

FIGURE 3

1970 AGE-SEX DISTRIBUTION NATIVES  
KOBUK CENSUS DIVISION



The population of the Kobuk census division is a young one. The 1970 median age for all races was 15 years. Median age for Natives for the State as a whole was 17 years, while that for whites in the State was 23 years.

General Social Considerations: The Kobuk River people are a distinct sub-group of the Inupiat, known as the Kowagmiut. Traditionally, their culture and life-style is unique among Arctic people. The relationship of these people with the land and its resources is called the Arctic Woodland Culture. The culture is based on the resources of the forested inland riverway, with ties to the coastal peoples of Kotzebue Sound. As was true for all Alaskan Natives, the subsistence pursuits were reflected in the social and cultural life of the people. The Kobuk people depended on the harvest of caribou and on river fish. Through trade ties with the coast, these food resources were supplemented when necessary by seal meat and oil. The traditional cultural patterns are discussed more fully in the preceding section on the ethnographic history of the region.

The Kobuk valley area population is predominantly bilingual. Although most speak English, about three-fourths of the population of the Kobuk census division speak Inupik--the northern Eskimo language. There are a few Natives who cannot speak English, and some young Natives cannot speak their ancestral language. Some who speak English have difficulty reading and writing it.

The social and material culture of the Kobuk area villages continues to reflect the close inter-relationship with the resources of the land.

Although family patterns, age and sex roles, community organization and leadership, and social life have been changing in response to contact with Western influences--such as government bureaucracies, independent entrepreneurs, educational and religious institutions, a cash economy--the adaptations are uniquely Eskimo.

Changes are most apparent in the town of Kotzebue, where Federal and State agencies maintain offices (staffed primarily by non-Natives) and direct programs aimed at the Native population of northwestern Alaska. In Kotzebue, the influence of Western culture has been felt for decades and many Natives have grown up in a cultural mixture of Western and Native values.

Items of Western technology and material culture have become integrated into a subsistence life-style. Guns, ammunition, snow machines, motorboats, gas, oil are some of the items which have become valuable to successful subsistence hunting and fishing activities.

Kotzebue is the service, administration, and commerce and transportation center of the Kobuk River region. It is a transitional community, still dependent on subsistence use of natural resources, but with an increasingly prominent cash economy. The traditional Native population has been enlarged by people from outlying villages seeking permanent or seasonal wage employment, and services of government agencies. At any one time, some of the people in Kotzebue are transients. They may be engaged in business--such as shopping, trading, or medical care. Some may be in Kotzebue for seasonal employment; others may simply be traveling to or from cities further south. Other people have settled permanently, attracted to a large

extent by the medical services. The non-Native minority makes up the business community of the town, or are employed by the various government agencies.

The size and diversity of the population at Kotzebue, and the contact with the dominant Western society and economy have affected community social organization and traditional social controls. New patterns are emerging which reflect a blending of traditional and Western life-styles. The Alaska Native Claims Settlement Act has given an impetus to Native leadership and involvement in community social, economic, and political affairs. The outlying villages have not experienced the pressures of Western influence to the same extent as Kotzebue, but the intensity of contact with the new culture is increasing.

Life in the small villages farthest up the Kobuk River--Kobuk, Shungnak and Ambler--retains much of the traditional quality. The villages lack the distractions and disruptions of the "urban" environment of Kotzebue. They also lack the services and facilities of the bigger places, although Shungnak has electricity, and Ambler is in the process of planning for electricity, and has almost completely installed a water and sewer system. Wage employment opportunities in the villages are almost non-existent, and most store-bought items must be obtained by mail-order, or directly in Kotzebue stores. Hunting, fishing and trapping are the principal occupations of the people, although people do leave the villages to seek seasonal employment in Kotzebue, and in other parts of the State.

Change is more evident at Kiana and Noorvik. A new school has been built in Kiana, and plans are underway for a new high school building. The village has an active local government, and has developed plans for parks and other community facilities. There are plans for a State criminal justice building at Kiana. Noorvik and Kiana both have electricity. All the villages have airstrips, a vital facility for all villages of rural Alaska. Most villages are served by twice-weekly flights from Kotzebue by Wien Air Alaska. These flights carry mail, freight, and passengers. Proximity to Kotzebue, and larger populations, gives these two villages a somewhat more modern character than those up river. Yet subsistence pursuits remain a vital feature of village life, and hunting and fishing remain the principal means of obtaining necessary food resources.

The Kobuk area villages are heavily dependent on Kotzebue for services, supplies and ties with the rest of the State. People must go to Kotzebue for medical care and other social services, for basic supplies, for transportation connections to places both within and outside the region. Governmental agencies located in the region maintain their staffs at Kotzebue and send their representatives and agents to the villages from Kotzebue. Kotzebue is the villagers' link with the modern world.

Each of the villages of the area has a village council. Some have advisory school boards and other civic groups concerned with a variety of village community problems and affairs. The Kobuk area villages are represented in the Northwest Alaska Native Association, and most recently, the NANA Regional Corporation, Inc. The villages are organizing village

corporations under the provisions of the Alaska Native Claims Settlement Act. In addition to the business corporation of the region, the former Northwest Alaska Native Association has been reorganized as a nonprofit social service oriented corporation, Mauneluk, Inc. Both regional corporations have their headquarters in Kotzebue.

These new Native organizations are already having an impact on village life, especially in the involvement of the people in decision-making affecting the future of village life.

Although the families remain more or less permanently settled in the village during the school year, community life reflects subsistence pursuits. The account below of the subsistence activities of Shungnak is taken from Heller and Scott's Alaska Dietary Survey, 1956-1961, as presented in Alaska Natives and the Land (Federal Field Committee, 1968). The subsistence activities at Shungnak reflect the patterns to be found in the other villages of the area, particularly those along the upper reaches of the river.

Some changes have taken place since the report was written, but it remains predominantly accurate. Villages closer to the coast probably utilize more sea mammals and fish resources than do the up-river villages. There have been some changes in the availability of certain animals in the area too. A more recent survey of subsistence harvests by the people of the Northwest Alaska Native Association region, which is discussed in greater detail in the section below on income and employment, indicates that moose have become more prevalent in the area, and are harvested in greater quantities than was true at the time of the Heller and Scott survey. Yet the recent survey reaffirms the role of the subsistence activities described by Heller and Scott. Their description appeared substantially as follows:

Most families return to Shungnak by fall, the women from their fish camps and the men from their summer

wage work. According to the Shungnak Eskimos, moose have always been present in the upper Kobuk area but never in large numbers--four to five is generally the largest number taken in a year.

"Mashu," the edible root the pea (*Hedysarum alpinum*), is usually collected in good quantity from along the riverbanks and from the innumerable gravel bars in the river. Some years as many as three large gunny sacks full per family are stored for winter use.

Caribou is the most important winter food in the diet of the Eskimos living in the upper Kobuk River area. Serious hunting of this animal begins in October and continues through April. Some early arriving caribou can be taken in September. In the most common migration pattern followed by the caribou, they drift south from the Noatak drainage area through passes in the Brooks Range to the headwaters of the Selawik River. Here they stay throughout the winter, leaving just before the ice breakup is imminent.

During October, whitefish, the last of the migrant fish to descend the Kobuk River, are obtained by trapping or netting them under the ice. They are available for a limited time only and used fresh.

Intermittently, from November through February, ling cod are obtained in moderate quantities by trapping under the river ice. They are used mostly as dog feed although the liver and roe are relished by the people.

In winter, ptarmigan, spruce grouse, and snowshoe hares, which undergo cyclic fluctuations in numbers for reasons not well understood, can usually be snared or shot. Porcupine, once plentiful in the area, are now occasionally caught.

Beaver can be trapped in some areas but at a considerable distance from the village. Muskrats are obtained by trapping or shooting with a .22 rifle. Both of these animals were important late

winter foods in aboriginal times, especially for their acquisition. They are scarce, however, in the immediate Shungnak area and to obtain significant numbers requires much travel; hence, they are little used now.

Throughout May and into early June most Shungnak families establish temporary camps on high ground near or at best only short distances from the village. During this time muskrats and ground squirrel may be obtained by trapping, snaring, or shooting with a .22 rifle.

Pike and sucker may be obtained from valley lakes and sloughs; ducks and geese are hunted during migration and later in summer their eggs are obtained from local nesting areas. None of these foods are available in large quantities.

In June, after the ice has gone from the river, sheefish and white fish--now on their upriver migration--and grayling and pickerel are obtained in variable quantities using seines and gill nets.

While the dog salmon run starts in June, the greater share of the catch is harvested in July and early August. This fish is one of the most important of the food resources of these people. It is obtained in quantity by seining and gillnetting. The women have the complete responsibility for both the fishing and the subsequent preparation of the catch for storage. Traditional family campsites are scattered along the river both above and below the village, occasionally at considerable distance from it. Salmon is used fresh in season, but most of the sizeable catch is dried and stored to be used in winter for dog feed.

Late in the spring wild edible rhubarb and sourdock are sometimes obtained in quantity and often moderate amounts are stored for winter use.

During summer an occasional brown or black bear or a hoary marmot may be taken. Fat from the latter animal used to be a prized food but since most of the men now work in the summer for wages (in the mines, etc.) they rarely make the extended hunting trips to the mountains for these animals as they did in the past.

Blueberries are usually plentiful in the area during late summer and some families try to store from 100 to 150 pounds for winter use. Most years from 50 to 100 pounds of crowberries and low-bush cranberries are collected and stored per family. The fruit of the wild currant, rose, cloudberry, and raspberry are available in limited amounts.

Health: The coming of non-Natives brought diseases and infections that Alaska Natives had never been exposed to. The common cold, for instance, wiped out whole villages. Mortality rates for Alaska Natives, especially infant mortality rates, far exceed those for white Americans. In 1966, the average age of death for Natives was about half that of other Americans. Respiratory infections, notably pneumonia, are a leading cause of death among Alaska Natives. Other leading causes are accidents, tuberculosis, and, indirectly, alcoholism.

According to the Alaska Native Medical Center, overcrowded housing and inadequate water supply and sewage disposal are central to the health problems of villagers: "Dark and poorly ventilated dwellings are the environment in which germs thrive; small, overcrowded, these dwellings are the setting for widespread infection and crippling illness, especially respiratory infections in humans."

Changes in diet, particularly in the larger places, and the substitution of processed, store-bought foods for Native foods may be another source of health problems. Candy and sweets have had a serious, widespread effect on dental problems among both children and adults.

Community and individual mental health problems are most apparent in Kotzebue, where acculturation pressures are the most intense. Alcoholism has become a major social and medical concern.

The Public Health Service (PHS) Hospital in Kotzebue provides both in-patient and out-patient services to residents of the Kobuk valley area. In addition, most villages have health aides who communicate as regularly as possible by radio transmitter or radio/telephone with the PHS doctors in Kotzebue.

Education: Education has played an important role in the acculturation process here as in other parts of Alaska. Low educational attainment and minimal technical training have been a barrier to employment opportunities open to Natives. Increasingly, however, young people are completing school and training programs, and some are attending universities.

In the Kobuk census division, the median number of school years completed by persons 25 years and older was 7.0 in 1970. This compares with a median for the State of 12.4 years. On the other hand, the

percentage of persons 14 through 17 years old who are in school is about the same for Kobuk census division as for the State as a whole--that is, about 90 percent. Thus, today's teenagers in the Kobuk valley area have, on the average, more years of formal education than their parents.

Every village in the Kobuk valley area has a school. Four schools, located at Shungnak, Noorvik, Ambler and Kobuk, are run by the State Department of Education. These four schools had a total enrollment in 1972 of 279 students. (Alaska Department of Education, 1972)

The schools include the first through eighth grades, and at Noorvik through the ninth grade. At Kiana, the Bureau of Indian Affairs school has nine grades. The Bureau's large school complex at Kotzebue has grades one through twelve, and provides special education. A high school is planned for Kiana. Many students, however, must travel outside the area for high school--to boarding schools as far away as southeast Alaska, or even Oregon. Some students go to the big city schools in Fairbanks or Anchorage, where the State conducts a Boarding Home Program.

Until recently, all teachers in these local schools have been non-Native people brought in from outside the area. In recent years Native people have been employed as teacher aides, and Native culture programs have been introduced. A bilingual program is being implemented

in some of the schools, and Native history and crafts will become part of the curriculum. Some villages of the area have had headstart programs which have relied on Native people as teachers and staff.

Recreational and Leisure Activities: Routine outdoor recreational activities are usually combined with subsistence living activities; often the two are difficult to separate. The same vehicles that are used for subsistence activities are used for recreation. For example, several people may go hunting or trapping and then have a snowmachine race on the way home. Or in the summer a person may travel by motorboat to a favorite swimming or hiking spot and then stop to check the salmon nets on the way home. For that matter, the subsistence activity itself may be carried out as much for enjoyment as need.

At various times throughout the winter, most villages hold weekend or weeklong festivals. The songs, dances, games, and stories that are a part of these festivals often have as their characters the animals and plants of the area. Outdoor activities at the festivals include races by snowmachines, dogsleds, snowshoes, and foot.

When people are indoors during their leisure hours, they entertain themselves with storytelling, portable radios, card games, and books. Newspapers and periodical literature generally are available only through the mail.

Children enjoy bicycle riding in winter and summer, in addition to a variety of traditional and Western games. Among other favorite activities, teenagers listen to records, play guitars, and participate in basketball and softball.

Income and Employment--General: Income and employment in the villages of the Kobuk area is of two types: subsistence and cash. Subsistence income consists of food, wood, and other raw materials taken directly from the land for personal use and consumption. If these resources were not available, cash would be needed to buy their equivalents. Therefore, any discussion of the income of the residents must include the resources taken directly from the land, as well as cash dollars received.

The time and energy devoted to subsistence pursuits are forms of economic activity. Hunting, fishing, trapping, and the preparation for use and storage of food and clothing are among the main activities. Maintenance of equipment is also an important part of subsistence living. Since opportunities for year-round wage employment are extremely limited in the villages of the area, with the exception of Kotzebue, and only modest opportunities for seasonal wage employment exist in the area, it is important to consider the manner in which people are involved in subsistence pursuits.

Subsistence: One of the most dramatic changes affecting subsistence living--and life in the north in general--is the replacement of dogs by snowmachines as the principle mode of travel and transport. When coupled with the introduction and use of modern weapons, the impact of Western technology on the traditional economy is very great.

This impact may be seen in the time and energy spent in subsistence pursuits, in the size of the harvests, and in the dynamics between the subsistence economy and the market economy. Snowmachines must be bought with money, and cash is needed to operate and maintain them. A noticeable decrease in the number of dog teams has been very apparent in the villages. John Burns, Wildlife Biologist for the Alaska Department of Fish and Game has stated that:

With the advent of these machines, great quantities of fish and game that formerly had to be used for dog food, can now be used for local consumption or sold. Also, the machines have increased the outdoor activities of a great many people here in Nome and Kotzebue. People who work during the week and keep no dogs can now get out when time permits, to supplement their cash income by hunting for some of their food. Also, the men who hunt and trap during the winter are now much more mobile (John Burns, personal communication).

According to John Schaeffer, Executive Director of the Northwest Alaska Native Association, this change permits boys in school to join their fathers on weekend and holiday hunting trips, an opportunity which has been limited since the introduction of the Western school system (John Shaeffer, personal communication).



Caribou hunting, fishing  
and trapping activities  
occur within the area.  
These and other subsistence  
activities will continue  
under this proposal.

The people of the Kobuk area villages carry on their subsistence pursuits throughout the proposal area. Exact location and intensity of subsistence activities at specific locations is difficult if not impossible to determine. This is especially true when considering the harvest of migratory animals, such as the caribou, which may move according to habitat requirements. Most subsistence fishing occurs along the Kobuk River itself, at the mouths of its various tributaries. Trapping and hunting generally take place within an approximate 50 mile radius of the villages, but this varies with the availability of game. In some years, people may have to travel further to obtain the necessary resources.

The Alaska Dietary Survey, 1956 - 1961 found that locally harvested foods in four northwest Alaska villages accounted for 30 to 46 percent of the caloric intake and 67 to 81 percent of the protein (Federal Field Committee, 1965). These ranges are probably typical of most smaller settlements today. The dependence on local subsistence food resources may be somewhat less in Kotzebue. Yet local materials are still used for clothing, building materials, utensils, and craft items.

Cash incomes, which are highly irregular, are typically obtained in temporary employment at relatively high wage rates or in some cases from welfare payments. A substantial part of the cash flow is used for

inputs of durable goods such as outboard motors, snowmachines, and guns, and of supplies used in the subsistence sector. Hunting skill remains the single most important determinant of social status and influence in the smaller villages

There is no closed season on caribou hunting in northwestern Alaska, and no limit on how many animals can be killed. The Alaska Department of Fish and Game finds it difficult to determine the annual kill of caribou in this region since the entire harvest can be presumed to be for subsistence purposes. The annual subsistence kill of caribou is believed to have declined from 20 to 30 thousand in the early-to-mid 1960's in the northwest game management units, to a current harvest of approximately 10 to 15 thousand animals. This decline has been attributed to the advent of the snowmachine as the major mode of winter transportation with a resulting drastic decline in the need of caribou for dog food (Personal communication, Smith, ADFG, 1972).

The Northwest Alaska Native Association (NANA), of which the Kobuk villages are member communities, has recently completed a detailed household subsistence survey. Average yearly harvests for each resource are estimates from data covering the last several years. Appendix **F** presents the results of the survey for those communities within the Kobuk area of concern, along with the totals for the whole NANA area.

According to the survey, the 5 Kobuk villages had an average annual harvest of 5,449 caribou. Kotzebue people accounted for an additional 5,000. The total average annual harvest of caribou for all the NANA villages was 14,219 animals.

Moose are an important source of food for the people of the Kobuk area. Of the 317 total average annual kill in all the NANA villages, the 5 Kobuk villages accounted for 172. Shungnak alone reported an average of 59 moose killed per year. The people of Kotzebue reported an average annual moose harvest of 60. The five Kobuk villages plus Selawik accounted for the total estimated harvest of black bear, an average of 106 per year and approximately 70 percent of all brown/grizzly bear harvests reported in the NANA villages--the five Kobuk villages reported an average annual harvest of brown/grizzly bear at 57. Beaver is valuable both for its food and its pelt. The people of Ambler reported an average annual kill of beaver of approximately 400. The total for all NANA villages was 1,084. The other Kobuk villages accounted for 74 beavers per year.

The people of Noorvik and Kiana are the only Kobuk River villagers to report use of reindeer. The average annual figure of 75 reported for Noorvik and the 45 reported for Kiana were obtained in trade from

reindeer herders or suppliers. Other small land mammals taken in some cases for their combined value as food and pelts and in other cases for their pelts alone included red fox, arctic hare, land otter, lynx, marmot, marten, mink, muskrat, porcupine, squirrel, weasel, wolverine and wolf. The Kobuk River villages accounted for a large proportion of the subsistence harvest of these resources in the NANA region. (See Appendix F.)

Of the 42 Dall sheep reported in the survey, Ambler accounted for 20, Shungnak for six, and Kotzebue for 13. Of the Kobuk villages only Noorvik and Kiana reported subsistence takes of sea mammals. Those two villages reported an average annual harvest of some 177 beluga whales and bearded and hair seals. In addition, Noorvik acquired an annual average of 400 pounds of bowhead whale meat through barter or trade. Total average pounds of potential useable value from all land and sea mammals for the Kobuk villages is estimated at 1,039,523 pounds. At Kotzebue the figure is 939,368 pounds.

Fish are an important part of the subsistence harvests of the Kobuk people, particularly of the villages in the lower portion of the river. Fish are taken for both human consumption and dog food. Arctic char, shum or dog salmon, mud shark, sheefish, smelt, trout, and whitefish are all harvested in quantity by the people of Noorvik, Kiana, and Ambler. Kobuk and Shungnak reported important quantities of sheefish and whitefish. (See Appendix F.)

The average annual fish catch for the five Kobuk villages was as follows: Noorvik -- 377,455 pounds; Kiana -- 236,033 pounds; Ambler --121,600 pounds; Kobuk -- 59,002 pounds; and Shungnak -- 190,033 pounds. These totals include small amounts of burbot, grayling, humpey salmon sucker, and shellfish.

Subsistence fishermen use set and gill nets and beach seines to catch salmon in bays and rivers. Nearly all the catch is consumed as dried fish. Eskimos have traditionally fished for char with handlines, jigs, spears, gill nets and traps. Today most fish by hook and line, or gill net. They eat the entire fish. The head is considered a delicacy.

There is some indication that dependence on subsistence fishing has declined in the region during recent years as a result of increased wage employment which interferes with the time of subsistence fishing, and the decline in dog food requirements. If it continues to decline, regulations may be liberalized to allow a greater catch for commercial purposes.

The NANA survey indicates that birds are a valuable addition to the diet of the Kobuk people. Shungnak reported an estimated average annual harvest of 6,225 ducks and 1,200 geese. Kobuk households reported an annual average of 2,500 ducks and 1,000 geese, while Ambler reported an annual average of 1,000 ducks and 500 geese. Kiana takes 400 ducks and Noorvik takes about 637 ducks. The latter two figures appear to be low estimates, in view of the population size of these two villages, and their location close to prime water-fowl habitat.

Plant resources supplement a diet otherwise dominated by meat protein. Quantities of berries, greens, roots, and wild vegetables are gathered by the people of all the five Kobuk area villages, as well as by the people of Kotzebue. Types of berries include blueberries, blackberries, cranberries, salmon berries, currants, gooseberries and strawberries. Greens and roots include fireweed, grass roots, rose hips, sourduck, tundra tea, willow leaves, wild roots, sudikroad, tinnik and tree gum. Other vegetables include celery eskimo potato, onions, and rhubarb. Total quantities of all plants gathered on a yearly average in each of the Kobuk area villages is as follows: Shungnak - 14,867 pounds; Ambler - 23,065 pounds; Kobuk - 7,656 pounds; Kiana - 15,040 pounds; Noorvik - 24,259 pounds; and Kotzebue - 16,782 pounds.

The "worth" of the moose or caribou, or of a fish or duck caught for personal consumption is a value not currently defined in the market place. This is because it is illegal to sell these commodities. However, this food is obviously still "worth" a great deal, for if it were not available, the person would have to have the money to buy the equivalent in a store. Even if an "equivalent" group of products could be identified and these subsistence resources assigned a dollar value on that basis, it would fail to include the cultural and social and recreational values attached to the resources and the activities associated with their harvest and preparation. Dollar

values, however, would make it easier for other people to understand the importance of subsistence resources, as well as the important contribution these resources make to the quality of life of those people engaged in acquiring them.

The viability of the Eskimo subsistence economy in the region is apparently not now endangered by population pressures on the wildlife resources nor by the influx of nonresident hunters. However, because of subsistence harvests, some geese populations may be at levels lower than expected otherwise (King and Lensink, 1972); and sheep, musk oxen, and caribou have been extirpated from some areas. Yet the take of several important subsistence species is in no case clearly approaching the maximum sustainable yield; in many places stocks of caribou, seals, walrus, and beluga whales can probably sustain greater harvests. However, there is little information on animal populations and greater harvests at this time may not be practical.

The snowmachine is working a revolution in hunting--and in other ancient pursuits, such as hauling firewood and water--comparable only to the introduction of the rifle. But snowmachines cost from \$900 to \$3,000 and require purchased fuel and parts. On the other hand, to the extent they replace sled dogs they can be expected to improve the human use of the kill, since much less of the meat and fish taken today is fed to the dogs than in even the recent past.

The limits on the perpetuation and expansion of the subsistence sector are cultural, economic, and ecological. Opportunities for wage employment, education, health, and recreation are drawing part of the population to places like Kotzebue, where game is scarce due to the population density and where contact with western cultural values and the requirements of "urban" living conflict with traditional pursuits.

Ecological limits on a subsistence economy are related to the Arctic ecosystem, which is considered to be extremely fragile; the impact of phenomena such as population, pollution, erosion, and overgrazing, seems proportionately more catastrophic than in temperate regions (Federal Field Committee, 1968).

Cash Income: The introduction of items of American material culture and their acceptance by the people of the region, has led to a growing demand for cash with which to purchase equipment such as fishing gear, outboard motors, ammunition, guns, snow machines, and a variety of household equipment. Food staples, such as salt, flour, sugar, coffee, tea, tobacco, clothing, and liquor are other valued retail items. Heating oil is another product that requires a substantial amount of cash. New home construction, public utilities, travel to other parts of the State all are costly, and require participation in the market economy, to obtain the necessary cash. The desire to seek wage employment reflects these needs, and may reflect increasing awareness of the social status and power that money confers on people in the dominant society.

Opportunities for permanent, year-round employment and a steady source of income are extremely limited in the small villages of the area. The few permanent jobs in the villages are primarily government jobs; in the schools, as teacher aide, or janitor, maintenance or kitchen worker; in the village post office, as postmaster. Perhaps a position might be available as store manager in the village store. Other year-round jobs exist at Kotzebue, with the various governmental agencies, and with the several businesses, and transportation and tourist services. Most of the area's non-Native people have year-round jobs either in the service trades or transportation industries, or in government. Many Natives, on the other hand, are

employed only seasonally with opportunities for work greatest during the short Alaskan summer.

Some people have to leave the region to find wage employment, both seasonal as well as full-time. For the small number who are union members, union hiring generally takes place in the union halls in Fairbanks or Anchorage. One of the significant indicators of the social and economic condition of a population is the ratio of nonworkers to workers in the population. This reflects the number of people a worker must support through his participation in the labor force. For the state as a whole, the nonworker-worker ratio was 1.28 in 1970, while in the Kobuk census division it was 4.22. Data on participation in the labor force does not adequately reflect the number of able-bodied people who actually work, since only those people working, or unemployed and looking for work, are generally included in the census figures on the labor force. Undoubtedly, many people in the Kobuk area villages do not look for work in the wage economy during the winter months -- when it is unavailable in the region -- through April or May, when the census was taken. Thus, the figure of 45.8 percent of males and 28.8 percent of females over 16 years counted as being the labor force for the Kobuk census division is probably a low estimate for seasonal wage workers.

Government as a Source of Income and Employment: Government is the largest single employer and source of cash income in the Kobuk valley area. In 1971, government employment averaged 71 percent of total wage and salary employment. Wage and salary employment does not include commercial fishing, trapping, reindeer harvesting, firefighting, or the National Guard. Government is the principal source of full-time jobs and also provides seasonal employment opportunities. Examples of government seasonal employment include neighborhood youth corps and firefighting.

The following figures are taken from the 1971 Statistical Quarterlies published by the Alaska Department of Labor. The Kobuk Area included here is larger than the Kobuk valley area under discussion, but the figures accurately reflect the substantial increases in employment brought about by seasonal work.

NON-AGRICULTURE EMPLOYMENT  
KOBUK AREA  
1971

Employment	Jan.	July	Aug.	Dec.
Total Government Employment	399	476	489	465
State and Local Government	121	201	222	195
Federal Government	278	275	267	270
Total Non-Agricultural Employment	596	1,028	858	681

Federal and State governmental functions in the area which provide income for the people include the administration and operation of the school system, public health services and welfare programs, postal service, transportation, aviation and weather services, land management services - principally firefighting, and law enforcement. These functions are primarily carried out at Kotzebue.

Administration of educational services is both Federal (Bureau of Indian Affairs) and State. The four State-operated schools -- at Ambler, Kobuk, Shungnak, and Noovik -- employ a total of 17 teachers (Alaska Department of Education, 1972). In addition there are jobs for local people at the schools - cooks, janitors, maintenance workers, and teacher aides. The Bureau of Indian Affairs school at Kiana employs, in addition to the teachers, five educational aides, one maintenance worker, one janitor, and one cook. The large school complex at Kotzebue, operated by the Bureau of Indian Affairs, and including both elementary and secondary grades, employs 45 teachers, 27 teacher aides and 28 maintenance, janitorial, and kitchen staff (U.S. Department of the Interior, BIA, 1972).

Health services provide an additional source of employment and income. The Public Health Service hospital at Kotzebue employs more than 100 persons. State health and welfare programs employ village aides in most of the villages.

Postal services account for a few year-round jobs in the villages of the area, and additional personnel at the Kotzebue Post Office. Governmental regulatory and service agencies have staffs in Kotzebue and employ some local residents. These agencies include the Federal Aviation Administration, the Weather Service, and State Division of Aviation, the State Division of Public Safety and the State Department of Fish and Game.

An important source of seasonal government employment is firefighting. Residents are employed on an emergency basis by the Bureau of Land Management to fight forest and tundra fires. The number employed each summer varies directly with the number, frequency, and size of fires, not only in the region but all over the State. In 1971, 35 persons were employed from the six Kobuk villages and from Selawik to fight fires. Income per person averaged \$1,764. In 1972 the Bureau of Land Management hired a total of 454 persons from the Kobuk River villages, and from Selawik, for an average income per person of \$1,082 (Bureau of Land Management, 1972).

All the villages of the area, except Kobuk, have a National Guard unit. Approximately 100 men from the five Kobuk villages are members of the National Guard and receive an average yearly income of \$1,000 each (U.S. Army National Guard, 1972).

FIGURE 4

NATIONAL GUARD AND EMERGENCY FIREFIGHTING EMPLOYMENT

Village	Current Population Estimate	National Guard	Firefighters	
			1971	1972
Ambler	180	14	4	1
Kiana	290	10	5	101
Kobuk	65	-	-	9
Kotzebue	1,965	13	9	126
Noorvik	445	18	9	116
Shungnak	159	10	-	32
TOTALS	3,104	65	27	384

Source: U.S. Department of the Interior, Bureau of Land Management.  
Open file and reports on emergency firefighters, 1971, 1972,  
District Office, Anchorage.

U.S. Army, Alaska National Guard. Open file and reports, 1972.

Government sponsored or supported community development projects, such as new housing, water and sewer projects, community facilities construction, provide seasonal employment and income. Some of the State-sponsored programs are on a self-help basis, and provide some employment. They may not involve cash income.

The local governments in the villages have had limited, if any, financial resources to provide a source of wage employment. In Kitzebue, there is some limited employment in local government. Under the provisions of the Alaska Native Claims Settlement Act this is likely to change. The Northwest Alaska Native Corporation and the village corporations will bring new vitality to the village and city governments, and should stimulate increased employment opportunities in local governmental services. The non-profit arm of the Native regional association is likely to introduce new social and educational programs which will be staffed, most probably, by local people to the greatest extent possible.

Governmental expenditures which contribute to the cash income of the area include the public assistance programs. In addition to limited unemployment compensation and social security benefits, the residents receive three types of income assistance: Bureau of Indian Affairs emergency assistance payments, food stamps, and State

welfare payments -- which include the categorical programs of Old Age Assistance, Aid to the Blind, Aid to the Disabled, and Aid to Families with Dependent Children. The number of recipients and the average dollars received per household have increased in recent years, along with the increase in population. The material standard of living for some persons who now utilize both subsistence and public assistance has undoubtedly improved.

Judging from October 1972 statistics, about 61 percent of the households in the five villages are currently receiving welfare payments from the State. Of the total number of welfare cases in the Kobuk area, over half are in Kotzebue. (See Figure 5 )

Bureau of Indian Affairs emergency financial assistance varies seasonally and from year to year. In recent years it has gone to between 12 and 22 percent of the population of the five Kobuk villages. It is intended to meet emergency needs due to delays in or ineligibility for State assistance, due to seasonal hardships suffered during the winter months when wage employment is unavailable, and other temporary emergencies. Average annual household income from State welfare payments, judging from October 1972, is about \$1,862.

FIGURE 5 : STATE WELFARE TRENDS - KOBUK AREA VILLAGES  
October 1967 - October 1972

Village	October 1967		October 1968		October 1969		October 1970		October 1971		October 1972	
	*Cases	Total \$										
Ambler	8	\$ 780	7	\$1,039	9	\$1,283	8	\$1,580	13	\$2,277	13	\$2,042
Kiana	22	2,092	19	2,641	24	3,040	27	5,106	28	4,820	31	4,668
Kobuk	4	**	4	**	4	**	4	**	5	**	4	**
Kotzebue	69	7,231	80	10,497	90	11,491	106	19,186	113	18,586	120	18,623
Noorvik	19	2,112	27	3,218	36	4,365	39	6,486	43	6,291	40	5,917
Shungnak	14	1,476	13	1,362	13	1,669	16	3,002	17	2,950	19	2,885
TOTALS	136	\$14,091	150	\$19,547	176	\$22,225	200	\$36,021	219	\$35,549	227	\$35,230

Corrected for Inflation:

Price Index***	100	104.2	109.8	116.3	121.3	125.0
1967 =100	\$14,091	\$18,759	\$20,241	\$30,972	\$29,307	\$28,184

\*A case may represent a family, and not necessarily an individual.

\*\*Figures removed to protect confidentiality of individuals, but included in totals.

\*\*\*Federal Reserve Bulletin Vol. 59, No. 1, Jan. 1973, p. A68.

Source: Alaska Department of Health and Welfare, Division of Public Welfare.  
Statistics on Active Public Assistance Cases, October 1967 to October 1972.

Commercial Fishing and Trapping: Commercial fishing is a source of seasonal employment not included in the above statistics. It is especially important for Kotzebue and neighboring villages. The commercial fishing industry provides cash income for almost 200 fishermen as well as 40 to 70 processing employees who work each summer for the Kotzebue Sound Area Fisheries Cooperative. In addition, a few people fish commercially for sheefish in the winter.

The Kotzebue cooperative is a Native-owned enterprise founded in late 1967. It has been a substantial positive impact on income received by commercial fishermen in the area. Since 1967, price of chum salmon has risen from \$1.00 per fish to \$1.30 per fish. By contrast, in the Norton Sound District south of the Kobuk valley, salmon prices have stayed the same or declined since 1967. The gross dollar value of the catch to Kotzebue fishermen, \$28,700 in 1967, has risen steadily each year to over \$250,000 in 1972. Total wages paid to processors and tender boat operators have climbed from \$15,000 to over \$40,000. The increases are not completely due to the existence of the co-op, as the salmon run has been consistently high for the last 3 years. However, the economic return to the local people would not have been as high without the co-op. The co-op's future plans include a larger and more sophisticated processing plant,

FIGURE 6

APPROXIMATE COMMERCIAL FISH CATCH IN POUNDS\*

<u>Year</u>	<u>Kotzebue District</u>
1967	283,341 lb.
1968	335,284 lb.
1969	469,067 lb.
1970	1,311,127 lb.
1971	1,285,111 lb.
1972	1,622,339 lb.

COMMERCIAL FISHING LICENSES--1972: 193

ESTIMATED DOLLARS TO FISHERMEN--1972: \$275,020

AVERAGE INCOME PER FISHERMAN--1972: \$1,424

About 4% of the catch in the Kotzebue District are sheefish and Arctic char, the rest are salmon. Figures were derived by multiplying the salmon catch by the mean weights of each species for each year for each district.

Source: Alaska State Department of Fish and Game, Division of Commercial Fisheries.

thereby further increasing the local residents' share of the economic return of the resource.

Trapping is still another significant industry in the area which relies on a natural resource. Its relative importance is much less in the Kobuk valley than in other areas of the State; but it is still an important source of income for many, especially those living in the villages farthest inland.

Trapping activity has declined since World War II, as wild fur prices have remained low due to competition from synthetics and ranch furs. Most persons who still trap do not rely on it as their sole source of cash income. Instead, trapping has become more of a part-time economic activity and even a recreational pursuit for some.

Since the first of 1973, however, the world market price for wild furs has risen sharply. Some fur prices, such as fox and lynx, have risen by as much as 200 percent over last year. Whether or not this indicates a future upward trend in prices remains to be seen. This could increase the trapping activity.

Tourism and Recreation Potentials: The Kobuk area has significant potential for an increase in the role of tourism and recreation industries in the local economy. Tourism ranked as the fourth most important industry in the State in 1971, and has become a more important factor in the State's economy yearly (Alaska Travel Division, 1972). The number of tourists entering Alaska has been steadily increasing, especially since 1968. The statistics on tourists visiting the Kotzebue and Nome areas show that approximately 8 percent of visitors entering Alaska make a trip to those northwest Alaska communities. One study predicts that by 1975 the numbers of tourists entering Alaska could grow to between 186,000 to 450,000 (Cresap, McCormick, and Paget, 1968). If the region continues to attract the same proportion of these visitors, this could mean that the number of tourists coming into the Kotzebue area could increase to at least 14,880 per year.

All studies indicate that scenery, wildlife, mountains, glaciers, and wild flowers all abundant resources in the Kobuk area -- are among the most common reasons for visiting Alaska. The recreational potential of northwest Alaska is high, and has so far remained undeveloped.

The Kobuk River valley appears to have potential for sport hunting. Moose, bear, and caribou are the principal targets. Dall sheep have been hunted in the Baird Mountains in the past but seem to be very rare or nonexistent at present (Warren Thompson, personal communication, 1972).

Recreational potential within the region is high. The archeologic and historic sites will draw ever-increasing interest. The multitude of lakes, rivers, and streams in great variety, offer a wide range of activities. Especially noteworthy are the Kobuk and Salmon Rivers.

An extremely varied potential for backcountry uses exists. Hiking and camping are possible throughout much of the area. Recreational use of the area is likely to increase more quickly than in other Arctic regions. Since diverse environments -- ranging from barren but interesting dunes to the Baird Mountains -- exist within a relatively small and easily understandable area.

The Waring Mountains are some of the finest hiking lands in the Alaska arctic with their gentle slopes, excellent views, and easy terrain. Canoeing on the Kobuk and Salmon Rivers is pleasant and not difficult.

Wildlife viewing, photography, and all other nonurban recreational activities have high potentials throughout the region.

The Kobuk area has very few organized recreation opportunities at the present time.

Alaska Airlines and Wien Consolidated Airlines, as a part of their summer tourism packages, take passengers on a tour of Kotzebue which includes a bus ride through the village, a stop at the Kobuk Jade Shop, and an Eskimo cultural demonstration.

Charter flights, on a purely individual basis, may be made over any of the area. Boat trips on the Kobuk River may be arranged in much the same manner.

The Selawik area as well as the Kobuk River are fly-in fishing areas far removed from population centers. As of now, the Kobuk River gets relatively high fishing pressure because of advertising and availability of facilities for anglers. Char and grayling are numerous in the Squirrel River and other streams entering the Kobuk River. Sport fishing for sheefish of the Selawik-Kobuk River will become more important because this is the only area where large trophy-sized fish, 30 to 50 pounds in weight, are present in numbers (Alt, 1969).

Sport hunting and fishing provide some residents of the area with part-time and full-time employment. Both Natives and non-Natives are registered guides, assistants to guides, camp helpers, and pilots who hire out to sportsmen to insure a successful hunt and to enable nonresidents to meet certain legal requirements of State regulations governing hunting. There are four guides located at Kotzebue and one in Kobuk. Some 133 licensed guides are qualified to conduct hunts in the Arctic guide districts of Alaska.

Sheefish, grayling, salmon and char are fished for sport in summer. Bear, caribou, moose and wolves are hunted in fall and spring.

A guided hunt could cost \$5,000 or more with licenses and transportation to Kotzebue additional. A guided hunt for any single species could range from \$1,000 up.

In the spring of 1972, 10 guide teams (a guide and an assistant guide with one or two hunters in separate aircraft constitutes a team) operating out of Kotzebue aided their clients in killing 87 polar bears. A polar bear hunt grossed the guide from \$2,000 to \$2,500 per animal. Taxidermy fees for making a rug from an average sized bear might be \$400 to \$500. None of these bears were within the proposal area.

Since the enactment of the Marine Mammal Protection Act of 1972, only Natives may harvest marine mammals, including polar bear, walrus, and seal. This new regulation will have an impact on the guiding industry in the region.

Income from arts and crafts production is important to many families. Products range from ivory, bone, and baleen carvings to sealskin and fur parkas and mukluks. Several arts and crafts Native-owned cooperative enterprises are located in the area, and there are arts and crafts retail stores in Nome and Kotzebue. Some craftsmen deal directly with customers through home businesses.

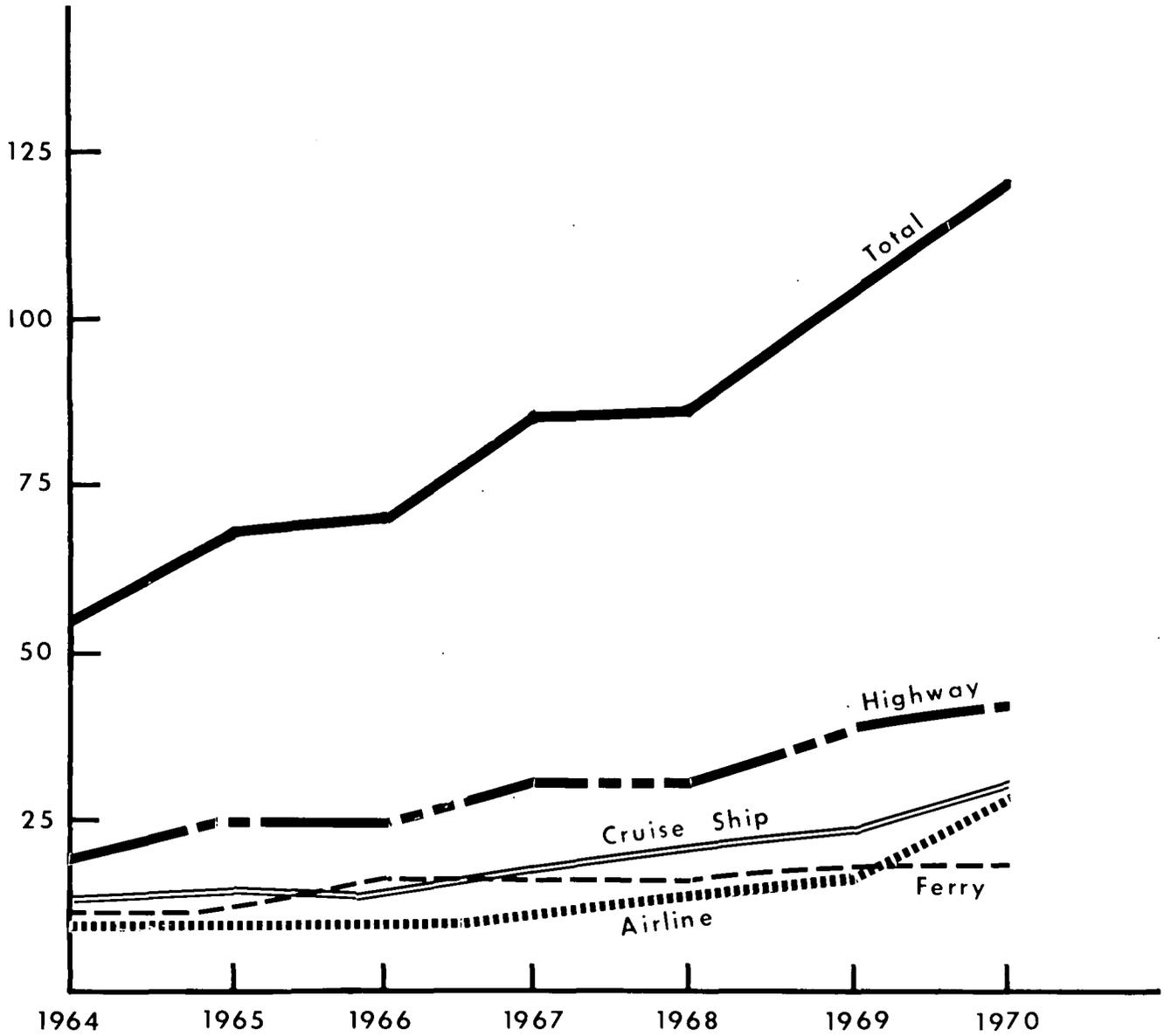
Kotzebue is an important tourism center in northwest Alaska, and will be the focus of increased growth in tourism in the region. The Eskimo life-style and the location above the Arctic Circle are among the tourist attractions of this part of Alaska. Some residents are employed by the transportation and service industries catering to tourists, especially in the summer.

Alaska Airlines and Wien Consolidated Airlines offer tour packages from Fairbanks and Anchorage to Nome and Kotzebue. In 1972 Alaska Airlines carried 8,579 paid tourists on their Circle Tours to Nome and Kotzebue. This figure is higher than the total resident population

FIGURE 7

NUMBER OF TOURISTS ENTERING ALASKA BY TRANSPORTATION MODE,

1964-1970 (thousands)



Source: 'Economic Outlook for Alaska', Federal Field Committee for Development Planning in Alaska, 1971.

of the area, and does not include travel agents and airline employees, who travel without charge. If the agents and employees are included, the total for 1972 on Alaska Airlines was over 10,000.

Wien Consolidated carried approximately 1,100 tourists to Nome and Kotzebue in 1972. They did not take any travel agents on promotional tours; however, they did take about 200 agents in the spring of 1973. Wien only overnighted their tours in Kotzebue in 1972 but overnighted in both Nome and Kotzebue in 1973 (Guffey, Wien Consolidated Airlines, personal communication, 1973).

Japan Airlines brought 2,000 Japanese tourists to Alaska in 1972. It expects to bring over 8,000 in 1973.

Other domestic and foreign airlines also indicate increasing tourist traffic to Alaska.

The retail businesses of Kotzebue benefit from the tourist traffic. None of the Kobuk River villages have tourist facilities or businesses catering to the visitor. Kotzebue's overnight accommodations, its gift shop and arts and crafts stores, its general stores and taxi service may hire some additional seasonal workers to take care of the increased volume of business during the summer months. Since many visitors come to Kotzebue on package tours for a stay of limited duration - sometimes only a day or less, the present economic benefits at the local level are limited.

The year-round operations of the retail and service sector of the economy provide income and employment principally to the owners-managers, and only indirectly to other inter-related sectors, such as transportation.

FIGURE 8: BUSINESSES

Village	General Store	Mining	Taxicab	Liquor	Arts and Crafts	Hotel	Air Trans.	Gift Shops	Electricity	Telephone
Ambler	XX									
Kiana	X						X		X	
Kobuk										
Kotzebue*	XXXX	XX	X	XXX	X	XXX	XXXXXX	X	X	X
Noorvik	X								X	
Shungnak	X								X	

\*In addition, other business in Kotzebue include: water transportation--1, motion picture--1, newspaper--1, broadcast--1, dentist--1, bars--2.

Source: Alaska Department of Economic Development. Alaska Industrial Directory of Employers, 1972-73. Juneau.

Facilities and Services: Kotzebue, as the regional service center, has an array of public services and facilities. In addition to the transportation services - the airport, with its adjoining Federal Aviation Administration facilities, the Weather Service, and the nearby Air Force radar installation -- the town has several air taxi and charter services. Kotzebue has a telephone system, and is connected with the rest of the State by telephone. There is a taxi cab service, hotels, cafes, general stores, post office, fuel storage and distribution, and barge shipping company.

The U.S. Public Health Service hospital and the Bureau of Indian Affairs school complex are both substantial modern structures, and prominent features of the town. New homes have been built, and are intermingled with the older, sometimes dilapidated houses. As is true in the smaller villages, Kotzebue's streets are unpaved, but they are lighted.

Housing is provided for many government agency employees, at the FAA complex and the school complex. The town has several churches, movie houses, a community hall, and a school gymnasium.

Kotzebue has a water system, but a water delivery service is also available. Plans for a sewage system are being discussed. There is electricity.

The Kobuk villages have few modern facilities and services. Some villages have or are seeking electricity and water and sewer systems. The U.S. Public Health Service has assisted in developing sanitary water supply systems for the villages. In some cases, they may mean a system of private wells. Others obtain water from nearby ground sources, such as the river or streams. In winter some may melt snow for water. Some homes may have cesspools or septic tanks, but waste usually is dumped at specific dump sites or in the river. Most homes in the smaller villages do not have indoor toilets or plumbing.

The Alaska Village Electric Cooperative is working to provide electricity in the rural Alaska villages. In some of the villages of the area private light plants are the only source of electricity, except for the school, which has its own generating capacity.

Private homes vary from old shacks constructed of scrap lumber, to old and new log houses, and modern pre-fab or frame houses. Between 1969 and 1971, 91 prefabricated homes were rehabilitated under the Alaska State Housing Authority's federally financed village housing program. Housing has also been provided in Kotzebue through the Alaska State Housing Authority.

Except for Kobuk, each of the Kobuk villages has a general store. All the villages have a post office, sometimes located in the home of the postmaster. All have mail, freight and passenger services, and airstrips.

Transportation and Communication: Kotzebue is the largest urbanized area in the region, and the transportation center which connects the area to the rest of the State. It is served on regular daily schedules by Alaska and Wien Airlines.

The Kobuk valley is not linked to the road and railroad systems of interior Alaska. The people of the valley are entirely dependent upon air and marine transportation for providing many necessities as well as hauling minerals to market. Except for sled and pack trails, land transportation has generally been confined to satisfying mining and defense needs. Heavy equipment can be moved over frozen tundra during the winter months. Winter and snowmachine trails, in some cases passable only in winter, are in use between settlements and along trap lines.

A road 3 miles long connects Kotzebue with the U.S. Air Force radar installation south of the village.

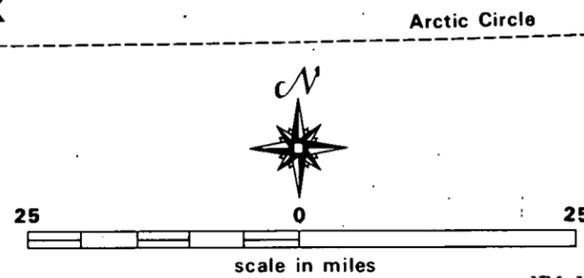
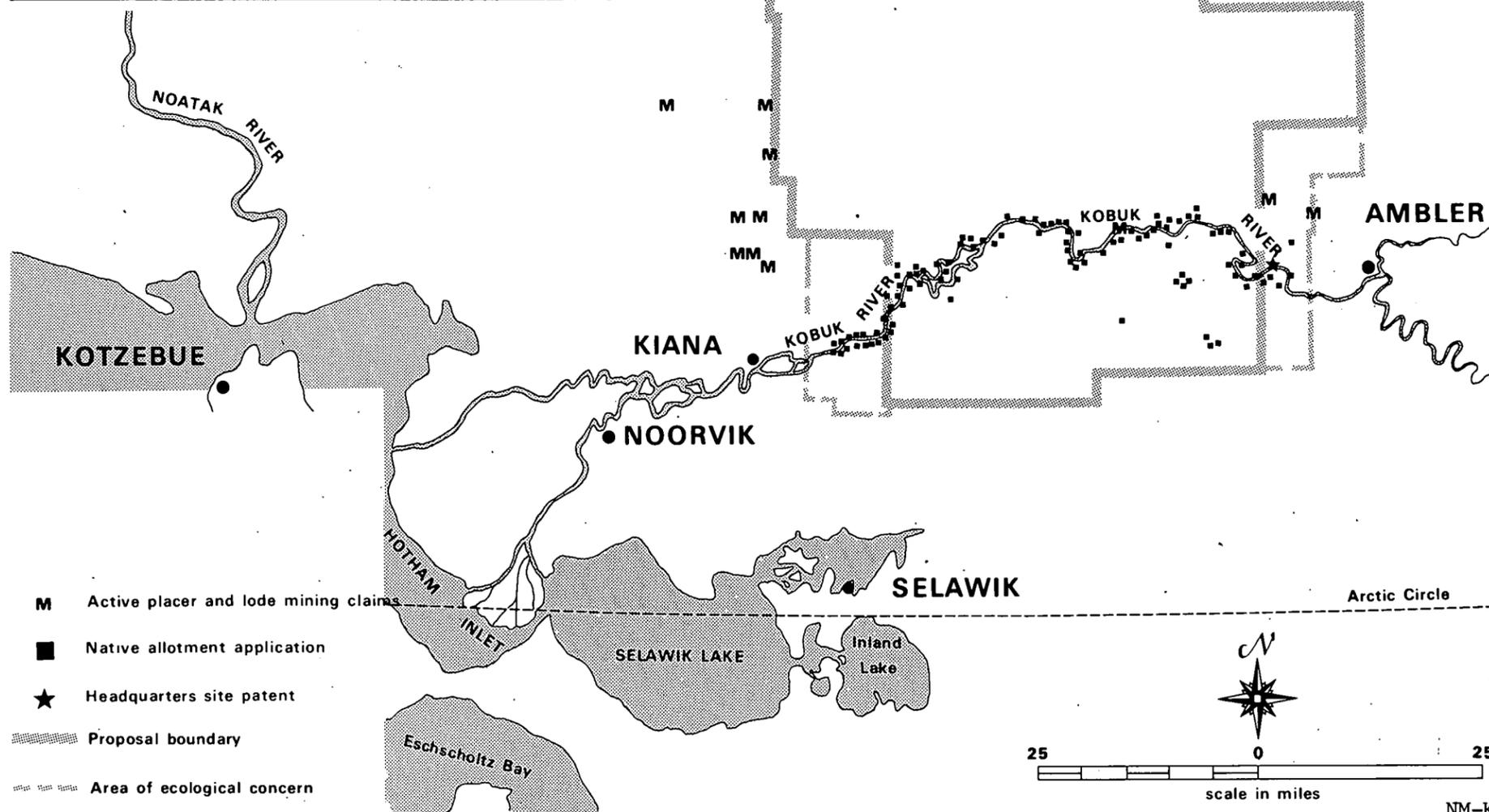
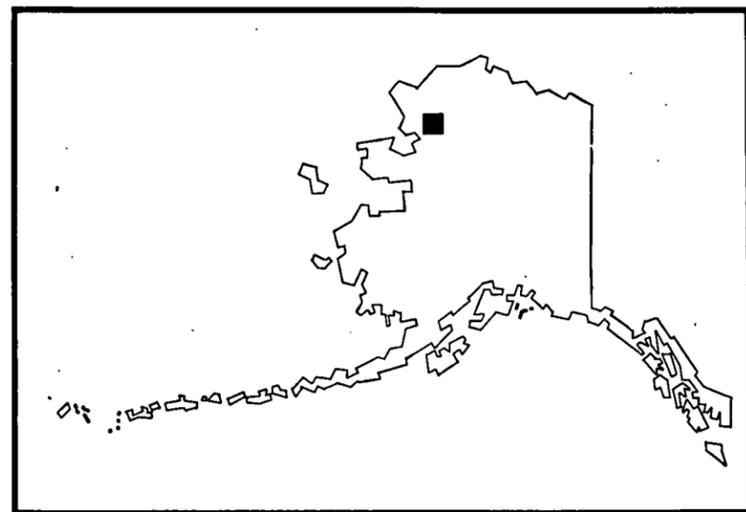
The Planned State Surface Transportation Corridors map appears in Chapter III.

Much of the area is accessible by floatplane. Landings can be made with properly equipped light planes on river bars. The nearest airfields are in Kiana and Ambler. The major air corridor in the region follows the Kobuk River east from Kotzebue.

With no overland routes, air and marine transportation have remained the principal modes of freight transportation in northwestern Alaska. The isolation of the area, combined with the short navigation season and the comparatively low volume of commerce, adversely affects shipping. A commercial company provides lighter services from an anchorage some 20 miles off shore for freight brought by sea to Kotzebue. This company also serves coastal communities by sea-going barges and operates river barges inland to villages along the Noatak, Kobuk, and Selawik rivers. Deep draft barges reach as far up the Kobuk as Kiana. Shallow draft barges can reach Ambler during most of the ice-free season.

Most of the villages within the region are serviced by aircraft from Kotzebue. Regular carriers, air-taxi services, charter services, and private aircraft haul passengers, freight, mail, and produce to the outlying settlements. A sandbar, a beach, or a bulldozed strip may suffice for a landing field for wheeled planes and a river or pond for a floatplanes. In winter, ski-equipped planes can and do land almost anywhere.

Kotzebue, as stated, has phone service that is available to all households upon subscription. RCA Alaska Communications is working to install one dial telephone within every village in Alaska. At present, villages have radio-transmitters. All villages have postal service, via air from Kotzebue.



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Contract Construction and Mining: Construction activities, both government and private, are important employers during the summers when there are village housing or other construction projects. Some persons travel to other areas of the State for construction jobs. Construction is important to the local economy during some years, but cannot be counted upon to provide a steady and permanent source of income.

Mining, an important natural resource-based industry in the past has steadily declined in importance during the past several years. Actual dollar values of production for the past few years are not available. Reports by the U.S. Geological Survey and the Bureau of Mines indicate mining potential on lands in the Baird Mountains, primarily east of Ambler in the vicinity of Bornite. The Bornite mines contributed briefly to the local economy of the mid-Kobuk watershed. Should overland or water transportation routes improve in this region, these mines could make a major contribution to the economy of the region.

Two mining claims, and 75 Native Allotment Applications lie within the proposed monument. No other lands are owned privately. (See Patents, Claims, and Applications map.)

Land Use: Existing land uses within the boundaries of the proposed monument are primarily Native subsistence use and some mineral prospecting. The proposed monument includes lands on which some 75 Native Allotment applications have been made. Five of these have seasonal home site designation. There is one squatter cabin with "swimming pool." Seasonal fishing and hunting camps are located along the rivers, particularly at the mouths of Kobuk River tributaries. In recent years, snow machines have been used by residents in their subsistence activities.

Two current mineral claims are within the proposed monument. There are also 20 oil and gas lease applications, and another 20 oil and gas leases.

The proposed monument has no agricultural land uses.

The Kobuk River is used regularly as an artery for travel. Motor-powered river boats, as well as large freight barges travel up and down the river during the ice-free season.

The Kobuk River, and other bodies of water in the area, are used for the landing of float and ski equipped aircraft according to season and condition of the runways at the villages.

There are no permanent village settlements within the proposal area. The villages nearby constitute a principal land use at the specific locations identified as settlements.

The annual round of subsistence activities and the manner in which resources of the proposal area are used have been described earlier in this chapter.

## 8. Potential Hydroelectric Sites

Two potential damsites have been investigated on the Kobuk River. Though one is outside the proposal area, both would have impacts within it. Studies by the U.S. Army, Corps of Engineers (1957) indicated low-potential for dams in the Kobuk because of complete stream freezing. More recent studies have indicated that such would not be the case (Alaska Power Administration, personal communication, 1973), and a reservoir project on the Kobuk could probably be operated.

One of the dams proposed is over 100 miles from the proposal area on the upper Kobuk. The upper 50 miles of the Kobuk River is precipitous with many rapids and small gorges. The most favorable damsite appears to be in the "Lower Gorge," 25 miles below the mouth of the stream draining Walker Lake. A dam in this canyon would be 225 feet high and would have a crest length of 1,500 feet. Water would extend up to Walker Lake, creating an active reservoir capacity of 2,000,000 acre-feet. The tributary to this site is rather small. There is, however, a possibility of diverting the flow of the Alatna River, a tributary of the Koyukuk River and the Yukon River system at a point above the mouth of Helpmejack Creek. This possible diversion would be subject to greater potential use farther

downstream on the Alatna or the Koyukuk. Using the Alatna water along with the Kobuk runoff, a power plant at the Kobuk River site would generate more than 110 million kilowatts of firm energy each year (USDI, BR, 1952).

The other site which has been studied is on the Kobuk River at the mouth of Kavet Creek. A dam here would create a reservoir which would cover much of the proposed monument. This project, according to the Alaska Power Administration (personal communication, 1973), is the only identified water potential development in the Kobuk basin meriting continued interest. The project might have regional significance in future power planning for the State.

Studies to date have consisted of inventory grade evaluations of the project as a single-purpose hydroelectric development. Multiple-use studies have not been made, but it is possible this project may have some significance for values other than hydropower.

The current plan contemplates construction of an earth dam about 150 feet high with a crest length of about 4,200 feet. This dam would impound 20.5 million acre-feet of water, with maximum water surface at elevation 150. The reservoir would have a surface area of 720 square miles. An arm of the reservoir would extend up the Ambler River about 22 miles.

The active capacity of 6.6 million acre-feet would be sufficient to fully regulate the runoff from the 7,820 square mile watershed to the site. This would permit firm power production of 120,000 kilowatts at 50 percent annual load factor. The project could produce an annual generation of 525,000,000 kilowatt-hours.

Construction of the reservoir would require relocation of the villages of Ambler, Kobuk, and Shungnak and would inundate the Kobuk River throughout half the proposed monument.

A surface geological reconnaissance of the damsite has indicated extensive sand deposits. Subsurface exploration prior to development would be required to ascertain the adequacy of the foundation materials.

Project studies have been accomplished in sufficient detail to estimate project power capabilities, and to provide a rough appraisal of probable project costs. They assume further geological exploration to establish the adequacy of foundation conditions. The value of the project for power would be about \$5 to \$10 million per year assuming average energy values of 10 to 20 mills per kilowatt-hour.

Investigations on the basis of estimated cost indicate that the project would have significant hydroelectric potential. Although one of Alaska's more favorable major hydroelectric resources, it would

likely not be justifiable as a single-purpose power development. There are no active proposals to build this project either as a public or private development.

The project studies to date have related solely to establishment of the power potential. With power operation, inflows to the reservoir would be stored and released as required to meet power demands. Navigation assistance would likely also be considered. Annual drawdown is estimated at only 5 feet. Ultimate development would include other purposes which might be incorporated in the project plan. The project operation would attempt to minimize any adverse effects on fish and wildlife, facilitate fishery enhancement opportunities, maximize recreational opportunities, and otherwise maximize the project benefits.

Transmission line routes have not been identified.

Access for construction would likely be by barge up the Kobuk River.

## 9. Wild and Scenic River Potential

Much of the area is coursed by rivers that would appeal to the boating enthusiast. Although white water is scarce in this region, except at breakup, the rivers within the proposed monument do traverse a variety of Arctic habitats, each with its special kinds of vegetation, fish, and wildlife. The waterways of the north have long been primarily avenues of transportation in summer. Most of the rivers have been canoed; barges are used on the Kobuk. Recreational boaters would certainly enjoy these rivers because of their historic and natural values, all in an Arctic wilderness setting.

The Salmon River within the proposal area has Wild and Scenic River potential. The Bureau of Outdoor Recreation studied the Salmon in cooperation with the National Park Service and Bureau of Sport Fisheries and Wildlife in the summer of 1973 (See Appendix E.)

## B. PROBABLE FUTURE ENVIRONMENT WITHOUT THIS PROPOSAL

Northwest Alaska is experiencing rapid change. The development of natural resources, the application of new technology, growing tourism, graphic evolution of Native cultures, increasing interaction and communication with the world that was outside: these things indicate that predictions of the future of this land are high speculation. Yet one thing is clear. Little of what we know as modern Alaska will remain long as it is. This one certainty has guided the development of this proposal.

In the analysis dictated by this section, several assumptions are made:

- That National Park Service management will bring to the proposal lands the most restrictive of possible management systems governing resource use.
- That, if this proposal is not enacted, it is unlikely that all the lands within the proposal will be placed under the control of a single agency; some lands will become private or State property.
- That, whatever management system is imposed upon the land, some change will occur.

From these assumptions, it can be concluded that without this proposal:

- Resource utilization in the area could continue at present levels or increase. For example, mineral prospecting could be allowed and would probably accelerate. If economically exploitable minerals were found, mining would take place. Both prospecting and exploitation could cause roads to be built in areas which are today roadless. Specific areas which would be most affected by exploration and extraction are the Baird Mountains (copper) and the area south of the Kobuk River (oil and gas).
- Exploitable resources such as timber and wildlife could be opened to extractive uses.
- Tourism would increase at a rate slower than if a national park unit were established. On the other hand, more people engaged in activities such as resource extraction, construction, and homesteading would be likely to use the area if it were not made a park. Thus, the number of people affecting the environment of the area might be the same regardless of management. Yet, without a park, these people would exert a greater impact on extractable resources.
- With a park, subsistence uses are guaranteed. Without a park, subsistence use could decrease. Competition from sport hunters, or habitat destruction from exploitive uses would very likely make the fulfillment of needs through subsistence difficult.

- No park would probably mean continued loss of some cultural elements of Native life, because the special ways provided by park status to preserve and interpret cultural elements might not otherwise be available. Modern technology and society will continue to introduce pressures for change of Native cultural patterns in the future, with or without the proposal.
- Proposed hydroelectric projects might proceed to completion, creating at least short-term profits for individuals and corporations, but also causing destruction of natural values.
- Roads probably would be built to and across the area, with attendant complex impacts that are inconsistent with the values advocated in this proposal.
- Known or undiscovered archeological resources would have a greater chance of being vandalized or destroyed without study, especially if lands containing them become privately owned.
- A mix of land ownership could decrease the possibility that effective regional planning and management would occur and that environmental impacts of the above mentioned exploitive uses would be effectively controlled.

These impacts are detailed in Chapter III, below.

### III. THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

#### A. IMPACTS ON WILDLIFE

Key wildlife resources within the proposed monument include caribou, waterbirds, and fish. Concentrations of these animals vary according to season. The area is used by the Arctic caribou herd--a herd of over 242,000 animals--as a significant portion of its migration route and wintering ground. The population of caribou that use the area fluctuates enormously from year to year. While the proposed monument contains only 2 percent of the range of the herd, upland lichen-covered areas which are blown free of snow provide critical feeding habitat in winter.

The proposed monument contains about 370,000 acres that are medium to highly productive waterfowl habitat, with an average density of about 44 birds per square mile during nesting, and a total fall concentration of about 40,000. Pintails and Canada geese predominate. Ten percent of all Kotzebue Sound regional waterfowl habitat lies within the proposed monument.

The Kobuk River and its larger tributaries witness substantial chum salmon and sheefish runs. These rivers also contain a significant resident whitefish population. The rearing and spawning habitat within the Kobuk watershed is important to the viability of coastal and downriver commercial fisheries.

Other important wildlife species inhabit the proposed monument. Of particular significance are local concentrations of black bear, moose, and various furbearers. Formerly, Dall sheep were well distributed in the Baird

Mountains, but have, for unknown reasons, virtually disappeared in recent years.

Throughout the Kobuk valley, a substantial quantity of wildlife is used for subsistence by people from Ambler, Kiana, and other villages along the river. (See Appendix F.) The replacement of dogs by snowmachines for transportation has lessened the need for dog food, and thus halved the caribou harvest. Yet kills remain substantial, with approximately 10,000 to 15,000 per year in the region. Considerable quantities of waterfowl and their eggs are used, as well as salmon, sheefish, and whitefish. (See section G, this chapter.) An estimated 200 persons now use the monument area for this purpose.

This proposal would not prohibit subsistence use of fish and wildlife. Nonetheless, detailed inventories and continuing surveillance of Kobuk wildlife population and movement will be conducted; if local wildlife populations are threatened or affected, regulations for subsistence use could be inaugurated. If essential, a limit on use or access could be imposed to protect critical habitat. Critical habitat might include fish spawning sites, caribou winter feeding grounds, and primary waterfowl nesting, rearing, and molting areas. The impact of such problematic actions will be to reduce stress on key resources at critical times, while allowing general levels of present use to continue.

Under this proposal, the area will be closed to sport hunting. The impact of this action will be minor, since this use is currently light within the proposed monument. Sport fishing will be permitted. While sport fishing

use is light now, catches of the largest trophy-sized sheefish in Alaska may attract increased interest in this species and in this activity.

This may lead to a moderate impact on sheefish population.

An increase in visits by the public normally accompanies the designation of a National Park Service area; projected visitation for the Kobuk Valley National Monument is expected to be 5,000 persons annually within 10 years after its establishment as a National Park Service natural area. This will cause increased human disturbance of wildlife populations, and could cause disruption of wildlife use patterns. Since people will come to the proposed monument by water and air, increased boat use might cause moderate local impacts on spawning fish and nesting waterfowl populations; air tours may disturb nesting waterbirds unless minimum overflight altitudes are enforced. However, under this proposal visitation would be concentrated in areas of low wildlife use. Disturbances would thus involve relatively few animals. As with subsistence use, public access to critical wildlife habitat could be controlled during vulnerable periods of the lifecycle of species. Given these conditions, impacts would be significant locally but insignificant for the area as a whole.

Under this proposal, the monument would contain no roads. Plans exist, however, for two State surface transportation corridors which would bisect the monument. This proposal seeks coordinated planning with the State Department of Transportation to preserve and protect the wildlife values of the Kobuk Valley National Monument (See Planned State Surface Transportation Corridors map.)

Cooperative agreements will be sought with appropriate Native groups to protect wildlife habitat on Areas of Ecological Concern adjacent to the proposed monument; similar agreements concerning the uses of the Kobuk River will be sought with the State of Alaska. In addition, the implementation of protective cooperating agreements for the tracts of land adjoining the proposed monument is likely to reinforce the purposes of this proposal regarding wildlife perpetuation. For example, an agreement could be made among all private and governmental landowners in northwest Alaska to develop an overall management and land use strategy to maintain the habitat and numbers of the Arctic caribou herd.

Overall, some provisions of this proposal would have minor disruptive impacts on current wildlife numbers and distribution in certain localities. However, National Park Service protection of key habitats as well as cooperative management agreements, could have a significant impact on the perpetuation of wildlife resources in the area.

#### B. IMPACTS ON VEGETATION

On the uplands north of the Kobuk River, within the proposed monument, vegetation consists of open woodland, and dry and moist tundra. Wet, open bogs and marshes, and flood plain communities exist in the lowlands to the south. Roughly one-third of the monument is composed of marshes and wet tundra, one-third drier upland tundra, and the remainder mixed deciduous and evergreen forests.

Trees grow primarily at elevations less than 1,000 feet. Permafrost patterns and frequent fires have developed considerable species diversity of plant communities. Stands of sizeable spruce are scattered on south-facing slopes and on some better-drained portions of flood plains.

Some vegetative communities within the proposed monument are of particular importance or interest. The vegetation found in successional stages on stabilized sand dunes and on the swales between the dunes has unusual scientific interest. This fragile vegetation is vulnerable to disturbance. The proposed monument contains over 300,000 acres of aquatic vegetation which is essential to many wildlife species for food and cover. Open lichen-covered ground, particularly on wind-blown sites, provides essential winter feed for caribou. This lichen is highly susceptible to damage by fire.

Under this proposal, fires of natural origin--which permit diversity--will be allowed to play their important role in the Kobuk valley ecosystem. The only exceptions to this policy would be for the protection of human use areas, and possibly, the protection of the vital caribou range. This policy would have very little impact on the existing vegetation patterns.

This proposal conceives of temporary visitor and administrative facilities; they may possibly be located on barges during the summer. By this means, park facilities will have a minimal impact on vegetation. Furthermore, most visitor use is expected to take place along the Kobuk River flood plain. Since the vegetation on the plain is disrupted annually by flooding

and ice scouring, the local plant species are hardy and resistant to disturbance. Therefore, impacts from human use on the flood plain vegetation would be slight.

Conceptual plans call for four public use sites outside the floodplain area where disturbance to vegetation could be more severe. However, little construction is planned at these sites, and therefore damage would probably consist of trampling and erosion around concentrated use areas such as pathways and campsites. A proposed air strip would cause major destruction of ground cover on and around the strip itself.

On the Kobuk Sand Dunes, sensitive plant communities could receive severe damage from unrestricted human use, but visitor use controls such as walkways would restrict this damage to localized areas. Also, an increase in archeological investigation is foreseen under this proposal. New excavation sites could remain as long lasting scars due to the very slow natural regeneration of vegetation under subarctic conditions.

In general the effect of this proposal would be substantial on vegetation in areas of heaviest use, especially on the stabilized portions of the sand dunes. However, since heavy use will occur mostly in river floodplains and on unvegetated portions of the sand dunes, both of which are least susceptible to damage from human use and which make up less than 5 percent of the monument, the overall impact will be slight.

C. IMPACTS ON AIR QUALITY

Air quality over the proposal area is presently unimpaired. A fairly substantial increase in motorboat and airplane use is envisioned as a result of this proposed action. A temporary and localized concentration of exhaust gasses may occur. Overall impact due to this proposal, however, would be negligible.

D. IMPACT ON WATER QUALITY

Present water quality within the proposal area is high, except for minor pollution of the Kobuk River due to discharge of wastes from villages upstream at times of low water flow. Summer concentrations of suspended sediment levels (BLM, 1973), are fairly low, 10-100 milligrams per liter. Good quality ground and surface water is somewhat scarce. Exploration is generally necessary to obtain potable ground water. Moderately deep wells are required except near major streams. Surface waters are of fair quality, although availability is restricted in winter.

The numerous shallow ponds of the area are generally turbid and have little surface water exchange. They are thus susceptible to damage from pollutants. The Kobuk River crosses the area, as a slow, smooth, meandering stream, with an average summer flow of 8,000 - 12,000 cubic feet per second. Formation and breakup of ice dams nearly every spring cause extensive flooding, siltation from which enriches the many sloughs within

the extensive floodplain. Average freezeup is in mid-October, with breakup in late May. Permafrost is continuous, at depths of 1-5 feet, except immediately adjacent to the Kobuk River.

Motorboat and airplane activity resulting from this proposal could lead to considerable increases in use, movement, and storage of petroleum products. Spillages of petroleum could cause chronic pollution of any streams or ponds that might be involved. Campsites and other human use areas could cause local pollution from human wastes. Except for proposed construction of one small air strip on the Salmon River, very little building is envisioned. Building could disrupt the vegetative cover, causing local melting of permafrost which might then lead to abnormal siltation of nearby streams and lakes.

This action would seek by cooperative agreements with upstream communities to minimize pollution entering the Kobuk River, thus maintaining the river quality at a higher level than otherwise might occur. Overall adverse impact of this proposal on water quality would be quite minor and temporary.

#### E. IMPACT ON VISUAL INTEGRITY

At present man-made alterations of the landscape within the proposal area are minimal. One seasonal residence near the Kobuk Sand Dunes is used partially as a lodge. Five seasonally used cabins are present. Seasonal camps are established for subsistence purposes, an activity which would continue

under the present proposal. An Eskimo house was restored by Giddings at the Onion Portage archeological site, and could be maintained. Two hundred miles of sled and winter haul trails exist on the Selawik proposal adjacent to the south border of this proposal. They are now used primarily by snowmobiles. An unknown but probably similar amount of such trails exist within the present proposal area, some of which have experienced enough compaction under the snow to form a visible line across the landscape during snow free season. The State has identified two potential transportation corridors bisecting the area, with a total length of about 90 miles.

Under this proposal, use would be concentrated on the Kobuk River flood plain, which is annually scoured by flooding and ice, and the active portion of the sand dunes, which are constantly altered by wind. River boats or barges could provide overnight facilities for visitors. Two proposed ranger stations could be placed on barges, and would be removed seasonally. Most air access sites would be on water or gravel bars. The impacts of all the above uses would be restricted to locations in which the landscape is annually scoured by nature and thus the visual effects of human use would be only temporary.

Four visitor use sites would be located away from the river flood plain. A proposed air strip would be built to provide access to the upper Salmon River, creating a locally major intrusion on landscape appearance. Implementation of this proposal could create use sufficiently heavy to cause conspicuous scars on the ground surface adjacent to air or boat access.

points and along favored walking routes and camping locations. Airplane and boat docking and ramp facilities would be evident unless carefully located and screened. By designating sites and, if necessary, travel routes and camping spots, these visual impacts would be confined to specific areas. Impacts of archeological research would be locally severe. (See Vegetation.) Impacts on existing cabins could be purchased and removed, if disruption caused by their presence or use would so warrant. While no road is contemplated by this proposal, it would affect possible State road construction by influencing route selection, regulating creation and use of borrow pits, and by minimizing permafrost disruption and subsequent slumping and heaving. Such controls could lessen the substantial visual impacts which a road would have in this open country.

Monument-related services would be centralized in villages outside the boundaries if cooperative agreements can be obtained. Such agreements would also seek to protect visual integrity within areas of ecological concern if mineral or other resource utilization were carried out. A similar agreement with the State could minimize any impacts caused by dredging to improve navigation along the Kobuk River.

Due to the capacity of the rivers, flood plains, and active dunes to absorb most visitor impacts, overall physical effects resulting from this proposal would be insignificant. The primary impact would be to maintain a landscape almost free of long-lasting visual disruption.

## F. IMPACT ON CULTURAL RESOURCES

(Historic, Archeologic, and Architectural) Due to ancient settlement patterns of Kobuk area Eskimos along almost the entire length of the Kobuk River, its banks may be regarded as a continuous archeological zone. Within this area are found uncounted numbers of archeological sites--remains of winter and summer houses, camp sites, work areas, artifacts, evidences of hunting, fishing, and gathering, and other signs of human presence. All of the above make the archeological record of the valley exceedingly rich.

Within the entire Kobuk valley area, Onion Portage is by far the most important and best known site. Onion Portage, which actually contains 20 to 30 sites and has four that are excavated, is the only place outside Cape Krusenstern which contains all the cultural phases so far identified in Alaska. It contains artifacts as old as 6,500 B.C. Further, it compliments Cape Krusenstern in that its sites are deposited and dated in verticle layers while the Cape's are horizontally dated. Cross checking between the two sites can greatly enhance the accuracy of archeological investigations in the area. Of the total Onion Portage Archeological District, which covers about 16,000 acres and which is listed in the National Register of Historic Places, less than a third is within the monument boundaries. The rest is in the eastern Area of Ecological Concern which is in the Ambler Village withdrawal.

The other known sites along the river, as well as Onion Portage, are important because they contain artifacts of the Arctic Woodland Culture

which developed in this area. This culture was unique because it represented an adaptation of the Eskimo people's marine-oriented subsistence culture, to existence in an area of interior Alaska much like that of the interior Alaskan Athapascan Indians. Upon establishment of the national monument, studies will be undertaken to further evaluate, locate, and identify the area's cultural resources.

If the monument were established, the Park Service would develop a program to interpret the archeological resources of the area for recreational and educational purposes. However, because of the difficulties of demonstrating most of these sites and the threat of vandalism, only those sites with particularly evident remains, stabilized and protected, would be used as specific interpretation sites. At Onion Portage, interpretive potential is rather limited, but interpretation of archeological research in progress at the site would be an important educational program for visitors. Also, J. Louis Giddings built a reconstruction of an Eskimo house for the benefit of accidental visitors, which could be used for interpretation.

Visitor numbers are very difficult to predict but are expected to remain relatively light within the first ten years after enactment. Only 1,000 to 5,000 people are expected annually.

Nevertheless, the impacts of increased human use around archeologic sites could cause degradation of the sites' research value through trampling of the surface, increased erosion, or looting for souvenirs. To the extent that visitor use is small and controlled, and visitor education and the presence of uniformed personnel are effective, adverse impacts are expected to be light and relatively insignificant.

Opportunities for scientific research will be expanded and research expeditions will be encouraged. It is possible that archeologic knowledge of this area will expand more rapidly as a result of this proposal than it would otherwise. However, increased research activity will have an adverse impact in that individual sites are significantly disturbed by excavation. Complete excavation of a site would eliminate any opportunity for future investigation and the possibility of using improved methods. Issuance of research permits would be limited to recognized scientists. Thus, amateur or improper research and excavation techniques will be prohibited.

In general, the proposal would protect the cultural resources of the area from despoilation, which could occur if there were no monument. Also, the proposal would make these cultural resources available to the public. The resultant expected increase in public awareness of Eskimo cultures and history will have significant impact on the scientific and educational attention devoted to these cultural resources.

Overall, the proposal would have significant impacts on cultural resources through increased public contact with these resources and through the preservation of them.

#### G. IMPACT ON SUBSISTENCE USE

Five villages in the Kobuk River valley, as well as the community of Kotzebue, use the proposal area for subsistence purposes. Kotzebue has a population of almost 2,000 people. The other villages are Kobuk (pop. 65), Shungnak (pop. 159), Ambler (pop. 65), Kiana (pop. 290), and Noorvik (pop. 445). These populations represent an areawide trend of rapid population growth (20 percent since 1950) and reflect a potentially increasing demand on subsistence resources. Almost all of the Natives in these settlements rely partially or wholly on subsistence, with the degree of reliance increasing as you move farther away from Kotzebue. Subsistence uses are crucial to the survival of those families who engage in them, as most do, because wage work is often difficult to find and is mostly limited to the summer season. Thus, hunting, fishing and trapping are the principal occupations of most of the people in the Kobuk Valley area and remain the primary methods of obtaining food.

The primary components of the annual subsistence harvest in the area are mammals and fish. Villages near the coast probably use more sea mammals and fish resources than do the up-river villages, but all villages rely very heavily on caribou. Of the 10 to 15 thousand caribou harvested annually in the Northwest Region, the five Kobuk villages took an average total of 5,449. Kotzebue accounted for about 5,000. Among other land mammals the villages and Kotzebue took about 200 moose, 100 black bear, 50 grizzlies, and 40 Dall sheep. Smaller land mammals also contribute to the meat supply. Only Noorvik and Kiana, of the five smaller villages,

reported subsistence harvests of marine mammals and this total take was small, 177 bearded seals, hair seals, and beluga whales. Kotzebue engages in substantial harvest of marine mammals as well as its large take of land mammals. The total annual harvest of land and sea mammals for the five Kobuk villages was 1,039,523 pounds (NANA survey 1972), while Kotzebue's take was 939,368 pounds.

Fish provide the other major food resource for the area. The Kobuk, being a large, clear river, supports a spectrum of 24 species of fish, which provide almost a million pounds of food annually to the local villages. The majority of the fishing is done with nets or lines in the river, mainly for sheefish, whitefish, salmon, and trout. The local people also carry out some trapping, partly as subsistence and partly for sale of furs. Beaver is the prime trapping species, as 1,084 were taken in 1972. Muskrat and other small furbearers, as well as fox, wolf and lynx are taken (see section on trapping for further detail).

Another major food source is migratory waterfowl, of which the villagers took a total of 13,462 birds in 1972. Gathering of eggs, as well as berries, wild vegetables, and roots provides an important dietary supplement to the high meat content diet. The people also use most of the area's tree and shrub species for fuel or construction purposes. Detailed figures on subsistence use by all five villages and by Kotzebue are given in Chapter II and Appendix F. Summarized, per capita use figures are also given in Appendix F.

The above discussion relates to the region-wide subsistence cycles of the five villages in the area of Kotzebue. Within the proposed monument itself, subsistence activities are, at present, the major use of the area. Exact location and intensity of subsistence activities at specific locations is difficult, if not impossible, to determine. This is especially true in regard to the harvest of migratory animals, such as the caribou, or of other mammals which move according to habitat requirements. Subsistence fishing is done principally along the Kobuk River itself, at the mouths of its various tributaries. Trapping and hunting take place generally within a radius of approximately 50 miles of the villages, but this too could vary according to the availability of game. Certainly during migration periods, the most important use of the area would be hunting of caribou, which are taken in large numbers. Wetland areas within the boundaries provide good hunting for waterfowl and moose and trapping for beaver.

In light of the above uses, it can be said that the proposed monument is extremely important as an area of subsistence resources for the people of the area.

The proposed action would have little direct impact on the subsistence uses of the area. These uses do not conflict with the values that qualify the area for preservation, and are a logical continuation of the generations of activities that make the area important in archeological terms. Therefore, subsistence uses will be allowed to continue and would

only be regulated in the event that local populations of species were to become endangered.

Local populations which are currently at lower than expected levels are some species of geese, furbearers such as beaver, and some populations of fish such as arctic char. These species will be carefully monitored and regulations on the harvest might have to be imposed.

Overall, the impact of this proposal on subsistence use would be minor, at least in the 5 to 10 year time frame. Over the longer run, as the proposal contributes to increased tourism and employment opportunities, it could have the impact of accelerating the changeover from subsistence to wage economy in the Native way of life (See section H, **Subsistence Economy**; this chapter.)

#### H. IMPACT ON THE LOCAL ECONOMY

Kotzebue is the service, administrative, and commercial center of the region. It is a transitional community still dependent on subsistence use of natural resources, but with an increasingly prominent cash economy. Opportunities for year-round employment and a steady source of income are still extremely limited, however, especially in the five villages of the area. Most job opportunities come in the summer time only and are primarily provided by the Federal and State governments, who together provide 71% of the total wage employment in the Kotzebue area. Commercial fishing is also an important source of cash income, as are recreation related businesses. Other, employment opportunities, especially for the future, might exist with the transportation, mining, or lumbering industries. All of these sectors of the economy are discussed in more detail in the following sections.

In relation to the general economic impacts of the proposal, however, it can be said that the combined effect of the three NPS proposals and two other Federal proposals that would headquarter at Kotzebue - Cape Krusenstern National Monument, Chukchi-Imuruk National Wildlands, Noatak National Ecologic Range, Selawik National Wildlife Refuge, and Kobuk Valley National Monument would be to increase the availability of Federal employment. The overall seasonality of this employment is hard to predict. Maintenance and interpretive jobs would tend to be seasonal, while management jobs would be more permanent. To the extent that Natives were trained and qualified as managers, they could have available more permanent jobs than now exist. It must be noted, however,

that the Park Service does not expect heavy increases in visitation nor substantial increases in staff positions within the first 5 to 10 years after the monument is established. Thus, the impact of this increase in job availability will be minor in the short run.

Overall, increased wage employment activity and economic growth will accrue over the long run as visitation to and investment in the area develops. Eventually, increases in employment directly brought about by government jobs and indirectly by jobs in monument-related, industries will cause a gradual transfer from subsistence to wage pursuits. The extent of this transfer is examined below.

#### 1. Subsistence Economy

Despite the fact that Native populations have been increasing in the three villages, subsistence levels have remained relatively constant; although there is a possibility that demand could increase in the future. This is in part due to outmigration of young adults, increasing reliance on wage jobs to supplement subsistence livelihood, and in some cases, abandonment of subsistence activities in favor of full-time wage earning occupations. Kobuk Valley National Monument, as one of five proposed Federal systems to be based in Kotzebue, could create new job openings for Natives. Also, by attracting more visitors to the area (approximately 15,000 additional annual visitors for Kotzebue within 5 to 10 years), the group of proposals could create greater opportunities for tourist-based economic activities. These factors could result in increased opportunities for wage employment and thus a lessening of subsistence activity. However, since the NPS

does not envision a rapid increase in visitation, nor the establishment of a large managerial staff, these impacts would certainly be small for the first 5 to 10 years after enactment of the proposals. In addition, increased employment opportunities could result in a decrease in the rate of outmigration. This could have the impact of offsetting a possible drop in the subsistence level by the addition of more part-time subsistence users.

## 2. Recreation--Tourism:

Tourist visitation to the Kotzebue area is, at present, about 12,000 annually. Increased publicity about the area, attendant on the establishment of the five proposed areas mentioned above, could contribute to an expected increase to 30,000 annual visitors in 5 to 10 years. Although no specific figures are available for tourist-based business and employment, it can be predicted that an increased visitation will contribute to gradual but substantial increases in service industries and related jobs. In addition, local residents may receive increased cash income from sales of arts and crafts. In conjunction with the proposal it is probable that Native crafts and subsistence culture will be included as part of the interpretive scheme. This could provide direct income to those Natives who may wish to participate.

Present visitation levels in the monument area are very light, probably less than 500 people, and consist mostly of sport hunters and fishermen. Since little development is planned for the first 10 years of monument

operations it is unlikely that visitation levels will increase rapidly. However, monument status with its attendant publicity about the area, could lead to an increase of up to 5,000 visitors annually. Within 10 years after establishment, the major attractions of the monument will be sightseeing and recreation on the dunes, uplands, and along the river at archeologic sites. Backcountry backpacking and river float trips with fishing will also be major recreational attractions.

The demand for facilities required to support this type of recreation in the monument, in conjunction with the same demands related to other Federal proposals in the area, will create an important opportunity for the people of the area to develop tourist-related businesses or seek tourist-related employment. This industry could, 10 to 20 years in the future, become one of the major sectors of the local economy, equal in importance to commercial fishing and government.

Overall, the impact of the proposed action on recreation and tourism in the area will be significant, especially when taken in conjunction with other proposals in the area. Yet the rate of impact will be slow and the full effect will only be felt in the long term, perhaps 10 or more years after establishment.

### 3. Commercial Fishing

Commercial fishing is becoming an increasingly important factor in the economy of the Kotzebue area. Since 1967, when the Kotzebue Sound Area Fisheries Cooperative was established, income from fishing has increased steadily. In 1971, the total catch, 1,292,295 pounds of fish products, brought \$200,000 in income to 198 licensed commercial fishermen. Thus,

fishermen earned an average of \$1,000 per man per year (see Chapter II Table 4). During 1973, according to sources in the Alaska Department of Fish and Game, the 50 most successful fishermen could make \$5,000 to \$10,000 on a record catch with record prices being offered. Fish processors at Kotzebue provide additional jobs related to the fish industry. The Kobuk river is important to the Kotzebue Sound fishery because of its spawning value.

To the extent that the Park Service's proposal protects spawning habitat of the Kobuk, it will contribute to the continued strength of the Kotzebue fishery. Otherwise the proposal will have no direct impacts on the commercial fishing industry, and the overall impact of the proposed action will be negligible.

#### 4. Trapping

The relative importance of trapping is much less in the Kobuk Valley area than in other areas of the State; but it is still an important source of income for many, especially those living in the villages farthest inland. Trapping activity has declined since World War II, as wild fur prices have remained low due to competition from synthetics and ranch furs. Most persons who still trap do not rely on it as their sole source of cash income. Instead, trapping remains a subsistence activity but has become more of a part-time economic activity and even a recreational pursuit for some.

Since the first of 1973, however, the world market price for wild furs has risen sharply. Some fur prices, such as fox and lynx, have risen by as much as 200 percent over last year. Whether or not this indicates a future upward trend in prices remains to be seen, but this could increase the trapping activity.

Trapping for furbearers has been very light in the area in recent years. Beaver are the primary trapped species, but since their pelts are not marketable, they are used for subsistence needs such as food and clothing. Other smaller land mammals are taken for their combined value as food and pelts and in some cases for their pelts alone. These would include wolverine, wolf, lynx, land otter and mink. Marmot, marten, hare, muskrat, porcupine, squirrel, and weasel are also taken. (See Appendix F for numbers in each case.)

The people of Ambler and Kiana are those most directly involved with trapping in the proposed monument. Ambler reported an average annual kill of 400 beaver while Kiana took approximately 100. To what degree they depend on monument lands is not known, however it is probable that a significant amount of trapping is done within the proposed boundaries.

Trapping for subsistence purposes would be allowed on the monument. However trapping for sale of furs or for recreational purposes would not be allowed. Because it is difficult to determine how much of the present trapping is done for subsistence and how much for other

purposes, it is equally difficult to determine the impact of the proposal on local trapping activities. All that can be said is that those residents who wish to trap for cash income or sport would be forced to use lands outside the monument. However, since the residents of both Ambler and Kiana have other lands available for trapping and since trapping activity is presently light, the impact of this proposal, though significant, would not be a major one.

#### 5. Sport Hunting and Fishing

Both Natives and non-Natives are registered guides, assistant guides, camp helpers, and pilots who hire out to sportsmen to insure a successful hunt and to enable non-residents to meet certain legal requirements of State regulations governing hunting. There are four guides based out of Kotzebue and one at Kobuk. In the spring of 1972, ten guide teams (one guide, an assistant guide, plus two hunters) operated out of Kotzebue. Sheefish, grayling, salmon and char are fished for sport in summer.

Bear, caribou, moose and wolves are hunted in the fall and in spring.

A guided hunt could cost \$5,000 or more, with licenses and transportation to Kotzebue additional. A guided hunt for any single species could range from \$1,000 up. In 1972 when polar bear hunting was still legal, these ten teams grossed approximately \$200,000 on polar bear hunting alone.

As in the case of trapping, it is difficult to assess the relative value of the area to sport hunting in the region and especially to the guides in the area. Probably the major use of the area is caribou hunting or possibly bear hunting. The relative importance of the proposed monument to regional hunting resources is probably small, since there are no significant concentrations of prime game species which are not also located elsewhere in the region.

In view of the above estimate of the monument's importance to sport hunting, the impact of the proposed action on sport hunting in the region would be significant, but not of major importance. Hunters would not be allowed to use monument lands, but their regional hunting resources would not be significantly depleted.

In terms of the proposal's impact on the local economies of Kotzebue and the five villages, a ban on sport hunting within the monument would not be significant.

Sport fishing, which is good on the Kobuk and other rivers of the monument, would be allowed. To the extent that the proposal would bring more people into the area (up to 5,000 within 10 years) the use level of sport fishing resources will probably increase. This could put significant pressure on popular species such as sheefish. However, any incidental economic impacts resulting from increased sport fishing in the monument would be insignificant.

## I. IMPACT ON TIMBER HARVESTING

Much of the forested portions of the proposal area have been burned over, and the present growth is low-quality shrub thickets, low growing spruce, and spruce-hardwood stands. There are some relatively good stands of white spruce adjacent to the Kobuk River where there is better drainage.

Using the accepted standard of defining commercial timber as stands capable of producing 20 cubic feet of industrial wood per acre annually, the entire Kobuk area would be classified as medium poor to non-commercial stocking. There would not be enough white spruce to support a small sawmill, although residents find sufficient supplies to use for local use for firewood, drying racks, cabin building, etc. Any additional development of the Bornite mining area adjacent to the proposal area could increase the demand for local timber use.

Should the State road proposed through the area eventually be built, or barge traffic be opened on the Kobuk, it is possible that there would be some demand at Kotzebue and other coastal towns for timber produced in the Kobuk valley.

The proposed action would preclude any commercial timber harvesting, although subsistence use would continue to be allowed. Since there is little commercial timber available in the monument, the impact on timber harvesting in the area would be slight. There would be a moderate impact on availability of timber for nearby mining use, since this would

have to be obtained outside the proposal boundaries and potential buyers would have to be supplied from other sources. This should not constitute a significant hardship at Kotzebue, since this resource is also available outside the proposed monument.

Generally, the impact of this proposal on timber harvesting in the region would be small, and its effect on the economy would be insignificant.

## J. IMPACT ON MINING AND MINERAL ENTRY

Although there has been only a partial exploration of the Kobuk area, the U. S. Geological Survey considers it to have moderate to high mineral potential. Placer gold in unknown amounts has been produced from Klery Creek, adjacent to the west side of the proposal, and there are two claims groups within the area that are not active at this time. Production records are not available. There is one known copper occurrence in the northern portion of the monument, and there appears to be a copper belt potential in the Baird Mountains along the northern boundary of the proposal. This is very low grade ore containing less than 1% copper. Yet the ore is minable, even though mining operations are not economically feasible at this time. There are larger deposits to the east of the proposal at Bornite, which are estimated to contain 100 million tons of ore at 1.2 to 1.6 percent quality. Bornite has good potential for development when economic conditions warrant. In addition to copper, there are potentially minable deposits of asbestos in the northern portion of the monument as well as gem-quality jade deposits to the east of the proposal boundary but partially within the Area of Ecological Concern. (See Minerals I map.)

There are two outcroppings of coal and one coalbed of low quality within the proposed monument. There is a petroleum province to the south of the proposal and within the monument itself there is low to moderate petroleum potential. There are 20 oil and gas leases and another 20 applications. (See Minerals II map.)

The proposed action would prohibit all mining and mineral entry within the monument boundaries. This will have no impact on the present day economy since no production currently takes place. However, there would probably be a substantial impact on future potential for economic developments since there appears to be a high mineral potential in the area. Since prospecting would not be allowed, there may never be a complete inventory and analysis of these resources. Therefore a full assessment of the impacts of the proposal's preclusions of resource removal would not be carried out.

In sum, based on present knowledge of mineral resource potential, this proposal will have a major impact on future mineral development in the region.

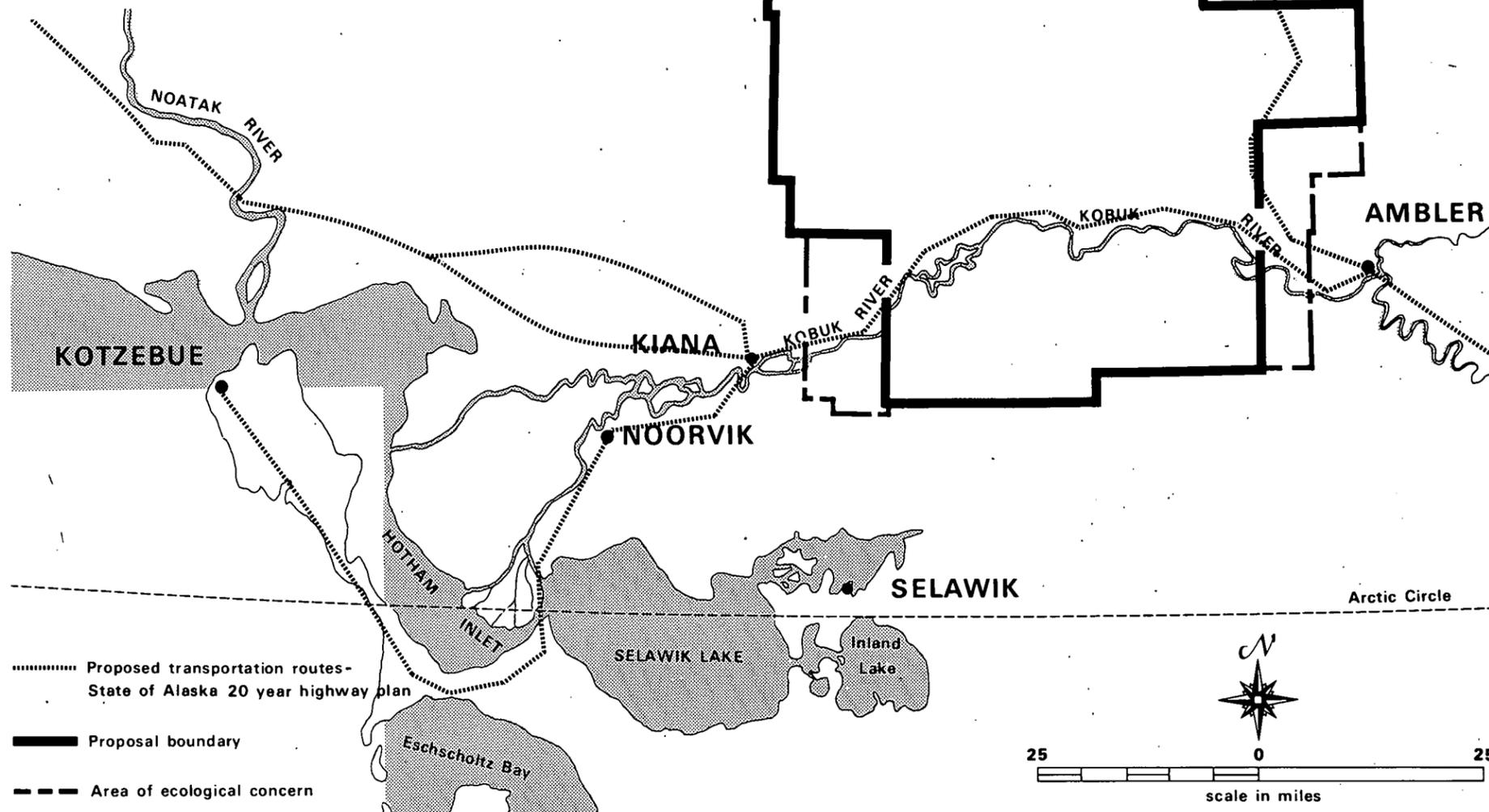
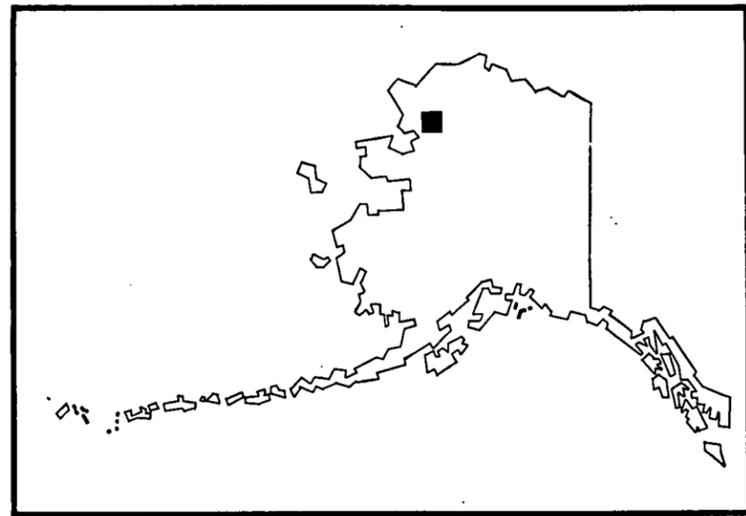
#### K. IMPACTS ON TRANSPORTATION

There are no roads or railroads presently serving the area. Daily air transportation is available to Nome and Kotzebue, and all the local villages have some small airfields with intermittent air taxi service. The nearest airfields to the proposal are in Kiana and Ambler, and the major air corridor follows the Kobuk River east from Kotzebue. River transportation in the summertime is important; large barges supply villages along the Noatak, Kobuk, and Selawik Rivers. On the Kobuk, barges go upstream to Kiana and Ambler. The local residents also maintain and use sled trails and snowmobile trails between settlements and along trap lines.

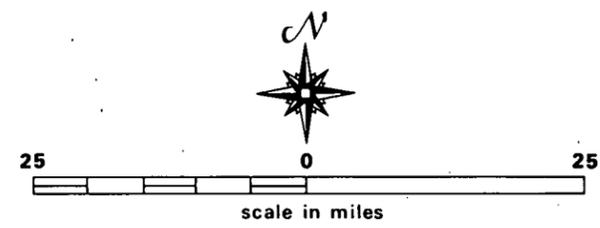
The State has a proposal for road along the north side of the Kobuk River connecting Ambler and Kiana, which would pass directly through the proposal. Another spur road from Ambler would proceed north towards the Noatak River, and would pass through the east side of the proposal. (See Planned State Surface Transportation Corridors map.)

If this proposal is implemented, any road construction would require special justification and a study of alternatives (Section 102, Transportation Act of 1949). This would be in addition to an environmental impact statement as required by the National Environmental Policy Act of 1969. These studies would be aimed at insuring that there was a bona fide need for the road and that there were no reasonable alternatives to the road. They would also insure that if a road has to be built, it would be in such a location and of such design as to avoid significant impacts on the natural resources of the monument. These studies could preclude

Planned State Surface Transportation Corridors



- ..... Proposed transportation routes - State of Alaska 20 year highway plan
- Proposal boundary
- - - - Area of ecological concern



construction of a road altogether or could require relocation of routing or special engineering design.

The impacts resulting from the potential preclusion, as a result of NPS action, of the roads proposed in the area would be important for villages along the Kobuk east of the proposal and also for the Bornite mining area. It could force them to use other means of transportation, as they do now. However, in view of the possibilities for river barge traffic and the existing air network, it is unlikely that demand would be sufficient to justify construction of the road. Therefore this proposal's impact on the foreseeable development of a transportation net for the area will be minor.

The proposed monument could have a significant impact on the amount of use of existing transportation facilities in the area. To the extent that the proposal contributes to an expected increase in annual visitation (see Recreation-Tourism, this Chapter), it will also contribute to increased use of air service to Kotzebue. It is also possible that sufficient demand will develop for increased air service to the local villages, near the monument. Further, regular river barge traffic which is oriented toward tourist use, might have to be instituted for the summer season.

Transportation-related industry will experience increased growth in light of the above mentioned demand. This will provide increased employment in this sector, which is already important to the area, and

could be especially significant for the towns of Ambler and Kiana, which lie nearest to the monument.

In sum the proposal would have a moderately important impact on the potential for future transportation development in the monument, Transportation systems and related industries will experience increased use and growth, especially in the summer season, and new types of transport facilities may become feasible for development. Overall, the proposal's impact on transportation would be significant.

#### L. IMPACT ON HYDROPOWER DEVELOPMENT

There are two potential hydroelectric sites noted by the Alaska Power Administration that could be affected by this proposal. The most viable one would be constructed on the Kobuk River, near the mouth of Kavet Creek, located in the central section of the proposal. It has been considered regionally significant for power planning purposes, but probably could not be justified on a single purpose development basis alone.

The proposal would preclude construction of this structure within the monument and this could be a major impact on the hydro-electric potential of the area and the project's associated benefits. Transportation and construction jobs would be lost, and the projected annual production of 525,000,000-kilo-watt hours would also be lost.

The other potential site is over 100 miles away on the upper Kobuk, and outside the proposal area. Water levels and flow rates within the monument could be partially regulated by the project. The impact of the proposed monument on this project would be to prevent fluctuations in the water level within the monument. Any such requirement would cause a reduction in the size of the dam and its full potential.

Both the above power projects are rated as long range development potentials by the Alaska Power Administration. The Federal-State Land Use Planning Commission has recommended against all damsites which would affected Onion Portage and Great Kobuk Sand Dunes, as the Kavet Creek site would.

Overall, the proposed action would have a major impact on the potential for hydropower development in the area. Yet, in view of the

feasibility of implementation of such development in the foreseeable future, this impact would probably not be important to the economic development of the area.

#### M. IMPACT ON LOCAL SOCIETY AND CULTURE

Far reaching and substantial changes have been underway in village life. The special character of cultural contact between Alaska Natives and the dominant American society has produced a blending of traditional subsistence lifestyles with the requirements of a highly seasonal cash and wage employment economy with only minimal development of a stable multi-sectored local base and considerable social and cultural dislocations. The growth of Kotzebue as a transportation hub and service center in the northwest has been accompanied by improved access to and increasing dependence on western manufactured goods and services but with limited wage employment opportunities. It has focused the social and cultural disruption of change in the region on that community. The cumulative effects of acculturative influences has brought problems of social control and aggravated community life, especially in Kotzebue. Demographic trends of selective net-outmigration from the region, and shifts within the region from the small villages to Kotzebue are subject to change from a variety of new factors. The effects of the Alaska Native Claims Settlement Act on social and economic patterns in the region have not yet begun to be anticipated, or identified, let alone measured. Social and cultural patterns are in a state of flux.

The precise impacts of the proposal on this dynamic social environment are difficult to measure. The manner in which the proposal is implemented will intimately affect the nature and quality of impacts. Additional employment opportunities stemming from construction of

facilities and management needs would give added cash income to some people, but if carried out on a crash basis, it could add to existing community social problems. An affirmative program of local hire for all levels of proposal implementation, combined with other expanding local employment opportunities could contribute to stemming out-migration of young people from the region. Added cash income at Kotzebue would have positive effects on the material standard of living of some people and contribute to raising the level of public services available. If outside manpower is attracted to fill new jobs, employment benefits to local residents would be diminished. At the same time increased cash and employment could contribute to problems of social controls and disparities among the population. Similarly, the impacts of the proposal would draw tourists and vacationers to the region-- especially to Kotzebue and the villages serving as access points to the proposed monument--thus bringing some increase in cash flow to local people. At the same time, tourism would introduce disruptive factors into the social life of the communities. Depending on the rate at which tourism increases to the area, there would be an increasing demand for services such as accommodations, meals, tourist "attractions." Some local people would receive cash income from tourist expenditures. The presence of tourists and other outsiders, which has been minimal in the smaller villages to date, could produce a variety of responses by the local people. Acculturative influences would increase. Opportunities to educate outsiders on the patterns and values of Eskimo culture, and to display Eskimo heritage could enhance cultural pride and contribute to the search for sources of social

stability. Some new business opportunities would be introduced. Alternately, hostility to outsiders could be heightened by increased tourism. Tourism is expected to grow with or without the establishment of the proposal area, but the proposal would give added impetus to it.

Subsistence activities, linked as they have now become to the cash economy could be strengthened by additional cash income in the region. Manufactured items used in subsistence pursuits have already altered the patterns of subsistence activities. Additional cash income stemming from implementation of the proposal would contribute to additional adjustments in subsistence activities and the social patterns tied to them.

N. IMPACT ON WILD AND SCENIC RIVER PROPOSALS

The Bureau of Outdoor Recreation has studied the Salmon River for inclusion within the National Wild and Scenic Rivers System, and has found that the river meets the criteria for wild river status.

This proposal includes a provision which would establish the entire Salmon as a wild river to preserve the river and its immediate environment in its natural primitive condition. Within this corridor, operations on existing mining claims would be regulated to provide safeguards against pollution of the river and unnecessary impairment of the scenery.

The proposed monument would provide for acquisition or similar controls on existing claims within the entire basin, as well as exclusion of other uses not compatible with maintenance of an essentially unaltered natural landscape. The proposed monument would significantly strengthen the objectives of wild river designation by protecting water and visual qualities relating to the wild river corridor.

#### IV. MITIGATING MEASURES INCLUDED IN THE PROPOSED ACTION

##### A. IMMEDIATE MEASURES

The two basic proposals that are made are: (1) a legislative proposal to establish Kobuk Valley National Monument -- including allowing Native subsistence and closing the area to mining and sport hunting -- and to designate a Salmon Wild River; and, (2) an administrative proposal in the form of a conceptual master plan for management of the monument.

Relocation assistance will be provided to affected property owners. Boundaries have been proposed which exclude most areas of mineral importance.

Cooperative regional management and planning in lieu of a proposal to include additional adjacent lands within the monument is proposed. This proposal is designed to accomplish esthetic and scenic protection while providing for appropriate management of these lands, to the ultimate benefit of the region, the State, and the Nation.

An extensive program of coordinated sociological and natural sciences research is proposed to develop methods to mitigate the effects of increased public use of park resources other than through strict limits on visitation. Such research specifically will include studies to determine the effect of existing and proposed activities and developments on critical wildlife habitats and communities. Proposed research will also provide for continuing status and trend studies for wildlife species. Baseline research is proposed

to provide the National Park Service and others information necessary to judge effects of other proposals in areas with similar conditions.

An interpretive program has been proposed that is designed to provide unique educational, inspirational, and reflective experiences. Such a program culturally mitigates the loss of this land for uses such as mining. Natives will be encouraged to capitalize on public interest in the Native culture by devising profitable enterprises centering on villages, archeological sites, Native crafts, knowledge of the countryside, and similar activities. This may provide a viable means of assisting the Native people in keeping their cultural heritage alive in the face of social change.

Development proposals have been made only in areas where minimum conflict with the primary natural resources of the monument would occur. Type and location of such developments have been proposed to insure the widest possible diversity of types and intensity of use consistent with current knowledge of the resources and National Park Service policies. The proposal of an air and boat transportation system will insure minimum impact of people on the land and at the same time reduce the present hardships of travel into the area.

The proposed reliance on private enterprise to provide visitor services such as overnight accommodations, stores, etc., provides the opportunity for a more stable and diversified regional economic base than would be

possible if such facilities were provided within the monument.

Before any development construction is begun, research and detailed development plans accompanied by environmental impact statements will be prepared with the objective of preventing undue destruction or degradation of natural, archeological, and historical resources known or as yet undiscovered.

Proposals to continue subsistence hunting, trapping, fishing, and gathering of natural materials will mitigate potential adverse effects on Native use of the land. Subsistence hunting will be limited only if wildlife and other natural resources are confronted by degradation. Primary subsistence areas would be classified Class VI, Historic and Cultural.

All socioeconomic changes are maximally disruptive if they occur rapidly. With this in mind, the National Park Service's plan envisions slow transition between the present conditions and those eventually desired. If present applications are taken to patent, private lands and improvements within National Park Service boundaries would be acquired slowly and only as necessary to protect the area's integrity; 25-year to lifetime tenure would be granted residents. Relocation costs would be reimbursed.

Adverse economic effects could be mitigated by the development of alternate sources of income for local residents as suggested in the proposed master plan. These sources can be locally operated concessions in the park, such as air tours, walking tours, boat tours, photography trips, etc., or they can be resource attractions and tourist facilities outside.

A sensitive public relations program will work to gradually dispel the feeling of lost freedom among those who wish no restrictions or regulations to interfere with their use of the lands. These public relations would strive to make clear the fact that the cherished frontier freedoms are bound to fade far more completely with increasing exploitation and adverse uses if the area is not protected in park status.

Every effort will be made to insure that cultural resources will not be inadvertently altered or destroyed by construction or other administrative activity. No action will be taken that might affect cultural resources until, (1) a professional examination of the affected area has been conducted to determine whether any such values are present, (2) all cultural resources worthy of preservation in the affected area have been nominated to the National Register of Historic Places, and (3) in consultation with the Alaska State Historic Preservation Officer and the Advisory Council on Historic Preservation, the procedures established under Section 106

of the National Historic Preservation Act or Section 2(b) of Executive Order 11593, as applicable, have been observed. Cultural resources will not be disturbed by development unless there is no practical alternative in the public interest. In the event that a project will result in the unavoidable destruction of cultural resources, after completion of review under Section 106 of Section 2(b), every effort will be made to mitigate the loss through the recovery of such data and materials as can be retrieved through salvage excavation. Such mitigation procedures will be developed in conformance with the requirements of Section 2(c) of Executive Order 11593.

Published National Park Service policies set forth a number of basic studies necessary to guide all aspects of management and visitor use. Accordingly, the following studies can be expected to follow establishment of the monument, to assure the achievement of the purposes of the monument and to avoid the unnecessary destruction of irreplaceable values while providing for appropriate visitor use. Most such studies are continual and ongoing, recognizing new information and changing needs.

## B. BASIC STUDIES NECESSARY

### 1. Historic Resource Study

- to locate, identify, evaluate, and describe in detail the cultural resources existing within the monument. The study will compile an archeological base map to plot the locations of identified cultural values.

2. Natural Resource Studies

-- to compile basic data on the natural resources of the monument and to provide the information on which to base management and preservation decisions.

3. Historic Resources Management Plan

-- compiled on the basis of substantive data on the monument's cultural values and on the needs of management and the public. Provides a detailed plan for the management and preservation of the monument's cultural resources.

4. Natural Resources Management Plan

-- compiled on the basis of substantive data on the monument's natural values and on the needs of management and the public. Provides a detailed plan for the management and preservation of the monument's natural values.

5. Development Concept Plans

-- an analysis of the human environment and of the alternative approaches to providing facilities for public use, interpretation, visitor services, administration and housing. Provides plans showing the purpose, concept, and location of all relevant physical facilities within and outside the monument.

6. Interpretive Studies and Plans

-- to develop programs of interpretation to best relate to the public the meaning of the monument's natural and cultural values.

7. Continual Monitoring of the Effects of Visitor Use

- to identify as early as possible any adverse effects on natural or cultural resources arising from visitor use patterns, locations of facilities, or other activities and to develop methods to avoid or mitigate any adverse effects.

V. ADVERSE EFFECTS THAT CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

Potential homesites, industrial lands, recreational homesites, or camps would be prohibited. Sport hunting would be prohibited. Unrestricted use of aircraft or off-road vehicles would be precluded.

Potential revenue from sale or lease of the lands would be foregone.

Existing private uses of lands within the area, such as for homesites, would be phased out over the next 75-100 years. Offspring of those people who own such sites would not be allowed to inherit the use of these lands.

Impacts arise unavoidably from inclusion in the National Park System. Designation as an NPS area is an effective advertisement which will swell visitation to the monument in particular and to the region in general. Although an economic asset, additional visitation will have an adverse effect on the presently tranquil and independent mode of life enjoyed by many residents, and--despite attempts at mitigation--on the environment.

National Park Service management policies result in restriction on, or prohibition of, such uses as hunting, mineral extraction, overland vehicular travel, power and industrial development. It is clear that despite mitigating factors, a reduction in the potential spectrum and volume of uses must occur in the area taken as a whole. There is little reason to believe that demand for most of these uses will decrease; rather

it will tend to be focused on other lands, with possible corresponding depression of their environmental integrity. National Park Service designation is to some degree a means of transferring impact and will remain so until our society is able to adjust downward its total impact on world ecosystems.

In the overall economic base of the State, mining restrictions in the area proposed for the monument would have a relatively small effect. There is no known extraction of minerals from the area at present. Exploration in the future and the development of potential deposits in the area would be limited by the proposal.

All proposed developments will require some degree of alteration of natural resources and loss of monument values (scenery, landscape integrity, and wildlife habitat). Many areas are now pristine; there are no developments. Developments will locally alter those pristine qualities.

The mandate for public use of a national monument requires developments to permit appropriate public use, causing unavoidable adverse impacts on natural systems. Land classification limits both the manager and the public in their uses of the monument and the location of developments and facilities which can be provided to accommodate use. Extensive areas have been classified to exclude developments and intensive uses. Such

classification is essential for the preservation of the area's scenic qualities and natural resources such as wildlife and plantlife. Those who would prefer more intensive use of the area will be adversely and unavoidably affected.

The proposal to continue subsistence hunting within the area will result in destruction of some wildlife and other natural features and resources.

Construction and occupation of National Park Service facilities and housing in Kotzebue, Kiana, and Ambler, the introduction of new facilities, and the encouragement of tourism may be viewed by some residents as disruptive of community patterns. There will be an additional burden on utilities, the school system, and medical facilities.

VI. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term uses that would occur under the proposal are intended to maintain indefinitely the long-term natural productivity of the area and the quality of its natural resources. Maintenance of natural populations and the integrity of cultural and natural processes over the long term is a major objective of the proposal. Likewise, the proposal's intent is to provide continued appropriate park uses into the future which can take place with no progressive deterioration of major resources. The proposal would also protect and study the anthropological, archeological, natural, and historic resources of the area as they relate to modern day northwest Alaskan cultures, and as they offer lessons for cultures throughout the world.

Establishment of the area would promote continuation of natural biological productivity of the included lands and waters. It would preclude human manipulation of resources which possibly could increase, at least in the short term, biological productivity of the area. Lack of data prohibits reliable predictions as to which course of action would provide for greatest long-term biological production.

The plan will have a stabilizing influence on environmental quality and natural production on adjoining lands, with the park acting as a "reservoir" of wildlife, unpolluted air and water, and scenic resources.

The area, acting as a protected reservoir for native wildlife, will provide continued wildlife production, thus providing for better hunting, trapping, and subsistence use opportunity within the greater region. It will also serve to protect a part of the winter range and some of the important migration routes of the Arctic caribou herd.

Fish and game and minerals are the two extractable resources of the area which have significant potential commercial value. If substantial mineral resources were found and exploited, the economic and social benefits derived could be moderate to high but could be comparatively short-term. Also associated with mining is the potential threat to the natural integrity of the area.

It is possible that there would be a short-term decrease in economic gain by local communities if this proposal were enacted. Income from prospecting would be decreased by the deletion of lands that can now be used for that purpose. This short-term use would support a few persons through the remainder of their lives. This support might lead to these people's children trying to adopt a way of life that is tending to become outmoded.

It is likely that the carrying capacity of the land for nonconsumptive uses is greater than for consumptive uses, with the result that the long-term productivity will equal or exceed the present productivity.

Long-term economic gains probably will result as tourism increases in the area. Some of these gains will be short-term, such as construction

of facilities, but most will be long-term through provision of services such as meals, lodging, transportation, and guiding for the visiting public. This will result in a more diversified economic base.

The preservation of the area's mineral resources now could have long-range economic consequences in at least two ways. If, with time extractive technology becomes more efficient, this technology should allow more complete and more profitable extraction of the resources should Congress dictate its extraction. Or, technological progress could reduce the need for these resources; postponement of extraction now will allow perpetuation of natural values on these lands.

Preservation of the land and waters for park purposes will in the long range increase property values of lands adjacent to the monument.

The long-term effect upon the Kobuk valley Eskimo culture would be to insure perpetuation of options available to them during the present period of cultural and economic change. Those members of the Native population who choose to continue in the subsistence economy would be free to do so, and the resources would be available to them. However, the proposal would also create a broader based economy that would benefit those members of the Native population who would choose to participate in it. The people of the villages of Ambler, Kiana, and Kotzebue would benefit to the greatest degree. Noorvik, Shungnak, and Kobuk may benefit to a lesser degree.

## VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed legislative action is a policy decision favoring a management program that is based on preservation of the cultural and natural environment. This preservation policy permits use of resources so long as that use brings no major or irreversible change to the system. The policy could be reversed at a later date by Congress. Hence there are no irreversible commitments of resources.

Passage of time will bring irretrievable commitments of resources. The major commitment will be human resources, since the life-styles of some people may be changed. All renewable resources that complete a natural life cycle without having been harvested by man will become irretrievable. Nonrenewable resources that are eroded away or chemically altered with time will also be lost. Opportunities for given individuals to recover nonrenewable resources at any specific time will become irretrievable. The nonrenewable resource itself will remain retrievable.

Individuals who may desire to homestead, or claim a trade and manufacturing site or a headquarter site within the proposed monument will be unable to do so.

Proposed developments for public use would require both irretrievable and irreversible commitments of resources in localized areas. Such losses would generally be restricted to the loss of vegetation and some disturbance. Proposals for developments to accommodate use and facilitate management

include an airstrip, walks, trails, docks, utilities, building sites with some attendant erosion, the consumption of energy, and alterations to the landscape as well as the destruction or alteration of some wildlife habitats. Much less than 1 percent of the total area would be affected by these developments.

## VIII. ALTERNATIVES TO THE PROPOSED ACTION

A number of alternative actions have been considered concerning the future of lands in the Kobuk valley region. Generally, these alternatives fall into four categories: (1) no action, (2) alternative land management philosophies, (3) alternative boundary configurations for a Kobuk Valley National Monument, and (4) alternatives to the conceptual master plan.

### A. NO ACTION

One alternative is no action on any elements of this proposal. The lands that are included within this proposal are currently classified as national interest lands, d-2. They will be reclassified as d-1 in the event Congress does not act upon this proposal before December 18, 1978.

Should the lands be classified as d-1 lands they will be assigned to the Bureau of Land Management for evaluation and reclassification. The lands could then be available for selection by the State of Alaska to meet its entitlement as provided by the Alaska Statehood Act. No matter who actually owns them, the lands probably would be managed under a multiple use management system. The detailed impacts of this multiple-use management philosophy are covered in one of the following alternatives.

### B. ALTERNATIVE LAND MANAGEMENT PHILOSOPHIES

Management of any parcel of land may be based on one of several viewpoints. When applied to a specific area, the suitability of a particular

viewpoint depends on the attributes of the area, the values ascribed by man to these attributes, and the environmental impacts generated by the management of these attributes.

Land Management based on the concept of "dominant use," emphasizes a key resource, a particular landscape condition, or an overriding value as the main policy determinant of the maintenance and use of a specific area. On the other hand, "multiple use" management, as the name implies, would permit a combination or an assortment of uses of a specific area.

#### 1. Dominant Use Management for Historical and Cultural Values

This land management plan would be principally concerned with the preservation of the significant archeological sites within the area, like the Onion Portage site and the Ahteut site at the mouth of Kavet Creek, and the preservation of cultural uses, such as the traditional subsistence uses of the Kobuk valley. All other uses of the area would be secondary to the primary purposes.

Impacts: Archeological values of the area would have maximum protection; priorities would emphasize the maximum input of knowledge of cultural values. Natural values of the area would be secondary and could, therefore, suffer to some extent. Habitat of important species like the caribou, which migrates through and winters in the area, might not receive full protection. Thus, critical habitat areas might be lost or excluded from the proposal and the level of protection to the Arctic

caribou herd might be reduced. Recreational values could be sacrificed, preventing a realization of the area's recreational potential. Visitors who might otherwise experience the Arctic could lose the opportunity.

## 2. Dominant Use Management for Wildlife Values

The area within the proposal contains a wide variety of interior Alaska wildlife species, including locally high concentrations of black bear, salmon spawning streams such as the Salmon and Kobuk Rivers, some waterfowl habitat, and a part of the winter range and migration routes of the Arctic caribou herd.

The principal goal of dominant use for wildlife is to ensure or enhance survival and productivity of selected animal species. Methods by which this goal may be pursued include preservation, habitat manipulation, and manipulation of the animal populations themselves. Uses not related to wildlife would be allowed if compatible with the principal goal.

Impacts: The impacts of preservation for wildlife protection are similar to those that would accrue to wildlife under the current proposal. By contrast, manipulative management options would require development of access and mechanized operations, with greater side effects. Impacts strictly due to wildlife management arise from manipulation of fauna and vegetation. As an example, should it be felt desirable to increase moose populations, the method most frequently used is the artificial increase of browse material by vegetational manipulation. This is

accomplished by freezing succession at an immature or non-climax stage. In this case, the stage would maximize browsing material and, therefore, moose population should increase. Yet this method would select against species like caribou and red squirrel whose primary habitat is mature vegetation. Also, faunal groups not selected for manipulation are affected in ways not necessarily predictable or desirable. Exotic species may enter the disturbed system more easily, and soil condition, drainage characteristics, and air quality may be affected.

Faunal manipulation alters size, structure, and behavior of populations being actively managed. Such changes in turn are transmitted to other parts of the ecosystem in ways such as the food web and habitat characteristic alterations.

Biotic manipulation of either vegetation or fauna may result in ecosystem simplification and instability. Management to maintain a desired non-natural condition by repeated manipulation must counteract this loss in natural stability.

The socioeconomic impacts of wildlife management would be similar to those incurred under preservation and recreation management. The impacts of hunting and fishing would probably increase.

Emphasis on wildlife may forego some of the economic impact from mining, logging, hydroelectricity, and residence, since these activities would at times conflict with maintenance of wildlife.

### 3. Wilderness Designation

As discussed in Chapter I of this statement, if the park is established, the National Park Service would conduct a study of the area for wilderness designation and would make a wilderness recommendation to Congress within three years after establishment of the area. An alternative to this would be to make a wilderness recommendation now, to accompany the legislation establishing the area.

Subject to final determination by the Congress the landing of aircraft and use of motorboats will be permitted as means of access to designated wilderness units subject to restrictions deemed necessary by the Secretary. Use of motorized, over-the-snow vehicles for subsistence purposes may be permitted within wilderness area in Alaska. When such uses are recommended for continuation following wilderness designation, the levels of use and types of equipment utilized prior to the enactment data of ANCSA will be permitted to continue for subsistence purposes. Should such uses be shown as adversely affecting the plant and animal resources in a progressive and depleting manner, additional restrictions may be promulgated by the Secretary after consultation with representatives of subsistence users.

This alternative would be a complicated one to enact under the present legislative deadlines due to the two laws involved (ANCSA and the Wilderness Act of 1964). It further would require more intensive land examination and study to delineate boundaries and management conditions. Although it is examined here in a general manner as an alternative to the proposal,

the Department feels this alternative requires further, intensive study than time allows under ANCSA. Therefore, the area will be studied within three years after the establishment to identify areas suitable for Wilderness designation. During the period (3 years) development will be restricted to prevent damage to areas having wilderness qualities.

Impact: This alternative would change the status of 1.8 million acres of public domain lands to National Wilderness Preservation System. The major effect of this action would be the preservation and protection of 1.8 million acres of mountain ranges, sand dunes, river systems, and wildlife habitat.

Natural forces of selection and evolution would continue to operate with minimum influence by man, thus protecting the primeval condition and characteristics of the area.

Such designation would result in less flexibility in future management. There would also be increased costs to management, possible rationing of use, and shifting of potential mass recreation needs to other locations. Archeological investigations could be inhibited.

The landing of aircraft and snowmobile use allowed under the two special provisions, described above, would likely have adverse effects on the wildlife and wilderness setting.

Limited commercial-grade timber exists in the area. Wilderness designation would preclude its use. This would lead to a very slight economic impact.

There are mineral potentials that could result in adverse impacts if commercial quantities were discovered. Wilderness designation would preclude development of mineral resources. This could deny economic benefits to the State and to the local region.

This alternative would have no major impacts on subsistence hunting and fishing activities.

#### 4. Multiple Use Management

Dominant use management is based on the premise that a single characteristic of an area deserves emphasis in preference to all others. By contrast, multiple use management attempts to place equal emphasis on as many uses as possible without seriously reducing the potential productivity of any individual resource.

The Kobuk valley area does not have a wide diversity of economically attractive resources of long-term interest. However, there are isolated areas within the region that do have potential economic interest, such as Jade Mountain and the copper belt trending east and west through the Baird Mountains that includes the deposit at Bornite.

No potentials for petroleum or natural gas production are recognized within the area, although there may be important oil potential in the Selawik lowlands south of the area. The Kobuk petroleum subprovince runs through the Kobuk River valley and the dunes area. There are three

localized deposits of sub-bituminous coal in the vicinity.

Impacts: Under multiple use management many of the resources could be economically exploited, thus stimulating the regional economy. If any mineral deposits with mining capability were located within the area they would be available for development.

In mining operations substrate removal or relocation may occur on a large scale with subsequent effects on drainage, soils, water quality, and scenery. Substrate disturbance would be greatest from open pit and large placer operations. Effects of this disturbance on drainage, soils, and water quality would be related to the nature of the minerals being mined (e.g., copper is toxic, gold is not), the chemicals used in extraction and concentration, and the care with which these substances are kept from entering natural systems. Effects on the biota would be greatest in clear-water stream systems and in areas of high animal concentration. Large-scale mining in valleys used as caribou migration routes could have high impacts on both the Arctic caribou herd and the wellbeing of those Eskimos who depend upon the caribou for their survival.

Open-pit mining, landscape scars, and abandoned facilities are among the important possible impacts upon the visual integrity of the Kobuk valley.

The power needs of mining are substantial. These may be met by fossil fuel combustion, with consequent exhaust discharge and potential fuel spills.

Transportation for such fuels would also have to be supplied. Alternatively, power could be supplied via hydroelectricity from dams on the Kobuk River.

Mineral production would contribute an economic element to the Kobuk Valley region that may be substantial although of limited duration. This economic element may be erratic in magnitude while extant, due to uneven rates of production and variations in labor and support needs during the exploration-development-production sequence.

Commercial-grade timber is very limited within the proposal area. Nonetheless, although it has small economic potential, it is an exploitable resource. Roads are usually required to remove the timber from the logging site; they could have impacts on wildlife, vegetation, and scenic values. Logging could also reduce the extent of climax forest habitat available to wildlife species. Extensive logging could limit the small amount of subsistence use of lumber by Natives.

The construction of dams and reservoirs on the Kobuk River could be part of a multiple use plan for the area. The construction of such facilities would provide power resources and flood control for the area, though neither are currently needed in the region. The construction of the facilities would result in a severe impact upon the wildlife values of the area. The reservoirs would serve as an obstacle in the migration routes of the Arctic caribou herd which would have an unknown effect on their habits and continued survival. There would be loss of a portion of the winter range, thus potentially reducing the carrying capacity of the land,

resulting in a reduction in the size of the Arctic herd. Waterfowl nesting areas in the Kobuk valley could be lost resulting in a reduction in the regional population of waterfowl.

### C. ALTERNATIVE BOUNDARIES

A variety of boundary alternatives were considered during the planning process that concluded with the proposal presented in this document. Six alternatives follow.

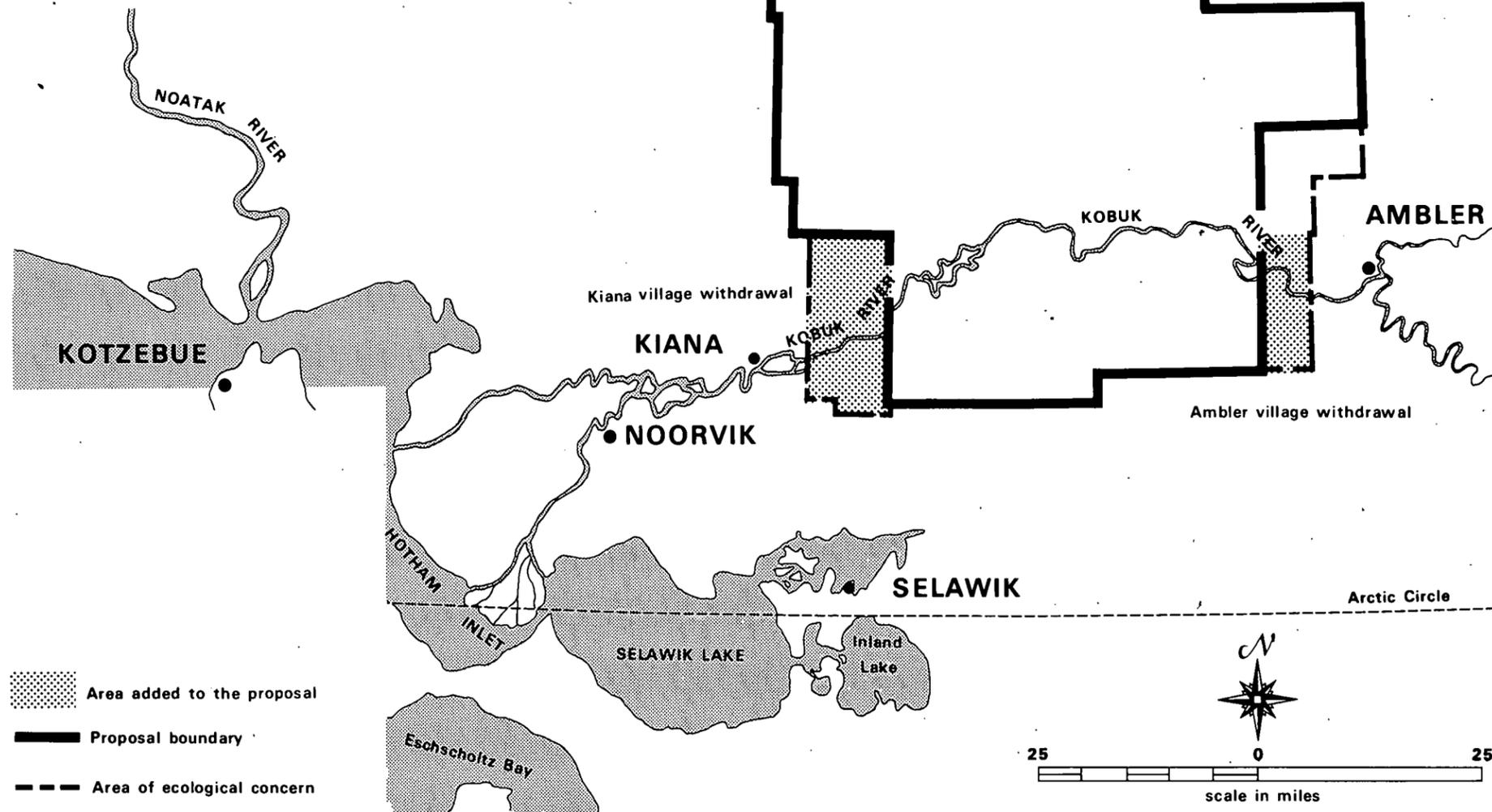
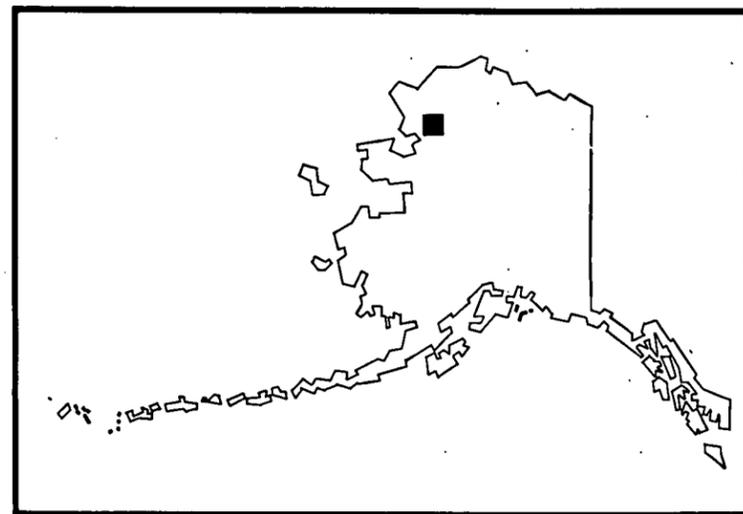
1. Add a portion of the Kiana and Ambler Village withdrawal lands.

The addition of these two areas, totaling approximately 160,000 acres, would add lands that are currently withdrawn for possible selection by the villages of Ambler and Kiana. (See Alternative C-1 map.)

The lands within the Kiana Village withdrawal contain the upper portions of small streams that are tributaries to the Salmon River.

The lands within the Ambler Village withdrawal contain two important resources. First, 12,800 acres of the 16,000-acre Onion Portage Archeological District -- including the Onion Portage site itself -- are within the withdrawal. The legislative proposals include the provision that all lands within the District not selected by Native corporations will become part of the National Monument. Second, the Little Kobuk Sand Dunes are also within the withdrawal. These dunes are geologically related to the Great Kobuk Sand Dunes which are within the proposed monument.

Impacts: Inclusion of the lands within the Kiana Village withdrawal would insure the protection of the entire watershed of the Salmon River, which qualifies for designation as a national wild river in the Wild and Scenic River System. The high quality of the water within the watershed would be protected. If not protected, activities such as mineral exploration could take place, which could lower water quality within the watershed and



affect fish and other natural values of the river.

The inclusion of lands within the Ambler Village withdrawal, would insure protection of the two important resources located there, the Onion Portage Archeological District, and the Little Kobuk San Dunes. Inclusion of the important archeological values would insure preservation and provide for the best opportunities to explore thoroughly the cultural resources found there. This would provide for maximum acquisition of knowledge significant to man's past. No known mineral values would be affected by including the area in the monument.

If either area were included in the monument, the options for land selection by local Natives under the Alaska Native Claims Settlement Act (ANCSA) would be reduced. Yet, whether these specific lands would actually be selected by the Natives is unknown, since the village selection of land does not have to be made until December 18, 1974.

Therefore, inclusion of these lands into the monument now may or may not have a significant impact upon the local Natives.

## 2. Add a Portion of the Ambler Village Withdrawal

This alternative would add approximately 69,000 acres of lands to the proposal that are currently classified as village withdrawal. This area included a portion of the proposed monument's watershed. (See Alternative C-2 map.)

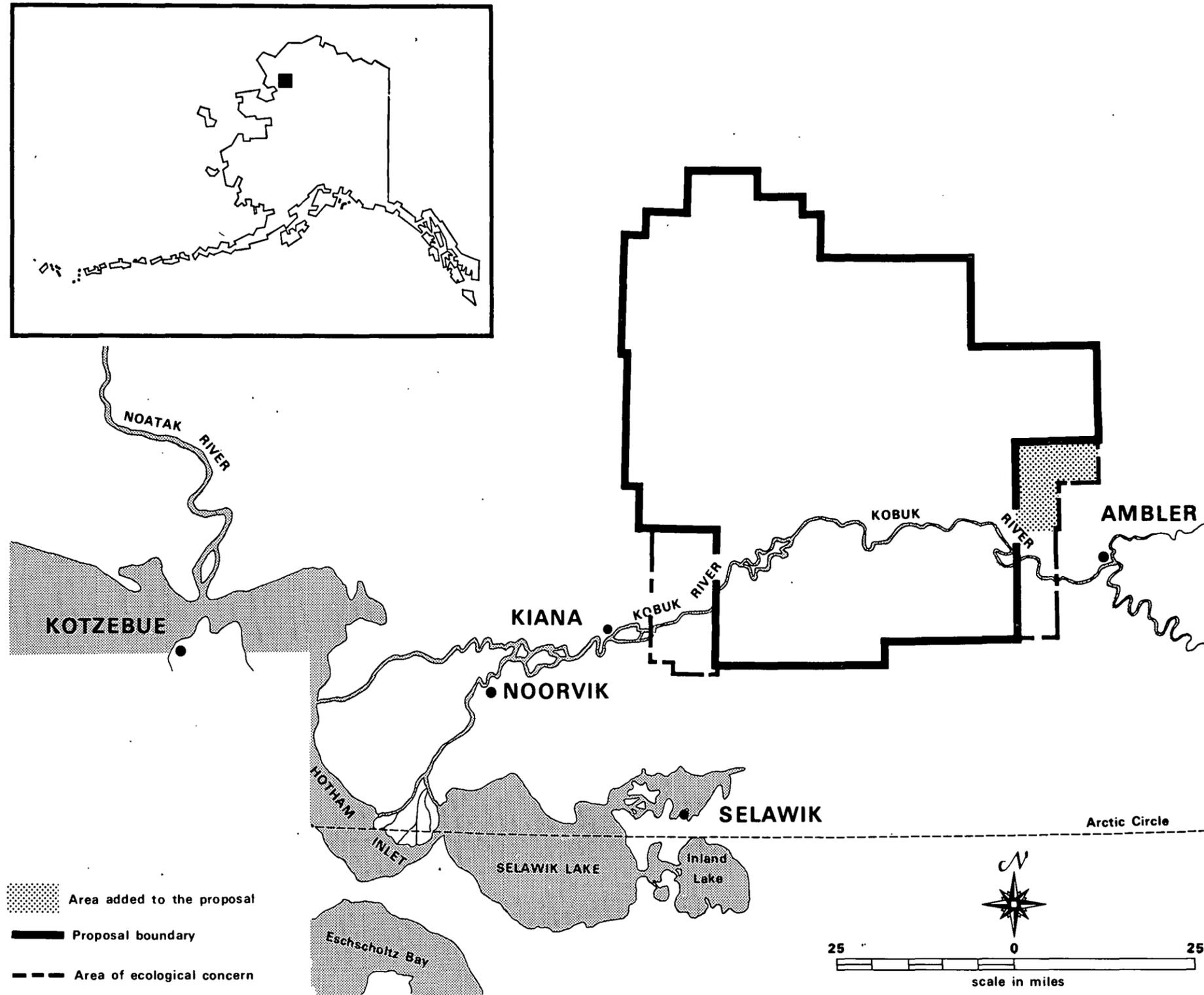
Impacts: The inclusion of the area would provide for watershed protection and insure the integrity of the watershed that flows through the

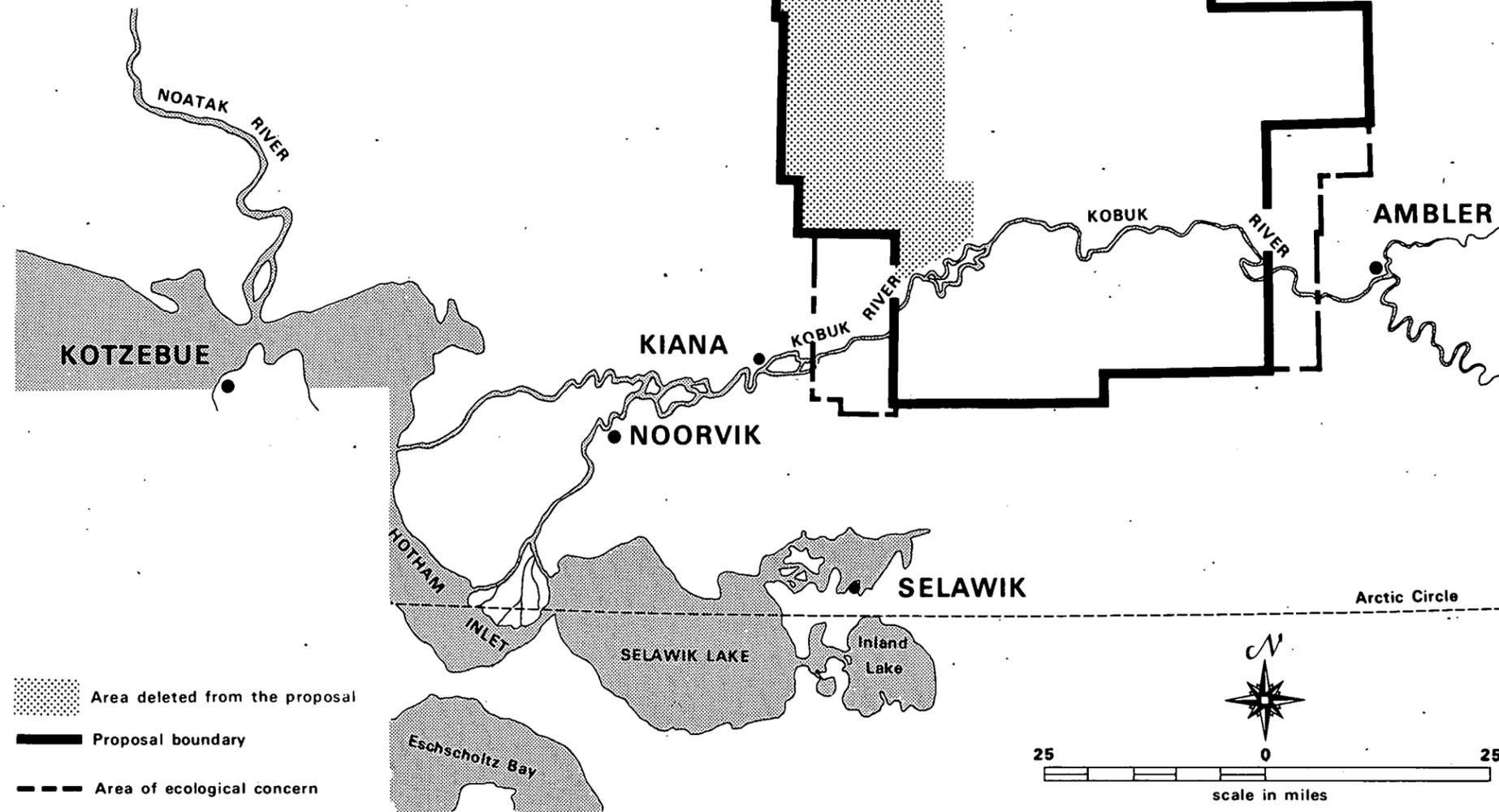
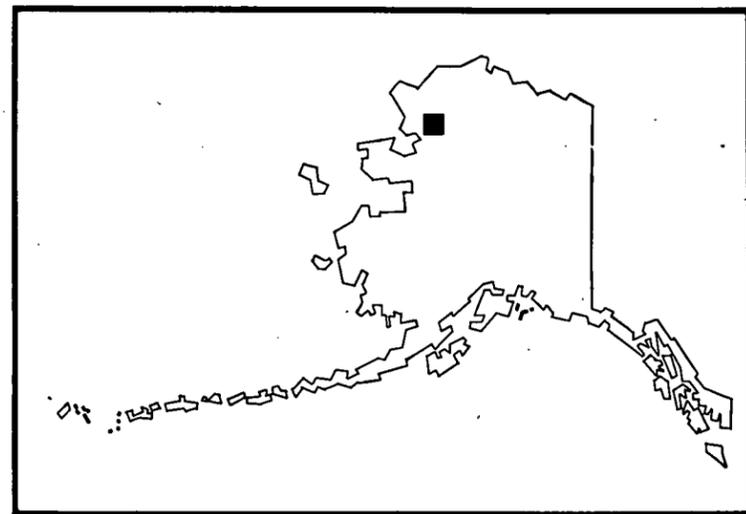
monument. It would also provide visual protection for an area that is easily seen from many portions of the area. Inclusion of the area would preclude the development of numerous mineral claims which have a fairly high economic potential for exploitation, resulting in a loss of revenue to the region and the State on at least a short-term basis. If mining activities are not carefully controlled, the possibility of degradation of water quality and the visual scene is possible. Also, as in the previous alternative, the inclusion of this area would reduce land selections now open to the Natives of Ambler under ANSCA.

### 3. Delete the Salmon River Watershed from the Proposed Monument

This alternative deletes the Salmon River watershed from the proposal. The Salmon River, which qualifies as a wild river in the Wild and Scenic Rivers System would be outside the monument. Mining and hunting would probably take place in the area. (See Alternative C-3 map.)

Impacts: Under this alternative the complete watershed of the Salmon River would not be assured the level of protection that it would receive if included within the monument. Even if the river itself is designated a wild river, a variety of things can occur within the watershed that could result in the loss of water quality of the Salmon. Mineral potential within the watershed could be realized with attendant economic impacts on the regional economy. Mining activity could result in a significant degradation of water quality of the Salmon and, in turn, the Kobuk. The visual scene would be altered as mining scars could be visible from locations within the monument. Pollutants entering the aquatic system could jeopardize this river's annual salmon runs.





Hunting would continue in the area, placing continuing pressure on the Arctic caribou herd in addition to other species. The result could be less diversity and fewer animals in the area; the Dall sheep would probably not return to its former range in the area.

Recreational opportunities would be lower within the region as the Salmon River would probably receive less visitor use than if included with in the monument.

4. Delete the Baird Mountains and the Salmon River from the Proposed Monument.

With this alternative, the Salmon River watershed and the Baird Mountains would be deleted from the proposal. The Baird Mountains contain mineral potential, scenic diversity, recreational opportunities, and important wildlife habitats, including migration routes for the Arctic caribou herd. (See Alternative C-4 map.)

Impacts: All representation of the Brooks Range physiographic unit would be deleted from the proposed monument. The upper portions of the Kobuk River from the north would be outside the control of the National Park Service. The conceptual master plan for the monument would be substantially different if the area were deleted because NPS-controlled recreational uses would be affected.

Should economically exploitable mineral deposits be found and developed in the Baird Mountains, it is likely that caribou movement patterns would shift, forcing changes of life-style on local Natives. At the extreme,

undue interference from mining activities could result in the extirpation of the herd from this area. Short-term economic benefits would be derived from the exploitation of mineral potential of the area resulting in a short-term stimulation of the regional economy.

Hunting would most likely continue in the area and would increase with time resulting in increased pressures on wildlife populations. The Dall sheep which once inhabited the area would most likely not return to its former habitats without the protection of hunting prohibitions.

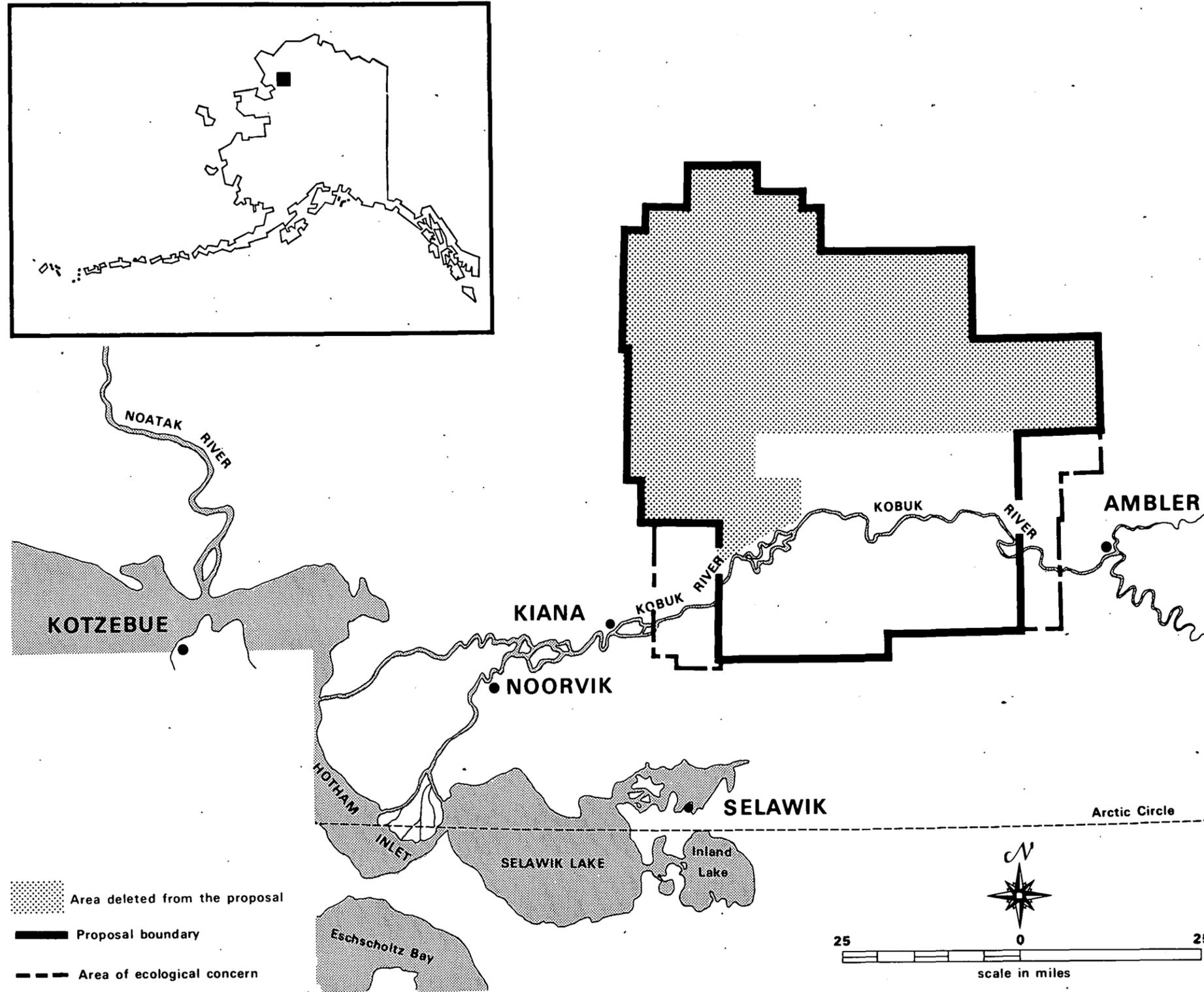
Many opportunities for future recreational activities and accompanying long-term economic benefits within the region would be lost. Archeological resources within the area would not receive the level of protection that would be received under monument protection. Construction and mineral development could result in the loss of major resources.

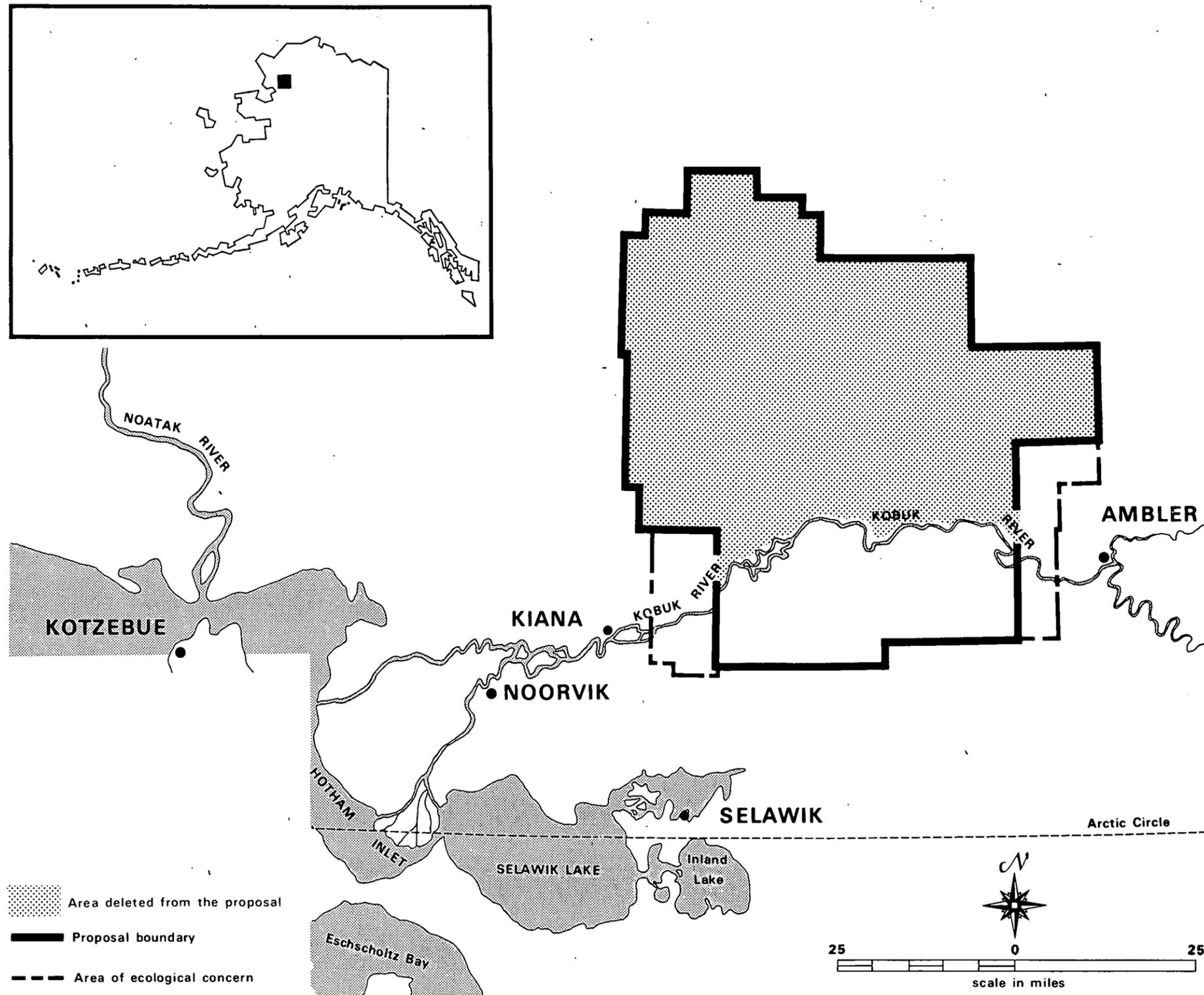
5. Exclude all Lands North of the Kobuk River

In this alternative all lands north of the Kobuk River, except for a one-mile wide corridor, have been excluded from the proposal. (See Alternative C-5 map.)

Impacts: These lands have good waterfowl values. More significantly, they are a part of the caribou winter range. Excluding them from the monument could allow uses of the area to occur which would be detrimental to both the herd and the related subsistence uses.

The cumulative effects of the deletions discussed in this alternative, plus the previously discussed deletions, effectively eliminate a major





portion of the biological and cultural significance of the proposal. In addition, recreational opportunities and diversity are severely compromised.

In biological terms, the ecological unit management concept is lost.

Deletion of areas north of the Kobuk River bisects the visual unit encompassed by the Baird Mountains, the Kallerichuk Hills, and the Waring Mountains; this invites the potential disruption of the aesthetic value of the area.

Should all of the area included in this alternative deletion be deleted, it is possible that subsistence values of the area would be greatly diminished, which could have important social impacts upon the Kobuk River Eskimos, possibly accelerating an acculturation process, with few economic opportunities immediately available as a substitute of the subsistence economy. As with Alternative 4, the recreational potential envisioned in the Kobuk Valley proposal could be compromised.

6. Exclude all Lands North of the Kobuk River, Except the Salmon River Watershed

This alternative differs from the previous alternative in that the Salmon River is not excluded from the proposed monument. (See Alternative C-6 map.)

Impacts: In this alternative, the finest river within the Kobuk watershed north of the Kobuk River would be protected and available for scientific, subsistence, and recreational use. That portion of the Baird Mountains

between Jade Mountain and the eastern edge of the Salmon River drainage would be available for consumptive uses, including mining and hunting. One of the major caribou migration routes would be protected. A wide variety of experiences covering a fully representative range of those available (but without the full diversity) in the proposal would be available to the public. Management difficulties as discussed under alternatives 4 and 5 would still occur.

#### D. ALTERNATIVES TO THE PROPOSED MASTER PLAN

The proposed master plan offers five major concepts, the total combination of which define the management, development, and use concepts for the area. The are:

Management of the monument as a single ecological unit based on a program which maintains the integrity of the area's unique natural features, environment, ecological process, and characteristic cultural heritage. This requires the development and implementation of a research program to gather baseline data;

A land classification plan;

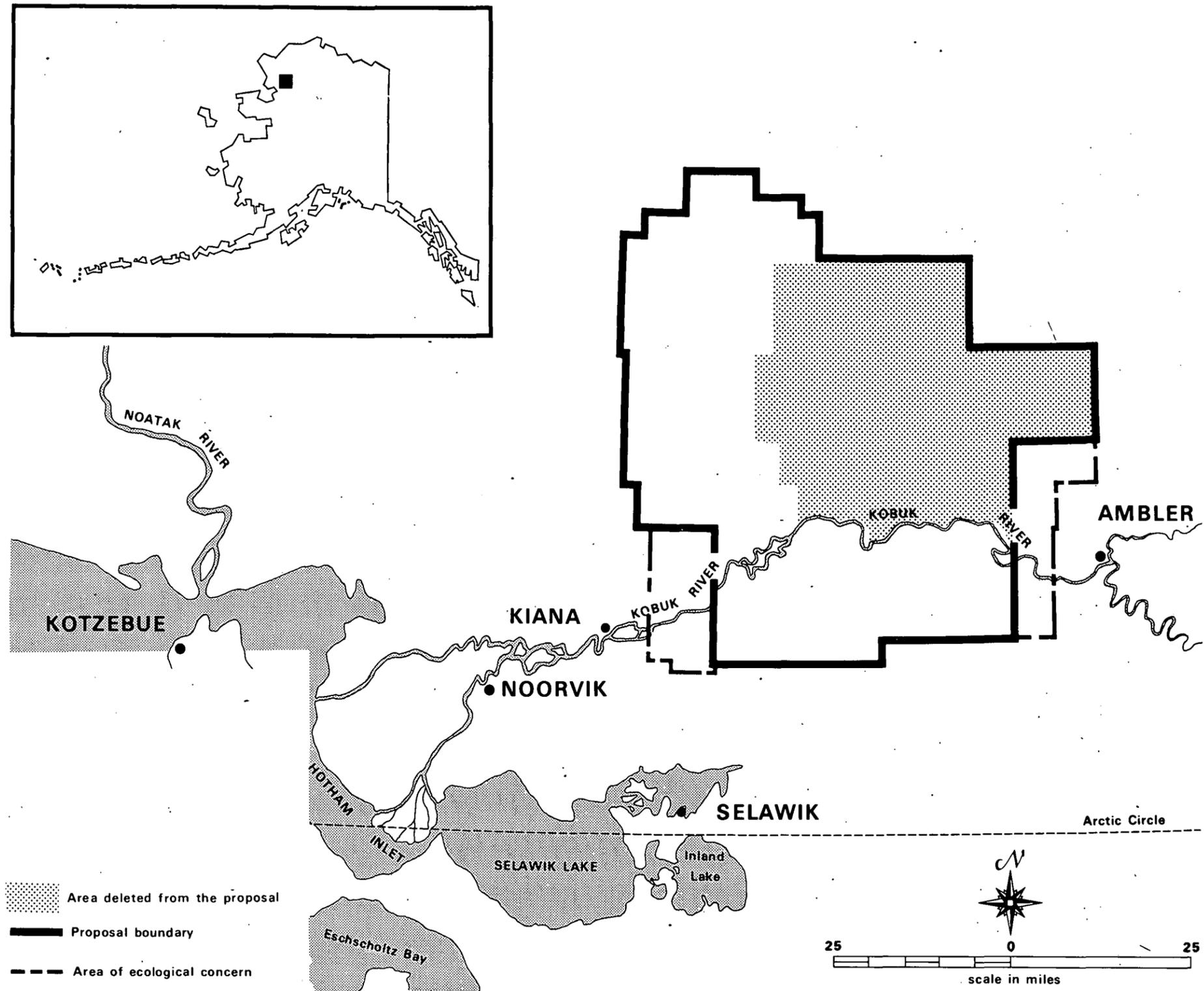
A general development and use concept;

A cooperative management and planning program; including agreements with the State to manage and protect submerged areas; and

Continuance of subsistence hunting,

##### 1. Land Classification

The land classification plan proposed is based upon the land classification



system utilized by the National Park Service. As such there are two basic alternatives: (1) a different plan, using the same system, and (2) no land classification.

Impacts: A different classification plan would create different land management and different development within the monument.

One different plan would be to classify the Kobuk River and an approximate 500 foot-wide strip along each bank as Class II, General Outdoor Recreation. If this were done, it would mean that the riverbanks were considered insufficiently important to be managed for retention of their natural scenic and ecological integrity. Recreational use, not preservation of the riverbanks would be emphasized, causing not only alternation of the visual scene but also greater pollution of the river. Should this happen, the impacts would be felt within the monument and in all downstream areas.

In another plan, for example, the sand dunes would be classified as Class III, Natural Environment, rather than Class IV, Unique Natural Area. Class III would not recognize the unique and outstanding qualities of the dunes in an arctic environment. To take the case one step further, the dunes could be classified as Class II. This classification would imply that the entire dune area would be appropriate for intensive degrees of recreational use. If such were the case, and use levels rose to an extremely high level, it is possible that the character of the dune field could be completely altered from its natural state.

As a final example, all areas classified as Class III, Natural Environment, in the proposal could be classified as Class I, High Intensity Recreation. As use levels rose, these areas could be developed into urban-like situations. Such action would completely alter the landscape and would increase the probability of more wide-ranging adverse environmental impacts such as trampling, littering, potential for fuel spills, vegetation alteration, and effects on wildlife ranges. The need for more services would also cause greater environmental impacts, either in the immediate vicinity or at some removed point.

There are many more possible variations of the proposed land classification plan, all with attendant and variable impacts. However, the examples above are sufficient illustration.

No Action: No action, or no land classification plan, would result in no defined land management policy, which could result in lack of continuity in land use management policies by different managers.

## 2. More Intensive Development

More intensive development would commit a larger portion of the natural resources of the area to a greater amount of development, more activities, and a greater number of visitors. Such development would cost more to develop and maintain. More intensive use would increase the potential for pollution of air, water, and scenic resources; decrease habitat available for wildlife; and increase undesirable human interactions such as crowding and safety to visitors. More intensive development could increase the potential for hazardous animal-man interaction. It could also

commit additional acreage to drastic change in areas in which there is insufficient ecological information to assess long-term effects of developments on primary resources. A great amount of development could result in a greater number of visitors, which could force acculturation of the Eskimos to occur more rapidly, either through greater economic opportunity, through destruction of subsistence resources, or both.

A greater amount of development could significantly alter the experiences that visitors could have in the monument. For instance, a skyline drive along the crest of the Waring Mountains could be proposed. Assuming for the moment that there would be some way for people to get their cars to the area, the experience would be quite different than than now contemplated for much of the area. First, the isolation of the Waring Mountains and of the sand dunes would be gone. Impacts would include alterations of the landscape and the air quality due to road construction and large numbers of internal-combustion vehicles. The quality of the visitor's experience at the dunes would be affected. Sound pollution would intrude on some parts or the dunes. There would be almost no place in the dunes that the natural scene would be unaltered by the visual presence of automobiles.

Psychologically the visitor would feel less a part of this wild but friendly land and more a stranger on the edge of it.

Further, the Waring Mountains would no longer be suitable for wilderness hiking in a relaxed and easy atmosphere.

A greater number of developed areas would not significantly increase visitor understanding or add to the variety of visitor experiences

possible within the monument, since the proposed plan has attempted to provide a sampling of as great a diversity of resources as possible.

### 3. Interpretive Program

The alternative to providing an interpretive program is no action; i.e., not providing an interpretive program.

If an interpretive program is not provided, there would be a significant decrease in public understanding and enjoyment of the outstanding resources of the area. The primary impact is cultural--the visitor may leave with impressions but with no knowledge and no in-depth understanding of the natural and cultural resources for which the area is proposed.

The cultural impacts relate to the visitor's experience. Having no interpretive program would result in less information disseminated about the area or the region than if there were an interpretive program. No available programs would explain the resources within the area, or tell ways in which visitors could enjoy or learn from resources. The history of the area would not be readily available to visitors. Little understanding of the cultural significance of the area would be gained.

Although the major impacts of this alternative are cultural, there are also impacts on the natural environment.

If an interpretive program is not instituted, impacts on the natural environment could be less than if the program is instituted. Much of

the proposed development for the area could be eliminated. To do so would eliminate such impacts as increased interaction with animal populations; potential for dangerous man-animal contacts; vegetative, landscape, and drainage alteration; and fuel spills and air pollution in areas not presently developed. However, human impacts would probably be greater if the visiting public were unaware of the fragility of the resources or were unable to appreciate those resources because of lack of knowledge.

In the conceptual master plan, the bulk of the interpretive program will be accomplished through the use of personal services; i. e., personal contact between interpreter and visitor. Other forms of interpretation require more facilities, audio visual devices, and signs, and consequently create larger impacts. They also probably convey the interpretive story less successfully than personal interpretation.

#### 4. Proposed Transportation System

No action would most probably result in the unevaluated acceptance of traditional transportation based on roads and motor vehicles. If imposed upon the monument, these transportation systems might not be able to fulfill the intent of the master plan; in other words, the systems would be unsuited to meet the transportation needs of the monument. Roads, also, would damage presently undisturbed natural environments and would generate conflicts between public use and wildlife habitat requirements.

A number of alternatives to the transportation system as proposed are possible.

First, the air tours of the monument could be eliminated. Such action would preclude the opportunity for many visitors to see or get to all or many parts of the monument. Without air transportation, ground transportation would have to be provided for visitors to experience the Salmon River, or the experience would be limited to those who could hike in. Provision of ground transportation would have effects similar to those outlined earlier in this chapter.

If air transportation were eliminated, the mandatory length of time required to get to the monument would be increased by a day or two, which would prevent many people from visiting the area.

Should all air transportation be required to make landings on airfields, rather than on water, greater damage to the natural resources would occur from construction of facilities.

The proposed river transportation system could be eliminated and replaced by a road. To do so would cause unnecessary environmental degradation and introduce increased pollutants into the air. Introduction of a road to the monument, unless roadside uses were carefully controlled, would also result in strip development of off-road parking in desirable locations along its route. It is also likely that road transportation for tourists would be expensive, since cars would have to be rented in Kotzebue for at least the foreseeable future.

Elimination of boat transportation would also result in loss of an attractive opportunity for a recreational visitor experience--the boat trip to the monument itself.

Imposition of systems not suited to fulfillment of their intent would result in decreased quality of the visitor's experience while in the area. For instance, the proposed boat system is intended to be a moving interpretive center. If it is eliminated, the visitor will receive only transportation and no interpretation. Consequently, the visitor's experience would be reduced to only that which he could see and understand without interpretation. Also, greater development on-site would be necessary to provide for the interpretive functions.

##### 5. Discontinuance of the Opportunity for Subsistence Activities

The alternative to this proposal is to eliminate subsistence use of the area. To do so would unnecessarily limit the livelihood and the quality of life of a significant portion of the Native population. The probable effect of eliminating subsistence use at this time would be to create an even greater reliance on welfare than presently exists. This would increase the expense to the general public and the possibly increase the degradation of the self-esteem of the individual. Such action would also embitter the local population toward the Federal Government.

In addition, curtailment of subsistence activity would limit, to some degree, the cultural significance of Kobuk valley by artificially removing a use that has existed in the valley for millennia.

Correspondingly, if the part played by subsistence living were eliminated, ecosystem balance would change or would have to be replaced by artificial management practices.

## IX. CONSULTATION AND COORDINATION WITH OTHERS

### A. CONSULTATION AND COORDINATION IN THE DEVELOPMENT OF THE PROPOSAL AND IN THE PREPARATION OF THE DRAFT ENVIRONMENTAL STATEMENT

Numerous agencies, groups, and individuals were contacted during the study that preceded the formulation of the proposal and during the preparation of the draft environmental statement. Individuals throughout Alaska and elsewhere, including Natives, provided data or leads to information, and several agencies provided comments in review of preliminary drafts of portions of the statement. The proposal plan as presented herein was not reviewed by participating groups but the draft statement is being circulated for public review and every effort will be made to coordinate and cooperate in further development of the planning.

The Joint Federal-State Land Use Planning Commission held a series of public hearings throughout the State of Alaska and the lower 48 States during the months of May and June 1973. The purpose of the hearings was to seek public input to the decision-making process regarding the uses to be allowed on the National Interest Lands withdrawn by the Secretary of the Interior in September 1972. Hearings were held in numerous villages and cities, including Kotzebue, Fairbanks, Anchorage, Seattle, San Francisco, Denver, and Washington, D.C. Representatives from the National Park Service attended all of these hearings and utilized the information and thoughts expressed to assist in the planning process.

In addition, three public meetings were attended by members of the NPS planning team. These were held in Ambler (15 persons on April 24, 1973) and at Kiana (30 persons, April 17) and Shungnak (20 persons on April 24).

Individuals from the following organizations were contacted during the planning process. Those agencies marked with an asterisk (\*) were sent copies of an earlier version of Chapter II of this document and provided comments on it:

State-Federal Land Use Planning Commission, Resource Planning Team

Advisory Council on Historic Preservation

District Engineer, Alaska District, Corps of Engineers

Alaska Task Force, Bureau of Outdoor Recreation

Alaska Task Force, United States Forest Service

Division Engineer, Federal Highway Administration

\*State Director, Bureau of Land Management

\*Area Director, Bureau of Sport Fisheries and Wildlife

U.S. Geological Survey

\*Regional Director, National Marine Fisheries Service

Area Director, Bureau of Indian Affairs

\*Alaska Field Operation Center, Bureau of Mines

Superintendent, Anchorage Agency, Bureau of Indian Affairs

Federal Co-chairman, Joint Federal-State Land Use Planning Commission

\*Administrator, Alaska Power Administration

\*Alaskan Regional Office, Federal Aviation Administration

Office of the Governor of the State of Alaska, Director of Planning  
and Research

State of Alaska, Department of Public Works, Division of Aviation

Staff, Alaska State Historic Preservation Officer

National Parks Advisory Board

Northwest Alaska Native Association  
City Council, Ambler  
City Council, Kiana  
City Council, Kotzebue  
University of Alaska, Institute of Arctic Biology; and,  
Department of Wildlife and Fisheries  
Planning Director, State of Alaska, Department of Highways  
Alaska Conservation Society  
Sierra Club  
Friends of the Earth  
Alaska Airlines  
\*General Manager, Alaska Railroad  
Wein Consolidated Airlines  
Western Airlines

B. COORDINATION IN THE REVIEW OF THE DRAFT ENVIRONMENTAL  
IMPACT STATEMENT

This draft environmental impact statement has been sent to the following  
for review and comment.

FEDERAL:

Department of the Interior  
Bureau of Sport Fisheries and Wildlife  
Bureau of Mines  
Bureau of Indian Affairs  
Bureau of Land Management  
Geological Survey  
Alaska Power Administration  
Bureau of Outdoor Recreation  
Office of Land Use and Water Planning

Department of Transportation  
Federal Aviation Administration  
Federal Highway Administration

Department of Defense  
Alaska Command  
Corps of Engineers

Department of Agriculture  
Forest Service  
Soil Conservation Service

Department of Commerce  
National Oceanic and Atmospheric Administration

Environmental Protection Agency

Advisory Council on Historic Preservation

STATE:

Governor of the State of Alaska (State Clearinghouse)  
Alaska State Historic Preservation Officer

OTHER AGENCIES:

City of Kotzebue  
Noorvik Village Council  
Kiana Village Council  
Ambler Village Council  
Shungnak Village Council  
Kobuk Village Council  
Selawik Village Council

NATIVE ORGANIZATIONS:

NANA Regional Corporation, Inc.  
Kotzebue Native Village Corporation  
Noorvik Native Village Corporation  
Kiana Native Village Corporation  
Ambler Native Village Corporation  
Shungnak Native Village Corporation  
Kobuk Native Village Corporation  
Selawik Native Village Corporation  
Alaska Federation of Natives  
Alaska Native Foundation  
Mauneluk, Inc.

OTHER ORGANIZATIONS:

Sierra Club  
Friends of the Earth  
The Wilderness Society  
National Parks and Conservation Association  
National Wildlife Federation  
National Audubon Society  
Alaska Historical Commission  
Alaska Conservation Society  
Alaska Wilderness Council  
Alaska Professional Hunters Association  
Sea Grant Program  
Alaska Sportsmen's Association  
Alaska Oil and Gas Association

APPENDIX A: CHECKLIST OF BIRDS

Information on the relative abundance, status and primary wintering areas of individual species is listed. Abbreviations used to indicate relative abundance and status are:

Relative abundance

- a abundant
- c common
- o occasional
- u uncommon or rare

Status

- n nesting migrants
- m migrant non-nesting
- r resident throughout the year
- v vagrant or stray

Relative abundance is considered relative to abundance of the species elsewhere. Thus, greater scaup, for example, is listed as "abundant" inasmuch as it is as numerous per unit of area in the Kobuk as in any other portion of its preferred habitat or range. Mallard, on the other hand, is listed as "common" because it is present in relatively low numbers compared densities in its major breeding range. Wintering area data generally follows the description of Gabrielson and Lincoln (1959). An asterisk (\*) indicates species that are endangered.

The checklist was compiled from information in Gabrielson and Lincoln (1959), Bailey (1949), Grinnel (1909), Hudson (1957), Kessel (1968), Divoky (1972) and unpublished observations by Bureau of Sport Fisheries and Wildlife personnel.

Abundance & Status

<u>Species</u>		<u>Primary Wintering Area</u>
Common loon	o n	S. Alaska & British Columbia
Yellow-billed loon	c n	SE Alaska & British Columbia
Arctic loon	c n	SE Alaska & British Columbia
Red-throated loon	c n	SC & SW Alaska
Red-necked grebe	c n	Aleutians to British Columbia
Horned grebe	c n	Coastal Alaska to California
Whistling swan	c n	Utah, Nevada, & California
Taverner's Can. goose	c n	Washington, Oregon, & California
White-fronted goose	c n	Texas & north-central Mexico
Snow goose	o m	Central California
Mallard	c n	Pacific Coast from Alaska to Oregon
Pintail	a n	Pacific Flyway from Canada to Mexico
American widgeon	a n	Pacific Flyway from Canada to Mexico
Green-winged teal	a n	Pacific Flyway from Canada to Mexico
Shoveler	c n	Pacific Coast States
Canvasback	o n	California
Greater scaup	a n	Pacific Coast south to California, Gulf Coast, Atlantic Coast to Virginia
Lesser scaup	o n	Gulf Coast States & as far north as Iowa
Common goldeneye	c n	Alaska south to California
Bufflehead	c n	British Columbia south to California
Oldsquaw	a n	Bering Sea, Siberia, northern Japan

Abundance & Status

<u>Species</u>		<u>Primary Wintering Area</u>
Harlequin duck	c n	Aleutian Islands
White-winged scoter	o n	Kodiak, southeastern Alaska
Surf scoter	u n	Southeastern Alaska
Common scoter	u n	Aleutian Is. to southeast Alaska
Red-breasted merganser	c n	Aleutian Is. to southeast Alaska
Goshawk	c n	Central Alaska to British Columbia
Sharp-shinned-hawk	o n	Montana through Mid-west States
Rough-legged hawk	o n	Japan & China southwest to Black Sea
Golden eagle	o n	Pacific coast States to British Columbia.
Bald eagle	c n	Coastal Alaska & British Columbia
Marsh hawk	c n	Southern British Columbia through Mexico
Osprey	c n	California to central South America
Gryfalcon	c n	Siberia, Kurile Is., & Japan
*Peregrine falcon	u n	Across Asia to Siam, SE Alaska to Mexico
Pigeon hawk	o v	From California to Texas & Mexico
Spruce grouse	c r	Resident
Willow ptarmigan	a r	Resident
Rock ptarmigan	c r	Resident
Sandhill crane	c n	West Texas, New Mexico, northern Mexico
Semipalmated plover	c n	Pacific Coast from California to Chile

Abundance & Status

<u>Species</u>		<u>Primary Wintering Area</u>
American golden plover	c n	From eastern India, to Malaya, New Zealand
Black-bellied plover	c n	British Columbia to Brazil
Surfbird	o m	SE Alaska to tip of South America
Ruddy turnstone	u n	California south to Chile, South Pacific Islands to New Zealand
Common snipe	c n	Western U.S. to Central America
Whimbrel	c n	Pacific Coast from California to Chile
Upland plover	u n	Pampas of South America
Spotted sandpiper	o n	South America
Lesser yellowlegs	c n	Texas south to Central & South America
Pectoral sandpiper	o n	South America
Baird's sandpiper	c n	Mountainous South America
Hudsonian godwit	u v	Southern South America
Mew gull	c n	SE Alaska to California
Bonaparte's gull	o n	Washington to Baja California
Arctic tern	c n	Central Chile south to Antarctica
Horned owl	c n	Alaska
Snowy owl	o m	Alaska
Hawk owl	o n	Alaska
Short-eared owl	c n	Western U.S.
Boreal owl	u r	Resident

Abundance & Status

<u>Species</u>		<u>Primary Wintering Area</u>
Yellow-shafted flicker	o n	SE States
Downy woodpecker	o v	Alaska
Northern three-toed woodpecker	o r	Resident
Tree swallow	o n	SW U.S., Mexico & Caribbean
Bank swallow	a n	Central South America
Barn swallow	c n	Central South America
Gray jay	c r	Resident
Common raven	c r	Resident
Black-capped chickadee	c r	Resident
Gray-headed chickadee	c r	Resident
Boreal chickadee	a r	Resident
Dipper	o r	Resident
Robin	c n	Southern States to Vera Cruz
Varied thrust	a n	Western States
Gray-cheeked thrust	a n	Central America to northern half of S. America
Arctic warbler	o n	Philippines, Indo-China, East Indies
Ruby-crowned kinglet	o n	British Columbia to California
Water pipit	o n	Oregon to W. Mexico
Bohemian waxwing	o v	Alaska, western Canada
Northern shrike	c n	Alaska south to western U.S.
Orange-crowned warbler	o n	California to Guatemala

Abundance & Status

<u>Species</u>		<u>Primary Wintering Area</u>
Yellow warbler	c n	Baja California to Panama
Myrtle warbler	c n	Oregon south to Panama & east to Mississippi
Blackpoll warbler	c n	Northern South America
Northern waterthrush	c n	Baja California, Mexico to northern South America
Wilson's warbler	c n	Mexico to Panama
Rusty blackbird	c n	South of Ohio to Gulf Coast States
Pine grosbeck	c n	Alaska south to upper Mid-West
Hoary redpoll	c r	Alaska & resident
Common redpoll	c r	Alaska & resident
White-winged crossbill	c r	Alaska & resident
Slate-colored junco	c n	Upper Mid-West, New England to Gulf Coast
Tree sparrow	c n	SW States
White-crowned sparrow	c n	British Columbia, western U.S. & Mexico
Golden-crowned sparrow	o n	British Columbia to California
Fox sparrow	c n	Gulf Coast States to Florida
Lincoln's sparrow	u n	SW States to Mexico
Lapland longspur	a m	Northern U.S.
Snow bunting	c m	Alaska to northern U.S., resident

APPENDIX B: LIST OF MAMMALS\*

Order INSECTIVORA

Family Coricidae, shrews

Sorex cinereus Masked or common shrew  
Sorex tundrensis Tundra shrew

Order LAGOMORPHA

Family Leporidae, hares and rabbits

Lepus othus Tundra or Arctic hare  
Lepus americanus Snowshoe or varying hare

Order RODENTIA

Family Sciuridae, squirrels

Citellus parryi Arctic ground squirrel  
Tamiasciurus hudsonicus Red squirrel

Family Castoridae, beavers

Castor canadensis Beaver

Family Cricetidae, native rats and mice

Dicrostonyx groenlandicus Green and collared lemming  
Lemmus trimucronatus Brown lemming  
Clethrionomys rutilus Tundra red-backed vole  
Microtus pennsylvanicus Meadow Vole  
Microtus oeconomus Tundra Vole  
Microtus miurus Alaska Vole  
Ondatra zibethicus Muskrat

Order CARNIVORA

Family Canidae, dogs

Canis latrans Coyote  
Canis lupus Gray wolf  
Alopex lagopus Arctic fox  
Vulpes fulva Red fox

\* From: Manville and Young 1965; Leatherwood, et al. 1972; State of Alaska, ADF&G 1973.

Family Ursidae, bears

Ursus americanus Black bear

Ursus arctos Grizzly bear

Family Mustelidae, weasels and allies

Martes americana Marten

Mustela erminea Short-tailed weasel

Mustela rixosa Least weasel

Mustela vison Mink

Gulo gulo Wolverine

Lutra canadensis River otter

Family Felidae, cats

Lynx canadensis Lynx

Order ARTIODACTYLA

Family Bovidae, bovids

Ovis dalli dalli Dall sheep

Family Cervidae, deer

Alces alces Moose

Rangifer arcticus Barren ground caribou

Rangifer tarandus Reindeer

APPENDIX C: CHECKLIST OF THE FRESH-WATER AND ANADROMONOUS FISHES  
OF THE SEWARD PENINSULA\*

Species

<u>Common Name</u>	<u>Scientific Name</u>
Arctic Lamprey	<u>Lampetra japonica</u>
Sheefish (inconnu)	<u>Stenodus leucichthys</u>
Humpback Whitefish	<u>Coregonus pidschian</u>
Broad Whitefish	<u>C. nasus</u>
Least Cisco	<u>C. sardinella</u>
Bering Cisco	<u>C. laurettae</u>
Round Whitefish	<u>Prosopium cylindraceum</u>
Arctic Grayline	<u>Thymallus arcticus</u>
Lake Trout	<u>Salvelinus namaycush</u>
Arctic Char	<u>S. alpinus</u>
Sockeye (Red) Salmon	<u>Oncorhynchus nerka</u>
Coho (Silver) Salmon	<u>O. kisutch</u>
Chum Salmon	<u>O. keta</u>
Pink Salmon	<u>O. gorbuscha</u>
Pond Smelt	<u>Hypomesus olidus</u>
Northern Pike	<u>Esox lucius</u>
Alaska Blackfish	<u>Dallia pectoralis</u>
Longnose Sucker	<u>Catostomus catostomus</u>
Burbot	<u>Lota lota</u>

\* McPhail and Lindsey, 1970.

Species

Common Name

Scientific Name

Ninespine Stickleback

Pungitius pungitius

Four-horn (Deepwater) Sculpin

Myoxocephalus quadricornis

Coastrange Sculpin

Cottus aleuticus

Slimy Sculpin

C. cognatus

APPENDIX D: CHECKLIST OF VASCULAR PLANTS

The following list of plant species was adapted from the distributional maps presented by Hulten (1968) and may not be entirely accurate.

<u>Scientific Name</u>	<u>Common Name</u>
<u>Alpinum</u>	Alpine Club Moss
<u>Equisetum variegatum</u>	N. Scouring-rush
<u>E. fluviatile</u>	Swamp Horsetail
<u>E. silvaticum</u>	Wood Horsetail
<u>E. arvense</u>	Common Horsetail
<u>Botrychium lunaria</u>	Moonwort
<u>Cystopteris fragilis</u>	Fragile Fern
<u>Picea mariana</u>	Black Spruce
<u>P. glauca</u>	White Spruce
<u>Dryopteris fragrans</u>	Fragrant Shield Fern
<u>Sparganium angustifolium</u>	Narrow-lvd Bur-reed
<u>S. hyperboreum</u>	Northern Bur-reed
<u>Potamogeton alpinus</u>	Northern Pondweed
<u>P. gramineus</u>	Various-lvd Pondweed
<u>P. perfoliatus</u>	Clasping-lvd Pondweed

<u>P. pectinatus</u>	Fennel-ldv Pondweed
<u>P. filiformis</u>	Filiform Pondweed
<u>P. vaginatus</u>	Sheathed Pondweed
<u>Zannichellia palustris</u>	Horned Pondweed
<u>Triglochin maritimum</u>	Seaside Arrow-grass
<u>T. palustris</u>	Marsh Arrow-grass
<u>Hierochloe alpina</u>	Alpine Holy-grass
<u>H. odorata</u>	Holy-grass
<u>H. pauciflora</u>	Arctic Holy-grass
<u>Arctagrostis latifolia</u>	Arctagrostis
<u>Clamagrostis canadensis</u>	Bluejoint
<u>C. neglecta</u>	Narrow Reed-grass
<u>Deschampsia caepitosa</u>	Tufted Hair-grass
<u>Trisetum spicatum</u>	Downy Oat-grass
<u>Poa alpigena</u>	Bluegrass
<u>Colpodium Wrightii</u>	Colpodium
<u>Arctophila fulva</u>	Pendent Grass
<u>Puccinellia phryganodes</u>	Creeping Alkali-grass
<u>P. borealis</u>	Northern Alkali-grass
<u>Festuca brachyphylla</u>	Alpine Fescue
<u>F. rubra</u>	Red Fescue
<u>Bromus Pumpellianus</u>	Arctic Brome-grass
<u>Agropyron macrourum</u>	Wheatgrass

<u>A. violaceum</u>	Wheatgrass
<u>A. subsecundum</u>	Bearded Wheatgrass
<u>A. boreale</u>	Wheatgrass
<u>Elymus arenarius</u>	Beach Ryegrass
<u>Eriphorum brachyantherum</u>	Closed-sheathed cotton-gr.
<u>E. vaginatum</u>	Sheathed Cotton-grass
<u>Trichophorum caespitosum</u>	Cotton-grass
<u>Eleocharis acicularis</u>	Needle Spike-rush
<u>Kobresia myosuroides</u>	Bellard Kobresia
<u>Carex capitata</u>	Capitate Sedge
<u>C. scirpoidea</u>	N. Single-Spike Sedge
<u>C. maritima</u>	Curved Sedge
<u>C. chorodorrhiza</u>	Creeping Sedge
<u>C. Lachenalii</u>	Arctic Hares-ft. Sedge
<u>C. glareosa</u>	Weak Clustered Sedge
<u>C. Mackenziei</u>	Norway Sedge
<u>C. tenuiflora</u>	Sparse-flowered Sedge
<u>C. Bigelowii</u>	Bigelow Sedge
<u>C. lugens</u>	Sedge
<u>C. aquatilis</u>	Water Sedge
<u>C. Ramenskii</u>	Ramenski Sedge
<u>C. Lyngbyaei</u>	Lyngbye Sedge

<u>C. holostoma</u>	Sedge
<u>C. Gmelini</u>	Gmelin Sedge
<u>C. nesophila</u>	Bering Sea Sedge
<u>C. rariflora</u>	Loose-flwd Alpine Sedge
<u>C. vaginata</u>	Sheathed Sedge
<u>C. atrofusca</u>	Dark-brown Sedge
<u>C. capillaris</u>	Hair-like Sedge
<u>C. rostrata</u>	Beaked Sedge
<u>C. saxatilis</u>	Sedge
<u>C. rotundata</u>	Round-fruited Sedge
<u>C. membranacea</u>	Fragile Sedge
<u>Juncus castaneus</u>	Chestnut Rush
<u>Luzula wahlenbergii</u>	Wahlenberg Wood Rush
<u>L. parviflora</u>	Small-flwd Wood-Rush
<u>L. arcuata</u>	Alpine Wood Rush
<u>L. tundricola</u>	Wood Rush
<u>L. confusa</u>	N. Wood-Rush
<u>Tofieldia coccinea</u>	N. Asphodel
<u>T. pusilla</u>	Scotch Asphodel
<u>Zygadenus elegans</u>	White Camass
<u>Allium schoenoprasum</u>	Wild Chive
<u>Tris setosa</u>	Wild Flag
<u>Amerorchis rotundifolia</u>	Orchis

<u>Coeloglossum viride</u>	Frog Orchis
<u>Platanthera obtusata</u>	Sm. Northern Bog Orchis
<u>Corallorrhiza trifida</u>	Early Coral Root
<u>Salix reticulata</u>	Netted Willow
<u>S. phlebophylla</u>	Willow
<u>S. arctica</u>	Arctic Willow
<u>S. fuscenscens</u>	Willow
<u>S. ovalifolia</u>	Willow
<u>S. arctolitoralis</u>	Willow
<u>S. glauca</u>	Willow
<u>S. niphoclada</u>	Willow
<u>S. lanata</u>	Willow
<u>S. alaxensis</u>	Alaska Willow
<u>S. pulchra</u>	Willow
<u>Betula nana</u>	Dwarf Birch
<u>Alnus crispa</u>	Mountain Alder
<u>Koenigia islandica</u>	Koenigia
<u>Rumex acetosa</u>	Green Sorrel
<u>R. arcticus</u>	Arctic Dock
<u>Polygonum viviparum</u>	Alpine Bistort
<u>P. bistorta</u>	Bistort
<u>P. alaskanum</u>	Wild Rhubarb

<u>P. caurianum</u>	Alaska Knotweed
<u>Atriplex Gmelini</u>	Gmelin Saltweed
<u>Claytonia tuberosa</u>	Tuberous Spring Beauty
<u>Stellaria humifusa</u>	Low Chickweed
<u>S. crassifolia</u>	Fleshy Starwort
<u>S. longipes</u>	Long-stalked Starwort
<u>S. laeta</u>	Shining Starwort
<u>Cerastium Beeringianum</u>	Beering Chickweed
<u>Sagina intermedia</u>	Snow Pearlwort
<u>Minuartia macrocarpa</u>	Large-podded Sandwort
<u>Honckenya peploides</u>	Seabeach Sandwort
<u>Moehringia lateriflora</u>	Grove Sandwort
<u>Wilhelmsia physodes</u>	Sandwort
<u>Melandrium apetalum</u>	Nodding Lychnis
<u>M. macrospermum</u>	Large-seeded Lychnis
<u>M. affine</u>	Lychnis
<u>Dianthus repens</u>	Carnation
<u>Nuphar polysepalum</u>	Yellow Pond Lily
<u>Caltha palustris</u>	Marsh Marigold
<u>Aconitum delphinifolium</u>	Delphinium-lvd Aconite
<u>Anemone Richardsonii</u>	Yellow Anemone
<u>A. parviflora</u>	N. Anemone
<u>A. narcissiflora</u>	Narcissus-flwd Anemone

<u>Ranunculus Gmelini</u>	Buttercup
<u>R. hyperboreus</u>	Arctic Buttercup
<u>R. pallasii</u>	Pallas Buttercup
<u>R. lapponicus</u>	Lapland Buttercup
<u>R. reptans</u>	Creeping Spearwort
<u>R. cymbalaria</u>	Seaside Crowfoot
<u>R. nivalis</u>	Snow Buttercup
<u>R. pedatifidus</u>	N. Buttercup
<u>Thalictrum alpinum</u>	Arctic Meadow-rue
<u>Papaver lapponicum</u>	Poppy
<u>Eutrema Edwardsii</u>	Eutrema
<u>Rorippa islandica</u>	Watercress
<u>R. hispida</u>	Watercress
<u>Cardamine pratensis</u>	Cuckoo Flower
<u>Draba hirta</u>	Draba
<u>Draba borealis</u>	Draba
<u>Descurainia sophioides</u>	N. Tansy Mustard
<u>Erysimum Pallasii</u>	Pallas Wallflower
<u>E. cheiranthoides</u>	Wormseed Mustard
<u>Parrya nudicaulis</u>	Rock-cress
<u>Sedum rosea</u>	Roseroot
<u>Saxifraga eschscholtzii</u>	Cushion Saxifrage
<u>S. hirculus</u>	Bog Saxifrage

<u>S. bronchialis</u>	Spotted Saxifrage
<u>S. tricuspidata</u>	Prickly Saxifrage
<u>S. punctata</u>	Cordate-Leaved Saxifrage
<u>S. cernua</u>	Bulbet Saxifrage
<u>S. exilis</u>	Saxifrage
<u>S. bracteata</u>	Bracted Saxifrage
<u>S. rivularis</u>	Brook Saxifrage
<u>S. hieracifolia</u>	Stiff-Stemmed Saxifrage
<u>S. caespitosa</u>	Tufted Saxifrage
<u>Chrysosplenium tetrandrum</u>	N. Water Carpet
<u>C. wrightii</u>	Bering Sea Water Carpet
<u>Parnassia palustris</u>	Bog Star
<u>P. kotzebuei</u>	Grass-of-Parnassus
<u>Ribes triste</u>	N. Red Currant
<u>Rubus chamaemorus</u>	Cloudberry
<u>R. arcticus</u>	Nagoon Berry
<u>Potentilla palustris</u>	Marsh Fivefinger
<u>P. fruticosa</u>	Shrubby Cinquefoil
<u>P. biflora</u>	Two-flowered Cinquefoil
<u>P. villosa</u>	Villosa Cinquefoil
<u>P. Uniflora</u>	One-flowered Cinquefoil
<u>P. hyparctica</u>	Cinquefoil
<u>P. virgulata</u>	Cinquefoil

<u>P. egedii</u>	Pacific Silverweed
<u>Rosa acicularis</u>	Prickly Rose
<u>Lupinus arcticus</u>	Arctic Lupine
<u>Astragalus umbellatus</u>	Hairy Arctic Milk Vetch
<u>A. aboriginum</u>	Indian Milk Vetch
<u>A. alpinus</u>	Alpine Milk Vetch
<u>A. polaris</u>	Polar Milk Vetch
<u>Oxytropis maydelliana</u>	Maydell Oxytrope
<u>O. campestris</u>	N. Yellow Oxytrope
<u>Hedysarum alpinum</u>	American Hedysarum
<u>Lathyrus maritimus</u>	Beach Pea
<u>L. palustris</u>	Vetchling
<u>Callitriche hermaphroditica</u>	Water Starwort
<u>C. anceps</u>	Water Starwort
<u>Viola biflora</u>	Two-flowered Violet
<u>V. epipsila</u>	Marsh Violet
<u>Epilobium angustifolium</u>	Fireweed
<u>E. latifolium</u>	River Beauty
<u>E. palustre</u>	Swamp Willow-herb
<u>E. davuricum</u>	Davurian Willow-herb
<u>Myriophyllum spicatum</u>	Spiked Water-Milfoil
<u>Hippuris tetraphylla</u>	Four-leaved Mare's tail
<u>Bupleurum triradiatum</u>	Thoroughwax
<u>Cicuta mackenzieana</u>	Mackenzie Water Hemlock

<u>Ligusticum scoticum</u>	Beach Lovage
<u>Conioselinum chinense</u>	Hemlock Parsley
<u>Angelica lucida</u>	Sea Coast Angelica
<u>Cornus suecica</u>	Swedish Dwarf Cornel
<u>Pyrola asarifolia</u>	Liver-leaf Wintergreen
<u>P. grandiflora</u>	Lrg-flwd Wintergreen
<u>P. secunda</u>	One-sided Wintergreen
<u>Empetrum nigrum</u>	Crowberry
<u>Ledum palustre</u>	Labrador Tea
<u>Rhododendron lapponicum</u>	Lapland Rosebay
<u>Loiseleuria procumbens</u>	Alpine Azalea
<u>Andromeda polifolia</u>	Bog Rosemary
<u>Chamaedaphne calyculata</u>	Cassandra
<u>Arctostaphylos alpina</u>	Alpine Bearberry
<u>A. rubra</u>	Alpine Bearberry
<u>Vaccinium vitis-idaea</u>	Lingen Berry
<u>V. uliginosum</u>	Alpine Blueberry
<u>Oxycoccus microcarpus</u>	Swamp Cranberry
<u>Primula tschutschorum</u>	Chukch Primrose
<u>P. sibirica</u>	Siberian Primrose
<u>P. cunefolia</u>	Wedge-leaved Primrose
<u>P. egaliksensis</u>	Greenland Primrose
<u>P. borealis</u>	Northern Primrose

<u>Androsace chamaejasme</u>	Rock Jasmine
<u>A. septentrionalis</u>	Rock Jasmine
<u>Dodecatheon frigidum</u>	Shooting Star
<u>Trientalis europaea</u>	Star Flower
<u>Ameria maritima</u>	Thrift
<u>Gentiana algida</u>	Gentian
<u>G. dentosa</u>	Gentian
<u>G. prostrata</u>	Moss Gentian
<u>G. propinqua</u>	Four-parted Gentian
<u>Lomatogonium rotatum</u>	Star Gentian
<u>Menyanthes trifoliata</u>	Buckbean
<u>Polemonium acutiflorum</u>	Jacob's Ladder
<u>P. pulcherrimum</u>	Beautiful Jacob's Ladder
<u>Mertensia maritima</u>	Oysterleaf
<u>M. paniculata</u>	Tall lungwort
<u>Lagotis glauca</u>	Lagotis
<u>Castilleja caudata</u>	Paintbrush
<u>C. elegans</u>	Paintbrush
<u>Pedicularis verticillata</u>	Whorled Louse-wort
<u>P. labradorica</u>	Labrador Louse-wort
<u>P. parviflora</u>	Louse-wort
<u>P. langsдорffii</u>	Louse-wort
<u>P. sudetica</u>	Sudetan Louse-wort
<u>P. capitata</u>	Capitate Louse-wort

<u>P. Kanei</u>	Louse-wort
<u>Borschniakia rossica</u>	Porque
<u>Pinquicula vulgaris</u>	Common Butterwort
<u>P. villosa</u>	Hairy Butterwort
<u>Utricularia vulgaris</u>	Common Bladderwort
<u>Galium boreale</u>	Northern Bedstraw
<u>G. Brandegei</u>	Brandegee Bedstraw
<u>Linnaea borealis</u>	Twin-flower
<u>Adoxa moschatellina</u>	Moschatel
<u>Valeriana capitata</u>	Capitate Valerian
<u>Campanula lasiocarpa</u>	Mt. Harebell
<u>C. uniflora</u>	Arctic Harebell
<u>Solidago multiradiata</u>	N. Golden Rod
<u>Aster sibiricus</u>	Siberian Aster
<u>Erigeron numilis</u>	Fleabane
<u>E. eriocephalus</u>	Fleabane
<u>Matricaria matricarioides</u>	Pineapple Weed
<u>Tripleurospermum phaeocephalum</u>	Wild Comomile
<u>Chrysanthemum bipinnatum</u>	Tansy
<u>C. arcticum</u>	Arctic Daisy
<u>A. senjavinensis</u>	Wormwood
<u>A. tilesii</u>	Tilesius's Wormwood
<u>A. arctica</u>	Arctic Wormwood

Petasites frigidus

Arctic Sweet Coltsfoot

P. hyperboreus

Coltsfoot

Arnica lessingii

Arnica

A. frigida

Arnica

Senecio congestus

Marsh Fleabane

S. atropurpureus

Arctic Senecia

S. pseudo-arnica

Senecio

S. lugens

Black-tipped Groundsel

Saussurea angustifolia

Sausarrea

APPENDIX E: BUREAU OF OUTDOOR RECREATION STATEMENT -  
SALMON RIVER

The Salmon River possesses high quality scenic, wildlife, and primitive recreational values along its entire length. The river's exceptional combination of primitive setting, magnificent scenery and undisturbed flora and fauna provide a great potential for recreational uses such as hunting, fishing, boating, and nature study. Fish and wildlife values are high with a large run of chum salmon and a significant caribou population during certain times of the year being prime attractants.

The river's scenery and pristine water conditions make it exceptionally attractive for floatboating (canoeing, kayaking, rafting) and wilderness camping.

The Bureau of Outdoor Recreation believes that the management concepts presented in this report recommending the establishment of the Kobuk Valley National Monument are compatible with the intent of preserving selected river areas in a free-flowing condition for the benefit and enjoyment of present and future generations as prescribed by the Wild and Scenic Rivers Act. Consequently, separate legislation to designate this as a component of the National Wild and Scenic Rivers System will not be recommended by the Bureau of Outdoor Recreation if the Kobuk Valley National Monument is authorized by Congress.

Within the study area the Salmon River has been identified by the Bureau of Outdoor Recreation as having high potential for inclusion in the

National Wild and Scenic Rivers System as one of 40 such rivers in Alaska. Based upon available information it is the conclusion of the Bureau of Outdoor Recreation that the Salmon River meets the criteria established by the Congress for inclusion in the National Wild and Scenic Rivers System in that:

The river is in a free-flowing natural condition.

The river and its immediate environment possesses outstandingly remarkable values.

Water quality is excellent.

There is sufficient volume of water during normal years to permit, during the recreation season, full enjoyment of river related outdoor recreation activities.

The river and its immediate environment are capable of being managed to protect and interpret special values and protect the user.

The river is of sufficient length to provide a meaningful experience to the river user.

After careful consideration of the resource values involved and the Guidelines of Evaluating Wild, Scenic and Recreational River Areas, adopted by the Department of Agriculture and the Interior in February 1970, it is the conclusion of the Bureau of Outdoor Recreation that the Salmon River qualifies as a wild river.

APPENDIX F: RESOURCES HARVESTED IN THE NORTHWEST  
ALASKA NATIVE ASSOCIATION REGION

ESTIMATED WEIGHTS OF SUBSISTENCE HARVESTS  
(in pounds)

The following inventory data estimates were obtained in 1972 from a survey of individual households in each village of NANA representatives. Compilation was provided by the Joint Federal-State Land Use Planning Commission.

The estimates are on annual average of the resources harvested over a period of years.

Resource Harvested	Kotzebue	Noorvik	Kiana	Ambler	Kobuk	Shungnak	Total <sup>1</sup> NANA Region
Mammals	939,368	282,551	176,540	411,313	33,620	135,499	2,892,975
Fish	164,480	377,455	236,033	121,600	59,002	190,820	1,914,729
Wildfowl	2,463	1,947	1,219	3,885	9,550	12,690	47,017
Berries	14,865	17,054	10,600	14,630	5,553	11,543	98,791
Greens/Roots Vegetables	1,917	7,205	4,340	8,435	2,103	3,324	33,393
<b>Totals</b>	<b>1,123,093</b>	<b>686,212</b>	<b>428,732</b>	<b>559,863</b>	<b>109,828</b>	<b>353,786</b>	<b>4,986,905</b>

Native Enumeration July 1973	1,587	426	280	170	60	154	3,725
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Per Capita Harvest Weight (lbs.)	708	1,611	1,531	3,293	1,830	2,298	1,339
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For mammals, wildfowl and fish, weights are estimates of dressed weights for each resource. For berries, greens/roots/vegetables gross weights are given.

<sup>1</sup>Total includes harvests for villages of Deering, Buckland, Kivalina, Selawik, and Noatak.

ESTIMATED RESOURCES HARVESTED IN THE NORTHWEST ALASKA NATIVE ASSOCIATION REGION

The following inventory data estimates were obtained in 1972 from a survey of individual households in each village by NANA representatives. Compilation was provided by The Joint Federal-State Land Use Planning Commission.

The estimates are an annual average of the resources harvested over a period of years.

RESOURCES HARVESTED	KOTZEBUE	NOORVIK	KIANA	AMBLER	KOBUK	SHUNGNAC	TOTAL <sup>1</sup> NANA REGION	
							Number	Pounds
Black Bear		22	14	20	5	27	106	15,900
Brown & Grizzly		16	10	10		21	80	18,000
Polar Bear							1	450
Beaver		35	22	400		17	1,084	16,260
Caribou	5,000	1,381	863	2,500	180	525	14,219	2,132,850
Coyote							--	--
Deer (Reindeer)**		(75)	(47)				(608)	(76,000)
Fox (Arctic)	18						42	*
Fox (Red)	50	33	20	40	15	42	349	*
Goat							--	--
Hare (Arc. & Snow)	350	1,272	795	500	200	1,122	5,079	15,237
Land Otter	1	27	17	30		30	215	*
Lynx		28	18	10		20	95	*
Marmot		4	3	10		8	53	636
Marten				15	1	2	18	*
Mink	3	82	51	20		60	331	*
Moose	60	47	29	30	7	59	317	221,900
Muskrat	350	4,446	2,779	50	100	979	11,988	23,976
Porcupine	10	45	28	30	17	37	204	2,040
Sheep (Dall)	13	1	1	20		6	42	4,200
Squirrel (tree)		6	4	6		14	30	15
Squirrel (ground)	18	47	29	40		22	191	191
Weasel	3	32	20	10	3	10	105	*
Wolverine	12	26	16	20	8	32	256	*
Wolf	29	23	14	30	10	40	201	*
Seal (Bearded)	260	13	8				533	213,200
Seal (Hair)	90	79	49				909	72,720
Sea Lion							---	--
Walrus	3						9	9,000
Whale (Beluga)	50	17	11				244	146,400
Whale (Bowhead)**	(2,144)	(400)					--	(2,744)
Total pounds useable weight	939,368	282,551	176,540	411,318	33,620	135,499		2,892,975

\*Fur bearers: Not used for human consumption.

\*\*Reindeer bowhead whale: Generally purchased, some barter/trade.

<sup>1</sup>Total includes harvests for villages of Deering, Buckland, Kivalina, Selawik, and Noatak.

ESTIMATED RESOURCES HARVESTED IN THE NORTHWEST ALASKA NATIVE ASSOCIATION REGION

The following inventory data estimates were obtained in 1972 from a survey of individual households in each village by NANA representatives. Compilation was provided by The Joint Federal-State Land Use Planning Commission.

The estimates are an annual average of the resources harvested over a period of years

RESOURCES HARVESTED	KOTZEBUE	NOORVIK	KIANA	AMBLER	KOBUK	SHUNGNAK	TOTAL <sup>1</sup>	
							NANA	REGION
	<u>Pounds</u>	<u>Pounds</u>						
Arctic Cod								1,200
Blackfish		640	400	200		725		1,965
Burbot								--
Char/Pike	337	28,415	17,759	29,000	1,000	1,500		143,312
Flounder	30							38
Grayling	250	975	609	300	100	300		4,544
Halibut								--
Herring	2,500							2,550
King Cod								50
Needlefish								--
Coho/silver								1,500
Chum/Dog	1,146	90,475	56,547	2,000	1,399	2,125		209,090
Humpey/Pink	50	5,670	3,544	200	50	175		10,069
King/Chinook	100	370	231					701
Sockeye/Red								--
Shark (Mud)	265	10,097	6,311	4,000				22,253
Sheefish	138,300	75,085	46,928	30,500	9,200	62,000		447,092
Sucker		1,668	1,043	1,000	300	1,200		5,211
Smelt	840	17,655	11,034		783	2,000		39,375
Tomcod	8,000							8,200
Trout	10,000	18,001	11,250	500	370	250		209,921
Whitefish								
(shortnose)	2,647	61,400	38,500	25,800	20,000	62,125		322,672
Whitefish (longnose)		59,794	37,371	25,100	20,000	50,220		276,155
Whitefish (small)		7,210	4,506	3,000	5,800	8,200		208,816
Clam/crab/shrimp	15							15
<hr/>								
Total pounds useable weight	164,480	377,455	236,033	121,600	59,002	190,820		1,914,729
	<u>Number</u>	<u>Pounds</u>						
Auk/Murre/Puffin							200	220
Crane	2			5		16	37	555
Ducks	554	637	400	1,000	2,500	6,225	17,716	17,716
Geese				500	1,000	1,200	3,650	14,600
Swan							--	--
Ptarmigan	1,819	1,023	639	700	3,000	1,125	11,726	11,726
Spruce hen/Grouse	12	77	48	50	50	60	362	362
White (Snowy) Owl	8	35	22	10		40	223	1,338
Harvest Eggs							(3,000)	500
<hr/>								
Totals + Pounds	2,463	1,947	1,219	3,885	9,550	12,690		47,017

<sup>1</sup> Total includes harvests for villages of Deering, Buckland, Kivalina, Selawik, and Noatak.

ESTIMATED RESOURCES HARVESTED IN THE NORTHWEST ALASKA NATIVE ASSOCIATION REGION

The following inventory data estimates were obtained in 1972 from a survey of individual households in each village by NANA representatives. Compilation was provided by The Joint Federal-State Land Use Planning Commission.

The estimates are an annual average of the resources harvested over a period of years.

RESOURCES HARVESTED	KOTZEBUE	NOORVIK	KIANA	AMBLER	KOBUK	SHUNGNAC	TOTAL <sup>1</sup> NANA REGION
	<u>Pounds</u>						
<b>BERRIES</b>							
Blueberries	3,262	6,763	4,200	4,500	2,000	5,662	37,650
Blackberries	7,175	2,445	1,530	3,100	600	2,555	19,452
Cranberries	1,571	2,920	1,825	7,000	2,579	2,756	19,768
Crowberries		12					112
Currants		190	120				310
Gooseberries		50					50
Salmonberries	2,857	4,506	2,820	30	374	450	20,765
Strawberries		168	105			120	684
<b>Totals - Berries</b>	<b>14,865</b>	<b>17,054</b>	<b>10,600</b>	<b>14,630</b>	<b>5,553</b>	<b>11,543</b>	<b>98,791</b>
<b>GREENS/ROOTS</b>							
Firewood	18	103	70			90	306
Grass Roots	19	485	300			300	1,164
Rose Hips	5	63					96
Sourdock	1,625	2,725	1,700	50		68	7,818
Tundra/Alaska Tea		20		10		32	95
Willow Leaves	99	220	140	100		5	765
Wild Roots	25	100	60	50			235
Sudikroak	18			25			72
Tinnik		370	230	100		500	1,270
Tree Gum		17				6	38
<b>Totals - Green/Roots</b>	<b>1,809</b>	<b>4,103</b>	<b>2,500</b>	<b>335</b>		<b>1,001</b>	<b>11,859</b>
<b>VEGETABLES (Wild)</b>							
Celery	1	162	100				631
Eskimo Potato (Musse)	88	1,405	880	1,500	1,100	1,200	6,768
Mushroom						1	61
Onions	6	115	70	600	3	12	821
Rhubarb	13	1,420	890	6,000	1,000	1,110	12,473
Spinach							780
<b>Totals - Vegetables</b>	<b>108</b>	<b>3,102</b>	<b>1,940</b>	<b>8,100</b>	<b>2,103</b>	<b>2,323</b>	<b>21,534</b>
<b>Totals: Berry/Green/ Vegetable</b>	<b>16,782</b>	<b>24,259</b>	<b>15,040</b>	<b>23,065</b>	<b>7,656</b>	<b>14,867</b>	<b>132,184</b>

<sup>1</sup>Total includes harvests for villages of Deering, Buckland, Kivalina, Selawik, and Noatak.

APPENDIX G: A CONJECTURAL HISTORY OF THE BERING LAND BRIDGE  
AND A SUMMARY OF CULTURAL TRADITIONS IN ALASKA  
SINCE THE END OF THE PLEISTOCENE

1. The Bering Land Bridge: The findings of geology, archeology, anthropology, paleontology, paleobotany, and other disciplines have for many years coalesced to support the assertion that the Native populations of the Western Hemisphere--the Indians, Eskimos, and Aleuts--descended from peoples who entered America from Asia over an adjoining expanse of land where the Bering Sea now flows. This now-submerged land area is usually termed the Bering Land Bridge, and is sometimes called Beringia.

Any discussion of the postulated history of the Bering Land Bridge and its human population must be prefaced by a few cautionary considerations. First, there have not yet been archeological finds in Alaska that undeniably prove the presence of man in the area before 8,000 to 10,000 years ago. Much earlier finds have been located farther south in North America. The essentially Mongoloid genetic heritage of the American peoples, however, is undeniable. Further, the earliest known peoples in Alaska must have had antecedents, and the similarity of their artifacts to those found in Asia point to a commonality of origin. Enough data have been collected in America and Asia to permit a plausible reconstruction of the approach of man to the New World.

Second, there probably were no actual "migrations" into America. Because of the extent of the land bridge--over 900 miles from north to south at

the widest point--the area was more likely inhabited by shifting populations of migratory hunters who did not envision a passage between two land masses that were not then distinct. The interior landscape of the land bridge was primarily a low rolling plain with little relief. The climate was very dry and consisted of "steppe-tundra," with few bogs and swamps, although thaw ponds would be present (Information presented at the All Union Symposium on the Bering Land Bridge, May 10-15, 1973, Khabarovsk, U.S.S.R.).

The essentially treeless, frozen expanse of land in the bridge was but a continuation of the environment on either end, and that environment with its large Ice Age herbivores permitted but a logical extension of the cultures of the far north, the peoples of which pursued game in small family bands. Movements of peoples would have been influenced by the necessities of the hunt, and the total population would never have been heavy. When the ice retreated with the end of the Ice Age and the resultant rise in sea level separated the continents, a remnant population existed in America to form the nucleus of a future aboriginal population. The permanent presence of man in the Americas, then, was not the result of conscious movement, but rather of the accident that the rise of the seas separated peoples in Alaska from their fellows in Siberia.

Third, our evidence of man's presence at very early dates and of his movements in the Old World and the New relate to the diffusion of technological traits--artifacts--rather than to positive observations

of the movements of peoples themselves. Similarly, as we observe the cultural development of arctic man, we must recognize that peoples and their cultures may not always coincide: the same culture may be exhibited by genetically distinct populations; the same genetic group may exhibit different cultural identities in different places; and changes in cultures may result, singly or in combination, from local innovation, the infusion of new ideas, the infusion of new peoples bearing new ideas, or the wholesale replacement of peoples and cultures.

Fourth, the present Native populations of the Americas do not descend from simply one "migration," but rather represent the descendents, intermingled to varying degrees, of peoples who appeared on the continent at various times over thousands of years. As each new group became established it proceeded to develop its own "American" culture, influenced by the cultures of its neighbors, new cultural elements coming from Asia, and its own cultural heritage--and in turn influencing others on the continent, or passing "American" cultural developments back even to Siberia.

Further, a relatively wide variety of physical types characterized American peoples, representing genetic developments since the establishment of early populations in the western hemisphere. Essentially, the early advent of Asian man into America paralleled the progressive rise of "Mongoloid" physical types in Asia, so that later entrants into the American population were probably progressively more Mongoloid. The earliest residents of America were likely pre-Mongoloid, rather long-headed peoples, who were followed through the millennia by progressively

more round-headed pre-Mongoloids, proto-Mongoloids (such as, perhaps, the ancestors of the Athapascans of Alaska, Canada, and the Southwest), and probably the latest entrants to the New World, the early Mongoloid ancestors of the Eskimos and Aleuts. However, detailed, positive evidence on this question is still sketchy, and there is no assurance that additions to the American population did not occur long after the land bridge had ceased to exist. Further, it cannot be stated categorically that identifiable, fairly recent peoples manifesting particular cultures necessarily descend genetically from the bearers of those cultures in the same area, but may in contrast represent the descendants of later peoples who supplanted earlier populations but continued the same cultural assemblage and development.

Fifth, in view of the postulated environment and human presence on the Bering Land Bridge and adjacent areas in Asia and America, the population probably consisted of a relatively few small bands of hunters and their families at any one time. This would mean that the numbers of people in Alaska during and immediately following the Ice Age would also be small, leaving limited traces that are difficult to discover. However, assuming a modest average increase per generation (20 years) of 1.4 percent, an original group of 400 individuals could have increased to 10,000,000 in 15,000 years (Laughlin, 1967). Accordingly, not only would a large influx of people be unnecessary to assure the population of the Americas in its recognized variety, but both established data and statistical logic militate against the false impression of a mass migration across the Bering Land Bridge of a horde of people bent on discovering a new continent.

At the risk of oversimplification, and to the neglect of volumes of data that bear on the question, the following is, in brief outline, a conjectural history of the Bering Land Bridge and its influence in American prehistory.

The great ice sheets that have several times in the past radiated from the polar zones to scour the continents absorbed enormous quantities of water from the oceans, significantly lowering the sea level. When the glaciers melted, water returned to the sea, raising their level and flooding previously dry land. The lowering of the sea level proceeded much faster than the overland spread of glaciers, while the rise of the seas similarly occurred ahead of the noticeable retreat of glaciers. The early periods of glaciations, then, presented broad expanses of new land available for living and hunting in advance of the constrictions produced by advancing ice sheets. And the great processes of nature are so ponderous that no man would be likely to notice in his lifetime that such events were occurring.

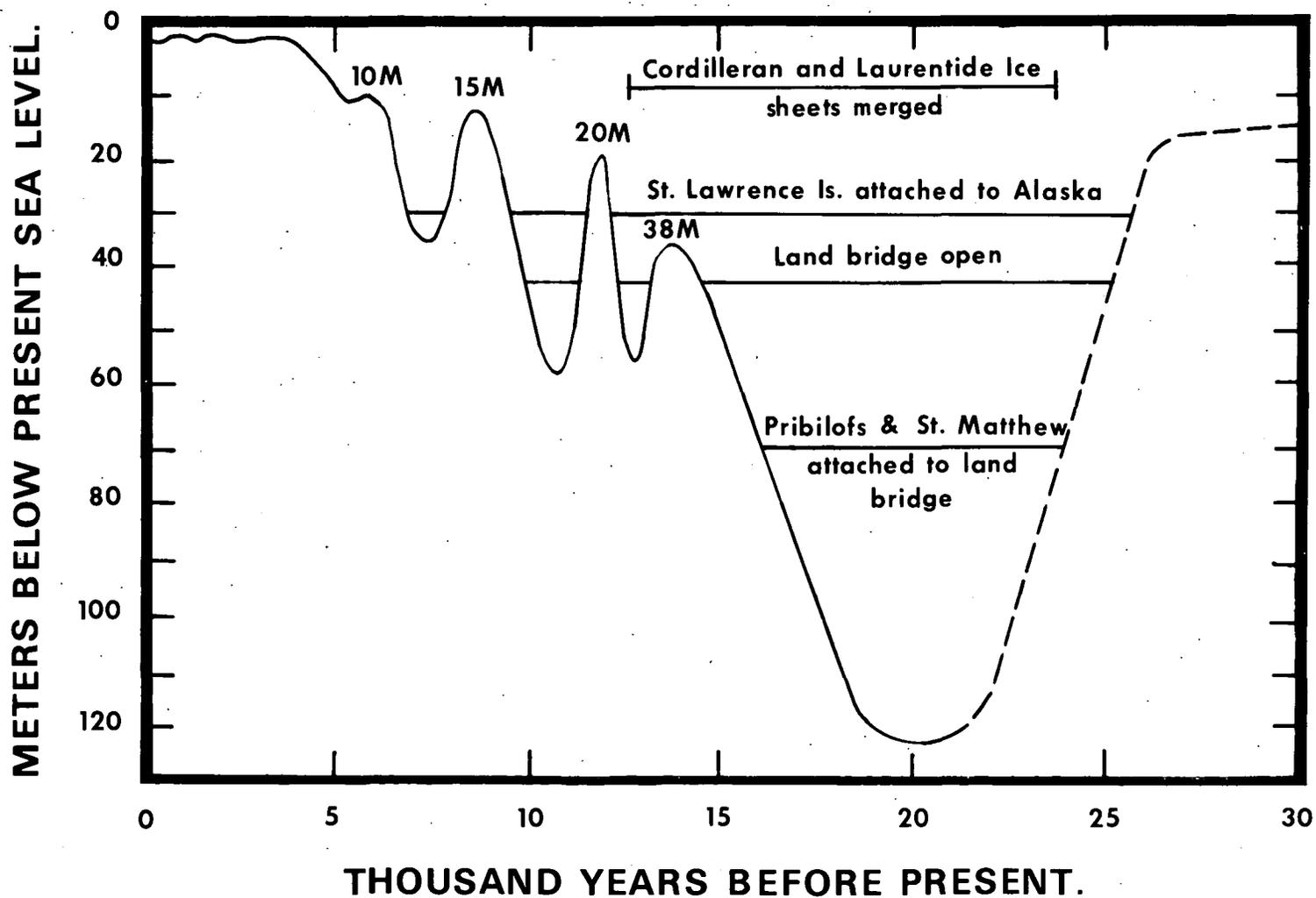
Three periods of glacial advance--and consequent opening of the Bering Land Bridge--bear on the history of human movements into the Americas. The land bridge was open about 40,000 years ago, but the question of human intrusion into the Western Hemisphere at that early date is problematic. There have been discoveries of stone-tool cultural remains in North America, possibly indicating the presence of "pre-projectile point" culture type (that is, projectile points have not been discovered among the artifacts) comparable to those existing in the Old World after 40,000 years ago. However, none of these finds

has been indisputably dated, nor have they been adequately correlated with the dating of human advance across Asia. Consequently, it must remain for future investigators to positively determine whether men may have entered America during the first of the glacial advances discussed here.

More advanced material cultures probably appeared in Alaska during the next glacial advance. During an approximately 5,000 year period from about 28,000 to about 23,000 years ago, the Bering Land Bridge was again open. Hunting peoples were adapted to the cold north, making stone artifacts of a type, termed Mousteroid, related to those in northern Europe, existed in eastern Asia and probably pushed into the Land Bridge to live and to hunt the Ice Age mammals that supported their existence. At least during the later portion of the period, projectile points were part of their artifactual assemblage. It is highly likely that these people expanded into what is now known as Alaska. Further, some of them probably intruded farther south and east into the continent before converging glaciers may have closed the route from Alaska.

While it is unlikely that the resurgent sea could have totally isolated Alaska from the influences of Asia, any population in the interior of North America may have continued its cultural development free of other influences. The Llano culture complexes of North America probably represent the presence of this population, whose technologies later may have returned to influence developments in the north after the end of glaciation.

FIGURE 9



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Speculative reconstruction of the history of sea level during the last 30,000 years in the Bering Sea area (Hopkins, 1967) (p. 464)

By about 15,000 years ago, a somewhat more complex culture--called Aurignacoid after its European origins--was present on the Siberian plains. For a comparatively brief period--1,000 to at most 3,000 years--beginning in the period 15,000 to 13,000 years ago, the land bridge was open again, and man again availed himself of the opportunities provided by new hunting grounds. The population of Alaska probably increased somewhat as a result of influx, and certainly the blend of old and new culture types furthered cultural development. Asiatic man was gradually becoming more Mongoloid, and it is likely that the populations of the Bering area varied in both physical type and culture. Inland; the hunting peoples who pursued the game probably shared the general ancestry of their pre-Mongoloid predecessors in the land bridge. However, it is possible that the coasts of the land bridge also were occupied by more nearly Mongoloid, marine-oriented peoples who may have been ancestors--cultural, if not genetic--of the Eskimos and Aleuts. As the ice began to melt and the land bridge ebbed before the sea, the ancestral Indians of the interior were benefited by the arrival of new artifacts and techniques that added to the diversity of cultures and life-ways that already characterized the Indians of the Americas. The sea-oriented peoples, sharing in the cultural interchange, probably continued to hug the retreating coastline, and as their population expanded and migrated, spread through the millennia across the Arctic to Greenland. The arctic tree line may have been the demarcation between "Indian" and "Eskimo" as long ago as the final closing of the Bering Land Bridge, some 11,000 years ago. The result, millennia later, of the cultural development

bifurcated at this period was, on one hand, the variety of peoples and cultures throughout the Americas comprehended by the term "Indian," and on the other, the rich and unique Eskimo culture evidenced from Siberia to Greenland.

The closing of the Bering Land Bridge did not serve to totally isolate Asia from America, although the separation was enough that the Native cultures developing in America thereafter can be regarded as truly American. Nonetheless, the peoples living on either side of the gap continued for millennia to influence and be influenced by each other. And despite the possible presence of sea-oriented cultures at the end of the period of glaciation, the possibility cannot be discounted that the true ancestors of the Eskimos migrated to America by sea as recently as 5,000 or less years ago.

(References for this section: Hopkins, 1967; Muller-Beck, 1967; Laughlin, 1967; Willey, 1966; Giddings, 1967; Bandi, 1969.)

2. Summary of Cultural Developments in Alaska since the End of the Ice Age: By 11,000 years ago, the tree line that marks the boundary between the Arctic and the subarctic may have become the line separating two main cultural types: the arctic cultures that would eventually be recognized as characteristic of the Eskimos, and the Indian cultures of the subarctic. There was certainly cultural interaction across the tree line as well as across the Bering Straits. Until about 3,000 years ago the lines of development of the sea-oriented Arctic way of life can be traced as the ancestral line of historic Eskimo culture,

but unfortunately skeletal evidence is lacking that would positively identify the peoples of the arctic coast as the genetic antecedents of the Eskimos. Similarly, while the basic lines of the development of subarctic cultures can be traced, it is likely that the movements of peoples prevent assured judgements that today's subarctic Indians are the actual descendents of the area's residents of many millennia ago.

The earliest identified archeological complex in the far north is called British Mountain. It is represented in discoveries in northwestern Alaska and on the Arctic coast of Yukon Territory of crude stone choppers, scrapers, and unifacial projectile points. Despite the lack of firm dating, the complex is probably very old, and may in some elements predate similar artifactual types found in the North American high plains and Pacific coast regions.

If so, they could well mark the southward migrations of some of the first hunters to enter the New World by way of a Bering Strait land bridge in Pleistocene times and, as such, could be the first technical traces of the North American Big-Game Hunting and Old Cordilleran traditions (Willey, 1966). The possibility remains that these finds could represent an Arctic backwash of artifactual types from the south.

The Plano point horizon, derived from areas in the northern Great Plains and the Great Lakes between about 9,000 and 5,000 years ago, is marked in the Arctic and subarctic. The projectile points that characterize this complex are lanceolate and frequently parallel-flaked. The presence of these points may represent a northern movement of buffalo hunting peoples after the end of glaciation.

Perhaps overlapping the Plano point horizon in time is the Northwest Microblade Tradition. This primarily western culture was prominent in the subarctic interior of Alaska, but may be found in some Arctic coastal areas. It is peculiarly characterized by microblades and certain types of burins--traits that almost certainly came from Siberia. "Possibly it was associated with migrations from Asia. . . and it may be that the ancestors of the later Athapascan Indians of the western subarctic entered the New World at this time" (Willey, 1967). The cultural tradition represented actually a blend of American and Asiatic elements. It probably began around 8,000 years ago, and by 6,000 to 5,000 years ago had died out in many areas, persisting in the forests of the western subarctic as late as 4,000 to 3,000 years ago.

Around 6,000 to 5,000 years ago, the Arctic Small-Tool Tradition developed in the western Arctic; it is best represented along the Bering Sea coast by the Denbigh culture. Building on elements definitely deriving from Siberia, the tradition is primarily expressed in a core and bladelet industry evidencing excellent craftsmanship. The tiny points, side-blades, and burins were much smaller and more finely made than those that characterized the Northwest Microblade Tradition, and can be found from Alaska to Greenland. The environment of the tradition was definitely the arctic coastal tundra, and the tools indicate that the people who made them were both sea mammal and land game hunters. "Its geographical distribution, its apparent ecological adaptation, and its chipped-stone technology all suggest that the Arctic Small-Tool Tradition was the American Arctic base culture for the subsequent

development of the Eskimo culture tradition. It may be that its bearers, who in many places were the first people ever to explore the far northern Canadian Arctic and Greenland, were of Eskimo physical type, although this thesis cannot yet be proved" (Willey, 1967).

The Eskimo cultural tradition is clearly defined after 3,000 years ago, and can be broken into four subgroups: Pacific-Aleut, a somewhat divergent manifestation, derived from the Arctic Small-Tool Tradition and adapted to the rather milder climate of the Aleutians and the Pacific Coast of Alaska, with some Asiatic influences; the Choris-Norton-Near Ipiutak, clearly developed from the Arctic Small-Tool Tradition, centered at Norton Sound and southward, and somewhat less well adapted to sea mammal hunting than the Northern Maritime; Northern Maritime, the most viable of the Eskimo subtraditions, originating on both the Asiatic and Alaskan sides of Bering Strait and on St. Lawrence Island, rising in its Okvik and Old Bering Sea phases, and spreading northward and westward across the Arctic in the Birnirk and Thule phases, and representing the classic sea mammal and whale hunting Eskimo culture that persisted into modern times; Dorset subtradition, the eastern branch of Eskimo culture, representing in the Hudson Bay to Greenland-Newfoundland area a blend of the Arctic Small-Tool Tradition with newer elements from the west, and superseded after about 900 years ago by the Thule phase of the Northern Maritime subtradition.

The cultural history of the subarctic falls into two primary traditions, Eastern and Western. Alaska's subarctic falls into the latter. It is termed the Denetasiro Tradition, and seems to have developed consistently from the earlier Northwest Microblade Tradition to the present day. However, extensive archeological data on the prehistory of the Denetasiro Tradition are lacking, but the culture is more fully studied through Athapascan ethnography.

(References for this section: Willey, 1966; Giddings, 1967; Bandi, 1969.)

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