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A PROPOSAL

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INFORMATION BASE



GATES OF THE ARCTIC

NATIONAL WILDERNESS PARK AND NUNAMIUT NATIONAL WILDLANDS

ON MICROFILM
#4

Errata

1. The official name of this proposed unit of the National Park System has been modified to:

   Gates of the Arctic National Park

2. Recommendations for wilderness designation within the area will be deferred pending public hearings.

3. The Nunamiut National Wildlands proposal has been modified as follows:

   a. The separate name has been removed; the lands included by that proposal now to be included within the Gates of the Arctic National Park.

   b. The provisions for legislatively establishing joint administration of the wildlands portion of the proposal by the NPS and a Native corporation have been removed. The Secretary, through the NPS,shall seek cooperative agreement with the Native corporation for mutually compatible administration of the lands.

NATIONAL PARK SERVICE
Alaska Task Force Office
524 W. 6th Ave., Rm. 201
Anchorage, Alaska 99501

Written comments on this proposal must be received at the address below by March 20, 1974. Comments received after that date will not be considered in preparation of the final environmental statement. Alaskan residents are urged to send all comments via air mail to assure their arrival in time for inclusion in the final statement.

Send comments to:
Theodor R. Swem, Chairman
Alaska Planning Group
United States Department of the Interior
Washington, D.C. 20240

PROPOSED

GATES OF THE ARCTIC
NATIONAL WILDERNESS PARK
AND
NUNAMIUT
NATIONAL WILDLANDS
ALASKA

Draft

Environmental Impact Statement

Prepared by

Alaska Planning Group
National Park Service
U.S. Department of the Interior

December 1973

Theodor R. Swem

Chairman, Alaska Planning Group

SUMMARY

(x) Draft ( ) Final Environmental Statement

Department of the Interior, National Park Service

1. Type of Action: Legislative and Administrative

2. Brief Description of Actions:

The National Park Service proposes that, via Congressional action, the Gates of the Arctic National Wilderness Park and Nunamiut National Wildlands be established from lands and waters removed from public domain under provisions of the Alaska Native Claims Settlement Act and the Noatak, Alatna, Tinayguk, Killik (including Easter Creek), and the North Fort of the Koyubuk Rivers be designated Wild Rivers under the provisions of the Wild and Scenic River Act. The National Park Service also proposes a master plan to guide the administration of the national wilderness park, national wildlands, and the national wild rivers.

3. Summary of Environmental Impact:

The proposal may affect: (A) the integrity of the ecosystem and landscape within the proposed boundaries, including the wildlife, vegetation, water quality, and visual aesthetics; (B) the continuation of subsistence use of the area by the Natives and commercial and sport fishing, mining, mineral entry, geothermal power, tourism, communication, and transportation; and (C) the socio-economic and cultural environment of the local area following development of visitor facilities and program and visitor use of the area.

4. Alternatives Considered:

(A) No Action; (B) Alternative Land Management Concepts; and (C) Alternative Boundary Configurations.

5. Comments Have Been Requested from the Following:

See attached pages.

6. Date Made Available to CEQ and the Public:

Draft 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 the 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:

- Arctic Slope Borough
- City of Kotzebue

Kiana Village Council
Ambler Village Council
Shungnak Village Council
Kobuk Village Council
Anaktuvuk Pass Village Council
Allakaket Village Council
Wiseman Village Council
Fairbanks North Star Borough

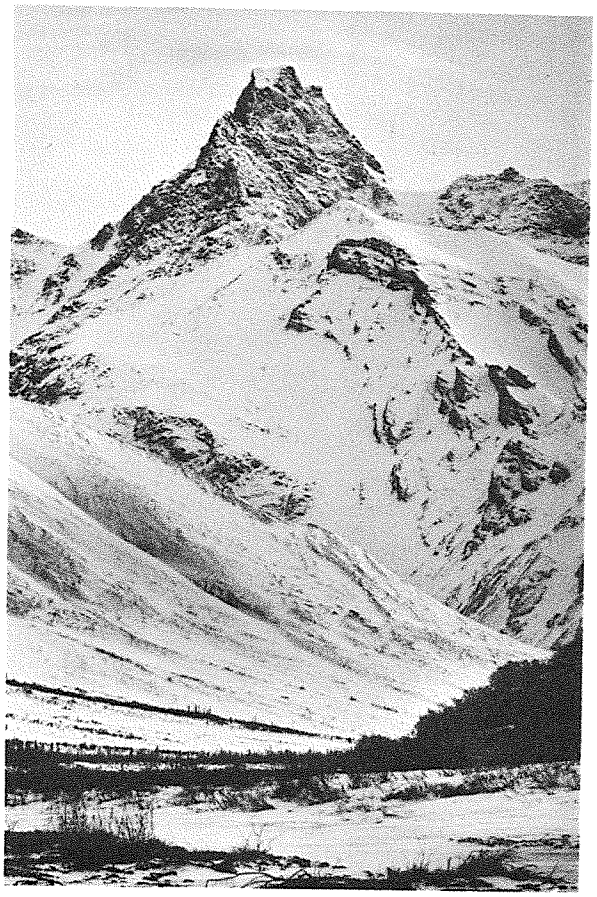
NATIVE ORGANIZATIONS:

Arctic Slope Regional Corporation
NANA Regional Corporation, Inc.
Kotzebue Native Village Corporation
Kiana Native Village Corporation
Ambler Native Village Corporation
Shungnak Native Village Corporation
Kobuk Native Village Corporation
Alaska Federation of Natives
Alaska Native Foundation
Mauneluk, Inc.
Doyon, Inc.
Barrow Village Native Corporation
Allakaket Village Native Corporation
Evansville Native Corporation
Tanana Chiefs Conference
Alatna Village Native Corporation
Hues Village Native Corporation

OTHER ORGANIZATIONS:

Sierra Club
Friends of the Earth
The Wilderness Society
National Parks and Conservation Assocation
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

Mount Doonerak



Gates of the Arctic. Boreal Mountain at left.

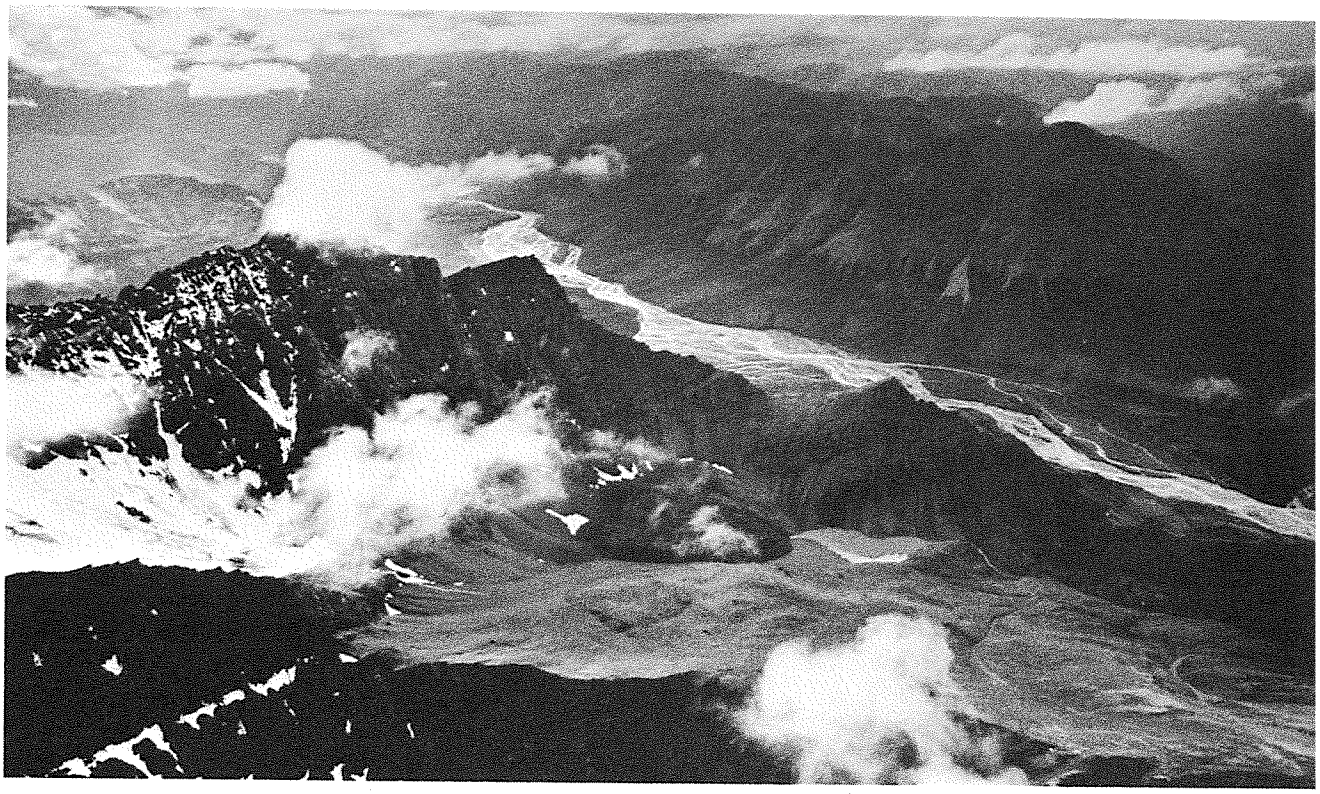


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I. DESCRIPTION OF THE PROPOSAL

The National Park Service, Department of the Interior, proposes (1) legislative establishment of a Gates of the Arctic National Wilderness Park and a Nunamiut National Wildlands in the Central Brooks Range of Alaska; (2) inclusion of those portions that are within the park of the Alatna, Noatak, Killik (including Easter Creek), Tinayguk, and North Fork of the Koyukuk Rivers as Wild Rivers in the National Wild and Scenic Rivers System; and (3) administrative action to adopt a conceptual master plan to guide management and development of the park and wildlands.

A. LEGISLATIVE PROPOSAL

1. Legislative Provisions

As a result of studies undertaken under provisions of the Alaska Native Claims Settlement Act (ANCSA), the National Park Service (NPS) proposes Congressional establishment of a 7,130,000 acre Gates of the Arctic National Wilderness Park (also referred to as the park) and a 2,390,000 acre Nunamiut National Wildlands (also referred to as the wildlands). Both units so established would become part of the National Park System, with the Wilderness Park and National Wild Rivers to be administered NPS as a natural area and part of the National Wilderness Preservation System, the wildlands to be jointly administered by the NPS and a Native corporation. Lands within the proposed park include approximately the following:

d-1	-	700,000 acres
d-2	-	5,600,000 "
dual d-2/Native regional deficiency	-	760,000 "
Native regional deficiency	-	70,000 "
Total		7,130,000

In the wildlands approximate acreages are:

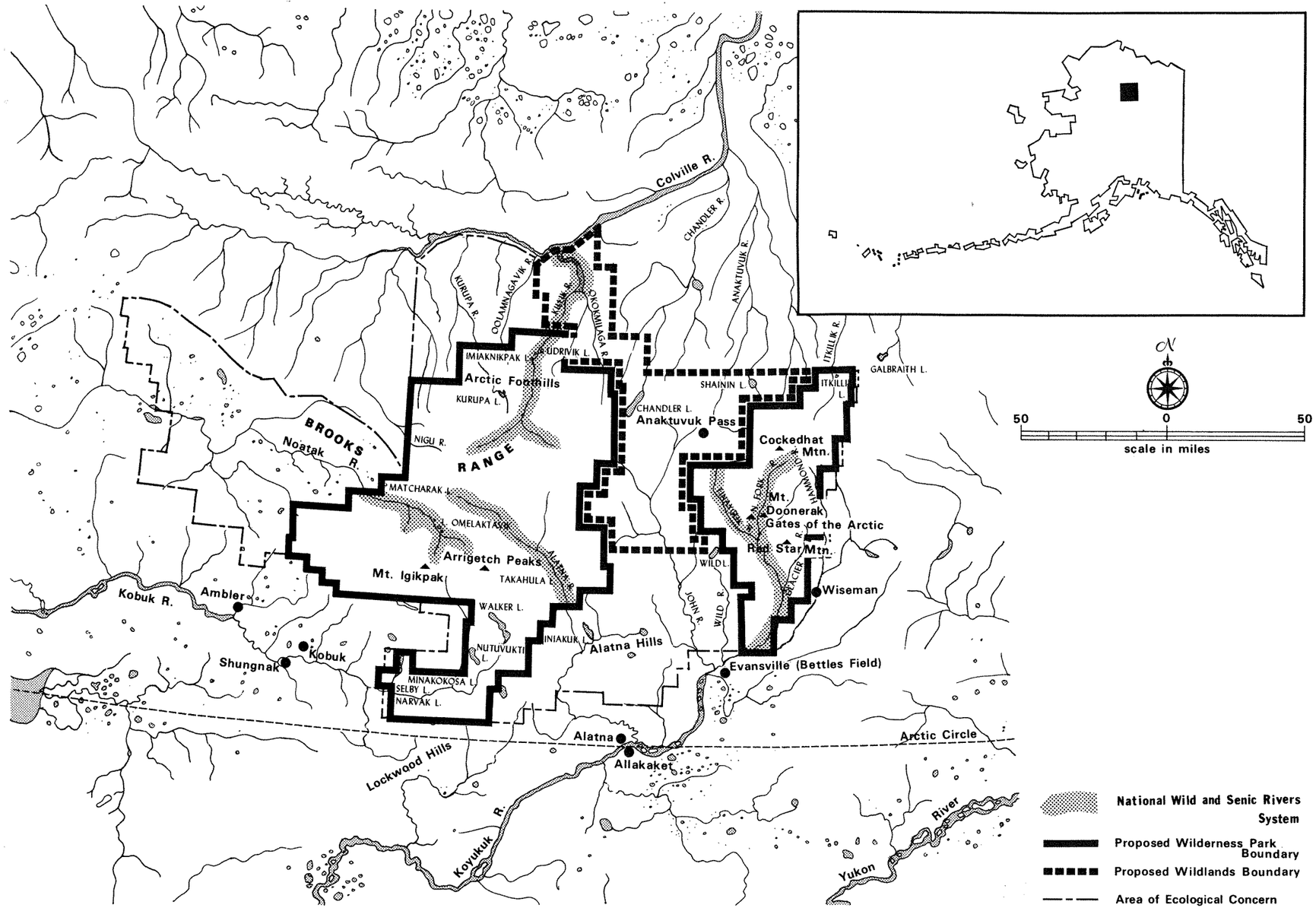
d-2	-	380,000 acres
d-1	-	640,000 "
dual d-2/Native regional deficiency	-	920,000 "
Native regional deficiency	-	450,000 "
Total		2,390,000

(See The Proposal map.)

Because of its unique resources and situations, the Gates of the Arctic National Wilderness Park would be the only area of the National Park System to be designated as wilderness by the legislation that creates it. The designation "wildlands" is also new to the National Park System and here is to include lands which have significant wildlife, scenic, recreational, and Native cultural resources which will be jointly administered by the NPS and the Arctic Slope Regional [Native] Corporation.

Other proposed legislative provisions include; (1) that the park 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, the Secretary of the Interior (the Secretary) is directed that 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 use of a resource demonstrates that continued subsistence uses may result in a progressive reduction of

The Proposal



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animal or plant resources which could lead to long-range alterations of ecosystems, the NPS, following consultation with communities and affected individuals, shall have the authority to restrict subsistence activities in part or all of the wildlands. The Secretary may authorize snowmobile use for subsistence purposes within the park. (3)that the Secretary may permit ingress and egress to and from the park by aircraft, but only on designated waters in the park; (4) that the Secretary of the Interior be authorized to enter into cooperative agreements for the management, protection, and public use of the park and wildlands and for the conduct of scientific research; (5) that the Secretary of the Interior be directed to acquire those private lands and/or interests within the established boundaries that are necessary for preservation and interpretation of the park's and wildlands' cultural and natural resources; (6) that authority be granted to acquire properties outside the park and wildlands for administrative purposes; and (7) that sport hunting will be allowed, with the Secretary to designate zones where and establish periods when no hunting may be permitted. The Secretary will report to the Congress within 10 years on the effect of all hunting, fishing, and trapping, including subsistence, and continue to report every five years thereafter. These reports must contain the Secretary's recommendations as to whether any or all such uses shall be continued.

2. Purposes

Gates of the Arctic National Wilderness Park: The purpose of the Gates of the Arctic National Wilderness Park is to preserve and protect an area

of the Brooks Range and its foothills in its pristine and undeveloped character for the benefit and education of present and future generations.

Nunamiut National Wildlands: The purpose of the Nunamiut National Wildlands is to assure that the outstanding cultural, natural, and recreational resources in the area are managed in a manner which will perpetuate the resource values for public use and benefit, and at the same time, complement similar values in the adjacent Gates of the Arctic National Wilderness Park.

B. ADMINISTRATIVE ACTION

1. General

Associated with the legislative proposal is the adoption of a suggested conceptual master plan to guide the management of the park and wildlands.

A conceptual master plan outlines the general management philosophy for an area and establishes broad guidelines for future planning, management, and development to ensure full protection for the resources while providing optimum public use.

The proposed conceptual master plan is tentative in nature, is designed to be initiated approximately 10 years after authorization of the area, and would probably be relevant for a maximum period of 20 years thereafter. The plan, in any event, will be frequently reviewed and updated, especially as new data are obtained and as circumstances change. Major reviews will occur at 8 to 10 year intervals and new impact statements prepared on major revisions of the plan. The following are general provisions of the proposed conceptual master plan.

2. The Wilderness Park

a. Management Objectives

(1) General

(a) Manage the national wilderness park as a wilderness and natural area within the National Park System.

(b) Provide for an orderly sequence of research, planning, and management to attain the legislative purposes.

(c) Cooperate with Federal, State, and local agencies and with Native corporations to achieve desired resource management objectives and to promote compatible use of areas adjacent to the park.

(2) Resource Management

(a) Develop a Resource Management Plan, based on research studies and aimed at maintaining a primitive environment where natural processes regulate the ecosystem.

(b) Develop and implement a viable research program.

(c) Monitor the intrusion of aircraft use upon the wilderness user and modify use as may be required to retain the wilderness atmosphere.

(d) Insure continued subsistence uses while protecting the resources for the benefit of present and future generations.

(e) Establish a program to implement and monitor "fair chase" hunting, in a manner which will recognize subsistence needs and the need to safeguard wildlife resources.

(3) Visitor Use

(a) Determine appropriate levels of visitation in relation to the various resources, seasons and visitor uses and provide planning which will obtain maximum allowable

use and maximum control of use within the purpose of the park under a reservation and permit system.

(b) Provide visitors with orientation, information, and interpretive services that will aid them in safe enjoyment of the areas and help them recognize personal actions that will have an impact on the environment.

(c) Develop an interpretive theme which (1) portrays man's present and future relationship to , influences on, and influences receivable from the environment, and (2) portrays the interrelationships of the flora, fauna, physical features, and climate of the area.

b. Development and Use

Developments in the park would be limited to a few ranger stations and patrol cabins or caches. Access would be by foot, canoe, or aircraft, with landings only on designated bodies of water, or, by special permit, on ponds, gravel bars, or snow. Private airplane mooring would be permitted on a few of the larger lakes; other aircraft would leave the park after bringing in park users. Controlled aerial sightseeing would be provided, as well as guide services for wilderness trips, both probably by concessionaires. Use would be by reservation and permit only and would be held to a level below that requiring special campsites, sanitary facilities, trails, and other developments usually needed to channel and mitigate environmental impact. "Fair chase" sport hunting will be allowed

subject to controls to assure resource preservation. Administrative offices will be located at Fairbanks with field headquarters at Bettles. Overall administration would be as a unit under the Alaska State Office in Anchorage. (See General Development map.)

3. Nunamiut Wildlands

a. Management Objectives

(1) General

(a) Manage the National Wildlands as a unit of the National Park System in accordance with existing policies and procedures as are appropriate to the purpose for which the area was established and in accordance with an approved Wildlands Management Plan.

(b) Administer the wildlands in conjunction with the Gates of the Arctic National Wilderness Park as a unit under the Alaska State Office in Anchorage with an administrative office in Fairbanks and a field headquarters at Anaktuvuk Pass or other location identified in the Wildlands Management Plan.

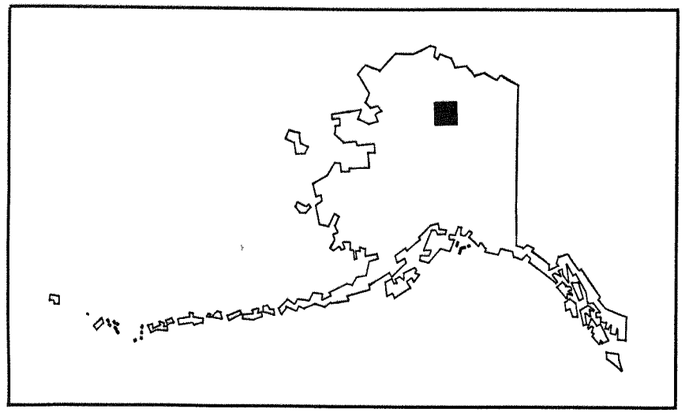
(c) Develop cooperative management agreements with local, Native, State and Federal agencies to assure compatible use of adjacent lands.

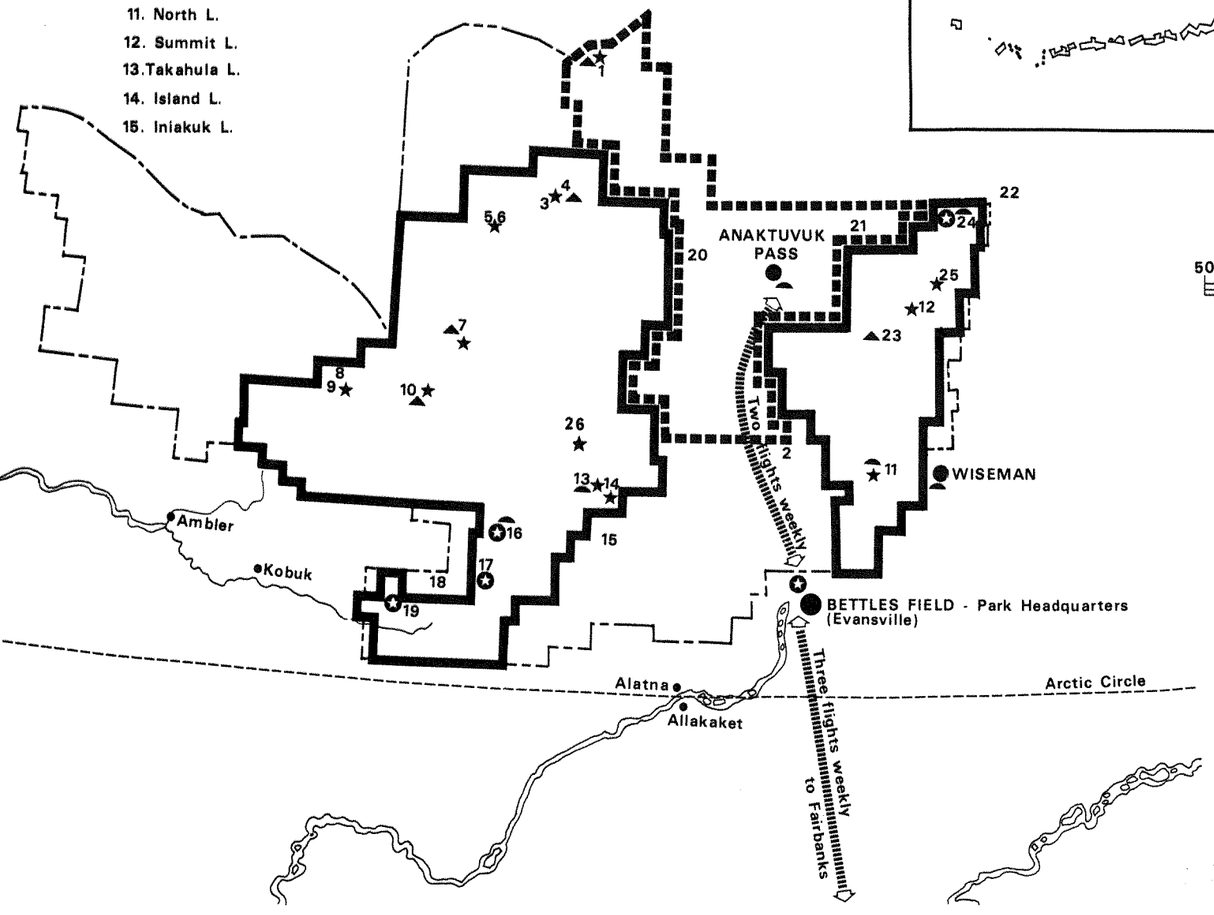
(2) Resource Management

(a) Develop a resource management plan aimed at maintaining a primitive environment where natural processes

General Development

1. Killik & Colville Rivers
2. Wild L.
3. Imiaknikpak L.
4. Lake Udrivik
5. Kurupa L.
6. Cascade L.
7. Alatna L.
8. Lake Matcharak
9. Lake Isiak
10. Omelaktavik L.
11. North L.
12. Summit L.
13. Takahula L.
14. Island L.
15. Iniakuk L.
16. Walker L.
17. Nutuvukti L.
18. Minakokosa L.
19. Lakes Selby & Narvak
20. Chandler L.
21. Shainin L.
22. Galbraith L.
23. Ernie Creek
24. Itkillik L.
25. Ulo L.
26. Unnamed lake on Alatna River





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regulate the ecosystem.

(b) Develop a means of insuring continued subsistence uses while protecting the resources for the benefit of present and future generations.

(c) Develop a program to implement and monitor sport hunting in a manner which will recognize subsistence needs as predominant and also recognize the need to safeguard wildlife resources.

(3) Visitor Use

(a) Develop visitor programs which will assist visitors in experiencing in appropriate ways, and with understanding, the natural historic and recreational resources of the area.

(b) Develop interpretive themes portraying the relationship of the physical environment to the cultural environment of prehistoric Arctic man and present day man with particular emphasis on Nunamiut history and culture. Work closely with the Native Corporations concerning the best means to achieve this objective.

(c) In connection with a jointly-developed Wildlands Management Plan, make appropriate provisions for low-density visitor use accommodations, facilities and services in balance with the ability of the environment to absorb such use and at such locations as

will provide for balanced use of the resources.

(d) Provide visitors with orientation, information and interpretive services that will aid them in safe enjoyment of the area and help them recognize personal actions that will have an impact on the environment.

b. Development and Use

The national wildlands, also open on a permit basis, would be administered jointly by the landowners, with a field headquarters at Anaktuvuk Pass. Plans for management and development for primitive types of recreational use will be drawn up jointly.

Visitor use facilities in keeping with the purposes of the wildlands would be developed by the Native landowners in cooperation with the National Park Service. Facilities on Federal lands would be limited to those necessary for management purposes.

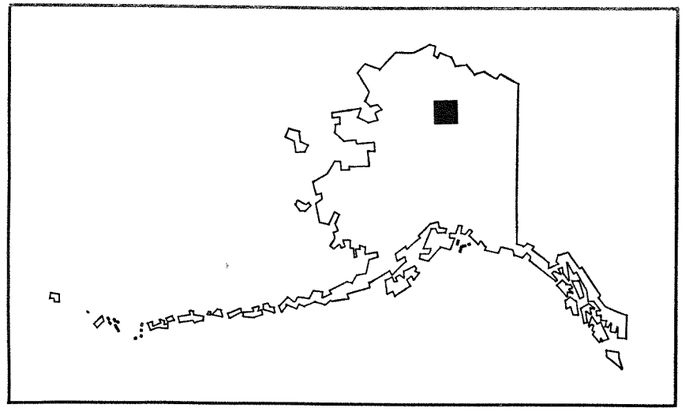
4. Outside the Proposal

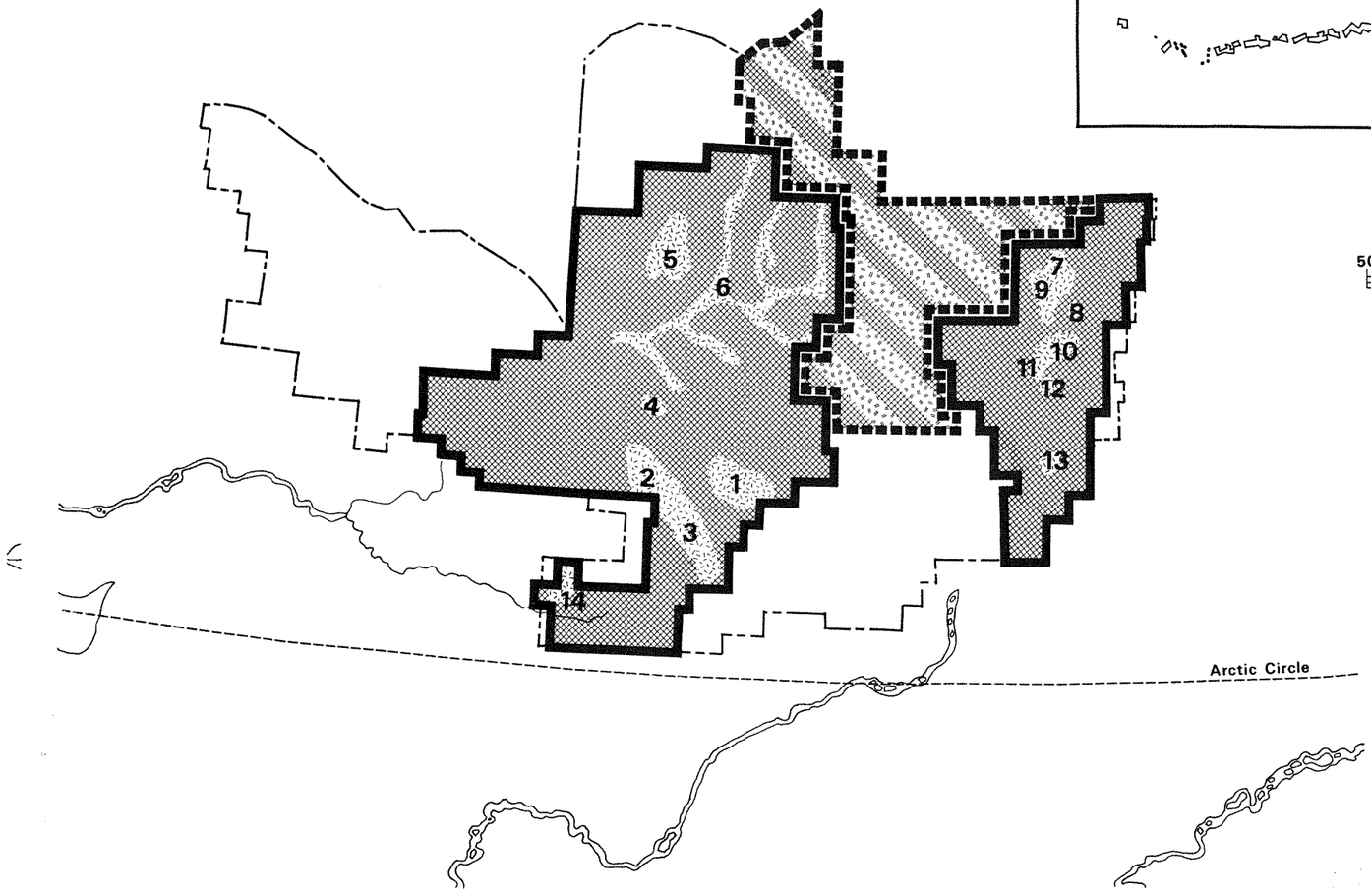
The possibility exists of establishing overnight visitor accommodations along with related interpretive and other services near Wiseman, along the pipeline corridor. These services would be provided in cooperation with private enterprise, the Bureau of Land Management and/or the State. Rustic, back-country accommodations also could be developed at Wild Lake under cooperative agreements with the State. The latter location could be made accessible on a regular basis and could serve as an entry point for hiking into the park and for floating the Wild River.

Land Classification

SPECIAL RESOURCES

1. Takahula Lake
2. Mt. Igikpak
3. Walker Lake
4. Pleistocene Exposure
5. Glacial Lakes
6. Killik River
7. Cockedhat Mountain
8. Koyukuk Canyon
9. Valley of Precipices
10. Mt. Doonerak
11. Gates of the Arctic
12. Redstar Mountain
13. North Lake
14. Lakes Selby-Narvak





N

50 0 50

scale in miles

Final designation pending

CLASS IV - Unique natural features

CLASS V - Primitive lands

Proposed Wilderness Park Boundary

Proposed Wildlands Boundary

Area of Ecological Concern

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5. For Both Wildlands and Park

A program of historic preservation is also proposed to locate, identify, evaluate and preserve the area's historic and archeological resources and to nominate them to the National Register of Historic Places, whereby they will be accorded the procedural protection of Section 106 of the National Historic Preservation Act (80 Stat. 915). Research on the area's historic and archeologic resources will be permitted by qualified investigators in conformance with the procedures for permitting research under the Antiquities Act of 1906 (34 Stat. 225). These resources will be protected and preserved in accordance with professional standards of historic preservation, and in recognition of the several requirements of Executive Order 11593 of May 13, 1971.

Administrative agreements will be sought with the State to manage the submerged lands that are within the proposal to insure that the resources are fully protected.

A land classification plan, based on the land classification system developed by the Outdoor Recreation Resources Review Commission has been prepared by the National Park Service for the Federal lands involved. (See Land Classification map.)

6. Areas of Ecological Concern

In addition to the area proposed for inclusion within the wilderness park and wildlands, nine Areas of Ecological Concern (AEC) have been identified. Areas of Ecological Concern are those lands and waters

adjacent to but not proposed for inclusion in the complex which contain resources that are part of the total ecosystem, and if compromised, would endanger resources within the proposal.

The Secretary may, if such lands and waters within the AEC 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 would be added to the park or wildlands. With respect to those lands within the AEC which are selected or are already in other ownership, the Secretary will 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.

a. Approximately 2,051,000 acres are included in an AEC to the south of the wildlands which includes portions of the Wild and Iniakuk Lakes and the lower portions of tha Alatna, John and Wild River drainages. The AEC includes primarily lands withdrawn for State selection but also includes public interest lands and lands withdrawn for Native selection. Lands in the AEC contain resources that are also well qualified for wildlands-type management. If the State of Alaska is willing, a large area of land currently withdrawn for possible State selection could be made a part of the wildlands area, and the State welcomed as a third party in the cooperative management. With such an addition, it would be possible to add public interest lands west and northeast of Bettles and also Native lands in the vicinity of Alatna, Allakaket and Evansville.

The latter additions could be added only if agreeable with the appropriate Village Corporations and Doyon, Ltd., Regional Corporation. Here it may be appropriate to establish a Koyukon National Wildlands, comprising Native, State and Federal land and honoring traditions of the Athapascan Indians as the proposed Nunamiut National Wildlands honors those of the Inland Eskimos.

b. Three small AEC's including approximately 252,000 acres of State selection pending land are located in the Kobuk drainage and include a portion of the Reed River, Coal Pass and Minakokosa Lake.

c. Three other small AEC's including approximately 221,700 acres are located in the utility corridor and incorporate portions of the upper Hammond River and several other small drainages on the east side of the Mt. Doonerak Unit.

d. Approximately 1,070,000 acres of d-2 land also withdrawn for Native selection (dual withdrawals) are located in the Colville drainage between the Killik River and Petroleum Reserve No. 4. This area contains Arctic foothills and is important as caribou and peregrine falcon habitat.

e. Approximately 2,901,000 acres of d-2 land is located west of the Mt. Igikpak Unit and contains the upper foothill and lake portion of the Noatak drainage which is used by caribou in migration. It also includes important habitat for rare and endangered species of birds and the barren ground grizzly. It also contains highly scenic areas and areas of special botanic significance.

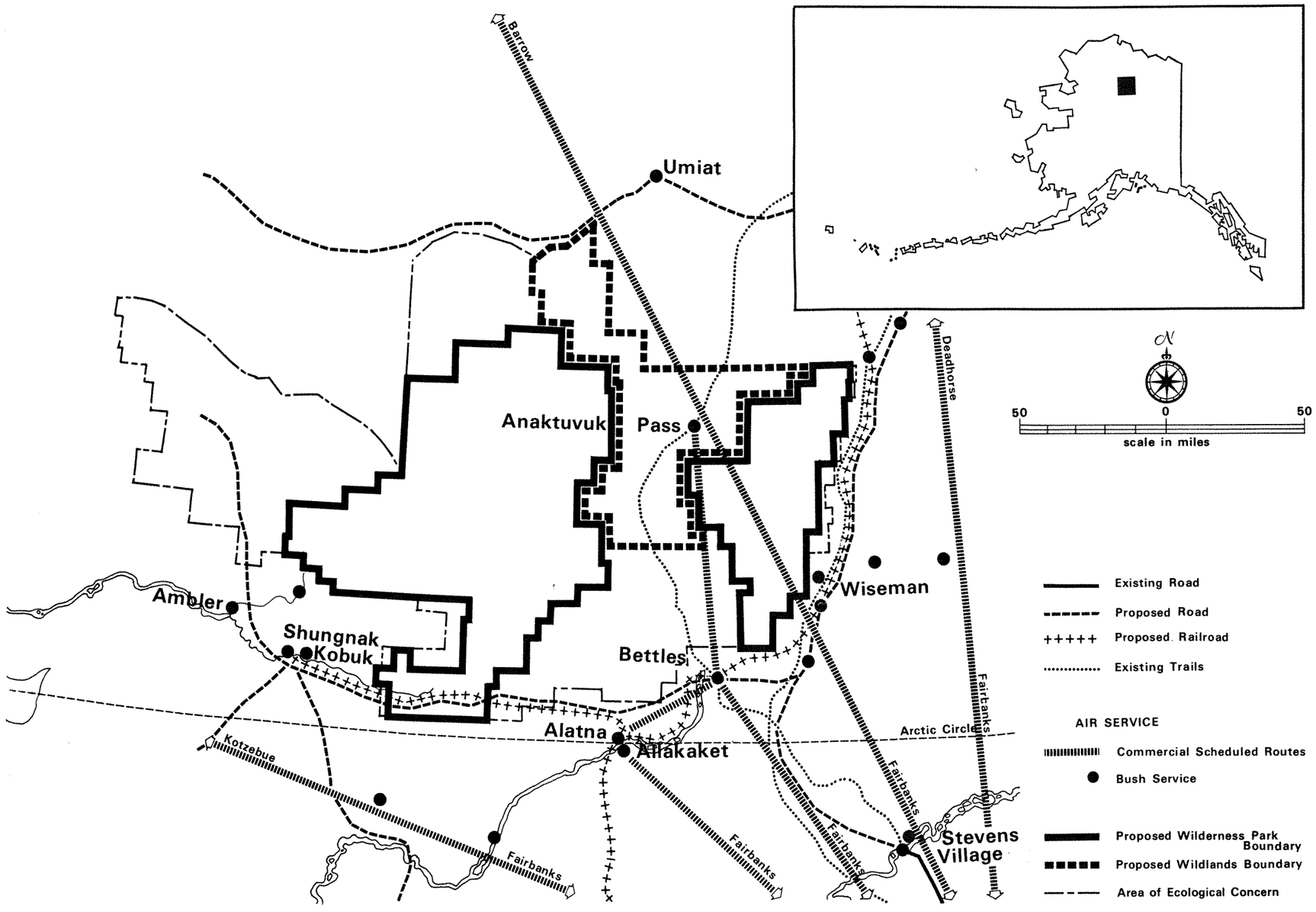
C. RELATIONSHIP WITH OTHER RESERVATIONS, PROJECTS, JURISDICTIONS, AND PROPOSALS IN THE AREA

The Gates of the Arctic National Wilderness Park and Nunamiut National Wildlands proposals are related, both geographically and conceptually, to other units of the Brooks Range region proposed for protection and management as National Parks, Forests, and Wildlife Refuges. These proposals include a Noatak National Ecological Refuge, comprising much of the Noatak River drainages, and a Kobuk Valley National Monument across the Baird Mountains from the Noatak Basin.

A corridor of land immediately east of the proposed Mt. Doonerak Unit, Gates of the Arctic National Wilderness Park, has been withdrawn for a projected oil pipeline and accompanying vehicular transportation system leading from the Arctic Slope oilfields at Prudhoe Bay to the Alaskan port of Valdez. This corridor, probably to be administered by the Bureau of Land Management, is closely related to the proposal, not only geographically, but in expected access to and use of the proposed park. Careful planning must occur to ensure that corridor developments are compatible with park objectives. Such planning, plus the width of the buffering lands and the steep terrain that must be crossed to gain access to the park from the corridor, should safeguard the park from adverse influences on the east. (See Transportation map.)

Farther east, abutting the Canadian border, is the Arctic National Wildlife Range, stretching to the Arctic Ocean and including the highest part of the Brooks Range.

Transportation



As outlined above and expanded in the master plan for the park and wildlands, there will be extensive cooperation between the NPS and Natives in management and operation of the park-wildlands complex.

Cooperation will also be necessary with the management of Petroleum Reserve Number 4 to assure compatible activities along boundaries with the Reserve.

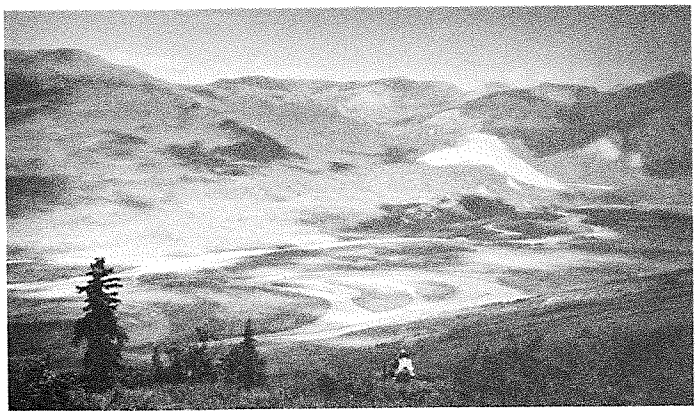
Cooperation with the State will include the areas of wildlife management, transportation, and land uses on adjacent lands.

D. BACKGROUND

1. General

The Bureau of Land Management, which currently has management jurisdiction over all Federal lands in Alaska not now in parks, forests, wildlife refuges, or other special reservations, has considered multiple-use management of the Central Brooks Range. In 1971, most of the Alatna, upper Kobuk, and upper Noatak watersheds (2.6 million acres in all) were suggested for withdrawal and classification as areas of national significance for natural, scenic, recreational, and wilderness uses by the Bureau of Land Management. Also, a number of lake areas elsewhere in the Central Brooks Range (averaging 40,000 acres each) were suggested -- for withdrawal and classification as areas of national significance for natural, scenic, recreational, and wilderness uses by the Bureau of Land Management. Also, a number of lake areas elsewhere in the Central Brooks Range (averaging 40,000 acres each) were suggested -- subject to State selection -- for withdrawal and classification as recreational and scenic tracts. Four of these areas, those surrounding Matcharak, Selby, Narvak, Kurupa, Cascade, and Itkillik Lakes, are in the proposed park area.

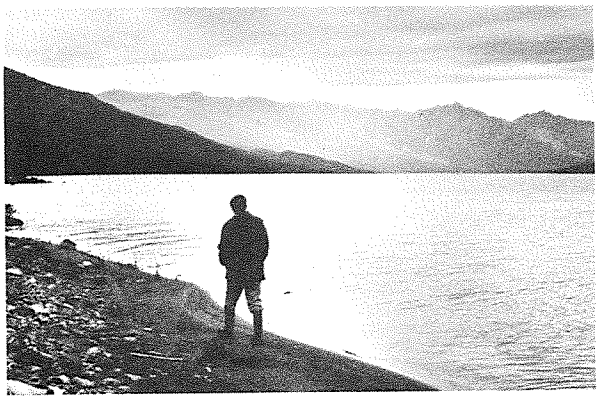
Public interest in the park potential of the Central Brooks Range in Alaska is traceable to writings of Robert Marshall, forester and wilderness proponent who explored there in 1929-1931, 1938, and 1939. Since that time, the area has become recognized as an outstanding part of the largest remaining wilderness in the United States, a place of remarkable beauty and ecological importance having features not now represented in the National Park System.



Alatna River valley near
Arrigetch Creek

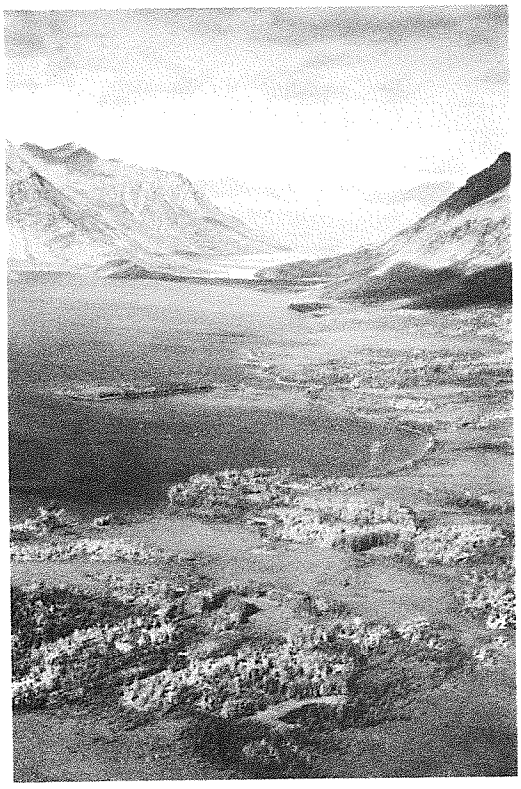


Lake Takahula

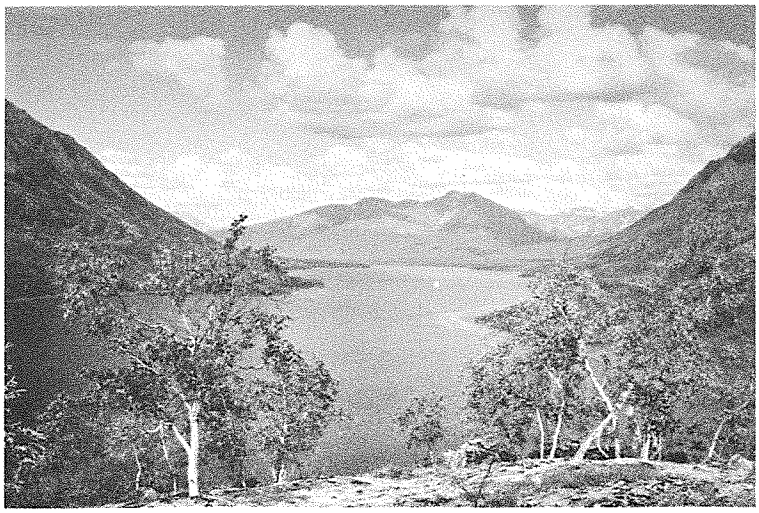




Walker Lake



Lakes Selby and
Narvak



In 1968, President Lyndon B. Johnson considered proclaiming a "Gates of the Arctic National Monument." In 1969, 1971, and 1973, legislation to establish a two-unit "Gates of the Arctic National Park," involving a portion of the area now under discussion, was introduced in Congress.

On April 23, 1973 the Arctic Slope Regional Corporation presented to the Joint Federal-State Land Use Planning Commission for Alaska a proposal for a Nunamiut National Park. That proposal included in large measure the preservation of the Central Brooks Range; and also suggested the cooperative management, by the Natives and the Federal Government, of an additional area to be used generally for park purposes. Out of that proposal grew the current proposal for the Nunamiut National Wildlands.

2. Resource Highlights

The three-unit complex is significant for a variety of values, among which are:

· A cross-section of northern Alaska extending from the Interior lowlands over the Brooks Range and north across the Arctic Foothills. The climatic contrasts compressed within this transect are not exceeded in North America as is reflected by the transition from boreal spruce forest to lowland arctic tundra.

· The entire watersheds of the Killik River on the Arctic slope and the North Fork of the Koyukuk on the southern slope, as well as upper portions of the Noatak and Kobuk drainages. Protected thereby are significant and manageable biotic units on both sides of the Brooks Range.

· The scenic climax of the Brooks Range with the needles and canyons of massive smooth granite cliffs. Also included are colorful and, in places, banded and contorted sedimentary rocks along the lower Alatna River; the spectacular Arctic Slope Ulo Valley; the North Fork Koyuhuk in the area of Redstar Mountain; and the imposing peaks known as the Gates of the Arctic.

· Lovely moraine - damned and glacier-gouged lakes abutting both the north and south fronts of the Brooks Range, such as Kurupa on the arctic side and Selby in the forested Kobuk valley.

· Opportunity to enjoy considerable populations of sheep and caribou, as well as an undisturbed complement of the great predators, notably wolf and grizzly, which are associated with them.

· Extensive good hiking terrain along the high rolling Arctic Divide west from Anaktuvuk Pass and long stretches of float streams, some, such as the Alatna, quite gently flowing through spectacular mountain valleys.

· The national significance of the area is in large part related to preservation of a very extensive area of wilderness.

America has always had places where the young and hardy could find the freedom of vast uncompromised wilderness. This park will ensure that in a world much tamed and shrinking, Americans will always have such an adventuring ground. And it will be one of superlative quality, fully meriting the rank of national park.

3. The Wilderness Park

The national wilderness park is comprised of two units. The Mt. Igikpak Unit on the west is about 150 miles long and 70 miles wide. The Mt. Doonerak Unit on the east is some 90 miles long and 40 miles wide. Between these two units lies the national wildlands, which encompasses the upper John and Killik River valleys. The entire complex is located between latitudes 66° 30' and 69° 15' north and longitudes 149° and 156° 30' west.

The Mt. Igikpak Unit includes portions of the upper Alatan, Kobuk, Reed, Noatak, and Nigu watersheds. In addition to the rivers, the unit's most notable physical features are granitic intrusions--Mt. Igikpak, which at 8,510 feet above sea level is the highest mountain in the central and western Brooks Range, and the Arrigetch Peaks not far to the east. Igikpak, whose glaciers are sources of the Noatak and Reed rivers, is spectacular far beyond its comparatively low height in the scale of Alaskan mountains. It is formed of a swirl of knife-thin ridges culminating in a massive double turret.

The Arrigetch Peaks are among America's most rugged pinnacles, resembling awls and axe blades rising in monoliths to heights of up to 7,190 feet above sea level, with smooth granite walls rising some 3,000 feet almost straight up above their immediate valleys. They are on the National Register of Natural Landmarks.

The Brooks Range contains relatively few lakes as compared with other heavily glaciated mountain regions but 11 of unusual size and beauty are included in the park, mostly in the Mt. Igikpak Unit.

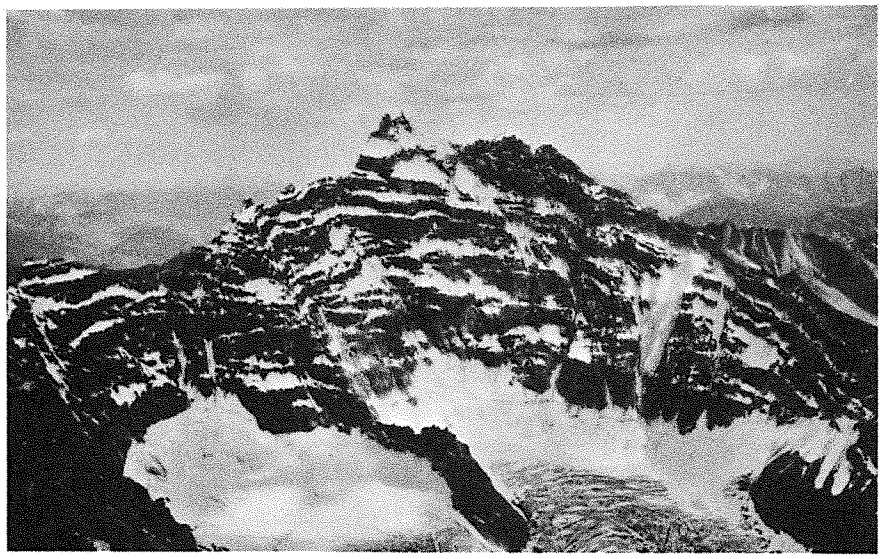
These include the twin lakes Selby and Narvak and Nutuvukti Lake, Walker Lake, and Takahula Lake all on the south side of the range--Matcharak in the Noatak Valley, and Kurupa Lake and Cascade Lake on the Arctic Slope. Because of the striking example of geological and biological relationships Walker Lake provides in the region, the lake has been placed on the National Register of Natural Landmarks.

The Mt. Doonerak Unit includes Mt. Doonerak, which was named and made known by the writings of Robert Marshall, who first called it "the matterhorn of the Koyukuk." It also includes another peak of equal height (7,610 feet) and impressiveness, Cockedhat Mountain, and much spectacular country around it (including an unnamed peak 7,620 feet in height).

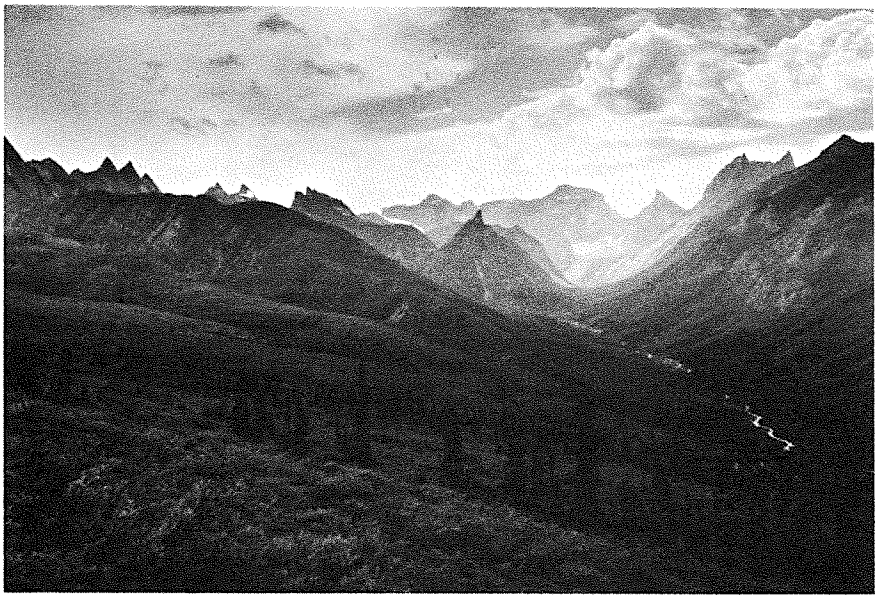
In this unit is the yawning glacial valley with its adjacent two peaks which Marshall named the Gates of the Arctic. The unit is drained principally by the North Fork of the Koyukuk and its tributary the Tinayguk (both qualified for their designation as National or Wild Rivers), and by the north-flowing Itkillik River.

Itkillik Lake, near the northern boundary, is the only large lake in the eastern unit of the wilderness park. The North Fork of the Koyukuk and the Itkillik form a route northward through the Brooks Range, as do the juxtaposed valleys of the Alatna and the Killik in the Mt. Igikpak Unit to the west.

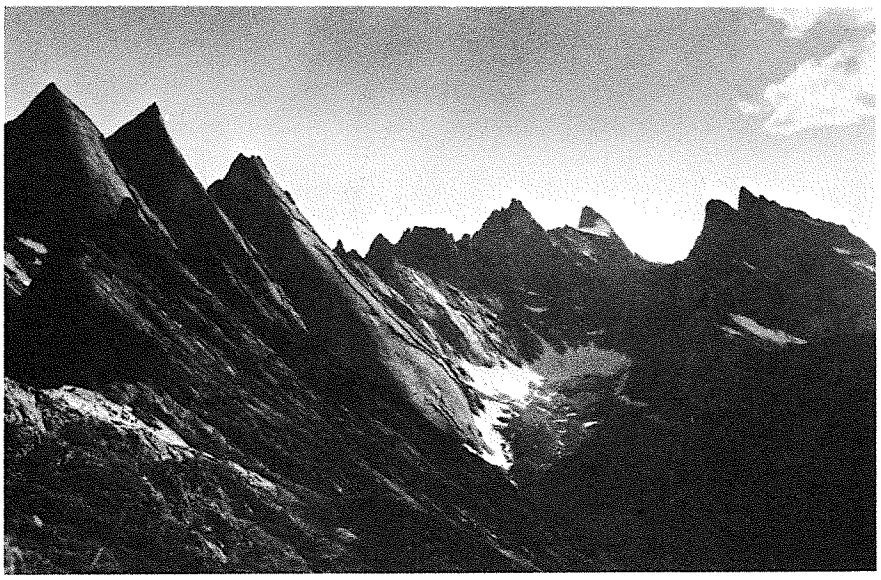
Included in the Mt. Doonerak Unit are the Glacier River on the southeast, much of the Hammond River on the east, the headwaters of the Anaktuvuk River on the northwest, and Nanushuk River on the north.



Mount Igikpak



Arrigetch Peaks



4. The Wildlands

A national wildlands introduces a new type of area in the National Park System, in its combination of human, historical and natural values. The Nunamiut National Wildlands evokes a purpose dedicated to aboriginal cultural uses and primitive types of low density outdoor recreation.

The spacious scenic upland valleys and wildlife-rich riverways complement Ahaktuvuk Pass, the only Eskimo village in the mountains. Its cultural heritage and the opportunity for its residents to continue their traditional culture comprise a substantial portion of the uniqueness and value of the proposed wildlands.

Principal features of this area incude the entire drainage of the Killik River, as well as a segment of the Colville River, on whose bluffs nest one of the densest peregrine falcon populations in North America. Scenic lakes include large imposing Chandler and remote Shainin Lake on the Arctic Slope as well as Loon Lake frequented by sheep and grizzlies in the John River valley. An extensive series of sand dunes and marshy ponds, much frequented by arctic waterbirds, extend along the broad rock-girt upper Killik River.

5. The Alaska Native Claims Settlement Act

The lands included in this current proposal (almost all in the public domain under the Bureau of Land Management) were withdrawn from public entry and disposition under Section 17(d) (2) of the Alaska Native Claims Settlement Act (ANCSA) which provided that they and other lands up to a total of 80 million acres be studied for possible inclusion in the National Park, Wildlife Refuge, Forest, and/or Wild and Scenic Rivers systems. In

enacting the law, Congress allowed itself until December 18, 1978 to consider legislative proposals growing out of the provisions of Section 16(d)(2) of the Act. (See Land Status map.)

A total of approximately 0.7 million acres in the Wilderness Park has now been placed in dual withdrawal -- national interest d(2) and regional deficiency for either Native selection or park use -- with the decision on disposition left for the Congress to determine. Similarly, about .9 million acres of the wildlands are under dual withdrawal. The following is a brief description of the various other land classifications involving this proposal:

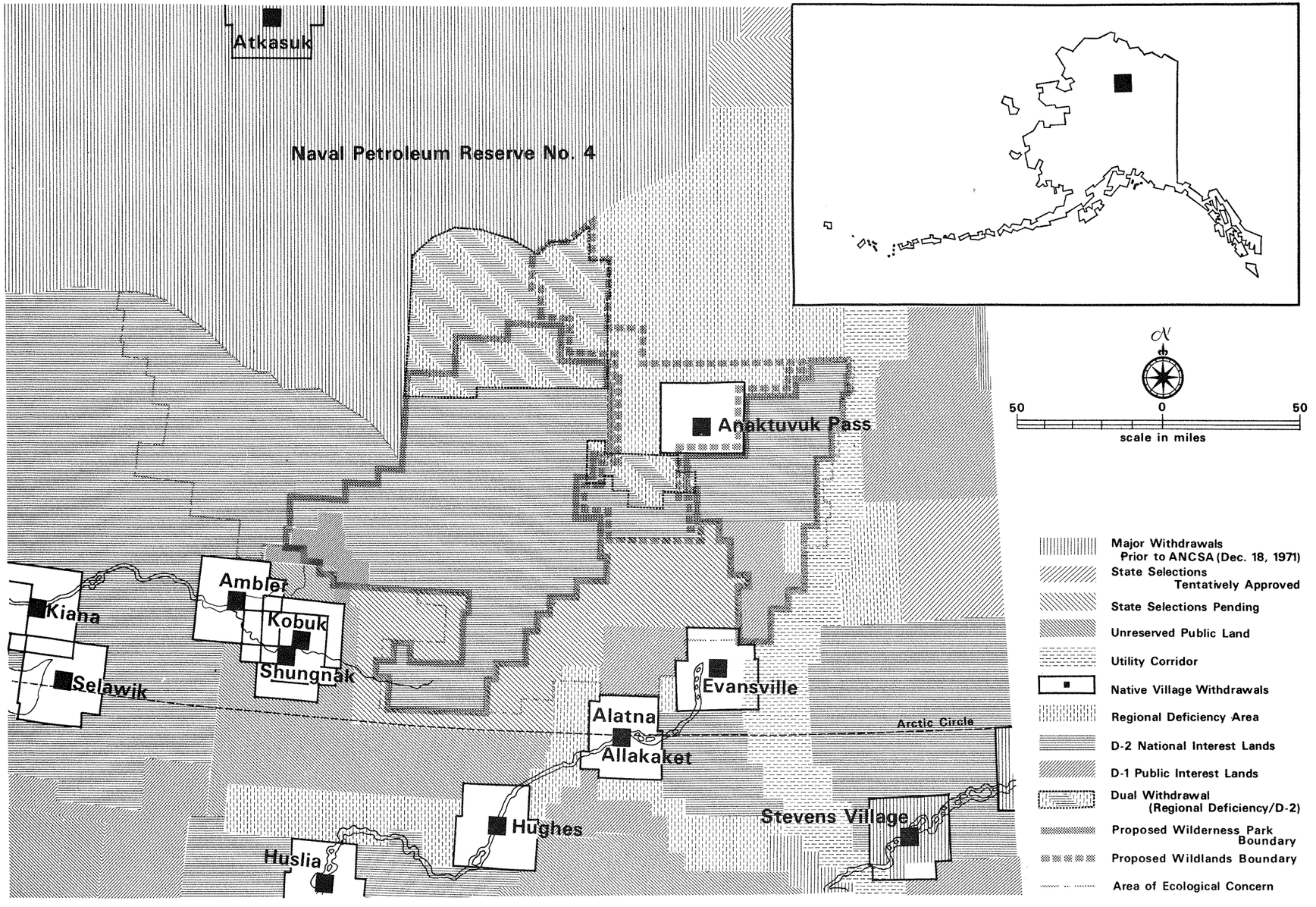
Private Patented Ownership: (within park boundaries only). Lands privately owned outright.

State Selections Pending: State selections pending lands are those lands that have been identified by the State of Alaska to complete their entitlement under provisons of the Statehood Act and ANCSA. These lands occur in areas of ecologic concern related to the parks.

Utility Corridor: Lands withdrawn by the Secretary of the Interior under existing authority for use for utility routes and not open to selection by Natives or the State under authority of the ANCSA (Section 17 (c)).

Native Village Withdrawal; Native village withdrawal lands are lands reserved for selection by village and regional corporations from lands withdrawn by the Secretary pursuant to Section 1 of ANCSA. Under provision

Land Status


Atkasuk
Naval Petroleum Reserve No. 4
Anaktuvuk Pass
Kiana
Ambler
Kobuk
Shungnak
Selawik
Evansville
Alatna
Allakaket
Arctic Circle
Hughes
Stevens Village
Huslia
N
50
0
50
scale in miles
Major Withdrawals Prior to ANCSA (Dec. 18, 1971)
State Selections Tentatively Approved
State Selections Pending
Unreserved Public Land
Utility Corridor
Native Village Withdrawals
Regional Deficiency Area
D-2 National Interest Lands
D-1 Public Interest Lands
Dual Withdrawal (Regional Deficiency/D-2)
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern

of ANCSA, each village will receive the surface rights of all lands within the township in which the village is located, and in two to six additional townships depending upon the size of village population. Sub-surface rights of village-selected lands are reserved in ownership by the appropriate regional corporation /Sub-Section 11(a)/, except for lands selected by villages within the National Wildlife Refuge or on Naval Petroleum Reserve Number 4, in which case the regional corporation for that region may select the sub-surface estate in an equal acreage from other lands withdrawn /Sub-Section 11(a)/ within the region. ANCSA directed the withdrawal of each township that is contiguous to, or corners on, the township that encloses the village, and the withdrawal of each township that 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.

Regional Deficiency Area: Regional deficiency lands are lands that may be selected by the regional corporation under Section 11 of ANCSA, if sufficient lands are not available for regional corporation selections within the Native Village Withdrawal areas.

National Interest Study Area d-2: National interest lands d-2, as described above, are established in Section 17(d)(2) of the ANCSA as lands withdrawn from all forms of appropriation under the public land laws, including the mining and mineral leasing laws, and from selection under the Alaska Statehood Act, and from selection by Native corporations.

Public Interest Area $^{d-1}$: Public interest lands $^{d-1}$ are lands classified in Section 17(d)(1) of ANCSA as public lands withdrawn from all forms of appropriation under the public land laws, including the mining (except for metaliferous minerasl) and the mineral leasing laws to ensure that the public interest in these lands is properly protected. These lands have been withdrawn for futher study and possible classification. The Secretary has withdrawn approximately 43 million acres of $^{d-1}$ lands. These lands could eventually become open to public entry and available for State application.

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 Act of February 8, 1887 (24 Stat. 389), or the Act of June 25, 1910 (36 Stat. 363), and repealed the Alaska Native Allotment Act of 1906 (34 Stat. 197).

Under these authorities, a Native could secure title to 160 acres (in up to four separate tracts) of lands which they use and occupy. ANCSA also provided that allotment applications which were then pending before the Department of the Interior could continue to 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 Sub-Section 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 Wilderness Park and National Wildlands, there are 20 recorded applications.

The validity of the applications is undetermined at this time. Any applications which go to patent will have the status of private land and will include the right of access.

II. DESCRIPTION OF THE ENVIRONMENT

A. THE EXISTING ENVIRONMENT

1. General Description

The Brooks Range is a gaunt, glaciated divide almost completely across northern Alaska. It separates the State's broad Arctic Slope, almost devoid of human life, from the more populated interior watersheds south of the range.

The central part of the range rises about 200 miles northwest of Fairbanks and nearly 200 miles south of Barrow, northernmost community in the United States. Nearest transportation center is Bettles Field and the adjacent village of Evansville, some 45 miles southward from the proposed park area. The airfield and village are usually referred to as Bettles, successor to the now abandoned village of that name four miles down the Koyukuk River at the mouth of the John River.

From the south the area is approached up meandering rivers whose broad lowland valleys are pocked with ox-bow lakes and many thaw and kettlehole ponds. Among the grim peaks and craggy ridges, these rivers are deeply incised and frequently braided as they make their way through glacial debris. The boreal forest, or taiga, of interior Alaska follows the valleys into the range. There it meets the region where tundra covers the mountain sides with so thin a veil of vegetation that it seldom hides the structure and substance of the land. At higher elevations on steep slopes vegetation occurs only in sparce patches and is replaced by rock rubble, fell fields and frost sorted skree.

The proposed park-wildlands area includes examples of three physiographic provinces: the Arctic Foothills, the Arctic Mountains, and Western Alaska. The latter province constitutes only a small portion of the area being considered. The Central Brooks Range comprises the Endicott and Schwatka Mountains, dominated in the west by Mt. Igikpak (8,510 feet) and in the east by Mt. Doonerak (7,610 feet), Cockedhat Mountain (also 7,610 feet), and an unnamed mountain noted by the U.S. Geological Survey as 7,620 feet. Most peaks in the range are between 5,000 feet and 6,000 feet above sea level.

These mountains are drained to the south by the Alatna, John, and the North Fork of the Koyukuk Rivers--all tributaries of the Yukon--as well as by the Kobuk. On the west the Noatak flows from small glaciers on the flanks of Mt. Igikpak. North flowing drainages include those of the Nigu, the Killik, the Chandler, the Anaktuvuk, Nanushuk, and Itkillik.

Lakes are relatively few in the Brooks Range as compared to other heavily glaciated areas, but the region includes a number of large ones such as Selby, Narvak, Minakokosa, Nutuvukti, Walker, and Iniakuk; Wildlife Lake to the east, and Kurupa, Chandler, Cascade, Shainin and Itkillik Lakes north of the Arctic Divide. Smaller lakes and ponds are distributed along the flood plains of many rivers, particularly the Killik and Anaktuvuk.

2. Climate

Climatic data are very limited for this rugged northern wilderness area, and information that is available applies mostly to elevations below 1,500 feet. To best describe this area climatically, it has been divided

into three zones:

South Side. Below 2,500 feet in elevation (south of the Brooks Range), having a continental sub-arctic climate;

North Side. Below 2,500 feet in elevation (north of the Brooks Range), having an arctic climate;

High Mountain Zone. Elevations above 2,500 feet.

South Side: This area is dominated by a sub-arctic climate characterized by great temperature variations daily as well as annually, combined with generally low precipitation and surface winds. Diurnal temperatures here range from an average 0° F. to -10° F. maximum and -20° F. to -30° F. minimum during the coldest month (January) to an average 65° F. to 70° F. maximum and 42° F. to 47° F. minimum during the warmest month (July). Mean annual temperatures average 15° F. to 25° F. Absolute extremes have ranged from the minus 70°'s F. in winter to the low 90°'s F. in summer, with the greatest extremes of both heat and cold occurring at the lowest elevations. Winters are long and bitterly cold. In contrast, summer temperatures are surprisingly pleasant, with 30 to 40 days each year reaching a maximum of 70° F. or higher.

Precipitation amounts are light, averaging from 12 to 18 inches annually in the Mt. Igikpak region west of the Alatna River, and from 8 to 12 inches over the slightly drier Mt. Doonerak region to the east. Measurable precipitation occurs about 100 days out of each year. Snow falls normally in 8 to 9 months of the year, averaging between 60 and 80 inches each season. Depending on exposure, localities receive slightly more

or less snow than this. In all areas, however, the snow has a light, dry consistency. The three-month period from late June to early September is the wettest time of the year, receiving over half the total annual precipitation. Thunderstorm activity is relatively frequent for latitudes this far north, with each location averaging between five and ten thunderstorms each summer. Thunderstorm intensities are generally mild; they occur mostly during June and July.

Surface winds at lower elevations are for the most part light throughout the year. Prevailing wind directions are influenced to a great extent by the terrain. Only on rare occasions will wind speeds exceed 35 m.p.h or 45 m.p.h., and these are limited mostly to a local funneling effect within narrow valleys.

North Side: In the Mt. Igikpak region, this zone extends from the Brooks Range northward to the Colville River on the Arctic Slope, and consists of the tundra-covered northern foothills of the Brooks Range. A small portion of the Mt. Doonerak area lies north of the Range divide.

The climate here is characterized by smaller variations in temperature than in those areas south of the Divide. Mean annual temperatures, however, are colder, averaging 5° to 15° F. compared to 15° to 25° F. over the south. The arctic climate is affected by a maritime influence in the summer but not to a great extent during the winter. Diurnal temperatures here range from an average -10° F. to 15° F. maximum and -25° F. to -35° F. minimum during the coldest month (February), to a 60° F to 65° F. maximum

and 35° F. to 45° F. minimum during the warmest month (July). Frosts occur even during the very short summer. Both the spring and fall months are significantly colder than over the South Side, with temperatures averaging over 20° colder during April and May and 10° to 15° colder in September. Absolute extremes have ranged from near -60° F. in the winter to the upper 80°'s F. in the summer. During the very short summer, temperatures warm rapidly, and on 15 to 20 days reach a maximum of 70° F. or higher.

Precipitation is extremely light, averaging only five to ten inches a year, but is more effective in promoting plant growth than in warmer regions because of the low evaporation levels and long periods of below freezing temperatures common to polar latitudes. Snow has been recorded during every month of the year, with an average total of 35 to 50 inches falling annually. This annual total is considerably less than that over the South Side. The meager precipitation is more evenly distributed throughout the year; however, a summer maximum is also in evidence here. About 110 days during each year receive measurable precipitation. Prevailing surface winds are from the east during the summer and from the west during the winter. Mean wind speeds are slightly higher than over the South Side, but still average less than eight m.p.h. Periods of very strong winds over 45 m.p.h., nevertheless, do occur on occasion. When these strong winds are accompanied by very cold winter temperatures, extreme caution must be exercised to protect exposed skin from "wind chill" temperatures approaching 100° F. below zero.

High Mountain Zone: Most of the Mt. Igikpak area and all of the Mt. Doonerak country is mountainous. No climatic data are available for elevations above 2,500 feet, but certain general patterns can be derived from observations at Anaktuvuk Pass (elevation 2,100 feet). At these high altitudes winter temperatures are noticeably warmer due to inversions and summer temperatures noticeably cooler than at the lower elevations on both sides of the Brooks Range. Since no month of the year has a mean temperature above 50° F., vegetation diminishes to lichens or is barren altogether above 2,500 feet. Due to the northern latitudes, yearly precipitation is likely to be no higher than 20 inches at any one point as indicated by the absence of large glaciers. Wind data are also lacking, but it can safely be assumed that mean wind speeds will increase with elevation during all months of the year. Mean wind flow charts indicate that the prevailing wind direction is from the southwest.

The term "Land of the Midnight Sun" befits this wilderness area, since it lies wholly north of the Arctic Circle. The Arctic Foothills region receives 65 days with continuous sunshine during the summer, while the southern flanks of the Brooks Range receive only 30 days. In contrast, a maximum of only one hour and 40 minutes refracted sunshine is received in the southern area on the shortest winter day. Cloudy skies occur about two-thirds of the time, with the highest incidence of cloudiness occurring north of the Divide during the summer.

3. Geology

The central Brooks Range is a wilderness of rugged, glaciated east-trending ridges that rise to generally accordant summits 4,000 to 8,000 feet in

altitude. The eastern trend of the topography is due to belts of hard and soft sedimentary and volcanic rocks. The mountains have cliff-and-bench slopes characteristic of glacially eroded, bedded rocks. Abrupt fronts face foothills and lowlands on the north.

The area is composed chiefly of Paleozoic limestone, shale, quartzite, slate, and schist. (Wahrhaftig, Physiographic Divisions of Alaska, 1965.) These rocks are locally arched into broad folds and dislocated by overthrust faulting of regional extent. Several small plutons, probably Cretaceous in age, cut the bedded rocks south of the Alatna and Noatak rivers. They comprise a narrow, discontinuous zone extending about 80 miles eastward from Shulkpachak Peak to Ernie Lake.

The oldest rocks in the area show that the region was once occupied by a sea in which sediments were deposited from the north and west. Uplift, folding, and faulting of these deposits occurred during Cretaceous time about 130 million years ago. The sediments were then metamorphosed and intruded by molten material. Disturbances continued, and the present form of the range resulted from uplifting which took place 10 to 20 million years ago. Still further uplifting, erosion, and heavy glaciation account for the rugged mountain profiles, deep U-shaped valleys, and braided streams seen today.

Petroleum Potentials: The relationship between recognized petroleum provinces in Alaska and the study areas of current interest to the National Park Service are shown by the petroleum map. The provinces

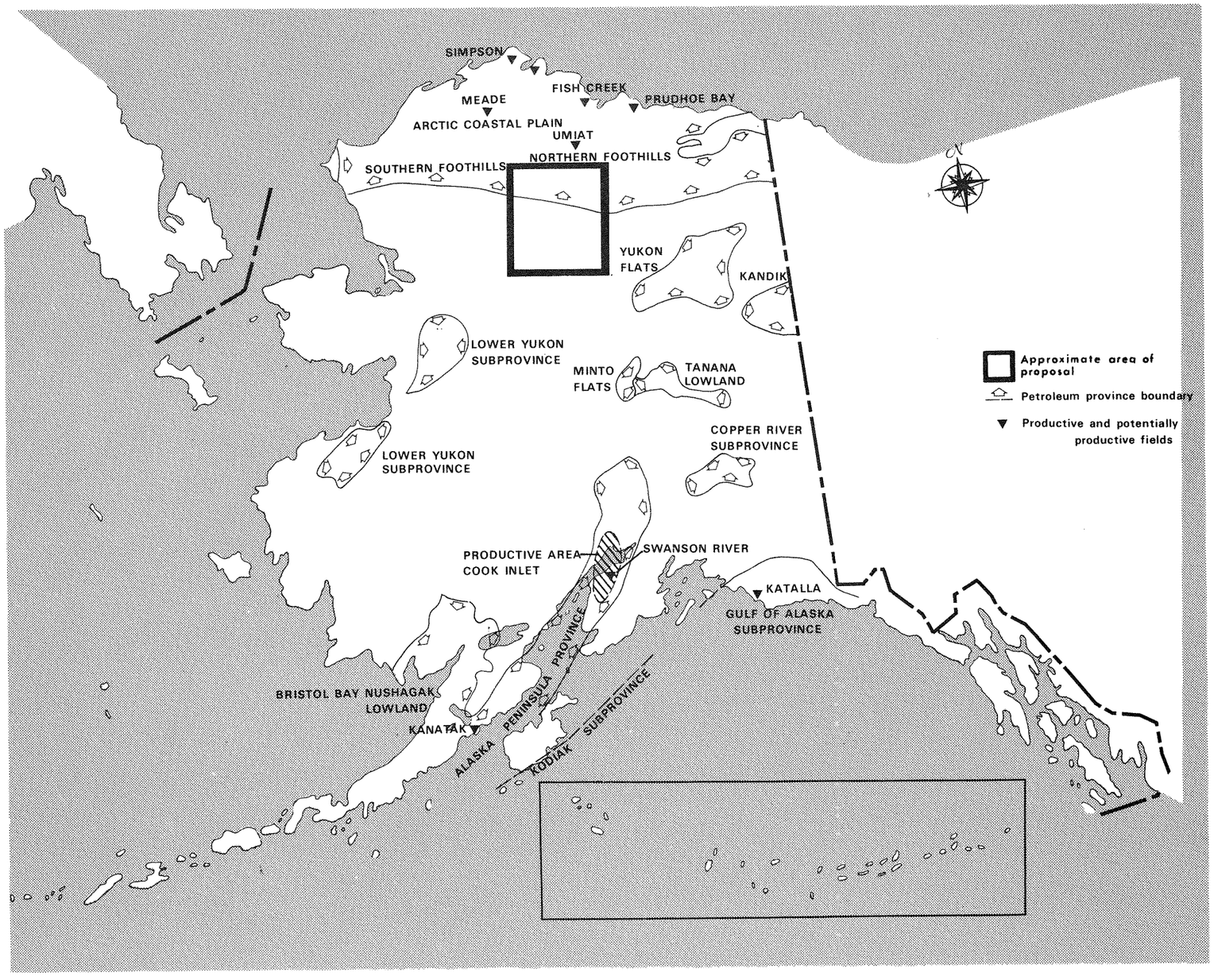
depicted thereon comprise a highly generalized display of the distribution of sedimentary rocks considered to present some possibilities for the existence of petroleum and natural gas. Although additional extensive zones of sedimentary rocks are known, their potential for petroleum is considered low to non-existent because of intense deformation, extreme depth of burial, and/or intrusive activity.

Only relatively small portions of these provinces contain petroleum or gas resources that might be recoverable in part. Identification and ranking by industry of exploration targets within these provinces are closely guarded proprietary information subject to continuous updating based on geologic investigations, improvements in exploration and production technology, and on projected economic patterns. (See Petroleum map.)

The north third of the park-wildlands complex includes portions of two physiographic provinces known to contain petroliferous rocks within drillable depths. About 2,052 square miles or 5.9 percent of the Northern Foothills, and 2,948 square miles or 14.7 percent of the Southern Foothills lie within the park-wildlands detailed as follows:

Area	Petroleum Province	Province Area Sq. Mi.	Area Occluded Sq. Mi.	Occlusion Percent
Gates of the Arctic/ Nunamiut	Northern Foothills	35,000	2,052	5.9
	Southern Foothills	20,000	2,948	14.8

It is emphasized that although the occluded lands represent only a minor part of the provinces, their reserve possibilities are completely unknown.


SIMPSON
FISH CREEK
PRUDHOE BAY
MEADE
ARCTIC COASTAL PLAIN
UMIAT
NORTHERN FOOTHILLS
SOUTHERN FOOTHILLS
YUKON FLATS
KANDIK
LOWER YUKON SUBPROVINCE
MINTO FLATS
TANANA LOWLAND
COPPER RIVER SUBPROVINCE
LOWER YUKON SUBPROVINCE
PRODUCTIVE AREA COOK INLET
SWANSON RIVER
KATALLA
GULF OF ALASKA SUBPROVINCE
BRISTOL BAY NUSHAGAK LOWLAND
KANATAK
ALASKA PENINSULA PROVINCE
KODIAK SUBPROVINCE
Approximate area of proposal
Petroleum province boundary
Productive and potentially productive fields

Appraisal of reserve is entirely dependent upon drill tests. Test wells at Umiat about 30 miles northeast from the wildlands boundary have demonstrated the existence of productive petroleum horizons.

Coal: About 1.2 percent of Alaska's estimated total coal reserve of 130 billion tons lies within the lands of the proposed park-wildlands.

The coal beds range up to eight feet in thickness; their average thickness, however, is much less. The coals are ranked as high volatile bituminous with a heating value ranging from 10,000 to 13,000 B.T.U./lb. It is estimated that about 13.4 percent of the total coal resource of the Colville River field is enclosed by the park-wildlands boundary.

Although no testing has been done, some of the coals are undoubtedly of coking quality. Similar selected coalbeds in the western part of the field have been found to possess significant coking properties. (R.S. Warfield, personal communication, 1973). (See Coal map.)

Metals: Potential of the park-wilderness complex for metallic mineral resources has not been evaluated. Tactite-type mineralization has been identified margining the plutons comprising the Arrigetch Peaks and Mt. Igipak. Stream silts and soils having geochemically anomalous amounts of the base metals have been found northwest of Mt. Igikak pluton.

The existence of a potentially significant copper deposit has been identified recently by core drilling at the area's southwest boundary, northeast of Kobuk. The importance of this deposit stems chiefly from the

fact that in character and geological environment, it is analogous to a proven deposit in the upper Shungnak River drainage northeast of Bornite.

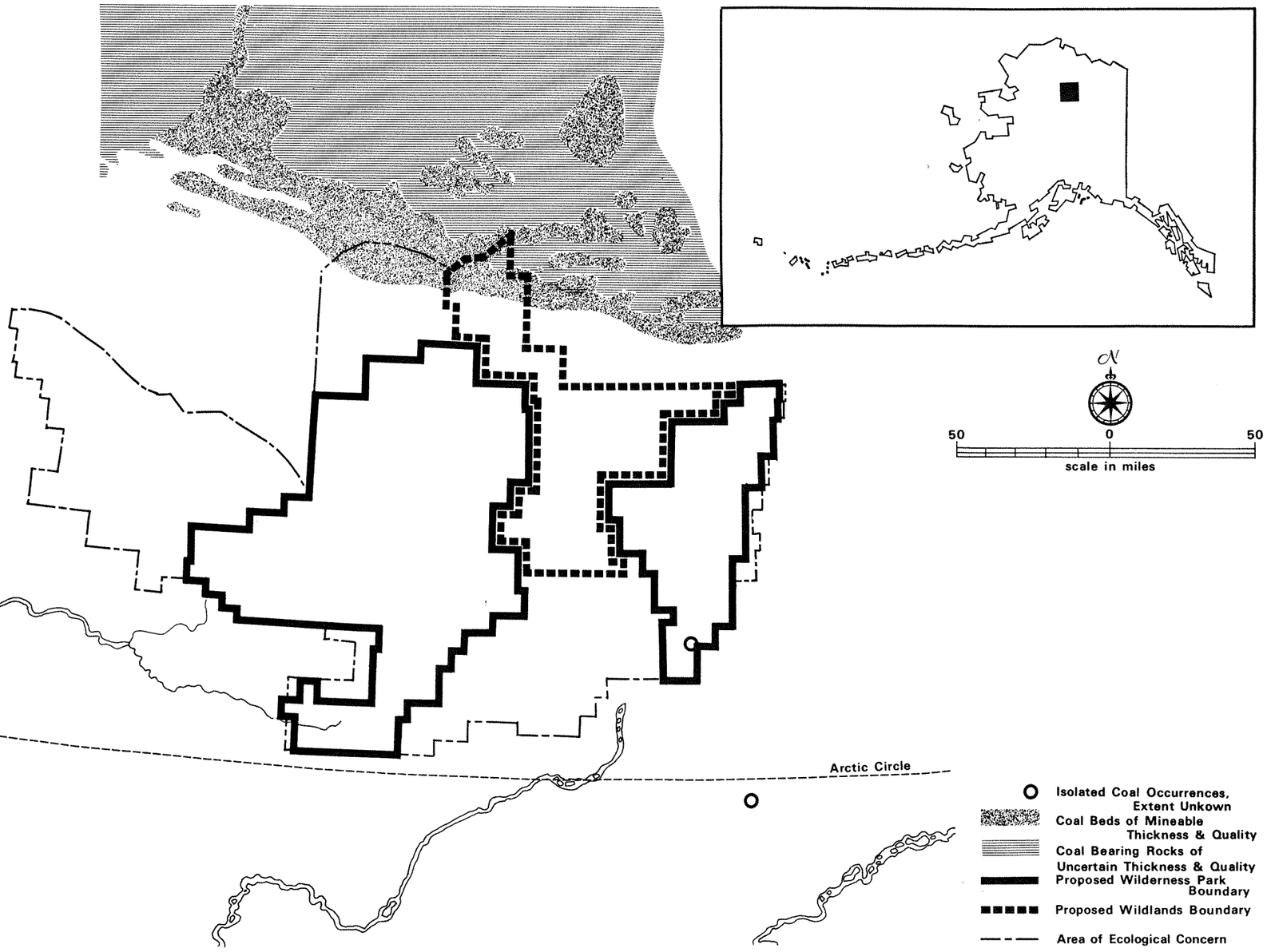
Except for gold mining, now reduced to a few, often sporadically operated placer mines, there is no record of mineral production for the area, and there are no patented mining claims of record. A total of 202 active claims in 17 groups is on file; however, most of them are gold placer and lode claims in the John Glacier and Hammond River valleys, and near the Noatak River-Midas Creek confluence. Four groups, totaling 29 claims, are within the park proposal area. In addition, an applied-for Native allotment is reportedly being mined for gold.

Additional lands may have been staked in the Mt. Igikpak area subsequent to August 1971, and not recorded because of the withdrawal. Such claims are without legal standing. (See Patents, Claims, and Applications map.)

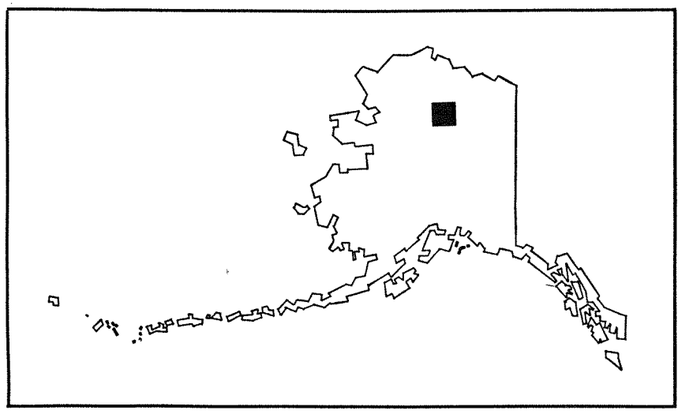
Permafrost, Soil, and Water: Permafrost,or ground that remains frozen for more than two years, lies under virtually all of the region being considered for the park-wildlands complex, and reaches depths of several hundred feet. During winter's cold, thermal contraction cracks the ground surface; in the summer meltwater flows into these cracks. This freezes, eventually veining the land with massive wedges of ice. These wedges are often tens of feet deep, several feet wide at the top, and separated from one another by more than 100 feet. Sometimes they create polygonal ground surface markings, but more often the wedges are not visible.

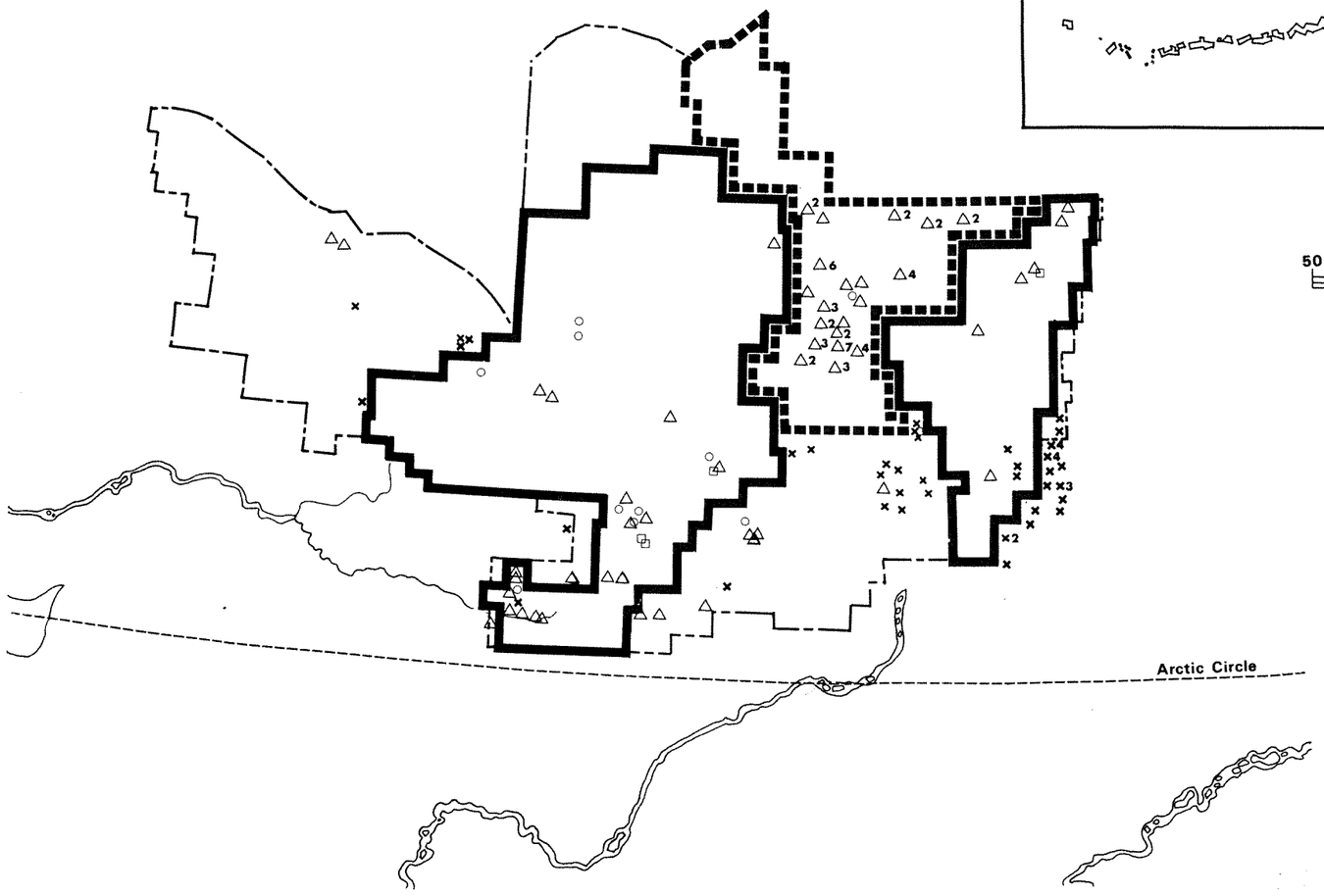
Atop the permafrost lies a thin layer of peaty ground that thaws during summer. This thin mantle, varying from six inches to several feet in

Coal


N
50
0
50
scale in miles
Arctic Circle
Isolated Coal Occurrences, Extent Unkown
Coal Beds of Mineable Thickness & Quality
Coal Bearing Rocks of Uncertain Thickness & Quality
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern

Patents, Claims, and Applications





N

50 0 50

scale in miles

× Mining claims

○ Private Applications

□ Patents

△ Native Allotment Applications

Proposed Wilderness Park Boundary

Proposed Wildlands Boundary

Area of Ecological Concern

NWP/NW-GA/NUN-90003
Dec 73/APG

depth, supports terrestrial life in the Arctic. Except in areas of rock desert, flood plains, and recent severe burns, it is crammed with a dense tangle of roots and stems growing in the accumulated peat. The tight mat of plant material tends to hold the thawing silt beneath in place, or at least slows and modifies its movement. When the overlying mat is altered or removed, the melting silt can display marked mobility, and slippage of soil and siltation of streams can be severe even on seemingly slopeless terrain.

With only a few small glaciers in the Central Brooks Range, streams normally run clear except after rains. Then, because permafrost reduces absorption of the rainfall, flooding can be rapid and severe and the water silty. In spring ice jams can aggravate the flooding. With light rainfall and a landscape sealed by permafrost, base flow rates are low in proportion to the size of drainage areas. Flood waters, racing down steep gradients, can cause heavy channel erosion and scouring. The flooding, eroding, and silt carried by Arctic rivers have been estimated to be nearly four times as great as those experienced in temperate areas.

Alluvial deposits are the principal aquifers for ground water, which is greatly restricted by permafrost. When under pressure from the frost, ground water bursts to the surface in places, forming conical hills of mud and debris called pingos. The quality of the ground and surface waters of the proposed park-wildlands has not been studied, but is at present almost totally unaffected by local human uses.

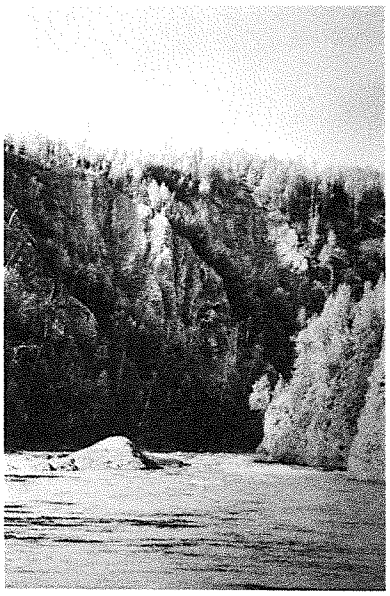
4. Vegetation

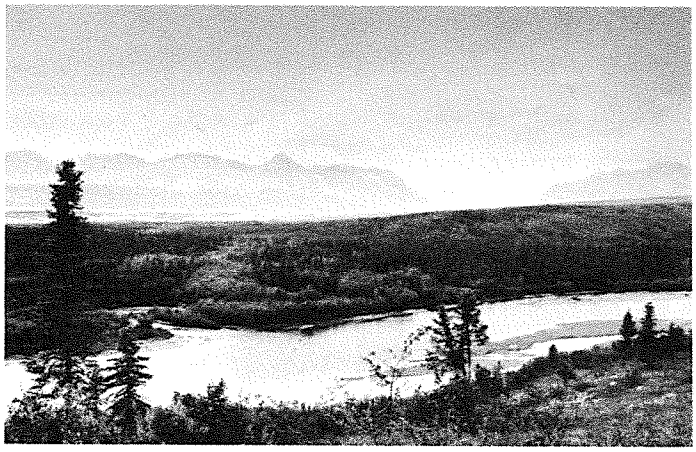
Four major vegetational associations occur in the region. These associations are the boreal forest (taiga or nothern coniferous forest), treeless bogs, shrub thickets, and tundra. Tundra and shrub thicket associations are the most extensive in surface area coverage. The forest and bog communities reach their most northerly limits along the southern border of the Brooks Range. (See Vegetation map.)

The boreal forest in the Brooks Range reaches its northern limit at about latitude 67° 30' N., along the river valleys of the range's south flank. South of the mountains the forest forms an extensive cover broken only by lakes and bogs. As it approaches the south slope of the range, the forest thins into scattered spruce that follow the braided river channels and valleys to an elevation of about 2,100 feet.

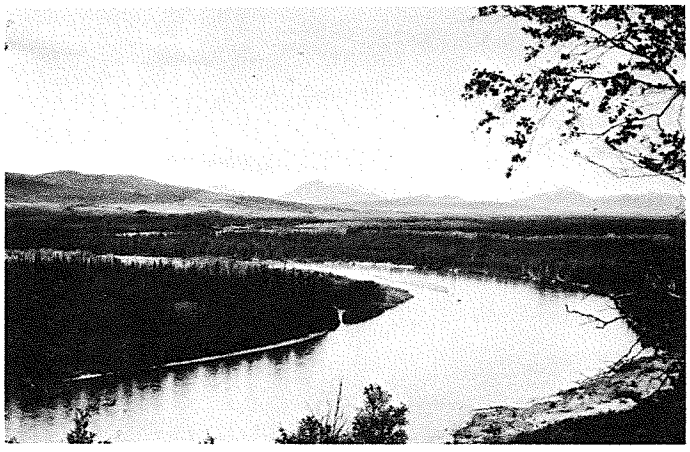
This forest occurs in two climax forms. One is a "closed" spruce-hardwood assocation in which the growth forms tend to be dense with individual trees in close proximity. The other is an "open" forest in which the trees are dispersed across the landscape. The spruce-hardwood association typically occurs on dry, south-facing slopes and is characterized by the presence of white spruce, paper or white birch, and balsam poplar. Heaths such as the bearberry, crowberry, Labrador tea, blueberries, and cranberries are common, as are the ubiquitous willows. Lichens and mosses cover the forest floor along with a variety of herbs. On better growing sites some spruces may reach age of 100 to 200 years and diameters of 10 to 24 inches. However, the entire area of the

Lower Kobuk canyon

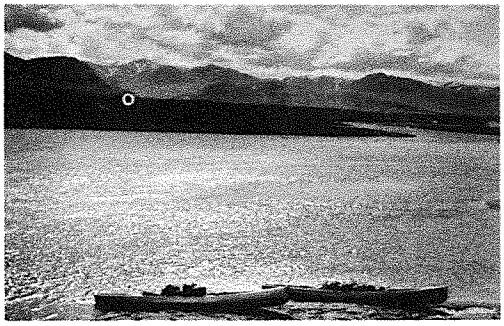


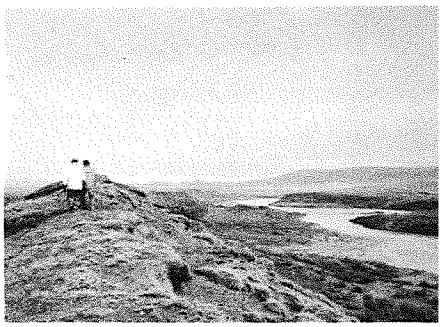


Upper Kobuk River



Kobuk River and
Angayucham Mountains.





Killik River above Sunday Rapids.

proposed park-wildlands is underlain by permafrost and such large trees are consequently rare. The "open" forests are composed of black spruce, which occur on the north-facing slopes and poorly drained lowlands of the region. Here trees seldom exceed eight inches in diameter, and it is not unusual to find a two-inch tree that is 100 years old. Birches and an occasional white spruce may be found in these forests. Common shrubs are essentially the same as those of the "closed" forests. As in the case of the closed forest, this open forest form seldom is found above 2,100 feet elevation.

Bog forests are found in poorly drained lowlands where the trees are sparse and stunted. Understory vegetation is varied but composed largely of mosses, lichens, sedges, grasses, and low shrubs. Conditions are too wet for tree growth, and pools of standing water often cover the ground. Bog associations, like the other forest, are limited in northward extent and seldom occur north of latitude 67° N.

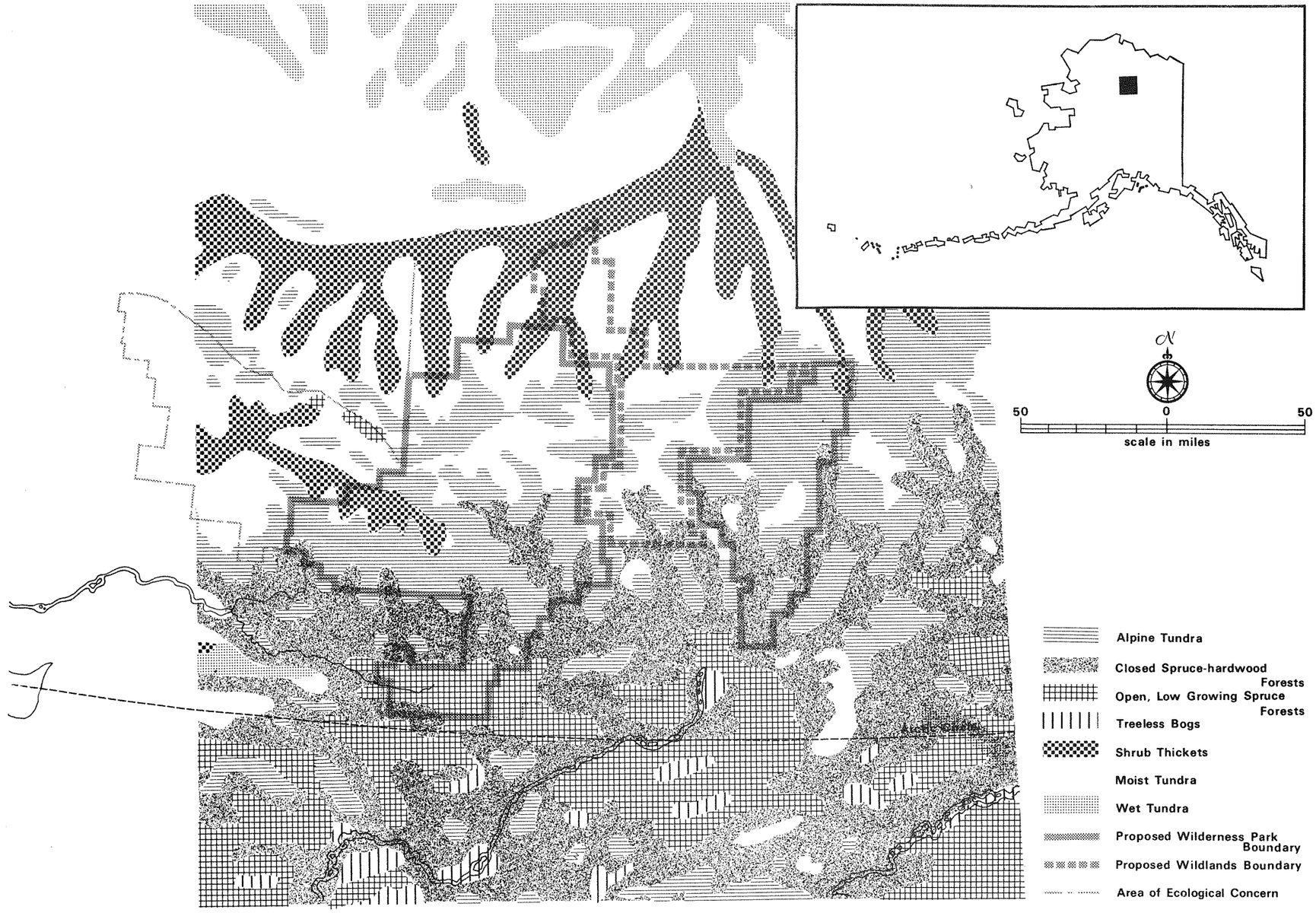
The boreal forest of the southern flank of the Brooks Range is essentially a fire-forest; that is, the occurrence of periodic wildfire is important in its maintenance. The development stages which follow a recent fire vary, depending primarily on topography, seed source, severity of the burn, and moisture. Fireweed is usually the most apparent plant in a recently burned site. However, two species of Labrador tea, willows, and alders quickly form new growth covering the burn. Heaths may also cover the burns.

Succession following the fireweed-shrub,willow-alder stage varies greatly, and three associations can be identified: the quaking aspen type that occurs primarily in upland areas on south-facing slopes; the paper birch type found typically on the east and west-facing slopes; and the balsam-poplar type that reaches its greatest extent and abundance on the flood plains of meandering rivers and of glacial outwashes. This latter successional stage occurs only sparingly in the Brooks Range. During the latter stages of maturation of each vegetative stage, the white spruce or black spruce association begins to invade and will eventually dominate the vegetation.

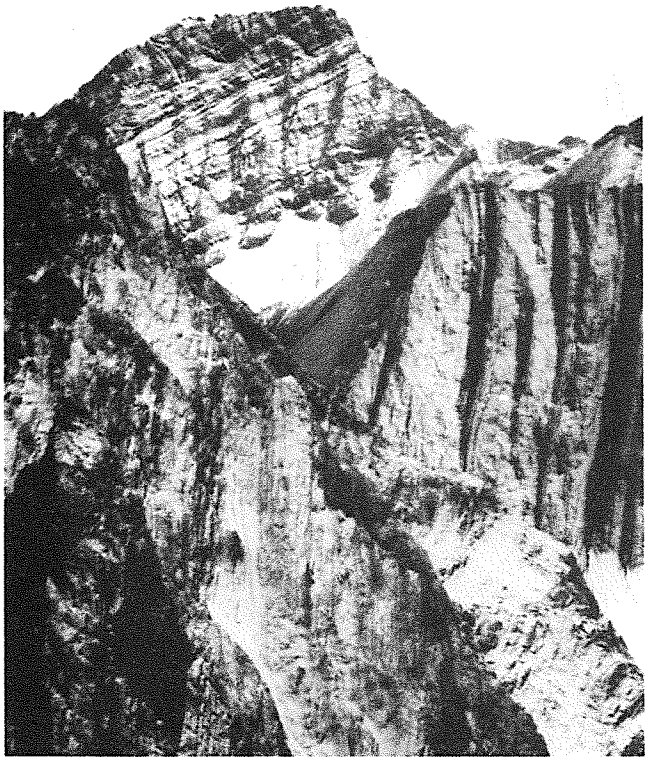
The forests of the central Brooks Range are not classified as commercial by the Forest Service. A few trees are cut by local residents for cabin and house logs and for fuel.

Above the forest and bog associations in altitude and latitude are shrub thickets consisting of resin birch, several species of alder, and willow as dominant species. These thickets may form extensive cover well beyond tree line, and they may be extremely dense or in open clumps interspersed with lichens and heaths with sedges and grasses forming the understory. Alder tends to occupy wetter sites, and birch inhabits drier situations. Such thickets may reach ten feet in height at lower elevations and in protected areas. Typically they occur at altitudes up to 3,000 feet and may extend well north of the Brooks Range out onto the Arctic Slope. The thicket formation may be interspersed with forest and tundra, forming a transition between the two.

Vegetation


N
50
0
50
scale in miles
Alpine Tundra
Closed Spruce-hardwood Forests
Open, Low Growing Spruce Forests
Treeless Bogs
Shrub Thickets
Moist Tundra
Wet Tundra
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern

Cockedhat Mountain





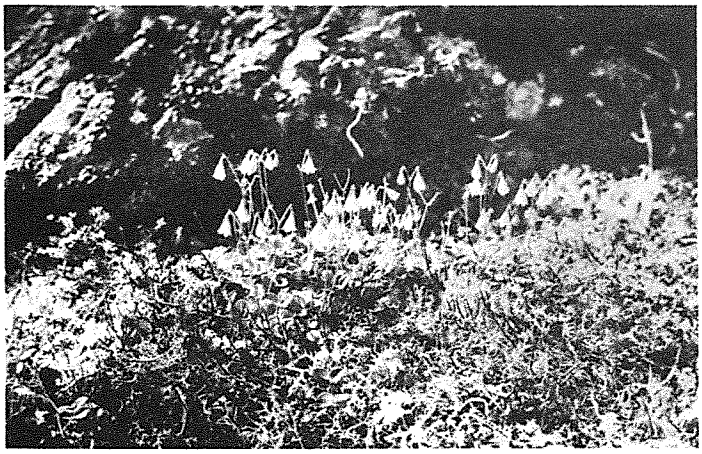
Hiking in Clear Creek valley.

Reindeer moss



TUNDRA DETAIL

Twinflowers



A second shrub thicket association occurs only along alluvial plains and gravel bars of braided streams. Willows and alders predominate as the woody plants, the birch normally found with them being eliminated by periodic flooding. The understory also lacks most herbaceous vegetation because of the floods that scour the stream beds and gravel bars.

Two types of tundra, the moist or tussock tundra, and the alpine tundra, comprise about 90 percent of the vegetative cover found in the region. The former occupies the lower elevations and foothills beyond the forest and thickets. In many places it forms extensive areas of cottongrass tussocks, and there is limited growth of other sedges and grasses. Stunted woody plants such as alders, willows, and birches--trees in lower latitudes--form a dwarfed, dense forest that is twisted and compacted by weather above and permafrost beneath. These stunted plants are found occasionally clumped in the cottongrass tussocks. Seldom do such plants exceed two or three feet in height. Mountain avens, Labrador tea, and other heaths are also found, and they too tend to be gnarled and bent. The tussock meadows usually have fewer woody shrubs than the meadows where the tussocks are absent. Where ice wedge formation is common, polygons dissect the cottongrass tundra.

Alpine tundra occurs on the rocky ridges and exposed slopes up to snow-line. This tundra consists of a wide variety of forbs, grasses, shrubs, and lichens that form a mosaic of dense mats and individuals scattered among the rocks.

Perennial life forms and vegetative reproduction are more common among the plants of the area than among species at lower latitudes. The growing season seems too short for annual plants to complete an annual life cycle from seed. Seed viability in tundra plants is variable, and thus seed production by rhizomes, bulbils, and layering is more important than sexual reproduction in maintaining populations. When flowering occurs, pollination is more likely to be by wind than insect at higher latitudes. When insect pollinators are present, they tend to be flies rather than the wasps that are more typical of lower latitudes.

The chlorophyll content of arctic herbaceous plants does not seem to be significantly different from herbaceous plants elsewhere, although photosynthetic and respiratory rates are higher during the few weeks of favorable climatic conditions. Despite these seemingly high rates, the total growing season is greatly reduced here, and thus annual production is less than at lower latitudes (Billings and Mooney, 1968).

Although the Brooks Range environment is extremely susceptible to damage by human interference, and despite the region's importance as a breeding ground for much valuable wildlife, fire ecology there has been virtually unstudied. Nevertheless, it has been observed that recovery in the boreal forest zone is much slower than in other climes, and for a spruce stand or a caribou lichen range, recovery may require 150 years. The vulnerability and slow recovery of mosses and lichens is in contrast to the tussock communities which in part regenerate quickly and completely.

Interior Alaska is a lightning-fire region today and must have been so for a long time in the past. The proposed park-wildland, particularly the southern flank of the Brooks Range, shares in this fire ecology. During the past five years there has been an average of 20 fires caused by lightning annually in the region. Most of the area has been burned at one time or another in recent history, and lightning fires are believed to have played a great part in recycling plant successions.

Wildfire in northern Alaska is now seen as a key environmental factor initiating new successions, controlling species composition and age structure of the forest, and providing vegetative patterns upon which the fauna depend. Fires can expose mineral-soil seed bed areas needed for conifer regeneration and can increase areas of deciduous vegetation providing good moose range. Fire can increase the lichen supplies used by caribou by destroying thick carpets of moss in upland forests. However, in the burning of the mat of organic material overlying the permafrost, higher soil temperatures, less insulation, and more erosion can result. Caribou range can be markedly reduced by the burning of lichen forests, which is the most important single source of winter forage for the barren-ground caribou.

The policy of the Bureau of Land Management, which has management and protection responsibilities for the region, is to fight all fires to the extent of its capabilities on the basis of priorities of danger to life, private property and valuable resources.

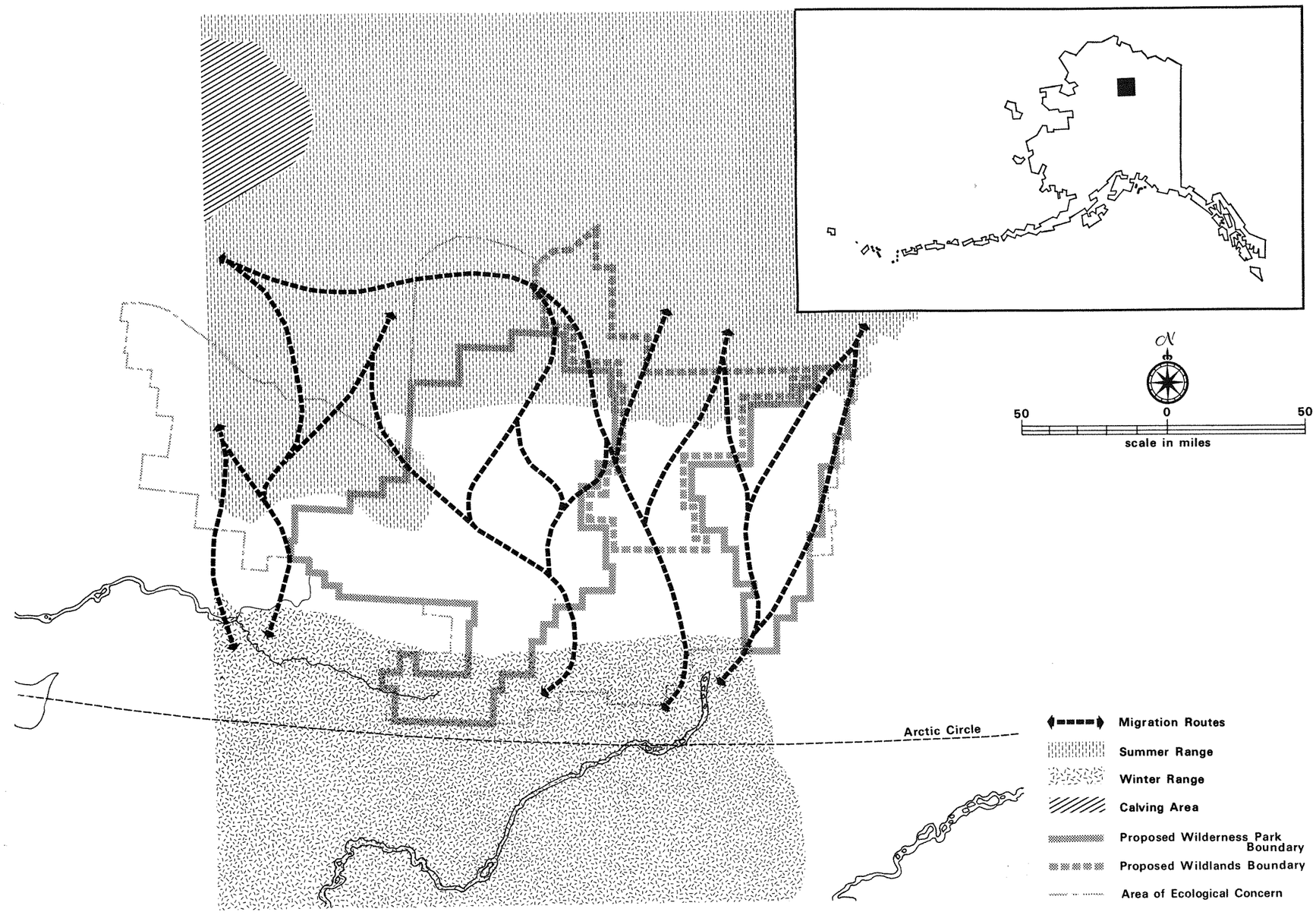
5. Wildlife

Wildlife of the proposed Gates of the Arctic National Wilderness Park and Nunamiut National Wildlands is representative of other portions of the Brooks Range. Species are relatively few, and their populations are frequently low as compared to more temperate regions. Yet, populations are characterized by spectacular local, seasonal, or cyclic abundance, as during the eruption of lemmings or voles, seasonal migrations of birds, or streaming of a caribou herd through the narrow mountain valleys.

Numerous studies have been conducted of birds and mammals within the central Brooks Range, particularly the region of Anaktuvuk Pass (Irving, 1954; Rausch, 1951 and 1953). The status of large mammals of recreational or economic importance—caribou, Dall sheep, grizzly bear, moose, and wolves—is best known from studies and surveys by the Fish and Wildlife Service and the Alaska Department of Fish and Game which extend over three decades (Hemming, 1971, and Alaska Department of Fish and Game, 1973).

Mammals: Thirty-six species of native mammals have been identified within the region (Rausch, 1951). Of these the caribou is most representative of arctic habitats and most completely illustrates many important characteristics of arctic ecology. They are the nomads of the north; traveling incessantly, they wear a lacework of trails traversing mountain slopes or ridges or channeling through the valleys and frequently appearing to have little regard for difficulties of alternate routes or terrain. (See Caribou map.)

Caribou


N
50
0
50
scale in miles
Arctic Circle
Migration Routes
Summer Range
Winter Range
Calving Area
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern

The Gates of the Arctic with the Noatak Ecological Range provide major travel routes for the Arctic herd which may number in excess of 242,000 animals (Hemming, 1971). Animals of this herd are most widely dispersed in midwinter when they are generally scattered in bands in forests on the south slopes and adjacent lowlands of the Brooks Range, and again in mid-summer when they may be scattered throughout the Arctic Slope west of the Sagavanirktok River. Both winter and summer ranges impinge on the proposal area, but migrant herds are of primary interest. Spring movement to summer ranges begins in March when bands of females travel northward up the Alatna, John and Middle Fork River drainages and cross the summit of the Brooks Range into valleys of the Killik, Chandler, and Anaktuvuk Rivers which they follow or cross in a generally westward movement to calving grounds at the head of the Utukok and Colville Rivers. The spring movement to calving grounds by females is direct and purposeful as compared to other wanderings of the herd. They appear to be governed by the energy demands of calving, lactation, antler development and molt, as movements are directed toward areas containing abundant forage (Klein, 1970).

Males and some yearlings begin moving to summer ranges somewhat later and after crossing the Range, disperse in small bands across the tundra of the foothills and Arctic Coastal Plain.

Northward moving caribou along the Dietrich and Chandalar Rivers may belong to either the Arctic herd or the porcupine herd of eastern Alaska and adjacent portions of Canada.

After calving in late May, animals join increasingly larger groups as they move to higher country of the northward slope and foothills of the Brooks Range, perhaps to take advantage of new growth of vegetation of higher elevations (Lent, 1966). As they progress, dispersal commences; and although most animals drift to the coastal plain, others remain in the mountains, and bands of caribou may be found from the Arctic Ocean to the summits of the Brooks Range by late July.

A leisurely southward drifting of caribou commences in August and in the central Arctic is directed toward the Anaktuvuk Pass and Killik River areas. Bulls gradually rejoin the cow segment of the herd and as rut approaches in early October, the mixed herds move on to the south slopes of the Range. Migration continues slowly during the rut; but as breeding declines, the tempo of movement increases until wintering grounds are reached (Hemming, 1971).

The movement patterns of caribou insure utilization of all portions of the range, and of each ecological type, in periods when forage conditions are optimum, thus preventing excessive degradation of grazed areas and permitting their annual recovery. Similarly, movements insure that most favorable climatic zones are occupied in each season, further insuring survival of the species and its dominant position in arctic ecology.

Because of their abundance, wide distribution, and pattern of behavior, caribou historically have been of major importance to man's survival in arctic regions of Alaska. They continue to play an important role in the

economy of the region--estimates of annual harvest ranging from 20,000 to 30,000 and exceeding the combined harvest of all other caribou herds in Alaska. Because only a small part of the range critical to the herd's survival is encompassed by the proposed park-wildlands, it will be essential that Park Service cooperate in managing the herd with other State and Federal land or resource agencies as well as with Native Corporations which will control a significant part of the land resource on which caribou depend.

Other large ungulates, moose and Dall sheep, are confined to relatively small segments of the arctic ecosystem--both belonging primarily to subarctic habitats. Sheep are widely distributed in alpine habitat throughout the Brook Range although seasonally they may range into brush or timbered zones. Rugged terrain with cliffs, steep slopes, and rocky outcrops (descriptive of most of the proposal area) are essential in providing sanctuary from predators, and sheep are seldom found where such escape features cannot be easily reached (ADFG, 1973). Mineral licks are desirable, but may not be an essential element of habitat. Several are located within the park-wildlands complex. The most important habitat requirement appears to be a suitable winter climate; cold and windy weather with relatively low snowfall is essential. This combination insures that windswept alpine ridges will be free of snow, exposing critical winter forage.

Moose are most prominent in forested regions south of the Brooks Range, but their range extends up mountain valleys, corresponding with the limit of forest or brush which provides critical winter habitat. In summer

moose may frequently move into alpine habitat although they are uncommon at the summit of the range. Northward, they again appear associated with brush and woodland habitat that extends along streams nearly to the arctic coast. Important concentrations are found within the proposed park-wildlands area and in valleys of the Alatna, John, and Middle Fork Rivers on the south and the Killik and Itkillik Rivers on the north (ADFG, 1973).

Moose form a significant part of the subsistence economy of villages south of Brooks Range, particularly in Alatna and Shungnak where there are approximately 50 being taken in each village annually (BIA, 1967).

Muskox are known to have occurred in the vicinity of this proposal area only on the basis of skeletal fragments that are occasionally found in the tundra (Rausch, 1951). Last native muskox were killed by Eskimos south of Barrow more than a century ago. Animals reintroduced to the Arctic Wildlife Range at Barter Island and others released at Kavik have dispersed widely, and it is anticipated that progeny from this transplant stock will eventually become a part of the park-wildlands' fauna.

Although they are widely distributed over much of North America, wolves and grizzly bears are also of significant importance to the park-wildlands region as these animals are declining or coming under the increasing pressure of civilization in other parts of their range.

Wolves of the central Brooks Range and Arctic Slope are largely associated with caribou, their chief prey. However, other prey may be used extensively when available or necessary, as when families with litters are unable to travel with migrant caribou and must subsist on local food.

During winter, wolves are normally found in packs of three to six animals—probably family groups—but occasionally packs are as large as 15 to 18 (Rausch, 1951) or even larger (ADFG, 1973). The large groups may be temporary associations of the smaller packs. The success of wolves as a species seems to be related to the complex social structure of individual packs which exhibit a degree of cooperation unusual in all mammals except man and certain primates (ADFG, 1973).

In forested regions south of the Brooks Range, wolves may prey extensively on moose or snowshoe hares, depending on their local abundance, but caribou are normally the dominant prey species within the region of the proposed area. In summer, depending on the location of their denning area in relationship to herds of caribou, wolves may depend largely on other food resources including Dall sheep, small mammals, birds, and beavers which appear to be actively sought where they are available.

In the region of the Brooks Range, denning usually occurs on dry, well drained slopes, where excavation of soils is unhindered by frozen ground. Litters usually average five or six pups.

Populations are naturally controlled by disease (Rausch, 1951) and by failure of females to reproduce when populations are high in relation to food resources. Although wolves were formerly bountied and intensively controlled on major game areas and reindeer ranges, the Alaska Department of Fish and Game (1973) has generally scorned control measures and has classified the wolf both as a big game and a fur animal, and has attempted to manage the species appropriate to the size of its population.

The wolves of the Alaskan Arctic appear to average slightly smaller in size than elsewhere in the State, ranging from about 75 to slightly more than 100 pounds. There is considerable color variation; but light colored, white, or grey phases appear to be more prevalent than in interior or southeastern Alaska, perhaps as an adaption to their tundra habitats.

The barren-ground grizzly lives throughout the region of the Brooks Range and Arctic Slope and is taxonomically identical and similar in appearance to grizzlies of both the forest and alpine habitat of interior Alaska, although slightly smaller in size. It is considerably smaller and averages lighter in color than the brown bears of coastal regions. The Alaska Department of Fish and Game (1973) considers that "of all Alaska wildlife, brown (or) grizzly bears are probably least compatible with human activities. Without special consideration, their numbers will be markedly reduced wherever substantial and sustained human occupation and confrontation occurs."

Although among the earth's largest predators, the grizzly bear of Brooks Range is primarily a vegetarian and feeds extensively on berries, sedges, hedysarum, and other plants (Rausch, 1951). They also feed extensively on voles, lemmings, and particularly the arctic ground squirrel, and may spend hours excavating ground squirrel burrows and locally disrupt much of the tundra surface in their pursuit of these small mammals (Bee and Hall, 1956). Caribou are occasionally killed, primarily as fawns, but most flesh of large mammals consumed by bears is probably obtained by

scavenging. The small size of the barren-ground grizzly as compared to coastal brown bears may be related to differences in their diet, the latter race relying extensively on the abundant salmon resources of its range.

The Alaska Department of Fish and Game (1973) has identified important grizzly concentration areas along most major streams within the proposed park-wildlands complex, including the Chandler, Middle Fork, Anaktuvuk, John, Natuvuk, Killik, and Itkillik Rivers, where use is particularly intensive during spring and fall. The population is believed to be higher than in the region to the west and may thus exceed average populations for the Range, which are estimated at one bear for each 100 square miles of habitat.

"Sport hunting is presently the most important human related mortality factor" (ADFG, 1973). Low human populations and lack of development activity in the region of the Central Brooks Range reduces the slaughter of nuisance bears or incidental destruction that occurs in populated areas. Sport hunting has significantly increased within the past decade as a result of greatly accelerated development activity and improved transportation to arctic regions, and continued protection of the grizzly is of increasing concern.

Although the grizzly bear ranges through all habitat types, its preference is for open areas of alpine or tundra habitat. In forest regions it is largely supplanted by the black bear which has similar behavior, habits and food preferences. The black bear is usually wary, and this behavior

along with the protective cover offered by its forest habitat has precluded significant effect on its population by activities of man. Populations fluctuate considerably for causes which are uncertain. It is possible that the fluctuations may relate to annual differences in the abundance of berries, which may be essential food in fall; or, the cause could be the variations in winter climate.

Fur animals common to interior Alaska are all represented within the proposed boundaries, although many, such as beaver, marten, and lynx, are largely confined to forested habitats in the southern parts of the area. Beaver, mink, otters, and muskrats are also limited by scarcity of aquatic habitats. Red foxes, including their various color phases, cross, silver, and black, are common throughout the region while the arctic fox is largely confined to foothill regions of the proposed area on the north slope of the range. Although foxes are omnivorous, they are chiefly predators on voles, lemmings, and arctic ground squirrels. Their populations may fluctuate sharply with the cyclic changes of abundance in their prey and with epidemics of rabies or other diseases.

Small rodents, the voles and lemmings, are of primary importance in arctic ecology for their conversion of plant resources to flesh on which a host of mammalian and avian predators depend. Lemmings, of which both the collared and brown lemmings occur, are particularly noted for their cyclic abundance, but Rausch (1951) suggested that cycles are not as pronounced in habitats within the Brooks Range as they are on the Arctic Coastal Plain. Within the Brooks Range other cyclically abundant rodents of

equal or greater importance include the singing, tundra, and red-backed voles. Collectively, these rodents may have a profound influence on tundra vegetation, which may have more significance locally than grazing by caribou.

Larger rodents include the arctic ground squirrel and hoary marmot. The former occurs primarily on well-drained soils along rivers or on slopes, whereas the latter is confined to steeper slopes, rock fields, and active tallus which provide protection. Both species are important food of arctic predators. The ground squirrel is undoubtedly the most commonly observed mammal of the Brooks Range and will almost certainly be present at any river camping site.

Birds: A total of 133 species of birds have been observed within the proposed Gates of the Arctic National Wilderness Park and Nunamiut National Wildlands. (See Appendix D.) These probably include most species which commonly occur in the Central Brooks Range. Information is particularly extensive for the alpine region where Irving (1960) made intensive studies with the assistance of Nunamiut Eskimos, particularly Simon Paneak. Records from this region encompass several years of observations at all seasons and include a careful analysis of traditional knowledge of Eskimo residents of Anaktuvuk Pass. Supplementary observations were obtained in the upper Noatak Valley by Manual (1973) under contract to the National Park Service.

Irving (1960) also summarized observations by several observers, including his own, on the upper Kobuk River which is within the area of

spruce forest. Additional observations within the forest region are available from the John, Hunts, and Savioyuk Rivers in the southeastern part of the proposal area.

The northern foothills region along the Colville and Oolamnagavik Rivers was visited by Cade during several season (Kessel and Cade, 1958; Cade, 1970), and is of particular importance for the continuing evaluation of populations of peregrines and gyrfalcons which nest on riparian cliffs.

Although many species appear throughout the entire region, many are largely confined to one of the three broad ecological areas, each with a variety of habitats which may further restrict or extend distribution. Thus, great horned, great gray, boreal, and hawk owls, spruce grouse, chickadees, white-winged crossbills, osprey, and woodpeckers occur exclusively or primarily in forested regions, appearing in other alpine or tundra areas only as visitors or vagrants. Jaegers, bluethroats, rosy finches, longspurs, snow bunting, tattlers, wheatears and gyrfalcons are associated primarily with alpine and tundra habitats.

Both lacustrine and fluviatile waters of diverse character are well represented in both tundra and forest zones, and 67 species, or nearly half of those recorded, are normally associated with aquatic habitats. Varieties of birds found in alpine regions are extended particularly by the presence of the aquatic habitats, and also by the extension of forest or brushland habitat far into mountain areas along the protected and well-drained valleys of major streams.

Birds of prey are unusual in their abundance and diversity and include 11 raptors, 3 jaegers and the northern shrike. Their abundance probably reflects both the diversity of habitats and the great abundance of certain avian and mammalian prey species.

In the family accounts which follow, it should be noted that a large number of species present on the proposed park-wildlands does not occur, are observed only rarely, or are disappearing in other States.

Loons

Four species of loons are throughout all regions but the Arctic, and red-throated loons are far more abundant than the common or yellow-billed loons. Although normally associated with lakes in the forest zone, in this area the common loon is found most frequently on larger alpine lakes.

Grebes

Both red-necked and horned grebes have been found nesting within the proposal area. They are not common in any zone but are most abundant in aquatic habitats of forested regions.

Waterfowl

Of 23 species of waterfowl, pintail, old squaw, greater scaup and green-winged teal are perhaps the most abundant species in the order named. Other species of ducks are those normally found in the vast lowland nesting areas of interior Alaska, except harlequins, whose nesting is confined to mountain streams and which generally winter in marine waters of the Aleutian Islands or the Gulf of Alaska.

Whistling swans, black brant, and Canada, whitefront, and snow geese occur primarily as migrants on the way to nesting grounds on the Arctic Coastal Plain, although a few Canada, and perhaps whitefronted geese, also nest along rivers within the area. The spectacular movement of geese through mountain passes heralds the event of spring and is not duplicated by fall migrants. The spring migration of black and snow geese is of particular interest. While brant are seen crossing mountains in spring, they are rarely seen elsewhere in the mainland of Alaska, and their point of departure from a coastal route is unknown. In fall they follow a coastal or marine route to waters of California and Mexico. Snow geese crossing the mountains are apparently those which follow the Yukon from near its headwaters, but their route of return is unknown.

Hawks

Only the goshawk and sharp-shinned hawks have been observed. Both occur in low numbers in forested regions, but only rarely stray into mountain regions. The goshawk is considered to be a winter resident.

Buteos and Eagles

The bald eagle is uncommon and perhaps occurs in forested regions more frequently than in the tundra or mountains, while the rough-legged hawk and golden eagle are typically birds of the tundra, nesting at widely scattered locations throughout the mountains where rock outcrops provide nesting ledges, and in the foothill region on outcrops or on riparian bluffs and cliffs. The golden eagle is most common in the alpine region, and during the summer one or two can almost always be seen soaring

(Irving, 1960). The rough-leg is most abundant on riparian cliffs of the Colville where it frequently nests in association with three to six pairs of Canada geese and a pair of peregrines or gyrfalcons (Kessel and Cade, 1960). The hawk appears to be the key species in this association. It returns each year to the same cliff, but not the same nest, and in time several abandoned nests are scattered in the vicinity of a nesting area. These may be used by falcons or geese. It is possible that geese derive further advantage from the association, since the falcons, particularly the peregrines, vigorously attack any predator that approaches the nesting area, and may thereby increase the nesting success of geese.

Harriers and Ospreys

The marsh hawk has been observed in all major areas but nowhere is it abundant. Ospreys are largely confined to forested regions, although they may rarely stray into the mountains. Their populations are limited by the availability of aquatic habitat, and they are not as abundant as in some areas of Alaska, such as the Yukon Flats where lakes and nesting sites are far more numerous.

Falcons

Of the four falcons found on the proposal area, the merlin and kestrel are largely confined to the forested region where they are believed to occur only in low numbers. Both the peregrine and gyrfalcon are associated with tundra habitats, although for the peregrine this association may be largely caused by differences in the geological character of river valleys in forest and tundra areas--the preferred nesting sites on riparian cliffs occurring only in tundra regions.

The gyrfalcon's food consists almost entirely of ptarmigan, where the peregrine's food is more diverse, consisting chiefly of shore birds and passerines, but occasionally of waterfowl, ptarmigan, or even a few microtine rodents and ground squirrels. Peregrines usually nest in aeries associated with aquatic habitat,and although gyrfalcons frequently occupy a similar site, they may also occupy a site that is far from water. Gyrfalcons are exceptionally shy about an aerie and may remain away as long as an intruder is near (Kessel and Cade, 1960). This behavior as well as the remote location of many nests suggests that far fewer gyrfalcon than peregrine nests are found in relation to their abundance. Nunamiut Eskimos questioned by Irving (1960) were able to identify locations of 17 aeries occupied by gyrfalcons in an area of about 10,000 square miles, corresponding roughly with the location of the subject proposal. Cade found three nests on the Colville in 1952, two on the Oolamnagavik, and two on the Colville in 1956, and three on the Colville in 1957. He found nine pairs and a resident female peregrine on the Colville between Oolamnagavik. Other drainages were not examined. Cade reported, however, that in 1970 the population had declined and reproductive success was reduced, apparently the result of eggshell thinning caused by contamination with DDT.

The peregrine of the Brooks Range is a transequatorial migrant that is subject to all the hazards of a long migration, including shortage or contamination of food supply. The gyrfalcon is resident Alaska and thus far has largely escaped environmental stresses that have caused declines in other raptor populations.

Grouse

Spruse grouse are common residents of the forest region, but ruffed and sharptailed grouse are rare, and it is uncertain that they occur within the proposal area at the present time. The willow and rock ptarmigan are both abundant on the tundra where the rock ptarmigan is associated with alpine habitats and willow ptarmigan with mountain valleys and the northern foothill region. Both are at least partially migratory, although seasonal movements are most pronounced for the willow ptarmigan, most of which move to woodland habitat in winter.

Cranes

Only the lesser sandhill crane is found in Alaska. It occurs only sparingly within the proposal area, a few nesting on lakes and marshes in forest portions of the proposal. Main interest is in their large migrations through mountain passes on their way to arctic nesting grounds.

Shorebirds

The general term "shorebirds" includes the plovers, sandpipers, curlews, godwits, and their allies of which 24 species have been identified within the proposal area. Of these the golden plover, most abundant in alpine habitats, and the semipalmated sandpiper, which is generally distributed in marsh or aquatic habitats throughout the area, are most abundant.

The semipalmated plover, common snipe, spotted sandpiper, lesser yellowlegs, pectoral sandpiper, Baird's sandpiper, and long-billed dowitcher are common either as migrant or as nesting birds throughout the area.

Unusual species, which ornithologists find most interesting, include killdeer and upland plover (both rare in Alaska), surfbird, whimbrel, and wandering tattler.

Phalaropes

Northern phalaropes are found on aquatic habitats throughout the proposal area, whereas red phalaropes have been observed only in migration except in tundra habitats of the Colville. Their presence on the Colville undoubtedly related to the proximity of major nesting areas near the Arctic coast. Both species winter at sea in the South Pacific Ocean.

Jaegers

Both parasitic and long-tailed jaegers commonly occur as nesting species throughout tundra areas. The pomarine jaeger has been observed only as a migrant enroute to its nesting areas on the Arctic coast. The jaegers are among the most efficient predators in tundra habitats, utilizing a wide range of foods including invertebrates, small rodents, and birds or their eggs. All are capable of hovering while in search of prey, or of acrobatic flight of unequalled performance when in pursuit of small birds. Their adaptability to varied sources of food as well as their hunting techniques undoubtedly account for their success as a species and abundance in tundra habitats as compared to other birds of prey.

Gulls and Terns

Five gulls and the arctic tern have been observed. The tern is widespread on rivers and lakes throughout the proposal. Bonepartes and herring gulls

occur primarily in forested regions, whereas glaucous and sabines gulls occur only erratically in forest areas and nest chiefly in tundra regions. The rare Ross gull has been observed only once at Anaktuvak Pass. Usually this species is associated with ice areas of the Arctic Ocean or Chukchi Sea, and comes ashore only to nest on island of the Canadian Arctic.

Owls

Six species of owls occur within the proposal area. The great horned, great gray, boreal, and hawk owls are confined to forest regions. The short-eared owl is ubiquitous to both tundra and forest habitats, although when in the latter, it is usually associated with open muskegs or marshlands rather than densely forested areas. The snowy owl nests only on the tundra. Only the short-eared owl is truly migrant, but the snowy owl is a well-known vagrant to the northern United States. By tradition its occurrence in the northern States foretells a severe winter there, but more correctly, its sporadic southward migrations indicate widespread reduction in its prey populations--chiefly voles and lemming. Populations of both snowy and short-eared owls may shift or alter dramatically from year to year as breeding birds seek places where prey is most abundant, insuring them successful rearing of broods.

Kingfishers

The kingfisher is common along streams in forested regions of the Kobuk Valley but has not been observed in tundra regions.

Woodpeckers

Yellow-shafted flickers, the downy woodpecker, and both the black-backed and northern three-toed woodpeckers are widespread throughout forested regions. All may stray into mountain areas where brush or other wooded growth extends along streams.

Flycatcher

The Say's pheobe is the only flycatcher that has been observed. It is common as a nesting species throughout forested regions as well as in brushy borders of streams in mountain valleys. Although not yet recorded, it is likely that the alder flycatcher also occurs in woodland regions.

Larks

The horned lark is an alpine species that at Anaktuvuk nests on drier slopes, usually 300 to 400 feet above the valley floor. They are the earliest nesting of the small fringilids, and although arriving in cold weather, they complete their rearing of broods and begin to leave the mountains soon after the warmest part of the arctic summer.

Swallows

Swallows of several species are widespread in Alaska south of the Brooks Range where they are able to take advantage of the great abundance of mosquitos and other insects emerging during the brief arctic summers. Five occur on the area. The tree and banks swallows are most widely distributed, but are largely confined to forested regions. The cliff swallow most frequently nests on buildings in villages south of the range but occurs on at least one natural site on the Kuparuk River within the

mountain region. The barn and violet-green swallows probably occur only as vagrants.

Crows and Jays

In this family, the northern raven and gray jay, which are widespread throughout Alaska, occur commonly on the area. The raven is most widespread, occurring both as a tree nester in forested regions or nesting on rock outcrops in mountains and on cliffs along the Colville and other streams. The jay nests in forested areas but commonly strays into mountain areas along wooded streams. Both remain throughout the winter, and the social behavior of jays as well as the acrobatic flight and varied calls of the raven place them among the most interesting of residents of the area.

Chickadees

The black-capped, gray-headed, and boreal chickadees all occur in forest regions throughout the year. The black-capped is most common and in winter may often stray beyond the forest to mountain valleys.

Dippers

The dipper occurs sparingly along streams throughout the winter. It is resident throughout the year, and its numbers are probably determined by the amount of open water in streams where it forages during the coldest months.

Thrushes

Four thrushes including the robin, gray-checked thrush, wheatear, and

blue throat occur within the proposal. Although primarily a resident of forest regions, the robin is also commonly found in mountain valleys. The gray-cheeked thrush is one of the most common birds of brush bordered mountain streams. The wheatear is largely restricted to mountain areas where it occupies a narrow band on slopes just above the valley floor. It is identical to the widespread European race and crosses the Bering Sea to winter in Asia. The blue throat is also an Asian species, and although uncommon in Alaska and found nowhere else in the United States, it is widely distributed throughout tundra habitats of the proposal area.

Wagtails and Pipits

The yellow wagtail and water pipit are among the most common residents of tundra regions but differ vastly in particular habitats they choose. The wagtail remains largely on the valley floor where it occupies thickets of willow, alder, or other brush or occasionally tall grass. The pipit chooses instead the mountain slopes and may nest in a variety of places to elevations of 4,000 feet.

Waxwing

The Bohemian waxwing is confined to forested regions. In summer they are widely dispersed, but in winter they may gather into large flocks and their appearance in any area may be erratic and ephemeral.

Shrikes

The northern shrike is widespread in both forest and tundra habitats, occurring in mountains both as migrant enroute to the Arctic Slope and as

a common nesting resident of willow thickets on valley floors where it forages on voles or lemmings and small birds. Its peculiar behavior of hanging and storing its prey on branches of small willows is common and widely known. A few may remain in mountain valleys throughout the winter.

Old World Warblers and Kinglets

The willow warbler is an illusive arctic species confined to Alaska for nesting but wintering in Asia. It is most commonly found in willow thickets of mountain valleys but has been observed throughout the proposal area. Ruby-crowned kinglets have been observed only on the Kobuk and at Anaktuvuk Pass. A few are believed to winter in mountain regions.

Wood Warblers

Five warblers have been observed within the proposal area, but only the Wilson's (pileolated) warbler has been found regularly in tundra areas where it inhabits willow and alder thickets. The blackpoll, myrtle, yellow, and orange-crowned warblers are largely confined to forest regions, although the yellow and myrtle warblers are occasionally observed at Anaktuvuk and the orange-crowned warbler has been found nesting in the Noatak Valley.

Blackbirds

The rusty blackbird is primarily a forest species but may nest occasionally in mountain valleys.

Grosbeaks, Sparrows and Finches

This large group contains 14 species which occur in the proposed area; one or more species occupy nearly every variation of terrestrial habitat,

and exceeds all other species in numbers.

Lapland longspurs, tree, white-crowned, Savannah, and fox sparrows, and hoary and common red polls are the most abundant species which, with the exception of the longspur, a tundra dweller, nest abundantly in both forest and tundra habitats. Species with restricted nesting habits include pine grosbeaks and white-winged crossbills in forest and gray-crowned rosy finches, Smith's longspur, and snow buntings found in alpine habitat. Red polls and snow buntings winter largely in forested regions of Alaska, but some remain in tundra or forested regions of the proposal area. Grosbeaks and crossbills are non-migrants, but may wander in winter. Most, however, are presumed to remain in the forested region of their breeding area.

Fish: The proposed park-wildlands lies at the headwaters of four major river systems. The north slope of the Brooks Range is drained by the Colville River and its many tributaries which flow north and empty into the Arctic Ocean. Westernmost portions of the area are drained by the Kobuk and Noatak Rivers which diverge; the Noatak circles northwest through the Baird Mountains, and the Kobuk circles southwest through lowlands south of the Brooks Range, before both empty into Kotzebue Sound. Southern and southeastern portions of the area are drained by the Alatna and John Rivers as well as other tributaries of the Koyukuk which eventually reach the Bering Sea via the Yukon River, approximately 1,000 miles from the mouth of Colville.

Despite the pronounced differences in regions through which they flow and in their terminal waters, the fishery fauna of the lower river systems are remarkably similar. A total of 27 species has been identified: 24 in the Yukon, 20 in the Kobuk, and 19 in the Noatak and Colville drainages. (See Appendix C.) A total of 14 species is known to occur in all drainages. Additional study of the individual watersheds is almost certain to further reflect their similarity.

The family salmonidae includes the inconnu, white fishes, grayling, trout, and salmon; with 16 species it is more important than all other combined. All species in this group are important food fishes and enter prominently into commercial, subsistence, and recreational fisheries. All five

Pacific salmon occur although only the chum and pink occur in all drainage. Others of this group occurring in all drainages include the inconnu, broad and round whitefishes, least cisco, arctic greyling, lake trout, and arctic char.

In other families the nothern pike, Alaska blackfish, long nosed sucker, burbat, nine-spined stickle back, and slimy sculpin are also found in all drainages. All of these except the slimy sculpin are extensively used in subsistence fisheries, and the pike is potentially of considerable recreational value.

Differences of the fishering faunas of the four systems which may prove of interest if verified include:

Dolly Varden trout, trout perch, boreal smelt, and lake chub are now known only from the Yukon;

Arctic cisco and the four-horned sculpin only from the Colville;

The Coast Range sculpin only from the Kobuk and Noatak;

Lake whitefish only from the Colville and Noatak;

Humpbacked whitefish only from the Yukon and Koyukuk; and,

Arctic lamprey only from the Colville and the Yukon.

The sockeye, coho, and chinook salmon do not occur in the Colville drainages.

Within the proposal area, the grayling is most widespread and is found in nearly all permanent water courses and larger lakes. It is a prized sport fish, but does not mature as rapidly or reach as large a size in arctic waters as in the warmer waters of Bristol Bay. Lake trout, northern pike, and arctic char may also be caught in lake and stream systems of the area.

6. Prehistory and History

Archeological investigations in the Brooks Range, while increasingly frequent in recent years, have nonetheless been too few to provide a clear, complete picture of the prehistory of the region. Many of the archeological discoveries have been the focus of controversy, particularly concerning their antiquity. Dates have been ascribed to artifacts recovered in the area that precede any others established in Alaska; some investigators have questioned these conclusions. Whatever the merits of the several controversies surrounding the archeology of the region, it seems clear that the passes, the river valleys, and the borders of lakes of the Brooks Range have been occupied since the earliest periods of American prehistory. Humans may have inhabited the area as far back as the Pleistocene, during the occurrence of the Bering Land Bridge. With further research and improved methods of analysis, the area may provide important new insights on the history of man in Alaska--and perhaps on the very early history of man in the New World.

The present inhabitants of the Brooks Range depend predominantly upon the caribou for subsistence. As revealed by artifacts discovered, the caribou hunt has dominated human life in the area from the earliest known occupations. This cultural consistency through several millennia provides an excellent opportunity for archeological investigation of the processes of cultural change and interaction in the Arctic. All of the

major cultural traditions seem to be reflected in Brooks Range archeology, but each assemblage of artifacts was adapted to the environment and subsistence needs of the mountain people. Such a phenomenon also raises interesting questions that can be answered only through further inquiry--for instance, in early periods, a single cultural tradition prominently associated with coastal regions was also prevalent in the Brooks Range. It is not yet known whether this indicates a common ethnic identity of coastal and interior peoples, a cultural tradition which dominated different ethnic groups, or other forms of cultural and ethnic interchange across broad areas. At various times any or all of these possibilities might have been true.

Most archeological investigations in the area have been conducted at points along the northern slopes of the Brooks Range and in Anaktuvuk Pass, which may be regarded as a continuous archeological zone. In 1962 that area was recommended by J. Louis Giddings for possible designation as a national historic landmark. Giddings noted: "The significance lies in the definition of flint forms associated with caribou hunting and the promise of stability in those forms that will make possible a far-reaching typology " (Giddings, Schumacher, and Snell, 1962). Most archeological sites in the pass and elsewhere in the Brooks Range are shallow and covered with tundra sod, and accordingly are difficult to locate. On the other hand, the surface

nature of the sites makes them vulnerable to amateur artifact collectors or others who might encounter them where they are apparent from surface indications. While the onsite interpretive potential for park purposes is low, the necessity for vigilant protection is increased by the importance and delicacy of the scientific potential of many sites.

The earliest cultural type identified in the Brooks Range is the Kogruk Complex, discovered in Anaktuvuk Pass. Although not conclusively dated, stratigraphic and geologic evidence indicates that the artifacts were probably deposited sometime between 16,000 and 6,000 B.C. This 10,000-year span covers a period from the earlier occupations of America to a time long after American populations were well established and widespread. The large, crude,unifacial points, scrapers, choppers, retouched flakes, and other implements have, according to some authors, remarkable affinities to artifacts occurring in Siberia around 20,000 to 15,000 B.C.--and in the view of those scholars may demonstrate some definite facts about early human migrations into the new world. Others believe that no such conclusions can yet be drawn. (Anderson, 1968; Bandi, 1969; Willey, 1966). Clearly, further research is necessary to demonstrate the earliest human occupations of the Brooks Range and neighboring areas, and any results must be correlated with discoveries made elsewhere.

The Kayuk Complex, also identified in Anaktuvuk Pass, seems to more firmly establish the presence of man in the Brooks Range since about

10,000 years ago, although the assignment of definite dates in such early periods is still conjectural. While there are evident Siberian affinities in many of the excellently flaked artifacts recovered, they may also indicate the beginning of a resurgence in the Arctic of artifactual types developed farther south in the lower United States.

Successive cultural complexes in the Brooks Range are the Naiyuk and Tuktu, which have similarities to discoveries made elsewhere, including the Campus Site (College, Alaska), Onion Portage (on the Kobuk River), and Cape Krusenstern. Naiyuk seems to represent the Plano point influence, a cultural horizon derived from areas in the northern Great Plains and the Great Lakes region between about 9,000 and 5,000 years ago. Its occurrence in the Brooks Range may be in about the middle of that period. Overlapping the Plano period in time is the northwest Microblade Tradition, which is prominently found in the subarctic, but is also located in some Arctic coastal areas. It is peculiarly characterized by microblades and certain types of burins--traits that almost certainly came from Siberia--and according to some scholars may represent a later movement of peoples into America. A blend of American and Asian elements, the tradition began around 8,000 years ago and generally had died out by 6,000 to 5,000 years ago. In the western subarctic, however, it persisted another 2,000 years or so. It is represented in the Brooks Range by the Tuktu Complex of approximately 3,500 B.C. (Giddings, 1967; Bandi; 1969; Anderson, 1968; Willey, 1966).

About 3,000 B.C. the Natvakruak Complex became pronounced in the Anaktuvuk Pass area. It evidences a great similarity to the Denbigh Flint Complex, best known in coastal regions, which marks the foundation of the Arctic Small-Tool Tradition, the mother of later Eskimo and Interior cultures. Cultural development in the Brooks Range followed the characteristic development of the Arctic Small-Tool Tradition through the millennia into the Eskimo Tradition, which by some time before 500 B.C. was established in the area. Since that time, it seems likely that the ancestors of the present Nunamiut Eskimos have occupied the Brooks Range, as indicated by the development of their material cultures which, while adapted to caribou hunting in the mountains, closely parallels the development of Eskimo cultures on the Arctic coast to the north and west. This can be explained by the familiarity between the Nunamiut of the Brooks Range and coastal peoples that has been observed in historic times.

For a long time, the Nunamiut of the Brooks Range remained less affected by European incursion than any other group of Eskimos in Alaska. Although their direct contact with non-Natives came relatively late,it was preceded by a long period of indirect influence and the introduction of trade goods. By the 1840's, American whalers were coursing the Chukchi Sea in the Arctic Ocean bringing a considerable store of trade goods. They also brought measles, influenza, tuberculosis, and venereal diseases. The desire for non-Native goods eventually attracted many of the Nunamiut out of the Brooks Range into long-term residence at the coast.

The continuing harvest of the caribou and the presence of Hudson's Bay Company trading posts to the south and east had kept the Nunamiut relatively secure in their traditional home. But the intense attraction of the trading opportunities the whalers presented, combined with the eviction of the Hudson's Bay Company and the massive killing of caribou encouraged by the whalers, totally upset the Nunamiut way of life. It was not until this process was underway that non-Natives first contacted them in their native homeland. Lieut. George M. Stoney encountered a few Nunamiut in the vicinity of Chandler Lake in 1886, while he was exploring the upper Kobuk River country. They erroneously told him that no one lived in the Brooks Range. One of Stoney's subordinates, named Howard, however, crossed the Brooks Range in the Spring and found several villages, the people of which had come to depend heavily on trade goods. But by 1899, when Frank C. Schrader of the U.S. Geological Survey explored the Brooks Range, it was evident that all but a few of the Nunamiut had abandoned the area for the coast, where trading was easier. More significant was the overall decline in the Nunamiut population, largely as a result of an influenza epidemic. The survivors still journeyed to the coast to trade but fewer returned to the mountains.

By the turn of the century the Nunamiut of the Brooks Range and Arctic coast directly north had all but disappeared. The near extinction of the caribou, diseases introduced by non-Natives, and the attractions of trade goods,had brought the population to a fragmentary level, and most of the survivors mixed with the Eskimos of Point Barrow to the northwest and Herschel Island to the northeast. By 1920, there were no Nunamiut in the Brooks Range. All had left for the attractions that Western influence had created along the coast. When the fur business evaporated in the 1920's, the survivors of the Nunamiut, still maintaining their identity, were left without a base of survival.

While some migrated to larger population centers, a few began to return to the old haunts--and the old ways--in the Brooks Range. Beginning with small seasonal hunting trips in 1938, returning to the coast to trade, an increasing number moved to the mountains. When the last trading opportunities on the coast ended in 1940, the reversion to the mountains became complete. There they resumed a seminomadic life, subsisting on the animals and plants of the mountains and occasionally venturing south to trade at Bettles or at villages along the Kobuk River. In 1947 there were two groups of Nunamiut in the mountains--five families at Chandler Lake and eight on the Killik River. Two years later, the Chandler Lake families moved to Anaktuvuk Pass to be followed shortly by the Killik River people. The settlement immediately

acquired permanency. In 1951 mail service was initiated and in 1960 the last Nunamiut family took up residence at the new village. In that year a landing strip was developed, to be followed by regular air service.

In the old days, the Nunamiut had almost no contact with non-Natives in the mountains. Later, the Nunamiut moved to the coast in stages to increase their contact and the changes wrought almost destroyed them. Abandoning the coast when the western economy had no more place for them, they reverted to the old way of life, hunting caribou in the mountains. But since that time the presence of non-Natives has become continual.

Teachers have been resident in the area for nearly two decades, and the visits of missionaries and medical personnel have long since become routine. Since the early 1950's, a procession of scientists and explorers of nearly every discipline who have come into the Brooks Range, almost every one of them meet the Nunamiut for varying lengths of time. In spite of this, the Eskimos have kept their basic lifestyle and social structure to a remarkable degree. Yet the attractions of the non-Native world and the material goods that cash obtained from the sale of artworks brings, are again making marked inroads in an ancient way of life. No longer seminomadic, they now base themselves permanently at Anaktuvuk Pass.

Nonetheless, the 10,000 years or more of occupation of the Brooks Range--demonstrated by the area's archeology--is represented today by a small village of people still practicing, in basic outline, the life that characterized the area for millenia. They represent the last of hundreds of generations and it seems assured that the changes in culture now being introduced, while not as traumatic as those that occurred before the 1920's, will continue to modify their way of life. While caribou hunting will continue for a long time, the last few decades seem to mark the ultimate break in the cultural continuity of the human occupation of the Brooks Range.

While the influence of non-Natives on the Nunamiut has been important, little evidence of their passing has been left on the land. A few trappers and prospectors have moved in and out of the mountains since the turn of the century, but their finds have been insignificant and the remains they left are few. The abandoned village of Bettles, south of the proposal area, was supply point for a small, brief, and disappointing gold rush at the turn of the century. The town of Wiseman, east of the proposal area, is an attractive relic of the same past. Here and there is an occasional trapper's cabin. Although many of the area's features carry the names of explorers and scientists, such as Stoney, Howard, Schrader, and Marshall, the historical legacy of non-Natives is largely intangible. (Guhser, 1965; Wharton, 1972)

There are no properties within the proposal area currently listed in the National Register of Historic Places. However, the archeological remains and sites like Wiseman, appear to qualify for nomination to the National Register. If the proposal is enacted, comprehensive inventories of the area's cultural resources will be compiled. All resources that appear to meet the criteria will be nominated to the National Register.

7. Social and Economic Considerations

The People: Portions of the proposed Gates of the Arctic National Wilderness Park and Nunamiut National Wildlands utilized by the Native people of several different communities for subsistence activities. The inland Eskimos, or Nunamiut people of Anatuvuk Pass, situated deep within the Central Brooks Range rely heavily on the caribou, and other plant and animal resources of the high upland plateaus, passes, and river and stream basins. In addition, to the southwest of the proposal area, the inland Eskimo people of Kobuk and Shungnak villages travel up the Kobuk River and its tributaries into areas included in the proposed park wildlands. To the south and east, the Indian and Eskimo communities of Allakaket, and Evansville, and the old mining community of Wiseman all on the Koyukuk River, occasionally travel into the area for subsistence or recreational purposes. In the near future, a population increase is expected to develop adjacent to the proposed park-wildlands in connection with the construction of the trans-Alaska oil pipeline.

The social and cultural patterns of each of these groups of Native people are intimately tied to their relationship to the land and its resources. The small and remote inland villages participate only minimally in the cash economy of northern Alaska. The river communities depend on the rivers, not only for the fisheries resources, but for communications with neighboring communities. Anaktuvuk Pass is more isolated, having

lost the traditional pattern of trade relations with the coastal villages. Overland travel in the winter is possible, but modern means of transportation and communications via the airplane is increasingly used for long distance travel to the coast or to the interior.

Changes are occurring in each of the communities as subsistence activities are being modified to accommodate new needs for cash. New technology is increasingly available (in particular the snowmachine) and access to sources of cash income for the Native people are having their impact on the numbers of people involved in subsistence gathering and amounts harvested.

The seven identified villages within the area of social and economic concern in or around the proposed area have a total population of more than 525 people. In addition, Alaska pipeline planners are calling for a peak construction crew of 500 to 600 by 1975-76, living at two campsites near the proposed park-wildlands eastern flank. Two campsites have been surveyed at Dietrich Pass and Coldfoot. Road construction to the area is slated to begin in 1974. During the operational phase of the pipeline's life, four or five persons will be employed at pumping stations, supported by air transport.

Bettles Field is a transportation center for the area, with airplane service from Fairbanks to Alakaket, Wiseman, Anaktuvuk Pass routed through

CURRENT POPULATION ESTIMATE
and
NATIVE ENROLLMENT

Village	Native Enumeration July 1973	Non-Native Population U.S. Census 1970	Total Current Pop. Estimate	Percent Native	Native Enrollment[1] July 1973
Anaktuvuk Pass	123	2	125	98	135
Allakaket	133	6	139	96	159
Alatna	27	-[4]	3	-[4]	31
Evansville	1	-[4]	3	-[4]	5
Kobuk	60	5[2]	65	92	64
Shungnak	154	5	160	97	165
Wiseman	7	-[4]		-	49
Bettles Field	20	(57)[2]	(77)[2]		71
	525	-	-		679

1. Natives must enroll at particular villages to receive benefits under the Alaska Native Claims Settlement Act.

2. Resources Planning Team Estimate, 1973.

3. Federal Field Committee Estimate 1969.

4. Not available.

Bettles. The villages of Kobuk and Shungnak are served by air service from Kotzebue.

The population of the area is a cross-section of the people of Alaska. The inland Eskimos of Anaktuvuk Pass constitute a distinctive cultural pattern among the northern Eskimo groups. The Nunamiut of Anaktuvuk Pass retain their traditional reliance on the caribou as their principal source of food. The individual and community life also revolves around the caribou. Previously, the people of Anaktuvuk Pass were seasonally nomadic, but are now permanently settled around the school and airstrip facilities. Most are bilingual, speaking English as well as Inupik, although some individuals do not speak English. Because many Nunamiut moved to the coastal villages of the Arctic Ocean or to the inland communities of the Noatak drainage in the early 1900's the Anaktuvuk people having family and social ties beyond the area.

Anaktuvuk Pass Caribou Subsistence Pattern: The Nunamiut people of Anaktuvuk Pass are the only remaining group of inland Eskimos in the Brooks Range. The traditional pattern of seasonal nomadic hunting of the caribou, with trade relations with the coastal peoples for marine mammal resources has been modified considerably in recent times. Caribou, however, remains of prime importance as a source of food, clothing tents, bedding, and household implements.

Today the Nunamiut of Anatuvuk Pass are becoming a sedentary people; and as such, their subsistence harvest practices have changed from a mobil hunting and trapping economy to one of localized hunting, tourist crafts and odd jobs. Although the caribou are basic, the people depend more on the caribou coming to them than their going to the caribou (Federal Field Committee, 1968).

At Anaktuvuk Pass, the household, with its core nuclear family augmented by children's families and relatives remains the important pattern of social organization. The elders of the village retain their traditional position of authority and control. Cultural values stressing individualism within a cooperative but sometimes competitive context continue to be important. According to Gubser (1965) there is a matrilocal marriage pattern; and hunting skill in men and industry in women are crucial attributes in mates.

Children are desired and loved, and are treated in the open and permissive fashion characteristic of Eskimos. (Gubser, 1965)

During the winter, the village may be isolated by bad weather conditions that prevent airplanes from landing. The community is self-contained and self-reliant; however, if weather prevents delivery of the now vital fuel supply, hardships can be severe. The long trips to obtain willow for fuel have been discontinued since the introduction of oil stoves in the late 1960's.

Village leaders are active in the affairs of the Arctic Slope Native Association and deal regularly with Federal and State agencies who provide needed services. No alcohol consumption is allowed in the village.

Community gatherings feature songs, dancing, and storytelling. The visit of the Presbyterian missionary may be an occasion for social gathering and leisure pursuits, as well as religious observances.

The seasonal subsistence activities of the people of Anaktuvuk Pass are focused on the taking of caribou (Gubser 1965). Beginning in September, when freeze-up comes and the snow begins to fall, the people begin intensive hunting of the caribou, that are migrating south. This continues through the fall and winter. In the fall, the people occasionally hunt for grizzlies, mountain sheep, and moose and trap for marmot. In September the mountain sheep are very fat, and the marmot and grizzly are also fat with good pelts. Some fish are still running. In September families move from summer tents to winter houses. The men of each household hunt independently. As the migration of the caribou continues, the people are engrossed in the tasks of skinning, transporting and catching skins, meat and fat, and in making and repairing of sleds, snowshoes, traps and snares. By late October and early November, the grizzlies, marmots and squirrels go into hibernation, and the southward migration of the ptarmigan begins. Ptarmigan are snared.

By November, caribou are found in scattered small groups in the timber and elsewhere. There is sporadic hunting of caribou and mountain sheep when necessary, and some ptarmigan snaring. Serious trapping for furbearers starts in November when the pelts are rich. Men leave the village to set up trap lines; then many households spread out over the countryside in groups of two, three or four to hunt and trap. These activities continue through December, January, and February, with dispersed households drawn together at the end of December for communal eating, singing and dancing at Christmas and New Years. Today, some families tend to remain in the village hunting and trapping nearby, other habitually prefer to range further afield. Ptarmigan snaring resumes in February as these birds begin their northward movement.

By March, the spring migration of the caribou to the north slope begins, with attendant intensive caribou hunting, skinning, transporting, and catching of meat and fat at the village. By the end of March or early April the pelts of many fur-bearing animals are no longer desirable, and trapping activity ceases. Caribou hunting continues during the duration of the spring migration, through May. With the end of hibernation of the grizzlies, marmots and ground squirrels, hunting and trapping of these animals picks up again. By the end of April and on into May, large birds migrate. It is during the spring that the heavy snows and strong winds come. At this time, if wood is needed for fuel, men take in long trips to wooded areas to being in logs with dogsleds or snowmachines.

By June the summer begins. Few caribou remain in the mountains. Some people hunt wolf-pups, or they may shoot and snare waterfowl or fish. Some men leave the village to seek wage employment, and some opportunities exist for sporadic employment. During the summer months there is occasional hunting for summer caribou skins, some bird snaring and fishing, and some moose hunting. By August there is trapping for ground squirrel, berry and root collecting.

Kobuk Basin - Northern Interior Eskimo Pattern: Compared to the people of the Anaktuvuk Pass, the Eskimo people of the upper Kobuk drainage follow a more varied subsistence round. The seasonal round at Shungnak is representative of the area. Data presented in the Federal Field Committee's report (1968) taken from the Alaska Dietary Survey, 1956-1961, can be expected to be somewhat out of date because of the increased use of the snowmachine and new avenues of source of cash income. Most families have returned to the village by fall--the women from their fish camps, the men from their summer wage work. Some moose are harvested in the fall. Occasionally a porcupine, at one time an important source of fat, is taken. Ptarmigan and spruce hens are usually available in moderate numbers near the village in the fall. They are snared or shot with a .22 rifle. "Mashu ," the edible root of Hedysarum alpinim is usually collected in good quantity from along the river banks and from the innumberable gravel bars in the river, and stored for winter use. Fall is also the time for collection and storing of crowberries and lowbush

cranberries, in addition to wild currants, rose hips and raspberries. During October, white fish, 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. Caribou strays sometimes drift into the area in September and sizeable herds are usually in residence in the general area of the Kobuk basin by October.

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. 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. They usually fawn in the Colville River watershed area. Intermittently, from November through about February, ling cod are obtained in moderate quantities by trapping under the river ice. They are used mostly as dog food, although the liver and roe are relished by the people. In December ptarmigan and spruce hen are either snared by the women or shot by the men. Some beaver can be trapped at considerable distance from the village. Muskrats are obtained by trapping or shooting, but require travel from the village.

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 to trap, snare or shoot "parka" squirrel. In the spring, pike and sucker may be obtained from valley lakes and sloughs. Ducks and geese are hunted during migration and later in the season their eggs are obtained from local nesting areas. In June after the ice has gone from the river, sheefish and whitefish, grayling and pike are obtained in variable quantities using seines and gill nets. Late in the season wild edible rhubarb and sourdock are sometimes obtained in quantity and often moderate amounts are stored for winter use.

The dog salmon run starts in June; however, the greater share of the catch is harvested in July and early August. This fish is one of the most important of the food sources for these people. Dog salmon is obtained in quantity by seining and gill netting. The women have the complete responsibility for both the fishing and the subsequent preparation of the catch for storage. Their traditional family camp sites are scattered along the river both above and below the village, occasionally a 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.

Blueberries are usually plentiful in the area and most families try to store some for winter use. In the summer an occasional brown or black bear or 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 they rarely make the extended hunting trips to the mountains for these animals as they did in the past. Some cloudberries are collected and eaten fresh.

Koyukon - North-Gentral Athapascan Indian Pattern: The people of Allakaket are predominantly Athapascan Indians. The village of Alatna is a culster of houses across the river, and has been the home of the few Eskimo families who had settled in the area. Today, both peoples intermingle and live as a single community. These Koyukuk people have social and cultural ties with the other Indian communities along the river. Together with the Hughes and Huslia, they speak the upper Koyukon dialect of the Athapascan language.

The river serves as an important method of communication between these communities, but air travel is another important means of transportation and communication. Yet many traditional social and cultural activities persist in Allakaket. The young people are experiencing an increasing desire to know the traditional ways. Nonetheless, the Episcopal Church established a mission at Allakaket in 1906, and today, the church serves as an important focus of community social life.

A village council is elected and established rules of conduct and runs the local Native Cooperative Store. People occasionally travel into Fairbanks to purchase supplies and for wage employment.

The people have felt the impact of contact with whites in the area of health. Change of diet, with greater consumption of non-Native, store-bought items has had its effect here as elsewhere. Dental problems are severe. Alcohol contributes to serious mental health problems in the village.

Fur parkas, snowshoes, mocassins and mukluks are made by the men and women for personal use and for sale. People attend the Eskimo-Indian Olympics herd in Fairbanks each summer, and participate in the many traditional games that event is helping to perpetuate. Occasionally some will travel to Fairbanks for the North American Sled Dog Championships. Dog sled and snow machine races are popular recreational activities in the village.

Villages of the upper Koyukuk make extensive use of the fisheries resources of the area. The food quest activities of Allakaket and Huslia follow, as reported by the Alaska Dietary Survey 1956-1961 (Federal Field Committee, 1968).

> The first offical hunting season for moose opens in September, and every hunter in the village tries to get his quota of one at this time, since the meat is usually in prime condition. A few sheefish are taken in the fall during the up river migration. Whitefish are more plentiful, and are caught by netting through the ice. During a short period in October grayling are taken.

Ptarmigan are hunted from about the middle of November through March and some rabbits are snared. The second, official moose hunting season is in November and some may be taken then, although the meat is not at its best eating then. Skins are used for making winter boots and gloves. In the years when caribou are available in the area, they are usually taken in November by the people of Allakaket. During winter, the people engage in trapping of mind, marten, and some otter, lynx and fox. Beaver are trapped from about February through March. Beaver pelts are an important source of cash income. Muskrats are available in the area and the trapping season opens about January 1.

April and May are not good months for traveling in this area. It is usually too soft underfoot and the rivers are not yet open for boat travel. Porcupine are taken in small numbers beginning in April. Ducks appear in the area in spring and are taken by the villagers in some numbers. During the latter part of May there is some fishing for pike, sucker, and white fish. In the first part of June wild rhubard is collected and eaten.

During June and early July very few native foods are available. This is the traditional "hungry time" of the past. The salmon runs begins approximately July 20th. First a few kings and then a few silver salmon are taken, followed by a more prolific run of dog salmon, but the run varies widely from year to year. Black bear are usually hunted during the last part of August. Blueberries and low-bush cranberries are available in moderate amounts in the area. Small amounts are stored for winter use. Summer has always been the best as well as the traditional time for getting wildfowl and their eggs at Allakaket.

Economic Activities and Resource Uses: 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, in discussing the income of the residents, it is important to discuss not only cash dollars received, but also the food taken directly from the land. The time and energy spent in subsistence pursuits, and reflected in harvests, constitute a form of economic activity. Hunting, fishing and trapping, and the preparation for use and storage are activities involved. Maintenance of equipment is also an important part of the subsistence activity. Since opportunities for year-round wage employment is extremely limited in the villages of the area, with the exception of Kotzebue, and only modest opportunities for temporary, seasonal wage employment exist in the area, it is important to discuss the manner in which people are involved in subsistence pursuits.

Subsistence:

Most of the people of the area are economically, socially, and culturally oriented to the subsistence utilization of the resources of the land and water. The replacement of dogs by snow machimes as the principal mode of travel and transport has been one of the most dramatic changes affecting life in the north. Combined with the use of modern weapons, it is infl uncing the time and energy spent in subsistence pursuits, the harvests, and the inter-relationship of traditional subsistence economy with the market economy. Snow machines must be bought with money, and

cash is needed to operate and maintain them.

Exact location and intensity of subsistence activities at specific locations is difficult if not impossible to determine, especially as regards the harvest of migratory animals, such as the caribou, which may move according to habitat requirements. Subsistence fishing is done principally along the Koyukuk River. Trapping and hunting takes place generally within a radius of approximately 50 miles of the villages, but this too varies according to the availability of game. In some years, people may have to travel further to obtain the necessary resources.

The proportion of subsistence production in the total quantity or value of goods and services consumed by the Eskimo and non-Natives of the region understates their importance in terms of total economic activity and cultural significance. As noted below cash incomes, which are highly irregular, are typically obtained in temporary employment at relatively high wage rates, or in some cases, from welfare payments. The vast bulk of labor input in terms of man-hours is devoted to hunting, fishing, fuel gathering, and other traditional activities. 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 section. Hunting skill remains the single most important determinant of social status and influence in the smaller villages.

An indication of the numbers and relative importance of subsistence resources harvested by the people of the several communities in proximity to the proposed park-wildlands is shown in the following tables. The Bureau of Indian Affairs' Fairbanks Agency compiled data on harvest in 1967. More recently, surveys have been conducted and data obtained on subsistence harvests by the Federal-State Land Use Planning Commission, in cooperation with Native groups in the region. The data represents the best available information to date: it is an approximate average annual utilization of the resources, based on several previous years' harvests. The extent to which these resources are harvested within the proposed park boundaries needs to be determined. For Anaktuvuk Pass, it can be fairly assumed that all subsistence pursuits are undertaken within the area surrounding the village and within the area proposed for inclusion in the parks-wildlands.

Cash Income and Wage Employment: Since the introduction of items of American material culture and their acceptance by the people of the region, a growing demand for cash with which to purchase such valuable equipment as fishing gear, outboar motors, ammunition, guns, snowmachines, and a variety of household equipment has emerged. Food staples such as salt, flour, sugar, coffee, tea, tobacco, clothing, and liquor, and other store-bought items as well all require substantial amounts of cash to purchase or maintain.

AVERAGE ANNUAL HARVESTS OF RESOURCES
REPORTED BY NORTHWEST ALASKA NATIVE
ASSOCIATION SURVEY

UPPER KOBUK DRAINAGE VILLAGES

Resource Harvested	Kobuk	Shungnak
Mammals	**Number**	**Number**
Black bear	5	27
Brown & grizzly	-	21
Beaver	-	17
Caribou	180	525
Fox (red)	15	42
Hare (arctic & Snow)	200	1,122
Land otter	-	30
Lynx	-	20
Marmot	-	8
Marten	1	2
Mink	-	60
Moose	7	59
Muskrat	100	979
Porcupine	17	37
Sheep (Dall)	-	6
Squirrel (tree)	-	14
Squirrel (ground)	-	22
Weavel	3	10
Wolverine	8	32
Wolf	10	40
Birds		
Crane	-	16
Ducks	2,500	6,225
Geese	1,000	1,200
Ptarmigan	3,000	1,125
Spruce hen/grouse	50	60
White (snowy) Owl		40

Resource Harvested	Kobuk (lbs.)	Shungnak (lbs.)
Fish		
Blackfish	-	725
Char/pike	1,000	1,500
Grayling	100	300
Chum/dog salmon	1,399	2,125
Humpey/pink salmon	50	175
Sheefish	9,200	62,000
Sucker	300	1,200
Smelt	783	2,000
Trout	370	250
Whitefish (shortnose)	20,000	62,125
Whitefish (longnose)	20,000	50,220
Whitefish (small)	5,800	8,200
Berries		
Blueberries	2,000	5,662
Blackberries	600	2,555
Cranberries	2,579	2,756
Salmonberries	374	450
Strawberries	-	120
Greens/Roots		
Fireweed	-	90
Grass roots	-	300
Sourdock	-	68
Tundra/Alaska tea	-	32
Willow leaves	-	5
Tinnik	-	500
Tree gum	-	6
Vegetables (wild)		
Eskimo potato (musse)	1,100	1,200
Mushroom		1
Onions	3	12
Rhubard	1,000	1,110

Inventory data was obtained from a survey of individual households in each village by NANA representatives. The estimates are an annual average over a period of years.

SUBSISTENCE HARVEST SURVEY

Bureau of Indian Affairs
Calendar Year 1967
Fairbanks Agency

Resource Harvested	Allakaket/ Alatna	Anaktuvuk Pass	Bettles
Mammals		(in numbers)	
Black/brown bear	12	-	-
Grizzly bear	-	5	-
Beaver	110	-	-
Caribou	230	800	-
Fox (Red)	10	30	-
Lynx	15	-	2
Land Otter	10	-	-
Martin	30	-	-
Mink	20	-	-
Moose	48	2	-
Muskrat	100	-	200
Porcupine	15	-	-
Rabbit	30	-	2
Sheep	-	6	-
Weasel	10	-	-
Wolverine	-	-	2
Wolf	5	25	4
Fish			
Char/pike	100	-	-
Grayling	1,000	1,000	-
Salmon	12,000	-	-
Whitefish	24,000	1,000	-
Birds			
Grouse/ptarmigan	200	-	-
spruce hen	1,000	-	-
Ducks	10	-	-
Geese			
Berries, Greens and Vegetables		(in pounds)	
Berries	500	400	85

Sources of cash income within the area are limited. Few opportunities for wage employment exist in the villages, so most people must go to Fairbanks or other urban areas for seasonal employment and year-round jobs. As is true for other areas of the State, government is a major employer and the principal source of cash income.

Government as a Source of Income: Federal and State governmental functions which provide employment and cash income for the people of the area include administration and operation of the schools, public health service programs, health and welfare programs, postal service, transportation, aviation, and weather services, land management services--principally firefighting. Local governments have played a negligible role in providing wage employment.

Administration of schools in the villages of Allakaket/Alatna, Anaktuvuk, Bettles, Kobuk, and Shungnak is the responsibility of the State. Approximately six local people are employed in these facilities as teacher aides. The Shungnak school employes a janitor and a cook. Other Government wage employment in the communities of the area generally include a postmaster, a health aide, and a welfare aide. The Federal Aviation Administration, the Weather Service, and the State Department of Aviation facilities at Bettles offer additional opportunities for wage employment of local people in that community. Some villages have a Native Cooperative Store which employes a manager.

One important source of seasonal government employment is fire fighting. Residents are employed on am 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 seven were hired as fire fighters from Allakaket/Alatna with per capita earnings of approximately $1,322. In 1972 77 were hired from Allakaket/Alatna with a per capita income of approximately $875; nine were hired from Kobuk with per capita earnings of approximately $783; and 32 were hired from Shungnak with per capita earnings amounting to approximately $980.

Shungnak has an Army National Guard unit that provides part-time, year-round employment for 10 men.

Governmental expenditures that contribute to the cash income of the people of the area include public assistance. In addition to limited unemployment compensation payments and social security benefits, the residents receive three types of income assistance; Bureau of Indian Affairs 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

material living standard for some persons who now utilize both subsistence and public assistance has undoubtedly improved.

Other Sources of Cash Income: Some people derive cash income from the sale of fur pelts and arts and crafts products. Tourism and service industries are limited in the area. Guiding and air charter services, as well as accomodations and hunting supplies bring a cash income for a few people principally at Bettles. In 1972 there were 133 licensed guides qualified to conduct hunts in the Arctic guide districts of Alaska. Most are not local residents. There was one guide at Kobuk and two at Bettles. A guided hunt for bear, sheep, caribou, and moose could cost the hunter $5,000 or more with licenses and transportation to Fairbanks additional. A guided hunt for any single species could range from $1,000 to $2,000.

Most people must travel out of the area for wage employment. A few residents of Kobuk and Shungnak may go to Kotzebue or Fairbanks for seasonal employment on construction jobs or in the commercial fisheries of the Kotzebue Sound. Some residents of Anaktuvuk Pass may go to Barrow for seasonal employment on construction jobs or in the oil drilling camps. Few people belong to labor unions, but for those who do, union hiring is done out of Fairbanks. Many of the people of the area travel to Fairbanks for seasonal construction jobs, and fire fighting. Some may move temporarily to Fairbanks in search of permanent wage employment.

The length of stay varies greatly, and depends on a variety of factors. Many have difficulty adapting to urban life styles, finding jobs, and housing.

General Hunting, Fishing, and Outdoor Recreational Uses: The area within and surrounding the proposed park-wildlands has been used by several Native groups for subsistence purposes. In addition, in recent years, small numbers of non-Natives have settled at several locations in the general area, and these people have adopted patterns of subsistence use of resources to supplement cash income.

Sport hunters and a growing number of backcountry users, as well as prospectors and scientists make use of the resources of the proposed park.

Principal areas for hunting, trapping, fishing, and fuel gathering by Native groups for subsistence uses in the proposed park-wildlands area are: the Anaktuvuk River in the northern foothills region, the John River as far as Hunt Fork, and the Chandler and Shainin Lakes areas, together with the valley routes connecting these areas with Anaktuvuk Pass. A few trappers go as far as Ernie Creek and the North Fork of the Koyukuk River, the upper portions of the Tinayguk River, and the upper reaches of Suluak Creek and the Okokmulaga River, both tributaries of the Killik.

As for the Eskimos and Athapascan Indians, inhabitants of the Native villages of Kobuk, Alatna, Allakaket, and Evansville use the southern flank of the Brooks Range. Kobuk River village people use the Kobuk River as far up as lower Kobuk Canyon.The Allakaket-Alatna residents regularly use the Alatna River as far up as the Malamute Fork. A few take power boats as far up as the Unakerak River for sheep. Evansville residents, as well as the Caucasian residents of adjacent Bettles Field, make occasional use of the John River as far as Crevice Creek and also the lower reaches of the North Fork of the Koyukuk for hunting and fishing.

Eskimo-Indian, and non-Native hunters from small settlements on the south and east sides of the proposal area trap and hunt its lower reaches for caribou, moose and wolves. Sport hunters (about 200 annually) go into the higher regions for sheep and bear (which are also occasionally taken by Native hunters).

The Central Brooks Range now supports subsistence hunting, primarily by Arctic Slope Natives, for caribou, and an increasing amount of sport hunting, mainly for Dall sheep. Moose and bear, particularly grizzlies, are also taken by sport hunters. Wolves are sought for their pelts, mainly by residents. The sheep kill from the area in 1971 was about 8 percent of the statewide total, but the percentage is expected to increase as more hunters seek the less crowded northern hunting grounds. Harvest totals for 1969, 1970, and 1971 were 30, 67, and 86 respectively for the general area under discussion, as compared to Statewide totals of 955, 998, and 1079.

Grizzly bear kills for State Game Management Units 23, 24, and 26, which include the proposed parks-wildlands were 30 in 1969, 57 in 1970, and 36 in 1971, when there was no open season in Unit 24. Bears killed illegally or for subsistence are estimated by the State Department of Fish and Game to be about 20 or 30 percent of the reported take. The department reports that Brooks Range grizzlies provide only a small portion of the Statewide harvest, as most sport hunters seek the larger brown bear of the Alaskan Peninsula and other coastal regions of Alaska.

Estimated moose harvest for the three game management units is from 150 to 500 animals annually. Roughly half of this take is unreported, most of it being along rivers in the vicinity of villages.

During the 1960's the caribou harvest from the Arctic caribou herd alone surpassed the combine total kill for all other big game animals in Alaska. Virtually the entire harvest may be presumed to be sor subsistence purposes, according to the State Department of Fish and Game. The annual harvest of a particular village usually depends upon movements of the herd in relation to that village, and this can very significantly. The best estimates of the annual harvest during the early and middle 1960's is between 20,000 and 30,000 animals, or roughtly 10 percent of the herd. With the advent of crosscountry snowmachine use in the late

1960's the need for caribou for dog food declined rapidly. Conversely the snowmachine vastly increased the ease with which caribou can be hunted and subsequently transported to villages. It is believed that Federal food stamps have further lessened the need for caribou. This decline may have resulted in as much as a 50 percent decrease in the harvest, or a current yield of 10,000 to 15,000 animals annually.

Wolf kills in the three game management units totaled 485 in the 1966-67 season, 536 in the 1967-68 season, and 237 in the 1971-72 season, when Unit 26 was closed for wolf shooting. Information for the1968-71 period is incomplete.

The proposed parks-wildlands area is also enjoyed by a small but growing number of hikers, boaters, and mountain climbers (about 50 per year), as well as persons interested in photography and the natural sciences. The latter include professional prospectors and other geologists seeking more information about the geological history and mineral resources of the region.

Existing Facilities and Services: Anaktuvuk Pass is notable for its physical setting in the sweeping upland valley of the pass. The cluster of dwellings near the airstrip consists of homes of scrap lumber, some old sod houses, tents, meat-drying racks, and several newer frame structures. The school building is situated a short distance away

and on higher ground. A small community hall offers a place for community social gatherings and village council meetings. There is no modern system of waste disposal or water supply. Outhouses are used for sewage disposal. Evidence of the importance of the caribou is plentiful. Meat racks, drying and discarded skins and bones abound.

South of the proposed park boundary, the community at Bettles Field and adjacent village of Evansville serves as a transportation center for the Central Brooks Range. This combination village-airfield succeeds the old and now abandoned Native settlement of Bettles that was formerly located about 4 miles from the present community down the Koyukuk River. Bettles Field has a Federal Aviation Administration flight service station, staffed by eight employees, who live with their families in half a dozen houses and apartment units. Bettles also has a small lodge, an airport and air charter service, one grocery, a post office, and a one-room, one-teacher school operated by the State. Five families live in Evansville. There are no medical services.

The other communities vary in size and degree of "modernization." The river villages of Allakaket, Alatna, Shungnak, and Kobuk consist of a grouping of log cabins or frame dwellings along the banks of the river with their associated outbuildings, fish racks, and boat moorings. Anaktuvuk Pass consists of a cluster of sod and frame houses, outbuildings, and meat racks near the air strip in the broad upland valley of the pass. There is no modern system of waste disposal or water supply.

Mineral Exploration: Mineral exploration in the Central Brooks Range dates back to the 1880's with a major gold rush in the area in 1898, year of the Klondike gold stampede. The Middle Fork of the Koyukuk was the principal area of gold mining, with the town of Wiseman the center. Mining booms were experienced in 1900, 1906, and 1911; and by 1915 about 35 mines employing 150 men were operating in the region. From 1912 to 1916 more than $1 million in gold was mined there. Then the mining declined, and World War I wages drew miners elsewhere. Today a handful of men make a living from gold mining; others mine as an avocation. The population of the picturesque log village of Wiseman has declined to 7.

In the mid-1950's prospectors in the Shungnak River area west of the proposed park-wildlands area discovered a copper ore deposit generally believed to be of national significance. Mining of this deposit has not yet been undertaken and reserves have not been divulged. Further prospecting has continued, with claims filed.

Most recently, considerable human activity is taking place in areas adjacent to the proposed parks-wildlands, particularly in surveying and other preparations for construction of the trans-Alaska oil pipeline. Equipment for the construction of oil drilling pads and facilities for exploration and drilling crews on the Arctic Slope have been transported through areas adjacent to the parks-wildlands.

B. PROBABLE FUTURE OF THE ENVIRONMENT WITHOUT THIS PROPOSAL

In the next few decades the environment surrounding the proposed parks-wildlands is likely to change markedly, though the precise nature of that change cannot be forecast at this time. Immediately to the east is the proposed pipeline corridor to bring oil from the Prudhoe Bay fields for ocean trans-shipment at Valdez. Use of this corridor will induce settlements along its route, because a highway and railroad are projected along the pipeline. Three large airstrips are planned at Prospect Creek, 18 miles from Bettles, in the Dietrich River valley, and at Galbraith Lake. These are to be turned over to the State for operation. These developments in transportation will serve not only pipeline operation needs but also the needs of visitors desiring to see the northland of Alaska. The severity of the impact of these new uses of the region will depend upon the effectiveness of Federal and State planning for the corridor. More hunting pressure on wildlife resources will undoubtedly be one of the first effects of increased travel through the region.

A corridor road could mean new life for the historic and picturesque mining community of Wiseman, which has dwindled in population to seven permanent residents. Already there is private interest and activity in restoring some of its remaining log buildings. Wiseman may become a target for tourists and a recreational departure point for trips into the proposed park-wildlands.

The scenic attractiveness of the large lakes in the region will bring developments to them unless special designation and protection is given. Interest in mining potential will also induce more people to come to the area, resulting in changes in the natural environment.

Bettles seems destined to grow steadily as north Alaskan developments unfold. This growth will be accelerated if a ground transportation corridor is opened from Bettles to Kobuk and Nome, as has been proposed by the Alaska Department of Transportation. The growth also would be speeded by park-wildlands establishment, for visitors who do not use the pipeline corridor route would rely on Bettles as a supply center and point of departure for park journeys. On the other hand, development of a major airstrip at Prospect Creek on the proposed pipeline corridor 18 miles away may influence the future use of Bettles. No changes in FAA facilities location are now planned, however.

A western access route including perhaps a railroad and a road could serve cooper mining operations in the vicinity of Bornite. The Alaska Department of Highways has included the road from Prospect (on the proposed pipeline corridor) to Bettles in its fiscal 1976 construction program and has programmed it 17 miles further in fiscal 1977. This could bring many more people to the southern flanks of the Brooks Range, both as residents and visitors using the new ground access, which has been proposed to follow the upper Kobuk River valley for a part of its route.

Development of oil, coal, or other mineral resources on Native and State lands and in Naval Petroleum Reserve Number 4 could increase human activity on vast reaches of the Arctic Slope now uninhabited and untraveled except for occasional hunting and exploration. This possibility is foreseen in a conceptual transportation system proposal by the Alaskan Commission of Highways in consultation with State and Federal agencies and presented in 1972 to the Federal-State Joint Land Use Planning Commission for Alaska. This proposal envisions an eventual east-west road generally following the Colville River valley and linking the proposed oil pipeline corridor with a parallel corridor across the Noatak Basin from Kobuk to Barrow. If all these proposed transportation routes are built the Central Books Range will be encircled by them. (See Transportation map.)

Although not a likely transportation hub for the region, a particularly convenient point of departure for trips into the Central Brooks Range is the Eskimo village at Anaktuvuk Pass. The location of the only airstrip in the mountain area having scheduled air service. The villagers now depend largely upon caribou subsistence, plus aid through the Bureau of Indian Affairs, and their livelihood consists of hunting and the making of hide masks for sale as handicraft items.

Should this way of life become untenable, or should opportunities for living elsewhere (perhaps along the pipeline) prove more hospitable than in the pass, the village might be abandoned. On the other hand, economic benefits from recreation provided for visitors both on Native lands and to the parks-wildlands might bolster the village's economy and insure its continuing existence.

Anaktuvuk Pass is linked on the map to Bettles and Umiat on the Colville River to the north, by a winter road up the John River valley. This road was constructed from Fairbanks to Umiat in 1968 as a first step in providing transportation to the Arctic Slope and its oil prospects. This route has been abandoned both as a motor road and railroad in favor of the pipeline corridor now proposed farther east. The winter road now is a derelict and partially water-filled scar. In winter, it is occasionally used by local people as a sled and snow vehicle trail. Conceivably, should there be new oil or mining operations on the Arctic Slope farther west from Prudhoe Bay requiring more than the one transportation corridor now proposed, the John Valley might again be considered for a transportation corridor, despite the less than optimum engineering conditions and possible disruption of wildlife now recognized as problems there. This corridor and also the westward transportation corridor routing through the Kobuk valley would be precluded by the parks-wildlands as proposed.

Without national park and national wildlands status, the quality of the environment proposed for such protection could deteriorate under the impact of increasing human use. Part of the area includes a broad band of mineralized metamorphic rocks, in which base metal mineral deposits have been identified which extends eastward from Bornite along much of the southern slopes of the Brooks Range. Numerous small placer gold mines exist and have been worked near the proposed park. Four legally located and maintained active claims are within proposed parks-wildlands boundaries, according to State records. Another claim is reported as a Native allotment application.(See Patents, Claims, Applications map.)

The contact area between the granitic intrusions represented by the Arrigetch Peaks and Mt. Igikpak is mineralized, and prospects there have aroused interest. Prospects promising an impressive copper deposit have been made adjacent to the Reed River watershed immediately west of the proposed parks-wildlands.

Extensive subituminous and bituminous coal deposits also are known in the area immediately south of the Colville River. This northern area of the Park is in the Northern Foothills and Southern Foothills Petroleum provinces. Exploration has found oil at Umiat.

Should the Congress not authorize a Gates of the Arctic National Park and Nunamiut National Wildlands or similar preserve, the d-2 status would

lapse, leaving the land still withdrawn under d-1 status. Its eventual treatment under the multiple-use land management principles and policies of the Bureau of Land Management, which would possibly administer the areas as heretofore, has not yet been planned. Although deposition of the most important scenic and recreational land directly to private ownership is not contemplated (if authority to classify it for public use is obtained), a number of the lake areas might be open to State selection. The lands would be open to mining, hunting and, in all probability, motorized use by snow and all-terrain vehicles, as well as aircraft. The natural environment of the region would most certainly undergo extensive and irreversible change.

III. THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

A. IMPACT ON WILDLIFE

Within the proposed park-wildlands complex both the larger and lesser species of wildlife are significant, primarily as components of ecosystems which have remained almost untouched by modern man. The various rodents, most notably the lemmings, are of primary importance in terms of their total biomass as well as their effect upon the landscape. Among the larger mammals, the caribou and its associated predators and scavengers are noteworthy. Nearly 10 percent of the range of the 242,000-animal Arctic caribou herd is included in the park-wildlands complex. Most of the range within the proposal is made up of migratory routes, but a portion of the Kobuk valley (equalling about 5 percent of the total park-wildlands) provides winter range and the Arctic Foothills (about 20 percent) is used for summer range.

Dall sheep are scattered throughout the uplands of the area though distributed mostly in local concentrations. No population figures are known, but a survey of sheep adjacent to the pipeline route counted over 1,000 individuals. Moose occur throughout the lowlands south of the Brooks Range, and have become quite numerous in recent years along willow-lined watercourses north of the range. Wolves, although much reduced prior to cessation of aerial wolf hunting, are widespread and increasing in numbers. Grizzly bears favor stream bottoms and adjacent

slopes, and exist at a density of about one animal per 100 square miles of suitable habitat in this region. At least 17 gyrfalcon aeries are found in or adjacent to the proposal area, most notably along the Colville River. Grayling, whitefish, sheefish, lake trout, and chum salmon inhabit waters in portions of the area. Productivitiy of arctic waters, however, it very low, about one pound per 100 surface acres annually.

Subsistence use in the region is substantial, from Anaktuvuk in the Brooks Range and six villages to the south, whose combined population is over 500 people. (See this Chapter, section F on Subsistence Use.) Anaktuvuk residents rely on the caribou migrations. The other villages, in addition to using the caribou, rely primarily on moose and the various fish species as well as furbearers. The total harvest of these wildlife species is substantial (See Chapter II, table on Subsistence Harvests and this Chapter, section F on Subsistence Use.) These uses would continue under this proposal, subject to restrictions necessitated by reproductive or other tolerance limits of the various species. Protection of sensitive areas of wildlife use such as winter caribou feeding grounds would be accomplished by restricting access or use levels where necessary. The impact of these policies would be to reduce stress on fish and wildlife at critical times and places while generally permitting present levels of use to continue.

Sport hunting and fishing use levels are relatively low but very rapidly increasing in the area. An estimated 200 non-Native hunters take an average of over 50 sheep per year in the area, equalling about 8 percent of the total State harvest. Also, significant numbers of grizzly and wolf are taken. Trophy sport fishing, primarily for trout, char and grayling has recently built up in the area.

Under this proposal, hunting in the park would be allowed to continue on a "fair chase" basis. This would be subject to closure in certain zones for the protection of concentrated visitor use areas or for management of wildlife. Ten years after park establishment and periodically thereafter, the Secretary would study the hunting situation and report on his findings. Public access will be limited in order to control times and locations of access and numbers of users. This will require the use of an entry permit system. The impact of such control in stabilizing wildlife distribution and population levels would be significant directly by limiting disturbance and indirectly by limiting harvest levels. In areas where sport hunting would conflict with subsistence utilization of wildlife, the latter would take precedence. Due to the slow growth of fish in the subarctic, fish could be kept only for personal use within the area. The impact of this requirement would be to allow fish species to maintain existing population and size levels.

In order to protect the wilderness values of the park, visitor use inside the park boundaries will be on a permit system. Use quotas will be assigned for various areas of the park such as valleys, lakes, and rivers, on the basis of each area's "carrying capacity." This capacity will be determined on the basis of ecological and behavioral research to protect the area's vegetation, wildlife, and especially its wilderness character. It is now estimated that with the above permit and quota system, overall visitation inside the park will not exceed 4,000 annually within 10 years after establishment. In the wildlands, by anticipated joint agreements with the Natives, recreation use could be kept to low intensity levels except at designated use sites such as Anaktuvuk and Chandler Lake. A permit system, similar to that in the park, could be implemented to protect the primitive character of the wildlands.

Outside the park at Wiseman and Bettles and inside the wildlands at Anuktuvuk Pass, visitation could reach much higher levels. It is possible that public visits will reach 40,000 annually within 10 years as a combined result of the proposal's establishment and pipeline construction with its related transportation net. (For details, see this Chapter, Impacts on Recreation, Tourism, and Transportation.) Such levels of human use could cause substantial disturbance to wildlife, especially on the periphery of the park. The proposal would have a significant impact on wildlife within the park and wildlands by preventing such human-use pressures from spreading into wilderness and primitive lands within the boundary.

No roads would be allowed in the wilderness park, thus precluding possible disruption of wildlife activity patterns caused by road construction and use. While this proposal plans no roads in the wildlands, the State has interest in a former road corridor through Anuktuvuk Pass. The road now has deteriorated almost beyond usability, but should the State wish to restore it, the impact of this proposal would be to restrict the road's impact on wildlife by coordinating planning with the State and Natives and by stipulating regulations on road construction and use. Such regulations could prevent or ameliorate damage to critical habitat, disturbance of distribution, and excessive hunting pressures on wildlife populations near the road.

Motorboat use of the Kobuk and lower North Fork Koyukuk could cause moderate disturbance of waterfowl and fish populations. Air tours are envisioned, which could agitate wildlife unless minimum overflight altitudes are controlled. Closure to mineral entry of federal lands within the proposal would preclude pressures which might otherwise develop on wildlife from increased hunting and mining activity.

A cooperative management agreement with the Native corporation involved would delineate wildlife policies on lands within the wildlands. Exact policies cannot now be stated, but probable impact of such an agreement would be to stabilize levels of human pressures on wildlife within these areas. Cooperative agreements with state, federal, and Native organizations would be sought to protect habitats in the areas of ecological concern, the impact of which would be to amplify the effects of this proposal on maintaining fish and wildlife populations. The most notable example would be working

out of such agreements between all governmental and private landowners in northwest Alaska to devise an overall management strategy for maintaining the habitat and population of the 242,000-strong Arctic caribou herd.

Implementation of this proposal could lead to an increase in hunting and other activities outside the proposed complex, which could adversely affect wildlife in those areas more than if no proposal were enacted.

The impact of this proposal on wildlife could be moderately detrimental in those areas receiving heaviest use. Overall the proposal would have a relatively minor direct impact on populations and use patterns. The most important impact would be on perpetuation of wildlife resources, particularly in view of eventual increased development expected in the area. The effect would be significant for key arctic wildlife populations.

B. IMPACT ON VEGETATION

Vegetation within the proposed park - wildlands complex is primarily determined by climate. Since the area extends across one of the sharpest gradients of summer temperatures in North America, vegetation varies from luxuriant spruce forest to lowland Arctic tundra. Boreal forest occupies roughly 15 percent of the proposed complex varying from tall closed forests on well drained river flood plains and southfacing slopes, to scrubby open-grown bogs where permafrost reaches close to the surface. Shrubby growth, covering about 5 percent of the area, occurs in burns, bogs, subalpine areas, and extensively along streams on the Arctic slope and lowlands. Roughly 25 percent of the complex is alpine tundra, both moist (tussock) and dry (heath). About 40 percent of the land is barren of vegetation. The remaining 15 percent, primarily in the Killik drainage, consists of true

Arctic tundra, primarily moist. This moist tundra is particularly vulnerable to disturbance, but in view of the fact that the amount of human use contemplated for this area is light, the direct impact of the proposal is expected to be insignificant.

Due to the short warm season, plant reproduction occurs primarily by vegetative means rather than by seeding. Permafrost occurs throughout the area, greatly restricting the potential for vegetative growth; thus most plants are swallow-rooted. Fires caused by lightning are widespread, primarily in forested areas, and substantially influence types and sizes of plants present. Lichen-covered areas where wind removes snow cover are vital for caribou feeding.

Present uses of vegetation are limited almost entirely to subsistence purposes, for food (berries, tubers) and wood uses for fuel, cabin logs, and sleds. These uses would be allowed to continue under this proposal. These uses would be subject to limitations on fuel gathering to assure adequate reproduction, particularly near the limits of forest and brush growth. The impact of this proposal on the vegetation used for subsistence purposes would be to maintain those species whose extent has been somewhat reduced by long-continued gathering.

Fires caused by lightining would generally be allowed to carry out their normal function in the ecosystem. Such fires would only be fougth in the event that they threatened human use areas or critical caribou habitat. This policy is expected to have a negligible impact on the existing vegetation patterns in the area.

Floatplane moorage facilities on six lakes are planned on federal lands within the proposed complex. Five manned ranger stations and 5 unmanned patrol cabins also are envisioned. Vegetation would be destroyed or altered at these sites, with substantial localized impact. Foot travel routes and campsites, particularly near a number of air access sites on lakes or gravel bars, could cause moderate impacts around these sites due to trampling and campfires. Such damage would be limited in extent, however, due to the entry permit system, which should limit use levels to the carrying capacity of the local vegetation. Snowmobile use for subsistence will be allowed to continue for subsistence purposes, and possible transportation use could be considered in the wildlands. Such use could have a minor impact on vegetation due to snow compaction or branches breaking.

The development of cooperative visitor use facilities will be studied at Anaktuvuk Pass and on one of the lakes in the Native-owned portion of the wildlands. Similar facilities will be considered on a cooperative basis along the pipeline corridor near Wiseman, and at Wild Lake on lands available for State selection. The Anaktuvuk and Wiseman facilities could be located in areas where vegetation already has been substantially modified by man. Nevertheless an increased visitor use level could significantly increase the present degree of man-caused alteration. Facilities of a rustic nature along the shores of one of more lakes could cause substantial disruption of vegetation in the immediate area, partly owing to the continuing use which such locations would experience.

Heavy use areas, though comprising less than 1 percent of the proposed complex, would entail substantial impact to vegetation. Overall area impact would be slight, with localized disturbances occurring at and near access points.

C. IMPACTS ON WATER QUALITY

Waters within the proposed complex are at present almost free of pollution, however, pollution is only one of a nunber of factors affecting the quality of water. Streams are generally clear, but lack of ground absorptive capacity due to presence of continous permafrost results in a rapid outflow following heavy rains or snowmelt. This leads to short-term turbidity, with concentrations of suspended sediments running from 5 to 500 milligrams per liter. Extensive exploration is necessary to develop groundwater supplies. Deep wells are generally required, and even these often yield poor quality water. Surface waters are of fair to poor quality for drinking (BLM, 1973).

Inside the boundaries portions of the Kobuk, North Fork Koyukuk, Noatak, Killik, and Alatna Rivers possess floodplains which frequently are enriched by siltation due to spring flooding from ice dams or snow melt. Rates of water flow fluctuate greatly in the upper portions of these streams. Average freezeup time is in early October; breakup, in early June. A number of normally clear lakes, some large, glacially scoured and moraine-dammed, are found on both north and south flanks of the Brooks Range.

Increased airplane and motorboat use as a result of this proposal could lead to some increased use, storage, and movement of oil and gasoline. Spills of these materials could cause minor chronic pollution in waters adjacent to areas of access.

Construction of administrative and visitor use facilities could disrupt vegetative ground cover, causing local melting of permafrost, which might then lead to siltation of nearby waters. The contemplated visitor facilities adjacent to one or more lakes in the wildlands, and adjacent to proposal boundaries could cause moderate deterioration of water quality, although careful location and construction could lessen the extent of this impact. Construction of more substantial facilities at Anaktuvuk, Wiseman, and Bettles could further reduce local water quality already affected by human habitation. This would result if facilities such as septic or sewage systems were not installed to handle the expected large increases in the need for human waste disposal.

In general, areas of primary development would experience substantial impacts on water quality due to increased human use. However, overall adverse impacts are expected to be minor and temporary. To the extent that the proposed park-wildlands would prevent water quality degradation from mining, road building, or other construction, its effect on preservation of water quality in the area would be beneficial.

D. IMPACT ON AIR QUALITY

Air quality over the proposal area is presently very high, except at times and places that wind-blown glacial silt obscures visibility. The moderate increase in airplane and possibly motorboat use that would attend this proposal could cause temporary and localized concentrations of exhaust gases. Overall impact from the proposed area would be negligible.

E. IMPACT ON VISUAL INTEGRITY OF THE LANDSCAPE

The only substantial human alterations of the landscape in the proposed park - wildlands complex exist at the Eskimo village of Anaktuvuk Pass. Elsewhere in the complex, man-made landscape alterations are minimal. Cabins are found in various locations, such as on Walker, Takahula, and Ernie Lakes, and along lower portions of several rivers. A number of cabins and seasonal camps are used for subsistence activities, many under allotment applications in the Anaktubuk area. Use of these shelters would continue under this proposal.

Faulty engineering in the construction in 1969 of a winter - haul road up the John River and through Anaktuvuk Pass has led to considerable progressive slumping and erosion along the right of way, alteration of drainage systems, and siltation of adjacent waters. Under this proposal, restorative measures would be attemted to lessen the long-term damage which could otherwise accrue to the landscape.

Road construction would be prohibited in the wilderness park, although the State has identified a right of way traversing 40 miles of the proposed park along the Kobuk River. While no road construction is contemplated in the wildlands, the State has interest in a right of way through Anaktuvuk Pass. The proposal would affect possible road construction by influencing selection of route, by regulating location and activities at road camps and borrow pits, and by regulating construction to minimize slumpage and erosion following permafrost disruption. Such controls could reduce the substantial visual impacts which such a road would cause in this open terrain.

Extensive snowmobile routes are presently used for subsistence and related travel purposes. Some of these routes may have been sufficiently compacted to be visible across the snow-free landscape. Such use would be allowed to continue under this proposal, even though it could cause additional minor impact.

Five manned ranger stations and 5 unmanned patrol cabins are proposed within the boundaries of the complex. Six lakes would be provided with moorage facilities for float planes. No other visitor facilities are contemplated on federal lands within the proposed complex. The moorage sites could intrude upon shoreline integrity, and administrative facilities would be highly visible on tundra or shorelines unless set back, harmonized, or screened by building design, natural topography, or vegetation. Differential melting of permafrost beneath and adjacent to these facilities could have locally significant impacts on appearances of these locations.

While campsistes or trails are not now planned, camping places and foot travel routes, especially near the designated air access points, could become conspicuous where ground surface is repeatedly disturbed. Locally significant visual impacts could occur, although the number of such sites would be limited, and their use could be rotated.

The primary administrative and visitor use facilities are planned at Anaktubuk Pass in the wildlands, and possibly also at Chandler Lake. Outside the boundaries they are proposed for Wiseman area, Bettles, and possibly Wild Lake and other sites.

In the wildlands, construction and use of facilities at Anaktuvuk would have a relatively minor visual impact on the existing community. Possible back-country accommodations on one of the Native-selected lakes would be appropriate. Such a facility would have a locally significant visual impact, though it would be carefully designed with cooperation between the Native corporations and the National Park Service.

Both administrative and visitor use developments are proposed, under co-operative agreement with the landowner, probably BLM, in the Wiseman area. Their impact in an existing human use area would be moderate and with proper designing, could blend in well.

Agreement would be sought with the State for a rustic backcountry accommodation at Wild Lake, whose impacts would be similar to those at the lake in the wildlands, discussed above.

Detailed studies and preparation of impact statements would precede commitment ot these proposed developments. Implementation of this proposal may concentrate developments along the boundaries of the complex, resulting in greater visual impacts in these areas than might otherwise occur. Cooperative planning could zone these developments in such a way as to lessen their impact.

The overall effect on visual integrity of the landscape may ultimately be significant at Anaktuvuk, and at two or possibly more development sites in the region. Impacts within the park-wildlands complex proper would be minor, affecting less than 1 percent of the area. The outstanding impact would be to maintain a landscape almost free of long-lasting visual disruption.

F. IMPACT ON SUBSISTENCE USE

Basic use of the area within and surrounding the proposed park-wildlands has been for subsistence purposes by three Native groups. The patterns of subsistence activities vary from group to group, based on resources available and traditional cultural and social values. In recent years, small numbers of non-Natives have settled at two locations in the general area, and these people have worked out their own patterns of subsistence use of resources to supplement cash income.

Of the seven communities (total population of 525 people), which use subsistence resources of the proposed area, the village that relies most heavily on proposal lands for these purposes is Anaktuvuk Pass (Pop. 125). The people of this village are the last remnant of the Nunamiut, an inland mountain Eskimo people who depend on the caribou for existence. The subsistence cycle of these people has changed in recent years from nomadic hunting and trapping to incorporating tourist crafts and odd jobs with localized hunting. Thus their subsistence uses are concentrated in the passes and river valleys at the heart of the proposed national wildlands and park lands, most probably in the John and Anaktuvuk River valleys.

In addition to the 800 caribou taken by the villagers in 1972, 30 fox, 25 wolf, and 5 bear were taken for their skin and meat.

Ptarmigan and several small mammal species such hoary marmots are snared or trapped. To a limited extent, the people rely on grayling and whitefish, with berries, greens, and wild vegtables as important dietary supplements.

(See Chapter II, section 7, Social and Economic Considerations--as well as the table on subsistence harvest for detail.)

The other two Native groups in the area who use proposal lands for subsistence purposes depend on them far less than do the people of Anaktubuk Pass. The inland Eskimo people of Kobuk (pop. 65) and Shungnak (pop. 159) travel up the Kobuk River and its tributaries into the southern portions of the Igikpak Unit.

They, like the Nunamiut of Anaktuvuk rely on caribou as their primary source of subsistence food and skins. Kobuk and Shungnak took 705 caribou in 1972. However, they also rely heavily on summer fishing in the Kobuk River for sheefish and whitefish. Residents of the two villages took over 200,000 pounds of fish in 1972 (NSNA survey 1972). They also trap for hare, muskrat, and porcupine.

The exact amount of subsistence use inside the proposal boundaries is unknown, but it is understood that most of the fishing and the caribou hunting is done outside the proposed park-wildlands. Their use of the park-wildlands is thought to be limited to some upland trapping and hunting for Dall sheep. Shungnak villagers took six sheep in 1972.

The third Native group that uses the proposal consists of the Athapascan Indians of Allakaket and the Eskimos of the adjoining village of Alatna (combined pop. of 166). These people rely less than the other villagers on the caribou in the area. According to a BIA survey, this group took only 230 caribou in 1967. They rely more heavily on moose, taking 48 in 1967.

They also are heavy users of whitefish, salmon, grayling, and pike, taking 37,000 fish from the Koyukuk River in 1967. They also trap for furbearers such as lynx, otter, martin, mink, beaver and muskrat. They take about a 1,000 waterfowl yearly and gather substantial amounts of wild berries, greens, and vegetables.

Very little of these subsistence uses are carried out in the proposed park or wildlands. Most of the hunting and trapping is done in the wetlands in the general vicinity of the village. It is probable that much of this activity takes place in the portion of the John River valley which lies in an Area of Ecological concern. This is especially true for caribou hunting.

In addition to the three Native groups discussed above, the people of Bettles (Evansville) and Wiseman, both Native (combined pop. of 27) and non-Native (combined pop. of about 60), use the subsistence resources of the area. Bettles subsistence pattern can be expected to be similar to that of Allakaket. The people of Wiseman probably use the lands of the Mt. Doverak Unit. Within the boundary they probably hunt, trap, and fish the North Fork of the Koyukuk and Tinayguk Creek. (See Chapter II, table on Current Population Estimate for exact populations of each village and settlement.)

In light of the above discussion, it can be said that the wildlands are of critical importance to the subsistence uses in the area, particularly for the people of Anaktuvuk Pass. The park, although some sections receive moderate use, is much less important to the subsistence cycles of the area.

The proposed action would have little direct impact on the subsistence uses of the area. Subsistence uses would be allowed to continue in the wildlands as well as in the park units. Inasmuch as most of the park is outside of subsistence use patterns, it is probable that zones will be designated where subsistence uses could take place and the rest of the park left free of hunting or trapping. In addition, should hunting, trapping, or fishing pressure increase to the point where they endanger local population of species, then subsistence use regulations would be inaugurated to protect critical habitat areas at critical periods, or methods and amounts of harvest may be limited. In the wildlands, and possibly in the park, should sport hunting and subsistence uses conflict, or should their combined pressure become too great on a local species population, preference would be given to subsistence needs. Thus the overall impact of this proposal on subsistence use would be minor, at least in a 5 to 10 year time frame. Over the longer run, as the proposal contributes to increased tourism and employment opportunities in the local villages, it could have the impact of accelerating the changeover from subsistence to wage economy in the native way of life. For analysis, see Subsistence Economy, this Chapter.

G. IMPACT ON CULTURAL RESOURCES

The cultural resources of the area consist mainly of archeologic sites along Anaktuvuk Pass in the Nunamuit National Wildlands. Dates have been ascribed to artifacts recovered in the area which precede any others in the State of Alaska. Some objects are thought to be as old as 18,000 years. In 1962 the area was recommended for possible designation as a national historic landmark.

While the onsite interpretive potential for park purposes is low, the necessity for vigilant protection is increased by the importance and delicacy of the scientific potential of many sites. In this area most of the sites are close to the surface, and though they are hard to detect with the untrained eye, it can be expected that increased visitation in the area will lead to pilfering and damaging of sites by amateur collectors and souvenir hunters.

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 significantly disturb individual sites where excavation takes place. This disturbance will be limited by NPS policy which disallows complete excavation of any one site, thus preserving research opportunities against a day when new methods and techniques may have expanded the possibilities for discovery and deduction. 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 the despoilation which could occur if there were no park or wildlands, and would make them available to the public. The increase in public awareness of Native cultures and history that could be expected to result, would have significant impact on the scientific and educational attention devoted to these cultural resources.

Overall, the proposal would increase public contact with these cultural resources and should result in an improved climate for their investigation and preservation.

H. IMPACT ON THE LOCAL ECONOMY

Village economies in the area rely on a combination of subsistence and cash income, despite the fact that these small, remote, inland villagers participate only minimally in the cash economy of northern Alaska. Almost no opportunities for wage employment exist in the villages, so most people must go to Fairbanks or other urban areas for seasonal employment and year-round jobs. As is true for other areas of the State, government is a major employer and the principal source of cash income. Government employment consists primarily of fire fighting jobs in the summer, with a few jobs in the administration and operation of schools, aviation, and weather services.

Other sources of cash income are available from the sale of fur products and arts and crafts items. A local guiding industry employs several people at Kobuk and Bettles, and a few residents of Kobuk and Shungnak find employment in the limited mining activity of Bornite.

Others from these villages may go to Kotzebue or Fairbanks for seasonal employment on construction jobs or in the commercial fisheries of the Kotzebue Sound. Some residents of Anaktuvuk Pass go to Barrow for seasonal employment on construction jobs or with oil drilling operations. Bettles, as the transportation hub of the area, provides several jobs in services at the airfield.

The area has substantial potential for growth, especially in the mining, transportation, construction, and tourism industries. The Alaska pipeline and related road and airport proposals will probably bring growth in income and job opportunities to the area, which will be felt mostly at Fairbanks, Bettles, and Wiseman, and, to a lesser degree, in Anaktuvuk Pass, Allakaket, Kobuk, and Shungnak. Increased opportunities for travel will create growth in tourist service businesses especially at Wiseman and Bettles. As a result of pipeline construction the area will probably also experience substantial population growth. Two proposed construction workers camp sites at Dietrich Pass and Coldfoot could double the area's population with 500 new residents by 1976. Details of the above-mentioned sectors of the economy, and the proposal's impact upon them, will be discussed in the following sections.

In general, social and economic impacts will be felt at Bettles, Anaktuvuk Pass, and, to a lesser degree, Fairbanks. Locating field headquarters for the park at Bettles and for the wildlands at Anaktuvuk Pass would create opportunities for seasonal and some permanent jobs. An influx to Bettles of eight year-round employees (with an average yearly salary of $14,625)

and their families would increase the town's population by a third and substantially increase its economic base. In Anaktuvuk Pass as well as Bettles, to the extent that Natives were trained and qualified as managers, they could have available more permanent government jobs than now exist. It must be noted that the Park Service does not expect substantial increases in staff positions within the first 5 to 10 years after establishment of the proposed park-wildlands complex. However, the need for expanded overnight and tourist facilities at both villages would provide significant new opportunities for local cash businesses and employment. Visitation could increase to as much as 4,000 people annually within 10 years of monument establishment.

Overall, the impact of the proposal on the local economy of Bettles, Anaktuvuk Pass, and to some extent Fairbanks and the other villages in the area, will be substantial and important, but it must be regarded within the context of the expected area growth as a result of pipeline construction and related activities. This impact will probably not peak until after 10 years after park establishment. To the extent that transportation improves in the area, park impact could speed up and intensify.

1. Subsistence Economy

Despite the gradual increase in the area's Native population, subsistence levels seem to have remained relatively constant. The possibility remains that demand could increase significantly as a result of very rapid population increases. Present stability in subsistence use level is due in part 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 fulltime wage earning occupations. At the moment, however, most of this cash employment is only available in large towns such as Fairbanks, Kotzebue, and Barrow, necessitating long summertime migrations to seek job opportunities.

To the extent that it increases the availability of jobs in local villages, this proposal would accelerate the changeover from subsistence to cash-based activities.

The extreme example of this changeover probably will occur at Anaktuvuk Pass. Very few jobs are available there at present. As headquarters for the Nunamuit National Wildlands and the best jumping off place for trips into the Central Brooks Range, the village will have greatly increased opportunities for tourist-based economic activity and for wildlands management employment. Villages which become engaged in such activities, even though only seasonally, would rely less on subsistence pursuits for a living. Thus establishment of the proposed park-wildlands complex would lead to a lessening of the subsistence activity level.

Even if the proposal were not established, new jobs would still be available in the region in the near future, particularly along the pipeline. Should these opportunities for living and working along the pipeline prove more attractive than life in the Pass, the village might even be abandoned. Therefore the proposed area, by leading to employment opportunities at the village site, might act as a counter-attraction to the pipeline lure, thus decrease the probabilities of outmigration from the village. This effect

would tend to keep subsistence activity at present level around the village by maintaining a population partially reliant on subsistence resources. This scenario, with variations, could also occur in the other area villages.

It is hard to guage accurately the net impact of the pipeline and the proposed area with their offsetting effects. In all probability, the increased availability of cash-based employment in the local villages as a result of the established park-wildlands would result in decreasing reliance on subsistence resources. However, a regional population increase would raise the number of subsistence users so that, region-wide, the Central Brooks Range would experience an increase in subsistence pressure. This increase in users would tend to cancel out the abating impacts of the proposal.

2. Mining and Mineral Development

One of the most important potential growth areas for the region's economy is in the mineral extraction industry. Since a significant portion of the area's mineral resource potential is thought to be inside the proposed boundaries, the proposed action could have a significant effect on local developments of mineral resources.

Oil: Approximately one third of the proposal area lies within the Northern Foothills and Southern Foothills oil provinces. Approximately 9 percent of these oil provinces is contained inside the boundaries. However, 3 percent is in the wildlands on Native lands or lands in dual withdrawal status. Another 3 percent approximately, is contained in the

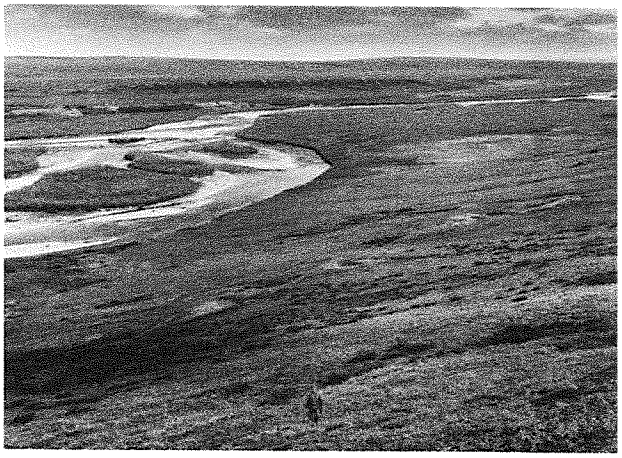
AEC on dual withdrawal lands. The final 3 percent is inside the actual park boundaries on d-2 and dual withdrawal lands. In addition, test wells at Umiat about 30 miles northeast of the boundary have demonstrated the existence of productive petroleum horizons.

Any oil development which took place on Native owned lands within the wildlands, under joint management agreements with the Park Service, would be regulated to prevent excessive damage to vegetation, wildlife, and the visual integrity of the area. It is possible that access to oil developments might be limited to air access. Should the dual withdrawal lands revert to Federal ownership, oil development on these lands within the wildlands would not be allowed.

Oil development in the AEC could be also regulated by cooperative, joint management agreements as in the case of the wildlands. The regulations probably would be similar to those on the wildlands. Should these dual withdrawal lands revert to Federal ownership and be included in the park or wildlands, oil developments would be precluded.

Any oil development inside the park boundaries would be prohibited except on dual withdrawal lands which may become Native-owned.

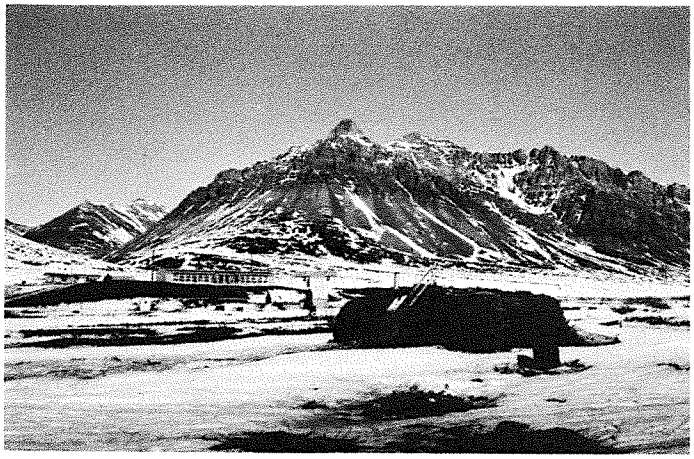
Impacts of the above actions on local oil development would be significant. Something between 3 and 7 percent of the oil provinces, depending on eventual disposition of dual withdrawal, would not be open for development. Oil development on Native lands within the wildlands or AEC could be made more expensive because of protective regulations. Overall, however, in



Arctic slope and
lower Killik River



Wild Lake



Anaktuvuk Pass

Shainin Lake



view of the fact that oil reserves are not proven to exist in these lands and the fact that only a small percentage of the oil province is involved, the proposal's impact on the region's potential for oil development would be small and the effect on potential economic growth of the area would probably be minor.

Coal: The upper tips of the wildlands and AEC portions of the proposal are contained within the Colville River coal field.

The coal beds range up to 8 feet in thickness; their average thickness, however, is much less. The coals are ranked as high volatile bituminous with a heating value ranging from 10,000 to 13,000 B.T.U./lb. It is estimated that about 13.4 percent of the total coal resource of the Colville River field is enclosed in these two areas. Although no testing has been done, some of the coals are undoubtedly of coking quality.

As in the case of oil development, the proposal's impact on coal extraction depends somewhat on the final disposition of the dual withdrawal lands which contain the coal beds. Should they become Federal lands, no extraction would be allowed in the wildlands, which contain about half of the coal beds inside the boundaries (67% of the Colville field).

Extraction probably would be allowed on the other half which lies in the AEC, however, regulations would probably be imposed by joint management agreements which would prevent disruptive extraction practises such as strip mining. Extraction on Native-owned lands in the wildlands would be subject to similar regulations.

The impact of the proposal on coal extraction would be similar to that on oil. Significant portions of the coal field would be precluded from development. Equally significant portions would be subject to regulations which would make extraction more costly. However, in view of the cost of transporting coal very long distances to potential markets, the probable lack of development of any nearby markets in the foreseeable future, and the relatively small portion of the coal field affected by the proposal, the impact of the proposed action on coal extraction and related economic growth can be considered minor.

Gold: Gold was the cause of early interest in the Central Brooks Range. There was a gold rush to the Wiseman area, just east of the Doonerak Unit, in the early 1900's, and over a million dollar's in gold was taken out prior to World War I. Today there are only a few sporadically operated placer mines within the proposal, with no record of mineral production. While there are no patents on record there are 4 claim groups known to lie inside proposed park boundaries.

The proposed action would prohibit all mining within the proposed park boundaries except on land which may become Native owned. Within Areas of Ecological Concern, which contain a total of 14 mining claim groups, cooperative management agreements could impose regulations to prevent excessive damage to the vegetation, water quality and visual integrity of the area.

In view of the lack of present production and the probable lack of future potential, the impact of prohibiting production on 4 claim groups and of

imposing probable regulations on 14 others would be minor significance to the mineral industry of the area, although individuals involved might be severely affected.

Copper: The existence of a potentially significant copper deposit has been identified recently by core drilling near the proposal's southwest boundary, northeast of Kobuk. The importance of this deposit stems chiefly from the fact that in character and geologic environment it is similar to a proven deposit in the upper Shungnak River drainage northeast of Bornite. While the extent of the Bornite reserve is unknown, the U.S. Geological Survey believes they are significant. Possibilities for similar deposits are believed to exist within the proposed boundaries.

As the proposed action would prohibit exploration for copper within park-wildlands boundaries except on lands which may become Native owned, its impact on copper development in the region should be significant. The possible regulation of mining methods on lands in the Areas of Ecological Concern or Native lands in the wildlands would probably not have a significant impact on the copper development potential of the area, except perhaps to require a longer waiting period before it becomes economically feasible.

Other metals: Potential for other metals has not been identified. The boundaries fall within some metal provinces, which have been determined not by actual locations of substantial deposits, but by adjacent deposits, geochemincal sampling, extrapolation of known geological environments, and evaluation by experts (USGS, 1973). The proposal would not allow exploration

or inventory of these as yet unknown resources inside park-wildlands boundaries. The impacts of this cannot be assessed at this time.

Summary: The proposed action would have significant impacts on the exploration and development of potential mineral deposits, oil deposits, and coal deposits within the proposal boundaries. In the regional picture these impacts pale to minor significance because of the extent of developable reserves outside the boundaries. The impact on the growth potential of the extractive industries could be substantial for individuals and villages involved with local deposits, but it is more likely that the regional potential for growth will more than overcome the cost of prohibitions and regulations on proposal lands.

3. Recreation - Tourism

Present recreation use of the proposal area is very light. A few sport hunters use the area (about 200 annually), going into the higher regions for sheep and bear.

The proposed park area is also enjoyed by a small but growing number of hikers, boaters, and mountain climbers, as well as persons interested in photography and the natural sciences. Although no figures are available for tourist-based employment in the villages of the area, it can be predicted that the advent of the pipeline and the accompanying road network will contribute to a substantial, sudden boom in tourist industries. The scenic beauty of the area, combined with its renown as an outstanding wilderness, will attract a substantial number of visitors to the area as

soon as easy transportation is available. The large lakes in the area could be developed for recreational purposes, thereby inhibiting their value as primitive areas.

All of this recreational use will probably occur even if no park is established. However, establishment of a Gates of the Arctic National Wilderness Park and Nunamuit National Wildlands, with the publicity that could follow, would probably increase visitation at a more rapid rate than would occur without the park. Specifically, the increase is difficult to ascertain at this time, but a preliminary quota of 4,000 visitors annually is being considered.

The reason for a quota system is to preserve the "wilderness" character of the park. It is felt that the lands within the park will only be able to stand a rather light amount of use before they become visually and scenically impaired, and lost their primitive character. For this reason, entrance to the park will probably be on a permit basis. Access will be limited to plane travel to specific locations in the park and foot travel to its fringes. Sport hunting and fishing will be allowed in certain zones as will subsistence use, but the primary use of the park is expected to be backpacking, climbing, and sightseeing.

As a result of these limitations on use within the park almost all visitor use developments will be outside the park. The villages of Bettles, as field headquarters for the park, Anaktuvuk Pass, as field headquarters for the wildlands, and Wiseman, a picturesque old mining town, will be the places where development is concentrated. Campgrounds and visitor support

facilities will be operated by private concessioners. Also, air tours of the park lands and mountains will probably be conducted by private enterprise. Under a possible cooperative agreement with the State, a major development site with overnight accommodations and recreation facilities would be located at Wild Lake near the southwestern boundary of the Doonerak Unit, a starting point for back country hikes and float trips.

Increased visitation in these villages will give the residents an opportunity to 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 plan. This could provide direct income to those Natives who may wish to participate.

The economic impact of this increase in visits to the area will be extremely important for the communities involved. Bettles, with present accommodations of only one grocery store, will have to develop visitor facilities sufficient to handle several thousand visitors annually. For a village of less than 100 people this would mean almost a doubling of its daily population during the summer. Anaktuvuk Pass, with no visitor accommodations at present except an airstrip, will receive a similar impact. Wiseman will probably undergo growth that is proportionately even greater than Bettles and Anatuvuk. To a large extent, however, this growth will be brought on by the pipeline. The park proposal for a development near Wiseman will probably add somewhat to the town's visitation increase, but primarily will serve to control visitation into the

park. Within a 10- to 20-year time span, the tourist related industries could become the single largest sector of the local economy in these villages. The other villages in the area, as well as Fairbanks, will receive similar impacts to those outlined above except that the relative extent will be far less.

Overall, the impact of the proposed action on recreation and tourism in the area will be a major one, relative to the size of the villages where the impacts will be concentrated. The rate at which these impacts will occur will depend directly on the timing of pipeline developments and its related road network. It can be predicted that substantial growth in the tourist industry will take place within the next ten years, especially after park and wildlands development plans begin to be implemented. It must be remembered, however, that most of the economic activity related to tourism will occur only in the summer season.

4. Transportation

The nearest transportation center to the proposal in Bettles field 12 miles from the southwestern tip of the Doonerak Unit. Bettles is served by regular air service from Fairbanks. It also has service to Allakaket, Wiseman, and Anaktuvuk Pass. Kobuk and Shungnak are serviced from Kotzebue. Bettles seems destined to grow steadily as north Alaskan developments unfold. This growth could be accelerated if a ground transportation corridor is opened from Bettles to Kobuk and Nome, as has been proposed by the Alaska Department of Transportation. The growth also could be speeded by park establishment, for park visitors who do not use the pipeline corridor route would rely on Bettles as a supply center and point of departure

for park journeys. On the other hand, development of a major airstrip at Prospect Creek on the proposed pipeline corridor 18 miles away may influence the future use of Bettles. No changes in FAA facilities location are now planned, however. A western access route including perhaps a railroad and a road could serve copper mining operations in the vicinity of Bornite. The Alaska Department of Highways has included the road from Prospect (on the proposed pipeline corridor) to Bettles in its fiscal 1976 construction program and has programmed it 16 miles further in fiscal 1977. This could bring many more people to the southern flanks of the Brooks Range, both as residents and visitors using the new ground access, which has been proposed to follow the upper Kobuk River valley for a part of its route. (See Transportation map.)

A road is also proposed for the Colville River valley running east-west and linking the proposed oil pipeline corridor with a parallel corridor across the Noatak Basin from Kobuk to Barrow.

Of all the above transportation corridor proposals, the only one which would conflict with the proposed park is the route from Prospect, on the pipeline corridor, through Bettles to Kobuk. If the proposed park were established, no roads would be permitted inside park boundaries. This would necessitate rerouting the corridor to the south of the park, a move of perhaps 30 to 40 miles. Road construction could be more difficult and expensive, and if no southern routes were to prove practical, the corridor might be abandoned altogether.

In addition to the above road and railroad proposals, there exists the remains of a winter trail through Anaktuvuk Pass. It is no longer used, except by snowmobiles.

Conceivably, should there be new oil or mining operations on the Arctic Slope farther west from Prudhoe Bay requiring more than the one transportation corridor now proposed, the John valley might again be considered for a transportation corridor, despite the less than optimum engineering conditions and possible disruption of wildlife now recognized as problems along the route. If this proposal is implemented, any road construction or reconstruction along this route, or elsewhere in the wildlands, would require special justification and a study of alternatives (Section 102, Transportation Act of 1949), in addition to an environmental impact statement as required by the National Environmental Policy Act of 1970. These studies would attempt to insure that a bona fide need for the road existed, and that reasonable alternatives to the road were considered. 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 wildlands. These studies could preclude construction of a road altogether or could require relocation of routing or special engineering design.

Transportation in the park itself would be limited mostly to hiking and controlled aircraft access to specified lakes. Aerial sightseeing tours would be directed along certain routes, restricted to certain altitudes where practical, and operated only on a permit basis. Snowmobile use for

subsistence purposes in specified zones would be allowed. Since this snowmobile use would occur in the season when most visitors do not use the park, it should not conflict with the "wilderness" experience of the visitor. Outside of subsistence uses, the impact of a "no vehicles" rule in the park would be most marked when roads are constructed along the east and south sides of the park and demand for off-road vehicle use becomes greatest.

To the extent that the proposed action will increase the use of existing transportation facilities and necessitate the development of new transportation services at places such as Wiseman, Bettles, and Anaktuvuk Pass, it will increase growth in the transportation related sectors of the economy. This impact will be relatively small at a place like Wiseman, in the context of the eventual development of a pipeline road. It could also be considered only moderate at Bettles, where plans already exist for developing road access; however, a park would certainly increase the demand for and use of such a road. But the impact would certainly be great at Anaktuvuk Pass, which would probably have little demand for increased transportation facilities were it not for the proposed park. The economic stimulus from the impact on this sector of Anaktuvuk's economy would be similar in importance and highly interrelated with the impact on the tourist industry.

Overall, the impact of the proposed action on transportation could be significant in that it would cause the rerouting of one proposed corridor and the careful evaluation of one potential corridor. Further, it would

significantly increase the use levels of present facilities and the demand for new ones. Finally, it would bolster the transportation sector of the economy, especially in certain villages, to the point where it could grow into one of the two major sources of local, cash income.

5. Sport Hunting and Fishing

Present sport hunting use of the proposed park and wildlands is limited to about 200 hunters annually. The prime game species are Dall sheep and grizzly bear. The Dall sheep of the area are hunted for trophy heads even though their horns are smaller than the sheep of the Alaska and Wrangell ranges. Eight percent of the statewide total sheep kill was taken in the Brooks range in 1971. The grizzly bear of the Brooks range is also smaller than that found in the rest of the State. Maximum weight rarely exceeds 600 pounds. Although no figures are available for the number of bear kills within the proposal boundaries, total kill in game management Units 23, 24, and 26, in which the proposal is contained, was an average of 41 bears annually in recent years. Of this total, probably half were taken for sport, the other half being used for subsistence. In addition, sheep and bear, and an occasional wolf, may be taken by sport hunters on an opportunity basis.

As a source of cash income, guiding for sport hunting and fishing is a limited, but important source of income in the area. One guide and his team operate out of Kobuk and two use Bettles as a base. A guided hunt for sheep or bear could cost from $1,000 to $5,000.

With increased visitation in the area, the demand for sport hunting, guiding, and attendant facilities could increase rapidly. To the extent that the proposal will contribute to the area's increase in visitation, it would also have a significant expansionary impact on the demand for sport hunting.

The proposed action would allow sport hunting in designated zones of the park and wildlands on a "fair chase" basis, i.e., no use of vehicles to pursue game. It is felt that fair chase hunting is in keeping with the wilderness spirit of the area. This will have the impact of discouraging some less energetic, potential hunting clients; however, it should not significantly affect the demand for sport hunting in the region.

Sport fishing, mostly as an adjunct to sport hunting, is primarily for grayling and whitefish in the lakes and rivers of the area. Sport fishing would be allowed in both the park and wildlands. The primary impact of the proposal on sport fishing would be to increase its use from the present, very light level to a higher level reflecting the increased visitation on proposal lands.

In the case of both sport hunting and fishing, should use levels increase to the point where they conflict significantly with subsistence pursuits or where they endangered local species populations, they could be regulated or possibly discontinued.

6. Hydroelectric Development

There are no currently viable hydroelectric development sites under active consideration by the Alaska Power Administration that could be affected by

this proposal. Earlier, a damsite on the Kobuk River approximately 25 miles below the mouth of the stream draining Walker Lake was considered (USDI, BR, 1952). Water would extend up to Walker Lake, and if the Alatna River were diverted to increase the water flow, a power plant on the Kobuk site would generate more than 110 million kilowatts of energy each year. However, according to the APA (personal communication, 1973) this potential development in the Kobuk basin has not been identified as meriting continued interest.

The impact of this proposal would be to preclude the development of this site, which would affect lands within the boundaries. The projected annual production of energey would be lost, as would any presently unidentified industry dependent on this energy for development.

However, since there is no longer any interest in developing this site, the impact on it from this proposal is considered to be inconsequential.

7. Timber Harvesting

The northern limit of the boreal forest is found in the southern slopes of the mountains included within this proposal. Forests are spruce hardwood and blackspruce. Permafrost underlays the entire area, drainage is poor, and tree growth is slow at this latitude. Periodic wildfire is important in maintaining the forest type. The U.S. Forest Service does not class the timber as being of commercial quality.

The proposal would not permit any commercial timber harvesting, although subsistence use of the forests would continue to be allowed. However,

since there are no commercial stands within the proposal, the impact of this prohibition would be negligible.

I. 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 economic growth represented in Kotzebue, Fairbanks, Barrow, and the pipeline 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 disrupiton of change in the region on the large communities. The cumulative effects of acculturative influences has brought problems of social control and aggravated community life. Demographic trends of selective net out-migration from the region, and shifts within the region from the small villages to Kotzebue, Fairbanks, and Barrow 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 hiring 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 Bettles and Anaktuvuk 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 in drawing tourists and vacationers to the region--especially to Bettles and Anaktuvuk as access points to the proposal areas--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 Native culture, and to display Native 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 case 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.

J. IMPACT ON WILD AND SCENIC RIVER PROPOSALS

The BOR has studied the Noatak, Alatna, Tinayguk, Killik (including Easter Creek), and the North Fork of the Koyubuk Rivers for inclusion in the National Wild and Scenic Rivers System, and has found that these rivers meet the criteria for wild river status.

This proposal includes a provision which would establish these rivers as wild rivers to preserve the rivers and their immediate environments in their natural primitive condition. Within these corridors, 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 basins, as well as exclusion of other

uses not compatible with maintenance of an essentially unaltered natural landscape. The proposal would significantly strengthen the objectives of wild river designation by protecting water and visual qualities relating to the wild river corridors.

IV. MITIGATING MEASURES INCLUDED IN THE PROPOSED ACTION

Under the proposed legislation, the natural systems of the park-wildlands would be perpetuated. In order to do this, the capacity for visitor use of the area must be determined; in other words, we must find out how much use and what kind of use the park-wildlands can stand without becoming altered or degraded by man. The capacity will be determined by research studies and the judgment of park managers -- each based not only upon the need to perpetuate the natural environment, but also upon characteristic wilderness values such as challenge and solitude.

Any park-wildlands development would conform to applicable State and Federal environmental regulations, and would be undertaken only after consultation and thorough review.

A permit system, effective orientation and information services, and encouragement of reliable guiding services should inhibit imprudent use of the park and wildlands by the inexperienced and the ill-equipped, thereby lessening the chance of accidents and fires. These measures would help insure that park users would be competent, physically capable, and properly equipped and informed to use the park lands with minimal risk, or, the measures would help insure that less prepared park users are in the hands of competent guides.

Adequate and sensitive public relations should gradually dispell the feeling of lost freedom among those who wish no restrictions or regulations

to interfere with their use of the park-wildlands. It will be shown that the frontier freedoms would fade more completely with increasing exploitation and adverse uses if the area were not protected as proposed.

Removal of containerized sewage by air transport, if necessary, would lessen environmental impact of ranger stations within the park and developments in the wildlands. Disposal of all wastes, possibly at Bettles or Anaktuvuk Pass, will be in accordance with Federal and State standards, supplementing existing treatment facilities if need be.

Cultural resources would not be inadvertently altered or destroyed by construction or other administrative activity. No action will be taken that might affect cultural resources until after a professional examination of the affected area has been conducted to determine whether any such values are present. Cultural resources worthy of preservation in the affected area will be nominated to the National Register of Historic Places, and -- 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 (80 Stat. 915) or Section 2(b) of Executive Order 11593 (May 13, 1971), as applicable, will be observed. Cultural resources would 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 or Section 2(b), the loss will be mitigated 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.

The sanctions of the Antiquities Act of 1906 (34 Stat. 225) against unauthorized appropriation or destruction of cultural resources will be enforced by area management through inspection of identified sites and posting of applicable regulations.

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

Construction of management and support facilities in the proposed wilderness park and both management and visitor services facilities in the national wildlands would have an unavoidable adverse effect upon the environment by committing small portions of it to development. In addition, small areas of lakefront would be used for airplane mooring. This would involve no facilities and the impact would be largely visual. Inasmuch as airplane mooring will probably be phased out at such time as alternative means of access are available, this impact may not continue long. A safer, larger floatplane landing and mooring area at or near Bettles could have a heavy, localized impact.

A segment of the public will continue to feel bitter over the freedoms lost to the necessary regulations and restrictions of park and wildlands management. This could persist despite the best efforts of the National Park Service and others to show that, without a drastic cutback in population and technology, alternative forms of management would prove even more destructive of those traditional freedoms enjoyed by pioneers.

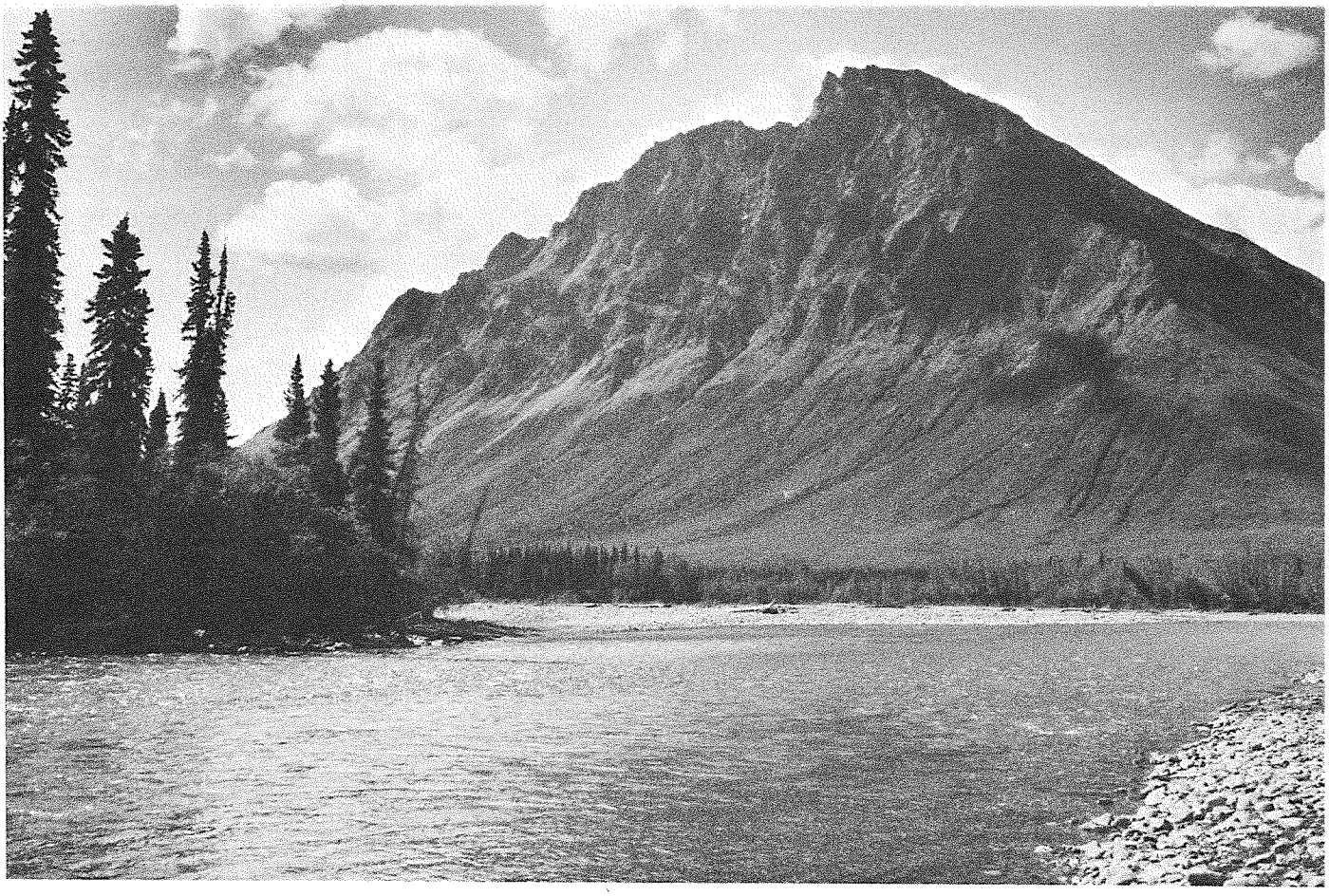
Establishment of a park and wildlands, even if disestablished at a later date, would deprive the present generation of would-be resource users in the area of opportunities to benefit from settlement and/or exploitation

of the land and from types of recreation prevented by park and wildlands designation.

The adverse economic and social effects of a ban on mining cannot be avoided.

Relocation of right of way corridors for transportation could cause more expensive routes and roadbuilding costs.

Ease of accessibility for owners of private lands and allotment patents within the proposal will be inhibited, since mechanical means of overland transportation will not be permissible.



Frigid Crags loom above the North Fork, Koyukuk Rive as it enters the Gates of the Arctic.

The Gates of the Arctic and the Koyukuk River-Ernie Creek confluence.



VI. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES AND LONG-TERM PRODUCTIVITY OF THE AREA

Except for possible mineral resources the proposed Gates of the Arctic National Wilderness Park and Nunamiut National Wildlands has relatively little economic value. If substantial mineral resources were found and exploited, the economic benefits and the social benefits derived therefrom could be high but probably would be comparatively short-term, with serious impairment or destruction of some of the area's many natural or cultural values which led to the recommendations of this proposal.

Despite spectacular scenery, the area does not lend itself to development for the usual forms of recreational activities which require substantial capital investment and which support a considerable vacation economy. The recreation season is too short and mosquito-infested. Soils and vegetation are too fragile for manipulation and reasonably quick regeneration. Water bodies are few. Fish and game resources, while they seem now to be reasonably plentiful, have low productivity rates and therefore cannot sustain heavy exploitation.

In non-material terms, the area's long-term value is high in biological importance to the ecosystem of arctic Alaska, is high as a central area for scientific study, and is high in cultural significance. The psychological value of establishing the park-wildlands should also be considered

seriously in weighing the long-term productivity of the area against the benefits of probably short-term use. Just as the clear-sighted establishment of Yellowstone, the world's first National Park, led to immeasurable national pride, so, too, will a Gates of the Arctic National Wilderness Park and Nunamiut National Wildlands be a measure of a nation's vision.

Park and wildland establishment will probably decrease economic gains in the short term, since income from the mineral activities would be lost when the lands are closed to mining. These uses could support some individuals for their lifetime.

Although some of these short-term uses of resources are negative, such as potential mineral development, others like wildlife, cultural, historic, and subsistence values and use are more than off-setting. The overall relationship of uses under the proposal to the region's environment is considered a definite enhancement of its long-term productivity for future generations.

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES THAT WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

There are no irreversible commitments of resources involved in the proposed action. No permanent change or damage to the environment would be caused by the few developments contemplated, except for possible alteration of a water body near Bettles for aircraft facilities and use.

The park could be disestablished at any time by act of Congress and the resources in the Federal lands opened for consumptive use and private ownership.

Park and wildlands establishment, however, would cause some irretrievable lost of opportunities for those people who now wish to utilize the area for other than park and wildlands purposes and could do so if this proposal is not implemented.

VIII. ALTERNATIVES TO THE PROPOSED ACTION

A number of alternatives to the proposed action has been considered. The alternatives fall into three categories: (1) no action, (2) alternative land management concepts, and (3) alternative boundary configurations.

A. NO ACTION ALTERNATIVE

This alternative proposes that none of the lands in the Central Brooks Range be recommended for addition to the National Park System.

As a result of no action, the d-2 lands in the area proposed for National Park System status would be classified as d-1 in the event Congress does not act upon the proposal before December 18, 1978. All lands changed to d-1 classification will be subject to reclassification by the Secretary of the Interior. This reclassification could make these lands available for State selection, private ownership, or retention under Federal control.

Impact: Pending reclassification, all lands administered by the Secretary of the Interior through the Bureau of Land Management will continue to be administered for multiple use sustained yield purposes. Under this form of management, no priority is necessarily given to any specific use. Rather, the Secretary will authorize a use or combination of uses, taking into consideration all pertinent factors including, but no limited to, ecology, existing uses, and relative values of the various uses in specific areas. Lands currently classified as Native deficiency but not selected for withdrawal by the Natives will also follow the above procedure.

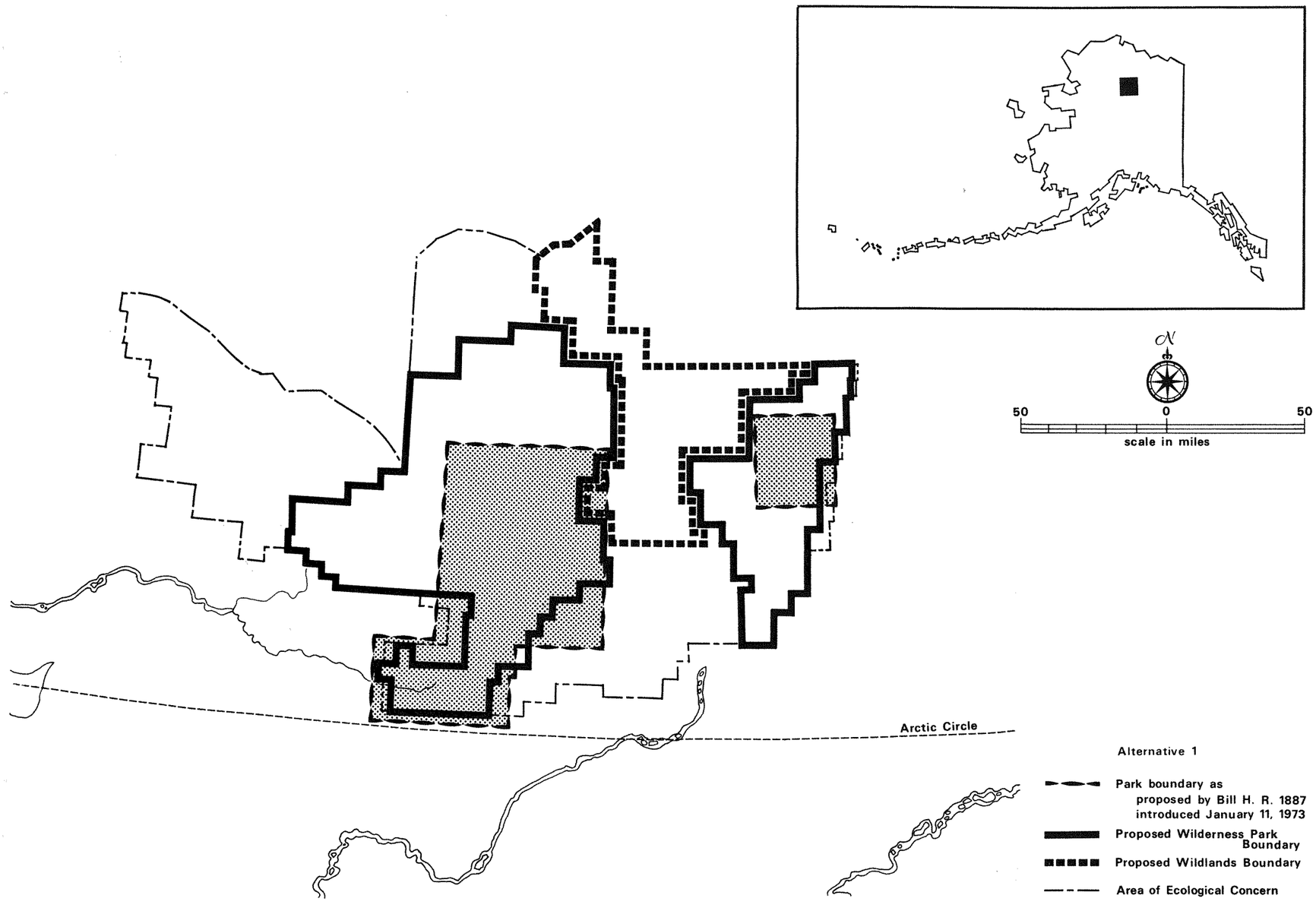
It is difficult to surmise what forms of development will occur on these lands under multiple use management except by extrapolating from current trends. If natural resource development occurs, such as mining and prospecting, attendant environmental impacts on water, vegetation, wildlife, and scientific values can be expected. The area, however, is not well endowed with natural resources other than scenery and wildlife. Recreation might not receive the same emphasis under a more restrictive use approach provided by National Park Service policy. Management by a multiple use agency would probably not result in any interpretive impact on the public. Impacts resulting from increased visitation and visitor development, both economic and environmental, would probably be both heavy and inadequately controlled due to increasing accessibility of the country, pipeline and possible mining activity nearby, and a Brooks Range's reputation as a wilderness hunting and recreational area where controls and surveillance are minimal.

B. ALTERNATIVE LAND MANAGEMENT CONCEPTS

1. Recreation and Wildlife Management

Manage the Area for Recreation Values: This alternative proposes that the Central Brooks Range be managed primarily but not exclusively for recreation. It would approach the dominant use concept except for accommodating some multiple use activities, such as mining, under as much control as practical.

Impacts: Multiple use activities such as mining would be allowed but under greater constraints than would apply to operations on most private


Arctic Circle
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scale in miles
Alternative 1
Park boundary as proposed by Bill H. R. 1887 introduced January 11, 1973
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern

and Federal lands designated for multiple use management. Where constraints would be greater on economic utilization of natural resources, they would be less on visitor utilization of potential outdoor recreational resources of the area. As a result of accommodating mineral extraction and maximizing recreational activities, the alternative has potential for direct economic benefits to the locality and the State.

Manage the Area for Wildlife Values: This alternative considers the management of the Central Brooks Range primarily, but not exclusively, for wildlife. It would approach a dominant use concept except that it accommodates some mining and other developments where not detrimental to wildlife.

Impacts: The potential for habitat improvement and maximum wildlife yield would be greater than under other alternatives. The potential for the protection of mineral resources and surface features would be less but not excluded. Multiple use activities such as mining could be allowed but under greater constraints than operations on most private and Federal lands designated for multiple use management. This alternative could increase the wildlife populations of the area, particularly the game species, and provide more hunting opportunities. It could alter the environment by means of habitat manipulation to achieve maximum game harvests.

2. Multiple Use Management

An alternative to the proposed action would be to manage the area under a multiple use concept involving classification such as authorized by the

Multiple Use Sustained Yield Act of 1960 (74 Stat. 15).

Impact: As previously mentioned in the no action alternative of this chapter, under the multiple use concept of management no priority is necessarily given to any specific use except as local or regional need might call for it. The proposal area could be opened to public entry and forms of development such as mineral extraction at some future point. This could have adverse environmental impacts for water quality, wildlife, scenic appreciation, and natural eco-system balance. These uses, if incurred, might be given preference at the expense of natural resource preservation and the recreational potential of the area. Generally, however, over the short term,management for multiple use would have the same impacts as those which would occur as a result of no action.

C. ALTERNATIVE BOUNDARY CONFIGURATIONS

1. A Two Unit National Park of 4.1 Million Acres

This alternative considers the proposal to establish a Gates of the Arctic National Park, composed of two separate units. This proposal would be the same as the one discussed in Chapter I of this statement, except that the proposed Nunamiut National Wildlands unit and large units of the proposed Gates of the Arctic National Wilderness Park would be excluded. (See Alternative 1 map.)

This 4.1 million acre alternative is identical to that envisioned in legislation now pending before Congress (H.R. 1887, 93rd Congress, introduced by Representative Saylor of Pennsylvania, January 11, 1973).

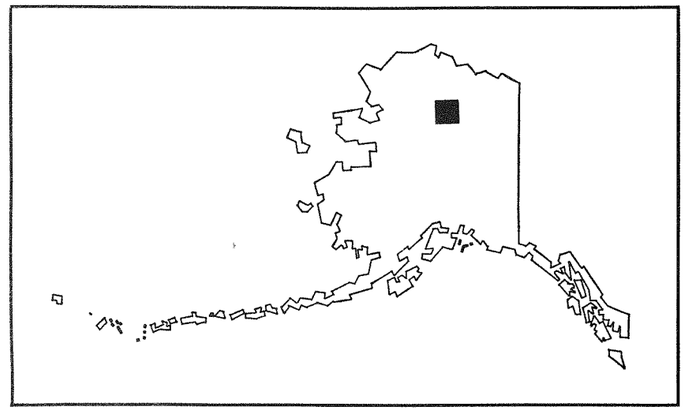
Impacts: The impacts of this alternative would be about the same as those discussed in Chapter III of this statement, but the protection of the 2.3 million acres provided for by the Nunamiut National Wildlands would be excluded. Excluded from the wilderness park protection would be the examples of the Arctic Foothills physiographic province on the Arctic Slope such as in the Killik and Itkillik valleys, most of the Noatak River valley, the Tinayguk River valley, and the North Fork of the Koyukuk River south of Redstar Mountain. This proposal would be much smaller and less diverse than a proposal that would include the proposed Nunamiut National Wildlands and the other areas mentioned above. The alternative would forestall some of the controversy over what lands should be available for Native selection, and would leave Native uses and development free from the constraints of managing lands in accordance with National Park System objectives. Although spacies scenic wildlife habitats of national significance would lose the protection afforded by a complementary management plan, between the Natives and the National Park Service, management would not have to contend with an intermixture of Federal and Native-owned lands.

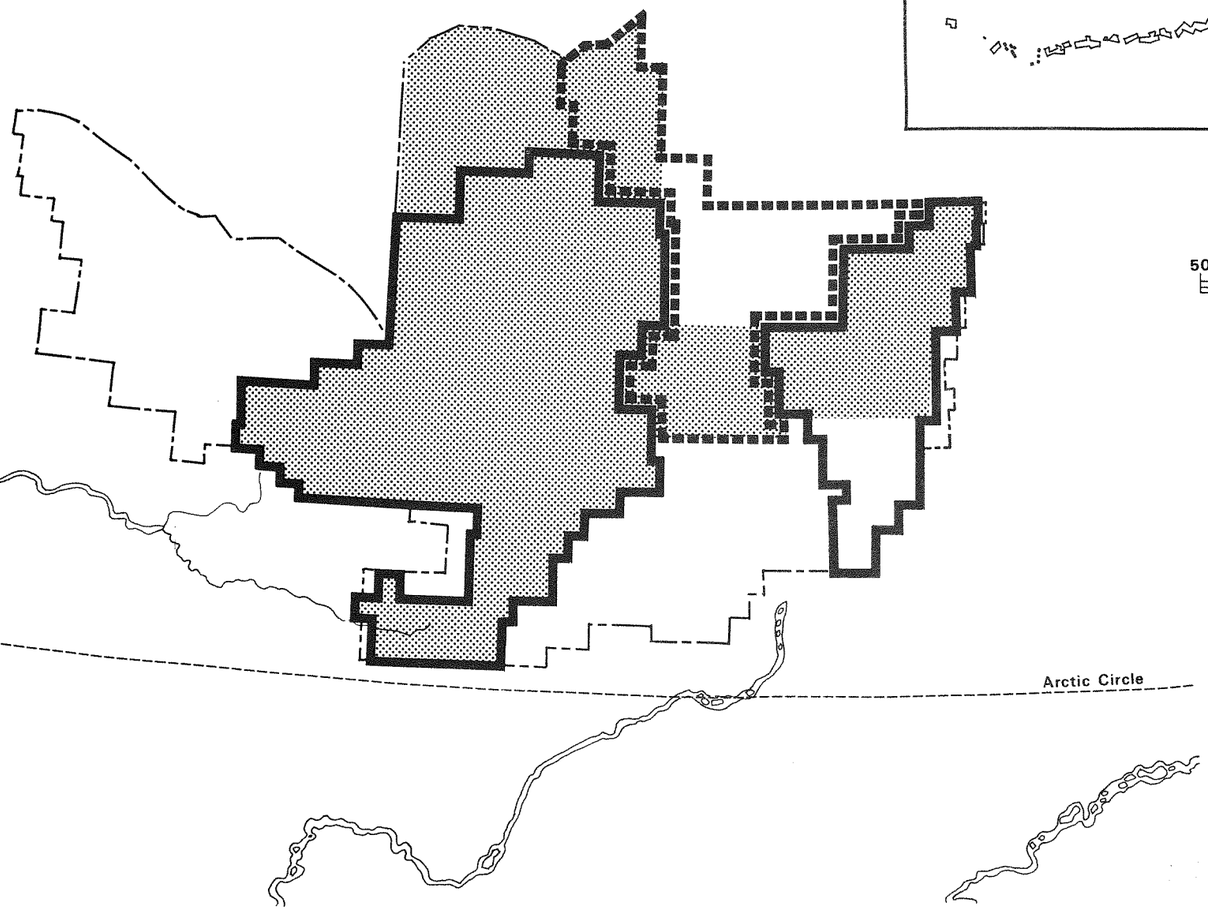
This alternative would change the status of approximately 4.1 million acres of public domain lands to National Park System. Mining, timber harvest, and sport hunting would be prohibited on this area. Emphasis would be placed on conventional National Park recreational activities such as sightseeing and hiking. Other forms of recreation such as snowmobiles would be restricted.

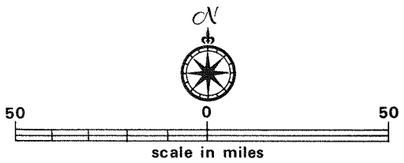
2. A Wilderness Park Utilizing d-2 Lands Only

This alternative considers the establishment of a Gates of the Arctic National Wilderness Park in the Central Brooks Range of Alaska. This alternative would utilize only d-2 lands in that area. (See Alternative 2 map.)

Impacts: The impacts of this alternative are about the same as those discussed in Chapter III of this statement, but the potential for the wilderness protection of lands above the John River valley within the proposed national wildlands would be increased by their being in park rather than wildlands status. Excluded from park status would be the lower reaches of the North Fork of the Koyukuk, including the lowest portion of the Tinayguk River and adjacent mountain country, the headwaters of the Mauneluk, Kogoluktuk, and Ambler Rivers, and a portion of the Glacier River traversing three townships of Native withdrawal lands. This would include all the lands above the John River valley of the proposed Nunamiut National Wildlands and other units mentioned above. This alternative, which involves no national wildlands proposal, would include in park status lands over which there is controversy associated with the selection of Native lands and with areas which may have mineral potential. Although the spacies scenic wildlife habitats of national significance in the region of Anaktuvuk Pass lose the protection afforded by national wildlands status, the management of the proposed park alone would be less complicated, avoiding management problems associated with intermixed Federal-Native lands. Approximately one million acres of







Alternative 2

National Wilderness Park

Proposed Wilderness Park Boundary

Proposed Wildlands Boundary

Area of Ecological Concern

Arctic Slope land not included in the park or wildlands proposals would be added to the park under the alternative, and potential Native selection and resource development would be precluded. Some 600,000 acres in the Killik watershed that are on the National Wildlands proposal would be placed in wilderness park status. This alternative would change the status of all the lands within the proposal from public domain to National Park System. Mining would be prohibited.

3. Proposal Excluding the Proposed National Wildlands

This alternative considers the establishment of a Gates of the Arctic National Wilderness Park only. This choice would be the same as the wilderness park discussed in Chapter I of this statement except that the d-2 lands in the John River valley, the village and regional deficiency withdrawals around Anaktuvuk Pass and the dual-withdrawal lands in the lower Killik watershed would be excluded. (See Alternative 3 map.)

Impacts: The impacts associated with this alternative would be about the same as those discussed in Chapter III of this statement, except that the potential for the protection of the proposed wildlands would be excluded. This proposal would be less diverse than a proposal that would include the national wildlands. It would eliminate some of the controversy associated with selection of Native withdrawal lands for park and proposed complementary area purposes. Although the spacious scenic wildlife habitats of national significance will lose the protection afforded by national wildlands status, the management of the region would be less complicated, not having to contend with intermixed private (Native) and Federal lands.

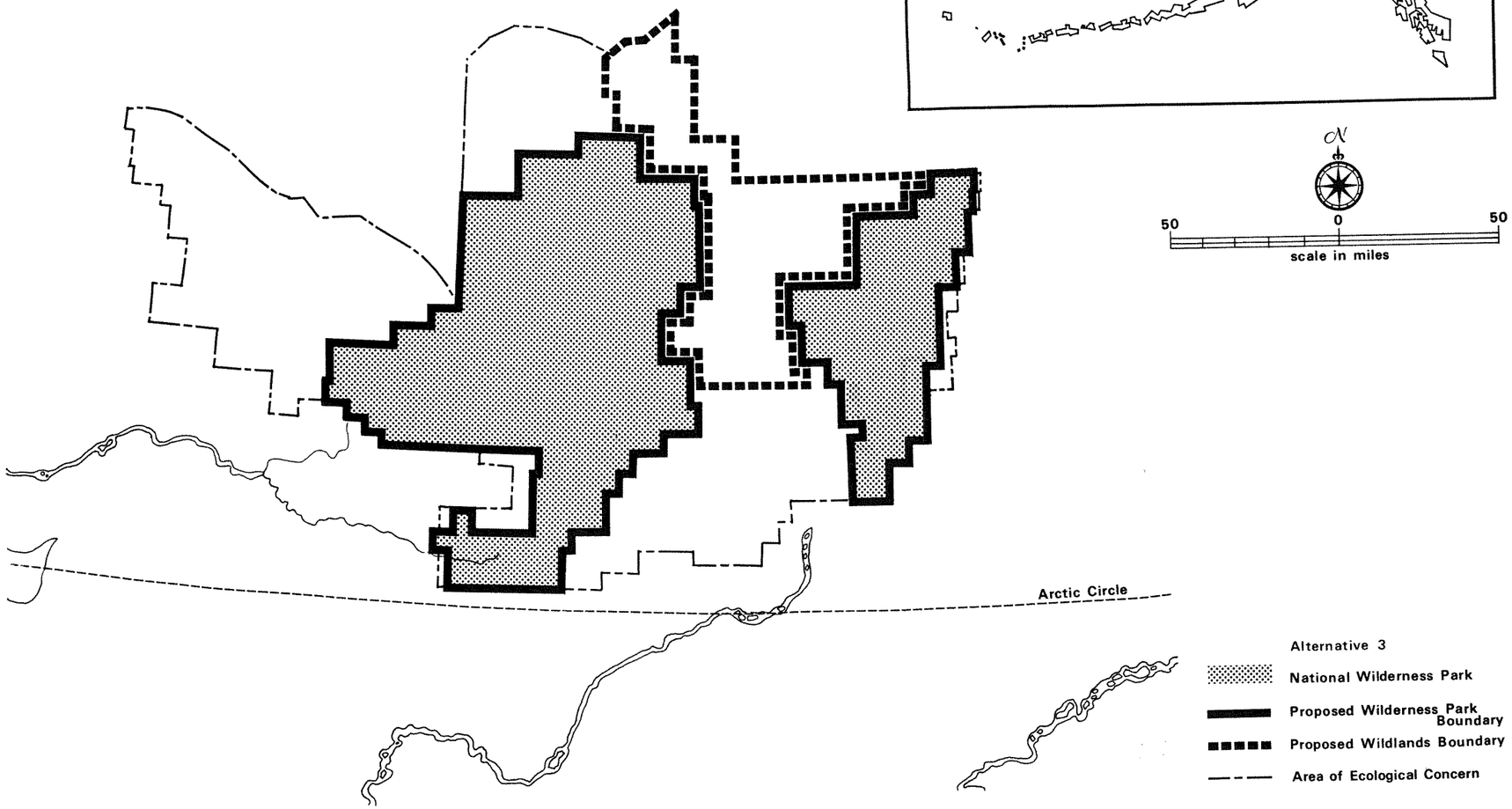
This alternative would change the status of all lands within the proposal area from public domain to National Park System. Mining would be prohibited. Under this alternative the John River d-2 lands would revert to d-1 status; the effects of this action are discussed in the no action alternative.

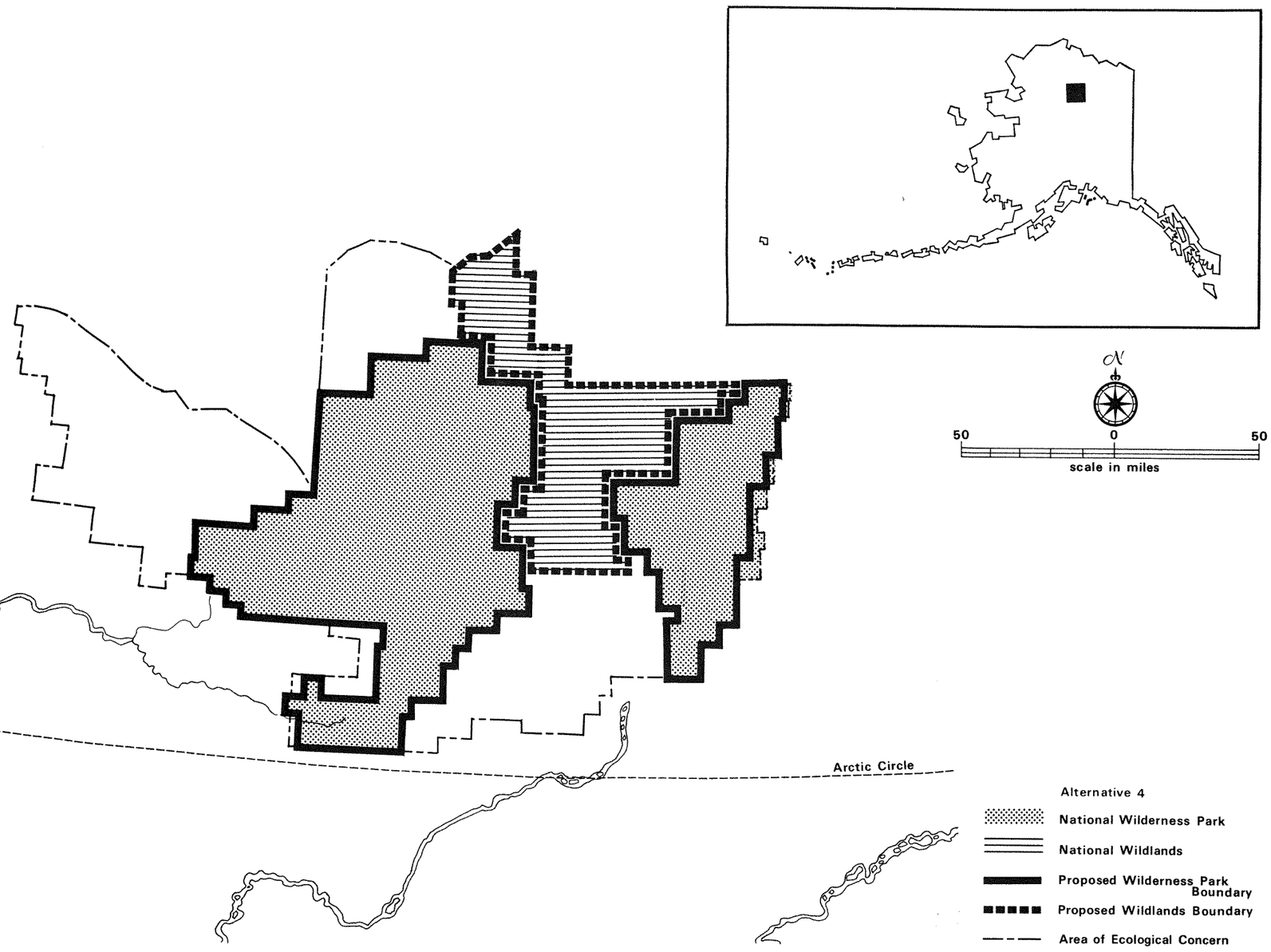
4. Enlarge Proposal to Include Certain Lands Withdrawn for Utility Corridor Purposes

This alternative considers the establishment of a Gates of the Arctic National Wilderness Park and Nunmiut National Wildlands in the Central Brooks Range of Alaska. The proposal is the same as the one discussed in Chapter I of this statement except that approximately 200,000 acres of utility corridor lands would be added to the Mt. Doonerak unit of the park. The lands are located on the eastern boundary of the Mt. Doonerak unit. (See Alternative 4 map.)

Impacts: The impacts of this alternative are about the same as those discussed in Chapter III of this statement but would include the potential for the protection of an additional 200,000 acres of a highly scenic mountainous portion of the Koyukuk watershed. This alternative would preserve as wilderness nearly all the Hammond River. This alternative would not affect the projected oil pipeline nor the road along it. It could conceivably involve mountains needed for communications relay stations.

In addition to the lands involved in the proposal discussed in Chapter I, this alternative would change the status of approximately 200,000 acres


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scale in miles
Arctic Circle
Alternative 3
National Wilderness Park
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern


Arctic Circle
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0
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scale in miles
Alternative 4
National Wilderness Park
National Wildlands
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern

of utility corridor lands to National Park System. Multiple use activities previously of option on these 200,000 acre area would be precluded by this proposal. Most affected by this alternative action would be two groups of active gold mining claims within the proposed additions, totaling seven claims.

5. Enlarged Proposal to Include State Selection Lands

This alternative considers the establishment of a Gates of the Arctic National Wilderness Park in the Central Brooks Ra nge of Alaska. This alternative is the same as the proposal discussed in Chapter I of this statement except that approximately 1.4 million acres of State selection lands would be added. These additional lands are closely related to the park proposal discussed in Chapter I and are located in units along the lower western and southern boundaries of that proposal. The additions would include a part of the lower Alatna River valley and Iniakuk Lake; Lake Minakokosa and the northern flanks of the Angayucham Mountains; portions of the Reed River valley; lands protective of Lakes Selby and Narvak; and the lower John River and Wild River valleys, including Wild Lake. (See Alternative 5A map.)

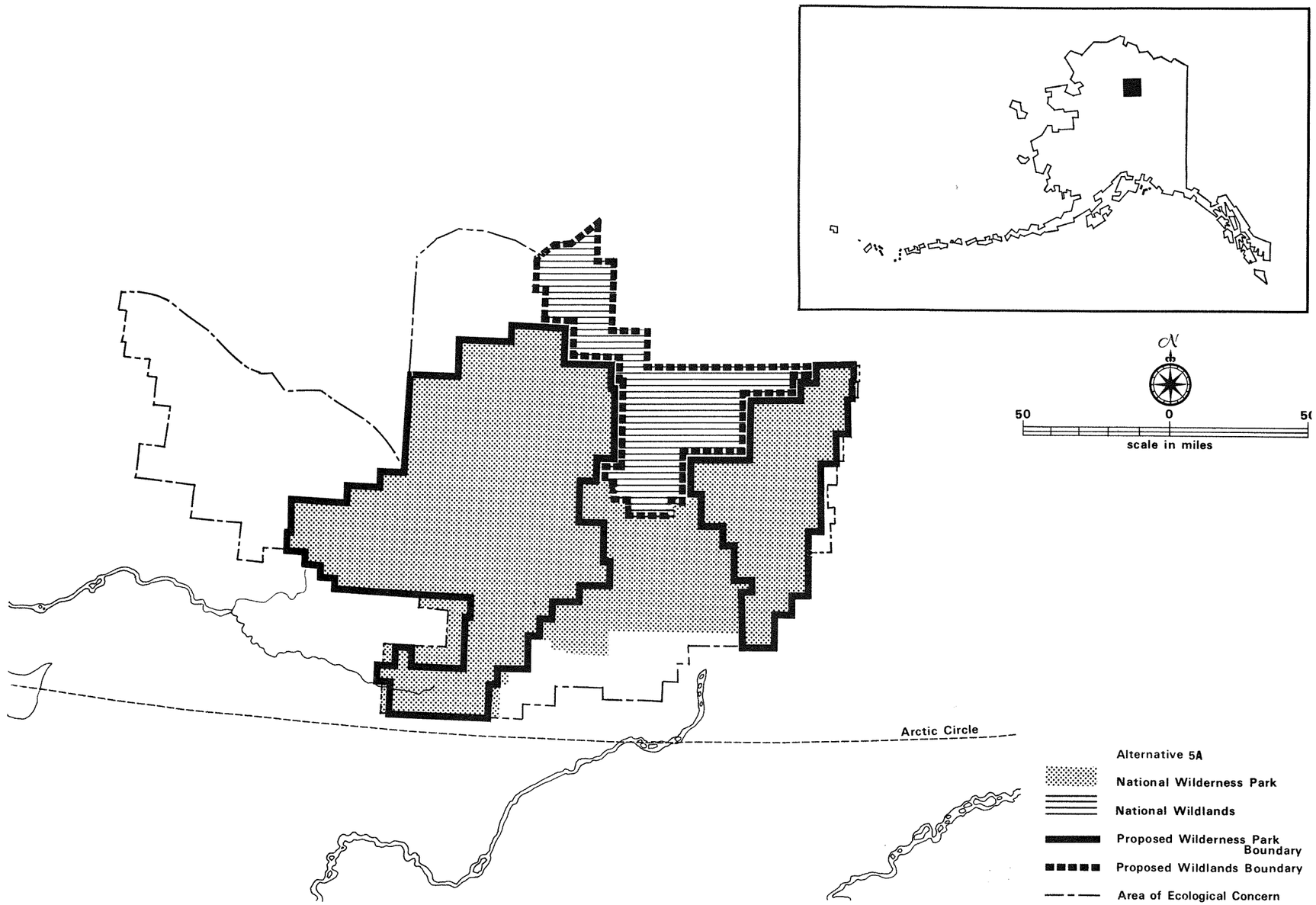
Impacts: The impacts of the alternative are about the same as those discussed in Chapter III of this statement but would include the potential for the protection of an additional 1.4 million acres of highly scenic mountainous, lake, and river valley lands. This alternative would complete the protection of much of the John, Wild, and Alatna River valleys including Mettenpherg Creek. It would protect Inakuk and

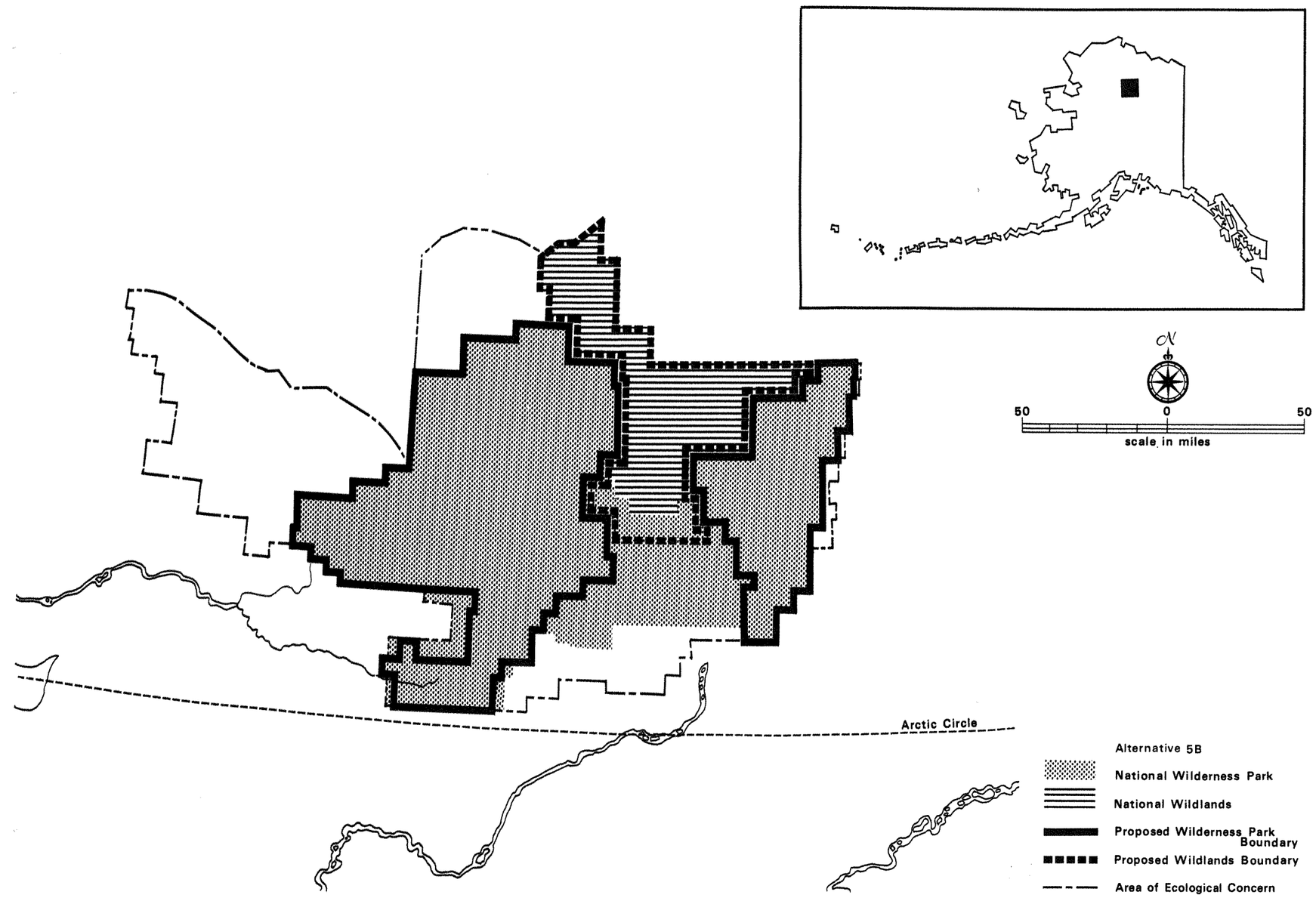
Wild Lakes. All of Lake Minakokosa would be within the park boundary, rather than only its south end. Both slopes of the Angayucham Mountains would be in the park. This alternative would provide a principal, within-park, approach route to the Mt. Igikpak area through the Reed valley.

The alternative unites a Nunamiut National Wildlands proposal and includes in the Park the John and Killik watershed lands proposed in national wildlands status (1.3 million acres).

This alternative would change the status of approximately 1.4 million acres of State selection lands to National Park System. This action would preclude any of the options of multiple use activites that would be appropriately applied to this area under State management. Mining, recreational development and/or private settlement, especially on the attractive lakes, would be precluded on the additional lands. Two private land applications, two Native allotment applications, and 13 groups of mining claims associated with the additional lands would be affected by this alternative.

The alternative would exclude from private settlement, mining and recreational development the 700,000 acres in the John River basin proposed in Chapter I as part of the Nunamiut National Wildlands and would do the same for the 600,000 acres in the lower Killik watershed also proposed for wildlands status. Protection of the resources in these ares would be in wilderness park status.


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scale in miles
Arctic Circle
Alternative 5A
National Wilderness Park
National Wildlands
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern


N
50
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scale in miles
Arctic Circle
Alternative 5B
National Wilderness Park
National Wildlands
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern

5b. Also considered as an alternative was a variation of Alternative 5 which retains the Nunamiut National Wildlands as proposed in Chapter I but reduces that portion of it in the John River basin which is not under dual withdrawal. This amounts to 17 townships in the southern portions of the national wildlands proposal. There, lands would be managed as part of the wilderness park and would be closed to mining, recreational development and use by mechanical vehicles. (See Alternative 5B map.)

6. Exchange of Park and State Lands

In assessing the importance of certain State selection lands for park purposes, one alternative considered was the exchange of 20 townships of proposed park lands for certain State selection lands of importance to the proposed wilderness park. This alternative would be about the same as the action discussed in Chapter I of this statement except the 20 townships forming the appendage on the southwest corner of the proposed Mt. Igikpak Unit of the wilderness park would be excluded; and an approximate equal acreage of State selection lands on the southwest and southern boundaries of the Mt. Igikpak Unit would be included.

These State selection lands include the Alatna valley, Iniakuk Lake, the Reed River valley and other lands including Lake Minakokosa, the Augayucham Mountains, and the Seeks, River and Coal Pass areas.

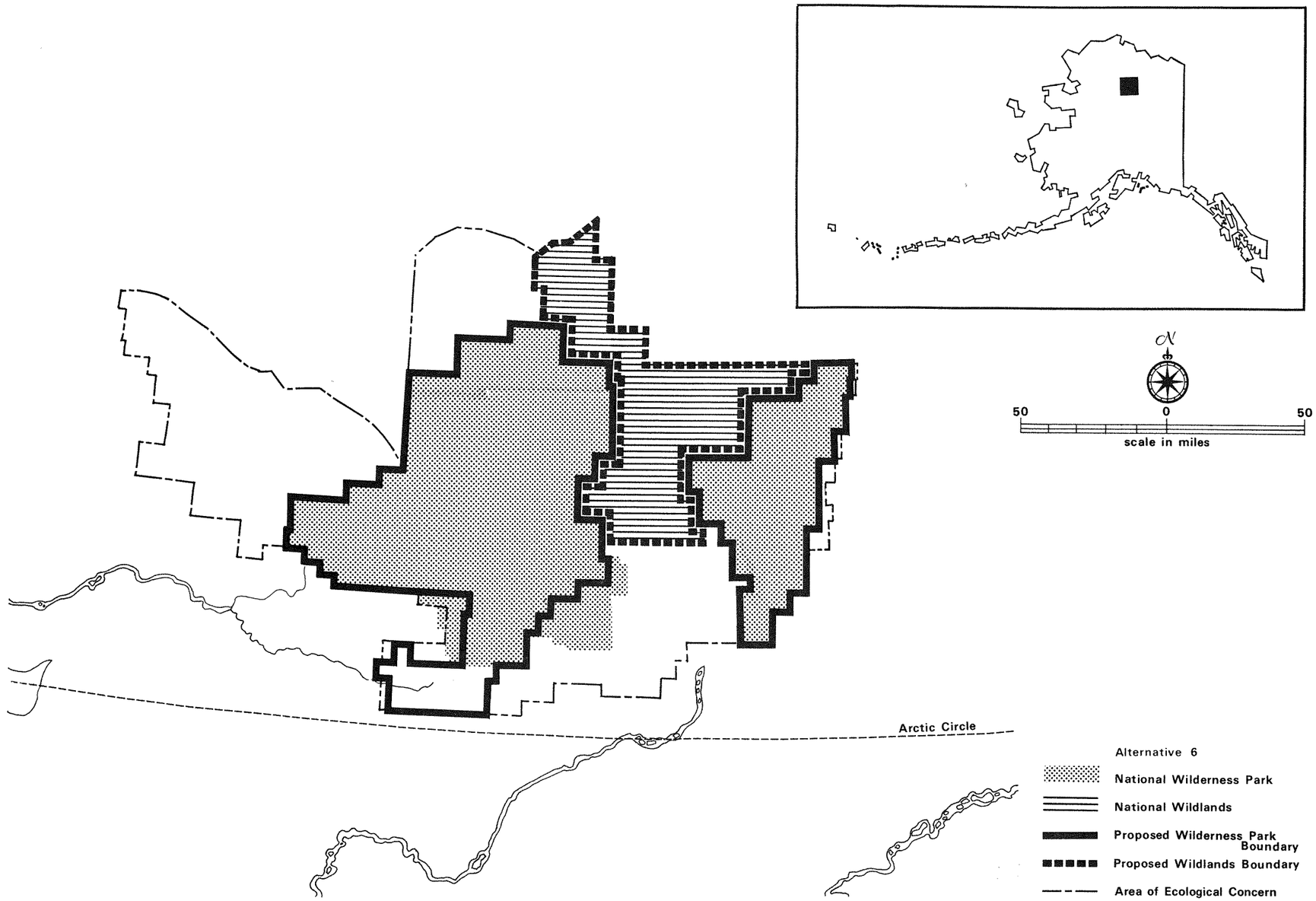
The proposed park lands that would be exchanged include the upper Kobuk River valley, Lakes Selby and Narvak, Niluncrat Hills, lower part of the Akotiakruich Hills, Lockwood Hills, and the Norutak Hills. (See Alternative 6 map.)

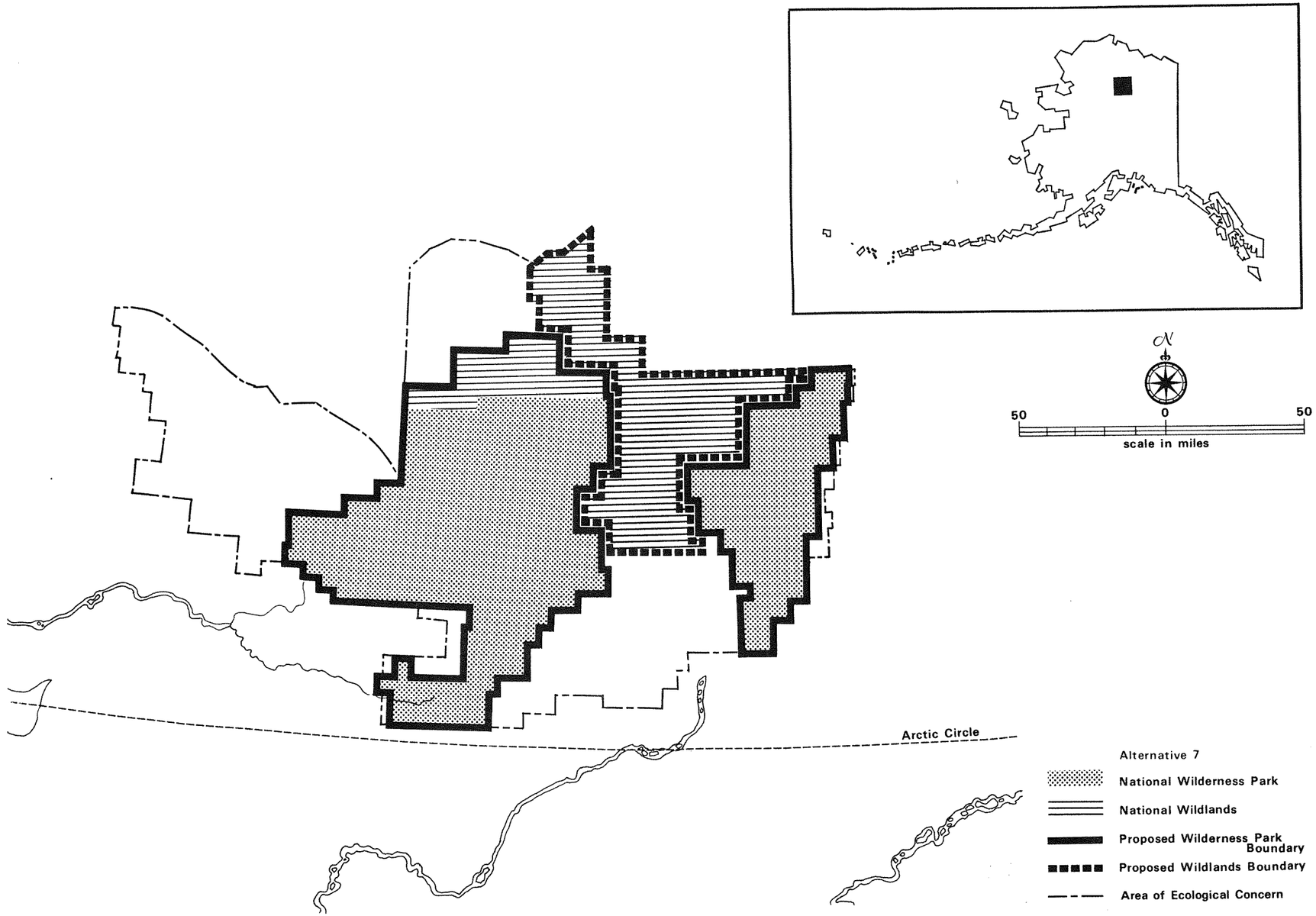
Impact: This exchange of land would have both beneficial and adverse effects on the proposed park and State interest in the area. The loss of acreage for each agency is counterbalanced by the inclusion of an approximately equal number of acres with an approximately equal balance of park resources or potential. The natural resources of the upper Kobuk River valley and surrounding hills would probably be utilized for economic development purposes under the multiple use system of State management. This would benefit the State's plans for its proposed westward transportation corridor down the Kobuk valley. This highway and the associated development that follows would result in adverse effects on the wilderness character of the valley and surrounding hill country. The inclusion of the Reed River valley and Alatna River valley-Iniakuk Lake area within the park proposal would probably result in the management of areas and their resources under the dominant use-park values policies of the National Park System. This would preclude potential for some economic returns to the State.

7. Transfer of Wilderness Park Proposal Lands to Wildlands Proposal

This alternative would be about the same as the action discussed in Chapter I of this statement except that approximately 700,000 acres of dual withdrawal lands in the Mt. Igikpak Unit of the wilderness proposal would be placed in the wildlands proposal.

These lands are the upper 35 townships of the Mt. Igikpak Unit. They are located in the Arctic Foothills physiographic province. (See Alternative 7 map.)


Arctic Circle
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scale in miles
Alternative 6
National Wilderness Park
National Wildlands
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern


Arctic Circle
N
50
0
50
scale in miles
Alternative 7
National Wilderness Park
National Wildlands
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern

Impacts: The impacts of this alternative would be about the same as those discussed in Chapter III of this statement, but the potential for development on approximately 700,000 acres of the Arctic Foothills physiographic province would be excluded. The transfer of dual withdrawl lands from the proposed wilderness park to the proposed wildlands would result in a higher potential for selection of these lands by Natives inasmuch as the national wildlands proposal envisions a cooperatively managed mix of public and private land.

8. Larger Wilderness Park Proposal Including All Arctic Slope Dual Withdrawal Lands

This alternative would enlarge the Mt. Igikpak Unit of the wilderness park by an additional 1.6 million acres. The additional lands of this alternative are 600,000 acres of dual withdrawal lands on the Arctic Slope of the wildlands proposal and a one million acre area of dual withdrawl lands between the northern boundary of the Igikpak Unit of the wilderness park proposal and the Colville River. (See Alternative 8 map.)

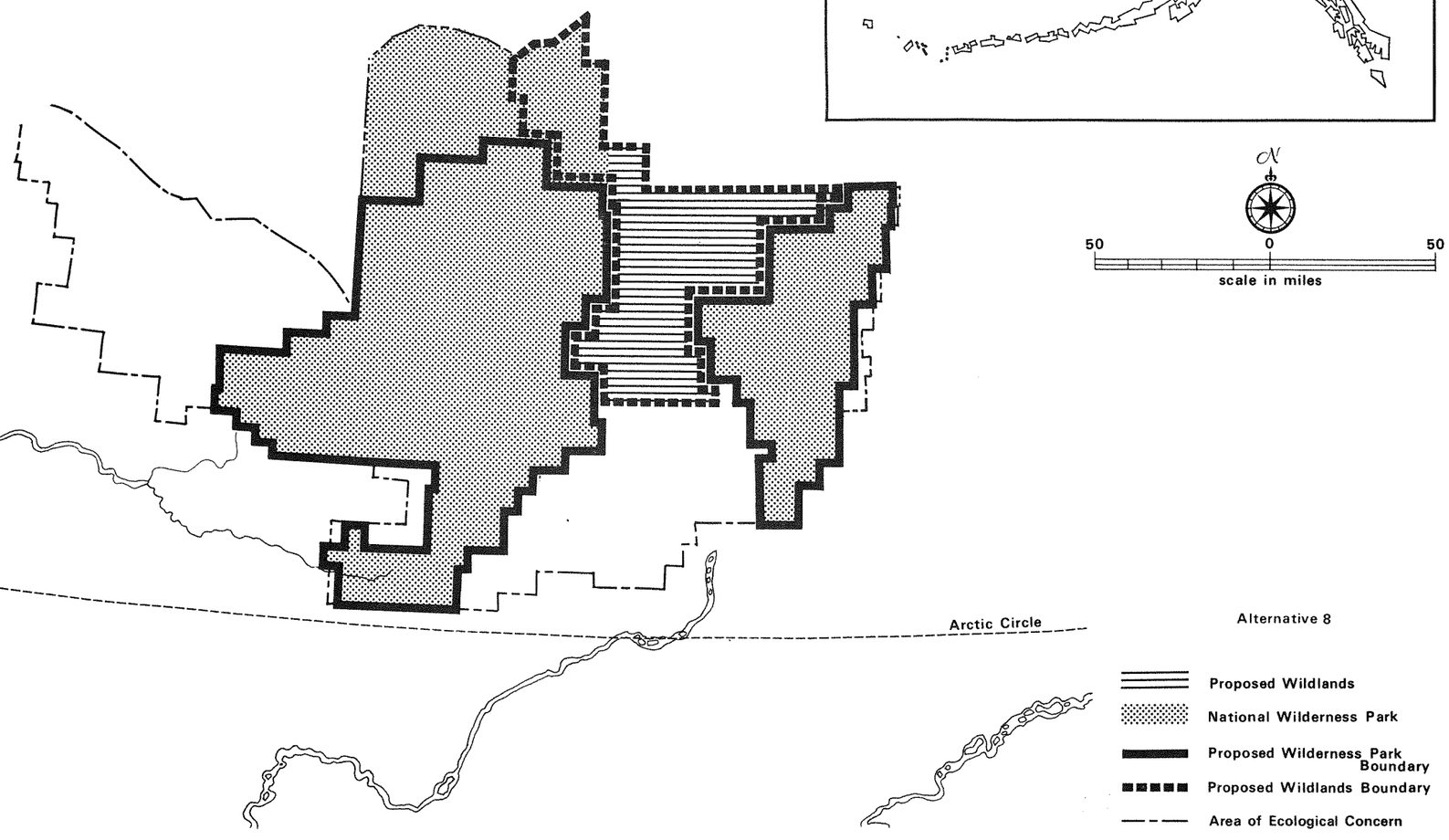
Impacts: The impacts of this alternative are about the same as those discussed in Chapter III of this environmental statement. However, the potential for the exclusion of development from an additional 1.6 million acres of Arctic Slope lands will be precluded. The inclusion of these dual 3-2 and Native withdrawal lands in the wilderness park proposal could have an adverse effect on the option of withdrawal of these lands by Natives. The classification of these lands as potential wilderness park would place more emphasis on the importance of preservation of their

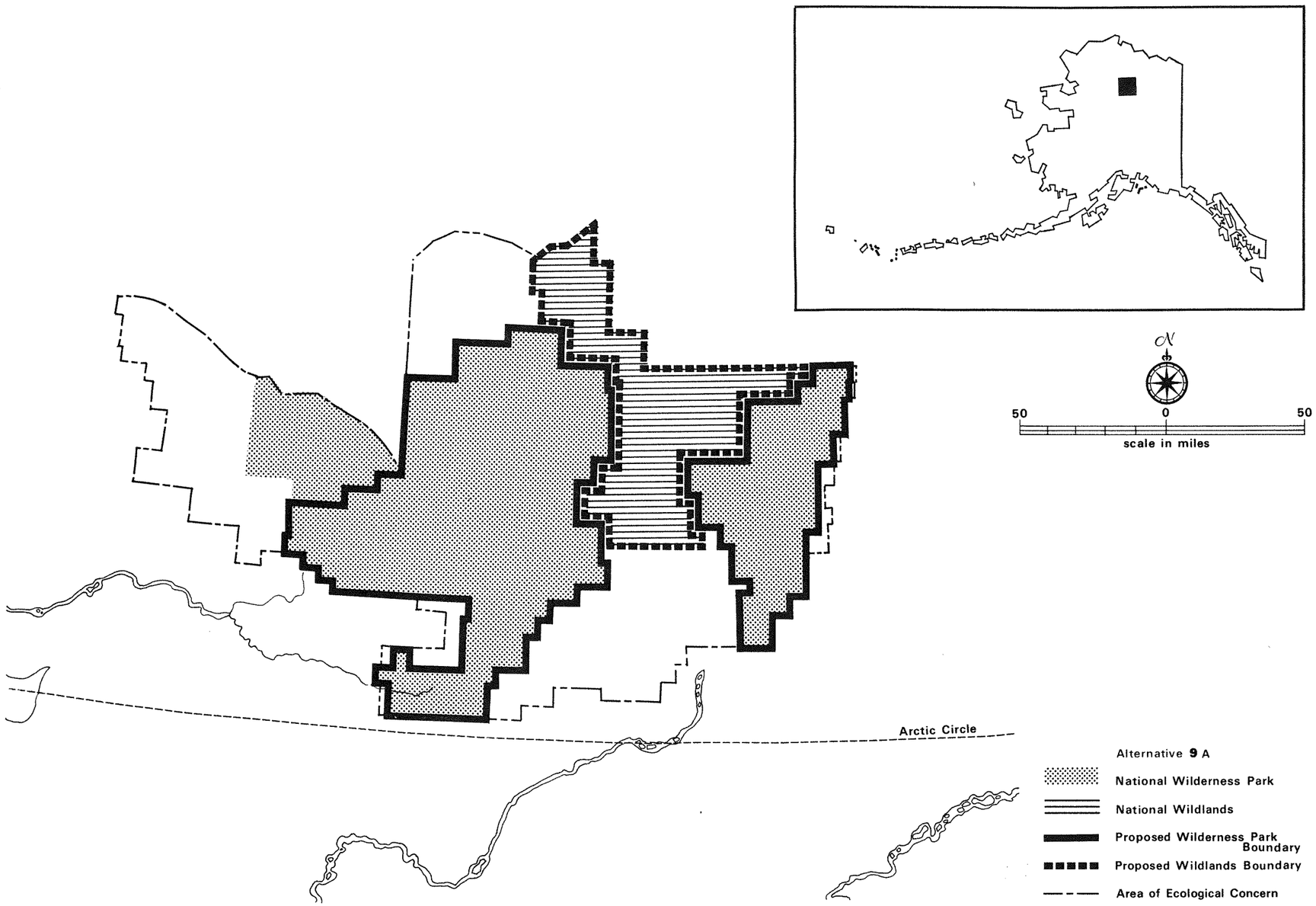
resources in a natural state. Wilderness park status would have the potential of excluding all multiple use activities except primitive type outdoor recreation research and subsistence use. This could have an adverse effect on the economy of the area as there is potential for minerals in this area. The alternative would place an entire Arctic Slope watershed within the proposed wilderness park. The Killik River, forming this watershed, is also qualified for designation as a National Wild River. The inclusion of the additional lands would also place in the proposed park the entire watersheds of the Kurupa and Oolamnagavik Rivers.

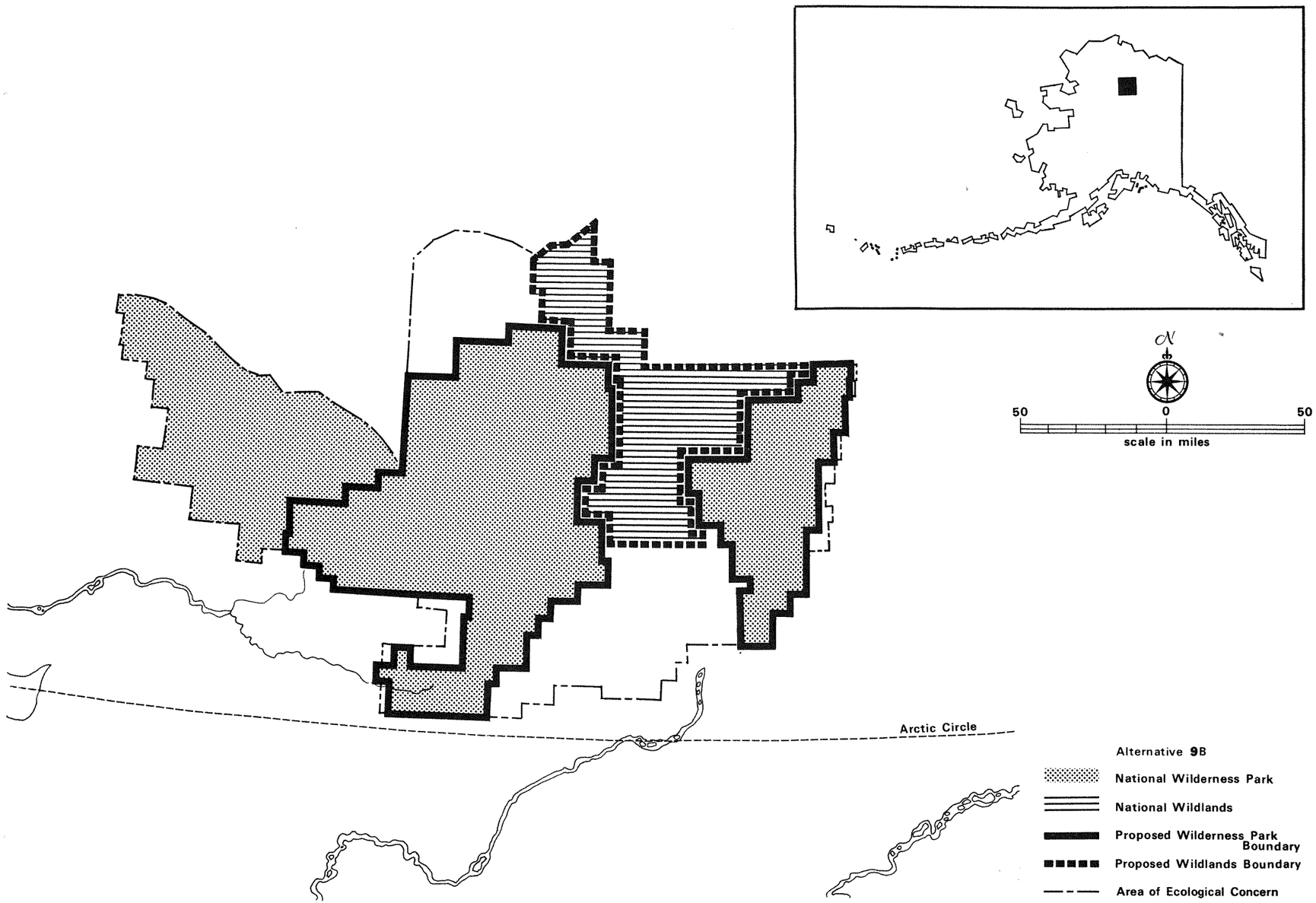
9. Larger Wilderness Park Proposals Including Parts of the Noatak National Ecologic Range

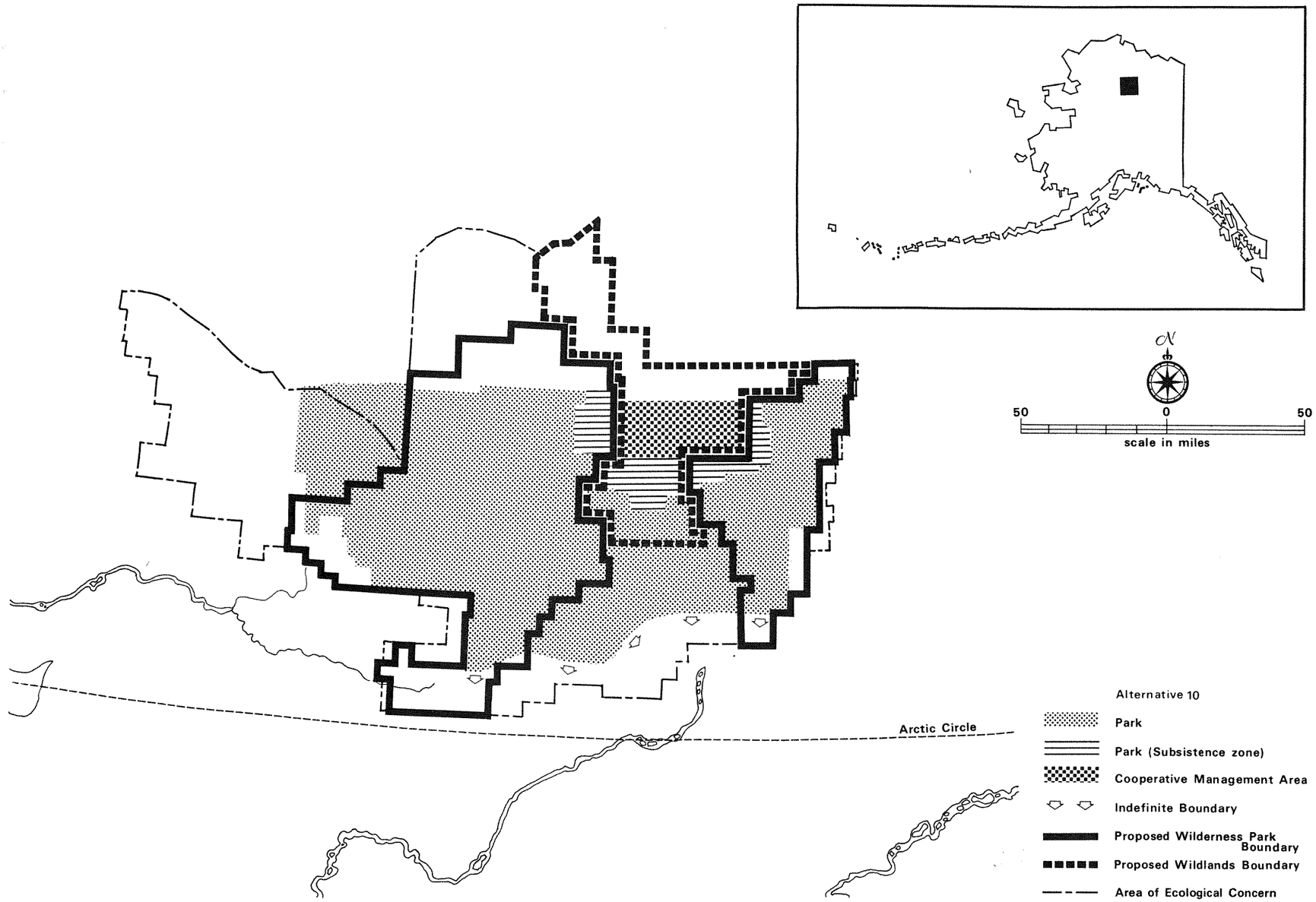
Two alternatives considered would increase the size of the Mt. Igikpak Unit of the proposed wilderness park by including lands west of the park and south of the Naval Petroleum Reserve No. 4 within the Bureau of Land Mangement's proposed Noatak National Ecological Range:

Wilderness Park Proposal Including the Upper Noatak Valley: This alternative would increase the size of the proposed wilderness park by 400,000 acres of park quality lands now within the proposed Noatak National Ecological Range. These lands are located immediately north of the northwest corner of the proposed wilderness park. The lands include the upper Noatak River valley that is closely surrounded by mountains, including areas of exceptional scenic and archeological importance. Special features of the area include the Inyorurak Lakes, Lake Kipmik,


N
50
0
50
scale in miles
Arctic Circle
Alternative 8
Proposed Wildlands
National Wilderness Park
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern


N
50
0
50
scale in miles
Arctic Circle
Alternative 9 A
National Wilderness Park
National Wildlands
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern


N
50
0
50
scale in miles
Arctic Circle
Alternative 9B
National Wilderness Park
National Wildlands
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern


N
50
0
50
scale in miles
Arctic Circle
Alternative 10
Park
Park (Subsistence zone)
Cooperative Management Area
Indefinite Boundary
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern

Midas Creek, Karachurak Creek, and Tunukuchiak Creek. (See Alternative 9A map.)

Impacts: The impacts of this alternative would be about the same as those discussed in Chapter III of this statement,but the potential for development of an additional 400,000 acres of primitive river valleys, mountains, and lakes could be precluded. This alternative would preclude all multiple use activities except primitive type outdoor recreation, research, and subsistence hunting and fishing. This could have an adverse effect on the local economy if mineral development were to occur in this area. The lands associated with this alternative contain 57 active copper claims in four groups and one group of 24 gold claims.

Wilderness Park Proposal Including a Large Portion of the Noatak Valley: This alternative would increase the size of the proposed wilderness park by including approximately three million acres of park quality lands that are within the proposed Noatak National Ecological Range. The lands are located to the west of the proposed wilderness park. The lands include four major tributary watershed and two highly important major lakes. The watersheds are those of the Imelyak, Cutler, Aniuk, and Anisak Rivers. The lakes are Feniak and Desperation, where outstanding botanical areas have recently been identified. (See Alternative 9B map.)

Impacts: The impacts of this alternative would be about the same as those discussed in Chapter III of this statement, but potential for development of an additional three million acres of primitive river valleys, mountains,

lakes, and major tributary watersheds might be precluded. This alternative would preclude all potential multiple use activities except primitive type outdoor recreation, research, and subsistence hunting and fishing. This might have an adverse effect on the local economy if the potential of economic mineral development were to occur in this area. The lands associated with this alternative contain 57 active copper claims in four groups and 210 gold claims in three groups.

10. Establish a Nunamiut National Park

Late in the course of the park study, the Arctic Slope Regional Corporation presented its Nunamiut National Park proposal to the Joint Federal-State Land Use Planning Commission for Alaska. The proposal was given careful and appreciative consideration. It corresponded very closely to the conclusions reached by the National Park Service park planners assigned to the Gates of the Arctic National Wilderness Park studies. These conclusions are presented below as an alternative to the proposed action.

This alternative is about the same as the action discussed in Chapter I of this statement but the Arctic Slope Lands would be excluded and subsistence zones would be established. Specific areas excluded from this alternative are most of the Arctic Slope lands, particularly the Krurupa-Cascade Lake area, the Pleistocene lake region of the Killik, and the lakes region of the Okokmilaga River, as well as the remainder of the Killik River and Itkillik Lake. (See Alternative 10 map.)

Impacts: The impacts of the alternative are about the same as those discussed in Chapter III, but the potential for the protection of the resources of the Arctic Slopes areas development would be unrealized. Potential Native and subsistence activities would be increased.

The cooperative management zone would be much smaller, resulting in less Native participation in the management of the area. This alternative would open a part of the Arctic Foothills Petroleum province and coal-bearing region to such options as mineral entry and mineral leasing, Native selection, and overland travel by machine.

11. Enlarged Wildlands Proposal Including the Wild, John, and Alatna River Basins

This alternative would be about the same as the action discussed in Chapter I, but would include an addition of 1.9 million acres to the wildlands proposal. This area is located to the south of the proposed wildlands and is identified as an Area of Ecological Concern. (See Alternative 11 map.)

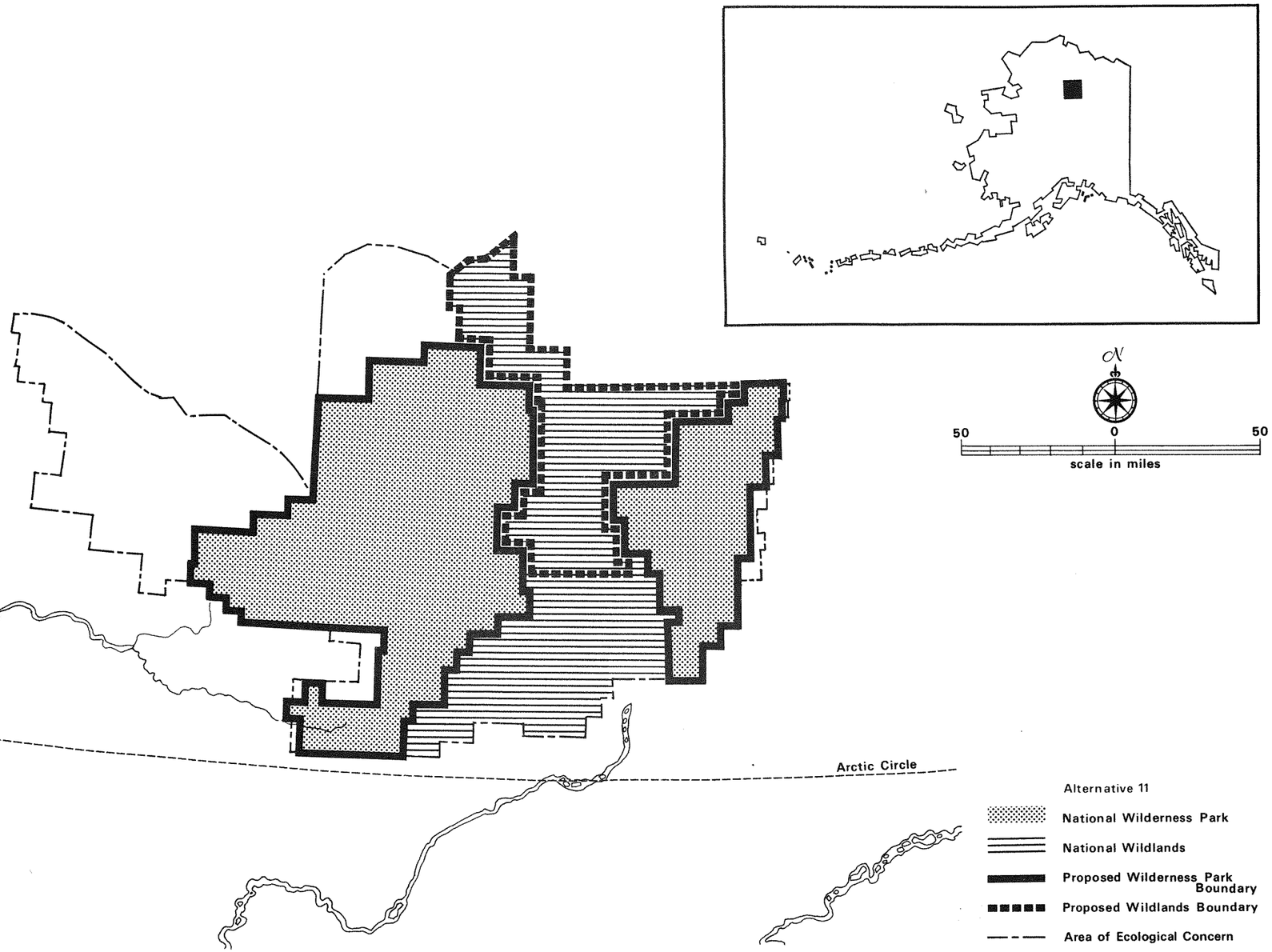
Impacts: The impacts of this alternative would be about the same as those discussed in Chapter III of this statement. However, it would include the potential for the protection of an additional 1.9 million acres of State selection, public interest, and Native deficiency lands. This alternative would present the potential to protect the subsistence and primitive outdoor recreation values of the additional lands by regulating use and controlling activities, such as mining, that could benefit the economy of the area but at the price of adverse, environmental

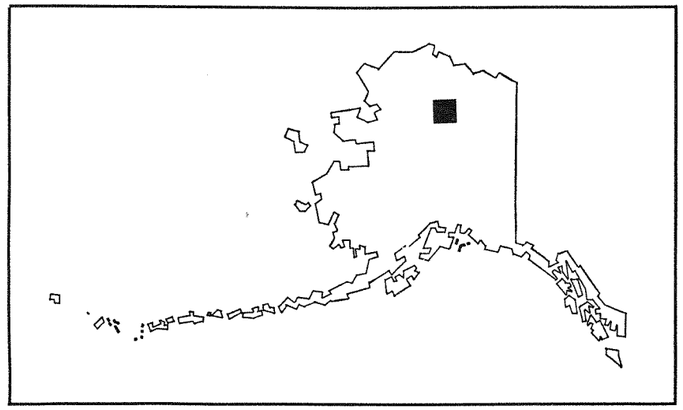
effects. This alternative would presumably close the additional lands to private settlement and would prevent transportation routes from crossing the area. There would be no recreational facilities developed on the Federal lands involved.

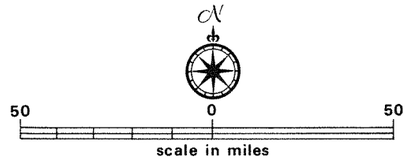
12. Smaller Wildlands Excluding Arctic Slope Lands

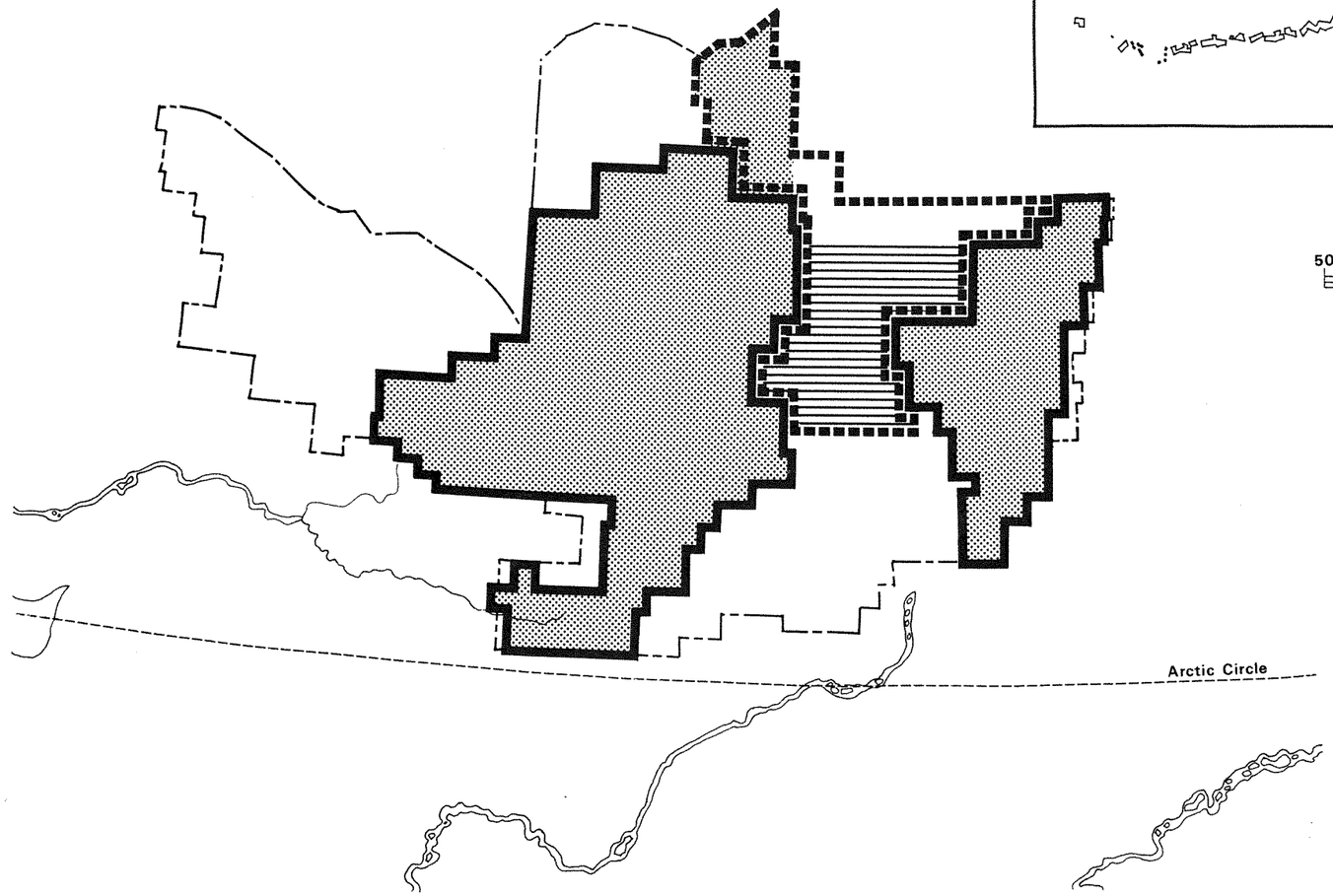
This alternative would be about the same as the action in Chapter except that the upper 27 townships of Native deficiency lands in the wildlands proposal would be excluded. The other Arctic Slope lands within the wildlands proposal would be transferred to the wilderness park proposal. (See Alternative 12 map.)

Impacts: The impacts of this alternative are about the same as those discussed in Chapter III of this statement, but the potential for the protection of 27 townships of Native deficiency lands through cooperative agreement would be excluded. Approximately 600,000 acres of Arctic Slope lands transferred from the wildlands proposal to the wilderness park proposal would be protected as wilderness, exclusing the option of cooperative management for private and public uses.


N
50
0
50
scale in miles
Arctic Circle
Alternative 11
National Wilderness Park
National Wildlands
Proposed Wilderness Park Boundary
Proposed Wildlands Boundary
Area of Ecological Concern







Alternative 12

National Wilderness Park

National Wildlands

Proposed Wilderness Park Boundary

Proposed Wildlands Boundary

Area of Ecological Concern

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 environmenal 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, 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, Forest Service

*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

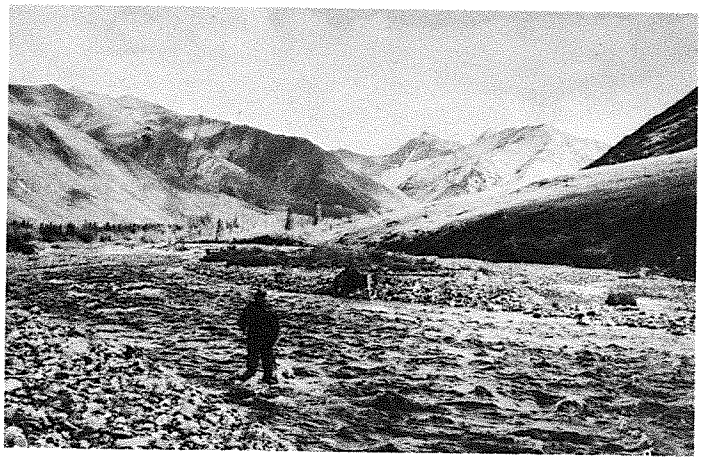
Office of the Governor of the State of Alaska, Director of Planning and Research

State of Alaska, Department of Public Works, Division of Aviation

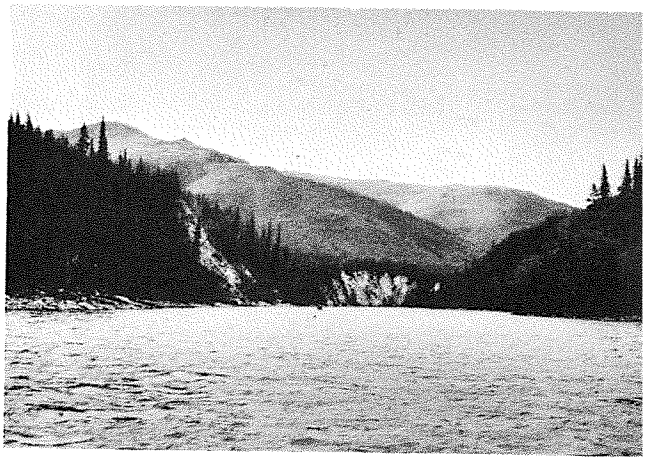
Staff, Alaska State Historic Preservation Officer

National Parks Advisory Board

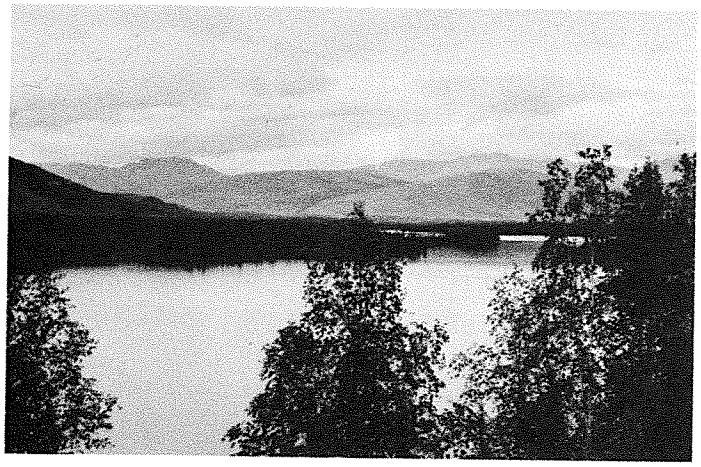
Naval Petroleum and Oil Shale Reserves, Department of the Navy



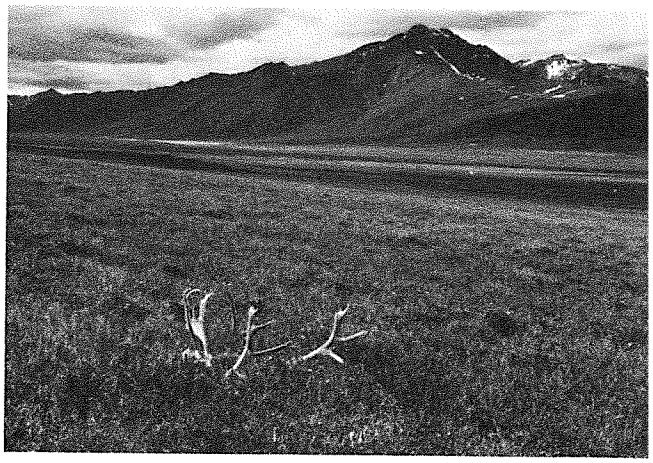
Upper Tinayguk River



North Fork, Koyukuk River



Unnamed lake near the North Fork of the Koyukuk River locally called "North Lake."



Chandler Lake valley

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 the 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:

Arctic Slope Borough
City of Kotzebue

Kiana Village Council
Ambler Village Council
Shungnak Village Council
Kobuk Village Council
Anaktuvuk Pass Village Council
Allakaket Village Council
Wiseman Village Council
Fairbanks North Star Borough

NATIVE ORGANIZATIONS:

Arctic Slope Regional Corporation
NANA Regional Corporation, Inc.
Kotzebue Native Village Corporation
Kiana Native Village Corporation
Ambler Native Village Corporation
Shungnak Native Village Corporation
Kobuk Native Village Corporation
Alaska Federation of Natives
Alaska Native Foundation
Mauneluk, Inc.
Doyon, Inc.
Barrow Village Native Corporation
Allakaket Village Native Corporation
Evansville Native Corporation
Tanana Chiefs Conference
Alatna Village Native Corporation
Hues Village Native Corporation

OTHER ORGANIZATIONS:

Sierra Club
Friends of the Earth
The Wilderness Society
National Parks and Conservation Assocation
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: BROOKS RANGE FLORA

Scientific Names of Plants Cited in Text

Common Name	Scientific Name
Alder	*Alnus spp.*
Alpine azalea	*Losieleuria procumbens*
Balsam poplar	*Populus balsamifera*
Bearberry	*Arctostaphylos alpina*
Black spruce	*Picea mariana*
Blueberry	*Vaccinium spp.*
Cottongrass	*Eriophorum spp.*
Cranberry	*Oxycoccus*
Crowberry	*Empetrum nigrum*
Fireweed	*Epilobium angustifolium*
Labrador tea	*Ledum spp.*
Lapland rosebay	*Rhodendron lapponicum*
Moss	*Sphagnum spp.*
Moss-capion	*Silene acaulis*
Mountain avens	*Dryas spp.*
Paper or white brich	*Betula papyrifera*
Quaking aspen	*Populus tremuloides*
Resin birch	*Betula glandulos*
White spruce	*Picea glauca*
Willows	*Salix spp.*

Major Plant Communities Occurring in the Brooks Range

BOREAL FORES (Taiga): The northern coniferous forest. Circumpolar in occurrence. Consists of 2 main forms in North America.

A. Closed Spruce-Hardwood Forest

White Spruce Type -- A climax forest in which white spruce, paper birch, and balsam poplar predominate. Occurs on south facing slopes with mesic conditions. Species of woody shrubs occur as understory Plants.

Recent Burn Type -- A seral (successional) stage of boreal forest. Composed of woody shrubs. Occurs rapidly following a fire. Succession depends on available seed source, topography, severity of burn, etc. Salix spp. (willows) and Alnus spp. (alders) most common shrubs. Epilobium spp. (fireweed) is typical herb.

Quaking Aspen Type -- A seral stage of boreal forest replacing the Salix-Alnus stage above. Populus tremuloides (quaking aspen) predominant tree. Occurs primarily in upland areas on south facing slopes. Twenty species of woody shrubs occur in understory.

Paper Birch Type -- A seral stage of boreal forest replacing the Salix-Alnus state on east and west facing slopes, occasionally on north facing slopes or flats. Twenty species of woody shrubs occur in understory.

Balsam Poplar Type -- A seral stage of boreal forest replacing Salix-Alnus stage. Reaches greatest extent and abundance on floodplains of meandering glacial rivers. Invades sandbars. Occurs in Brooks Range in small clumps.

NB: White spruce begins to be found in latter stage of maturation of each of the above seral types.

B. Open, Low Growing Spruce Forest -- A climax forest in which black spruce predominates. Found on north facing slopes and poorly drained (i.e. wet) lowlands and bog edges. Comes in directly after fires. Cones opened by heat (fire). Twenty-three species of woody plants found in this forest type. Understory of thick moss mat and lichens. This community does not extend as far north as the white spruce form.

TREELESS BOGS AND MUSKEGS: Occurs within boreal forest complex under conditions too wet for tree growth, e.g. unglaciated areas, old river terraces and outwashes, along ponds and sloughs, occasionally on gentle north

facing slopes. Various species of grasses, sedges, and mosses on drier peat ridges. Twenty-three species of woody shrubs may be found.

SHRUB THICKETS: Two types are recognized as occurring in the Brooks Range. Characterized by woody shrubs that may reach 12-18 feet in height. Usually very dense growth.

A. Floodplain Thickets -- The major shrub community along river floodplains. Periodic flooding probably maintains the community. Forms quickly on new alluvial deposits. Extends well north of Brooks Range along streams and rivers. Twenty-six species of woody shrubs occur in this community, of which 16 are Salix.

B. Birch-Alder Willow Thickets -- The major shrub community occurring near tree line (latitudinal and altitudinal) and beyond. Differs from preceeding by presence of birches (Betula spp). Often interspersed with Cladonia lichens or patches of ericaecous shrubs or tundra. Seventeen species of woody plants occur in this community.

TUNDRA: Three major tundra types can be described, two of which occur in parks-wildlands region. All types are treeless. Some species occurring as trees in other communities are stunted or

dwarfed in tundra conditions. Essentially a dwarfed or stunted forest.

A. Wet (or Coastal) Tundra -- This community does not occur in the Gates of the Arctic region according to published maps. (It does occur in the Noatak Basin however.) Characterized by standing water, shallow (thaw) lakes, and polygonal features. Primarily grasses and sedges NOT forming tussocks. A few woody shrubs occur on raised ridges, above water table.

B. Moist Tundra -- Occupies foothills and lower elevations of Brooks Range, north to the flat arctic coastal plain. Varies from continuous and uniformly developed Eriophorum spp.

C. Alpine Tundra -- A dry upland tundra typical of exposed mountain ridges between shrub/timber line and barren areas. Usually interspersed between barren rocks in sheltered areas. Species predominate. May be either herbacious or woody forms. Thirty-one species of woody plants are known to occur in this community.

All four major categories of these plant communities occur in the park-wildlands region.

In general, thres do not grow above 2100 feet (in a few instances under favorable south facing slope conditions timberline will reach 3,800 feet), or north of 67° 30' N latitude in the park-wildlands area. (It exceeds that latitude both east and west of the area however.) Trees are generally confined to river valleys and southern edges of the proposed boundary. Most of the region encompassed by the proposed parks-wildlands is covered either by shrub thicket or tundra communities, with the latter predominating.

Compiled from Viereck and Little. 1972 and Hulten 1968.

APPENDIX B: BROOKS RANGE MAMMALS

Beast	Probable Occurrence: South Slope	Probable Occurrence: North Slope
Sorex obscurus Dusky Shrew	X	X
Sorex cinereus Masked Shrew	X	X
Sorex arcticus Arctic Shrew		X
Sorex vagrans Vagrant Shrew	X	
Myotis lucifugus Little Brown Bat	?	?
Lepus americanus Snowshoe Hare	X	
Lepus othus Alaskan Hare		X
Marmota claigata Hoary Marmot	X	X
Spermophilus undulatus Arctic Ground Squirrel	X	X
Tamiasciurus hudsonicus Red Squirrel	X	
Castor canadensis Beaver	X	
Clethrionomys rutilus Northern Red-backed Vole	X	X
Microtus pennsylvanicus Meadow Vole	X	
Microtus oeconomus Tundra Vole	X	X
Microtus miurus Singing Vole	X	X
Ondatra zibethicus Muskrat	X	
Synaptomys borealis Northern Bog Lemming	X	
Dicrostanyx groenlandicus Collared Lemming		X

	Probable Occurrence	
	South Slope	North Slope
Rattus norvegicus Norway Rat	?	?
Mus musculus House Mouse	?	?
Erethizon dorsatum Porcupine	X	
Canis latrans Coyote	X	X
Lemmus trimucronatus	X	X
Canis lupus Gray Wolf	X	X
Alopex lagopus Arctic Fox		X
Vulpes fulva Red Fox	X	X
Ursus americanus Black Bear	X	
Ursus arctos Grissley or Brown Bear	X	X
Martes americana Marten	X	
Mustela ermineau Ermine	X	X
Mustela rixosa Least Weasel	X	X
Mustela vison Mink	X	X
Gulo gulo Wolverine	X	X
Lutra canadensis River Otter	X	X
Lynx canadensis Lynx	X	
Alces alces Moose	X	X
Rangifer tarandus Caribour or Reindeer	X	X

	Probable Occurrence	
	South Slope	North Slope
Ovibos moschatus Musk Ox		X
Ovis canadensis Mountain (Dall's) Sheep	X	X
Total	31	25

Summary: 11 spp. limited to south Slope only

5 spp. limited to North Slope only

19 spp. found on both North and South Slopes

References

Crook, J.L. 1971. Determination of abundance and distribution of Brown Bear (*Ursus arctos*) north of the Brooks Range, Alaska. MS Thesis, U. of Alaska. 78 pp.

APPENDIX C: HYPOTHETICAL LIST OF FISHES OF THE CENTRAL BROOKS RANGE BY WATERSHED

Fish	COLVILLE	YUKON	KOBUK	NOATAK
Family Petromyzontidae				
Arctic Lamprey-Lampetra japonica	X	X		
Family Salmonidae				
Inconnu-Stendous leucichthys	X	X	X	X
Humpbakc Whitefish-Coregonus clupeaformis		X	X	
Broad Whitefish-Coregonus nasus	X	X	X	X
Lake Whitefish-Coregonus	X			X
Least Cisco-Coregonus sardinella	X	X	X	X
Arctic Cisco-Coregonus autumnalis	X			
Round Whitefish-Prosopium cylindraceum	X	X	X	X
Arctic Grayling-Thymallus arcticus	X	X	X	X
Arctic Char-Salvelinus alpinus	X	X	X	X
Dolly Varden-Salvelinus malma		X		
Lake Trout-Salvelinus namaycush	X	X	X	X
Sockeye(Red)Salmon-Oncorhynchus nerka		X	X	X
Coho(Silver)Salmon-Oncorhynchus kistutch		X	X	X
Chinook(King)Salmon-Oncorhynchus tshawytscha		X	X	?

	COLVILLE	YUKON	KOBUK	NOATAK
Chum Salmon-Oncorhynchus keta	X	X	X	X
Pink Salmon-Oncorhynchus gorbuscha	X	X	X	X
Family Osmeridae				
Boreal Smelt-Osmerus eperlanus		X		
Family Esocidae				
Northern Pike-Esox lucius	X	X	X	X
Family Gadidae				
Alaska Blackfish-Dallia pectoralis	X	X	X	X
Family Cyprinidae				
Lake Chub-Couesis plumbeus		X		
Family Catistomidae				
Long Nose Sucker-Catostomus catostomus	X	X	X	X
Family Percopsidae				
Trout-Perch-Percopsis omiscomaycus		X		
Family Umbridae				
Burbot-Lota lota	X	X	X	X
Family Gasterosteidae				
Nine spined stickleback-Pungitius pungitius	X	X	X	X
Family Cottidae				
Coast Range Schulpin-Cottus aleuticus			X	X
Slimy Sculpin-Cottus cognatus	X	X	X	X
Four-horned Sculpin-Cottus	X			
TOTALS	19	24	20	19

Twenty-five total species

APPENDIX D: BIRDS OF THE BROOKS RANGE

The following checklist of birds is based primarily on observations by Irving (1960) Cade (Kessel and Cade, 1968) and Manual (1973), and previous authors whose work they summarized. Codes for the abundance and status of individual species are:

Abundance

(a) Abundant

(c) Common

(u) Uncommon

(r) Rare

(x) Unknown

Status

(r) Resident

(n) Nesting. (Combined with residents gives total of breeding species. A part of the population of nesting species may migrate to other breeding grounds.)

(m) Migrant

(v) Vagrant or stray

(x) Unknown

Birds are listed separately for each area in which observations were made. Abundance or status is usually based on actual observations rather than assumed distribution, although the latter procedure

may have provided a more accurate estimate of occurrence and status for some species. Observations at Kobuk were primarily in forested areas although some alpine areas are included. Noatak and Anaktuvuk are mountain areas where observations included both alpine and valley habits. They include observations in many adjacent mountain valleys including the Killik. Colville observations were mostly limited to the immediate vicinity of the Colville and Oolamnagavik Rivers. Observations on the Noatak were limited to summer months and while those on the Colville included at least a part of the spring migration, observations are far less comprehensive than those of Anaktuvuk.

	Kobuk (forest)	Noatak (alpine)	Anaktuvuk (alpine)	Colville (tundra)
Common Loon	x n	- -	u n	u v
Yellow-billed Loon	x m	u v	u n	u n
Arctic Loon	x n	c n	c n	a n
Red-throated Loon	x n	c n	a n	c n
Red-necked grebe	x n	- -	- -	r n
Horned grebe	x n	- -	u v	- -
Whistling Swan	x n	- -	c m	u x
Black Brant	c m	- -	c m	c m
Canada Goose	x n	- -	c m	c m
White-fronted Goose	c n	- -	c m	c m
Snow Goose	x m	- -	c m	- -
Mallard	c n	- -	u n	u n
Pintail	c n	c n	a n	c n
Green-winged teal	c n	c n	c n	u n
American Wigeon	c n	- -	c v	u v
Shoveler	u n	- -	r m	- -
Greater Scaup	c n	c n	c n	c n
Lesser Scaup	x x	- -	u n	- -
Old Squaw	x n	c n	c n	c n
Harlequin	u n	- -	u n	u x
Bufflehead	u x	- -	- -	- -
Steller's Eider	- -	- -	r v	- -
White-winged Scoter	c n	u n	c n	- -

	Kobuk (forest)	Noatak (alpine)	Anaktuvuk (alpine)	Colville (tundra)
Surf Scoter	x n	u n	u n	u n
Black Scoter	u v	- -	- -	- -
Red-breasted Merganser	x n	c n	c n	u n
Goshawk	x r	- -	u v	- -
Sharp-shinned Hawk	x m	- -	- -	- -
Rough-legged Hawk	x m	- -	c n	c n
Golden Eagle	x n	u n	c n	u n
Bald Eagle	x v	- -	u v	- -
Marsh Hawk	x n	c n	c v	r x
Osprey	x n	- -	u v	- -
Gyrfalcon	x r	c r	c r	c r
Peregrine Falcon	- -	u n	u x	c n
Pigeon Hawk (Merlin)	x n	- -	u n	- -
Sparrow Hawk (Kestrel)	- -	- -	u v	- -
Spruce Grouse	x r	- -	*	- -
Ruffed Grouse	x x	- -	*	- -
Sharp-tailed Grouse	x x	- -	*	- -
Willow Ptarmigan	c r	c r	c r	c r
Rock Ptarmigan	c r	c r	a r	u r
Sandhill Crane	x n	- -	c m	- -

*Reported from forest habitat on John, Hunt's fork, or Savioyuk Rivers.

	Kobuk (forest)	Noatak (alpine)	Anaktuvuk (alpine)	Colville (tundra)
Semi palmated Plover	x n	c n	c n	c n
Golden Plover	x n	c n	a n	- -
Killdeer	x x	- -	r v	- -
Ruddy Turnstone	x m	- -	c m	- -
Surfbird	r v	- -	- -	- -
Common Snipe	c n	c n	c n	c n
Whimbrel	c n	- -	u m	u x
Upland Sandpiper	r x	u n	r v	- -
Spotted Sandpiper	x n	c n	u m	c n
Solitary Sandpiper	x n	- -	u m	- -
Wondering Tattler	x n	r x	c n	- -
Lesser Yellowlegs	c n	c n	c n	- -
Stilt Sandpiper	- -	- -	u m	u x
Pectoral Sandpiper	x n	c n	u n	a n
White-rumped Sandpiper	x n	- -	u v	- -
Baird's Sandpiper	u m	c n	c n	- -
Dunlin	u v	- -	m v	- -
Least Sandpiper	x n	u n	c n	- -
Long-billed Dowitcher	x m	c n	c x	c n
Semi palmated Sandpiper	x n	- -	a n	c n
Buff-breasted Sandpiper	x m	- -	u m	- -
Sanderling	x m	- -	u m	- -
Bar-tailed Godwit	x n	- -	u m	- -

	Kobuk (forest)	Noatak (alpine)	Anaktuvuk (alpine)	Colville (tundra)
Red Phalarope	u m	- -	c m	c n
Northern Phalarope	c n	c n	c n	c n
Pomarine Jaeger	u v	- -	u m	c m
Parasitic Jaeger	x n	c n	c n	c m
Long-tailed Jaeger	x n	c n	c n	c m
Glaucous Gull	x n	x n	u n	c m
Herring Gull	c n	- -	u v	- -
Mew Gull	c n	c n	c n	- -
Ross's Gull	- -	- -	r v	- -
Bonaparte's Gull	x n	u x	- -	- -
Sabine's Gull	x v		u v	- -
Arctic Tern	c n	c n	c n	u m
Snowy Owl	c v	- -	c r	u r
Great Horned Owl	x r	- -	u v	- -
Hawk Owl	x r	- -	*	- -
Great Gray Owl	x r r	- -	*	- -
Short-eared Owl	x n	- -	c n	c n
Boreal Owl	x m	- -	u v	- -
Belted Kingfisher	c n	- -	*	- -
Yellow-shafted Flicker	c n	u x	r v	- -
Downy Woodpecker	u r	- -	u v	- -
Black-backed Three-toed Woodpecker	x r	- -	- -	- -
Northern Three-toed Woodpecker	x r	u x	*	- -

	Kobuk (forest)	Noatak (alpine)	Anaktuvuk (alpine)	Colville (tundra)
Say's Phoebe	x n	c n	u n	u n
Horned Lark	x n	c n	c n	- -
Violet-green Swallow	- -	- -	r v	- -
Tree Swallow	c n	c n	u v	- -
Bank Swallow	c n	c n	u v	- -
Barn Swallow	u v	- -	u v	- -
Cliff Swallow	c n	c n	r n	- -
Gray Jay	c r	c r	u r	- -
Common Raven	c r	c r	c r	c r
Black-capped Chickadee	c r	- -	c v	- -
Gray-headed Chickadee	x r	- -	- -	- -
Boreal Chickadee	x r	- -	*	- -
Dipper	u r	- -	u r	- -
Robin	c n	c n	c n	u n
Varied Thrush	c n	- -	- -	- -
Gray-cheeked Thrush	c n	- -	c n	c n
Wheatear	x n	c n	c n	u n
Bluethroat	- -	u n	u v	u n
Ruby-crowned Kinglet	x n	- -	u r	- -
Arctic Warbler	c n	u n	u n	c n
Yellow Wagtail	x n	x x	c n	a n
Water Pipit	x n	c n	a n	- -
Bohemian Waxwing	x m	x n	*	- -

	Kobuk (forest)	Noatak (alpine)	Anaktuvuk (alpine)	Colville (tundra)
Northern Shrike	x n	c n	c n	c n
Yellow Warbler	c n	- -	u v	- -
Orange-crowned Warbler	x n	x n	- -	- -
Myrtle Warbler	x n	- -	r v	- -
Black poll Warbler	x n	- -	- -	- -
Wilson's Warbler	c n	c n	u n	u x
Rusty Blackbird	x n	x n	u n	- -
Pine Grosbeak	x r	- -	c r	- -
Gray-crowned Rosy Finch	x n	x n	c n	- -
Hoary Redpoll	c r	- -	a r	a n
Common Redpoll	a r	a n	c r	- -
White-winged Crossbill	x r	- -	r v	- -
Savannah Sparrow	c n	a n	c n	c n
Slate-colored Junco	x n	- -	u v	- -
Tree-sparrow	c n	a n	a n	a n
Golden-crowned Sparrow	x x	u n	- -	- -
White-crowned Sparrow	c n	a n	c n	c n
Fox Sparrow	x n	c n	c n	c n
Lapland Longspur	x n	a n	a n	a n
Smith's Longspur	- -	u n	c n	- -
Snow Bunting	c r	c n	u n	- -

	Kobuk	Noatak	Anaktuvuk	Colville
Area Totals				
Resident	22	5	11	5
Nesting	75	53	53	37
Migrant	3	0[a]	17	8
Vagrant	8	1	29	2
Status Unknown	7	5	2	6
	125	64	112	58

Grand Totals	
Resident	24
Nesting	86
Migrant	9
Visitor or Vagrant	11
Status Unknown	3
	133

a) Observations not available for period of migration.

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