Iliamna Proposed National Conservation Area

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

A PROPOSAL

ILIAMNA

NATIONAL

CONSERVATION

AREA

Alaska State Office
Bureau of Land Management
May 1973

PART I

LEGISLATIVE PROPOSAL FOR THE

ILIAMNA NATIONAL CONSERVATION AREA

A BILL

To provide for the establishment of the Iliamna National Conservation Area, Alaska

Be it enacted by the Senate and the House of Representatives of the United States of America in Congress assembled, That in order to preserve the outstanding natural resource values and to manage and utilize the lands and other resources therein under a program of multiple use, sustained yield, and environmental protection and enhancement compmtible with the provisions of section 3 of this act, the Secretary of the Interior is authorized to establish within the general area depicted on BLM Map No. 101 , dated May 11, 1973 , and on file in the office of the Bureau of Land Management, Department of the Interior, the Iliamna National Conservation Area in the State of Alaska.

SEC. 2. Definition of terms. As used in this Act:

(a) "Secretary" means the Secretary of the Interior.

(b) "Area" means the Iliamna National Conservation Area.

(c) "National Conservation Area" means all lands and interests in lands (including the renewable and nonrenewable resources thereof) now and hereafter administered by the Secretary through the Bureau of Land Management.

SEC. 3. Management.

(a) The Secretary shall manage the Area under the principles of multiple use, sustained yield, and environmental protection for any

combination of uses.

(b) The Secretary shall permit hunting and fishing on federally-owned lands within the boundaries of the Area in accordance with applicable laws and regulations of the State of Alaska and the United States, except that the Secretary may designate zones where, and establish periods when, no hunting or fishing shall be permitted for reasons of fish and wildlife management, public safety, administration, or public use and enjoyment. Except in emergencies, regulations of the Secretary pursuant to this section shall be put into effect after consultation with the Alaska Department of Fish and Game.

(c) In managing the Area in accordance with the purposes of this Act, the Secretary may utilize such other statutory authorities as are available to him for conservation and management of the land, and the wildlife and other resources therein, as he deems appropriate for preservation, recreation, and resource development purposes.

SEC. 4. Mining and mineral development.

(a) Subject to valid existing rights, lands within the Area are withdrawn from location, entry, and patent under the United States mining laws. Within zones of the Area designated by him for such use, the Secretary may permit mining and mineral leasing in accordance with the United States mining and mineral leasing laws and in accordance with regulations issued pursuant to this Act provided that patents issued

under the mining laws pursuant to this section shall convey title to only the mineral deposits within the claim.

SEC. 5. Rules and regulations; unauthorized use.

(a) The Secretary is authorized to issue such rules and regulations as he deems necessary to carry out the purposes of this Act.

(b) The use, occupancy or development of any portion of the Area, contrary to any regulation of the Secretary or other responsible authority, or contrary to any order issued pursuant thereto is unlawful and prohibited.

SEC. 6. Enforcement.

(a) Any violation of regulations which the Secretary issues with respect to the management, protection, development of the Area and property located thereon and which the Secretary identified as being subject to this section shall be punishable by a fine of not more than $500 or imprisonment for not more than six months, or both. Any person charged with a violation of such regulation may be tried and sentenced by any United States magistrate designated for that purpose by the court by which he was appointed, in the same manner and subject to the same conditions and limitations as provided for in Section 3401 of Title 18 of the United States Code.

(b) At the request of the Secretary, the Attorney General may institute a civil action in any United States district court for an injunction or other appropriate order to prevent any person from utilizing the area in violation of regulations issued under this Act.

(c) The Secretary may designate and authorize any employee to make arrests within the Area without warrant for any misdemeanor or violation

of any law or regulation committed in his presence or view, or for any felony if the arresting officer has probable cause to believe that the person arrested has committed or is committing such felony and a delay in obtaining a warrant would jeopardize the possibility of his apprehension. Such authorized employee may execute within the Area any warrant or other process issued by a court or officer of competent jurisdiction for the enforcement of the provisions of any Federal law or regulation. Such authorized employee, while engaged in carrying out his official duties, may carry such firearms as are authorized by the Secretary. Such employees may also pursue and arrest outside of the Area, a person fleeing from the Area to avoid an arrest or service of process which the employee is authorized to make within the Area.

(d) In connection with administration and regulation of the use and occupancy of the Area, the Secretary is authorized to cooperate with the regulatory and law enforcement officials of the State of Alaska, or a political subdivision thereof. Such cooperation may include reimbursement to the State or its subdivision for expenditures incurred by it in connection with activities which assist in the administration and regulation of use and occupancy of the area.

SEC. 7. Acquisition of lands.

(a) The Secretary of the Interior is authorized to acquire lands and interests in lands for inclusion in the Area by purchase, donation, purchase with donated funds, exchange or otherwise, provided that such lands and interests owned by the State of Alaska or its political subdivisions may be acquired only with consent of either the State or its political subdivisions, whichever the circumstances require.

(b) In exercise of his authority to acquire lands or interest in lands by exchange, the Secretary may convey in the State of Alaska any lands, or interests therein, under his administrative jurisdiction, which he determines to be suitable for disposition, when in his judgment the exchange will be in the public interest, and such lands are available to exchange under applicable laws. The values of the lands so exchanged shall be equal, or if they are not equal, the values shall be equalized by the payment of money to the grantor or to the Secretary as the circumstances require.

(c) In order to minimize payment of severance damages, the Secretary may acquire the whole of a tract or parcel which is located only partially inside the Area, and may exchange the portion outside the boundaries for land or interests in lands inside the boundaries.

(d) Notwithstanding any other provision of Law:

(1) The Secretary may administer as a part of the area any federally-owned lands under his administrative jurisdiction located within the Area, as depicted on BLM Map No. 101, dated May 11, 1973.

(2) Any other Federal property located within the Area so depicted may, with concurrence of the head of the agency having custody thereof, be transferred without consideration to the administrative jurisdiction of the Secretary for use in carrying out the provisions of this Act.

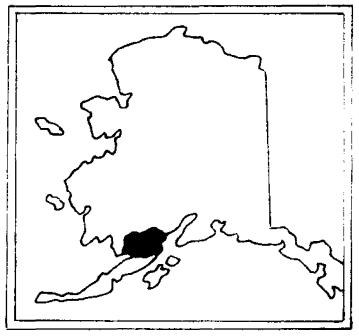
SEC. 8. Boundaries.

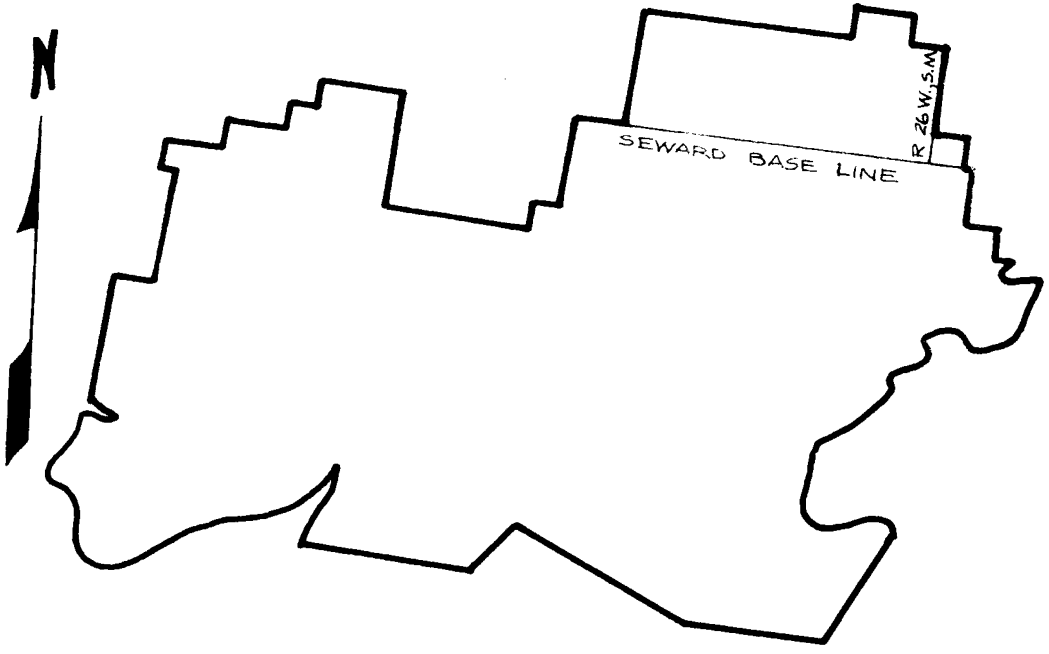
Boundaries of the Area shall be established by the Secretary by publication in the Federal Register. Such notice shall notify the public of availability and location of a map depicting the

area established, which shall be available for public inspection at appropriate offices of the Department of the Interior.

SEC 9. Appropriations.

There are hereby authorized to be appropriated such sums as may be necessary to carry out the purposes of this Act.





MAP NO. 101

MAY 11, 1973

ILIAMNA NATIONAL CONSERVATION AREA

one inch equals approximately forty miles

PART II

ENVIRONMENTAL ASSESSMENT

TABLE OF CONTENTS

INTRODUCTION

Based on an ecosystem productivity study, the Bureau of Land Management has identified areas in Alaska where limited use or multiple use management should prevail for the best long run public interest.

The Bureau of Land Management believes it is imperative to present its case for Federal ownership of lands under the Alaska Native Claims Settlement Act to the Secretary before long-range management options are foregone. The desired quality of management for some of the areas dictates that a special legislative and budgetary authority be prepared for the Bureau of Land Management.

The following is the environmental impact analysis for the multiple use management by the Bureau of Land Management as proposed in the legislation for the Iliamna National Conservation Area.

I. DESCRIPTION OF THE PROPOSED ACTION

A. Proposed Action

The proposed action is the enactment of legislation to provide for the establishment of the Iliamna National Conservation Area in the State of Alaska.

B. Purpose of Action

The purpose of the action is to attain, through recommendation by the Joint Federal-State Land Use Planning Commission, Secretarial determination and Congressional deliberation and approval for specific legislative and budgetary authority for the Bureau of Land Management to administer the proposed Iliamna National Conservation Area for multiple use purposes.

C. Objective of the Action

The objectives of the action are to (1) protect and enhance important environmental values for present and future generations; (2) provide for the most efficient use of nonrenewable resources; and (3) return to the Federal government, both now and in the future, fair market value for the use of natural resources.

D. Assumptions Used

The following assumptions were used in assessing the mitigating measures for the potential environmental impact of the proposed action:

1. Congress will provide a well defined multiple use management policy for BLM.

2. Enabling legislation for management of the area will specifically provide for the following:

a. Arrest authority and the establishment of rule violation penalties

b. Exchange authority

c. Acquisition authority

d. Disposal authority

e. Defined management boundary

f. Classification authority

g. Permit system for locatable minerals

h. Authorization for funding and appropriation of funds

3. There will be no changes in mineral leasing laws.

4. The National Environmental Policy Act requirements will be met.

E. Components of the Action Analyzed for Their Potential Impact on the Environment.

1. Realty Transactions

Under the proposal realty transactions can be made to accommodate needs for easements, rights-of-way, establishment of new communities, expansion of existing communities, and intensive land uses for both public and private entities. Land needs for governmental use and for state land selections can also be accommodated. This proposal also provides for acquisition of land to further governmental programs by means of both purchase and exchange.

Before any major land disposals are considered, the area must be subject to a detailed resource analysis from which a logical, viable management

framework plan is developed. Detailed plans, which may lead to realty transactions, are then necessary to fill out the framework and to make the area usable to the public.

Any land use normally entails some surface disturbance and could lead to lowering of air and water quality. Other resources may also be affected by any proposed land use.

2. Mineral Development

An objective is to make minerals in the area available for national use. Minerals are necessary to man's development and would be made available consistent with good planning. Although the area does not appear to be rich in the energy minerals, they, including the geothermal resources, would be made available consistent with planned development and local and national needs. Mineral development may result in a need for other surface use, with spin-off needs such as use of forest products and recreational uses. Development must therefore be carefully planned so as to consider all phases of mineral extraction, including those resulting from community development. Its effect on air must be considered and any degradation must be located as to have the least effect on the natural community.

3. Range Management

The Range Management Program of the BLM includes inventory, evaluation and management of the range resource on the public lands used by domestic livestock or reindeer. The program involves authorizing and supervising grazing use and developing and maintaining livestock management facilities.

One of the objectives of the program is to

provide forage to help meet needs of the Nation and to help stabilize the economy of the livestock industry, individual users, and dependent communities.

Permits and leasing of the public lands that are issued in Alaska for reindeer and domestic livestock, respectively, are subject to analysis under provisions of the National Environmental Policy Act. Basically, three alternatives exist: (1) grazing with only administrative permission; (2) grazing under intensive grazing systems of several types; and (3) no grazing.

These alternatives would be considered not only in formal environmental assessment reviews but also through the BLM planning system which would weigh the conflicts of livestock grazing with other resource values. The planning process may indicate utilization of the grazing resource may involve environmental costs that exceed the benefits to be derived.

In the case of the Iliamna National Conservation Area, reindeer grazing is projected as a possible resource use. No grazing of any kind is authorized in the area at the present time. No potential for domestic livestock, other than reindeer, is foreseen due to conflicts with other uses, economic problems, and the marginal characteristics of the area for grazing due to climate, topography, and vegetation. In the case of reindeer, serious conflicts would exist with current wildlife use including predators and caribou. Ability to control and manage reindeer to protect resource values has not been demonstrated elsewhere in Alaska.

4. Forest Management

The forestry program in BLM includes inventory, evaluation, and management of the forest

resources on the National Resource Lands. Within environmental and cost constraints, the program objective is to provide timber for national and regional needs to the extent possible under sustained yield criteria. Criteria include harvest only from commercial forest lands; provision for exclusion from harvest for aesthetic, recreational, watershed, or other purposes, and prompt regeneration of harvested areas.

Elements of the forest management program include: (1) forest development including tree culture and regeneration actions; (2) sale of forest products including timber, posts, poles, and vegetative products; (3) timber trespass detection and prosecution; and (4) forest pest and disease control.

Commercial forest lands are found in two small portions of the Iliamna NCA. A narrow band of coastal commercial forest is located on well-drained soils where found along the eastern edge of the NCA, adjacent to Cook Inlet. This area contains the most northwestern stand of Sitka spruce in the Western Hemisphere. Transitional influences cause this coastal commercial forest to include white spruce and Sitka/white spruce genetic crosses in addition to Sitka spruce, hemlock associations as found in the type within its normal range.

Interior commercial forest type is found at the northeastern end of Lake Iliamna and in narrow bands along portions of the Nushagek and Alagnak Rivers. Only the former area is suitable for consideration for planned harvest. It is the southern extension of a general type through the Lake Clark area from the Susitna Valley.

Planned harvest from commercial forest land will be undertaken when consistent with Bureau policy and where determined to be appropriate through the BLM planning process. Any planned harvest cannot be based on the limited commercial forest base of the NCA alone. If such harvest is deemed suitable, it must be as a component of the Cook Inlet commercial forest complex.

Noncommercial forest and areas containing trees may be found throughout the proposal area to an elevation of 1,000 feet. Demand-generated small sales and free use may be considered for subsistence purposes where such use is consistent with MFP constraints and environmental considerations.

5. Watershed Management

The general watershed program includes vegetative manipulation through mechanical, chemical, and biological methods, and water development and control structures. These are directed toward stabilization of soil resources, maintenance or restoration of soil productivity, protection, and enhancement of water yield and quality, and reduction of flood and sediment damage.

In Alaska the program goal is watershed quality maintenance. This is implemented during planning of all action programs. One feature of BLM multiple use management is to foresee possible watershed problems and then design the action programs to avoid the potential problems. Watershed field work in Alaska is limited to rehabilitation of surface disturbed sites such as material sites, firelines, off-road vehicle trails, and mine tailings. Rehabilitation includes land shaping, construction of water diversion bars, seedbed preparation, fertilization, transplanting and seeding, mulching and watering.

6. Wildlife Habitat Management

The BLM wildlife program is primarily concerned with protection, enhancement, or rehabilitation of fish and wildlife habitat on the public lands. Special attention is directed to the habitat of endangered species. The goals are to provide a variety of wildlife recreation and commercial use opportunities commensurate with public needs, resource potentials, and a quality environment. Program activity is closely coordinated with State wildlife agencies.

The program may involve vegetation manipulation by chemical, biological, or mechanical means or by use of prescribed fire. Enhancement could also involve seeding or planting preferred food species.

No actions for the enhancement or rehabilitation of wildlife habitat would be undertaken without having been exposed and processed through the development of a MFP and through a critical environmental assessment.

7. Recreation Management

The basic philosophy of the Bureau's recreation program is to provide an adequate variety and supply of outdoor recreation opportunities commensurate with public needs, resource potentials, and a quality environment on the national resource lands. The recreation management program includes: (1) the management of visitors; (2) the control of recreation activities; (3) the identification and protection of historic, archeological, and cultural values; (4) the identification and protection of natural values which may be valuable for their recreation use; and (5) the construction, operation, and maintenance of recreation facilities to achieve management objectives.

Specific recreation oriented designations on the national resource lands are: recreation lands, primitive areas, outstanding natural areas, natural landmarks, historic landmarks, historic districts or sites, and recreation sites. Within the proposal area there are quality recreation opportunities for hunting, fishing, winter sports, water sports, sightseeing, and primitive values. Numerous rivers meet the criteria for inclusion in the National Wild and Scenic River System. Currently, the Alagnak and Copper (by Iliamna) are under study.

8. Fire Protection

The fire protection activity includes prevention, presuppression, and suppression of damages caused by wildfire, and restoration of damages from suppression actions on lands administered by the Bureau of Land Management. The suppression activity and standards are directly extended over lands granted to the Natives under the provisions of the Alaska Native Claims Settlement Act, and over State-owned lands by contractural provisions. The suppression activities are also indirectly extended under cooperative agreements over lands administered by the Bureau of Indian Affairs, the Bureau of Sport Fisheries and Wildlife, National Park Service, the National Forest Service, the Alaska Railroad, the Department of Defense, and borough and local governments.

The long-term objectives of the program include: (a) minimizing losses of public lands and their resources from wildfire damage and preserve their capabilities to contribute to the resource needs of the Nation, (b) protecting all rare or unique natural and historical resources and critical environmental

values from wildfire and preserve them for the use and enjoyment of present and future generations, and (c) rehabilitating burned areas in accordance with land use and management plans.

Management framework plans will guide the implementation of fire control plans, insuring that such plans are compatible with environmental needs and resource management objectives for the area.

Fire suppression techniques least damaging to the resource and the environment will be used. Rehabilitation of fire lines through seeding, water diversion and recovery will be used to lessen fire control damage to the environment.

9. Road and Trail Construction

The road and trail construction and maintenance program provides construction and maintenance of roads and trails for purposes of access to the public lands administered by the Bureau of Land Management.

The long-term objectives of this program are to build and maintain road and trail systems which provide access to public lands commensurate with the economic and social value of the resources served and the need for their development, use, and protection, to an extent and in a manner consistent with the protection, enhancement, and development of a quality environment.

F. History and Background

1. Relationship of the area to the Alaska Native Claims Settlement Act. The act provided a land and monetary settlement package for the Native people of Alaska and opened the way for resumption of the State selection program under the Alaska Statehood Act.

Among other provisions the act provided for

the withdrawal of up to 80 million acres of unreserved lands for inclusion in the National Park, Forest, Wildlife Refuge, and Wild and Scenic River Systems. The act also provided for the withdrawal of public lands to be classified or reclassified, and to open them to entry, location, and leasing in accordance with the classification.

In general, an initial three-way land distribution pattern resulted from the act--those lands withdrawn for the Native villages and the regional corporations' selections, those lands withdrawn for reservation in the Federal ownership, and those lands to be selected by the State.

More specifically, the existing and pending land status within the general area affected by this proposal, as shown on the attached Map II, includes the following:

	In approximate acres
Major withdrawals, pre-ANCSA	None
Power site or project withdrawal pre-ANCSA	59,665
Other withdrawals, pre-ANCSA	1,599
17(d)(2) National interest study area	3,238,180
17(d)(1) Classification & public interest area	1,487,083
Unreserved public domain	None
Indian reserve	917
Native village withdrawals	4,151,574
Village deficiency area	None
Regional deficiency area	236,276
State selection patented	130,246
State selection tentatively approved	22,950
State selection pending	79,235
Private lands patented	5,518
Other patent applications	3,203
Native allotment applications	54,269

All lands not selected by the Native villages and regional corporations and the State within the general area will revert to the Federal domain.

Total land surface	9,174,739
Total inland navigable waters	903,423
Total tidal water	226,807

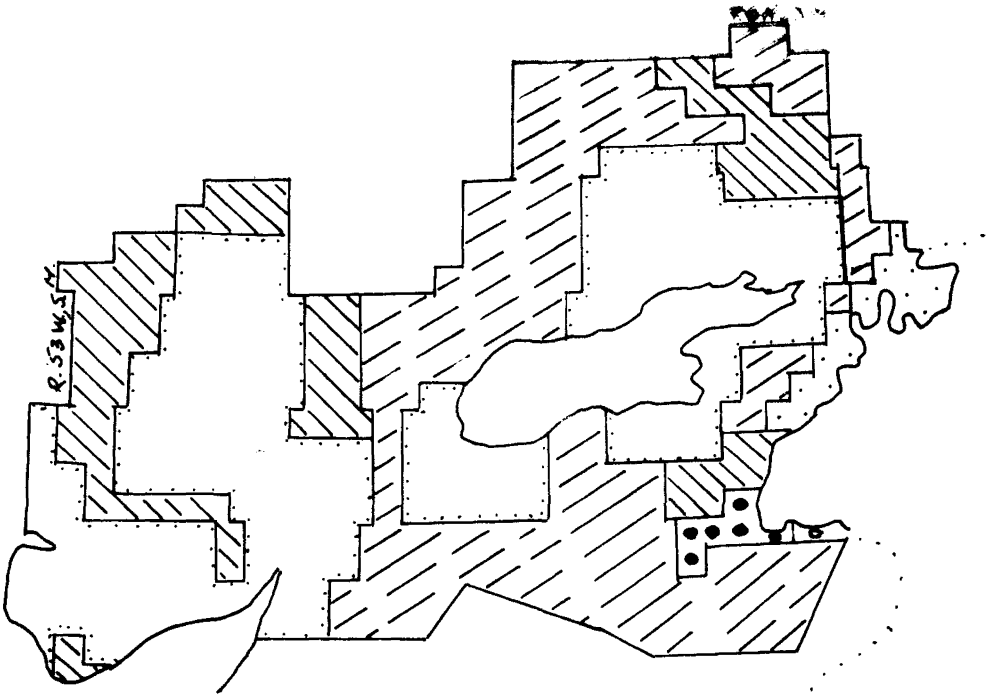
2. Relationship of the Area to Land Use and Environmental Analysis

Any new creation or addition to the National Parks, Forest, and Wildlife Refuge Systems can be made to fit a given area of the up to 80 million acres withdrawn for inclusion in the National Systems. However, what is needed first is an assessment of the resource management opportunities without regard to the man-made lines on a map.

Using data and knowledge collected over the years of land management in Alaska, the Bureau of Land Management has completed an ecologically oriented assessment of the State and has identified areas where either limited use or multiple use management should prevail in the best public interest.

The process reflects a broad ecologically assessed classification of land use forms grouped together by use associations. Tested against topographic features, primarily ridge lines of watersheds, and regionally oriented assessments (in terms of existing and proposed road net, village and urban population, socio-economic growth patterns, and resource base and development potentials), the initial lines, either readjusted or retained intact, formed the basis for definition of a manageable unit.

This process resulted in the definition of 28 manageable units. The resource values, with



MAP NO. 2
(Iliamna National Conservation Area)
Scale: 1 inch approximately 40 miles

LEGEND

- D-1 Public Interest Areas
- D-2 National Interest Study Area
- Village Withdrawal
- Village Deficiency Areas
- Regional Deficiency Areas
- Indian Reserves
- Unreserved Public Domain
- Power Project Withdrawal
- Utility Corridor
- Military Withdrawal
- State Selection Patented
- State Selection TA
- State Selection Application

the indicated predominant use associations within each defined unit, provided an implication of the management philosophy to be applied for this unit.

II. DESCRIPTION OF THE ENVIRONMENT

A. General

1. Geographic Location

The Iliamna area, which contains approximately 9.2 million acres, is located at the base of the Alaska Peninsula on the west side of Cook Inlet, approximately 150 miles southwest of Anchorage. The boundaries of the area on the north extend from Dillingham around the headwaters of the Nushagak River to Black Peak in the Aleutian Range, thence southerly along the ridge of the range to Chinitna Bay. The eastern boundary follows the shore line of Shelikof Strait from Chinitna Bay to Hallow Bay. The southern boundary of the area follows the ridgeline north to Naknek Lake from Hallow Bay across the Alaska Peninsula to Kviahak Bay and back to Dillingham.

2. Topography

The bulk of the lands in the eastern portion can be characterized as rough and mountainous with many broad "U" shaped glacier scoured valleys, a number of which are occupied by medium to large sized, long, narrow, and deep lakes. An exception to this, and the most prominent single feature in the area, is the broad and vast Iliamna Lake, Alaska's largest, with a surface area of some 1,000 square miles and extending 80 miles in length. To the west the mountains are gradually reduced to low rolling hills and lake dotted coastal plain.

The northern part of the Aleutian Range--the Alaska Peninsula's volcanic mountain backbone--traverses the eastern portion close to Cook Inlet, in a northeasterly direction. At some ill-defined location north of Iliamna Lake in the vicinity of Lake Clark, it merges with the

southern ramparts of the Alaska Range. Together the two ranges form a single chain of mountains extending from the Aleutian Islands to the Canadian border. These mountains, at the southern boundary of the resource area, are in the neighborhood of 6,000 to 7,000 feet above elevation, lower to less than 4,000 feet in the central narrow isthmus area east of Iliamna Lake, and rise highest in the glacier cloaked Chigmit Mountain subrange which includes the 10,000 foot peaks of the semi-active Iliamna and Redoubt Volcanoes.

The Aleutian-Alaska Range forms a drainage divide which separates the area into two unequal parts, each distinct because it is quite different from the other. The smaller narrow area, draining east to the Cook Inlet side, is characterized by numerous short drainages, deeply indented fjord-like, but shallow bays, sheer rocky headlands, and numerous offshore reefs. In the northern portion of the area, with its extensive glaciers, the majority of the drainages are turbid with a burden of rock flour and glacial silt.

The larger area on the west side contains the bulk of the Kvichak River drainage system flowing southwesterly to the head of Bristol Bay. From the summit divide westward is a band of mountains--widest at the north-- which tend to diminish in height and ruggedness and change into isolated groups of low rounded mountains and hills. To the west and south, toward Bristol Bay, these hills finally give way to the low, somewhat featureless, small lake dotted terrain of the Bristol Bay coastal plain. The Nushagak River drains most of this lowland area to the north of Dillingham. Thus, the major large lakes in the area--Clark, Iliamna, Kukaklek and Nonvianuk--tend to have rugged

mountainous shorelines at their head or eastern ends, and extend out into relatively level terrain at their western outlets. Because a few of the glaciers drain west from the northern high mountain area, Twin Lakes, Lake Clark, Kontrashibuna, and Tazimina Lakes have light to moderate glacial turbidity. Despite this glacial content emptying into it, Iliamna Lake itself is clear as are the remaining lakes to the east and south of it.

Four well-defined and relatively low mountain passes provide the major access routes through the mountains. Lake Clark Pass--long and narrow--extends from the northeast corner of the resource area southwest to the head of Lake Clark. At the east end of Iliamna Lake are three much shorter passes, Pile Bay to Iliamna Bay, Kokhanok to Bruin Bay, and Kokhanok to Bruin Bay, and Kokkanok to Ursus Cover. All four passes are major routes for small aircraft. There is at least one other, less well-used, but relatively low level route, traversing the area, from Kulik and Battle Lakes across to the McNeil River and Kamishak Bay. The only developed surface route crossing the mountains, a 14-mile single land gravel road, follows the Pile-Iliamna Bay route.

3. Climate

Climatically the area is a transitional one between the maritime and the continental influences. Typically, the area has cool, cloudy, and drizzly summers. Relatively warm, cloudy, snowy winters predominate except in the interior portions which receive intensely cold winters of the continental climatic type. The late spring and early summer months are frequently favored with long intervals of clear, warm, and dry weather. Similarly, periods of clear, cold weather occur during the winter. At Iliamna airfield, the only

major recording station in the area, the average annual precipitation is 26 inches, with extreme temperatures ranging from -64°F. to +84°F. The mean temperatures here are about 15°F. in January and 55°F. in July.

Iliamna Lake is usually frozen from late December until late May or early June. The other major lakes have a similar frozen period but generally tend to freeze and thaw earlier because of their smaller size, given a similar elevation. Usually, some snow may be expected in September, but at low elevations the ground is usually not permanently covered until a month or two later. The snow usually leaves the low ground in April, but may remain until June and July at 1,000 feet or more elevation and on north slopes. In the Pile Bay-Iliamna Bay Pass snow remains in places until June, when the State Highway Department begins its annual road maintenance.

B. Aspects of the Environment that Could be Impacted

1. Nonliving (abiotic)

a. Air

As in most areas remote from concentrations of human development, the air is generally free of man-caused pollution. There is a minimum source of gaseous or dust pollution.

Temperature differentials between land and water areas, and between mountains and lowlands, create almost constant wind conditions. In the winter months strong winds, originating from Aleutian low pressure zones, are common. Pollution, therefore, is quickly dispersed.

There is no record of air inversions in the area. Ice fog conditions may exist, but only briefly because of the generally prevailing winds.

b. Land

Land forms in the area vary from the rough Cook Inlet coast to the smooth Bristol Bay shores, and from muskeg flats to the precipitous Iliamna Mountains. Several volcanoes rise to ten thousand feet, but, in general, the mountains average about 5,000 feet. Soils vary from silt deposits to bedrock of granitic intrusives with volcanics to the southeast and northeast of Lake Iliamna. Mountainous areas show signs of intense glaciation.

The common bedrock through most of the area is the granitic intrusives which form the Aleutian Range. A number of copper deposits are known, together with large, low grade titaniferous magnetite deposits. Minor amounts of gold have been mined. Oil seepages are known along the Cook Inlet shores, but exploration has not developed into production. A significant mercury deposit is known north of Dillingham.

East of Lake Iliamna, soils tend to be largely shallow rubble and sandy gravel with silt to ten feet in depth. To the west the soils are finer, with loess to 15 feet in depth.

Although the silt supports a dense growth of native vegetative material, it is generally too infertile without artificial fertilizer for long-term agriculture. The weather is generally too inclement for commercial agriculture. On a short-term basis, however, vegetables have been and are grown for home use by a number of residents.

The entire area is underlain by discontinuous permafrost. The permafrost, in other areas, is generally deep and in sufficiently thin beds as to cause little long-term problems when disturbed.

c. Water

The Aleutian Range forms the divide between Cook Inlet on the east and Bristol Bay to west. There are two major drainages in the Iliamna National Conservation Area, both on the west side of the divide. These are the Kvichak and the Nushagak River systems.

By contrast, the Cook Inlet side has numerous short separate drainages flowing directly to tidewater. There are no major drainages; however, the Drift, Crescent, Tuxedni, McNeil, and Kamishak Rivers are fairly lengthy (15-40 miles).

These rivers are somewhat rugged near their origins with relatively short stretches of level or meandering water course near the Inlet. North of Chinitna Bay the streams drain glaciers and are highly turbid.

The streams on the Bristol Bay side have relatively short stretches of rough water and many miles of wandering water before reaching Bristol Bay. More commonly the Bristol Bay streams flow into lakes where their silt loads are deposited. This is particularly true of the streams north and east of Pile and Pedro Bays. Thus the major streams are clear until they reach the tidelands of Bristol Bay. Most of the Cook Inlet streams within the conservation area, however, carry silt right down to salt water and cause considerable murkiness in the upper inlet.

At present the water quality in the Iliamna NCA is excellent with very little man-made pollution. There are natural conditions which reduce water quality but these are usually local or temporary. For example, in the fall the pure clean waters of Lake Iliamna suffer from the stench of millions of moldy, rotting salmon. Within a few weeks almost all evidence of the fish has disappeared save for the windrowed jaws and skeletons on the beaches, and the lake again appears quite clean and pure.

2. Living

a. Plants

Vegetal associations within the Iliamna NCA tend to approach climax due to relative absence of factors which would cause regression. Man's activities have been limited to date except in scattered spots along coasts and around Lake Iliamna. Fire occurrence is much less than experienced further north and through the interior. Catastrophic activity, such as volcanism, generally affects areas above the vegetation line which is 1,000 to 1,500 feet in the Aleutian Mountains.

Coastal commercial forest type as found along the Cook Inlet coast contains an overstory of Sitka spruce, white spruce, hemlock, and hardwoods including cottonwood, birch, and aspen. This association, on well-drained soils, exhibits undergrowth of willow, alder, Labrador tea, and berry bushes. Ground cover includes grass, herbs, ferns, and moss.

The narrow coastal forest belt may contain high brush on south slopes, moist tundra,

and limited amounts of coastal marsh in localized areas. Where the coastal plain does not give way rapidly to dry tundra associated with vegetal elevation limits, the intermediate zone contains high brush--primarily, willow, alder, and dwarf birch.

Moist tundra occupies most of the area south and northwest from Lake Iliamna, except for lakeshore bands of higher vegetation. This type occupies the entire middle area between Lake Iliamna and the Nushagak-Mulchatna River systems.

The area around the outlet end of Lake Iliamna, extending toward Bristol Bay, is largely low evergreen-deciduous mixed forest type. Black spruce is the predominant evergreen testifying to poorly drained, silty soils.

b. Animals

The Iliamna area contains animal species that are typical of freshwater, marine, boreal forest, coastal forest, alpine, and tundra environments. The lowlands adjacent to the Kvichak, Nushagak, and Mulchatna Rivers contain medium value waterfowl habitat. Breeding waterfowl reach a density of about 32 birds per square mile. Waterfowl species include whistling swan, Canada goose, mallard, pintail, green-winged teal, American widgeon, shoveler, greater scaup, goldeneye, harlequin duck, scoter, and red-breasted merganser.

Lowlands along Bristol Bay contain good nesting habitat for shore birds. At least one sea bird colony occurs in Lake Iliamna. High quality nesting habitat for bald eagles exists along Cook Inlet. The

endangered peregrine falcon nests in the area. Other raptors include osprey, goshawk, sharp-skinned hawk, rough-legged hawk, gyrfalcon, and pigeon hawk, marsh hawk.

Freshwater and anadromous fishes include arctic char, Dolly Varden, lake trout, rainbow trout, grayling, northern pike, red salmon, king salmon, silver salmon, dog salmon, pink salmon, whitefish, blackfish, long-nose sucker, and burbot. There is a long history of subsistence use of salmon from the Iliamna system. Sport fishing is very popular for trophy-sized rainbow trout and grayling. Iliamna Lake and its tributaries are the most important red salmon producing waters in the world and support a large commercial fishery.

Mammals include grizzly/brown bear, black bear, wolf, red fox, lynx, wolverine, marten, mink, otter, beaver, muskrat, least weasel, ermine, marmot, arctic squirrel, red squirrel, porcupine, moose, caribou, Dall sheep, mountain goat, arctic hare, showshoe hare, red-backed vole, tundra vole, brown lemming, collared lemming, and little brown bat. Heavy concentrations of black bears occur on the northern part of the area. Brown/grizzly bears are abundant and receive heavy pressure from sport hunters. Wolves and wolverine are common. The area boundaries encompass much of the seasonal range of the Mulchatna caribou herd, but the calving area lies just outside the northeastern boundary. Beaver trapping is popular among native residents and beaver carcasses are a subsistence food item. Harbor seals concentrate along the west side of Cook Inlet and fair numbers are found in Iliamna Lake. The latter area is the only place in Alaska where seals are known to occur regularly in fresh water. Sea otters congregate on the

north side of Augustine Island. The area has high value for sport hunting or observation of moose, caribou, and Dall sheep.

3. Ecological Interrelationships

Aquatic ecosystems of the Iliamna NCA consist of the following broad types: riverine, fresh water marsh, salt water marsh, bog lakes, and fresh water lakes other than shallow bog lakes. The riverine systems could be broken into two subtypes unique to glacier areas; that is, clear water and glacial streams or rivers. In a broad overview the complexity of these aquatic ecosystems cannot possibly be assessed.

In general, the streams, lakes, and marshes of the area have not been disturbed by man and are subject to the same principles of ecosystem dynamics that are evidenced by all ecosystems.

The particular functioning of these aquatic ecosystem processes in the area such as the Iliamna area with its temperature and climate extremes has received little study.

As in the terrestrial community, the general ecological principle that the farther north one goes the fewer the number of components of the ecosystem seems to apply. The somewhat milder maritime climate of the area probably has a lot to do with the much greater salmon production of the areas in comparison to areas further north.

It has been incorrectly assumed by many that the aquatic systems of Alaska are low producers and even sterile. Closer observation reveals that for short periods of time most streams and water bodies are very productive in terms of biomass although the number of species making up the biomass is few. The tremendous production of insects such as mosquitoes and fish such as salmon are examples. This is not to imply that

the total biomass production, which includes all levels in the food chain, is comparable to the biomass produced by more southern rivers with longer growing seasons and greater species and biomass potential. Even glacial streams, which have been written off as too polluted by natural silt to be productive, have been found to be key refuges of life during the winter period when they are clear and the lateral feeder streams are frozen to the bottom.

Presently the streams and rivers of the area are the breeding and reproductive waters for not only anadromous species, such as the salmon, but also the grayling and other fish, such as the whitefish. The streams and lakes provide the hatchery and rearing grounds for juvenile fish of these species which feed on the abundant micro- and macro-organisms as well as higher forms of life in the food chains, such as insects and crustaceans. The larger rivers, such as the Nushagak and Kvichak, serve as refuge areas for species such as the grayling during the winter, as well as habitat and migration paths for salmon and other anadromous species.

Specific information on the aquatic ecosystems is required to show the differences in succession, food chains, and resiliency of these northern systems in comparison with the more thoroughly studied ecosystems of the temperate zones. Great differences are expected between bodies of water of any particular area as well as overall differences as a result of the climate.

Specific bodies of water such as Iliamna Lake and other large lakes of the area can be expected to have variant ecosystem because of different geology of their watershed, different depths and sizes. Intensive salmon related dtudies

have been in progress for over 50 years on the lakes of the area; however, little work has been done on the study of aquatic ecosystems.

The terrestrial plants and the animal life related to them are contained in basically four broad types with various succession stages represented throughout. These four types could be referred to as forest, alpine, moist tundra, and coastal forest. For the most part these types have not been directly disturbed by man.

a. Succession

The boreal forest, which can be considered to cover the northern portions and most of the valleys and foothills of the area, is actually a complex mosaic of ecosystems arising from fires. In general, the simplified succession for specific sites in this boreal forest area following a fire is roughly as follows: (1) grass, sedge, forbs; (2) grass, sedge, shrub, willow, birch, or aspen; (3) willow, birch, or aspen, white spruce, or black spruce; (4) white spruce; (5) black spruce, sedge, shrub, lichen. Step 3 could go to black spruce or white spruce, depending on circumstances. Viereck (USFS) in his studies has found that black spruce is probably the replacement of white spruce and forms the climax species along with lichens and sedges.

Early successional stages in the plant community are favorable for moose populations, while the climax vegetation of black spruce lichen is a favorite wintering type for caribou. Other shifts in animal populations will be influenced by the successional stages to perhaps a lesser degree than the caribou and moose, which are respectively closely identified with climax and early successional stages.

The alpine tundra type which occupies portions of the higher elevations is basically a climax tundra type made up of lichens, sedges, and dwarf shrubs. Large areas of the mountains are barren. Scant growths of very few of these species may occupy harsh sites while complex mixtures of sedges, grasses, lichens, and prostrate shrubs such as willow and blueberry occupy the better sites. Moist tundra is differentiated from alpine tundra by its more luxuriant growth of a greater number of lichens, grasses, and shrubs. At lower elevations this tundra type includes large areas of cottongrass tussocks. Caribou and grizzly or brown bears are the large animals associated with this ecosystem. Caribou and Dall sheep are the principal major animals utilizing this vegetation. The caribou is ecologically related to this type and utilizes the mountains for both food and insect relief. The distribution of the sheep is probably related more to the occurrence of suitable escape terrain in combination with the availability of suitable forage.

As in any ecosystem, there are complex interactions between hundreds of species, from micro-organisms in the soil to small mammals and birds up to the moose, wolf, caribou, and grizzly bear.

b. Food Chain

The food chain of the area from the producers to the consumers and reducers is a simplified shortened chain as a result of the cold temperatures, permafrost, and short growing season. The short growing season is also responsible for the slowed decay rate and resulting accumulation of plant material which

insulates the ground and heavily influences the ecological succession. The number of species is reduced in comparison with more southern areas and the total biomass production is considerably lessened. Variation in seasonal and annual distribution and abundance of faunal species is especially pronounced. Variation in entire ecosystem processes may occur as the result of major changes in the populations of any one of the limited number of species.

c. Resiliency

Resiliency of the ecosystem is varied. In general the alpine and moist tundras with their lichen associations or the black spruce-lichen sequence, both of which could be considered climax situations, are the least resilient. The early successional groups, such as the sedges, grasses, willows, and forbs, respond much more quickly to destruction and disruption. In the case of fire, for instance, burning of a sedge, willow, or aspen complex will result in rapid regeneration, whereas old growth lichen stands may require up to several hundred years to recover to the same stage after burning.

Burning or other disruption of a cottongrass-lichen complex may result in rapid recovery of the cottongrass but loss of the lichen component which in turn may disrupt caribou use.

Since the tundra ecosystem is basically simple, that is, having few component members, it is felt by some observers that the ecosystem inherently is unstable and any effect on one of the components will have major impacts on the function of the ecosystem.

The ability of any of the succession stages to respond to man's impact is now being intensively studied as a result of the oil development on the North Slope of Alaska. It is likely that all of the ecosystems present in the Iliamna area have low resiliency to any of man's activities that disturb the soil, such as strip mining, roadbuilding, clearing, etc. Certain less destructive activities, such as driving on the tundra, may disrupt the climax stages while doing little long-term harm to the early successional stages. Examples of dredging throughout the Alaska interior demonstrate the very slow recovery and low resiliency of these ecosystems to total disruption.

In the case of the aquatic ecosystem, disruptions may be equally severe and long-term. Idaho studies have shown that streams severely disturbed over 80 years ago still have not restored themselves to even a minor percentage of the production of similar undisturbed streams.

4. Human Use and Settlement

a. Resource Use

Archeological evidence found in this proposed NCA, chiefly associated with Iliamna Lake and its tributaries, indicates that prehistoric man used the fish and game resources of the area for subsistence purposes. This area, which is the heart of the Bristol Bay sport and commercial fisheries, has a history of the subsistence use of fish and contains the most important red salmon waters in the world. These resources are currently the basis for a considerable commercial and sport fishing industry.

Other resources of the area that have been used include minerals, timber, and wildlife. Of these, timber and wildlife have received the heaviest use. The bulk of this use has been for subsistence purposes, although the impact of sport hunting is increasing.

The greatest potential for future use of resources in the area lies in expansion of the sport and commercial fishing resource, minerals, timber, tourism, and geothermal energy.

b. Human Settlement

Human settlement in the Iliamna area has occurred since prehistoric times. The shores of Lake Iliamna, Lake Clark, and areas along the Newhalen and Kvichak Rivers are dotted with archeological sites. Currently there are eight Native village withdrawals in the proposed NCA and the entire Bristol Bay area supports a population of approximately 3,500. The major non-Native community, King Salmon, is the site of a U.S. Air Force base.

There is a potential for future growth in the area, particularly in association with the development of the iron and copper resources found in the southern part of the unit. Also, if the proposed highway link to Iliamna Lake is constructed, settlement growth in association with tourism and recreation could be expected. Regardless of road construction, growth of settlements that are recreation-service oriented will continue.

5. Aesthetics and Human Interest

a. Aesthetics

From an aesthetics or scenery point of view, the Iliamna NCA is like two separate provinces. From Cook Inlet westerly through the Aleutian Mountains and into Lake Iliamna basin, the combination of color, form, texture, line, and scale provides many examples of outstanding scenery. South and westerly from Lake Iliamna, there are few areas where the five elements of landscape perception blend together in full harmony to produce high quality scenery.

An extensive scenery evaluation of Alaska by the Alaska Land Use Planning Commission staff shows the east half of the proposal area to be class B or better. Class A scenery is found around Lake Iliamna and Lake Clark, in the Mt. Douglas area, and large portions of the Aleutian Range.

A previous, more intensive, scenery evaluation by BLM shows class A scenery around Lake Clark Pass, Mt. Redoubt, Chinitna, Twin Lakes, Little Clark, and in some portions around Lake Clark and Lake Iliamna.

b. Geological

A large variety of geological features may be viewed within the Iliamna NCA. Many examples of volcanism, both evidence of past activity and potential for new occurrence from Iliamna and Redoubt Volcanoes, are present. Quality examples of glacial action, including moraines, active glaciers, glacial scour and polish,

stria, and braided streams, have been inventoried. An inventory also includes quality erosional features such as natural bridges, rock sculpturing, waterfalls, and deeply eroded canyons; paleontological study areas, rock and mineral collection areas, and formations illustrative of faults, folds, and dikes are also identified within the NCA.

c. Archeological and Historical

The proposal area is rich in opportunities for archeological investigation associated with the long-term habitation along Cook Inlet and around Lake Iliamna and Bristol Bay. It provides an excellent laboratory to study relationships between Eskimo and Tanaina cultures.

Historically, the area represents examples of strong Russian influence. Sites as far inland as Lake Clark have been found to represent this relationship. Early oil exploration at Oil Bay dates from 1898 to 1906--possibly the earliest attempts at oil production in Alaska.

d. Cultural, Ethnic, and Religious

Scholars believe Iliamna NCA to have a long cultural heritage in terms of continuous occupancy. Availability of the bounteous salmon resource of Bristol Bay, its lakes and streams, contributed to early abandonment of nomadic ways.

West of the Aleutian Range ethnic alignment is predominately Eskimo of the groups classified as Togiagmuit, Kistagmiut, Aglemuit, and Nuskogagmuit.

Interaction with Athapascan speaking Tanaina Indians occurred around Lake Iliamna and Lake Clark. East of the Aleutian Range cultural influences were entirely Tanaina Indian.

Natives of the area continue to rely on subsistence economy. Late nineteenth century cannery exploitation of the salmon resource provided an opportunity which led to ever greater dependence on commercial fishing for livlihood. Within recent times the commercial inclination has broadened into service-related activity such as guiding for recreationists.

III. ANALYSIS OF PROPOSED ACTION

A. Unmitigated Impacts

1. Nonliving

a. Air

Most intensive land uses will lead to some degradation of the air.

Wherever people gather for intensive land use, they almost always have automobiles, snowmachines, or gasoline powered vehicles. Normally in remote areas in Alaska, power is derived from diesel engines driving generators. Such power units discharge significant amounts of pollutants into the air.

Minerals development would require larger power units, particularly in the case of major producers. Mine vehicles, drills, hoists, concentrators, and the like are heavy power consumers.

Heating units powered by fossil fuels, particularly petroleum products, give off by-products of combustion into the air.

Where small power units are used, as in lodges, the exhaust is often used to heat the building, or part of it. Although some low quality coal is known, its location makes it unlikely to be developed.

Construction of a smelter, if not carefully located with respect to prevailing air movements, could seriously affect the environment. Fumes might be so concentrated as to damage plant life in the area, drive animals even further away, and cause respiratory difficulties to humans. The fumes arise from the need

to smelt, or roast, sulphide ores in order to separate the sulphur from the metal. Smelting iron oxide (magnetite) ores is not nearly so detrimental.

Generally speaking, therefore, intensive land use would result in a low to moderate degradation of the air quality. Only a smelter would result in serious air quality pollution.

The less intensive uses such as logging, most recreational activities and some types of construction would result in low impact. Road and trail construction would probably have a low impact during the construction phase, but a moderate impact during the use period due to the increased numbers of vehicles and the dust raised in traversing such roads in the summer and fall, although the average precipitation through most of the area would tend to keep the dust down.

b. Land

Use of land, except for a few of the most extensive uses, carries with it the implication of some change; hence some impact on the environment. In the case of the various surface uses (acquisitions, disposals, leases and permits, and rights-of-way), the impact, at least locally, would be medium to high.

Use of the land for minerals extraction and associated activities is similar to many land uses, except that the lands affected are generally impacted in a more intense manner. While some surface-mined lands can be rehabilitated to some extent, complete restoration is not possible in all cases. Often there is insufficient or no topsoil to be saved for later spreading. Tailings and waste material

are often sterile rock and surface mining commonly involves extraction of large quantities of mineralized rock in a limited area. During any mining operation, the bulk of the area is a takeout from the natural system, thus decreasing the availability of the land for other needs. Impact is therefore high.

An exception is in the case of oil and gas exploration and extraction. Only a small part of the surface of an oil and gas field must be utilized as opposed to, say, an open pit mining operation. Surface disturbance by exploration equipment and disturbance and physical displacement of animal populations can be serious environmental problems. The most serious environmental danger from oil and gas operations are those threatened to offsite areas. Escaping brine or petroleum can cause greater and longer lasting degradation than many concurrent surface uses.

In this area the lands potentially valuable for oil and gas lie along Cook Inlet, in an area with significant wildlife values. Any escape of brines or hydrocarbons could be seriously detrimental. In the areas potentially valuable for metal extraction, the streams represent a significant portion of the Bristol Bay salmon hatchery. Any contaminated drainage into such streams could cause severe depletion of the fisheries.

Grazing would have little effect on land in this area. There is little potential for cattle and sheep grazing, although some potential for reindeer. Reindeer grazing does present the possibility of animals trampling waterfowl nests and muddying lakes and streams. Although the possibility exists, the probability of land degradation appears

small. Reindeer could be grazed in the areas now used by caribou if, like the latter, they could be moved from one area to another through the year.

Forest management's greatest impact on the land comes from logging operations. Logging operations, roads, and camp sites would lead to a constant erosion threat. Camp sites are intended to include both logging camps and sawmill sites. Resulting barren land is then subject to erosion. The danger of significant land degradation from this source is slight to moderate. This situation exists only along the Cook Inlet coast, the only lands with potentially commercial timber.

Watershed management is not considered to have any noticeable effect on the land. The Bureau's policy is generally to maintain current water quality. While no rehabilitation is currently considered, any rehabilitation would result in an improvement. The efforts themselves, while otherwise degradational, would be conducted in an area already degraded.

Wildlife habitat management is considered to have very little if any impact on the environment. The Iliamna area does not lend itself to vegetative manipulation, except possibly through prescribed burns. The area lends itself to the widespread human development which would necessitate animal damage control.

The impact of recreation management varies considerably depending on the extent of anticipated use. Extensive uses such as photography, fishing, or cross-country skiing, commonly encompass wide areas and involve little or no alteration of the environment. Intensive use often involves group activities

and may require development such as camp sites, downhill ski runs, or areas for vehicle rallys and races. Extensive use normally has little impact on the environment. Intensive use, however, would have low to medium impact. Because of the nature of the use, developments to facilitate intensive recreational pursuits are constructed so as to result in the minimum impact, and every effort is made to preserve the natural features which make the site or area attractive and desirable. In order to erect any facility, however, some commitment for one use of the land is necessary.

Fire control activities in presuppression have little effect on the land. Suppression activities, on the other hand, involve substantial land impacts as vegetation in front of the fire must be removed down to mineral soil. If the fire can be caught while it is still very small--that is two or three acres--it can be contained manually. Once it gets a "foothold" it is often necessary to use mechanical equipment. This results not only in fire lines but also emergency trails to convey equipment to the fire zone. Since the lines and trails are constructed under emergency conditions, often by persons who have had no training in construction activities or surface protection concepts, they may lead to further degradation and to serious erosion. Fire suppression activities, therefore, are considered to have a moderate effect on the land. Because of the prevailing damp weather in the fire prone areas, fires are not common to this area.

Road and trail construction, as in the case of other surface uses, does have a definite impact on the land. Vegetation must be cleared, drainages bridged, and special

techniques used to prevent slides from damaging the road or trail. Once the road or trail has been constructed, continued use will compact the earth and prevent revegetation. In short, a road or trail represents a removal of land from the natural system. Not only would the surface be changed, but the soil characteristics would be changed, particularly after use. The soil would be compacted, as noted, and the lack of an overlying vegetative mat would break the balance between the loss and gain of nutrients along the strip. Contaminants from users, more serious in the case of vehicles, would alter the biochemical composition. Although roads and trails will normally revegetate themselves after use has ceased, traces of access ways will remain visible for years, possibly for generations. For these reasons, effect on the land of road and trail construction is considered to be moderate, with a high or great effect on the soil.

c. Water

Most of man's actions have impacts on natural waters. BLM multiple use programs which have potential for impacts include realty transactions, mineral developments, grazing of domestic animals, utilization of forest products, recreation developments, fire presuppression and suppression actions, and road and trail construction.

Realty transactions, including land disposals through exchange, public sale, and state selections, have potential for changes in management and land use. Similar changes may result with leases, permits, and rights-of-way. With some land uses, soil erosion increases and the eroded material often

moves to water bodies. Some of the streams already carry capacity loads of suspended particles during the thaw season.

Mineral developments, including exploration and production, can have impacts on waters. These actions are accompanied by increased soil erosion and sometimes the eroding material may reach formerly clear streams or lakes. Some production processes use toxic reagents which degrade water quality. Other production processes use large quantities of water and may even result in complete consumption of some streams. Disposal of waste from gravel and mineral extractions presents a severe erosion and water pollution hazard, particularly in areas of thaw-unstable permafrost.

The Iliamna National Conservation Area has a small potential for utilization of forest products. Removal of the timber decreases the plant cover over the soil and increases erosion. Timber harvest operations (machinery movements) often disturb the surface sufficiently to start severe soil erosion. Wood processing can use large quantities of water and sometimes discharge toxic reagents into the waters.

A small amount of grazing may occur in this conservation area and there will be an associated impact on water. Even with good management grazing animals use vegetation and water and the increased soil erosion and animal wastes may degrade the water of particular sites.

This area will continue to be subject to increasing recreational activities. These people involved activities are often difficult to manage. There will be many abuses of

the land and these will cause impacts on the water. Just the increased number of people will put greater demands on water use, this would include drinking, cooking, washing, sewerage, and boating. Perhaps the most severe impact on water from recreation activities will be by off-road vehicles (ORV) use. ORV use will occur on land and in streams and lakes. There will be pollution from fuel, exhaust, coolants, lubricants, equipment parts, etc. ORV use will initiate severe soil erosion, especially in thaw-unstable permafrost areas. This eroding material may move into formerly clear waters.

Fire presuppression and suppression actions affect water in several ways. If the actions keep natural fires out of large areas and the vegetation continues to succeed and provide cover, accelerated soil erosion will be prevented. Natural geologic erosion will continue, maintaining water quality at current or background levels.

Fire retardants may pollute water during fire fighting activities. Construction of fire-lines exposes soils to severe erosion which results sometimes in large quantities of soil material moving to the waters of the area. In thaw-unstable permafrost areas the soil erosion may start immediately upon exposure and continue for years, forming deep and long gullies and sometimes diverting streams.

Road and trail construction has an impact on water in at least two ways. Sometimes the road bed and often bridges impinge on streams and lakes. During construction soil is exposed to erosion and the eroded material may move into formerly clear waters.

2. Living

a. Plants

The existing plant communities within the Iliamna NCA are the result of natural factors over time. Modern man has had minimal impact to date overall, but in localized areas man's action has affected ecological relationships. Primarily this has been caused by removal of vegetation for a specific purpose. The impact is not dissimilar from that caused by fire in the fire ecology of the area. When the vegetation--any step in vegetal succession--is removed, natural regeneration--if no further impact is applied--will take place beginning at a lower ecological stage.

Several programs have been identified as having potential for impact on terrestrial and aquatic plants. These include land use, mineral use, grazing, forest management, recreation management, fire control, and construction of roads and trails.

Lands actions resulting in transfer of land from Federal administration lessens any further voice in the selection of use alternatives for the tract. Secondary impact is from the use, which may involve vegetation removal or alteration.

Leases, permits, and rights-of-way for lands retained in Federal jurisdiction will have specific, identifiable impacts on vegetation in place. Secondary impacts may result if the permitted action facilitates availability of the area to people.

Mineral use has an impact on plants during the exploration, development, and extraction phases in that vegetation may be damaged or purposely

removed during these actions. Bare soil may erode or mine and mill waste may leach into surface and ground waters impacting aquatic plants. Secondary impacts may be felt on forested segments of the vegetal community if mineral development creates a need for forest products available in the area.

Grazing would utilize portions of the plant and could lead to other impacts such as trampling. Facilities associated with management may require removal of vegetation or result in concentration of animals.

The primary impact from forest management practices would involve disturbance associated with timber harvest. Removal of commercial forest products will impact understory plants and possible surface waters. Roads and access facilities associated with harvest and transport of timber also could impact terrestrial and aquatic plants.

Within the recreation management program extensive use such as hunting or protective use such as wilderness or scenery enjoyment have minor impact. Intensive uses such as campgrounds, wilderness portals or trails, ORV parks and trails, or interpretive facilities will impact terrestrial plants and may impact aquatic plants through ground and surface water deterioration. Specific designation, such as a Wild and Scenic River, may enhance its status in the eyes of the public and thereby attract additional use. Any facility designed to fulfill an identified recreation management need will impact the environment by attracting usage greater than was experienced in the unmanaged condition.

Fire control methods may impact the plant communities due to degree of ground disturbance involved in some measures. Occurrence

of fire is natural in the proposal area but fire is neither an annual nor severe danger due to moisture patterns normally anticipated.

Road and trail construction creates a primary disturbance impact. Secondary impacts may result due to access provided by such construction. People management impacts, as discussed under recreation, may result.

b. Aquatic and Terrestrial Animals

The productivity of the area for wildlife will be reduced in those instances where permanent structures and roads are constructed, reduced air quality affects food chain organisms, mineral soil is removed or unstable soils are disturbed. However, if the productivity of an ecosystem is defined in terms of the biomass it produces, the overall impact of soil disturbance may increase productivity by altering plant succession, provided the mineral soil has not been removed. The ability of animal populations to move freely will be inhibited by permanent structures and human activity, but the level of impact will depend on the animal species involved and the size and location of the structure.

Programs that have potential for impacts on aquatic and terrestrial animals include lands, minerals, grazing, forest management, wildlife habitat management, recreation management, fire control, and road and trail construction.

Lands actions, including disposal through exchange, public sale, and state selection, have the potential for changes in land use patterns that may be totally disruptive to animal populations. Leases, permits, and rights-of-way may also set in motion primary and secondary effects that may disrupt ecological systems. Changes of land tenure may prevent coordinated management of wildlife habitat.

Oil and gas exploration development and transportation or prospecting and production of mineral resources will have direct impacts on specific areas, indirect impact on some of the area, and secondary impacts for much of the area.

Habitat will be removed from productive status and potential conflicts with animal movements exist wherever permanent structures are constructed, mineral soil is removed, or minerals or mineral materials are mined.

The potential for erosion, air pollution and water pollution will increase wherever road systems, airports, mineral reduction plants, topping plants, refineries, and human settlements are established.

Air pollution poses high impact potential. Some contaminants in low concentrations are not directly hazardous to humans, but will destroy major food chain components; e.g., lichen species that are a preferred winter food for caribou can be totally destroyed by sulfur oxides at emission levels that are acceptable according to existing national standards.

Water pollution from toxic chemicals, crude oil, or silt will reduce the productivity of the affected area for wildlife and may cause direct mortality among aquatic animals.

Grazing by domestic livestock would have high impact on the terrestrial animals and moderate impact on aquatic animals of the area. Wild grazing and browsing animals such as moose, caribou, or bison would have to compete with domestic livestock for food and space. Livestock fences would affect wild animal movements and species such as moose and grizzly bears may cause regular damage to fences.

The management of domestic grazing animals usually brings with it requests for predator control. Therefore, wolf and grizzly bear populations in the area may be highly impacted with additional grazing.

Timber harvest for lumber or pulp could temporarily eliminate habitat for species such as marten, red squirrel, lynx, otter, woodpeckers, and spruce grouse, while improving habitat for moose, snowshoe hares, and many shrub nesting passerine birds. Logging operations in productive fish areas would have high potential for causing erosion and siltation that could damage critical fisheries.

Recreation management in its most intense forms may reduce the productivity of the area for wildlife. Off-road vehicle use during snow-free periods has caused high impact on wildlife habitat, particularly where permafrost conditions are present. Recreational structures such as campgrounds, picnic areas, trails, and parking areas, will attract people and increase potential for water pollution, littering, disturbance of wildlife, and modification of habitat.

Fire suppression allows plant communities to proceed to a climax stage and allows organic litter to build up. Fire control methods will destroy wildlife habitat wherever heavy equipment is used, pollute lands and waters when chemical retardants are used, and increase erosion potentials. Fire control may have a positive or negative impact on wildlife habitat depending on management objectives for each area. If climax plant and animal communities are the management goal then suppression of fires is desirable. However, if maximum diversity of wildlife species and optimum "edge effect" have priority, then the impacts of fire suppression are negative.

Road and trail construction takes wildlife habitat out of production. Human use of the road system increases potentials for water pollution and wildlife disturbance.

3. Ecological Interrelationships

Any action man takes in the area will have impacts on the ecosystem. The natural resiliency of both aquatic and terrestrial ecosystems will provide protection from permanent damage from any actions. The Bureau Planning System and environmental assessment procedures will screen the impacts and prescribe the environmentally compatible resource actions. Not all ecosystem impacts can be screened or mitigated, especially as regards specific sites. Some impacts of man's activities while changing the ecosystem may have beneficial effects. While only conjective, it has been ventured that a nuclear power plant in certain areas could raise water temperatures and substantially raise biomass production potential as a result. Secondary, or cumulative effects of human use in the area may also result in changes in the food chain or succession of the ecosystem that are unmitigable either through the planning system or stipulations.

Programs which have potential for impacts include lands, minerals, grazing, forest management, recreation management, fire control, and road and trail construction.

Lands actions, including disposal through exchange, public sale, and state selections, all have the potential of setting in motion changes in land use under other ownership that may be totally disruptive to the ecosystem. Leases, permits, and rights-of-way may also set in motion primary and secondary effects which may disrupt ecological interrelationships.

Disruptions of the land tenure pattern may prevent coordinated land management of the degree necessary to maintain ecosystem viability. For example, a zone of homesteads or other settlements may prevent normal caribou migrations and then destroy the herd or cause a substantial loss of numbers.

Prospecting and production of the mineral resources of the area will have direct impacts on specific areas, indirect impact of some of the area, and secondary impacts for much of the area. Prospecting and mining, besides destroying the soil and vegetative community at the site may also result in off site damage to ecosystems through erosion into streams or other forms of water pollution. Physical displacement of animal populations may take place because of man's presence, temporary or permanent disruption of some population may occur if mineral activity takes place on a critical area, e.g., Dall sheep lambing ground, or critical fish spawning areas.

If large scale mineral development occurs and people are attracted to the area to establish communities, secondary impacts on the ecosystem are likely to occur. These include water pollution from chemicals and silt, and disruption of wildlife use patterns.

Siltation of the stream beds is known to have a severe impact on the survival of the salmon eggs and fry. Chemical pollution may effect not only the eggs and fry but more likely one of the species of the food chain. As discussed in the section on ecosystems the destruction of one component may have severe effects on the whole since the number of species involved is few.

Grazing, if allowed in the area, introduces the conflict of domestic animals for space and food; puts grazing pressure on specific sites and vegetative species, and introduces the conflict of

domestic animals with native predators and game herd such as caribou. Implementation of grazing systems through fencing introduces impacts by interfering with movement of wildlife such as the moose, caribou, and sheep.

Forest management and the harvest of mature Sitka spruce stands introduce the possibility of destruction of wildlife which depend on these sites, such as the Spruce grouse. Removal of the timber in its own right is a direct impact on important vegetative segments of the plant community. Removal of mature spruce may also be of benefit to the total ecosystem by opening dense stands to allow different species of plants to grow.

Recreation management in its more intense forms may destroy many of the plant and animal components at a given site. Widespread recreation uses, such as hiking and off-road vehicle uses, have the potential for disturbance of wildlife populations and possible selective destruction of individual species such as showy flowers or unique animals.

These occurrences in the Iliamna area are much less than in the interior of Alaska although fires do occur. From an ecosystem standpoint much of this area could be considered to be at or approaching a relatively stable climax condition. Occasional light burns at very long time intervals may have an important role in maintenance of these terrestrial ecosystems although the role is not as pronounced as in the interior of Alaska.

Fire control in the area has basically two impacts. (1) Complete suppression of all fires allows the plant ecosystem to proceed to a mature climax composition. While the climax composition may be desirable for some species, many plants and animals only occur in fire sequence communities. Diversity of the plant species through constant renewal due to fire disturbance is basic to the ecosystem.

(2) Fire control methods may physically destroy habitat, displace animals, and silt streams. A positive impact of fire control, however, is that it allows desired climax vegetative communities to become more prevalent--if this is a management objective.

Road and trail construction holds the possibility of destruction of specific sites and siltation of streams with a resultant impact on stream life. From a secondary standpoint such construction allows almost universal access by large numbers of people to portions of the ecosystem not normally visited. This may result in destruction of vegetation or displacement of animal populations by human presence.

4. Human Use

The principal unmitigated impacts which would affect human use in the Iliamna area would result from the conflict between uses. The most obvious impact would be the effect that various resource uses would have on the commercial and sport fishing industry. If mining, logging, or oil and gas development interfered with the spawning of salmon or rainbow trout, this could be considered a serious unmitigated impact. Also, there is the possibility that sport and commercial fishing could impact each other. The uncontrolled or poorly controlled use of the fish resources by either sector, could significantly impact the other. Likewise, the increased subsistence use of fish could impact the sport and commercial sectors and vice versa.

A land disposal program could provide the vehicle for most serious impacts by allowing critical areas, such as spawning streams, to be managed under systems less beneficial than that of BLM.

5. Aesthetic and Human Interest

a. Aesthetic

Activities on the landscape, whether natural or manmade, which affect landform, color, line, texture, and scale, will have an effect on aesthetics. The degree to which any action upsets the harmony of these components determines extent of effect.

Those components of the NCA proposal which may have an adverse impact on aesthetics of the Iliamna area are land use, minerals use, forest management, wildlife habitat management, recreation management, fire control, and roads and trails construction. All these actions have the potential of significantly altering one or more components of the landscape.

The Watershed Management and Recreation Management Programs have potential positive impacts through rehabilitation capabilities and programs to preserve significant aesthetic components of the environment.

b. Geological

The components of the NCA proposal most apt to have an adverse impact on the area's geological interest points are the Land and Minerals Programs. These actions could be disposals, leases, permits, rights-of-way, and the extractive development of leasable and locatable minerals and materials. The recreation management program may have some adverse impacts through the introduction of people concentrations.

c. Historical and Archeological

All programs may have an adverse impact on the area's historical resources. Factors

of the historic resources are extremely fragile and susceptible to damage from any of man's activities. Bureau motion programs or visitor use by the public can be equally destructive.

d. Ethnic, Cultural, Religious

Both positive and negative impacts from all NCA activities can be envisioned. Any program which will influence consumptive use of the area's natural resources, introduce new people into the native's cultural environment, or provide a money economy for the native people, will have a tendency to westernize the native culture and change the current life style.

B. Possible Mitigating Measures

In order to properly identify possible mitigating measures, we will assume that the following tools of management will become available to BLM.

1. Classification Authority--Ability to classify and reclassify lands when necessary.

2. Ability to exercise the BLM planning process before any major commitments are made.

3. Continuation of NEPA authority.

4. Exploration and development of locatable minerals will be allowed under a permit system only.

5. Arrest authority will be available for trespass control and enforcement of use stipulations.

6. Sufficient funding and manpower allocations will be made to support all the above activities in the Iliamna National Conservation Area.

Assuming the above factors are operational, many of the unmitigated impacts identified as possibly resulting from multiple use management will be corrected in whole or in part.

Classification authority can be used to defer conflicting uses on an area until the potential conflicts can be processed through the planning system to resolve or minimize conflicts through stipulations. The authority may also be used to zone those areas where conflicts cannot be reconciled and management decisions must be made to limit use in an area.

The BLM planning system is designed to identify critical areas and surface possible conflicts of use. Many potential conflicts can be resolved through use of stipulations on any authorized use. Where conflicts cannot be resolved, the system provides a mechanism for selection of the alternative which will best meet national, regional, and local needs. Through the system, critical resources can be protected from any impacts by decision. Public involvement is a mandatory requirement of the BLM system, insuring the public an opportunity to assist and make their opinions known in the planning process.

NEPA requires in depth analysis of any proposed action. When the time and effort can be expended on a searching analysis, mitigation measures can often be identified and stipulated for any proposed use.

One of the greatest objections the public has to multiple use management is the fact that very little control can be exercised over the activities permitted under the 1872 Mining Act. BLM at present has only two options available; leaving areas open to mineral location, or closing the area completely to operation

of the 1872 act. The present situation allows little room for actual management. In many areas with important or critical resources, mining may not seriously impact on other resources provided that the mining is controlled to some extent and accomplished according to a developed mining plan. This option would be available to management if the legislative proposal is approved. If not, the manager must decide to leave the area open to mining, perhaps involving high potential environmental risks, or close the area to mining which forecloses any opportunity to extract what may be an important mineral resource.

Authority for arrest and enforcement is necessary to insure against unauthorized use and that authorized use is conducted in the manner stipulated. This action strengthens the ability of the BLM to insure proper compliance in a direct manner.

In order for the Bureau to function efficiently and to avoid any undue delays in decision making, adequate funding and manpower in necessary. Without adequate funding and manpower, in-depth analysis of conflicts and potential solutions will be impossible. The tendency will be to short-circuit some of the detailed planning and analyses with consequently poorer controls on use. Opportunity for mistakes and omissions increases with greater chance for environmental degradation which could have been avoided.

In addition, much less effort would be expended in surveillance of operations. The opportunity for modifying use when necessary and correcting errors in the field will essentially be foregone.

Given the authorities and sufficient support, the Bureau in Alaska could mount a sophisticated management program which would allow use and development while protecting or enhancing the quality of the environment.

Specific measures which could be incorporated into management plans and permitted use are indicated in the following sections.

1. Nonliving

a. Air

Federal law requires considerable lowering in pollutant discharge by passenger vehicles by 1975. A start will have been made on mitigating potential air pollution by passenger vehicles by the time the Bureau's management of the area would take effect.

A concentration of vehicles in a small area could cause a serious air pollution problem if an inversion situation existed. But the prevailing winds could be expected to disperse such fumes in short order. Heating and stationary power plants present a similar situation. Again, the fumes would be quickly dispersed. Operations can be improved by requiring that they be placed advantageously to maintain air quality. Regular maintenance to keep the facility operating properly can be required. Although construction of a smelter in the area is improbable, if one were needed to process local ores, its design and construction would be subject to in-depth review. Current federal and state air quality laws cover smelter emissions.

Road dust, if sufficiently serious as an air pollutant, could best be mitigated by road paving. Dust from roads and other sites requiring stripping of vegetation can also be kept from being a seriously degrading element by watering and by chemical treatment.

In order to protect food chain organisms from loss or damage by air pollution, standards for pollutants such as sulphur dioxide will have to be more restrictive than existing state and federal standards.

b. Land

The extractive minerals industry does not lend itself to the same depth and impact mitigation that other surface uses do. There are a number of techniques which can be required to lessen the impact of both prospecting and mining operations. Use of equipment could be restricted to designated routes. Prospecting excavations could be required to be left in such condition that they would revegetate themselves when abandoned. Tailings could be required to be deposited in a previously agreed upon manner.

From a positive impact standpoint, past experience has shown that dredge trailings can become valuable lands because of their permafrost free condition. Surface mineral development resulting in large quantities of waste rock, if properly disposed of, could lead to the same condition, permitting construction of heavy plants, communities, and airstrips on lands not susceptible to thawing and subsequent movement.

Preplanning for roads and campsites to prevent erosion and siltation, and preplanned slash disposal to decrease fire hazards would reduce the impact of the activity.

Recreation management, particularly of intensive use activities, would require careful preplanning. Such things as campsites and downhill ski areas can be made attractive without seriously degrading the land and resources in the neighboring areas through proper stipulations. Application of landscape architecture is one of the most successful mitigating factors of recreational land use.

Mitigating the impact on land of fire control activities requires both a previously devised

plan showing detailed consideration for the fragility of the lands and the capability for overseeing suppression activities. When fire control suppression activities are taken, there is normally little time to determine optimum routes for equipment. Such routes must be planned in advance. Proper preplanning may hold adverse impacts to a minimum and rehabilitation efforts can further reduce the adverse impacts.

Road and trial construction impact is best mitigated by careful planning as to location, type, and need. Detailed supervision over the layout and construction will keep the impact "on site," only the users will have offsite impacts. Paving and chemical treatment can be used to prevent erosion and to preserve road surfaces and grades. Selective water run-off spillways and suitable culverts and bridges will also decrease erosion.

c. Water

Rehabilitation of disturbed surfaces will be used but will not be depended upon for general mitigation of impacts on water. The impacts usually will be avoided by requiring the development activity to follow operational guidelines and achieve certain performance.

Permit stipulations for rights-of-way will require operations to minimize impacts on water. Surface disturbance and soil erosion will have to be kept to a minimum by such methods as allowing off-road vehicle use only when it will not compress or tear the surface organic mat.

Mineral development permits will require settling of suspended particles before used water is allowed to enter streams or lakes.

Toxic substances must be "neutralized" or kept from entering the area's natural waters. Particular care will be required for location and management of waste disposal areas.

Location and type of recreation development and access will be determined through the BLM planning system.

The only sure mitigating measure for fire presuppression and suppression is to completely discard the entire fire control program. There might be less impact on water if the land is burned over more often. Revegetation can be relied upon as a last resort for mitigating impacts from fire suppression activities.

The impact of road and trail construction on water can be mitigated largely through planning and design. Adequate allowance for surface and subsurface drainage will be required. The amount of soil exposed to erosion will be kept to a minimum and that exposed will be revegetated as soon as practicable.

2. Living

a. Plants

General mitigation techniques include revegetation, soil cultivation and manipulation to encourage plant growth and fertilization. In general, reestablishment of native species is recommended. Introduction of exotic plants must be approached very carefully.

In some cases mitigation of an impact of one program can create another impact on plants. Grazing structures or fences can adversely impact plants in local areas even though their management justification is to distribute use. Recreation facilities designed to direct people use can attract and concentrate people to the

detriment of local vegetation. Fertilizer leaching into streams from rehabilitation efforts can have a positive impact on some aquatic plants but a negative impact on other plants and some animals.

b. Animals

If the objective is to allow the ecosystem to operate without manmade impacts, then man must be excluded from the area. However, the BLM multiple use program accepts public use while attempting to minimize impacts.

Acquisition or exchange of land can be used to secure manageable wildlife habitat units. Environmental assessment will allow management plans to be developed that will prevent indiscriminate distribution of permanent structures and roads.

Critical wildlife habitat such as nesting, lambing, denning, migration, or winter feeding areas will be identified under the planning system and human use of the area can be excluded completely or modified or prohibited by stipulation.

Stipulations for development projects can require containment structures and treatment facilities to accommodate undesirable waste materials. Rehabilitation of all use sites would be planned and stipulated.

Fire control would be consistent with the requirements of existing wildlife populations of the area except as noted in the multiple

use plan for the area, i.e., fires that threaten human settlements would be suppressed. Prescribed burning or mechanical manipulation could be used to alter plant succession wherever it is desirable to increase the diversity of wildlife in the area.

Recreation and access development would be designed under the guildlines of the planning system. With excellent boat access on rivers and large lakes plus bush plane access via lakes, rivers, gravel bars, and airports, it is possible that road development would be very limited in the area. ORV regulations plus time and space zoning and enforcement will reduce damage to wildlife habitat. In order to maintain the productivity of the area for wildlife, air, and water pollution standards and stipulations would be established under the planning system that may exceed existing federal and state standards.

3. Ecological Interrelationships

Use of exchange or acquisition authority to block up lands into a managed viable ecosystem could be a significant method of mitigating major environmental impacts.

Mineral exploration and mining under a permit system could mitigate much of the damage to the ecosystem. Review of prospecting plans and comparison of these with ecosystem needs will allow joint resource plans to be formulated with stipulations to protect the environment. Once a mine area has been located, a proper mining and development plan could be prepared with planning objectives and environmental constraints. In both cases, prospecting and mining, rehabilitation of use sites would be planned and stipulated.

In the case of the Iliamna area, maintenance of the very valuable salmon run must be weighted against the ecological risks and dollar benefits of minimal production.

Adequate technical data is available to establish grazing and forest management practices within the constraints of the multiple use planning objectives for the area. It is entirely possible that grazing would not be allowed in the area as a result of economic, cost-benefit, and environmental analyses in the planning process. This is one form of mitigation.

Fire control activities in the area would be brought in line with the requirements of the ecosystem and the objectives for the ecosystem as spelled out in the multiple use plan for the area. Fire control methods and rehabilitation methods could be technically designed to be compatible with ecosystems needs.

Recreation and access development would also be screened by the planning system and environmental assessment to insure location in concert with ecosystem needs. Construction stipulations and contract inspection on the project site and during maintenance stages will insure compliance.

4. Human Use and Settlement

The most effective possible mitigating measures would be those which resolved the conflicts of resource users. The possible conflict of the users of fish resources could be mitigated by BLM retaining control of critical fisheries and, in conjunction with the State, regulate commercial, sport, and subsistence fishing so that the impacts of one user upon another would be minimized.

Also, the adverse impact that mining, timber harvest or oil and gas development have on each other and upon other resource uses such as fishing and recreation could be mitigated through a planning system such

as that used by BLM.

5. Aesthetics and Human Interest

   a. Aesthetics

      Proposed actions can be required to be hidden, buffered, colored, altered, or designed so as to harmonize with the natural scene.

      The institution of visitor management programs is a possible mitigation opportunity of recreation management.

   b. Geological

      All lands use and minerals use proposals should be carefully screened against the human interest values. Disposal areas can be changed or eliminated, rights-of-way hidden or moved, leases and permits issued so as not to affect, or minimize the effect, on these natural features. The recreation management program offers the positive opportunity for mitigation through preservation actions and control of visitor use.

   c. Historical and Archeological

      The institution of visitor management programs provides opportunity for mitigation.

      Impact from all programs can be partially mitigated if knowledge of historical and archeological value is made available. An inventory of such values is critical if the planner is to avoid or minimize impact.

   d. Cultural, Ethnic and Religious

      The Alaska Native people, through their educational programs and their subsequent actions,

will be the key factor in defining the impact of resource utilization of the ethnic and cultural environment. Section 14(h) of the ANCSA provides for native identification and selection of sites and locations historically valued in their heritage.

Prior to any land use action, the land manager will seek aid from Native groups, BIA, State social agencies, and the academic community in identifying impacts. Mitigation measures can only follow identification.

C. Adverse Impacts That Cannot Be Avoided

1. Nonliving

a. Air

Some degradation of the air is probable where there is human use. Should the state highway net be extended through this area, a great increase in recreationists travelling by car, can be foreseen. This would, of course, greatly increase the air degradation. With the possibility of significant mineral development would be the possibility of mining community development. These concentrated human activities cannot help but cause some air degradation.

In the unlikely event that a smelter is found necessary to process ores in the area, there is no question that a measurable amount of air quality degradation would take place. Current smelter design is far more efficient than that of a generation ago, and air quality standards are much higher. The degradation, therefore, would not be comparable to the older smelters in the western states. Nevertheless, the nature of the operation is such that some pollution may be expected.

b. Land

Use of lands for any sort of development necessarily causes some surface disturbance. In each case there is a removal of the land from other uses including wildlife and natural plants. In most cases there is also some effect on adjoining lands due to dust, noise, and odors. Vegetation disturbance is normally very local, but the effect on some animal species is usually much wider. Some animals require wide areas for subsistence.

Continued use of lands will change the soil characteristics. Even though revegetated, trace of the use will remain for a long time. One notable exception would probably be in areas of surface mining and waste rock disposition. Because of the significant difference in soil composition, revegetation would be slow. In fact, where there would be little or no soil, the plant succession would be especially slow until sufficient soil had been formed. Waste rock and spoil piles, where planned, should present no great problem. Some types of surface mining, however, will leave large pits. Normally, however, they are so large as to appear natural after aging has discolored the rock and vegetation has started to assert itself.

c. Water

Most of man's actions in the conservation area will have some impact on the waters. Even with careful management, multiple use of land will have unavoidable impacts on waters. There will be water loss through comsumption by such activities as mineral processing and settlement. There will be some soil erosion from mining and waste disposal areas and from roads

and recreational activities, particularly use of ORVs. The eroding material may move into the waters. Another unavoidable impact on water will occur with lack of BLM management controls or authority over disposed lands.

2. Living

a. Plants

Impacts on plants cannot be avoided without total exclusion of all activity from the area. Any action which requires working with the ground, on it or under it, necessitates removal or modification of vegetation.

Through management directions of the MFP, involving full public participation, acceptable limits of plant impact will be established. While impacts will still be allowed in some areas, they will be controlled and restoration practices provided.

b. Animals

Implementation of the multiple use concept causes certain unavoidable impacts to occur. Development projects or mitigation measures will cause individual animals to be displaced and killed. Disturbance of areas subject to permafrost conditions will cause thaw and erosion that will require a lengthy period before ecological relationships that existed prior to the action can be established. Some short-term soil compaction and erosion will occur regardless of development methods. Accidental spills of chemicals, gasoline, and oil will occur. The removal of vegetation will cause changes in seasonal distribution of runoff and peak flows that may influence fish, furbearers, and waterfowl. Roads and other permanent structures will cause long-term unavoidable impact to wildlife by

destruction of habitat and the disrupting effects of people.

3. Ecological Interrelationships

Any of man's actions that take place in the area are going to have impacts on the ecological relationships. Secondary impacts such as air pollution or conflict with wilderness-loving animals such as the wolves or grizzly bears may be caused by the influx of people to enjoy the recreation or develop a town at a mining site.

Human use and activity in the area is going to confront the ecosystem with permanent and temporary impacts that are adverse to the natural operation of ecosystem. Most of the permanent impacts will occur on specific sites where the human influence is constantly felt due to occupancy or construction of facilities. In order to use the area, man must build roads, structures, recreation facilities, services and resource development facilities. All of these have impacts, that even though mitigated to some degree, cause disruption to the natural ecosystem.

The only alternative, if the objective is to allow the ecosystem to operate without man-made impacts, is to exclude man completely.

4. Human Use

Human use involving the consumptive utilization of resources and any developments placed by man on the land represents a removal of an area from potential wilderness.

Impact of human use and development in a scenic area may not be entirely mitigable. To the extent such unmitigable impacts impinge on the scenic view is a measure of the adverse impact.

5. Aesthetic and Human Interest

Under multiple use management there are bound to be some actions in which all impacts cannot be avoided. In such cases the manager is obligated to show that every opportunity for mitigation has been examined and that all efforts to reduce the extent of the impact have been applied.

It is particularly important that special, unique, and superior values receive the fullest possible protection. When a specific action will affect a valuable entity which may be made portable, salvaged, or restored for protection in another location, this should be done. While this does not represent full mitigation, it represents a marked improvement over destruction.

D. Relationship Between Short-Term Use and Long-Term Productivity

1. Nonliving

a. Air

The long term productivity may be considered the long-term high quality of the air. In the short-term, it is improbable that the air quality will suffer so much as to be significantly measurable. Long-term high quality of air will probably not significantly suffer because of the generally windy condition.

In the worst case, where a smelter might be erected, the air quality would decrease. But before one would be authorized, detailed information would have to be supplied which, among other things, would have to show need for the facility and that it would contribute a greater benefit than the somewhat higher air quality. Although smelters normally operate

for many years, in terms of a man's lifetime, each will eventually "work itself out of a job." Upon eventual closure, the air quality would return to the ambient state.

b. Land

Commonly land use is a long term use. Further, since land use is dynamic and constantly changing, its effect on long term productivity is constantly changing and may affect long-term productivity. However, short-term uses, such as a small mine, temporary communities, some forms of recreation, and fire trails and lines, alter productivity during the period of use. Where a structure is removed, the area will eventually revegetate itself. If man should completely move away, any displaced species will become reestablished if the species in the area has not been eliminated.

Whatever length of time is included in the short term use, the long term productivity should be affected in the immediate area of the impact. In areas, such as the Iliamna area, where much of its value is for extensive use and for isolated intensive uses, loss of long term renewable productivity would be minimal. The percentage of the natural long term productivity lost would be relatively small.

c. Water

Lands, minerals, recreation, and road construction activities probably may have long-term impacts on water productivity.

Massive changes in the vegetative communities, weather, and soils of the watershed are not anticipated. Potential exists for limited

on site consumption or transport of water flows for such uses as hydroelectric power, municipal water, or steam production. If these uses cease, water yield and flow should return to original levels.

2. Living

a. Plants

Some program actions such as timber harvest and tree culture may increase long-term production of timber. Selective harvest, thinning, and pruning can result in faster growth of better quality trees for ultimate utilization.

Destruction of other plant forms, such as lichens, will result in long-term productivity losses. Destruction could occur through overuse by reindeer or caribou, fire, oil and gas exploration, land clearing, and mineral exploration.

The relatively harsh environment of much of the NCA causes eventual vegetative recovery to be much slower than encountered in more temperate climates. It is therefore most important to recognize long-range impacts inherent in specific actions of any program.

b. Animals

The tundra portion of the area is dominated by wildlife species that require climax vegetation as part of their niche. The tundra ecotype is not as resilient as the boreal forest, i.e., a disturbed tundra site takes far longer to return to a climax condition than a disturbed area in the boreal forest. The lands, minerals, grazing, recreation, and road construction programs have high potential for long-term

effects from short-term actions in the Iliamna area.

3. Ecological Interrelationships

The ecosystem is dynamic and will proceed on its natural long-term successional course unless one of man's actions disrupts it. The lands, minerals, recreation, and road construction programs involve actions with a high probability of long-term effects because of short-term actions. Many have a great likelihood of impacts that will push a segment of the ecosystem past its point of resilience.

4. Human Use

The primary relationship between human use, and short-term use and long-term productivity is one of consumptive users versus nonconsumptive users. Reasonably, most short-term uses can be mitigated in such a manner that long-term productivity is not affected. For example, the Sitka spruce, which occurs on the Cook Inlet Coast of the proposed NCA, could be harvested, even by clearcutting, and regrown to maturity in 100 to 120 years. Exceptions would be extractive or consumptive uses of nonrenewable resources such as minerals.

5. Aesthetic and Human Interest

Of particular importance in this category is the impact on native cultural, ethnic, and religious values. Any specific action under multiple use management may provide for greater interaction between modern society and native society. While access will provide the opportunity for cultural change, it would be subjective to assume that native culture will be destroyed thereby or that the change will be adverse or beneficial.

Over the long term it can be assumed that demand for subsistence resource usage by natives will

decline. Experience with aboriginal peoples elsewhere has shown that tribal elements recognize when ethnic values are being diluted and take steps to preserve representative samples of the cultural heritage.

E. Irreversible and Irretrievable Impacts and Commitment of Resources

1. Nonliving

a. Air

There is no true irreversible or irretrievable impact on the air quality, nor commitment of the air or air quality. Although some degradation of the air would probably result from the increasing human use of the Iliamna area, it can always be raised again, if necessary, by closing the area to use and shutting down all facilities. Air quality is a function of man's use. In an area such as this, where human use is considered to be generally low, the degradation would be low, and therefore, returnable to the natural state.

b. Land

There are few impacts on land so serious as to be completely irreversible. This is particularly true where all actions taken on the land are consistent with an approved comprehensive plan. Land uses which cause destruction or reduction of the soil may be considered irreversible. Uses that completely alter the site due to construction can also be practically considered irreversibly impacting.

Areas heavily disturbed as a result of mining operations may be presumed to have a continuing impact as revegetation will normally be a long-term affair. This recognizes that

such mitigating factors as recovering with topsoil, fertilizing, and reseeding may be helpful, but not always possible or practical.

Any continuing loss of land would have impact on the wildlife dependent on the area's renewable resources for sustenance, or for denning purposes. The principal impact, however, would be the continued use by people with the noise and odors they add to the area. While these are not irreversible and irretrievable impacts, they are normally long lasting, and while in effect may be considered irreversible.

c. Water

Water consumption by recreational and mineral processing activities will be a permanent impact on the water resource of the conservation area. Disposal of the lands containing waters and activities affecting waters will be lasting impacts on the waters of the area.

2. Living

a. Plants

In theory there are no irreversible or irretrievable impacts with regard to plants in ecological succession if there is sufficient time allocated. Destroyed vegetation will regenerate if soil remains. If the soil is lost, plants are a primary element in the making of soil and will accomplish the task eventually.

In reality, any commitment of growing space to a use which precludes plant growth is irreversible unless that commitment is overturned. A road or a structure prohibits plant growth on that location but each may be removed.

Irretrievable only applies when a time frame is stated, otherwise the theory above applies.

b. Animals

The loss of wildlife productivity while habitat is committed to other uses, even if temporary, must be considered irretrievable.

3. Ecological Interrelationships

Man's activities on a basically undisturbed ecosystem carry the probability of many changes that are basically irreversible. The mineral or gravel source that is removed cannot, in most cases, be replaced. The exotic plant that is introduced in the process of mitigating construction damage may become an irreversible addition to the ecosystem. Time, meaning hundreds or thousands of years, may allow much of man's activities to heal or appear to heal. The present ecosystem, however, will be irreversibly changed in the process. Rehabilitation of damaged sites for the most part will not be restoration from an ecosystem standpoint. It will not be possible, in most cases, to reestablish the original vegetative cover on severely disturbed sites.

4. Human Use

Similar to the relationship between short-term use and long-term productivity, irreversible and irretrievable impacts are determined by the type of resource use, that is, consumptive versus noncomsuptive use of nonrenewable resources. Reasonably, the multiple use of resources with the controls imposed by a comprehensive planning program, the requirements of NEPA, and other federal, state, and local laws, few irreversible or irretrievable commitments of resources exist.

5. Aesthetic Human Interest

ANCSA indirectly provides for changes in cultural, ethnic, and religious standards of native groups. Cultural, economic, and land/resource requirements are inextricably intertwined. Change in one sector causes adjustments in the others.

IV. RECOMMENDATIONS FOR THE MITIGATION OF ENVIRONMENTAL IMPACTS

When considering the broad spectrum of activities which could be accommodated under a system of multiple use management, a listing of specific mitigation measures without close scrutiny of a single proposed action and its possible effects on the environment is not practicable.

Under the umbrella of NEPA, proposed actions undergo environmental analysis, with full exploration of alternatives and possible mitigating measures. The mitigating measures discussed here involve primarily the authority for the BLM to exercise a greater range of management options with better controls, monitoring and followup than presently available under the myriad of laws affecting public lands and resources.

The following measures are recommended as positive actions which will strengthen the Bureau's ability to mitigate many of the actions that are possible under a philosophy of multiple use management and to more adequately allocate resource utilization according to expressed needs.

Many of the proposed measures recommended are included within the proposed Organic Act for BLM. They are repeated here in the event that the proposed Organic Act does not become law prior to the establishment of the Iliamna National Conservation Area.

1. A well defined multiple use management policy for BLM.

2. Establishment of a defined boundary for the National Conservation Area.

3. Exchange, acquisition, and disposal authority.

4. Classification authority.

5. Establishment of a permit system for locatable minerals.

6. Arrest authority for violations of law or regulations.

7. Defined penalties for violation of law or regulations.

8. Authorization for funding and appropriations sufficient to manage the lands and resources properly.

No changes are anticipated or proposed in the mineral leasing laws. NEPA requirements are mandatory and will be met on all proposed actions.

The Bureau's planning system is an excellent tool to surface conflicting land and resource uses and in resolving those conflicts with minimal impacts. When conflicting uses cannot be resolved, decisions will be made and lands classified to best meet national, regional, and local needs. The Bureau's mandatory requirements for public input and participation in the planning process is highly desirable and will be continued. Public exposure of management policies, alternative options available, and decision making are essential to inform the public of the needs for land and resource utilization and the environmental costs, if any, associated with the satisfaction of those needs.

The proposed legislation establishing the Iliamna National Conservation Area will incorporate those tools which, together with those presently available, will allow the Bureau to more fully exercise its mandate for multiple use management in the area.

V. ALTERNATIVES TO THE PROPOSED ACTION

A. No Action

This alternative is the same as the present legislative and budgetary authority for the Bureau of Land Management to administer the Federal lands in the general area described in the proposal for multiple use purposes, subject to the withdrawals made under the Alaska Native Claims Settlement Act. The Federal lands referred to above exclude all Federal land withdrawals where the Bureau has no surface management or interim management responsibilities.

The various forms of withdrawals (village selection, village and regional corporation deficiency, national interest study area, classification and public interest area, etc.) under the Alaska Native Claims Settlement Act with certain exceptions, segregates the withdrawn areas from all forms of appropriation under the public land laws, including selections by the State of Alaska, from location and entry under the mining laws and from mineral leasing. The exceptions, however, allow the Secretary of the Interior to make contracts and to grant nonmineral leases, permits, rights-of-way, or easements. In addition, those lands withdrawn for the classification and protection of public interest under the Alaska Native Claims Settlement Act are subject to locations for metalliferous minerals.

Under a management program of this type, the probable environmental impact from the components of the actions on the given area (both of which are described in the proposed action) will be influenced by the segregative limitations and the purposes of the withdrawals as made under the Alaska Native Claims Settlement Act. While the lands remain withdrawn

for the purposes of the various Native village and regional corporation selection entitlements and for study and inclusion into the National Park, National Forest, National Wildlife Refuge, and Wild and Scenic Rivers Systems, there will be little or no new Bureau-directed program relative to mineral development, grazing of domestic animals, utilization of forest products, watershed developments, recreation developments, and road and trail construction work.

Fire presuppression and suppression actions, cadastral survey and realty work leading to transfer of lands to the Native villages and regional corporations and the State, however, can be generally expected to be intensified from the present level of operations in these areas.

For those lands withdrawn to be classified for the protection of public interests, there could be an intensification of certain components of the program actions under the Bureau's multiple use management program. This would be particularly true in the general area described for the proposal where Bureau activities include developing management framework plans, providing realty related services for the local populace, providing for individual needs for forest products, and protecting the areas from fires. The rivers and lakes, renowned for their fish habitat, and the roadless feature into this region also contribute toward the increasing public use pressures on the Federal lands by fly-in sport fishing and hunting enthusiasts.

The unmitigated impacts from the components of the Bureau's programs described above will likely be the same as those described for the proposed action. Although the Bureau's multiple use program is carried on under a myriad of laws

and regulations, these program actions will still be guided by framework plans developed through its planning system and by the requirements of the National Environmental Policy Act.

There still will be no control over the locatable mineral explorations.

The mitigating factors which could be imposed under the Bureau's present regulatory, budgetary, and management controls in Alaska, however, will differ from those discussed under the proposed action. Without the additional management tools, such as direct arrest authority and regulation violation penalties measures, exchange authority, acquisition authority, disposal authority, congressionally defined management boundary, classification authority, permit system for locatable minerals, and authorization for appropriation and funding for a specific management area, the mitigation measures which could be defined to lessen or control the undesirable impacts, like those described in the proposed action, will be weakened.

This condition is particularly troublesome with regard to nondiscretionary actions such as operations under the general mining laws. Also troublesome,were it not for the Alaska Native Claims Settlement Act with its temporary segregative provisions, are the various types of entry and location laws and the State of Alaska's right to appropriate rights-of-way. Other problems are related to the vastness and remoteness in relation to administrative and policing types of management actions. Manpower is critical to prevention and control of trespass and violations of stipulated conditions.

The impacts which could not be mitigated in part or entirety can be grouped into those

reflected by available discretionary control and those which occur under nondiscretionary actions. In general those adverse impacts from the components of the program described in the proposed action will hold true for this alternative. The difference will be reflected in the degree or intensity of adversity. The temporary segregative effects of the Alaska Native Claims Settlement withdrawals in many ways tempers and helps to keep some of the adversities described in the proposed action from occurring.

Under this alternative, the short-term use of the environment is also constrained by the Alaska Native Claims Settlement Act to those uses authorized under the act (see earlier discussions). The Bureau's management program will be an interim one for most of the areas until determinations and decisions are made for disposition under the act. The maximum period for all determinations to be completed which are not encumbered by litigations is seven years from December 1971.

Without establishing land tenure on those lands to be reserved in the Federal ownership, management direction by the Bureau in Alaska, except for those dictated by interim needs such as fire protection, cadastral survey, transportation and communication systems, and the realty work related with the Native Claims Settlement Act and the Statehood Act, will be set back or deferred.

Such being the situation, there will be little irreversible and irretrievable impacts and commitments from the standpoint of Bureau programs under this alternative. What could be critical, however, is the pattern of land ownership and the level of use or nonuse which could occur after tenure has been established for this region.

The general holding action dictated by this alternative should not be controversial.

B. Limited Use Management

This alternative, treated in three parts, assumes that the management and administration actions on the national interest study area located in the area of the proposed action as shown on the attached Map 2 will generally be consistent with the fundamental purposes for which the National Park, National Wildlife Refuge, and the Wild and Scenic Rivers Systems are established. All three systems, by charter through Congressional authorizations, however, could be managed to accommodate other uses such as some of those described under the proposed action. Moreover, each alternative part could include proposals for adding the adjacent land areas withdrawn for classification and public interest protection into its system.

The following descriptions on the alternative uses under the three systems were composed with excerpts taken and rearranged from printed material prepared by each agency for the Joint Federal-State Land Use Planning Commission in Alaska.

No assessment of environmental impact is made. Such an assessment would require an indepth knowledge of the management capabilities and practices of each agency involved. This is obviously beyond the scope of BLM capabilities or even jurisdiction. However, in a given program, such as mineral development, grazing, or forest management, the environmental impact to be realized under any other agency would be essentially the same as the proposed action.

1. National Park System

Congress has assigned the National Park Service of the Department of the Interior a dual mission: to manage the superlative natural, historical, recreational, and cultural areas which comprise the National Park System for the continuing benefit and enjoyment of all the people; and, to provide national leadership in cooperative programs with other Federal agencies, State and local governments, private citizens, and organizations in the preservation of our Nation's natural and cultural heritage.

At the present time Alaska is represented in the National Park System by Mount McKinley National Park, Glacier Bay and Katmai National Monuments, and Sitka National Historical Park.

In addition to its responsibilities for management of the National Park System, the National Park Service administers a grants-in-aid program for the preservation of historic properties, conducts archeological and historical research programs, and administers a national program for the identification and registration of natural and historic landmarks. The National Landmark Program gives Federal recognition of the importance of nationally significant natural and historic areas under a variety of ownerships. Thirty-two areas have already been identified in Alaska.

Management Policies. Prior to 1964 the National Park Service undertook to assimilate the diverse types of areas which had been added to the National Park System into one largely undifferentiated system. In July 1964 the National Park System was subdivided into three categories: natural

areas, historical (including archeological) areas, and recreational areas. Each of these categories has a separate management concept and a separate set of management principles coordinated to form one organic management plan for the entire National Park System. At present the system consists of 75 natural areas, 178 historical areas, 42 recreational areas, two cultural areas, and the National Capitol Parks.

In 1968 the National Park Service issued management policies for each of the three categories of areas. These statements are too voluminous to describe here, but certain policies which are of greatest interest to the people of Alaska will be mentioned. It must be recognized that Congress may, when authorizing an area for addition to the National Park System, provide for uses which are not consistent with normal National Park Service policy.

Natural areas, which include the great national parks like Mount McKinley and the scientific National monuments such as Katmai and Glacier Bay, are managed so as to safeguard the forests, wildlife, and natural features against impairment or destruction. Commercial harvesting of timber is not permitted except where cutting of timber is required in order to control the attacks of insects or disease. Domestic livestock grazing is permitted only where it is sanctioned by law. Except where authorized by law or when carried on pursuant to valid existing rights or as part of an interpretive program, mineral prospecting, mining, and the extraction of minerals or the removal of soil, sand, gravel,and rock will not be permitted. Public hunting shall not be permitted. Sport fishing is encouraged in natural areas, but commercial fishing is permitted only when specifically authorized by law.

Historical areas include all national historic sites, monuments and parks, such as Sitka National Historical Park, established for prehistoric as well as historic values. Management is directed toward maintaining, and where necessary restoring, the historic integrity of structures, sites, and objects significant to the commemoration or illustration of the historical story. Natural resources (forests, fields, fauna, etc.) will be maintained to resemble, as nearly as possible, the natural resource scene that occurred at the time or period of history being commemorated.

Recreation areas include the national recreation areas, national seashores and lakeshores, national parkways, national scenic riverways, national rivers, and national scenic trails. Outdoor recreation shall be recognized as dominant, or primary, resource management objective. Natural resources within a recreation area may be utilized and managed for additional purposes where such additional uses are compatible with fulfilling the recreation mission of the area. Harvesting of timber, in accordance with sound forest management principles, is permitted in recreation areas. Mineral prospecting and the removal of nonleasable minerals may be permitted under applicable regulations where such use would not significantly impair values of the area. Leasable minerals may also be removed in accordance with the Mineral Leasing Act. Public hunting, fishing, and possession of fish and resident wildlife shall be in accordance with applicable State laws and regulations, but the National Park Service may designate zones where, and establish periods when, no hunting or fishing shall be permitted for reason of public safety, administration, fish and wildlife management, or other public use and enjoyment of the area.

2. National Wildlife Refuge System

The possible uses of land on a National Wildlife Refuge discussed here are representative of actual uses made on existing refuges and therefore may be recommended in any Bureau of Sport Fisheries and Wildlife proposal. It must also be recognized that Congress, in passing legislation for this system, may provide provisions that alter the normal operation of an area. Such legislative provisions may be either more restrictive or more lenient than present regulations governing such areas. Again, this resume of National Wildlife Refuge activities is based on existing refuges, usually established by Executive Order or purchase, and describes the traditional and present operating rules, regulations, and practices of the Bureau of Sport Fisheries and Wildlife in managing its lands.

The Bureau's Division of Wildlife Refuges administers those lands which are designated as Wildlife Refuges, Game Ranges, and Waterfowl Production Areas. Basically, all refuge areas are maintained for the fundamental purpose of wildlife conservation and rehabilitation. Within this purpose the special mission of the Refuge System is to provide, manage, and safeguard a National network of lands and water sufficient in size, diversity, and location to meet people's needs for area where the entire spectrum of human benefits associated with migratory birds, other wild creatures, and wildlands are enhanced and made available.

In Fiscal Year 1971 over $4 million in revenue was generated from resources removed from National Wildlife Refuges. These resources included: oil and gas, forest products,

grazing, trapping, haying, concessions, surplus animals (buffalo, elk, and longhorned cattle), sand and gravel, and others. Hunting and fishing are permitted on over 120 refuges. Special management considerations and regulations may preclude certain of these activities on many refuges in the system where endangered species may be involved or where small size or other factors limit opportunities for hunting and fishing.

In Alaska the permissible activities on refuge proposals will be determined on an area-by-area basis. A recommendation to permit hunting, fishing, trapping, berry picking, and other subsistence activities will be made in all Bureau proposals for new refuges. The United States has proprietary jurisdiction over the land in most National Wildlife Refuges which are therefore subject to all State laws pertaining to hunting, fishing, and related activities on those lands, as well as criminal and civil law enforcement matters.

Basically, all acts are prohibited on a refuge unless permitted by the Secretary of the Interior. The Secretary is authorized under such regulations as he may prescribe to (1) "permit the use of any area within the system for any purpose, including but not limited to hunting, fishing, public recreation and accommodations, and access whenever he determines that such uses are compatible with the major purposes for which such areas were established.... and, (2) permit the use of, or grant easements in, over, across, upon, through, or under any areas within the system for purposes such as but not necessarily limited to, powerlines, telephone lines, canals, ditches, pipelines, and roads--whenever he

determines that such uses are compatible with the purposes for which these areas are established."

Some of the limitations are described below:

Wilderness. Unless altered by Congress, the Wilderness Act of 1964 does not apply to any of the four systems proposals. However, Congress may alter the Wilderness Act or make a special management commitment on any system proposal.

Off-Road Vehicles. All refuges are closed are closed to use of off-road vehicles unless this use is specially authorized. All-terrain vehicles could be permitted after study to determine time and areas of use which will be compatible with refuge objectives. Snow machine use of refuge proposal areas will be recommended. Such use may be limited to periods when there is snow on the ground deep enough to prevent damage to the vegetation.

Hunting, Fishing, and Trapping. All proposals will recommend these activities be permitted in accordance with existing State and Federal rules and regulations.

Temporary Cabins and Camps. Temporary trapper cabins and fish camps can be built under permit issued by the refuge manager.

Winter Trails. Existing winter trails may be used. New trails will be possible under permit authority of the Secretary.

Mineral Leasing. Mineral leasing including oil and gas as provided for in 43 CFR will be handled on an area-by-area basis. Bureau recommendation generally will be to permit leasing unless such activities

would be inconsistent with refuge purposes. All leasing activities and recovery operations will be in conformance with 43 CFR and any stipulations or other special regulations the Secretary may impose.

Mining and Metalliferous Location. The Bureau recognizes the vital minerals cannot be "locked up forever" and the Secretary may permit controlled mining when such mining is in the national interest, subject to existing laws or as may be provided by Congress in the establishment of new refuges.

Timber Sales and House Logs. On timbered areas commercial harvest and cutting of house logs for private use is possible by permit.

Hiking, Camping, Photography. These activities as they relate to a wildlife-wildland experience will be permitted.

Scientific Investigations. Scientific research will be permitted subject to refuge objectives and regulations.

Historical and Archeological Sites. Sites that are within any refuge area will be protected by the Antiquities Act.

Other Activities. Activities not listed above may be permitted on an area-by-area basis if such activities are compatible with refuge objectives.

3. Wild and Scenic Rivers System

The Wild and Scenic Rivers Act (P.L. 90-542), approved on October 2, 1968, established the National Wild and Scenic Rivers System and prescribed methods and standards by which additional rivers may be added to the system.

There are two methods for adding river areas to the national system: (a) Federal legislation, or (b) State legislation and approval by the Secretary of the Interior. No rivers in Alaska were identified in the act.

All rivers in the national system must be substantially free-flowing and have high quality water. The river and adjacent lands must possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. In addition, the river area should be long enough to provide a meaningful experience and have sufficient volume of water to permit full enjoyment of water-related outdoor recreation activities normally associated with comparable rivers.

Rivers are diverse and most have been altered in varying degree by man's use of them and their watersheds. This diversity is especially true in Alaska where there are differing types of glacial and non-glacial streams. Many Alaska free-flowing river areas or portions thereof could fit into one of three classifications provided in the Wild and Scenic Rivers Act:

Wild River Areas--those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic River Areas--those rivers or sections of rivers that are free of impoundments, with shorelines and watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational River Areas--those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

It is probable that all Alaskan rivers meet the minimum criteria established by the Congress for inclusion in the National Wild and Scenic Rivers System. Therefore, the first task confronting the Bureau of Outdoor Recreation was to determine the types of Alaskan rivers which should be considered for inclusion in the system and to identify those having the highest potential for inclusion. Federal and State agencies, conservation groups, and others knowledgeable about Alaska recommended that some 166 Alaskan rivers totaling more than 15,00 miles be considered.

Through screening and reconnaissance, 40 rivers have been selected without regard to existing or potential ownership by Federal, State, or Native groups.

As rivers may be included in the National Wild and Scenic Rivers System under Federal or State supervision, priority was given for completing studies of Alaskan river areas where substantial portions of the lands in the river areas were designated by the Secretary of the Interior in September, 1972, under the provisions of Section 17(d)(2), ANCSA. Twenty-nine of the 40 previously identified by the Bureau of Outdoor Recreation are in this category.

The remaining river areas are to be studied upon request of the State or Native groups

which now, or may in the future, administer the adjacent land area.

Boundaries. One of the objectives of the study is to determine the approximate boundaries should the river be included in the National Wild and Scenic Rivers System. The criterion for boundaries is that land which directly contributes to or affects the particular values of the river receive proper protection and management. Factors such as topography, vegetation, existing and potential land uses and access would be the basis for making this determination. In Alaska a two-mile corridor--one mile on either side of the river--is being studied.

Management Objectives. Congress established procedures that protect the values for which a river area is added to the national systems. However, depending on the classification selected for the river area, the Wild and Scenic Rivers Act does not necessarily prohibit the construction of roads or bridges, timber harvesting and livestock grazing, or other uses that do not substantially interfere with full public use and enjoyment.

Wild river areas, being the most primitive, inaccessible, and unchanged, will be managed to preserve and enhance the primitive qualities.

Scenic river areas which are accessible in places by road will be managed to preserve and enhance a natural, though sometimes modified, environment and provide a modest range of facilities for recreation.

Recreational river areas normally will provide the visitor with a wide range of

readily accessible recreational opportunities, including more elaborate and more numerous facilities in an environment which may reflect substantial evidence of man's activity, yet remain aesthetically pleasing.

Administration. Overall administration of each river included in the National Wild and Scenic Rivers System would be made on a case-by-case basis according to whether the river were included by Act of the State Legislature and approval of the Secretary of the Interior or by Act of the Congress.

The responsibility for federally administered rivers will be assigned by the Congress taking into account the recommendations contained in the report filed by the Secretary of the Interior and the views of various Federal departments, the Governor of Alaska, and the Joint Federal-State Land Use Planning Commission. For the 29 Alaskan rivers now under study it is expected that primary responsibility would be assigned to the agency managing the adjacent area. Probable Federal land managers include the Bureau of Land Management, Bureau of Sport Fisheries and Wildlife, Forest Service, and National Park Service. The Bureau of Outdoor Recreation is not a land managing agency.

It is possible for a river to be administered by more than one land managing agency. Several Federal agencies or a combination of Federal, State, local, or Native agencies could be involved according to the specific river area being considered.

Hunting and Fishing. Hunting, fishing, and trapping on lands and waters included in the national system would continue to be governed by appropriate State and Federal laws.

Nothing in the Wild and Scenic Rivers Act affects the jurisdiction or responsibilities of the States with respect to fish and wildlife, unless in the case of hunting, the river environment is also within a national park or national monument. The Secretary of the Interior or, where national forest lands are involved, the Secretary of Agriculture may designate other zones where, and establish periods when, hunting is not permitted because of public safety, administration, or public use and enjoyment. Any such action, however, is undertaken only after consultation with the wildlife agency of the State.

Mining. Nothing in the Wild and Scenic Rivers Act affects the applicability of the United States mining and mineral leasing laws within components of the system except that:

a. The issuance of a patent to any mining claim affecting lands within the system shall confer a title only to the mineral deposits and such rights only to the use of the surface and the surface resources as are reasonably required to carrying on prospecting or mining operations.

b. Regulations will, among other things, provide safeguards against pollution of the river involved and unnecessary impairment of the scenery within the component.

Minerals in lands which constitute the bed or bank or are situated within any river designated a wild river will be withdrawn, subject to valid existing rights, from all forms of appropriation under the mining laws

and from operation of the mineral leasing laws. This withdrawal is not applicable to a scenic river area or a recreational river area.

C. Multiple Use - National Forest System

This alternative applies to the national interest study area located in the area of the proposed action, as shown on the attached Map 1. The alternative could include the proposal for adding the adjacent land areas withdrawn for classification and public interest protection into its system.

The following description was composed with excerpts taken and rearranged from printed material prepared by the Forest Service for the Joint Federal-State Land Use Planning Commission in Alaska.

Broadly, National Forests are managed under the 1960 Multiple Use Act, which defines multiple use as "the management of all the various renewable surface resources of the National Forest so that they are utilized in the combination that will best meet the needs of the American people."

Today the National Forest System of 187 million acres includes southern cypress swamps, northeastern hardwood forests, chaparral of the southwest, and the Sitka spruce forest of coastal Alaska. The taiga and tundra of the north are not yet represented.

The National Forest System is more than forests--it includes plains and prairies, meadows, alpine areas, and many other kinds of wildlands. Less than half of the national forest areas are commercial timber lands.

Public input is an important part in the Forest Service's multiple use planning process. The agency's programs and management policies for Alaska are briefly described below:

Environmental Planning. The Forest Service brings a large and highly skilled work force to bear on careful environmental analysis and planning as a part of multiple use management. Complex relationships among soils, geology, topographic, climatic, and biologic factors are assessed by professionals in many disciplines before major developments are undertaken. The impact of each action is considered to insure continued productivity and attractive environment. National Forest administrators are backed up by the Forest Service's wildland research organization.

Wildlife and Fish. This key resource is of importance to many. Hunting, fishing, and trapping for subsistence and recreation are permitted on National forest lands and are subject to State laws and regulations. The responsibility for management is shared equally by the State and the Forest Service. The Alaska Department of Fish and Game sets seasons, bag limits, methods and means of harvest and use. The habitat is managed by the Forest Service, who surveys and evaluates food, water, and cover conditions, provides for its management and protection and, when needed, may improve both fish and wildlife habitat. Coordination of these management programs insures a healthy continuing fish and wildlife resource.

Mineral Development. The Forest Service encourages the development of mineral resources on National forests and cooperates with legitimate miners. Exploration and development of "locatable minerals" on National forest lands include the right to prospect, locate, mine, and remove minerals and obtain patent to the claim. Exploration and removal of the "leasable" minerals such as oil, gas, and coal are granted through leases and permits.

Safeguards to protect the environment are a part of any mineral exploration and development lease or permit on National forest lands.

Outdoor Recreation. National forests are open to a wide spectrum of recreational activities, ranging from camping in well-developed campgrounds, to back-country hiking, fishing, hunting, and ski touring. Alaska's present National forests already provide a significant portion of the developed camping and picnicking areas in the State. Commercial ski areas, lodges, and resorts are permitted where they will enhance recreation opportunities. Over 160 outlying cabins provide a unique quality recreation opportunity for families to enjoy Alaska's great back-country and coastal areas. Over 500 miles of recreation trails have been built.

Timber Management. Timber is an important resource on many National forest lands. Logging is done by private operators under contract with the Forest Service. All aspects of this harvesting process are supervised and regulated to protect the environment. National forest timber is managed on a sustained yield basis to insure a continuous flow of forest products. Timber harvested from Alaskan National Forests has a major impact on the State and local economy, supporting an important forest products industry.

Special Areas. The Forest Service, through the Secretary of Agriculture, has broad authorities for special classification of National forest lands. Throughout the system, areas of special interest have been designated as virgin, scenic, geological, historical, botanical, and zoological areas.

National forests may also contain units of the Wilderness Preservation System, Wild and Scenic Rivers, and National Recreation Areas when calssified as such by Congress.

Rural Area Development. The Forest Service has a tradition of working actively with local people. Native corporations will be selecting valuable resource lands. National forests can be managed cooperatively with other landowners. An example would be the supplying of timber or some other resource to supplement production from Native lands to support a local industry. Forest Service specialists provide training and assistance in sawmill operations to rural Alaskan villages for local housing projects. Forest products utilization and marketing specialists can help to develop stable industries. Technical assistance in other areas of natural resource management and environmental protection is also available.

National forests provide jobs on fire crews, in construction and maintenance, and in other skilled work. Environmental education programs assist school teachers.

Research. The Forest Service is responsible for conducting research related to the protection and management of the natural resources. In Alaska, there are two Forest Service research facilities investigating the many problems peculiar to Alaska's environment. At Fairbanks, the Institute of Northern Forestry concentrates on understanding, protecting, and managing the northern forest (taiga) and tundra of interior Alaska. The Forestry Sciences Laboratory at Juneau studies the environment and the northern coastal zones.

State Selection - Homesites. The Alaska Statehood Act provided for selection by the State of up to 400,000 acres of National forest land for community expansion or establishment and for community recreation uses. Homesite selections are also permitted.

Scenic Protection. Visual impacts of each management activity on National forests (such as timber sales) are assessed and landscape design incorporated in plans. The Forest Service is a leader in scenic area management, employing many landscape architects. Areas of specific interest and those which receive significant public use are zoned to give special consideration to aesthetic values.

Watershed Protection. The Forest Service is responsible for maintaining continuous flows of water from the National forests. Protection of the valuable watershed vegetation cover led to the development of a very extensive fire-fighting force. Hydrologists and soil scientists assist National forest managers in identifying and properly evaluating critical soil and water problem areas.

Special Uses. People need to use National forests for many special and varied purposes. National forest lands may be used when the proposed use will not harm the environment and is in accordance with law. Some of the many uses permitted include trapper cabins, commercial fishing sites, water, gas, oil, telephone and power lines (carefully located to protect scenic values), airstrips, roads and trails, sawmill sites, pastures,and garden plots. A fee may be charged for private use of these public lands.

VI. INTENSITY OF PUBLIC INTEREST AND CONTROVERSY

A. National Level

The inclusion of sections 17(d)(1) and 17(d)(2) in ANCSA providing for withdrawals of national resource lands for study and for possible additions to the National Park, National Forest, National Wildlife Refuge, and Wild and Scenic Rivers systems must be considered prima facie evidence of the national scope of public interest in the disposition of public lands in the State of Alaska.

Much of the proposed Iliamna National Conservation Area is withdrawn under the provisions of sections 17(d)(1) and 17(d)(2) of ANCSA. Numerous articles have appeared in national magazines supporting the establishment of a national park incorporating the Iliamna area. National organizations such as the Sierra Club and the Wilderness Society support park status for much of the proposed National Conservation Area.

B. State Level

On the State level there is a vocal minority actively working for establishment of a large national park in the Iliamna area. Strongest supporters appear to be the local chapters of the Sierra Club, the Wilderness Society, and the Alaska Conservation Society.

The State government in general opposes limited use management and would prefer that the lands remain under a system of multiple use management. Alaska is essentially in a pioneer era, and the

state government prefers a more open policy on land uses to encourage the establishment of a viable economy. Pockets of severe poverty exist in the state, primarily in the predominantly native areas. Much of the present employment is on a seasonal basis. The state's concern is to encourage sufficient development of lands and resources to maintain a stable economy by year-round employment and reduction of the high poverty level. The state's position is probably generally supported by the business community and many of the local newspapers.

C. Local Level

On the local level, by and large, the feeling probably runs closer to maintaining the status quo. Many of the native communities are fearful that many of their traditional uses of the land may be prohibited or curtailed if a national park or national forest is established in the area. Some local support for national park or national forest establishment is expected, primarily from local members of the national organizations which are supporting the national park proposal.

PART III

PROPOSED OPERATING BUDGET

DEPARTMENT OF THE INTERIOR

Legislative Program Projections

(In thousands of dollars)

Bureau, legislative item, account	1974	1975	1976	1977	1978
Bureau of Land Management	250	540	615	615	615

New Legislation:

3. Iliamna National Conservation Area in Alaska

Cost Analysis

	1974	1975	1976	1977	1978
Area Support	150	325	400	400	400
Special Cost:					
Office & Housing Rental	20	40	40	40	40
Sub-Total	170	365	440	440	440
State Office Support	80	175	175	175	175
Total	250	540	615	615	615

Construction

Estimated Total Cost $1,250,000