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US FISH & WILDLIFE SERVICE--ALASKA

IVISHAK WILD AND SCENIC RIVER REPORT

by  
Tileston, Jules V.

RARE  
FWS  
BUREAU

WILD & SCENIC RIVERS PL'S

Ivishak, Killik, Noatak, Nowitna,  
Nuyukuk, Porcupine and Sheenjek River

FWLB  
1293

Clay Hudy <sup>PKT</sup> <sup>RU</sup> <sup>92</sup>

UNITED STATES GOVERNMENT

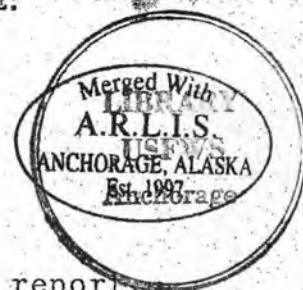
# Memorandum

TO : Assistant Director Eastman

DATE: June 4, 1973

FROM : Leader Alaska Task Force

SUBJECT: Ivishak Wild and Scenic River Report ✓



Enclosed are Chapters IV and V of the subject report. Copies have been provided to NWRO and the Alaska planning teams of BLM, BSF&W, IS and NPS. Also copies of Chapter IV will be provided participants in the field investigation scheduled for the last of June.

We emphasize that the report is preliminary and is based upon a single overflight on June 13, 1972 and office review of available information. Field examination may result in substantial revisions.

*Jules V. Tileston*  
Jules V. Tileston

2 Enclosures

cc: WASO/ Fred Strack

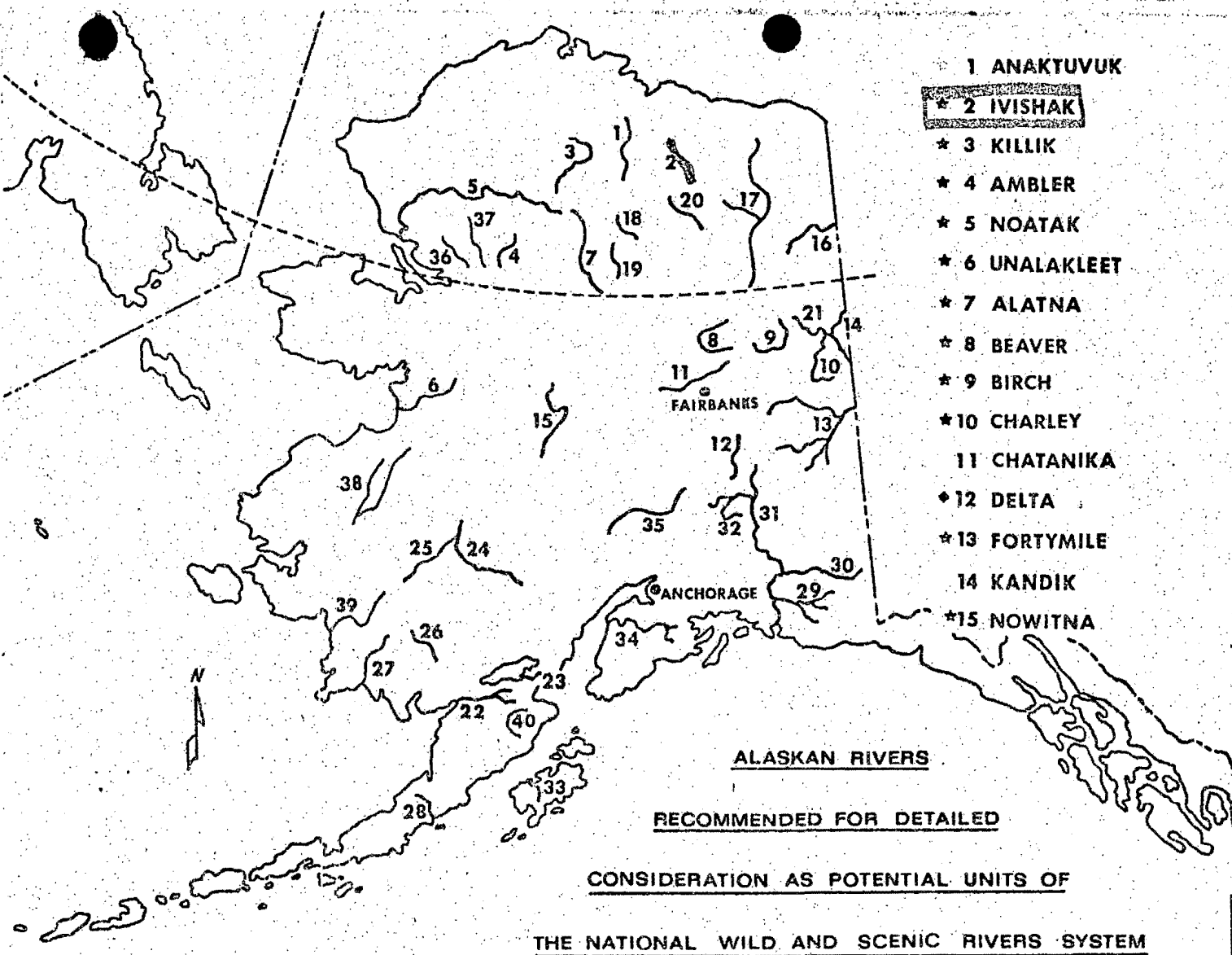


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1 ANAKTUVUK

\* 2 IVISHAK

\* 3 KILLIK

\* 4 AMBLER

\* 5 NOATAK

\* 6 UNALAKLEET

\* 7 ALATNA

\* 8 BEAVER

\* 9 BIRCH

\* 10 CHARLEY

11 CHATANIKA

♦ 12 DELTA

\* 13 FORTY MILE

14 KANDIK

\* 15 NOWITNA

\* 16 PORCUPINE

\* 17 SHEENJEK-KONESS

\* 18 TINAYGUK

19 WILD

\* 20 WIND

\* 21 YUKON

\* 22 ALAGNAK

\* 23 COPPER (ILIAMNA)

24 HOHOLITNA

25 HOLITNA

\* 26 NUYAKUK

\* 27 TOGIAC

\* 28 ANIAKCHAK

\* 29 BREMNER

\* 30 CHITINA

\* 31 COPPER

♦ 32 GULKANA

33 KARLUK

34 KENAI-RUSSIAN,  
SWANSON R.-SWAN LK.

35 SUSITNA

♦ 36 SQUIRREL

♦ 37 SALMON

♦ 38 ANDREAESKY

♦ 39 KANEKTOK

♦ 40 AMERICAN CREEK

BOR, OCTOBER, 1972

\* ALL OR SUBSTANTIAL PORTIONS CLASSIFIED UNDER 17(d)(2) OF ANCSA, SEPT. 1972

♦ RIVERS WHERE DETAILED STUDIES HAVE BEEN REQUESTED

Conclusions

The conclusion of this study is that the entire Ivishak River and its immediate environment together with its tributary area Porcupine Lake, possesses values which qualify them for inclusion in the National Wild and Scenic Rivers System.

Careful review of available information together with on-site inspection shows that:

- It is a clear, free-flowing river without impoundment and no straightening, rip-rapping or other modifications of the waterway.
- The river is long enough to provide a meaningful outdoor recreation experience.
- There is sufficient volume of high quality water during normal years to permit full enjoyment of the outdoor recreational potentials of the Ivishak River.
- There is no existing evidence of man's activities and the area is exceedingly pleasing to the eye.
- The Ivishak River and its immediate environment possess an outstandingly remarkable combination of scenic, recreational, geologic, fish and wildlife, scientific, ecological and similar values.
- The Ivishak River is capable of being managed to protect both people and the resource; has significant values



which can be interpreted to the public; and will support a high quality outdoor recreation experience at the desired level of use.

- There is a combined Federal-Native interest in the short and long range management of the resources of the river and its immediate environment.
- The existing and potential values are not duplicated by those of the 39 other Alaskan free-flowing rivers identified as having high potential for inclusion in the National Wild and Scenic Rivers System.
- Inclusion of the upper reaches of the River in the proposed extension of the Arctic National Wildlife Range would adequately protect existing and potential free-flowing values of the Ivishak River and its immediate environment.
- The upper portions of the river and its immediate environment included in the existing withdrawal under Sec. 17 (d)(2) have sufficient length and values to qualify it for inclusion in the National Wild and Scenic Rivers System.
- Development of oil and gas can be conducted in a manner compatible with retention of existing natural values of the river and its immediate environment.

#### Recommendations

It is recommended that:

The portion of the Ivishak River and Porcupine Lake located

upstream of Flood Creek which are presently withdrawn under the provisions of Sec. 17 (d)(2) ANCSA be designated as a unit of the Wild & Scenic Rivers System unless all or substantial portions are included in the proposed extension of the Arctic National Wildlife Range.

- The administering Federal agency be that agency administering the adjacent land area.
- The area be designated as a wild river area as defined in Sec. 2 (b)(i) of the Wild and Scenic Rivers Act with the specific provision for oil and gas development.
- The administering Federal agency work with prospective downstream native landowners to determine the feasibility and desirability for adding that portion of the river downstream from Flood Creek into the National Wild & Scenic Rivers System under Native administration.
- Lands within the immediate environment of the river downstream from Flood Creek not selected by Natives be retained in Federal ownership until such time as a coordinated, comprehensive plan for management and development of the resources for the entire river is prepared and approved by the concerned Federal, State and Native groups.

River Setting

The Ivishak River is a large, clear free-flowing stream flowing northward some 95 miles from its source on the Continental Divide in the Philip Smith Mountains of the Brooks Range to its confluence with the Sagavanirktok River approximately 55 miles south of Prudhoe Bay on the Beaufort Sea. The Echooka and Saviukviayak Rivers (65 and 35 miles long respectively) are major tributaries to the Ivishak River.

At its source the Ivishak is entrenched in a narrow glaciated valley surrounded by colorful yet stark mountain peaks rising to 6,960 feet above sea level. Several of the small dashing headwater streams stem from isolated hanging glaciers which are relics of of valley glaciers flowing northward from the Continental Divide to the Arctic Coastal Plain.

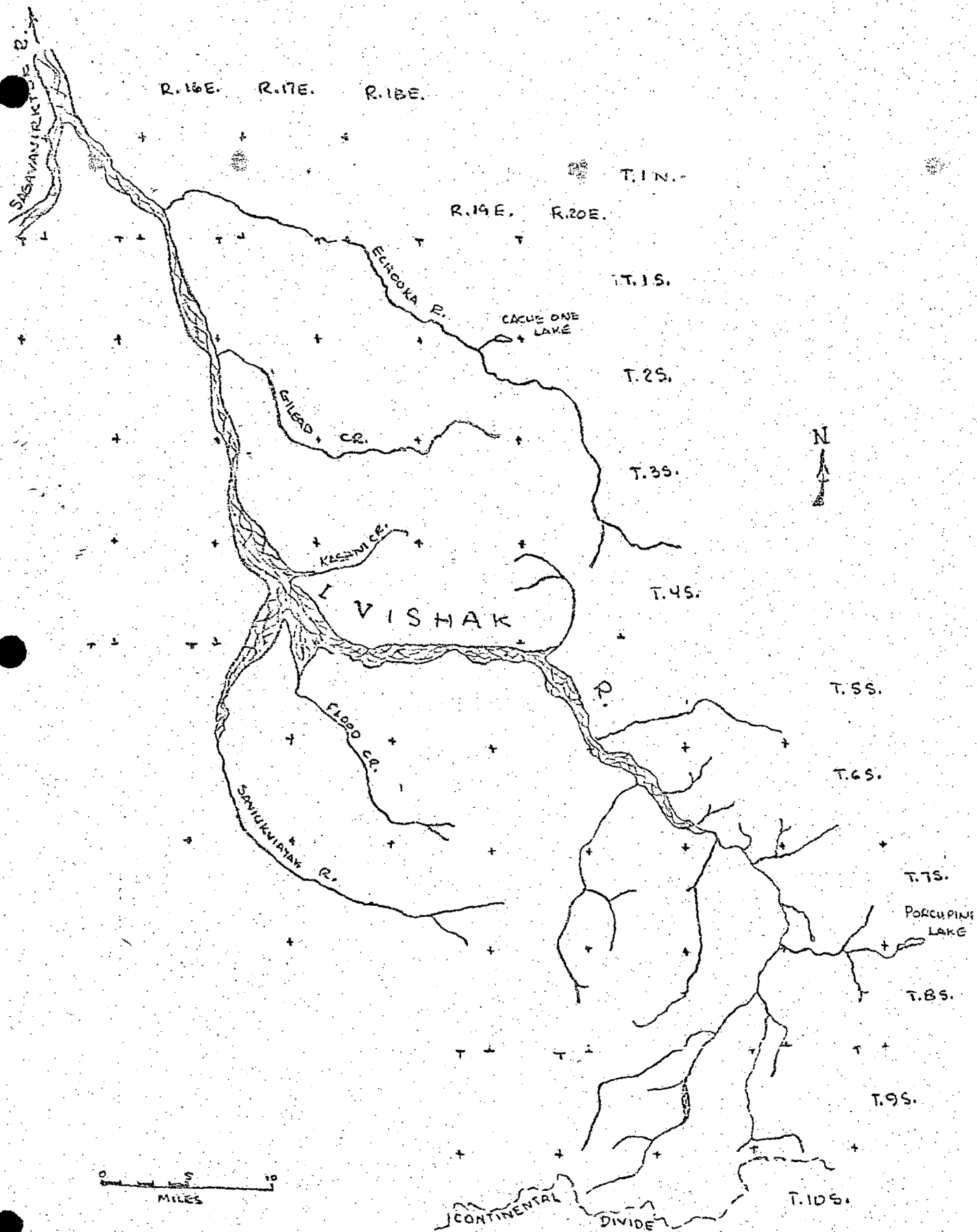
As the River flows north it becomes larger and assumes the typical braided character of North Slope rivers. Although still encased in the Philip Smith Mountains for its first 60-70 miles, it quickly develops a flood plain which is often in excess of one mile wide. As soon as the Ivishak breaks out of the Brooks Range it is joined by the Saviukviayak River and at this point its combined flood plain is approximately four miles wide.

To the casual observer the river is divided into two prominent types: Mountain and Coastal Plain. Approximately two-thirds of the upper river is in the Mountain Type (Fig ).

Topographically and ecologically however, there are three divisions: Eastern Brooks Range, Arctic Foothills and Coastal Plain. (Fig ).

The Eastern Brooks Range, which encompasses the Philip Smith Mountains and the upper one half of the Ivishak River drainage, is a wilderness of rugged glaciated east trending ridges with elevations to 7,000 feet above sea level. Local relief is great and can be in excess of 2,000 feet. On the north side are abrupt mountain fronts rising sharply from the more gentle and subdued topography of the foothills and coastal plain. Limestones of the Lisburne Group comprised of folded, uplifted light to dark gray limestone and dolomites interbedded with light and dark gray modular to bedded cherts. Intricately shaped exposures of these colorful formations flank the Ivishak River and provide a varied and extremely facinating backdrop. There are few lakes in the area. For this reason, Porcupine Lake the largest, being some 300 acres in size, is not only distinctive, but an important aspect of the Ivishak River.

Porcupine Lake is a natural reservoir for the upper Ivishak River drainage. Located to the east of the River in a



VISHAK RIVER, ALASKA

# B E A U F O R T SEA

etis I Leavitt I

Jones Is Midway Is

Return Is Cross I

McClure Is

Stockton Is

Tigvariak Is Maguire Is

Flaxman I

Barter Island

Arey I Kaktovik Griffin

Camden Bay

White Hills

Sagayniktok

Toolik

Sagwon

Kadler

Juliper

Camden

SADLEROGHIT MTS

SHUBLIK MTS

MT CHAMBERLIN 9131

MT MICHELSON 9239 8700

ROMANZOF MTS

FRANKLIN MTS

DAVIDS

BRUSHMAN MTN

INDEX MTN

SHOULDER MTN

HELMET MTN

SMOKE MTN

Arctic Village

8200

8000

7500

7400

6600

6100

7100

7000

5000

5500

5815

3000

3000

3000

3000

3000

3000

3000

3000

3000



large east-west glacially shaped trough in the heart of the Philip Smith Mountains, this 300 acre lake is in a scenic setting of lush green tundra surrounded by mountains of black shale. An eight mile long stream from Porcupine Lake helps sustain summer-time flows in the Ivishak and is a valuable rest stop for the Fall southward migrations of waterfowl.

The Arctic Foothills consists of rolling plateaus and low linear east-west mountains paralleling the higher Philip Smith Mountains to the south. Altitudes range from 600 to 3,500 feet with gravel-covered sediment surfaces forming low divides between north flowing tributaries such as Gilead Creek and the Echooka River and the headwaters of the Echooka River and an unnamed small tributary to the Ivishak River in T. 4 S., R. 20 E. In overall appearance the Arctic Foothills province along the Ivishak River is not distinguishable to the casual observer. The primary distinction being the smaller total relief and isolated nature of the separate folds in the earth's crust masked by the vast increase in size of the flood plain which distorts the perspective. Cretaceous sedimentary rocks have been deformed into long linear Appalachian type folds where differential erosion is the chief architect of topography. This province occupies the next 20 miles of the Ivishak drainage.

The Arctic Coastal Plain is found in the lower 5-10 miles of the drainage and like the Foothills province, its

presence is masked by the immensity of the flood plain. The Arctic Coastal Plain is an area of little topographic relief. It is poorly drained and consequently very marshy in summer. Here permafrost is the predominate factor in the landscape with a marked increase in thaw lakes. The average elevation is approximately 600 feet above sea level.

#### Stream Flow

There are no guaging stations on the Ivishak River and little specific information on North Slope rivers in general.

The U.S. Geological Survey reports<sup>1/</sup> that the seasonal snowpack is probably the most important component of the hydrologic cycle in the Arctic Slope Region. Next in importance are river icings, lakes, glaciers, swamps, ground water, and soil moisture. Of these, snowpack, springs, river icings and Porcupine Lake are significant factors in the flow of the Ivishak River.

There are wide fluctuations in stream flow as the permafrost prohibits ground water storage. During the long Arctic winter available surface water is locked up as ice. With the advent of spring and long continous days of sunlight combined with periods of rain, water levels rise and fall dramatically.

As a rule, most of the snow has melted by the last week in May and does not start to accumulate again until the last

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Water Resources Division, Alaska District, Open File report, 1969 "Water Resources of the Arctic Slope Region, Alaska-- a Preliminary Report."

week in August or early September.

Flooding can be caused by rapid snow melt or by intense, long periods of rain during the summer. These rapid and repeated fluctuations cause a braided stream bed of sorted gravel and boulders. New stream channels are cut in the flood plain with each highwater stage, thereby causing sudden and pronounced shifts in the location of the river with respect to adjacent hills and river banks.

Low flow, except in all but the largest rivers such as the Ivishak, means virtually no flow. This condition is evident throughout the winter and also during very dry summers. Even the larger streams occasionally have no visible surface flows, as the water may for short stretches be spread literally over a flood channel up to one mile wide at depths of only a few inches.

All major rivers in the area are "...navigable by boat from early June until late October." During the spring breakup or after rain storms, smaller tributary streams such as Gilead Creek and the Echooka River are navigable by small boats.<sup>1/</sup>

Streams are shallow and current swift. During normal runoff these can be waded with caution. However the loosely compacted boulder and cobble streambed combined with the swift flow make such crossings dangerous unless the site is carefully chosen.

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A.S. Keller and others. 1961. Geology of the Shaviovik and Sagavanirktok Rivers Region, Alaska. U.S.G.S. Professional Paper #303-D.

The eastern Brooks Range has many springs along its northern flanks where sandstone and shales are overlain by limestone. Some flow throughout the year and several are reported to be "hot" springs. The largest are to the north and east along the Canning River (Shublik Springs) along the contact of the Lisburne sandstone and the Sadlerochit sandstone. Here the discharge is estimated to be 1,000 gallons per minute. The summer water temperature of these springs are reported to be 43° F. and 48° F. During the winter these keep the Canning River free of ice for a short distance. Similar, but smaller springs have been reported on the Ivishak and Echooka Rivers. The former is in the vicinity of Flood Creek. It is not known whether the Ivishak springs flow throughout the winter but the abundance of Arctic char strongly suggest they may.

During the winter streams often freeze completely to the streambed thereby causing the water to flow on top of the ice. The process is repeated until extensive layers of ice are formed. Smaller areas of this overflow ice or "aufeis" are normally melted during the summer. Larger field of aufeis may however persist on a semi-permanent basis with the river each spring cutting an incised channel to the streambed. At the confluence of the Saviukviayak and Ivishak Rivers such a field exists. This area of aufeis is 12 miles long and

15 to 20 feet thick. The presence of the Ivishak springs immediately upstream from this area is considered to be a contributing factor to the formation of such a large ice field. Melting during the summer helps stabilize the downstream flows of the Ivishak.

Gradient throughout the Ivishak is steep, but relatively uniform. There are no falls or impassible rapids. When excluding the first 12 miles where the river averages a drop of more than 100 feet per mile, the average gradient is approximately 32 feet per mile. Small tributary streams have exceedingly steep gradients and are more cascade than stream. The stream connecting Porcupine Lake to the Ivishak River has an average gradient of 67 feet per mile while the 25 mile long Gilead Creek has an average gradient of 44 feet per mile. The profiles of the Echooka and Savinkviayak Rivers are similar to the Ivishak River.

#### Water Quality

There are no accurate water quality data for the Ivishak. However since man has in the past been only a temporary and infrequent visitor, water quality is assumed to be good.

There is no evidence of floating debris, undesirable aquatic life or other objectionable substances.

Sediment in the Ivishak, a clearwater stream, is derived from a complex set of processes which involve mechanical forces of freezing and thawing rather than chemical processes.

In addition to the freeze-thaw mechanical action, hydrologic erosion of fine-grained and poorly indurated deposits such as shale, debris slides in talus slopes, soilfluction and the simple factor of one stone grinding against another in the swift current contribute to the sediment in the Ivishak River. Turbidity is most pronounced with highwater. During the summer, however, the stream becomes a striking blue.

The chemical quality of the water of the Ivishak is unknown, but it is assumed that the mineral content is within established limits for drinking water.

Water temperature, except in the vicinity of Ivishak Springs, is cold. As such, pathogenic organisms would probably have a prolonged life and could pose health hazards with improper sanitation and increased human use.

#### Land Use

Man is a visitor to the Ivishak River. There are no known cabins, roads, trails, miners, agriculture, airfields or other permanent or semi-permanent regular uses of the Ivishak or its immediate environment.

Although rivers are historic routes of travel, the Ivishak is remote with major drainages such as the Canning to the east and the Sagavanirktok to the west the predominant travel routes.

Arctic Village (population 85) to the southeast and



Anaktuvuk (population 99) to the southwest are the closest settlements.

Undoubtedly early Eskimo nomads hunted caribou or other game along the Ivishak from time to time. Today modern sport hunters, explorers, scientists, prospectors and more recently, the canoeist and hiker are infrequent visitors.

The lower reaches of the Ivishak are within the corridor withdrawn for construction of the Trans-Alaska Pipeline to transmit oil and gas from the Prudhoe Bay fields. Accordingly, the entire area is on the verge of major shifts away from the traditional uses.

Where once were vast areas with only modest evidence of man there soon will be 15,000 people. Although these will be primarily centered at established villages or new oil communities along the Arctic coast, roads, trails and air fields will interconnect the producing oil and gas wells. Evidence of such activities are just now beginning to appear as transportation throughout the area is improved. The future impact of these changing land uses on the Ivishak and its immediate environment are unknown.

#### Forestry

Except for willows and an occasional cottonwood along the river bank there are no trees.

## Mining

There are no known mining claims for metaliferous minerals in the bed of the Ivishak River or its immediate environment. Pyrite in carbonate rocks near the Ivishak in the mountainous area have been noted but the significance of this deposit is unknown.

The U.S. Geologic Survey<sup>1/</sup> reports that there are no unusual or significant mineral deposits along the river within the Philip Smith Mountains. However, a mafic body intruding the Mississippian age carbonates near the river at the northern edge of the mountains is a "relatively significant and unusual occurrence for the area and deserves more study."

Approximately the lower one-third of the Ivishak River (the portion downstream from the Saviukviayak River) flows through a geologic province referred to as the Arctic Foothills Province which is considered to have potential as a possible hydrocarbon province.<sup>2/</sup>

A small portion in the mountainous area, flows through the southern foothills section of the province, while the greater portion, where it emerges from the mountain area is in the northern foothills section.<sup>3/</sup>

1

Personal communication, H.N. Reiser, Geologist, Branch of Alaskan Geology, Menlo Park, Calif. April 4, 1973

2

Miller and others. Geology of Possible Petroleum Provinces in Alaska. U.S.G.S. Bull. #1094

3

Brosge & Tailleir. Future Petroleum Provinces of the United States--Their Geology and Potential Memoir 15. AAPG

According to the Bureau of Mines the lower Ivishak River areas seems to hold promise and has been the area of exploratory interest in recent years. The general area has had airborne magnetometer surveys and geophysical exploration. One exploratory well has been drilled in the immediate environment of the Ivishak River. This well, Echooka No. 1, is located in the NW quarter Sec. 32, T. 1 N., R. 16 E., Umat Meridian. It was drilled by Mobil Oil Corporation in 1972 to a depth of 12,673 feet was not productive for hydrocarbons and has been plugged and abandoned. Several dry holes also have been drilled within a distance of 10 miles NW of the confluence of the Ivishak and Sagavanirktok Rivers. The closest gas production is at a well 20 miles east of the Ivishak River in Sec. 17 T. 1 N., R. 20 E., Umat Meridian.

The entire lower portions of the Ivishak River basin are included in oil and gas leases as the general area is part of the oil province centered around the 1968 discovery at Prudhoe Bay. The extent of oil and gas underlying the Ivishak River and its immediate environment is not known, but the poor record to date based upon the limited drilling can not be used to dismiss the possibility for such deposits.

#### Water Resource Developments

There are no existing, authorized or proposed water resource developments. The presence of the Ivishak Springs,

however, and its significance, if any, for geothermal utilization is unknown.

#### Land Ownership

The entire river and its immediate environment are in Federal ownership and administered by the Bureau of Land Management.

The upper two-thirds of the Ivishak River and its immediate environment have been withdrawn as part of a large block of public land under the provisions of Sec. 17 (d)(2) ANCSA for potential addition to the existing Arctic National Wildlife Range. Except for the lower six miles, the remainder has been withdrawn for potential native selection under ANCSA. The lower six miles are included in the utility corridor for construction of the Trans-Alaska Pipeline.

There are no privately owned lands along the Ivishak River or its immediate environment. There are no pending applications for private ownership under the various settlement or mineral laws or under the 1906 Native Allotment Act preceeding the enactment of ANCSA.

Figure \_\_\_\_ shows the native land status of the Ivishak River and its immediate environment.

#### Water Rights, Navigability and Riverbed Ownership

There are no adjudicated water rights and no outstanding applications for use of the waters of the Ivishak River or its tributaries.

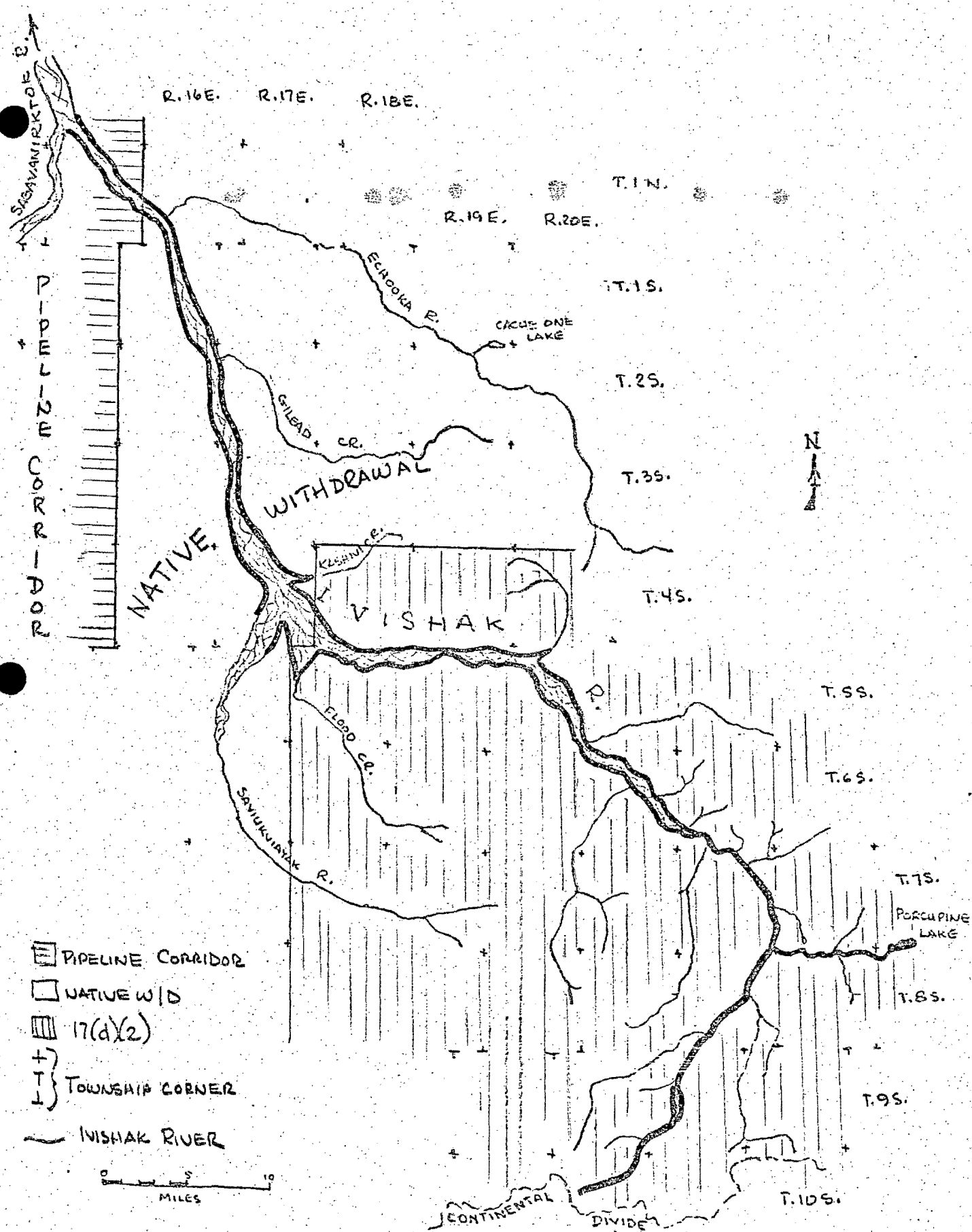


FIG. GENERALIZED LAND STATUS, IVISHAK RIVER, ALASKA

The Ivishak River is not considered by the Corps of Engineers to be navigable.

Under the provisions of the Alaska Statehood Act, the State owns the beds of all "navigable" waters in Alaska. Under preliminary criteria established by the State it would appear that at least Porcupine Lake might be considered "navigable". Final determination on this matter has not been made.

#### Access

Access to the Ivishak River is by air.

Porcupine Lake in the headwaters area provides an excellent landing site for planes on skis or floats; whereas, the many gravel bars in the bed of the river provide good landing sites for wheeled aircraft.

There are no airstrips along the river or within its immediate environment. There is, however, a major airstrip at Sagwon on the Sagavanirktok River a few miles upstream from the mouth of the Ivishak River.

For a North Slope area, the Ivishak River has excellent air access.

The construction of the Trans-Alaska Pipeline will provide road access to the vicinity of the mouth of the Ivishak River. The distance from major population centers would, however, reduce the effectiveness of this road access in terms of general public outdoor recreation use of the Ivishak River.



There are no other known plans to construct road access into the Ivishak River or its immediate environment. Should producing oil or gas wells be developed in the basin a means of access to and from the wells would be required. At an estimated cost of \$200,000 a mile for roads in the Prudhoe Bay area, it is expected that the primary means of access will continue to be by air.

### Geology

The Philip Smith Mountains and the Ivishak River valley are a geologist's paradise. The general character of the sparse Arctic tundra combined with steep slopes along the Ivishak Valley combined to provide dramatic exposures of folded, uplifted rock strata.

The Ivishak Springs also are of great geologic interest.

Numerous ice fields and small hanging valley glaciers are present in the headwater areas. These are the remnants of once mighty valley glaciers which scoured the Ivishak River valley. Glacial drift and moranic deposits in the vicinity of the northern flanks of the Philip Smith Mountains provide a graphic record of repeated glaciation.

Soils are shallow rubble and sandy gravel. The riverbed is predominately gravel and boulders.

Permafrost, which underlies the entire river area, has a pronounced effect upon both soils and plants. From September

until the following June, the ground is at or below the freezing point of water. With the onset of summer daylight and increased temperatures; snow melts and the surface of the soil begins to thaw. Thawing continues until late August or early September and reached a depth of from 4 to 60 inches depending upon the contour, soil color, vegetative cover, slope and exposure.

The impervious layer of permafrost also has a significant impact on surface geology in that it provides a well-lubricated surface for solifluctuation (movement of soil downslope). Solifluction terraces and cirques are common in the foothills, mountainous and riverbank areas.

Good climatological data for the Ivishak River is lacking. The closest comparable weather station in the inland portion of the Arctic Slope is at Umiat approximately 130 miles southwest of the Ivishak River. In general, the climate can be characterized as rigorous with short, cool summers and long, cold winters. Temperatures below freezing predominate from early October to mid-May.

The sun is continuously above the horizon from May 19 to July 25 and light conditions do not fall below Civil Twilight from April 30 to August 13. During the winter daylight recedes to only 5 hours of "dusk". Average annual precipitation is less than six inches and is distributed throughout the year. Almost 50 percent falls as rain during June, July and August. Snow can occur at any time.

Keller and others (Op. Cit.) considered the best weather to be in May and June with July and August the worst. During the 1951 field season 17 days were lost to bad weather while in 1952, 19 days were lost. At Umiat, Kessel and Cade<sup>1/</sup> reported that during 1952 and 1956 the number of clear, partly cloudy and cloudy days as 9, 45, and 16 and 11, 42 and 17 respectively.

### Vegetation

The dominate vegetation type is tundra where the visitor has unincumbered views and often feels exposed and conspicuous. During the summer, soft velvet green punctured by masses of bright flowers dominate the river setting for all except the highest elevations, steep rock outcrops, and gravel bars along the river. In August frost colors the leaves of low woody plants such as willow and bearberry producing sharpley contrasting reds and yellows. By September the land is clothed in gold and brown.

Although vegetation of the Ivishak River area has not been specifically studied, it is assumed that the river is comparable to other Arctic river areas.

Wiggins and Thomas <sup>2/</sup> report that soils are generally youthful and slow in formation. Since the entire area is underlain by permafrost, the soil is usually damp, wet or saturated. Sand bars along the larger rivers contribute

<sup>1</sup>

Birds of the Colville River, Northern Alaska. U. of Alaska April 1958.

<sup>2</sup>

The Flora of the Alaskan Arctic Slope. Arctic Institute of North America Special Publication No. 4

substantial amounts of sand and dust which in turn effect plant life. They note that the transition from arctic coastal plain to foothills vegetation is gradual.

The stream bed at low water stages exposes areas of sandy and gravelly materials which provide suitable habitats for plant seedbeds. Willow seedlings are common and although most do not survive the winter and subsequent spring flooding, once established can provide soil stabalization which in turn effects river bed location. On such sand bars are lupines, astrogalus and sagebrush.

On the riverbanks are found willow communities and in the most favorable locations, cottonwood. Willows stablize the riverbank soils from both wind and water erosion and grow in dense thickets between one and seven feet in height. These shrubby plants provide critical wildlife habitat for both birds and mammals.

Overall the Ivishak provides a wide range of plant communities ranging from tundra where cottongrass sedge, mosses, lichens forbs and postrate shrubs dominate to the flood plains where willow thickets with an understory of blueberry, cranberry, rosehip, coltsfoot and plume flower are found.

During studies of the birdlife of the Arctic along the Colville River to the west, Kessel and Cade<sup>1/</sup> noted 11 habitat

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1956. Haibtat Preferences of the Birds of the Colville River.  
In: Science in Alaska

types according to vegetation types. These are: Sedge-grass marsh; Tussock-heath tundra; Dwarf Shrub; Tall Bush; Tundra-Lacustrine water Edge; Dry Tundra; Bluffs, Slides and Outcrops; Alluvial Deposits; Riparian Cut Banks; Fluvial Waters; and Lacustrine Waters. Fig \_\_\_\_ shows a cross sectional diagram of these habitat types in the Colville River Valley. It is assumed that a somewhat similar relationship exists in the Ivishak River valley.

### Wildlife and Fishery

#### Wildlife

The visitor to the Ivishak River can expect to see a rich assemblage of wildlife.

Grizzly bears are concentrated along the river and spend most of their active season in the river valleys where food is most abundant. Primary foods are grasses, sedges and carrion with some predation on moose. The Alaska Department of Fish and Game estimates that the Arctic Slope generally supports an average density of 1 grizzly bear per 100 square miles. This density is greatest along rivers and in 1972 the Atlantic Richfield Company study team reported the largest concentration of bears near the head of the Ivishak River with eight adults in one group and five in another. The Alaska Department of Fish and Game also reports that "River valleys are clearly the most important habitat during the active season."<sup>1/</sup>

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<sup>1</sup>

Alaska's Wildlife and Habitat. January 1973.

The Ivishak River and its immediate environment (including Porcupine Lake) is "an intensive spring-fall use area", while its headwater areas are suspected to provide suitable denning habitat.

Moose are also concentrated in the river valleys of the Arctic Slope because of the willow plant communities. The ADF&G<sup>1</sup>/ has also identified the Ivishak and Echooka River Valleys as a year-around concentration areas.

Dall sheep are found in the mountainous portions of the Ivishak River area.

Wolves and wolverine are distributed throughout the area as are red and arctic foxes. Small rodents are abundant.

The Ivishak is near the mixing point of the Arctic and Porcupine barren ground caribou herds and is occasionally used as a migration route from the Arctic slope summer grounds to the Interior wintering grounds. In the Spring there is a general northeasterly migration along the north face of the Philip Smith Mountains which would cross the Ivishak near its confluence with the Sagavanirktok River.

Birdlife is especially abundant and although there have been no specific studies, it is probable that more than 100 species of birds are present in the river valley during the spring summer or fall. During the winter only the most hardy birds such as the ptarmigan, raven, snowy owl and gyrfalcon are found.

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<sup>1</sup>

Ibid.



The cliffs and bluffs along the Ivishak are used by golden eagles, rough-legged hawks, gyrfalcons and the rare peregrine falcon for nesting sites.

### **Fishery**

Little is known about the fishery of the Ivishak. Grayling and arctic char have been reported to be present. The gravels of the Ivishak provide ideal spawning grounds, which combined with the flows of the Ivishak Springs, appear to make very valuable habitat for arctic char. Overall growth rates are slow; taking 15 years to produce a 5 pound char.

### History and Archeology

The history and archeology of the Ivishak River is unknown. Past activities of man have been limited in the Ivishak River area and there are no indications of permanent or regular settlements or use of the river area by the native people.<sup>1/</sup>

There are two major Eskimo groups on the Arctic Slope: nuunamiut or people of the land and tareumiut, the people of the sea. Of these the nuunamiut probably visited the Ivishak River valley from time to time in search of caribou and perhaps wood and other resources necessary to sustain life in a harsh environment. The extent and evidence of such use is unknown.

### Recreation

#### **Existing Uses**

Existing recreation uses are limited to a few fly-in

sport hunters seeking Dall sheep and the infrequent hiker or boater. The actual extent of such use is unknown.

#### Future Uses

Future recreation uses are expected to be associated with rafting, kayaking, hiking, photography, nature and geological study and sport fishing and hunting.

#### Limitations

Primary limitations on existing and potential recreational use are associated with two factors: access and climate.

Access is now remarkably good for aircraft use but relative costs are high because of the distances involved.

Climate not only limits use to the more favorable summer weather but also promotes an extremely low growth rate in plants and animals. Accordingly any significant increase in consumptive uses of the resources of the Ivishak River environment could profoundly effect future uses.

#### Scientific

The Ivishak River is located between two major river systems-- the Sagavanirktok and Canning-- which have and will continue to be used as transportation corridors to and from the Arctic Slope. The former will also be the route of the Trans-Alaska Pipeline.

Accordingly the Ivishak River and its immediate environment offer high potential for scientific study to determine what, if

any, changes occur in the natural environment as historic,  
low intensity uses of the land and its resources are changed.

UNITED STATES GOVERNMENT

# Memorandum

*M. Day Hand*  
RLD  
CL

TO : Assistant Director Eastman

DATE: JUN 1 1973

FROM : Alaska Task Force Leader

SUBJECT: Killik Wild River Report, Alaska

Enclosed are two copies of the subject report's Chapters IV and V. Copies have been sent to NWRO, BLM, NPS, BSF&W, and FS planning teams.

We emphasize that conclusions and recommendations are based upon a one-day flight last summer. The on-the-ground inspection is scheduled for July 1, 1973.

*Jules V. Tileston*  
Jules V. Tileston

2 Enclosures

cc: WASO/Fred Strack



# A Wild and Scenic River Analysis

Killik River, Alaska

THIS REPORT WAS PREPARED PURSUANT TO PUBLIC LAW 90-542, THE WILD AND SCENIC RIVERS ACT. PUBLICATION OF THE FINDINGS AND RECOMMENDATIONS HEREIN SHOULD NOT BE CONSTRUED AS REPRESENTING EITHER THE APPROVAL OR DISAPPROVAL OF THE SECRETARY OF THE INTERIOR. THE PURPOSE OF THE REPORT IS TO PROVIDE INFORMATION AND ALTERNATIVES FOR FURTHER CONSIDERATION BY THE BUREAU OF OUTDOOR RECREATION, THE SECRETARY OF THE INTERIOR, AND OTHER FEDERAL AGENCIES.

PRELIMINARY

Bureau of Outdoor Recreation  
Alaska Task Force

June 1, 1973

PRELIMINARY DRAFT ---  
NOT FOR PUBLIC DISTRIBUTION OR PUBLIC USE  
--- SUBJECT TO REVISION

#### IV.

#### DESCRIPTION AND ANALYSIS

##### River Setting

The Killik River is a clear, free-flowing intermediate-sized river flowing north to enter the Colville River in the Arctic Foothills on the north slope of the Brooks Range. The river officially (DICTIONARY OF ALASKA PLACE NAMES - Geological Survey, Professional Paper 567) is formed by April Creek and Kakivilak Creek and flows 105 miles to the Colville River. However, on the quadrangle map entitled "Survey Pass, Alaska," scale 1" = 250,000," dated 1956 and compiled by the U.S. Geological Survey, the river is shown to start in T. 27 N., R. 19 E. and giving it a total length of approximately 135 miles. This study covers the entire river from its unofficial source to its confluence with the Colville River. The Killik River rises at the Continental Divide (Brooks Range, which is the northern extension of the Rocky Mountains) in the Endicott Mountains of the central Brooks Range. The river's source lies approximately 300 miles north-northwest of Fairbanks, Alaska, and 240 miles northeast of Kotzebue, Alaska.

The Endicott Mountains immediately surrounding the source of the Killik River are 6,000 to 7,000 feet in height. The southern half of the river, from its source downstream to its approximate midpoint, flows between mountains which vary from 4,000 to 7,000 feet in height.

These mountains are composed chiefly of Paleozoic rocks: limestone, shale, quartzite, slate, and schist. These rocks are in giant plates or nappes thrust to the north. The north front of the range is made of light-colored cliff-forming Mississippian limestone.

The northern half of the river, from its approximate midpoint to its mouth, flows through the Arctic Foothills which consist of rolling plateaus and low linear mountains. The mountains vary from 600 to 3,500 feet in height. The northern part of the Foothills is underlain by Cretaceous sedimentary rocks deformed into linear folds. Unequal erosion of rock layers differing in hardness has resulted in the low linear mountains. The southern part of the Foothills is underlain by diverse sedimentary rocks of Devonian to Cretaceous age together with folded, north-thrust mafic intrusions.

The Killik River is small while flowing through an average 2 mile wide U-shaped valley in the central Brooks Range. Moist tundra is the dominant vegetation in the valley from the riverbanks to snowline. Some dwarf shrubs grow immediately along the river. Numerous small lakes dot the valley, several lakes have small outlets into the Killik River. The river becomes larger, as does the valley, along its lower reach in the Arctic Foothills. The U-shaped valley is 3 to 5 miles wide and has a covering



of mixed moist tundra and shrub thickets. The shrub thickets consist mainly of 5 to 10 foot high willows and some alders. Three large lakes line the river at its midpoint. Dozens of small lakes line the river throughout this reach. Bluffs rise along the river to heights of 200 feet.

#### Stream Flow

There are no stream gaging stations on the Killik River. Stream velocity is estimated to vary from 3 to 4 mph in rapid and braided areas to less than 1 mph in the sluggish pools especially found along the river's middle section.

The river forms a broad dendritic (tree-like) pattern, that becomes braided near the confluence of April Creek and for most of the river's lower reach. The river, especially its braided portions, flows across gravel flats that can be covered in winter with ice sheets called aufeis or anchor ice. The aufeis freezes to the riverbed and fills the channels causing the river to flood across the gravel flats.

Maximum stream flow occurs in June as a result of spring breakup and snow melt. Stream flow then begins to taper down until freezeup in September. Rain storms in August can be expected to raise the river's water level somewhat.

### Water Quality

Water quality data are not available for the Killik River. However, it is assumed that overall water quality is good. There is no evidence of undesirable aquatic life, floating debris, or other objectionable substances. A natural increase in turbidity and sediment load occurs during spring breakup and after rainy periods. The amount and duration of turbidity is highest when there have been substantial disturbances of the river channel or vegetation cover.

There has been some sampling done of surface water in the region. This limited sampling indicates that overall chemical quality of surface water, except for high salinities of lakes near the Arctic Ocean, is probably acceptable for domestic and public supply uses. Surface water samples generally have contained less than 120 mg/l dissolved-solids content. Data collected suggests that both dissolved-solids content and mineral composition vary considerably between winter and summer. Temperature measurements, from the limited sampling, indicate an annual range of 30 to 37 degrees F. Low temperature conditions of water elsewhere has been reported to be conducive to prolongate life of pathogenic bacteria.

## Land Use

Permanent human use of the land within a two-mile corridor surrounding the Killik River is practically nonexistent; however hunters and fishermen visit the area each year. A few organized groups exploring a part of the Arctic Foothills for minerals or studying fauna and flora have camped along the river and/or used the river as a transportation route.

The Nunamiut (People of the Land) Eskimo in the past lived in the area from the Anaktuvuk River west to the Killik River; however, few remain today. Most of the Nunamiut moved to the arctic coast. A group reestablished a village at Anaktuvuk Pass in 1949. They principally hunt, fish and trap as far west as Chandler Lake, to the east of the Killik River. A few go into the upper reaches of the Suluak Creek and Okokmilaga River, tributaries of the Killik River.

There are no agricultural lands or commercial timber areas in the river corridor. Two cabins, one located about 6 miles below Easter Creek on the Killik and the other about 2 miles up Easter Creek from its mouth, are shown on the Killik River quadrangle map. Their actual existence is unknown.

## Mining

Approximately the lower two-thirds of the Killik River is located in a geologic area referred to as the Northern

Alaska Petroleum Province.<sup>1/</sup> This province includes the northern foothills and southern foothills sub-provinces which are considered to be highly promising areas of petroleum potential. Along the Killik River itself, there are no substantiated surface indications of oil or natural gas. Gas seeps are known to occur where Aupuk Creek<sup>2/</sup> joins the Colville, approximately 12 miles upstream of the confluence of the Killik and Colville Rivers (reference Ikpihpuk Quadrangle).

The nearest exploratory drilling that has been done near the Killik River took place at Knifeblade Ridge, 20 miles to the northwest of the Killik River's mouth, during the exploration of Naval Petroleum Reserve No. 4.<sup>3/</sup> These wells were plugged and abandoned as dry holes, although there were noncommercial shows of oil in some of the cores taken. All of the wells drilled within a 50-mile radius of the Killik River have been relatively shallow holes. There has been no deep drilling (i.e., 10,000 feet or more) near the river to test deeper sediments.

#### Water Resource Developments

There are no known existing, authorized, or proposed water resource development projects on the Killik River.

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1/Brosge, W.P. and I.L. Tailleux. Future Petroleum Provinces of the United States--Their Geology and Potential, "Northern Alaska Petroleum Provinces." Memoir 15, Volume 1. American Association of Petroleum Geologists. 1971. pp. 68-90.

2/Miller, Payne, and Gryc. "Geology of Possible Petroleum Provinces in Alaska." U.S. Geological Survey Bulletin 1094. 1959. p. 93.

3/"Test Wells, Titaluk and Knifeblade Areas, Alaska." U.S. Geological Survey Professional Paper 305-G.

### Land Ownership

The Killik River and a two-mile wide corridor surrounding the river lies entirely within a much larger block of land withdrawn under Sec. 17(d)(2) of ANCSA by the Secretary of the Interior in March 1972.

There are no mining claims or prospecting permits along the river, nor are there any patented lands. There are no applications for land by Natives under the 1906 Native Allotment Act.

### Water Rights, Navigability, and Riverbed Ownership

Under the Alaska Statehood Act the State of Alaska owns the streambeds of all "navigable" waters of the state. Under preliminary criteria developed by the State it would appear that the Killik River may be considered "navigable" from its mouth upstream for approximately one-quarter its length.

Evidence collected in this study indicates there generally is sufficient water volume to permit a pleasurable recreation experience in small nonmotorized watercraft for the entire length of the river.

The Killik River is not on the U.S. Army, Corps of Engineers list of approved navigable waterways.

### Access

#### Existing

Aircraft serves as the only reasonable means of existing

access to the river. The only other means of access is by foot. Aircraft can land (using floats) on some of the larger lakes lining the river; on wide stretches of the river itself; on the Colville River near the Killik's mouth; or (using wheels) can possibly land on gravel bars paralleling the river.

#### Potential

Possible means of access would include using riverboats navigating up the Colville River from Umiat (a landing strip is located there) during the summer, and using snow-mobiles or dog sleds either overland or on the river during the winter.

#### Geology and Soils

##### Geology

Geology along the Killik River has been field mapped in detail except for the upper reaches (approximately 10 miles). Interpretation of aerial photographs was used to supplement field mapping and for mapping of areas not reached in the field (Chapman, 1964).<sup>1/</sup>

The Killik River region includes parts of two well-defined physiographic provinces, the Brooks Range and the Arctic Foothills; the Foothills have been subdivided into southern and northern sections.

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<sup>1/</sup>Chapman, Robert M., Robert L. Detterman, and Marvin D. Mangus, 1964. "Geology of the Killik--Etivluk Rivers Region, Alaska." U.S. Geological Survey Professional Paper 303-F, 83 p.

7

Sedimentary rocks at least 36,000 feet thick are exposed in the region. These are dominantly of marine origin and range in age from early Late Devonian, Paleozoic Era, to early Late Cretaceous, Mesozoic Era. Paleozoic sedimentary rocks, exposed only in the Brooks Range and in the southern foothills section of the Arctic Foothills, consist of slate, shale, quartzite, quartzitic conglomerate, chert, and limestone. Mesozoic sedimentary rocks in the foothills are primarily shale, siltstone, sandstone, conglomerate, and some coal.

The sedimentary rocks are deformed by a system of west-striking folds and faults. Deformation in the Brooks Range is characterized by large overturned folds, thrust faults and reverse faults. Folds in the southern foothills section are small, tight and steeply plunging with numerous high angle faults cutting the bedding. In the northern foothills section, where most of the coal occurrences are located, large open folds are characteristic.

Small sills and plugs of mafic intrusive rocks are present in the Brooks Range and southern foothills section. Two of these small intrusive bodies were identified near the Killik River in the southern foothills section.

Part of the Killik River was glaciated at least three times by alpine valley glaciers. The most northern advance was to within about 6 miles above the mouth of Okokmilaga



River. Small cirque glaciers remain near the head of April and Easter Creeks. A glacial lake about 29 miles long was formed in the Killik River valley below the junction with Easter Creek; the drained lake-bed is presently, in part, a sand dune area.

There are no mineral claims or prospecting permits along the Killik River or its immediate vicinity, but coal beds, phosphate-bearing rocks, and oil shale either are known to occur along the Killik, or as in the case of oil shale, although not specifically identified, a belt of organic rich shales several hundred miles long intersects the Killik in the Southern Foothills Province. An oil shale sample taken along the Okpikruak River, a tributary of the Killik, about 13 miles east of Lake Udrivik yielded 10.6 gallons of oil per ton (Tourtelot & Tailleir, 1966).<sup>1/</sup> Oil shale was found in place along Imnaitchiak Creek about 17 miles west of the Killik River.

Phosphate-bearing sedimentary rocks occur in the Brooks Range and southern foothills section. A sample taken for analysis from the Alapah limestone near the north front of the Brooks Range along the Killik yielded only .4 percent  $P_2O_5$  content. The estimated grade of the 6.8 billion tons of potential phosphate reserves of the United States is about 10 percent P (23 percent  $P_2O_5$ ) (Lewis, 1970).<sup>2/</sup>

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1/Tourtelot, H.A., and I.L.Tailleir, 1966. "Oil Yield & Chemical Composition of Shale from Northern Alaska." U.S. Geological Survey Open-File report, 17 p.

2/Lewis, R.W. 1970. "Mineral Facts and Problems." Bureau of Mines Bulletin 650, p. 1143.

11

Coal is present in the Northern Foothills Province along the Killik River from about 3 miles above the junction of the Okpikruak River to the Colville River. Coal beds without bone or partings are as much as 4 feet thick. A single sample taken for analysis from a 3 foot bed in sandstone, siltstone, and shale dipping 4 to 5 degrees S. was determined subbituminous in rank (Chapman, 1964). Other samples taken in the region, however, were mostly bituminous in rank and although not tested for, undoubtedly some of the bituminous coals possess coking properties.

#### Soils

The land surrounding the river where the river flows through the Arctic Foothills, is underlain by permafrost. Stone stripes, polygonal ground, ice wedges, and other features of a frost climate are common.

A thin layer of peaty ground lies on top of the permafrost. This layer varies from 6 inches to several feet in depth. Gravel bars are found along the river and small inland sand dunes also are found along the river.

#### Vegetation

Moist tundra is the dominant vegetation in the river valley from the river's source to its midpoint. The tundra covers the ground from riverbank to snowline. Some dwarf shrubs grow along the riverbanks. This type of tundra consists of almost continuous cottongrass tussocks with

sparse growth of other sedges and dwarf shrubs. The main shrub types locally found with the tundra are various willows. Also found are some birch and mountain-avens.

The river valley from its midpoint to its mouth has a mixed covering of moist tundra and shrub thickets. The moist tundra is as described above. The shrub thickets are called floodplain thickets and form on newly exposed alluvial deposits that are periodically flooded. Such thickets develop quickly, reaching heights of 5 to 10 feet. The dominant shrubs of this type are willows and occasionally alders.

Although the Brooks Range environment is extremely susceptible to damage by man and despite its importance to wildlife, fire ecology there has been virtually unstudied. Wildfire can change wildlife habitats, destroy the vegetative cover of watersheds leaving the watershed subjected to damage by flash floods and causing loss of a stable water supply.

#### Wildlife and Fishery

##### Wildlife

Wildlife found along the river includes the large mammals: grizzly bear, wolverine, wolf, Dall sheep, moose, and barren ground caribou.

The grizzly bear range throughout the region but concentrate along the river valleys during their active season

(spring to fall) because food is most abundant. Primary foods are grasses and sedges, berries, and carrion, with some predation on moose and caribou. Wolverines also range throughout the region, with distribution probably unchanged from that of prehistoric times. They are like the bear in that they are scavengers and at times predators. Their fur is highly prized for parka ruffs; therefore, the wolverine is actively hunted and trapped throughout the state, especially near human habitation. Wolf populations in the region also are probably unchanged from historic and prehistoric times. However, their abundance in a particular place and at a particular time is governed by the abundance and movements of caribou, moose, and sheep. Much of the region has little escape cover, leaving the wolf very vulnerable to aerial hunting.

Dall sheep are found in abundance throughout the Brooks Range through which the upstream half of the river runs. Some subsistence hunting of sheep by Natives occurs, but sport hunters probably account for more taking of sheep than subsistence hunters. Moose concentrate year-round along the Killik River valley and are distributed throughout the region except for high up on the mountain slopes. The most important and virtually the sole habitat for moose in the region is the willow communities along the rivers.

The largest herd of caribou in Alaska, 242,000 head of Barren ground caribou, use the Killik River valley as one of their major annual migration routes from the Utukok and Colville Rivers breeding grounds to the winter range south of the Brooks Range. Wintering areas, calving grounds, and major migration routes are considered critical habitat areas for all caribou herds. Such habitats have thus far been protected primarily because of remoteness.

Small furbearers like arctic fox and red fox also inhabit the region.

Small mammals found along the river include: shews, squirrels, voles, hares, and lemmings. The hoary marmot or siksikpuk, a ground-squirrel, is found in colonies along the riverbanks and is probably the most commonly observed mammal in the region. The arctic ground squirrel is also common. The red-backed vole is common and lives in the willow communities along the river.

Waterfowl are present in the river valley from its mouth to the confluence of April Creek. White-fronted geese, whistling swans; and ducks are the more common birds found.

#### Rare and Endangered Species

The arctic peregrine falcon is listed in the Department of the Interior's 1973 book, "Threatened Wildlife of the United States." Its distribution or even existence along

the Killik River is unknown. However, its known existence along the Colville River (into which the Killik River empties) causes the assumption that a good chance exists for some birds to be found living along the Killik River.

### Fishery

The Killik River supports a good arctic char, grayling, and whitefish fishery. Northern pike are also found. Trout-perch and sculpin are believed to inhabit the river's waters. The burbot, a freshwater cod, is a slow growing predator fish also living the river. The chum and pink salmon both occur in the Colville River, but it is not known whether they go up the Killik.

### History and Archeology

Very little research has been accomplished concerning the history and archeology of the Killik River valley. Many archeological sites have been discovered in the adjacent river valleys to the east and also around nearby Chandler Lake. The Nunamiut (People of the Land) Eskimos lived at one time in the area from the Killik River east to the Anaktuvuk River. Few remain today, however, with most having moved to the arctic coast.

### Recreation

#### Resources

The Killik River and its immediate surroundings offer such untapped resources as open space, scenery, wildlife,

fishery, and recreation. It is a clearwater, free-flowing stream in a pristine and primitive environment of mountain and arctic splendor. The river is navigable by small non-motorized watercraft for its entire length.

#### Existing Uses

The only known recreation use of the Killik River valley consists of sport hunters after grizzly bear and Dall sheep. Their numbers are relatively small, which is understandable considering the distance and cost to get there, but increasing each year.

#### Potential Uses

The river is canoeable with water level determining the particular daily navigability for a canoe or rubber raft. The river probably falls in Class II/III of the International Whitewater Scale. (Appendix A). Boating opportunities for the experienced canoeist, kayakist, and rafter are good.

Opportunities exist for hiking, nature study, and sightseeing in pristine open country that has year-round snowcapped mountains, clearwater rivers and lakes, fish and a variety of wildlife, and unspoiled examples of arctic flora.

#### Limitations

The extremely long, harsh arctic winters resulting in an extremely short burst of summer is the major limitation to recreation. Distance and lack of access are also



contributing limitations. The slow growth of the fish and wildlife and their need for larger areas per animal in which to survive may limit the use of the area generally and particularly the numbers of hunters and fishermen.

Some recreational activities such as All Terrain Vehicle uses may be limited by soil conditions. Surface damage can occur which may persist for long periods of time. Most surface damage occur during summer thaw periods. As human activities increase, accelerated surveillance and regulations of vehicles (particularly on any permafrost soils) may be necessary to minimize watershed damages and protect ecological and aesthetic values.

Potential limitations to recreation include the users themselves. It is quite possible that large numbers of recreationists in the river area would degrade or destroy the pristine environment and the primitive experience of the user. The most outstanding value of the river area could thereby be lost through overuse.

V.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The conclusion of this study is that the Killik River and its immediate surroundings possess the qualities necessary for inclusion in the National Wild and Scenic Rivers System. This study shows that:

- The river is in a free-flowing natural condition.
- The river is sufficiently long to provide a meaningful experience
- The river and its immediate surroundings possess outstandingly remarkable scenic, fish and wildlife, geologic, and recreational values.
- The river has sufficient water volume during normal years to permit full enjoyment of water-related outdoor recreation activities.
- Water quality is good.
- The river and its immediate surroundings are capable of being managed to protect and interpret special values and protect the river.
- The river is a pristine waterway flowing through a primitive area untouched by man.
- The entire river meets the qualifications for inclusion in the National Wild and Scenic Rivers System as a wild river.

- There are presently no rivers in Alaska included in the National Wild and Scenic Rivers System. There are also no State or local plans or programs for the protection of free-flowing streams and their immediate surroundings.
- The Bureau of Outdoor Recreation has recommended that 40 Alaskan rivers having high potential for inclusion in the national system be given detailed study. The range of outstandingly remarkable values possessed by these 40 rivers is great and consequently no one river duplicates the unique environment of another.

#### Recommendations

It is recommended that:

- The Killik River which flows in its entirety through lands designated under Sec. 17(d)(2) of ANCSA, be added as a component of the National Wild and Scenic Rivers System.
- Approximately 135 miles of the Killik River from its source in T. 27 N., R. 19 E. to where it empties into the Colville River be classified and managed as a wild river together with approximately 143,000 acres comprising its immediate surroundings.

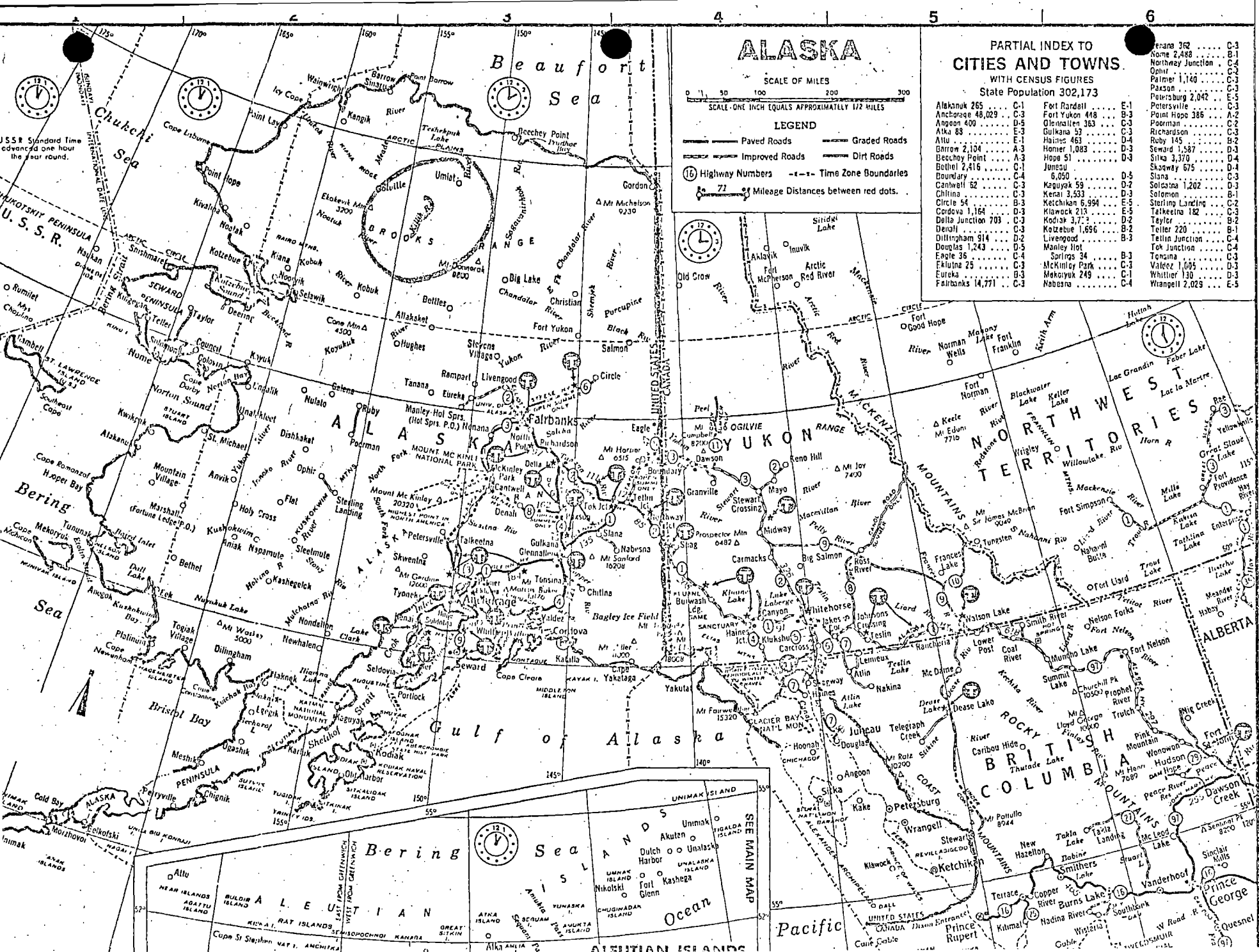
- The administering agency develop lateral river boundaries within one year as part of the detailed management plan for the river area. Such lateral boundaries should include the "primary visual corridor," an area generally not exceeding one mile from each river bank.
- The river be managed by the adjacent upland manager.
- Native interest in the future development and use of the river be determined and the plans developed for the river reflect Native interest.
- Should the larger area surrounding the Killik be designated as a unit of the National Park System, designation of the previously mentioned section of the river as component of the National Wild and Scenic Rivers System need not be made. Such river designation would be unnecessary because management of the river as part of a unit of the park would protect the river and its surroundings as sufficiently as would its designation as a National Wild and Scenic River.

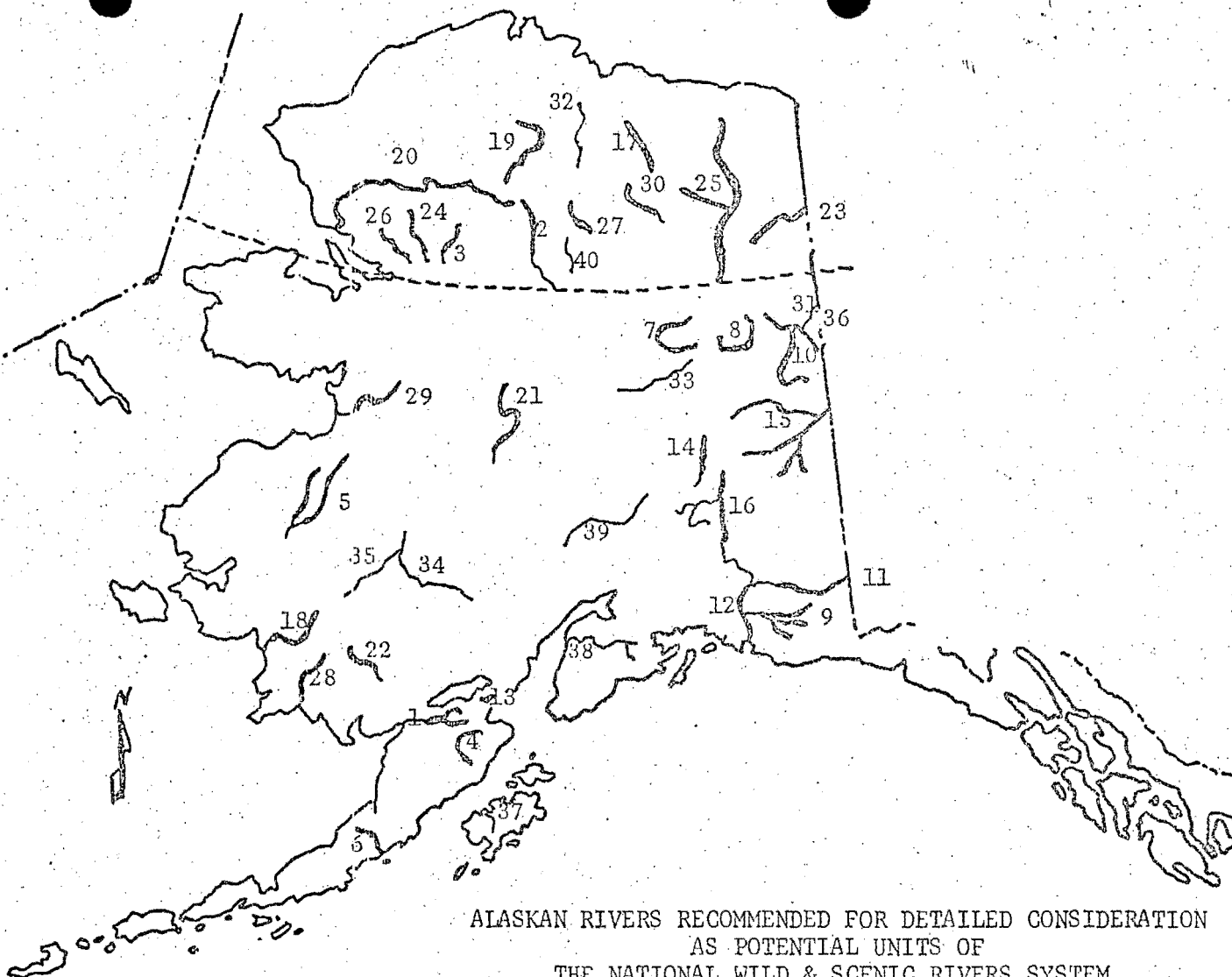
## APPENDIX A

### SMOOTH AND WHITE WATER RATING SCALE:

International Difficulty Rating of canoeable waters, to be used in connection with Personal Ratings on page 12.

Rating	Water Characteristics
<b>Smooth Water</b>	
A	Pools, Lakes, Rivers with velocity under 2 miles per hour.
B	Rivers, velocity 2-4 mph.
C	Rivers, velocity above 4 mph (max. back-paddling speed) may have some sharp bends and/or obstructions.
<b>White Water</b>	
I	Easy — Sand-banks, bends without difficulty, occasional small rapids with waves regular and low. Correct course easy to find but care is needed with minor obstacles like pebble banks, fallen trees, etc. especially on narrow rivers. River speed less than hard back-paddling speed.
II	Medium — Fairly frequent but unobstructed rapids, usually with regular waves easy eddies and easy bends. Course generally easy to recognize. River speeds occasionally exceeding hard back-paddling speed.
III	Difficult — Maneuvering in rapids necessary. Small falls, large regular waves covering boat, numerous rapids. Main current may swing under bushes, branches or overhangs. Course not always easily recognizable. Current speed usually less than fast forward paddling speed.
IV	Very Difficult — Long extended stretches of rapids, high irregular waves with boulders directly in current. Difficult broken water, eddies, and abrupt bends. Course often difficult to recognize and inspection from the bank frequently necessary. Swift current. Rough water experience indispensable.
V	Exceedingly Difficult — Long rocky rapids with difficult and completely irregular broken water which must be run head on. Very fast eddies, abrupt bends and vigorous cross currents. Difficult landings increase hazard. Frequent inspections necessary. Extensive experience necessary.
VI	Limit of Navigability — All previously-mentioned difficulties increased to the limit. Only negotiable at favorable water levels. <i>Cannot be attempted without risk of life.</i>





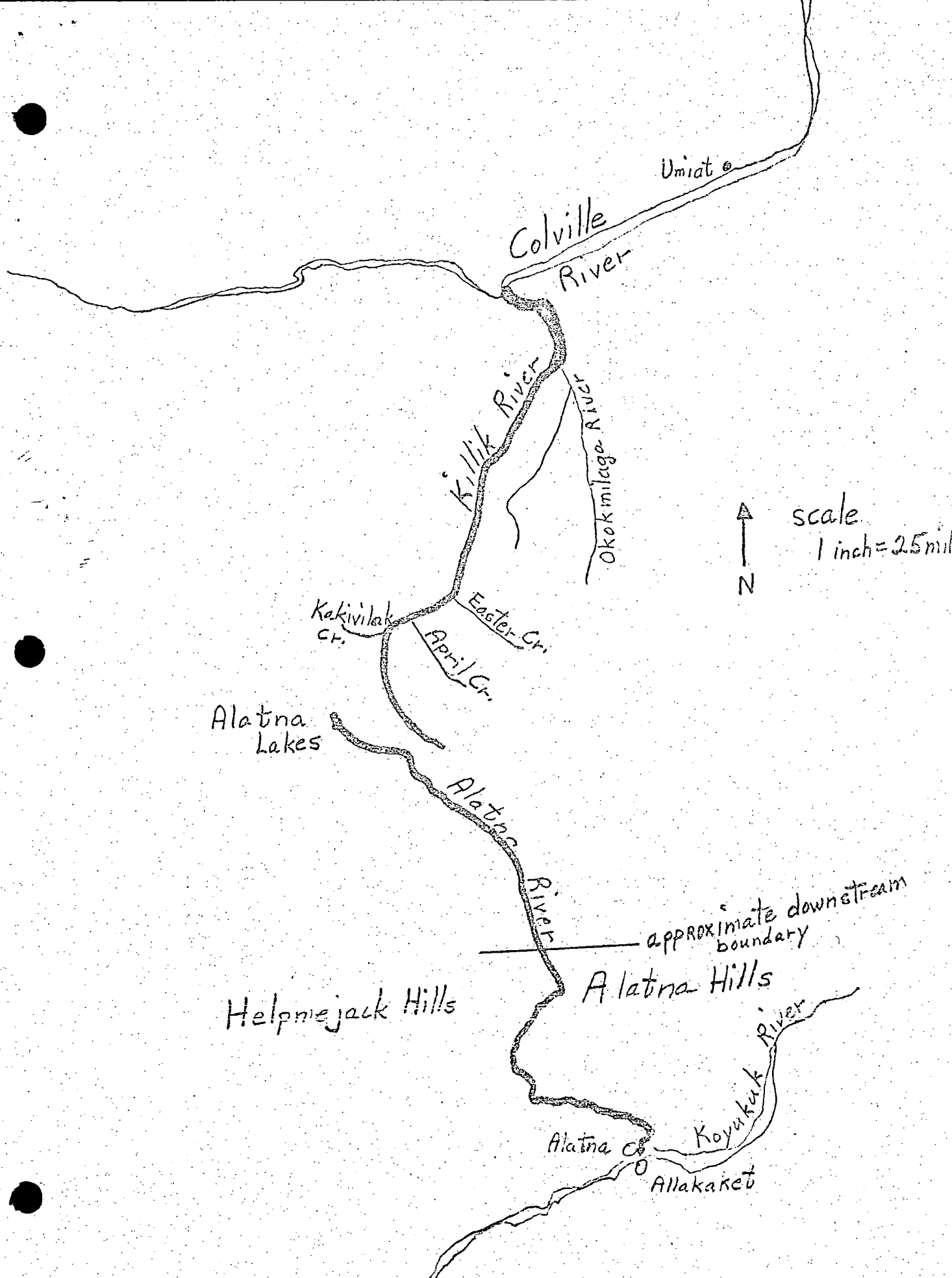
ALASKAN RIVERS RECOMMENDED FOR DETAILED CONSIDERATION  
AS POTENTIAL UNITS OF  
THE NATIONAL WILD & SCENIC RIVERS SYSTEM

\* All or substantial portions classified under 17(d)(2) of ANCSA.

# Detailed studies have been initiated on segments shown in heavy line.  
Other rivers could be studied upon request by land manager.

- \*# 1. ALAGNAK
- \*# 2. ALATNA
- \*# 3. AMBLER
- # 4. AMERICAN CREEK
- # 5. ANDREAFSKY (2 FORKS)
- \*# 6. ANIAKCHAK
- \*# 7. BEAVER CREEK
- \*# 8. BIRCH CREEK
- \*# 9. BREMNER
- \*# 10. CHARLEY
- \*# 11. CHITINA
- \*# 12. COPPER
- \*# 13. COPPER (ILIAMNA)
- # 14. DELTA
- \*# 15. FORTYMILE (SYSTEM)
- # 16. GULKANA
- \*# 17. IVISHAK
- # 18. KANEKTOK
- \*# 19. KILLIK
- \*# 20. NOATAK
- \*# 21. NOWITNA
- \*# 22. NUYAKUK
- \*# 23. PORCUPINE
- # 24. SALMON
- \*# 25. SHEENJEK-KONESS
- # 26. SQUIRREL
- \*# 27. TINAYGUK
- \*# 28. TOGLAK
- \*# 29. UNALAKLEET
- \*# 30. WIND
- \*# 31. YUKON
- 32. ANAKTUVUK
- 33. CHATANIKA
- 34. HOHOLITNA
- 35. HOLITNA
- 36. KANDIK
- 37. KARLUK
- 38. KENAI-RUSSIAN,  
SWANSON - SWAN LK
- 39. SUSITNA
- 40. WILD







UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF OUTDOOR RECREATION

IN REPLY REFER TO:  
D4225 Alaska  
(W&SRS)

NORTHWEST REGION  
~~XXXXXX~~ 1000 SECOND AVENUE ~~XXXXXX~~ 813 D Street  
~~SEATTLE WASHINGTON 98104~~ Anchorage, Alaska 99501  
Phone: 265-4850

Jan 5, 1972

Dear Wild & Scenic River Participants:

Enclosed is discussion draft of the Noatak River Wild & Scenic River report. This report is based on aerial and field reconnaissance and information obtained from study participants. In some sections information is lacking and in other sections revisions will be necessary. We request your help in supplying whatever additional information you feel is appropriate for the final report which will be assembled by February 15, 1973.

The concepts and conclusions that are put forth in this draft will be contained in the final report should there be no serious objections from the Interdepartmental Study Group for Rivers or study participants. Thus, any comments or problems you have concerning the recommendations in this draft should be promptly indicated.

We would appreciate your comments and an indication of what additional information you feel should be included prior to or at the January 16, 1973 meeting of all agencies concerned with the Alaska Wild & Scenic River studies. This meeting is to be held at 9 a.m. in the BSF&W conference room, 813 D St., Anchorage, Alaska.

Thank you for your cooperation.

Sincerely yours,

Jules V. Tileston  
Alaska Task Force Leader

1 Enclosure

NOATAK RIVER  
A Wild and Scenic River Analysis  
Discussion Draft

PRELIMINARY

THIS REPORT WAS PREPARED PURSUANT TO PUBLIC LAW 90-542, THE WILD AND SCENIC RIVERS ACT. PUBLICATION OF THE FINDINGS AND RECOMMENDATIONS HEREIN SHOULD NOT BE CONSTRUED AS REPRESENTING EITHER THE APPROVAL OR DISAPPROVAL OF THE SECRETARY OF THE INTERIOR. THE PURPOSE OF THE REPORT IS TO PROVIDE INFORMATION AND ALTERNATIVES FOR FURTHER CONSIDERATION BY THE BUREAU OF OUTDOOR RECREATION, THE SECRETARY OF THE INTERIOR, AND OTHER FEDERAL AGENCIES.

PRELIMINARY

Bureau of Outdoor Recreation  
Alaska Task Force  
January 5, 1972

PRELIMINARY DRAFT ---  
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U. S. Fish and Wildlife Service  
Resource Planning

# PRELIMINARY

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## FOREWORD

This discussion draft report evaluating the resources of the Noatak River, Alaska, is incomplete and subject to substantial revision as additional data is received. In particular, information on State highway programs, information on water rights and river bed ownership, Native participation, and agency management plans will require revision and/or completion.

Although various agencies and individuals have been consulted and library research conducted, the basic ideas in this discussion draft cannot be construed as official policy of the Bureau of Outdoor Recreation, other Federal or State agencies or Natives.

In addition to review of available data, this report reflects on-the-ground investigation of the Noatak River. The entire river area has been examined during an aerial reconnaissance.

### Summary of Findings and Recommendations

1. The Noatak River has been found to possess outstandingly remarkable scenic, geologic, fish and wildlife, archeological, and recreational values.
2. It meets the requirements for inclusion in the National Wild and Scenic Rivers System.

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3. The public resources of the Noatak River and its immediate surroundings are capable of being managed to protect both people and the environment, have significant values which can be interpreted to the public, and will support a high quality outdoor recreation experience at the desired level.
4. The presently proposed highway across the mid-Noatak could have a harmful effect on the pristine character of the river.
5. There is substantial hydroelectric power potential on the river according to Alaska Power Administration. It is recommended that no dams be built on the Noatak River because these could result in flooding substantial portions of the river creating a significant loss of fish and wildlife, flora, archeological, aesthetic, geological, scenic, recreational, and human values.
6. It is recommended that the Noatak River from its source to the confluence of the Kelly River be managed as a wild river and that from the confluence of the Kelly River to Kotzebue Sound it be managed as a scenic river.
7. There are certain traditional Native uses of the Noatak River and its immediate surroundings. It is recommended that the Native interest in the future development and use of the Noatak River be determined and the plans developed for the Noatak River reflect Native interests.

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8. It remains to be determined by the interagency task force whether the Noatak River or any portion thereof will be recommended for inclusion in the National Wild and Scenic Rivers System.

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## Noatak River

### Description and Evaluation

#### Physical characteristics and setting

The Noatak River has its source high in the Schwatka Mts. of the Brooks Range near Mount Igikpak. Its headwaters are located approximately 200 miles east-northeast of Kotzebue, Alaska. It flows westward approximately 325 miles then turns south for approximately 100 miles before entering Kotzebue Sound at the mouth of Hotham Inlet.

The Noatak River could physically be divided into four quarters: (1) the headwaters to Lake Matcharak--water depth 4 inches to 3 feet; width 75 feet; flow speed about 3 m.p.h.; few rapids. (2) wide valley/basin area from Lake Matcharak to the start of the Grand Canyon of the Noatak--water depth averaging 2 feet with some deep "holes"; width 75 to 250 feet; flow speed about 3 m.p.h.; numerous rapids with standing water up to 2 feet high. (3) Grand Canyon of the Noatak and Noatak Canyon--water depth 3 to 4 feet with numerous large 10 foot deep pools; width 75 to 250 feet; flow speed increases to about 4 m.p.h.; rapids with standing water up to 3 feet high. (4) starts at downstream end of Noatak Canyon and end at Kotzebue Sound--water depth 3 inches over ledges to 15 foot pools; width varies with individual channels being 50 to 500 feet; flow speed increases to 6 to 7 m.p.h.; no rapids.



The river rises at an elevation of 3800 feet, descends to 1600 feet at Lake Matcharak, and then to 600 feet at the Grand Canyon of the Noatak. Major tributaries are the Cutler, Aniak, Nimiuktuk, Kugururok, Kelly, and the Agashashok Rivers. The Noatak River is a large clearwater, nonglacial river. Water character varies from long, wide, smooth pools to narrow, fast moving rapids.

The following information on the geological values of the Noatak River area was taken from Dr. Thomas D. Hamilton of the University of Alaska report entitled Noatak Valley Reconnaissance, 1972.

"From its source in the Mount Igipak area of the Schwatka Mountains, the Noatak River flows for about 50 miles through a narrow glacial valley with steep flanking walls 2,000 to 3,000 feet high. Bedrock is exposed to the base of the valley walls in places; elsewhere the valley floor is flanked by talus cones, protalus ramparts, solifluction slopes, and lateral moraine segments. Much of the bedrock here is limestone and marble, rock types which produce relatively "clean" slopes with much exposed rock and relatively little solifluction cover. Phyllite, chloritic schist,

and other metamorphic rock types also are abundant. These rock units are marked by more highly vegetated outcrops and relatively extensive solifluction slopes.

Through a stretch of about 50 miles downvalley from the Ipnelivik River confluence, the Noatak's valley floor is covered by glacial deposits of probable Wisconsin age. This complex area, marked by striking glacial landforms and occasional steep rapids, serves as a transition zone between the narrow glacial valley of the upper Noatak and the broad till plains farther to the west.

Glacial deposits here can be grouped into four divisions:

1. Lateral moraines and ice-stagnation deposits between Ipnelivik River and Douglas Creek.
2. End moraines and associated ice-contact deposits below Douglas Creek.
3. End moraines around Atongarak Creek.
4. End moraines above Aniuk River.

As the glacier retreated from each moraine area, the glacial deposits acted as a barrier behind which finer-grained stream and lake sediments accumulated. The moraine belt thus is characterized

by stretches of broad floodplain and gentle river gradient alternating with steep boulder-choked rapids enclosed by towering river bluffs.

Below the Aniuk River confluence, the Noatak's valley floor abruptly widens into a broad basin flanked by bedrock ridges 20 to 40 miles apart. The basin extends west about 50 miles to the Aglungak Hills near the Nimiuktuk River confluence, where the valley narrows again into a canyon less than 3 miles wide. Through most of the basin area, the valley floor is covered by a vast till plain of probable Illinoian age into which the Noatak River and its modern floodplain are incised to a depth of 200 feet or more. Younger glacial deposits, derived probably from Nimiuktuk Valley, become conspicuous only near Itimtikrak Creek, 15 miles east of the canyon's head.

The till plain consists of glacial deposits clearly older than those upvalley from Aniuk River. It lacks primary glacial landforms such as moraines, kettles, and kames. Extensive postglacial modification by solifluction and stream erosion has reduced the original glacial relief to an irregularly undulating surface

heavily dissected by stream channels and drainage swales. Dense tussock vegetation, interrupted only by frost boils, covers most of the till plain, which lacks surface exposures of ice-contact gravels comparable to those of the moraine belt farther upvalley.

The Noatak's modern floodplain commonly is as broad as 3 to 4 miles through this portion of its valley. Almost continuous lines of bluffs about 100 feet high border the floodplain, and intersect the river's course in places where it swings laterally to the floodplain margin. Most bluff faces are heavily vegetated, but occasional poor exposures display unstratified till containing stones to boulder size in a clayey matrix. Boulders up to 3 to 4 feet in diameter, derived from the till, sometimes are abundant in the channel bed and banks where bluffs intersect the river.

The Noatak Valley narrows abruptly at the Aglungak Hills, and for about 60 miles downvalley is enclosed by steep mountain flanks which seldom are more than a few miles apart. The valley walls, which rise to altitudes of about 2,000 to 3,000 feet, extend directly down to the modern valley

floor in places. Elsewhere, the Noatak River follows a bedrock gorge incised within the floor of a higher-level abandoned glacial valley.

The largest and most complex Pleistocene exposure seen along the entire Noatak Valley occurs near Sisiak Creek about midway between the mouths of Kugururok and Kaluktavik rivers. The exposure extends about 2,500 feet along the north bank of the Noatak River and rises from 70 to 130 feet above river level. Outwash gravel, fluvial sand, lacustrine clay, and till are overlain by organic and sandy postglacial deposits.

The Noatak Canyon area culminates in a spectacular 4.5 mile stretch at Sekuiak Bluff, where the river occupies a very narrow inner gorge with nearly vertical bedrock walls 200 to 300 feet high. The highly deformed metamorphic rocks exposed along the canyon walls exhibit complex folds and crenulations, and are colored reddish-yellow to reddish-brown in places by iron oxide staining. East and west of Sekuiak Bluff, the bedrock walls terminate abruptly, and are succeeded by somewhat lower bluffs of till and outwash. The gorge probably was

formed when the Kukururok glacier extended south into the main valley and forced the Noatak River into a position astride the base of its southern valley wall.

Beyond the mouth of Noatak Canyon, the river flows southwestward across a valley floor which gradually widens to more than 20 miles. This portion of the Noatak Valley comprises a vast depositional basin, filled with till, outwash, and postglacial stream sediments, which extends about 70 miles to the Igichuk Hills near Kotzebue Sound."

#### Water volume and climate

The Noatak River has a drainage area of approximately 12,000 square miles. Water records kept for the years 1965 to 1970 show a total discharge in acre-feet of 1,025,000 for June; 577,400 for July, 1,201,000 for August; 341,100 for September; and 210,400 for October. Water temperatures range from approximately 50 degrees F. in early June to 56 degrees F. in mid-July to 35 degrees in late September before freezeup

#### Water Quality

The Noatak River is a fresh water stream. Its waters are crystal clear except when heavy rains occur in the mountains causing water level to rise and pick up loose sediment materials along the river banks. No study has

been made of water quality of the river. Some surface water samples have been made \_\_\_\_\_ in the general area. The overall chemical quality \_\_\_\_\_ was acceptable for most purposes. Surface-water samples generally have contained less than 200 mg/l dissolved-solids content and most have been of the calcium bicarbonate type. Water in coastal areas is generally higher in sodium and chloride contents during the summer than is water sampled farther from the coast. Streams nearer to the coast contain more sulfate relative to chloride than is common in most of Alaska. On the basis of 32 samples \_\_\_\_\_ the annual temperature ranges from 0 degrees C. to 16 degrees C.

Low temperature conditions of water elsewhere has been reported to be conducive to prolongation of the life of pathogenic bacteria. Although present low use of the river area appears to pose no health problems, indiscriminate disposal of wastes by larger numbers of recreationists or river users could lead to health risks in the future.

The present effect of the village of Noatak and other water users on the river's water quality is unknown; it is to be provided later by EPA.

#### Existing land use

The NoatakRiver and its immediate surroundings are primitive in nature. The main evidence of man is the

village of Noatak. The village has a population of just under 300 persons. It lies on the right bank of the river and is spread inland about 500 feet and is about 1/2 mile long up and down the river. A small airstrip lies on the southwest edge of the village. Numerous riverboats from the village are used on the river. Native fishing camps are located at the mouth of the Kelly River. Four cabins, of which two are being seasonally used by hunters, are located along the middle reaches of the river. One cabin near the Cutler River is clearly visible from the Noatak River. Excepting the village and the fishing camps, the remaining river shows practically no evidence of man's presence.

From the headwaters to the start of the Noatak Canyon, the river flows through arctic tundra as the main vegetative cover with numerous wildflowers and blueberry bushes interspersed through the tundra. Four to six foot high willows are dense where the tributaries meet the Noatak River and are scattered along the river between tributaries. The boreal forest starts at Noatak Canyon and becomes the dominant vegetative type. Although willows become larger (20 foot average height) and more plentiful, the spruce is the dominant tree. Willows and spruce (6 inch base diameter) are so thick from the Kelly River on downstream than an open campsite is difficult to find.



Very little mineral exploration has been done in the area. There are no known oil reserves, no known gold mining districts, and no known coal reserves along the Noatak River or in its immediate surroundings. Existence of other industrial minerals is unknown.

#### Present river uses

Existing use of the Noatak River is extremely limited as the study area is not road accessible. Natives fish the Noatak River, especially for salmon, at the confluence of the Kelly River. They also use the river as a main transportation means to get to Kotzebue. Natives also use the river to get to the caribou hunting area along the middle Noatak. These Native uses are traditional.

Recreational use of the river is practically nonexistent. As previously noted, two apparent hunter's cabins are located near the river and are being used. There is some hunting for Dall sheep in the headwaters area.

The Noatak appears to have significant water development potential according to Alaska Power Administration.

APA Reports state that inventory grade studies which involve only the power aspect indicate three potential developments. These are the Agashashok, Nimiuktuk, and Misheguk sites which have a combined firm power potential of about 500,000 kilowatts (50 percent annual load factor) with firm energy of about 2.3 billion kilowatt hours per year.

The Agashashok Project would involve the lowest unit power costs and have the most favorable location for access for construction and operation. It is considered the most favorable of the three.

Studies have not been made of benefits which might result from development of the projects under appropriate multiple-purpose plans. In this regard, the Agashashok Project may have particular significance as one of very few potentials for developing large water supplies in Northwest Alaska.

Potential values for water supply, storage and power indicate the Agashashok site may have both regional and national significance especially in view of the limited range of alternatives in Northwest Alaska.

#### Agashashok Project

The project would involve a concrete gravity dam raising the water surface elevation to 150 feet, or about 145 feet above the present river level. This would create a reservoir with a total volume of 28,500,000 acre feet and a surface area of 445 square miles, and provide full regulation of the Noatak River at the site. The plan would involve relocation of the village of Noatak.

Estimated firm power potential is 186,000 kilowatts (50 percent load factor) with annual energy production of 820 million kilowatt hours.

Preliminary observations indicate the project would have significant fish and wildlife, transportation, and sediment control aspects.

#### Misheguk Project

The plan involves a concrete dam and two earth dikes which would create a reservoir with water surface elevation at 550 feet, or about 245 feet above the present river elevation. This would create a reservoir with a total volume of 3,900,000 acre feet and a surface area of about 76 square miles. The reservoir would be about 46 miles long and confined in the Noatak Canyon.

Estimated firm power potential is 174,000 kilowatts (50 percent load factor) with annual energy production of about 760 million kilowatt hours.

Likely effects on fish and wildlife and other resources have not been evaluated.

Geologic conditions in the dike area on the right abutment of the Misheguk damsite may restrict development to a somewhat smaller scale.

#### Nimiuktuk Project

The plan involves a concrete dam and reservoir with water surface elevation at 750 feet, or about 205 feet above the present river elevation. The reservoir would be confined to the canyon and extend 42 miles up the Noatak

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River and 12 miles up the Nimiuktuk River. The reservoir volume is estimated at 5,700,000 acre feet, with a surface area of about 83 square miles.

Estimated firm power potential is 140,000 kilowatts (50 percent load factor) with annual energy production of about 613 million kilowatt hours.

Likely effects on fish and wildlife and other resources have not been evaluated for the Nimiuktuk project.

The inventory grade studies to date have been sufficient only to give rough estimates of the probable project costs and confirm the engineering feasibility of the project power features. Value of the three projects for power probably exceeds \$20,000,000 per year.

Because of its size and location APA believes the Agashashok Project merits consideration in any long range plans for the Noatak and the Northwest region.

The Misheguk and Nimiuktuk projects, though identified as among the more favorable hydro potentials of Alaska, appear to have relatively less importance. They may be

justifiable as future stages following development of an Agashashok project. Because of less favorable location and costs, they do not appear justifiable as single-purpose hydroelectric projects.

As indicated previously, studies have not been made of the benefits that might accrue under appropriate multiple-purpose plans.

The project studies to date have related solely to establishment of the power potential. With power operation, inflows to the reservoirs would be stored and released as required to meet power demands. The project operation according to APA would be shaped to minimize adverse fish and wildlife effects, facilitate fishery enhancement opportunities, facilitate water-borne transportation,

-----minimize  
downstream bank erosion, and otherwise maximize the project benefits.

The large reservoir capacity at Agashashok permits achievement of the full power potential with normal reservoir drawdown of about 22 feet. Minimum levels would be expected in spring, and maximum levels in late summer and fall.

Specific transmission line routes have not been established to date. Primary construction access to the Agashashok project would be via barge on the river. Approximately 110 miles of road along the foothills east

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Scale 1:250,000

Approximate  
Existing River  
Course

NOATAK

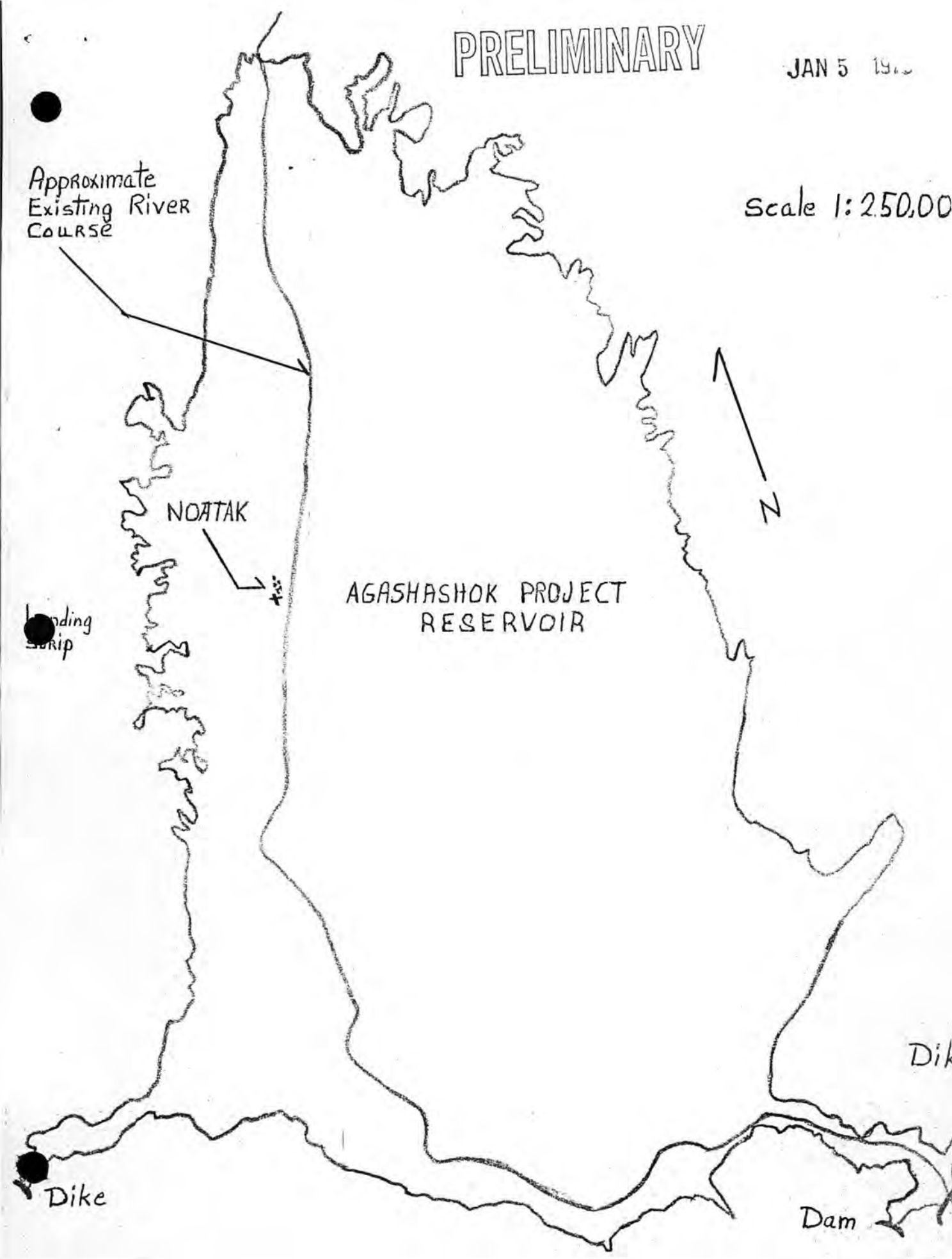
AGASHASHOK PROJECT  
RESERVOIR

Landing  
Strip

Dike

Dike

Dam



of the river would be required to reach the two upstream sites.

Revised cost data for the above projects is forthcoming and will reflect current prices and evaluation criteria as part of the current Alaska Power Survey.

Land ownership

The Noatak River lies within lands withdrawn for Native selection by the Alaska Native Claims Settlement Act and also lands withdrawn under section 17 (d)(2) of ANCSA. The Native withdrawal lands lie around the village of Noatak and the mouth of the Noatak River. The remaining lands are in (d)(2) status.

The larger (d)(2) land area surrounding the river contains more than 8 million acres. Within this larger (d)(2) area are approximately 159 applications for Native allotment land which totals 19,230 acres. None of the above figures include the Native Withdrawal lands around the village of Noatak or around the mouth of the Noatak River.

The Noatak River is 425 miles long. Approximately 60 miles of its length lies within Native withdrawal lands. The remaining 365 miles of the river lie within Federally owned lands. In the Federally owned lands, there are no patented mining claims, no patented homesteads, or any other lands patented to private individuals or groups. The cabins located along the river and the airstrips located at the Kelly River and at Cottonwood Creek are apparently in trespass.

River access

Present access to the Noatak River is limited to aircraft and riverboat. Riverboats navigate across Kotzebue Sound and then upstream to the village of Noatak and on up to the Kelly River. An airfield is located at Noatak. Two other small private landing strips are located at the Kelly River and near Cottonwood Creek. The Alaska Highway net, as proposed by the Alaska Department of Highways (1970) shows a proposed road traversing the Noatak River in its upper middle reaches and then continuing on to the Northwest Arctic Planning area. Other possible means of access to the river include All Terrain Vehicle use overland during the summer and snowmobile use during the winter.

Water rights - river bottom ownership

This section is to be supplied by the State of Alaska through the state representative on wild rivers.

Outdoor recreation resources and opportunities

Present recreational use of the Noatak River, especially the upper 3/4's, is minimal. Present use consists mainly of sports fishing and hunting, with hunters mainly after trophy Dall sheep. The river is navigable by 25 foot riverboats upstream from its mouth at least to the confluence of the Kelly River. The entire river is canoeable; however, few canoeists float the river. The river offers many rapids and long stretches of deep smooth pools for the



canoeist, depending upon water level. The river falls in class II of International Whitewater scale.

Excepting the village of Noatak, the river lies within a primitive wilderness setting. Outstanding recreation values of the Noatak River and its immediate surroundings include a distinct change and variety of scenery for the sightseer. The upper Noatak offers views of the high mountain grandeur of the Schwatka Mts., most notably Mt. Egikpak with its several glaciers. The middle river traverses through wide expanses of rolling arctic tundra country with background vistas of far away mountains. The Grand Canyon of the Noatak and Noatak Canyon gives variety to this by affording views of bluffs and interesting rock formations. The lower Noatak offers a distinct change in scenery as it flows through the dense boreal forest.

Wisconsin glaciation contributes much to the geologic history of the Noatak Valley. Pleistocene exposures are found along the river banks. The 200-300 foot high walls of Noatak Canyon exhibit interesting metamorphic rock formations, most notably a large "Z" formation on the north side along mid-canyon.

Ecological communities of animal and plant life are available in abundance for interpretation and observation. The largest (250,000 head) caribou herd in Alaska migrates across the Noatak valley from the calving grounds in the

north to the winter range south of the valley. Dall sheep inhabit the mountains along the upper Noatak and wolves and barren ground grizzlies roam the valley. Moose are also scattered throughout the valley. Arctic ground squirrels inhabit the riverbanks in large numbers. A large variety of birdlife can be observed by the amateur ornithologist. Raptors, including eagles, osprey, rough-legged hawks, gyrfalcon, and peregrine falcon can be seen. Sea gulls are seen along the middle and lower reaches of the river. A variety of waterfowl inhabit the delta and lower reaches of the river.

The river supports a good grayling, whitefish, and arctic char fishery, and a heavy chum salmon fishery for the sports fisherman. Occasionally sheefish can also be caught.

Archeological, historical, fish and wildlife,  
scientific and similar values

The Noatak River and valley reportedly have been used since early times by Natives as transport routes between Kotzebue Sound area and the North Slope area. Numerous archeological sites have been reported, especially along the middle reaches of the river. The "Z" shaped strata in Noatak Canyon is so striking that S. B. McLenegan wrote of it in his account, Exploration of the Noatak River, Alaska, dated 1885, and called it a "most remarkable phenomenon."

McLenegen was the first explorer of the Noatak River area to record his findings. From the Dictionary of Alaska Place Names, Geological Survey Professional Paper 567, we find concerning the river that "the early English name 'Inland River' published by surgeon John Simpson, RN, on his 1853 'Native Map,' appears to be a general translation of the Eskimo name 'Nunulak' which he also recorded. The name 'Nunatak' could also mean 'new land' or 'belong to the land.'"

The Noatak's unusually rich flora attracts diversity of wildlife. Although productivity rates are quite low for most species, vastness of most habitats results in significant total biomass.

The area represents a significant portion of one of the last great ranges of large American hoofed mammals and their predators. The approximately 240,000 member Arctic caribou herd frequents the Noatak annually during its migrations between wintering areas in the adjacent boreal forest and its calving ground and summer range on the North Slope of the Brooks Range.

This caribou herd is the largest in Alaska and its annual migration movements across the Noatak Valley represents one of the greatest wildlife spectacles of North America.

Other wilderness wildlife associated with caribou in the climax vegetation of the tundra biome include the barren ground grizzly, grey wolf, wolverine, Arctic fox, and moose. The Noatak is reportedly still a major stronghold of the barren ground grizzly, and sizeable numbers of Dall sheep range the high mountain country.

Approximately 150 species of birds of 33 families are known to inhabit the region. These include 25 species of waterfowl with pintails and greater scaup the most common nesting ducks. About 200 pairs of whistling swans raise their young in the delta country of the lower Noatak River.

Numerous species of shore, water, and passerine birds travel to the Noatak from many different lands to nest. Raptorial birds of special national interest include the golden eagle, white race of the gyrfalcon, and the peregrine falcon - an endangered species.

#### Limitations to recreation

The first existing limitation to recreation is the harsh arctic climate which allows a relatively short season for "summer" recreational uses (June through August). The river is usually frozen from mid-September to end of May.

Recreation is also presently limited by lack of access.

Potential limitations to recreation include the three potential damsites located on the lower and middle reaches of the river.

The state proposal for a highway across the mid-Noatak is a significant factor influencing land use. Should the highway be built, it is possible that the Noatak River area could be overused, thereby degrading and destroying the primitive character of the river.

Construction of trails and other intensive use recreation facilities is limited by the delicate nature of the area's vegetation and perhaps by soil conditions. Ecological costs of these items were developed in the wrong areas, may be excessive.

Some recreational activities such as cross-country vehicle uses may be limited by soil conditions. Surface damages can occur which may persist for long periods of time. Most surface damages occur during summer thaw periods. As human activities increase, accelerated surveillance and regulation of vehicles (particularly on any permafrost soils) may be necessary to minimize watershed damages and protect ecological and aesthetic values.

Potential limitations to recreation include the users themselves. It is quite possible that large numbers of recreationists in the river area would degrade or destroy the pristine environment and the primitive experience of the user. The most outstanding value of the river area could thereby be lost through overuse.

Since little is known of the mineral potential of the Noatak River area, potential limitations to recreation are unknown at present.

### Evaluation and Recommendations

#### Evaluation

The Noatak River possesses the qualities necessary for inclusion in the National Wild and Scenic Rivers System in that:

- The river is in a free-flowing natural condition.
- The river is sufficiently long to provide a meaningful experience
- The river and its immediate surroundings possess outstandingly remarkable scenic, geologic, fish and wildlife, archeological, and recreational values
- The river has sufficient water volume during normal years to permit full enjoyment of water-related outdoor recreation activities
- Water quality is good
- The river and its immediate surroundings are capable of being managed to protect and interpret special values and protect the user

The Noatak River is a pristine waterway flowing through a primitive wilderness area. With the exception of Noatak

Village, the Native fishing camps at the Kelly River, and a few cabins, the influence of man is not to be found along its reaches. The Noatak River meets the qualifications for inclusion in the National Wild and Scenic Rivers System as a wild river.

#### Recommendations

The Noatak River from its source to the confluence of the Kelly River should be managed as a wild river, from the confluence of the Kelly River to Kotzebue Sound it should be managed as a scenic river. The river should be further managed to maintain its pristine character and its surrounds should be kept in their natural state.

Further recommendations will be made when management plans are completed. Management plans for the Noatak River are to be supplied for the (d)(2) lands by the following interested Federal agencies: National Park Service, Bureau of Sport Fisheries and Wildlife, and the Bureau of Land Management.

A highway crossing the mid-Noatak could have a harmful effect on the pristine character of the river.

There are three potential powersites on the river according to Alaska Power Administration. If built, one reservoir would flood the village of Noatak necessitating its removal to another location. The three reservoirs would cover valuable arctic plant life, would remove

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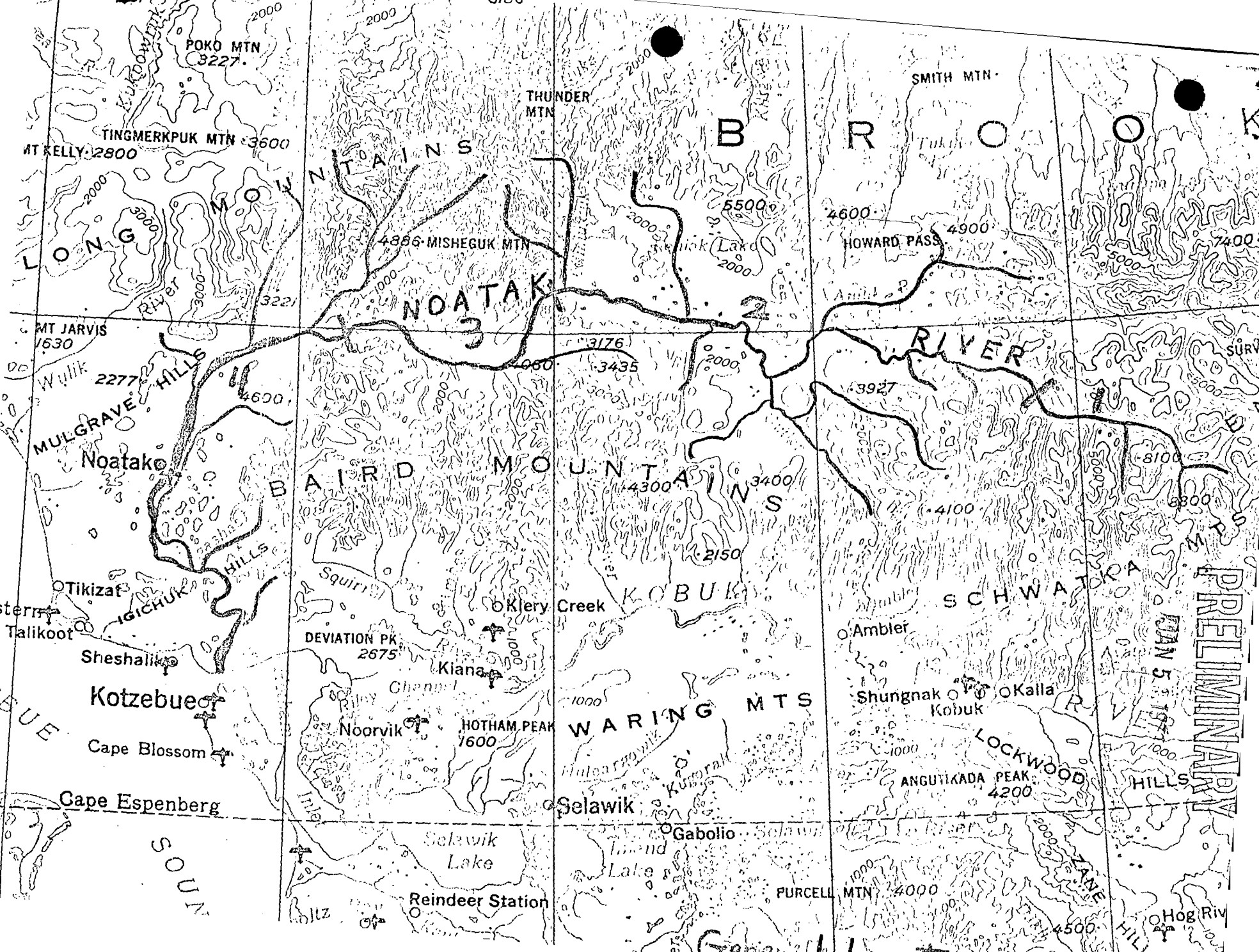
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wildlife and waterfowl habitat, and would inundate some areas of archeological and geological interest, and some scenic and recreational values would also be lost. It is therefore recommended that no dams be built on the Noatak River.

The Natives of the area have traditionally used the river for fishing, as a transport route to hunting grounds and to Kotzebue by crossing Kotzebue Sound after leaving the river. There are archeological sites containing Native artifacts located along the Noatak. It is recommended that the Native interest in the future development and use of the Noatak River be determined and the plans developed for the Noatak River reflect Native interests.





UNITED STATES GOVERNMENT

# Memorandum

*Mr. Clay Hardy*

D4225 Alaska  
(W&SRS)

TO : Assistant Director Eastman

DATE:

FROM : Alaska Task Force Leader

SUBJECT: Nowitna Wild and Scenic River Report

Enclosed are two copies of a preliminary draft of Chapters I through V of the subject report. A copy of this report has been provided to NWRO and BLM, BSF&W, NPS, and FS planning teams in Anchorage. Chapter IV will be distributed to study team participants.

It is emphasized that the conclusions and recommendations are based upon a single aerial examination on June 15, 1972, and upon office review of available information. On-site field examination is scheduled for this summer.

Following field work, the preliminary draft will be revised as appropriate and the remaining portions of the report completed.

*Jules V. Tileston*  
Jules V. Tileston

2 Enclosures

cc: WASO/Fred Strack



## I.

## INTRODUCTION

This report evaluates the free-flowing character of the Nowitna River, Alaska, as a basis for determining whether the river qualifies for inclusion in the National Wild and Scenic Rivers System and if so whether the river and its immediate environment should be included as a Federally administered component.

Within the next few years a major redistribution of the total land ownership patterns in Alaska will take place. These in turn will largely determine foreseeable uses and availability of public resources. On June 30, 1972, approximately 96.7 percent of Alaska's total acreage was owned by the Federal government. Selections by Natives under the provisions of the Alaska Native Land Claims Settlement Act will transfer 40 million acres (11.3 percent of the total land area) into private ownership. Combined with the 103 million acres made available to the State under the provisions of the Alaska Statehood Act, a total of 40.7 percent will move from Federal ownership.

Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act, P.L. 90-542, was approved on October 2, 1968. As stated by the Congress of the United States in that Act:

"It is hereby declared to be the policy of the United States that certain selected rivers of the Nation, which with their immediate environments,

possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes."

To implement this policy, Congress: established the National Wild and Scenic Rivers System; designated all or portions of eight rivers having a total of approximately 800 miles of free-flowing stream as initial components, and: designated 27 other rivers having a total of approximately 3,750 miles of free-flowing stream for study as potential additions to the system. None of these are in Alaska.

The task of preserving and administering free-flowing streams is not one that can or should be undertaken solely by the Federal government. Therefore, the 1968 Wild and Scenic Rivers Act directs the various Federal departments to encourage and assist states, political subdivisions and private interests, including nonprofit organizations, in the establishment of wild, scenic and recreational river areas.

For this reason two methods for preserving select free-flowing streams were authorized by the Wild and Scenic

Rivers Act: Act of Congress where Federal administration was appropriate, or; State legislation and the approval of the Secretary of the Interior where State or local groups would administer the area.

Free-flowing rivers within existing or proposed national forest, parks, wildlife refuges or other Federal land management units cannot be added to the national system without enactment of Federal legislation.

#### Alaska Native Claims Settlement Act

The Alaska Native Claims Settlement Act (ANCSA), P.L. 92-203 was approved on December 18, 1971. In that Act the Congress declared that:

"There is an immediate need for a fair and just settlement of all claims by Natives and Native groups of Alaska . . . the settlement should be accomplished rapidly . . . with maximum participation by Natives . . . "

To implement this settlement ANCSA directed that up to 120 million acres or one-third of the total land area of Alaska be made available for potential Native selection. The amount withdrawn for this purpose is approximately three times the 40 million acres which can be selected by Natives, and once the Natives have selected their land, the remainder will be made available for selection by the State under the Alaska Statehood Act or managed by the Bureau of Land Management under the Public Land Laws.

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Sec. 17(d)(2) further directed the Secretary of the Interior to:

" . . . withdraw from all forms of appropriation under the public land laws, including the mining and mineral leasing laws, and from selection under the Alaska Statehood Act, and from selection by Regional Corporations . . . up to, but not to exceed 80 million acres of unreserved public lands in the State of Alaska . . . which the Secretary deems are suitable for addition to or creation as units of the National Park, Forest, Wildlife Refuge, and National Wild and Scenic Rivers Systems . . . . "

Approximately 155 miles (      percent) of the Nowitna River, Alaska, from T. 18 S., R. 22 E. of the Kateel River Meridian to its mouth has been withdrawn under this provision of ANCSA.

#### Background

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 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 river totaling more than 15,000 miles be considered. Through screening and reconnaissance, 40 rivers with more than 3,400 miles were identified by the Bureau of Outdoor Recreation as having high potential

value (see Fig. 2, p. 26). These rivers were selected without regard to existing or potential ownership by Federal, State or Native groups.

On September 15, 1972, the Secretary of the Interior withdrew a two-mile wide corridor along approximately 115 miles of the Nowitna River between T. 15 S., R. 25 E. to T. 12 S., R. 26 E., Kateel River Meridian, under the provisions of Sec. 17(d)(2), ANCSA, as a potential unit of the National Wild and Scenic Rivers System.

On December 14, 1972, a 45-mile segment of the Nowitna in its headwaters area was redesignated by the Secretary of the Interior. This action, undertaken at the request of the Native Regional Corporation (Doyon, Ltd.), resulted in land previously withdrawn for potential Native selection being designated as "public interest" lands under the provisions of Sec. 17(d)(1), ANCSA. Authority to withdraw land for potential addition to the National Wild and Scenic Rivers System had expired at the time of the redesignation.

The uppermost 50 miles of the Nowitna River (    percent) have been identified for potential selection by the State under the terms of the Alaska Statehood Act.

#### Conduct of the Study

The study of the Nowitna River, Alaska, as a potential unit of the National Wild and Scenic Rivers System was a cooperative effort under the leadership of the Bureau of

Outdoor Recreation. On May 16, 1972, the Bureau created a task force to evaluate free-flowing rivers throughout Alaska and on May 31, 1972, established a temporary task force office in Anchorage, Alaska.

Evaluations and recommendations made by the Bureau of Outdoor Recreation have been coordinated with various Federal, State, Native and private groups. The final recommendations, however, are those of the Bureau of Outdoor Recreation.

Agencies invited to participate in field examinations, provide factual data and to review preliminary drafts included:

Alaska Natives

Tanana Chiefs Conference (Doyon, Ltd.)

State of Alaska

Coordinated through the Governor's Office

Department of Agriculture

Forest Service

Department of the Army

Corps of Army Engineers

Department of the Interior

Alaska Power Administration

Bureau of Indian Affairs

Bureau of Land Management

Bureau of Mines

Bureau of Sport Fisheries  
& Wildlife

Geological Survey

National Park Service



Department of Transportation

Federal Aviation Agency

Federal Highway Administration

Office of the President

Environmental Protection Agency

Joint Federal-State Land Use Planning Commission

Land Use Planning Team

Comments received from these agencies and groups are reflected in this report.

Comments and views presented at hearings held by the Joint Federal-State Land Use Planning Commission in April and May 1973 throughout Alaska and at selected cities in the conterminous 48 states are reflected.

Field investigations were conducted by air, canoe and auto during 1972 and 1973.

## II.

## SUMMARY OF FINDINGS AND RECOMMENDATIONS

### Findings

This study has revealed that the Nowitna River possesses the values which qualify it for inclusion in the National Wild and Scenic Rivers System. The Nowitna River fulfills the requirements of the Wild and Scenic Rivers Act, and meets the supplemental criteria established jointly by the Secretary of the Interior and the Secretary of Agriculture, as published in "Guidelines for Evaluating Wild, Scenic and Recreational River Areas Proposed for Inclusion in the National Wild and Scenic Rivers System under Sec. 2, P. L. 90-542, February 1970."

The fundamental assets of the Nowitna River are its outstandingly remarkable scenic, geologic, wildlife and recreational resources.

It has been found that:

- There are no developed areas within the river corridor with the exception of a few isolated cabins.
- The river is unpolluted and meets the "Aesthetics-General Criteria" developed by the National Technical Advisory Committee on Water Quality, FWQA, Water Quality Criteria, April 1, 1968.

- Existing recreational use of the river corridor is exceedingly light with greatest use during August and September when hunters travel up the Nowitna by river boat or fly into the upper reaches in search of moose.
- There are no water withdrawals, channel improvements, impoundments or any type of water resource development within the Nowitna corridor; however, on the Yukon River below the mouth of the Nowitna near the village of Ruby there is the potential Ruby hydroelectric damsite which, if developed, would inundate approximately 75 miles of the lower Nowitna.
- There are no extensive stands of commercial quality timber along the Nowitna River. Trees of commercial size are found in patches or stringers along the river and have, in the past, been cut for firewood and construction of cabins.
- At the present time the economic potential of the Nowitna River corridor is unknown. There are a few gold placer claims within the drainage but none along the river corridor. The quality of the area may be considered favorable for mineralization.

## Recommendations

To preserve the Nowitna River in its free-flowing condition and to protect and enhance its natural values for the benefit and enjoyment of present and future generations.

It is recommended that:

- The lower 200 miles of the Nowitna River be included in the National Wild and Scenic Rivers System as a Federally administered component.
- The river segment designated be from T. 18 S., R. 22 E. of the Kateel River Meridian, 2 miles below the mouth of Pilot Creek, to the mouth of the Nowitna where it flows into the Yukon.
- The Nowitna be designated a Wild River area as described in Sec. 2(b)(i) of P.L. 90-542, the Wild and Scenic Rivers Act.
- The Federal land manager of the adjacent land area administer the Wild River area.
- Lateral boundaries be delimited by the administering agency within one year from the date of the Act including the Nowitna Wild River in the national system. Such boundaries not to exceed an average of 640 acres per mile from the high water line on each side of the river or approximately 256,000 acres.

- The administering Federal agency work with the State to determine the feasibility and desirability for adding the uppermost 50 mile segment of the Nowitna which has been identified for potential State selection under the Alaska Statehood Act.
- That provisions be made by the administering agency to provide for continued use of the river and its immediate environment by local residents in order to help preserve their cultural heritage and life style.

### III.

### REGIONAL SETTING

#### Landscape

The region through which the Nowitna River flows is located in the west central portion of Alaska's Interior. The mouth of the Nowitna approximately 200 miles west of the Fairbanks area (population 45,864)<sup>1/</sup> and 300 air miles northwest of the Anchorage area (population 124,542)<sup>1/</sup>.

The west central portion of Alaska's Interior is characterized by broad river valleys bordered by stream sculptured hills. By comparison with much of Alaska the topography is relatively gentle. The Boreal Forest covers the lowlands and tapers gradually into tundra vegetation at between one and two thousand feet. Wildlife is abundant. The first impression of most summer observers is that this is a friendly, habitable land. And so it is, however, being at such high latitude it is beyond the zone of the optimum human development of agriculture and manufacturing thus is not doubt destined to remain an area of sparse population.

The Yukon River cuts a diagonal path southwesterly across the region. The Nowitna is one of several tributaries which drain lake dotted alluvial basins that afford outstanding summer habitat for ducks, geese and other northern nesting birds.

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<sup>1/</sup>1970 Population Census, U.S. Department of Commerce.

The region lies within the Yukon-Koyukuk Census Division, is relatively remote and lacks road access with the major population centers of Alaska.

Spruce and birch are dominant species within the region with cottonwood and tamarak abundant in places. Largest specimens of spruce are found along the river in well drained soils. Stunted spruce trees grow generally over the poorly drained areas and are the chief form of forest growth in the swampy alluvial lowlands. Birch does better on well drained slopes and dunelike hillocks of the alluvial plains where it vies with cottonwood. Tamarak grows sparingly except in areas underlain with limestone. Of the smaller species, willow and alder are the most prevalent and thrive along the river.

Vegetation within the region, besides trees, consists of mosses, grasses, shrubs, and a variety of herbaceous plants.

The region supports a wide variety of wildlife. Black and grizzly bear, wolves, moose and caribou are found in addition to numerous smaller animals. Waterfowl are also abundant in the region.

The rivers of the area support runs of chum coho and chinook salmon as well as northern pike, arctic grayling, sheefish, whitefish ciscoes, barbot, longnose suckers, trout-perch, sculpins and lake chubs.

There are no major agricultural activities in the region. There are small mining operations near Hughes and Ruby. The region is still relatively primitive in setting and the landscape has not been significantly altered by the presence of man.

### Climate

Lying within the interior basin of Alaska, the climate is classified as sub-polar continental. Winters are long and severe. Extended periods of intense cold with 90 degrees of frost are not uncommon during the winter. In the summer, the temperature often rises above 80 degrees F. as a result of the long duration of sunlight at this latitude.

The frost-free period is normally about 100 days; however, frost may occur during every month of the year.

Precipitation averages less than 20 inches annually and is erratic. Rainfall generally occurs as fine drizzle which, during July and August can last for several days at a time. Heavy downpours are rare. Snowfall averages between 45 and 60 inches in the region.

### Population and Economy

#### Population

The population in Alaska in 1970 was 302,173, of which 51.6 percent was rural and 48.4 percent urban.



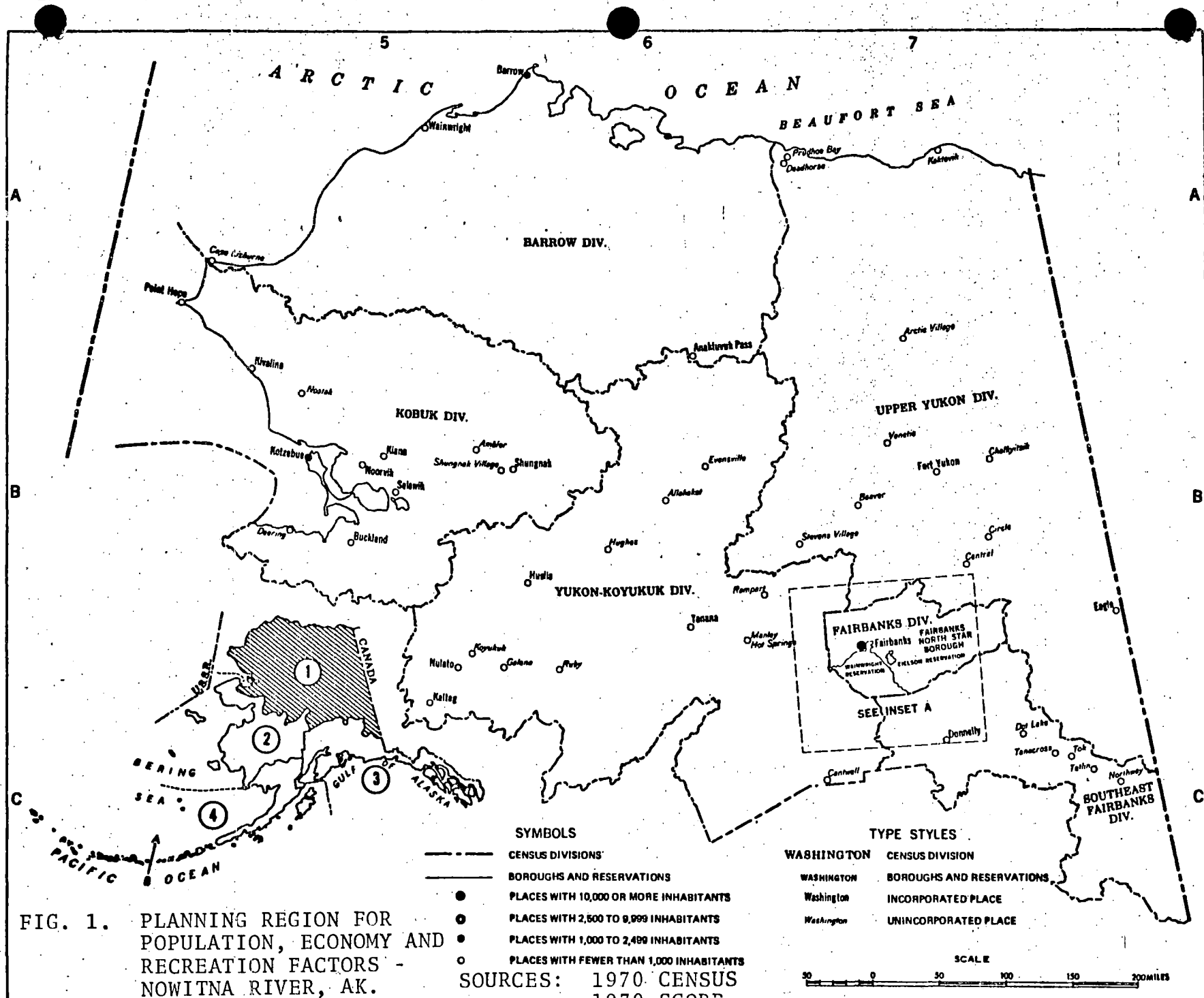
Between 1960 and 1970 the population of Alaska increased 32.8 percent while the people residing in urban areas increased 10.5 percent.

Population projections used in the Alaska Statewide Comprehensive Outdoor Recreation Plan (1970) estimates the total State population will be 331,000 by 1975 and 565,000 by 2000.

The Nowitna River basin in its entirety is located within the Yukon-Koyukuk Census Division (Fig. 1 ). In 1970 there were 4,752 people living in this Census division. Unfortunately, the census division does not give a total for 1960 as many of the villages were not incorporated at that time; consequently, we have no definitive assessment of the percent change during the decade.

Most of the population resides in 20 places. The largest are Anderson City and Nenana, both with a 1970 population of 362. The smallest of the 20 is Manly Hot Springs with a population of 34 in 1970.

Of the 20 villages, mentioned within the census division, the closest to the Nowitna are Ruby and Tanana. Ruby lost 19 percent of its population from 179 to 145 between 1960 and 1970. Tanana was not incorporated prior to 1960; therefore there are no data on percent change. The 1970 population of Tanana was 120.



## Economy

Alaska's economy can be separated into two distinct parts: cash (where dollars earned purchase goods and services) and subsistence (where work is related to direct procurement of food and shelter).

Important elements of the Statewide economy include government, minerals, forestry and tourism. Of these minerals (primarily oil and gas) and tourism have shown the greatest growth and appear to have the greatest potential for future growth.

Growth in the mineral industry other than oil and gas has been fairly slow in recent years. The low rate of growth is related to several factors: low base metal prices, high investment cost, difficult access and uncertainty of future land ownership. These inhibitors are further compounded by the subarctic climate.

Tourism in its broadest sense shows the greatest promise for statewide expansion. The Alaska Survey and Report, 1970-1971, Vol. 2, states:

"Of all parts of the Alaskan economy, tourism can most rapidly provide jobs to the widest spectrum of educational and age levels. It can also, with advertising and investment, direct economic growth to depressed areas of the state."

Between 1964 and 1971 tourism in Alaska increased from 59,200 visitors who spent \$18.2 million to 130,000 visitors and \$45 million. In 1972 there were slightly more than

161,000 tourists and a preliminary estimate of 190,000 in 1973. Expenditures by tourists were distributed as follows: 30 percent lodging, 20 percent each restaurants and transportation, and 10 percent each food stores, merchandise and other services.

Information developed by the University of Alaska indicates that of the over \$50 million generated by tourism in 1971, 64 percent (\$29.8 million) were attributable to visits to the four units of the National Park System in Alaska.

During 1971, the latest year for which complete figures are available, tourism accounted for 3,700 employed persons with total wages of \$22.9 million.

The same factors for investment cost, transportation, resource ownership and climate that inhibit mineral development also depress outdoor recreation growth.

Sport fishing and hunting are also significant contributors to the Alaskan economy. Information developed by the Alaska Department of Fish and Game indicates that sport fishing in Alaska contributes approximately \$22 million in 1972.

Within the Yukon-Koyukuk Census Division unemployment in 1970 was 11.4 percent. Median family income was \$13,028 with 17.6 percent earning less than the poverty level. Most wage employment is seasonal with greatest opportunities

during the short summers. Local residents are often employed on an emergency basis to fight forest fires. The income in that activity fluctuates in direct proportion to the number, size and frequency of the fires.

### Subsistence

Subsistence is defined as a life style related to obtaining food and shelter directly from the land. Included are those activities where the person must secure his food by hunting and fishing or else go hungry, and the pursuit of food as either a matter of choice or as supplemental activity.

Recent changes in life style have increased the shift from a subsistence economy to cash. The advent of the snowmobile may represent the largest factor in this shift as cash must be obtained to purchase fuel for the snowmobile whereas dogs to pull sleds could be fed fish. New housing with more space to heat and the switch from wood to oil burning heaters also requires cash as do water, sewer and electricity. Trapping is the only significant activity in the region which now offers cash potential in this life style.

Natives residing in the region look mainly to the Yukon and tributary rivers for their continuing dependable supply of food. The surrounding interior forested hill and mountain country offers a variety of terrestrial game

animals and fur animals for subsistence. Among these the caribou, moose and bear and beaver, marten, mink, and muskrat are most important.<sup>1/</sup>

### Transportation

The region surrounding the Nowitna River basin is accessible by air. There are no road or rail facilities. Barge transportation does exist on the Yukon River. Daily air service is found at Fairbanks and periodic scheduled air service is available to all villages and several bush strips. Chartered air service is available throughout. Small riverboats still ply the waters of the region for recreational and subsistence purposes.

The Alaska Department has long-range plans which involve consideration of constructing a highway link along the north side of the Yukon River between Tanana and Amangak near its mouth.

### Recreation

The large Interior Region used by the State in its Statewide Comprehensive Outdoor Recreation Plan includes all of the Nowitna River basin, much of the Yukon-Koyukuk Census Division as well as Alaska's second largest population area and the northern part of Mount McKinley National Park. Based upon data collected by the State for that area it becomes apparent that even with the outstanding amount of raw resource available for outdoor recreation, most is

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<sup>1/</sup>1968. Alaska Natives and the Land. Field Comm. for Development in Alaska.

unavailable because of distance, limited access or lack of facilities. Those resources which are accessible and developed often receive use in excess of their intended capacity.

The Alaska Statewide Comprehensive Outdoor Recreation Plan indicates a

" . . . . major need for trail development, particularly in view of the high cost of other means of access. Trail related activities (including canoeing) also constitute by far the most popular form of recreation in the State, and a strong system of trails would provide not only trail recreation (such as hiking and horseback riding) but also badly needed access to remote areas for other recreational pursuits (such as camping, fishing and hunting)."

Projected total annual outdoor recreation demand for the State as a whole indicates an increase of between 235 and 516 percent for selected activities between 1967 and 1985. Of these, trail-related outdoor recreation activities are the most popular. By 1985 trail-related activities -- a form of outdoor recreation in which 85 percent of residents and nonresidents participate -- will increase by 249 percent. The State further anticipates that trail-related activities will maintain its top ranking as the most popular activity (Table I).

When existing facilities are compared with projected annual demand for outdoor recreation in the Interior Region it is found that there are major deficiencies (Table 2).

It should be noted that the data presented in Tables 1 and 2 were based upon the primary assumption that approximate land status would continue. These projections would be most conservative in the event all or substantial portions of the public lands withdrawn under section 17 (d)(2) of ANCSA are included in one of the four national conservation systems by the Congress. Also it is noted in 1972 there were 53,252 visits to state park units in the Interior Region. Projected visits for 1973 contemplate a 300 percent increase -- to 179,000 visits. Thus, even under present conditions the 1970 data appear conservative.

Table 1. Forecast of Total Annual Demand for Selected Outdoor Recreation Activities, Alaska, 1970, 1975 and 1985.

Activity	Percent increase over 1967 in participation days		
	1970	1975	1985
Trail related	129	147	249
Sightseeing	146	175	385
Driving and pleasure	136	162	335
Picnicking	132	162	235
Fishing	134	169	343
Camping	156	197	516
Hunting	130	149	254

Source: Alaska Statewide Comprehensive Outdoor Recreation Plan, 1970, Vol. 1, p. 20.



Table 2 Comparison of available Outdoor Recreation Facilities and Projected Demand<sup>1/</sup> for Selected Activities in the Interior Region, Alaska.

Activity	Facilities <sup>2/</sup>	1975	Participants <sup>3/</sup>	
			1980	2000
Hiking	54 mi.	3,500	3,800	6,200
Canoeing	137 mi <sup>4/</sup>	2,200	2,400	3,200
Cross-Country Skiing	none	100	200	300
Snowmobiling	50 mi.	1,500	1,600	2,400
Motorboating	29 launching spaces	3,950	4,800	8,800
Picnicking	157 units	14,700	17,200	29,200
Developed Camping	1,202 units	7,200	9,100	23,200
Undeveloped Camping	20 units	2,800	3,500	6,800
Sightseeing	209 <sup>5/</sup>	12,400	15,400	37,600
Driving for Pleasure		15,100	17,800	32,000

<sup>1/</sup>Demand computed on basis of peak day or average day depending upon the activity and need for specific facilities to be available at any one time.

<sup>2/</sup>Statewide Comprehensive Outdoor Recreation Plan, 1970, Vol II, Exhibit IV-15.

<sup>3/</sup>Ibid. Vol. IV, Appendix J.

<sup>4/</sup>125 miles are inventoried as in Federal ownership.

<sup>5/</sup>Parking spaces in scenic turnouts

The Alaska Statewide Comprehensive Outdoor Recreation Plan makes reference to the availability of 399 miles of "formal" canoe trail (137 miles in the Interior Region. See Table 3). The term "formal" is misleading in that there are no specific State or local plans or programs to protect or manage these resources, and the vast majority of the identified "formal" canoe trails are located on Federal land.

There are presently no rivers in Alaska included in the National Wild and Scenic Rivers System; however, the Nowitna River has been identified by the Bureau of Outdoor Recreation as one of 40 Alaskan rivers (Fig.2 ) having high potential for inclusion in the National Wild and Scenic Rivers System. Of these 40 select Alaskan free-flowing rivers, 15 (including the Nowitna River) are located within the 220,000 square mile Alaskan portion of the Yukon River drainage. The values of the Nowitna River are not duplicated by any of the 39 other free-flowing rivers identified by the Bureau of Outdoor Recreation.

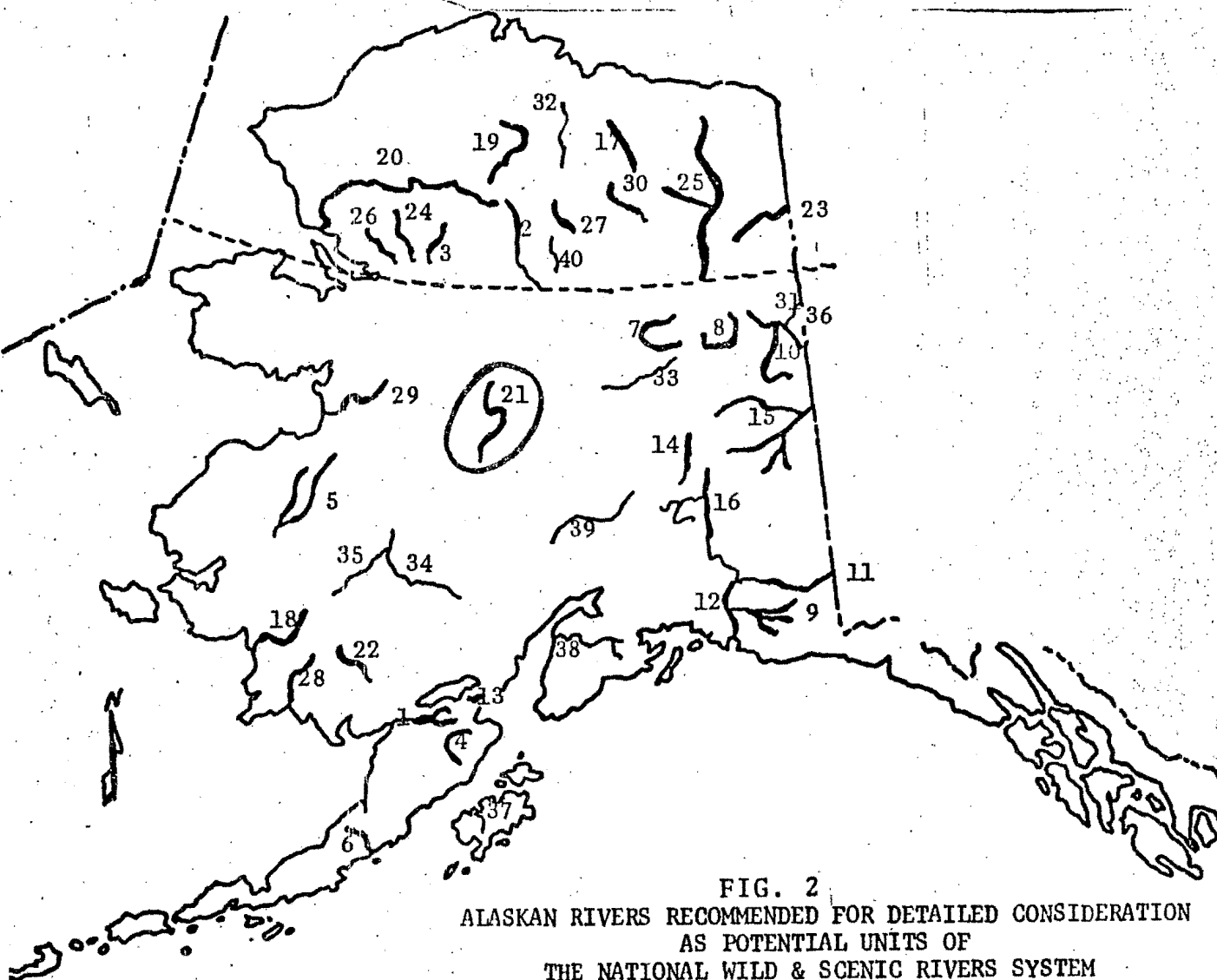


FIG. 2  
ALASKAN RIVERS RECOMMENDED FOR DETAILED CONSIDERATION  
AS POTENTIAL UNITS OF  
THE NATIONAL WILD & SCENIC RIVERS SYSTEM

- \* All or substantial portions classified under 17(d)(2) of ANCSA.  
# Detailed studies have been initiated on segments shown in heavy line.  
Other rivers could be studied upon request by land manager.

- \*# 1. ALAGNAK
- \*# 2. ALATNA
- \*# 3. AMBLER
- # 4. AMERICAN CREEK
- # 5. ANDREAFSKY (2 FORKS)
- \*# 6. ANIAKCHAK
- \*# 7. BEAVER CREEK
- \*# 8. BIRCH CREEK
- \*# 9. BREMNER
- \*# 10. CHARLEY
- \*# 11. CHIITINA
- \*# 12. COPPER
- \*# 13. COPPER (ILIAMNA)
- # 14. DELTA
- \*# 15. FORTYMILE (SYSTEM)
- # 16. GULKANA
- \*# 17. IVISHAK
- # 18. KANEKTOK
- \*# 19. KILLIK
- \*# 20. NOATAK
- ~~\*# 21. NOWITNA~~
- \*# 22. NUYAKUK
- \*# 23. PORCUPINE
- # 24. SALMON
- \*# 25. SHEENJEK-KONESS
- # 26. SQUIRREL
- \*# 27. TINAYGUK
- \*# 28. TOGIAC
- \*# 29. UNALAKLEET
- \*# 30. WIND
- \*# 31. YUKON
- 32. ANAKTUVUK
- 33. CHATANIKA
- 34. HOHOLITNA
- 35. HOLITNA
- 36. KANDIK
- 37. KARLUK
- 38. KENAI-RUSSIAN,  
SWANSON - SWAN LK
- 39. SUSITNA
- 40. WILD

#### IV.

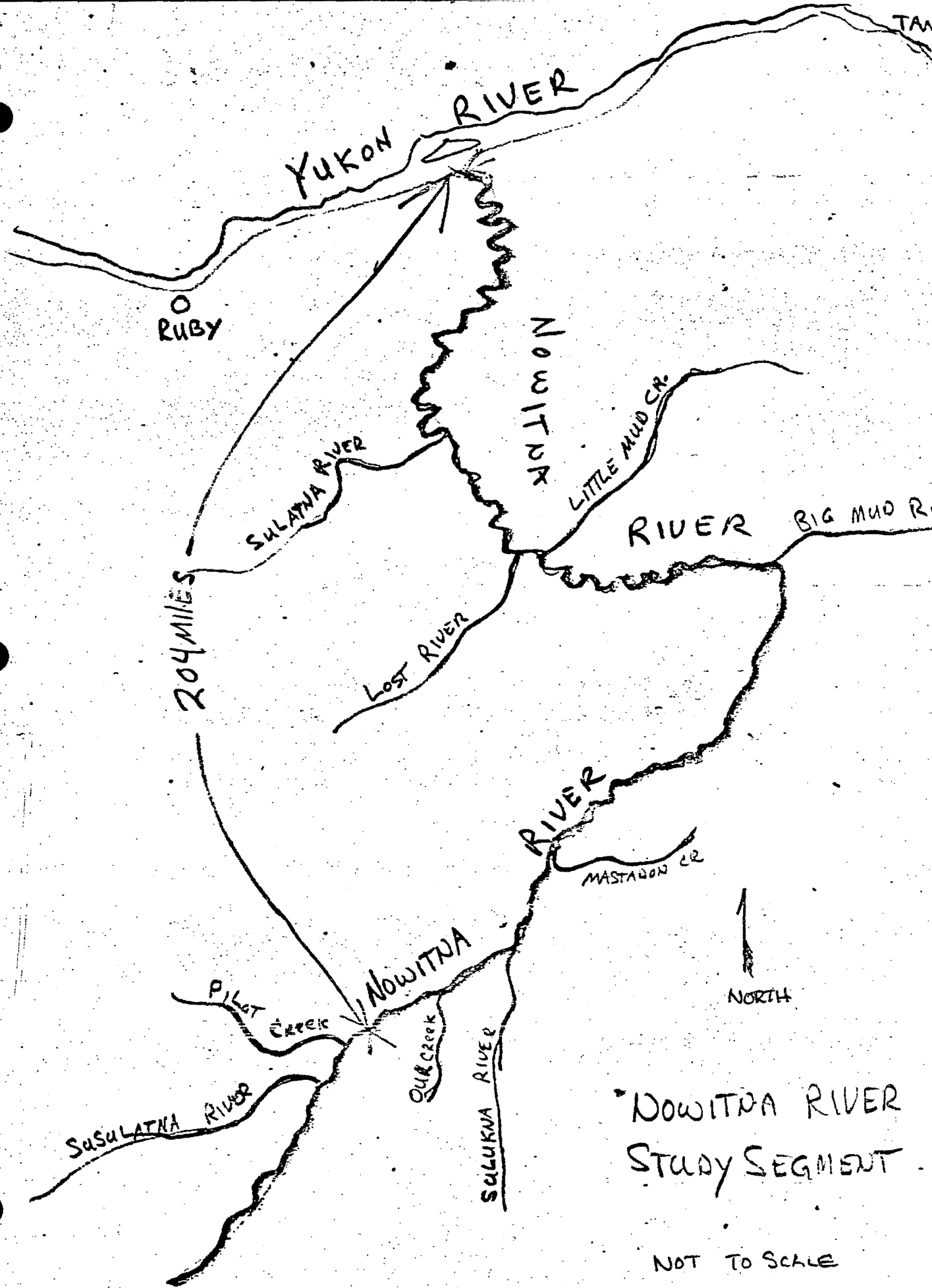
#### DESCRIPTION AND ANALYSIS

##### River Setting

The Nowitna River is a clear-free-flowing stream which rises in the Kuskokwim Mountains in interior Alaska. It meanders in a northerly direction for 250 miles to its confluence with the Yukon River approximately 190 miles west of Fairbanks.

The river flows through an unglaciated area of Alaska. From source to mouth the Nowitna drops from 1,000 feet to approximately 150 feet m.s.l. as it meanders through a variety of landscapes including rolling hills, canyon, broad valleys and flats. River width varies from approximately a quarter mile near the mouth to less than 30 feet in the headwaters. The average width is about 300 feet.

The Nowitna River flows through primitive country which may be termed a true wilderness. The river is inaccessible except by air or riverboat from the Yukon. Trappers who frequented the region in the past generally outfitted at Tanana or Ruby and got their supplies to their base camps during open season by poling their boats up the river. They would bring out their furs in the spring by the same means following break-up. A few isolated cabins may still be found in the Nowitna drainage. The study segment extends 204 miles from 2 miles below Pilot Creek to the Yukon.



The river corridor is generally forested owing to its low altitude. Timberline in this latitude is about 2,000 feet above sea level and the Nowitna headwaters are approximately 1,000 feet above sea level. There are untimbered areas where soil conditions are apparently unfavorable.

The Nowitna, or Novi, as it is referred to locally, originates just south of Sunshine Mountain and follows a serpentine course to its confluence with Mastadon Creek. From Mastadon Creek to approximately 10 miles below the confluence with Big Mud River, the Novi unwinds and picks up speed. Occasional stretches of riffles and some white-water is encountered in this reach. It is here the river cuts through a canyon in contrast to the flats above and below. Beyond Big Bend River the Novi begins to meander. Large oxbox lakes, bogs and ponds are characteristic of the setting through which the river flows to its mouth opposite Edith Island in the Yukon.

#### Stream Flow

Detailed information on flow characteristics is unavailable as there are no stream gaging stations on the river. The Nowitna is a free-flowing, clearwater river carrying a moderate amount of organic material which gives the water a murky cast. The river character varies from smooth pools to low rapids. Seasonal flows are assumed

to be typical of other nonglacial streams which flow northward to the Yukon. Maximum stream volumes are associated with spring breakup and snow melt. As a result of continuous permafrost conditions present which prevent any substantial amount of percolation, rainstorms can result in a stream rise of several feet; however, rain induced river volumes are limited to a matter of hours to days.

As a rule the Nowitna runs free of ice in May and freezes over in October. Permafrost is continuous along the Nowitna corridor and this condition results in spring floods and hundreds of ponds and small lakes in the Nowitna lowlands.

#### Water Quality

As of the date of this writing there have been no water quality studies performed on the Nowitna River by the U.S. Geological Survey or the Environmental Protection Agency; consequently, there are no data available to compare with water quality standards. The Nowitna River does meet the Aesthetics-General Criteria developed by the National Technical Advisory Committee on Water Quality, FWQA, Water Quality Criteria, April 1, 1968.

There are no known permanent residences along the Nowitna River nor are there any known sources of sewage or chemical pollution.. During the summer months the river

is used by recreators and water for drinking and cooking purposes is often taken directly from the river and used without treatment.

Sec. 12(c) of the Wild and Scenic Rivers Act states that:

"The head of any agency administering a component of the National Wild and Scenic Rivers System shall cooperate with the Secretary of the Interior and with the appropriate State water pollution control agencies for the purpose of eliminating or diminishing the pollution of waters of the rivers."

Sec. 9(a) of the same Act also directs the administering Secretary to issue mining regulations which " . . . shall among other things, provide safeguards against pollution of the river involved . . ."

Water quality standards are being revised in accordance with latest regulations and guidelines resulting from the enactment of the Federal Water Pollution Control Act Amendments of 1972.

#### Land Use

Land use patterns along the Nowitna River corridor have changed little over time. There are no developed areas except for a few isolated trappers cabins. The river flows through a primitive environment for its entire length.

Present use of the Nowitna is limited primarily to recreation, hunting, fishing and trapping. Users must



either fly in or travel upriver by boat from the Yukon.

The mineral potential of the Nowitna drainage basin is unknown. Not enough data are available to make an accurate appraisal of the mineral potential of this area. There are only a few gold placer claims within the drainage, with most of these being located in the Sunshine Mountains in the area upstream from the study area. One other gold placer occurs near the head of Our Creek, which is a headwater tributary to the Nowitna. There are no known claims within the river corridor or its immediate environment.

Based on the U.S.G.S. Metal Province Map of Alaska, the Nowitna River drainage basin could realize a potential for antimony, copper, gold, mercury, lead, silver, tin, tungsten, and zinc. The geology of the area can certainly be considered favorable for mineralization.

As a result of the continuous permafrost and attendant poor drainage, wide expanses of forest are of noncommercial value. There are stringers of commercial quality timber along the Nowitna and its tributaries but not extensive stands. Although there are signs of previous cutting, there have been no commercial harvests of timber along the Nowitna.

#### Water Resource Developments

There are no existing or authorized water resource development projects on the Nowitna River.

The Alaska Power Administration, in their "Summary of Alaska Lower Priced Hydroelectric Potentials" - 1968, has listed 76 potential power projects. None of these sites are located on the Nowitna River; however, the Ruby site located on the Yukon River would, if constructed, inundate approximately 75 miles of the lower reaches of the Nowitna, assuming a maximum water surface elevation of 210 feet.

Information furnished by the Alaska Power Administration states that the Ruby site is the most favorable storage potential between the mouths of the Tanana and Koyukuk Rivers, and would be a key unit in any plan to develop the power, navigation and related potentials of the Yukon River. It also could be a key to providing flood protection on the Yukon River below the Tanana River.

The studies of the Ruby project to date have been largely limited to considerations of the project as a single-purpose hydroelectric development operating in conjunction with the Rampart project. Reservoir elevation would be at 210 feet, the tailwater level at the Rampart power plant.

However, the available topographic maps and geologic inspection of the damsite indicate the Ruby project could be developed to fully regulate the Yukon River at the site without upstream storage. The Ruby project is a key

storage potential on the Yukon River that could be developed either independently or in conjunction with any of several possible upstream storage systems.

Should the development of other major upstream storage potentials be precluded or limited, the Ruby reservoir according to the Alaska Power Administration would be essential to regulation of middle Yukon River flows.

Assuming a maximum water surface elevation of 210 feet, Ruby project would have an annual average energy production of 6.4 billion Kilowatt hours, with installed capacity of 1.46 million Kilowatts at 50 percent load factor. The comparable figures for a high project with a water surface elevation of 325 feet would be 14.2 billion kilowatt hours and 3.25 million kilowatts.

No studies of fish, wildlife and recreational aspects have been made by the Alaska Power Administration and specific needs and routes for electric transmission facilities have not been determined on this \$510,000,000 project.<sup>1/</sup>

The Ruby project is an identified major water resource development potential; however, there are no active proposals to construct it.

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<sup>1/</sup>Costs are on an October 1965 base price. All data related to the project are preliminary approximations for inventory purposes.

## Land Ownership

The Nowitna River heads in the Kuskokwim Mountains and flows through lands withdrawn as State selections pending until about 2 miles below the confluence of Pilot Creek, T. 18 S., R. 21 E. of the Kateel River Meridian. The remainder of the river flows through lands owned by the Federal government and presently managed by the Bureau of Land Management.

Generalized land status for the Nowitna River from its source is as follows:

Initial 50 river miles - Withdrawn for potential transfer to the State under the Alaska Statehood Act

Next 45 river miles - Withdrawn as "public interest" lands under the provisions of Sec. 17(d)(1), ANCSA.<sup>1/</sup>

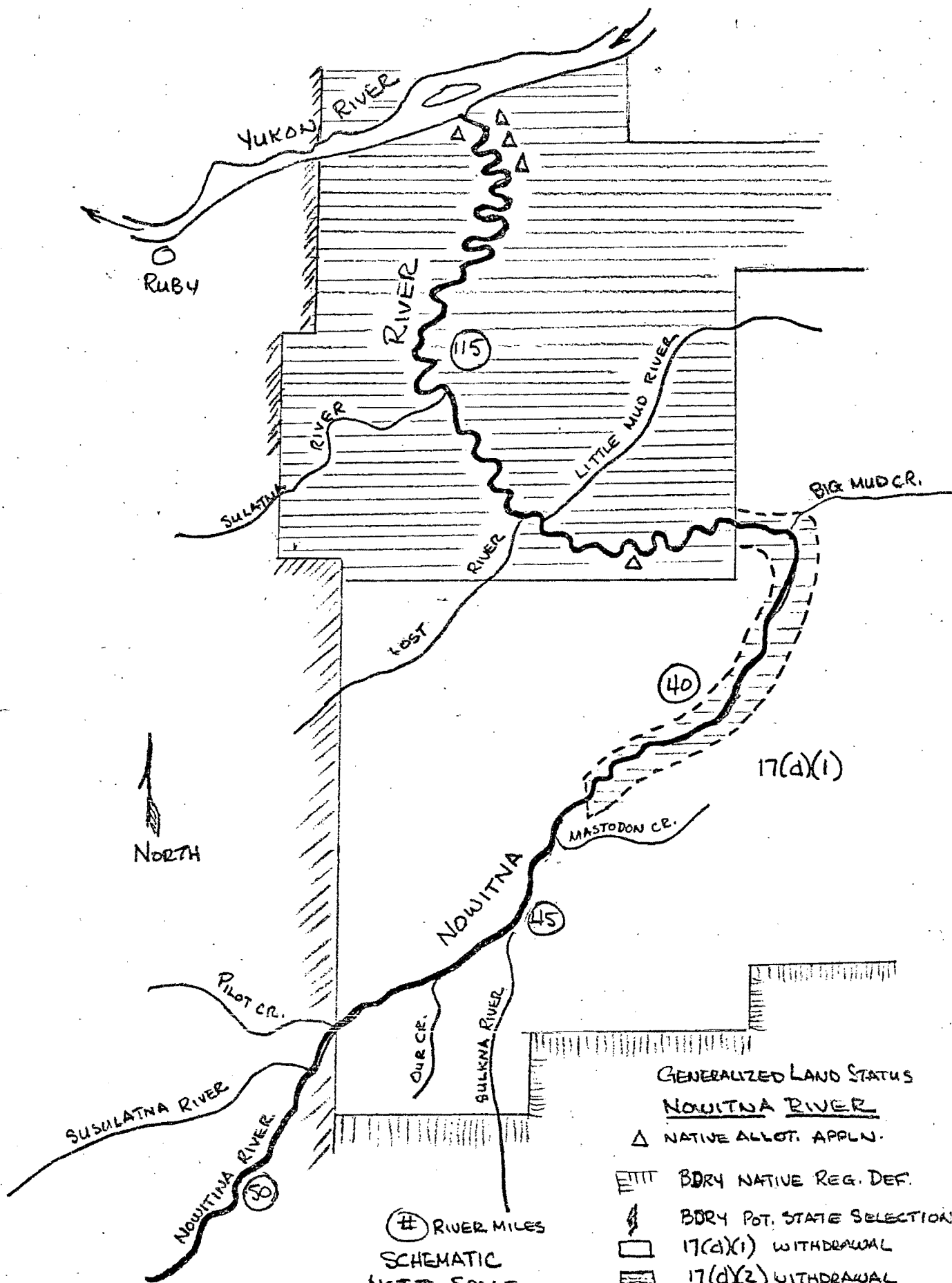
Next 40 river miles - Withdrawn as a two-mile wide corridor of national interest lands under Sec. 17(d)(2), ANCSA, surrounded by lands withdrawn under Sec. 17(d)(1).

Lower 115 river miles - Withdrawn as a larger block under Sec. 17(d)(2).

There are no mining claims in the river corridor and no patented lands. There are, however, five Native allotment applications, two of which are divided into two parcels each.

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<sup>1/</sup>This is part of a larger tract withdrawn by the Secretary of the Interior for potential Native selection under the provisions of ANCSA. At the request of the Doyon, Ltd. Native Regional Corporation this withdrawal was relinquished on December 14, 1972.



Federal land managing agencies expressing interest in the Nowitna River area are the Bureau of Land Management, the Bureau of Sport Fisheries and Wildlife and the U.S. Forest Service.

#### Water Rights, Navigability, and Riverbed Ownership

There are no adjudicated water rights within the river corridor.

Under the Alaska Statehood Act, the State of Alaska owns the streambeds of all "navigable" waters of the State. Under criteria being developed by the State of Alaska to determine streambed ownership, the Nowitna River would appear to be "navigable."

The U.S. Army, Corps of Engineers, does not consider the Nowitna River a "navigable" stream. As of the date of this writing, streambed ownership has not been determined.

Evidence collected in this study indicates that there generally is sufficient water volume to permit a pleasurable recreation experience in powerboat, raft, canoe or kayak.

#### Access

##### Existing

The Nowitna River is not road accessible anywhere along its 250 mile long course. There are presently no plans on the part of the State Department of Highways to

construct a road to the river; however, a potential transportation corridor follows the Yukon and passes opposite the mouth of the Nowitna.

There are no landing fields along the river although light aircraft on floats can land on the river itself and wheeled aircraft can land on many of the gravel bars except during flood stage.

The river is accessible by riverboat from the Yukon. Many hunters from the Fairbanks area trailer their riverboats to Manley Hot Springs when they put in their boats and travel down the Yukon to the mouth of the Nowitna and thence upstream to this selected hunting areas.

During the long winter months the Nowitna is accessible overland by snowmobile and dogsled.

#### Potential

In addition to the existing means of access, potential exists for access to the lower Nowitna by canoe from Trail Creek. It is possible to drive from Ruby to the Johnson VABM site, put a canoe in on Trail Creek, canoe Trail Creek to the Sulatna River and down it to the Nowitna.

#### Geology and Soils

##### Geology

The Nowitna River drainage is stratigraphically and structurally very complex. The basement rock is dominantly

a Precambrian or Paleozoic metamorphic complex, which is separable into two groups - a lower group composed chiefly of limestones and greenstones, and an upper group of mainly schists and quartzites. These rocks are unconformably overlain by Ordovician limestones.

The dominant trend of the structural features throughout the region is northeasterly. Local variations from the dominant trend are few, and such variations probably represent local deflections of the stresses that formed the major features. At least two stages of faulting are present. Reverse faults and dominantly right-lateral strike slip faults of an earlier period appear to be genetically related to the folding. Recent movement along younger normal faults can be seen east of the drainage in scarps on alluvial fans of Quaternary age.

The Nowitna River valley might be termed a rock collector's paradise. Garnets, petrified wood, chalcedony, and agates are present with agates occurring in great numbers, varying in color from deep red to bright yellow.

In addition to these quartz rocks, bones of prehistoric animals may occasionally be found along the river as the Nowitna slowly erodes its banks. One of the tributaries to the Nowitna is named Mastadon Creek - a tribute to the fact that huge animals once roamed this wilderness in those distant days before history.



## Soils

The severe winters, short growing season and low temperatures of the Nowitna River area result in extremely thin and fragile soils. The gravelly and stoney soils on the slopes of the canyon area are subject to solifluction and destruction of the vegetative cover can result in severe erosion.

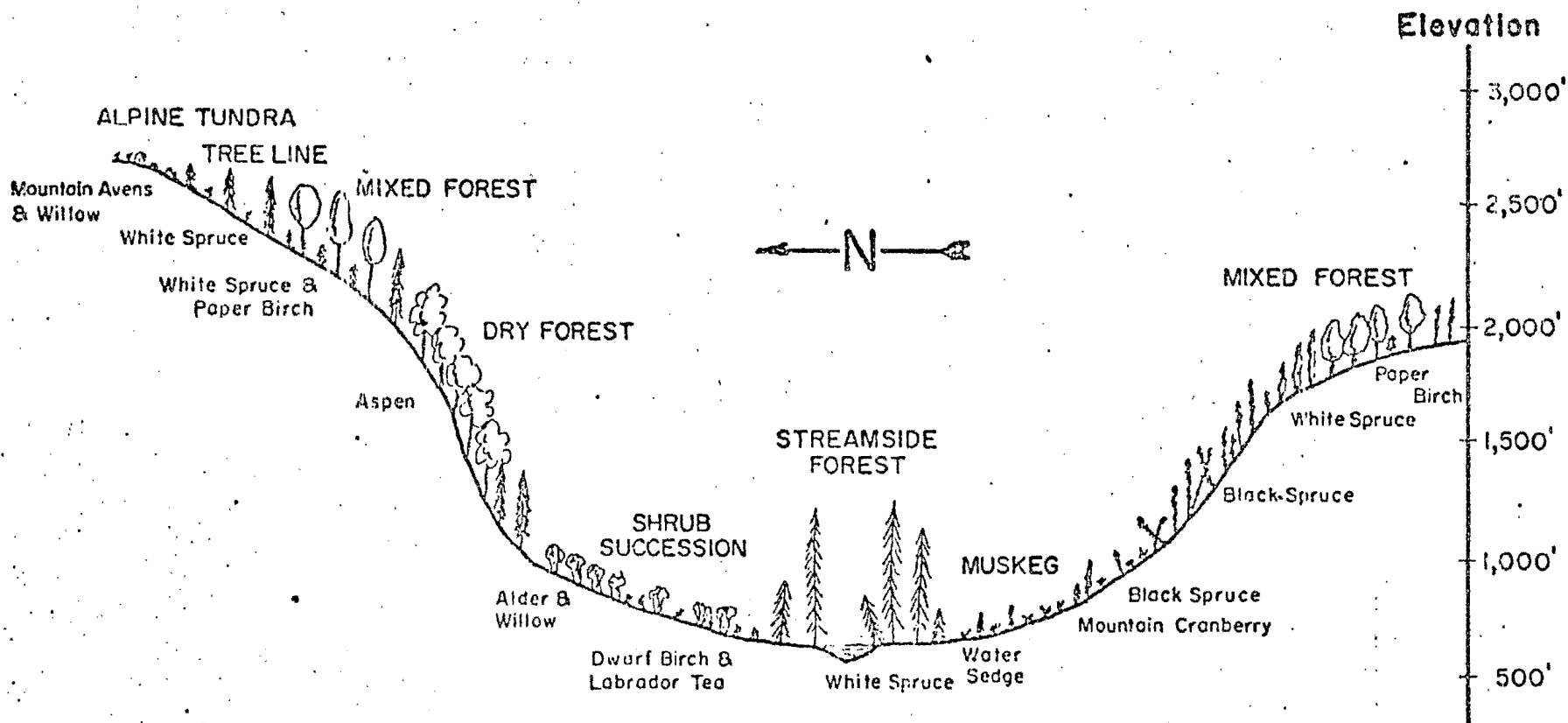
The valley floor is susceptible to marshiness and/or flooding and soils are poorly drained. A large portion of the river area is underlain by permafrost which, because of shallow overlying soils, is quite incompatible with surface disturbance.

## Vegetation

Plant associations within the Nowitna River corridor and the immediate environment of the river are typical of interior Alaska. See Fig. . The white spruce-paper birch forest is called the boreal forest or taiga. Most forest stands are a mixture of two or more tree species but are usually classified by the dominant species.

Closed spruce-hardwood is the dominant forest type along the Nowitna River drainage. White spruce stands are found on the warm, dry, south-facing slopes where drainage is good and permafrost is lacking or not close to the surface. Associated with white spruce are paper

FIG. 3. DIAGRAM OF VEGETATION TYPES ALONG A TOPOGRAPHIC GRADIENT IN



birch, balsam poplar, bearberry, red current, prickly rose, several willows, mountain-cranberry and bog blueberry.

Because of extensive burns during the past 100 years, large areas of the interior are in various stages of forest succession.

In general, fires or surface disturbances where at least some topsoil is left are first covered with light-seeded willows, prickly rose, labrador-tea, dwarf blueberry and mountain-cranberry.

Following the willow stage, fast growing quaking aspen stands develop in upland areas on south-facing slopes. After 60 to 80 years quaking aspen are replaced by white spruce in all but excessively dry conditions where aspens persist. If the disturbance or fire occurs on well drained lowland river terraces, the quaking aspens are often replaced by black spruce. Plants commonly associated with the quaking aspen type are white and black spruce, several willows, bearberry, prickly rose, buffaloberry and mountain-cranberry.

If the fire or surface disturbance occurs on east or west facing slopes (and occasionally on north-facing slopes and areas of low relief) the paper birch type is the initial tree community. Paper birch stands may be in pure stands but are more often in mixed stands of black and

white spruce. Understory plants are commonly labrador-tea and mountain cranberry.

In addition to the above plant communities, the Nowitna River drainage has locally well developed stands of the balsam poplar type, and open, black spruce.

The balsam poplar type reaches its greatest size and abundance on flood plains. Other important plants associated with this type are alders, black cottonwood, willows, prickly rose and high bushcranberry.

Open, black spruce forests are found on north-facing slopes and poorly drained lowlands where permafrost is close to the surface. A thick moss mat, often of sphagnum mosses, sedges and grasses are also found.

Because of long dark winters and short bright summers, flowering plants bloom and seed in rapid sequence. Wildflowers, especially in burned areas are striking in their color and abundance.

Blueberries are locally abundant, ripen during the last week of July and are found in edible quantities for some six weeks thereafter. Low bush cranberries ripen in late August. Rose hips are edible in late August and early September.

In addition to aesthetic and wildlife values, the natural vegetation in the Nowitna River area is extremely

important in maintaining water quality and a stable watershed. Dense ground cover of grasses, mosses, shrubs and trees retards surface runoff and insulates the underlying permafrost.

Some of the timber found along the river has commercial value; however, the difficult access and small size of timber stands associated with the Nowitna River suggest little likelihood for economic development. In the past, a few trees have been cut for construction of hunting, trapping and guiding cabins and for related use as fuel.

#### Wildlife and Fishery

##### Wildlife

Black bear habitat and life styles vary little throughout much of interior Alaska. They have been present at least from post-glacial times. Being highly mobile and omnivorous, they live wherever foods such as grass, horsetail, sedges, berries, carrion and fish are available. Population levels are poorly known, but seem to fluctuate greatly over a period of years from relative scarcity to abundance. Hunting pressure has never been sufficient to affect population levels in the interior. Most recreational use of black bears is incidental to other hunting activities, hiking or sightseeing. Harvest by hunters is low; however, in recent years black bear hunting has gained in popularity.

Brown-grizzly bear distribution in the region is related to the occurrence of alpine and sub-alpine habitat. Highest population levels appear to be in the central Kuşkokwim Mountains but they also occur sporadically on lowlands. In general, population levels in the Nowitna region are low to moderate compared to those found in most of interior Alaska. General observations, limited surveys and harvest data are the only present sources of information.

Wolverines occur throughout the Nowitna area and distribution likely has not changed significantly in the last several hundred years although minor shifts may have occurred in response to shifts in distribution of moose and caribou. Population levels are known only in relative terms and appear moderate to high compared with other parts of interior Alaska as existing food and habitat are probably near optimal for wolverines in this area.

Wolf range throughout the area. Their chief prey species is moose. Population levels are known only in general terms and relative abundance has varied from low to very high in response to production, natural mortality and hunting. Varied cover and prey species assure the continued success of wolves as a part of the natural fauna of the area.

Moose have apparently long inhabited the Nowitna River valley although few observations of moose distributions and abundance have been recorded. Population appears to expand rapidly only to "crash" during winters of deep snow. The relative influence of flooding on calf survival is not known. Riparian willow stands are of prime importance in sustaining moose populations.

Caribou distribution and range have changed markedly over the past century. Presently there is a winter range along the south side of the headwaters of the Nowitna River above Clearwater Creek. Caribou may be found elsewhere along the river as far upstream as the confluence of Lost River; beyond this area, caribou are not present. There are no migration routes along the river corridor.

Extensive waterfowl habitat is associated with the Nowitna drainage. Primary species of ducks include lesser scaup, pintail, American widgeon, mallard, green winged teal and white winged scoter. Other breeding birds include shoveler, golden eye, bufflehead, canvasback, redhead, old squaw, red-breasted merganser, harlequin, sandhill crane, loons, grebes, Canada geese and white-fronted goose. Trumpeter swan are relatively scarce although habitat appears to be suitable.

## Rare and Endangered Species

The following wildlife species associated with the Nowitna River basin are listed in the Department of the Interior's 1966 "Red Book of Rare and Endangered Species":

American peregrine falcon (Falco peregrines anatum) - rare

Timber wolf (Canis lupus lycon) - endangered  
(only in conterminous 48 states)

Grizzly bear (Ursus arctos) - endangered  
(only in conterminous 48 states)

Wolverine (Gulo luscus) - status undetermined

Canada lynx (Lynx canadensis) - status undetermined

## Fishery

Of the five species of Pacific salmon, only chum, coho and chinook ascend the Yukon River as far as the Nowitna. Resident fish include northern pike, arctic grayling, whitefish, ciscoes, longnose suckers, inconnu (sheefish), burbot, lake chubs, trout-perch, and sculpins. Of these the northern pike is most common.

The Nowitna River is an excellent sport fishery for sheefish and northern pike.

## History

There is no single treatise on the history of west central Alaska as such. The more dramatic events of Alaska's history have taken place elsewhere. Except for the several reports of early explorers and geologists the



area is mentioned only in general terms in works relating to larger areas.

Man first occupied the Yukon Valley during the Pleistocene Period at a time when much of North America was covered by ice sheets. The first immigrants were hunters from Central Asia who were no doubt lured across the Bering Land Bridge by a wealth of great mammals, many of which are now extinct. Much of the Yukon valley was never ice covered and was probably forested throughout the ice age. Early hunters after crossing the tundra covered Bering land bridge may have found the area with its boreal vegetation a more practical place to live than the wind swept coastal regions. Remains of ancient man have yet to be found in the study area but the bones of mastadons and other great mammals are not uncommon.

The first white man found an extremely vigorous group of Athapascan Indians occupying the river valleys of this region. The Ingalik people lived along the Nowitna River.

The history of the white man in West Central Alaska began with the discovery of the Yukon by the Russian, Andree Glazanof in 1834. Russian interest in the furs of the region resulted in the establishment of a post at Nulato in 1838. Relations with the Indians were evidently tenuous because twice the post was burned when the Russians

were absent and in 1851 the inhabitants were massacred.

But Nulato survived as a profitable station until the Alaska Purchase in 1967. In the early years of the Nulato post it became evident that much of the fur of this region was bypassing the post and reaching Kotzebue thence Siberia by some unknown native route. In 1842 Lieutenant L.A. Zagoskin of the Russian Navy was dispatched to investigate the unknown trade routes. Zagoskin's explorations resulted in the first description of the Yukon to the Nowitna.

After the Alaska purchase steamboats began to ply the Yukon from St. Michael on the coast to supply fur traders but by 1873 there were no more than half a dozen white men living along the entire Yukon River. Gold discoveries on the Upper Yukon caused a slow increase in river traffic. Wood cutting for the steamers became an important local industry that lasted several decades until the conversion of boats to oil prior and during World War II. Evidence of this is still visible along the lower Nowitna.

After the big gold stampedes to Dawson, Fairbanks and Nome subsided prospectors penetrated nearly every portion of Alaska. There were small gold rushes to the Ruby area and the head of the Innoko and Koyukuk Rivers in the first decade of the century. Populations of these mining

districts never exceeded a total of five thousand. The Innoko and Koyukuk were both important trade routes during this period with attendant wood camps, trails, roadhouses for winter use and other minor developments. The lands surrounding the Nowitna were prospected during this period but no discoveries of any consequence were made.

As interest in gold subsided many white men diverted to trapping. There was a boom in fur prices during the twenties and thirties and the river valleys were fully occupied by trappers both Indian and white.

Today the Nowitna River valley is substantially as it was before the coming of the white man. The region shows little evidence of the activities of man except for a few trappers cabins.

### Recreation

#### Resources

Alaska presents a challenge for the future. Its unusual array of open space, wildlife, fisheries, and frontier atmosphere combine to make an unexcelled potential recreation mecca. At the same time these many attractions are diminished as uncontrolled and often conflicting resource uses expand.

The river, wide and deep, is suitable for both canoe

or power boat. The flow is slow as it meanders north from the Kuskokwim Mountains to the Yukon. Fishing is excellent, and the animal and plant life and their ecological communities are available for interpretation. The Nowitna flows through a region inhabited by numerous species of small mammals and furbearers as well as black and grizzly bear, wolf, wolverine, moose and caribou; consequently, it offers excellent opportunity for hunting with rifle or camera.

#### Existing Use

The Nowitna, in its relatively inaccessible location, has limited recreation pressure even though it lies within 200 miles of the second largest city in the State. There are no lodges, permanent campgrounds or public facilities along the river, and, although the river is visited by recreators, there are no figures available for recreation use.

Present recreational use of the river is limited to such activities as hunting, fishing, rock collecting, canoeing and boating. The Nowitna is most popular as a boating stream. Recreationists from Fairbanks boat down the Tanana, down the Yukon and up the Nowitna. Its chief attractions are its clear water, good fishing and abundant wildlife in a primitive setting. The river gets its heaviest use during the hunting season when hunters travel upriver by riverboat to hunt for moose.

The gravel bars in the river contain agates, some as large as a man's fist. The Nowitna may be referred to as a rock collector's paradise. Some recreators journey to the river for the sole purpose of collecting agates of various sizes and colors.

#### Potential Uses

In addition to hunting, fishing, boating and gem collecting the Nowitna provides the opportunity for hiking into side drainages in the upper reaches. Gold panning on a recreational basis can have considerable appeal to the outdoorsman.

The abundance of wildlife and the scenic qualities of this remote region provide outstanding subjects for the nature photographer and sightseer.

Although camping would generally be associated with all of the above activities, some people engage in this outdoor recreation activity as an end in itself. There are numerous opportunities for primitive camping sites along the Nowitna River. The many gravel bars and plentiful firewood in this primitive setting are most attractive for this purpose.

Table - shows projected outdoor recreation demand for the Interior Region, Alaska (Alaska Statewide Comprehensive Outdoor Recreation Plan). The Interior Region includes

Table: Projected Outdoor Recreation Demand 1/

Interior Region, Alaska

Activity	1975	1980	2000
Hiking	3,600	3,800	6,200
Picnicking	14,700	17,200	29,200
Developed camping	7,200	9,100	23,200
Undeveloped camping	2,800	3,500	6,800
Beach Swimming	3,600	4,300	7,400
Sightseeing	12,400	15,400	37,600
Driving for Pleasure	15,100	17,800	32,000
Motorboating	3,950	4,800	3,800
Canoeing	2,200	2,400	3,200
Alpine Skiing	2,700	3,500	6,100
Cross-country Skiing	100	200	300
Snowmobiling	1,500	1,600	2,400
Flying for Pleasure	1,000	1,100	1,700
Totals	70,750	84,700	164,900

1/ Design load in participation days

that portion of the State between the Brooks and Alaska Ranges and includes the entire Nowitna River basin. The Table also shows the estimated potential of the Nowitna River, if included in the National Wild and Scenic Rivers System, to meet some of this demand.

### Limitations

The climate of Interior Alaska limits recreational use of the Nowitna River. The river is generally frozen from October to May. Winters are long and severe and the short summer season hosts mosquitoes by the millions. During the months of July and August gray days and drizzle are the rule rather than the exception.

A potential limiting factor is the hydroelectric dam-site on the Yukon River at Ruby. If this potential power project were developed the lower 75 miles of the Nowitna River would be inundated turning the free-flowing river into an arm of a lake.

The relatively large population of black bears along the river may be considered by some as a limiting factor. Although the bears are not normally aggressive, they are generally curious animals and the potential for man-bear conflicts exists. On the other hand, the abundance of bears may well serve as an attraction to the wildlife photographer and wilderness traveler.

The most serious condition which limits recreation use of the area is the lack of access. The river is not road accessible and may be reached only by air, riverboat or overland travel. Light aircraft can land on river bars, or, if equipped with floats, in the river. Boats can proceed upstream from the Yukon as long as the rapids are not too shallow for the propeller shaft. Jet boats could proceed considerably further upstream than those equipped with outboards. Overland travel during the winter months by dog team or snow machine is possible; however, during the summer, overland travel is limited by terrain and marshy conditions resulting from permafrost inhibiting snow melt percolation.



Conclusions

The conclusion of this study is that the Nowitna River and its immediate environment possess values which qualify for inclusion in the National Wild and Scenic Rivers System.

Careful review of available information together with on-site inspection shows that:

- The river is in a free-flowing natural condition.
- The river is of sufficient length to provide a meaningful experience to the river user.
- There is sufficient volume of water during normal years to permit full enjoyment of water-related outdoor recreation activities.
- The river and its immediate environment possess outstandingly remarkable scenic, geologic, wildlife, historic and recreational resources.
- Water quality is good and meets the "Aesthetics - General Criteria" as defined by the National Technical Advisory Committee on Water Quality in the Federal Water Pollution Control Administration's Water Quality Criteria, April 1, 1968.
- The river and its immediate environment are capable of being managed to protect and interpret special values and protect the user.

- The wildlife, river character, geology and the primitive setting of simple vastness offer spectacular recreation opportunities. Hunting and fishing, rock collecting and power boating are presently the major recreational activities along the Nowitna River; however, potential exists for many forms of outdoor recreation. Sightseeing, nature study, wildlife photography and camping in a primitive environment are also activities for which the Nowitna River valley offers outstanding opportunity.
- The values of the Nowitna River are not duplicated by any of the 39 other Alaskan free-flowing rivers identified by the Bureau of Outdoor Recreation as having high potential for inclusion in the National Wild and Scenic Rivers System.

#### Recommendations

It is recommended:

- That the Nowitna River be included in the National Wild and Scenic Rivers System as a Federally administered component.
- That the river segment designated be from 2 miles below Pilot Creek in T. 18 S., R. 22 E. of the Kateel River Meridian, to its mouth where

it flows into the Yukon River, a distance of 204 miles.

- That the Nowitna be designated a Wild River area as described in Sec. 2(b)(i) of P.L. 90-542, the Wild and Scenic Rivers Act.
- That the Federal land manager of the adjacent land area administer the Wild River area.
- That lateral boundaries be delimited by the administering agency within one year from the date of the Act including the Nowitna Wild River in the national system. Such boundaries not to exceed 640 acres per mile from the high water line on each side of the river, approximately 262,000 acres, for protection of the river environment and provision of recreation use areas giving special attention to the primary visual corridor and wildlife habitat.
- That the 46-mile river segment above the study reach which has been withdrawn under the Alaska Native Claims Settlement Act for State selection be studied at a later date for possible addition to the Nowitna Wild River area should the State request such a study be undertaken. This upper segment, if included, to be administered by the State of Alaska.

- That provisions be made by the administering agency to provide for continued Native subsistence use of the river and its immediate environment in order to help preserve the cultural heritage and lifestyle of America's oldest inhabitants.

UNITED STATES GOVERNMENT

# Memorandum

D4225 Alaska  
(W&SRS)

TO : Assistant Director Eastman

DATE: May 25, 1973

FROM : Alaska Task Force Leader

SUBJECT: Nuyakuk Wild and Scenic River Report

Enclosed are two copies of a preliminary draft of Chapters IV and V of the subject report. A copy of this draft has been provided to NWRO and BLM, ~~BSF&W~~ NPS, and FS planning teams in Anchorage. Chapter IV will be distributed to study team participants.

It is emphasized that the conclusions and recommendations are based upon aerial examination in 1972 and office review of available information. On-site field inspection of the river is scheduled for this summer. Following the field work the enclosed draft will be revised as appropriate and the remaining portions of the report completed.

  
Jules V. Tileston

2 Enclosures

cc: WASO/Fred Strack



Conclusions

Careful review of available information together with on-site inspection shows that the 16 1/2 mile segment of the Nuyakuk River from T 3 S., R. 51 W. (4 1/2 miles below Tikchik Lake) to the Native Village withdrawal boundary at T. 3 S. R. 49 W., Seward Meridian:

- Is a clearwater, free flowing river without impoundment, straightening, rip rap or other modifications of the waterway.
- Has sufficient volume of high quality water during normal years to permit full enjoyment of available outdoor recreation potentials.
- Has outstandingly remarkable character in terms of its unspoiled natural setting where the works of man have not intruded or altered fish, wildlife, scenery, streamflow, geologic, historic or other similar values.
- Supports a salmon run which is a valuable commercial fishery resource.
- Would be seriously effected by an interbasin hydroelectric water resource project which would drastically reduce the overall flow of the Nuyakuk River.
- Has existing and potential public outdoor recreation values which are not duplicated in the nearby Alagnak, Togiak or Kanektok River areas or the other 37 Alaskan

free-flowing areas identified by the Bureau of Outdoor Recreation as having high potential for inclusion in the National Wild and Scenic Rivers System.

• Is immediately adjacent to an area (Wood River-Tikchik Lakes) identified by the State of Alaska as having exceptionally high recreation potential for protection and development.

• Is in an area where there is a continuing Federal interest in the short- and long-range management of public resources and there is significant potential for coordinated management of these resources with both upstream and downstream resource managers.

It is further concluded that:

• In its existing condition the 16 1/2 mile segment of the Nuyakuk River together with its immediate environment meets all the attributes and criteria established for "wild river areas" as defined by the National Wild and Scenic Rivers Act (P.L. 90-542)- EXCEPT that the study segment is not of sufficient length to provide a meaningful outdoor recreation experience in terms of values normally associated with components of the National Wild and Scenic Rivers System

• The river may be of sufficient length for inclusion in the national system if State and native lands are added to the study segment.

## Recommendations

It is recommended that the 16 1/2 mile segment of the Nuyakuk River and its immediate environment from T. 3 S., R 51 W.:

- Not be included in the National Wild and Scenic Rivers System as a Federally administered component at this time.
- Be retained in federal ownership and be given special management consideration to preserve the river's existing "wild river type" values.
- Be administered by the Bureau of Land Management as the agency having primary responsibility for the adjacent area.

It is further recommended that:

- The Bureau of Land Management actively participate with both upstream and downstream land owners to explore the possibility of including their sections of the river in a coordinated management plan.
- The Bureau of Land Management, the State, and Natives conduct a coordinated investigation to determine if a combination of their lands would qualify as an addition to the National Wild and Scenic Rivers System and how the river should be added to the system and classified.



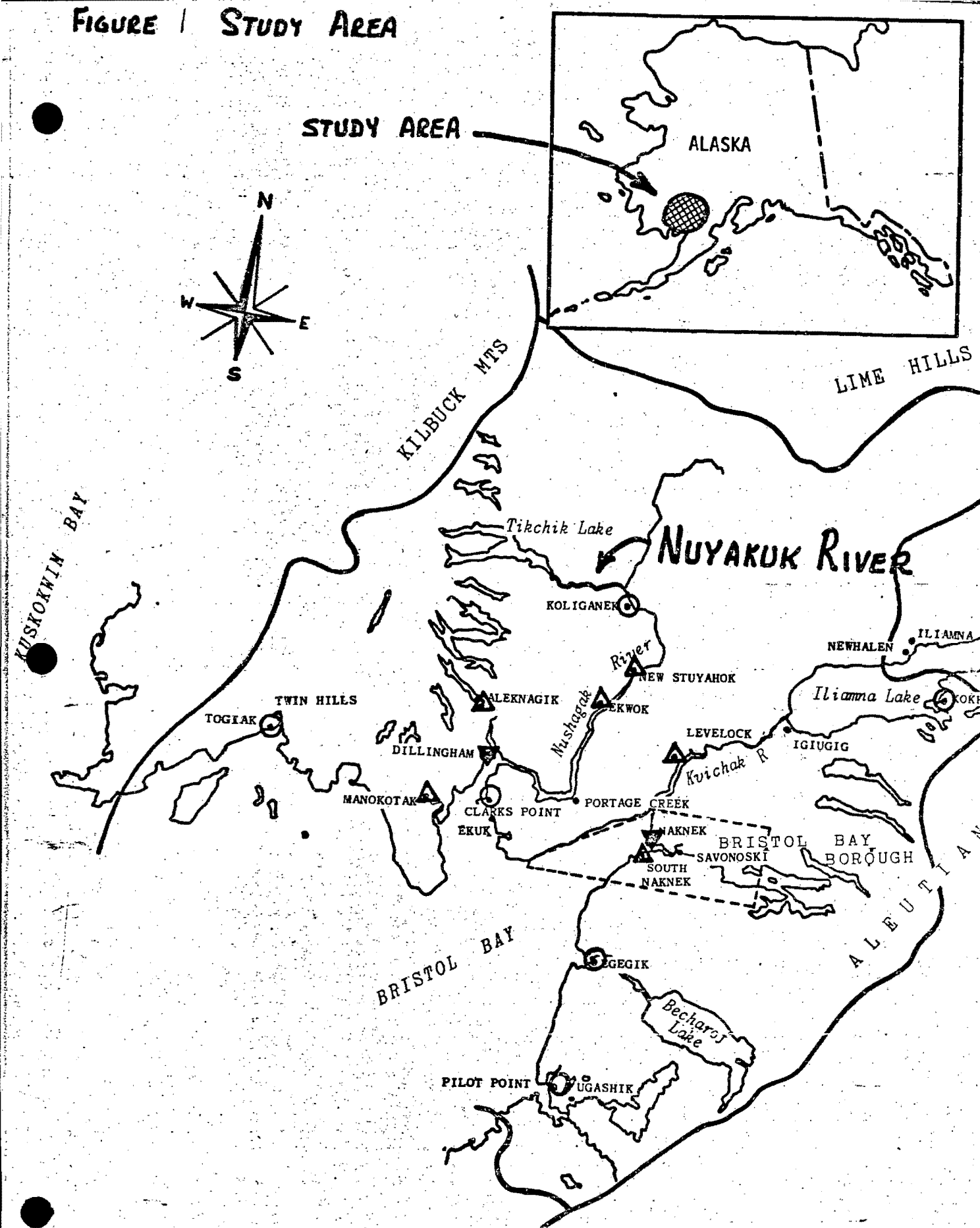
#### IV.

#### DESCRIPTION AND ANALYSIS

##### River Setting

The Nuyakuk River is the principal western tributary of the Nushagak River which is the major drainage feature of the Bristol Bay region of Southwestern Alaska (Fig. 1). The Nuyakuk begins at Tikchik Lake the lowest of six large interconnected lakes which form the river's headwaters. From Tikchik Lake the river flows west and then slightly southeast for 43 miles to its mouth on the Nushagak River near the village of Koliganek approximately 65 miles northeast of Dillingham. The river is deep and clear and has a moderate (5 m.p.h.) current. Within the first six miles are found three sets of rapids, the last of which is a massive cataract over a half mile long. Below this final rapid the river is calm and placid with only an occasional small riffle. Approximately 18 miles below the lake the river changes character. Up to this point, the river has been relatively straight, flowing over occasional bedrock outcroppings and between cut banks up to 30 feet high. Below this point the river enters an area of little relief. The flat topography gives rise to swampy lowlands characterized by poorly drained, muskeg type areas. As the gradient flattens, the river begins to meander, forming large looping bends. As the meanders become more prominent numerous old oxbows

FIGURE 1 STUDY AREA



and sloughs appear. Despite the change in gradient, the river continues to have a good current.

While the first 18+ miles of the river flow through rolling hills dotted with lakes and an occasional rock outcropping, the lower section of the river is almost completely devoid of relief. The one exception to this flat topography is a low ridge on the north side of the river about 24 miles below the lake. The ridge rises to about 500 feet and provides a change from the flat surrounds for 2-3 miles. As the river enters the lower reaches just above its mouth, it splits repeatedly forming a wide, island dotted channel.

#### Streamflow

The Tikchik Lakes system which provides the water for the Nuyakuk River drains an area of about 1,486 square miles. Although the Nuyakuk is a short river, it runs quite deep and carries a large amount of water. Maximum flow occurs in June and July with minimum flows in March and April. The only available streamflow data is from a U.S.G.S. gaging station at the outlet of Tikchik Lake. Since the Nuyakuk has few tributaries in its 43 miles length, this data is considered a good measure of the river's flow. Table 1 summarizes flow data from 1954 through 1969.

The gradient of the first six miles is fairly steep averaging approximately 17 feet per mile. Once past the last of the rapids the gradient flattens considerably and averages 1 1/2 to 2 feet per mile to the river's mouth.

With the exception of the three rapids in the upper stretch, the river is characterized by Class I water (International Difficulty Scale, Appendix \_\_). The three sets of rapids are Class III, Class II and Class IV-V respectively. The last of these being a portage for all but the very expert kayaker.

#### Water Quality

In recent years, the U.S. Geologic Survey has collected water quality data at the Tikchik Lake gaging station. Tables 2 and 3 summarize their findings.

While water quality data is not highly refined, it does indicate there are no existing conditions that would alter traditional recreation uses of the river. The only finding of significance is that winds on Tikchik Lake can cause an increase in sediment discharge to the river.

#### Land Use

Existing land uses within 5 miles of the Nuyakuk River are similar to those of the region as a whole. The entire area is generally a primitive environment with only occasional and minor man caused intrusions. There are no permanent

TABLE /

NUYAKUK RIVER (TIKCHIK LAKE OUTLET) (USGS, 1964)  
(drainage area: 1,490 sq. mi.)

Monthly and yearly mean discharge, in cubic feet per second

Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
5,909	3,750	2,700	2,100	1,700	1,400	1,300	3,919	10,360	6,794	5,191	5,589	4,236
5,058	6,111	4,029	3,000	2,400	2,100	2,000	3,359	11,790	20,420	12,730	7,485	6,740
6,592	3,800	2,400	1,800	1,400	1,300	1,400	3,298	16,680	11,880	7,006	9,277	5,568
5,395	3,333	2,732	1,800	1,400	1,400	1,700	4,806	13,080	7,232	3,855	11,540	4,857
7,500	8,886	4,887	3,097	2,354	2,100	2,050	3,854	19,900	21,850	11,460	7,093	7,948
6,255	3,450	2,600	2,300	1,700	1,300	1,400	3,415	13,680	10,910	5,836	5,271	4,857
9,049	5,092	3,190	2,545	1,855	1,448	800	5,084	16,650	13,630	9,579	7,068	6,261
6,531	5,586	4,100	3,176	2,700	2,010	1,700	5,890	15,930	12,460	9,820	5,813	6,576
6,402	4,010	2,187	1,897	1,800	1,600	1,600	4,161	15,640	15,370	6,707	5,351	5,579
5,228	3,500	2,900	3,100	3,200	3,041	1,900	3,550	14,230	11,480	6,306	10,770	5,768
6,702	3,057	1,848	1,397	1,252	1,097	1,100	1,719	16,370	13,740	7,720	7,620	5,305
7,364	4,225	2,700	2,000	1,600	1,700	2,300	3,247	18,910	14,940	9,255	14,370	6,895
11,520	5,300	3,100	2,000	1,700	1,600	1,500	2,010	10,900	12,870	9,103	8,684	5,884
10,470	5,900	3,916	2,939	2,371	2,003	1,833	2,323	11,280	9,625	6,397	6,573	5,484
6,015	2,976	1,939	1,574	1,462	1,400	1,400	3,942	11,030	7,297	8,098	6,127	4,444
3,816	2,570	2,187	1,887	1,600	1,500	1,500	4,090	23,290	15,760	6,564	5,633	5,875

TABLE 2

NUYAKUK  
SUSPENDED SEDIMENT DATA IN ~~SELECTED~~ RIVERS (FROM USGS UNPUBLISHED FILE REPORTS)

LOCATION	DATE OF COLLECTION	TIME (24 hours)	WATER TEMPERATURE (°F)	DISCHARGE (cfs)	SEDIMENT CONCENTRATION (ppm)	SEDIMENT DISCHARGE (tons per day)
Nuyakuk River near Dillingham	6/16/67	1100	45	13700	2	74
"	9/30/67 (a)	1500	46	8070	6	130
"	10/1/67 (b)	1200	46	8100	420	9200
"	5/26/70	1815			2	
"	7/07/70	2100			4	
"	8/20/70	1430			2	
"	"	"			3	
"	9/27/70	1145			2	

- ) Sample taken at outlet of Tikchik Lake when lake was calm
- ) Sample taken at outlet of Tikchik Lake during 20-40 knot winds

TABLE 3

NUYAKUK  
WATER CHEMISTRY DATA IN SELECTED RIVERS  
(from U.S.G.S. unpublished file reports)

Nuyakuk River					
DATE OF COLLECTION:	6/16/67	9/30/67	5/26/70	7/7/70	
MEAN DISCHARGE (cfs)	13700	3070	7200	13600	
SILICA (SiO <sub>2</sub> )	3.0	4.1	2.7	3.3	
IRON (Fe)	0.16	.50	0.02	0.04	
CALCIUM (Ca)	8.2	9.2	9.0	8.4	
MAGNESIUM (Mg)	1.5	1.4	1.5	1.4	
SODIUM (Na)	1.0	1.0	1.0	0.8	
POTASSIUM (K)	0.2	.1	0.3	0.2	
BICARBONATE (HCO <sub>3</sub> )	23	29	28	26	
SULFATE (SO <sub>4</sub> )	8.0	4.0	5.9	7.4	
CHLORIDE (Cl)	0.0	.7	0.4	0.6	
FLUORIDE (F)	0.5	.0	0.0	0.1	
NITRATE (NO <sub>3</sub> )	0.8	.5	1.0	0.7	
DISSOLVED SOLIDS (residue at 180° C)	34	36	36	36	
HARDNESS AS CaCO <sub>3</sub>	CALCIUM				
	MAGNESIUM	26	29	28	27
	NON-CARBON- ATE	7	5	5	6
SPECIFIC CONDUCTANCE (micro-mhos at 25° C)	56	64	65	62	
pH	7.1	7.1	7.6	7.5	
COLOR	5	5	0	5	

dwellings or roads along the river. No significant or commercial mineral finds have been identified within a corridor extending one mile back from each bank of the river.

There are no commercial timber stands<sup>1</sup> along the Nuyakuk and the only use of trees has been for an occasional cabin or some small cutting for firewood. Evidence of such use is extremely rare however.

Subsistence and sport hunting and fishing appear to be the only significant uses in the area. A number of guiding operations use the overall area and several lodges are located on nearby lakes.

Subsistence hunting and fishing by residents from both the east (Koliganek and New Koliganek) and south (Dillingham and Aleknagik) probably occur in the area. The extent of such use is unknown but believed to be generally light.

#### Water Resource Developments

There are no existing or authorized water resource development projects on the Nuyakuk River.

A potential interbasin hydroelectric project has been identified for the area. The project calls for diverting

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1

Grumman Ecosystems Corp; A Resource Inventory and Evaluation of the Recreational Potential of the Wood River--Tikchik Area of Alaska. Vol II, p. 139, 1971.



water from the Tikchik Lakes drainage to the Wood River drainage and consists of a dam at the head of the Nuyakuk River at the Tikchik Lake outlet and a tunnel and penstock diverting water from Tikchik and Nuyakuk lakes to Lake Kulik. The project would not inundate the river but it would cut stream flow drastically. Current estimates place this reduction at 5,200 cfs. Figure 2 portrays the project graphically. Estimated firm power potential is 127,000 kilowatts at 50 percent annual load factor, with firm energy of 555 million kilowatt-hours per year. Estimated construction costs are \$190 million based on 1965 prices.<sup>1</sup>

"Though it is identified as one of the more favorable of Alaska's hydro potentials, the Nuyakuk Project would likely not be justifiable as a single-purpose power development.

The project is thus considered to have sufficient value to merit consideration in long range plans for the Nushagak basin, but of relatively low priority in terms of broader regional needs."<sup>2</sup>

#### Land Ownership

The Nuyakuk River begins in land selected by the State but not yet patented to it under the Alaska Statehood Act. Following the 4 1/2 miles of the river in State selection the

1

Current construction costs would be about 50 percent higher.  
Source: Alaska Power Administration

2

Source: Alaska Power Administration, unpublished document

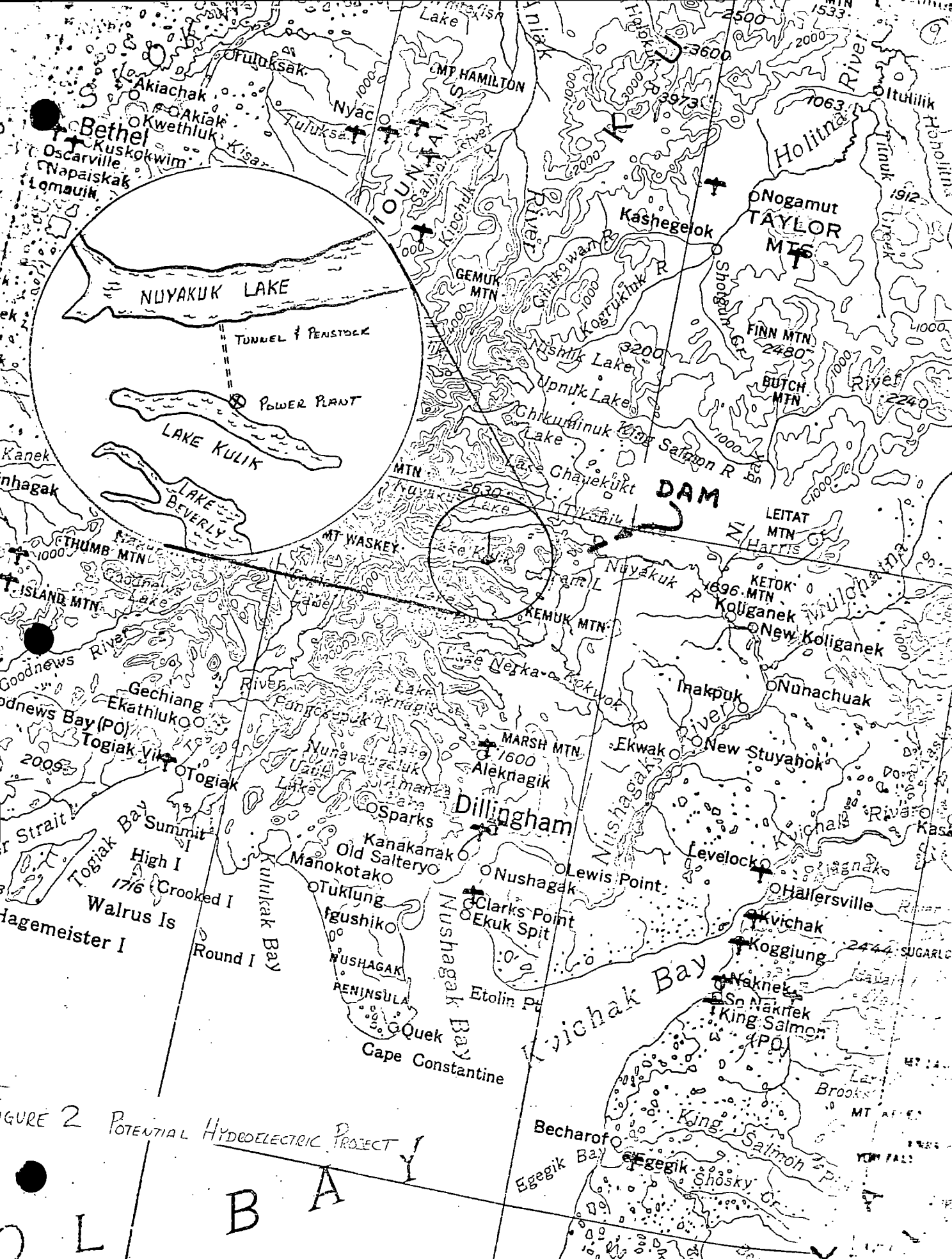


FIGURE 2 POTENTIAL HYDROELECTRIC PROJECT

YUKON BAY

river flows through 16 1/2 miles of land withdrawn by the the Secretary of the Interior as National Interest lands under Section 17 (d)(1) of ANCSA. The lower 9 1/2 miles of this segment have an additional classification. They have been placed in a Section 17 (d)(2) corridor extending one mile back from each bank of the river. This (d)(2) corridor was withdrawn in conjunction with this wild and scenic river study. Below the Section 17 (d)(2) segment to its mouth the river lies within lands withdrawn as Native Village withdrawal under ANCSA. Figure 3 illustrates these ownerships.

It is the 16 1/2 miles of Section 17 (d)(1) and (d)(2) corridor that constitute the study segment of this report (Fig. 4). State lands above the study segment and native lands below were not included in the study segment as neither the State or the Native Regional Corporation (Bristol Bay Native Corp) speaking on behalf of the natives wished to have their sections of the river studied at this time.

There are no privately patented lands along the study segment. Within the 16 1/2 mile study segment however are 6 pending native applications under the 1906 Native allotment act. Final adjudication of these application of has not been made by the Bureau of Land Management.

FIGURE 3 LAND OWNERSHIP STATUS

SECTION 17 (dXz) CORRIDOR  
NATIONAL CONSERVATION SYSTEMS LAND

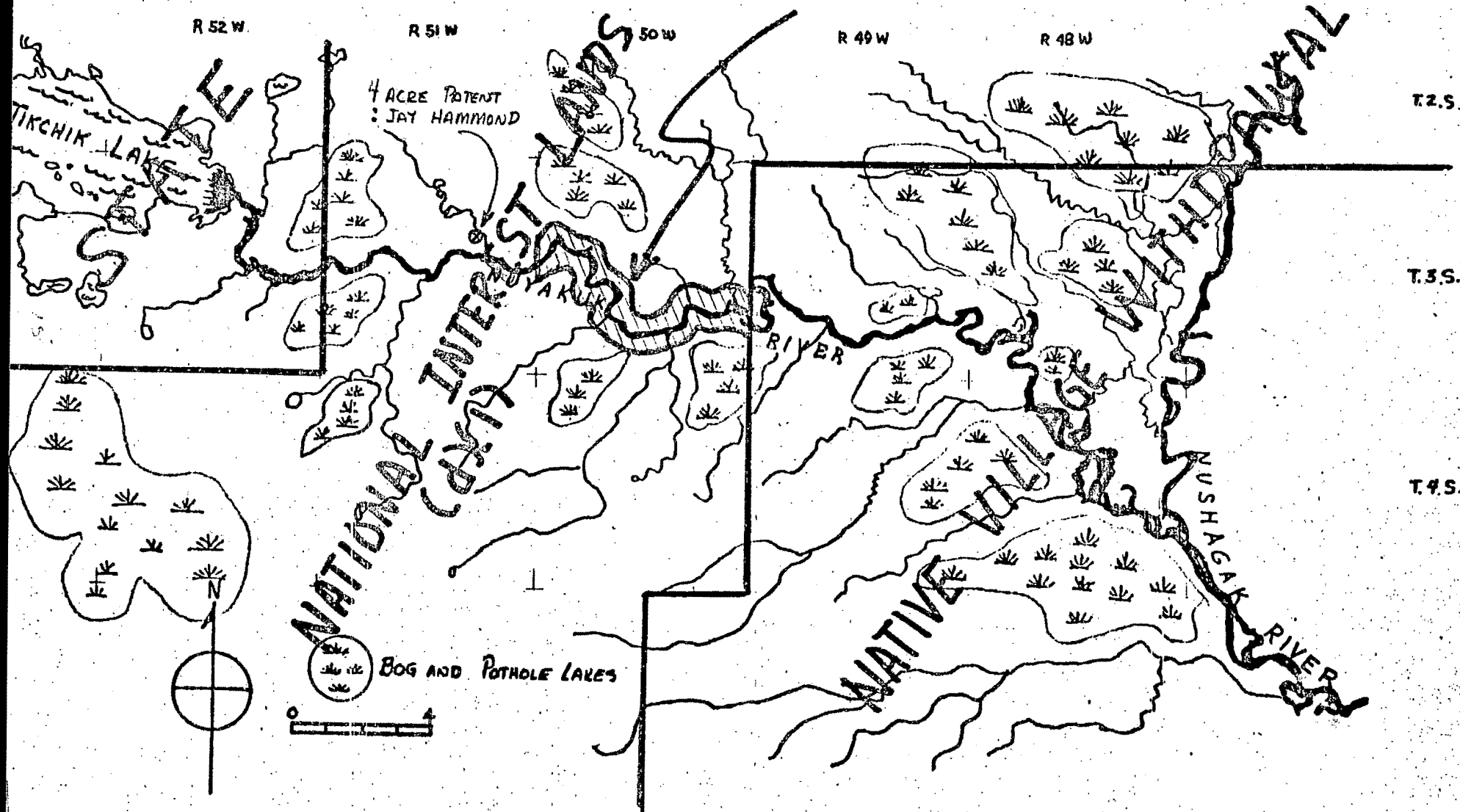
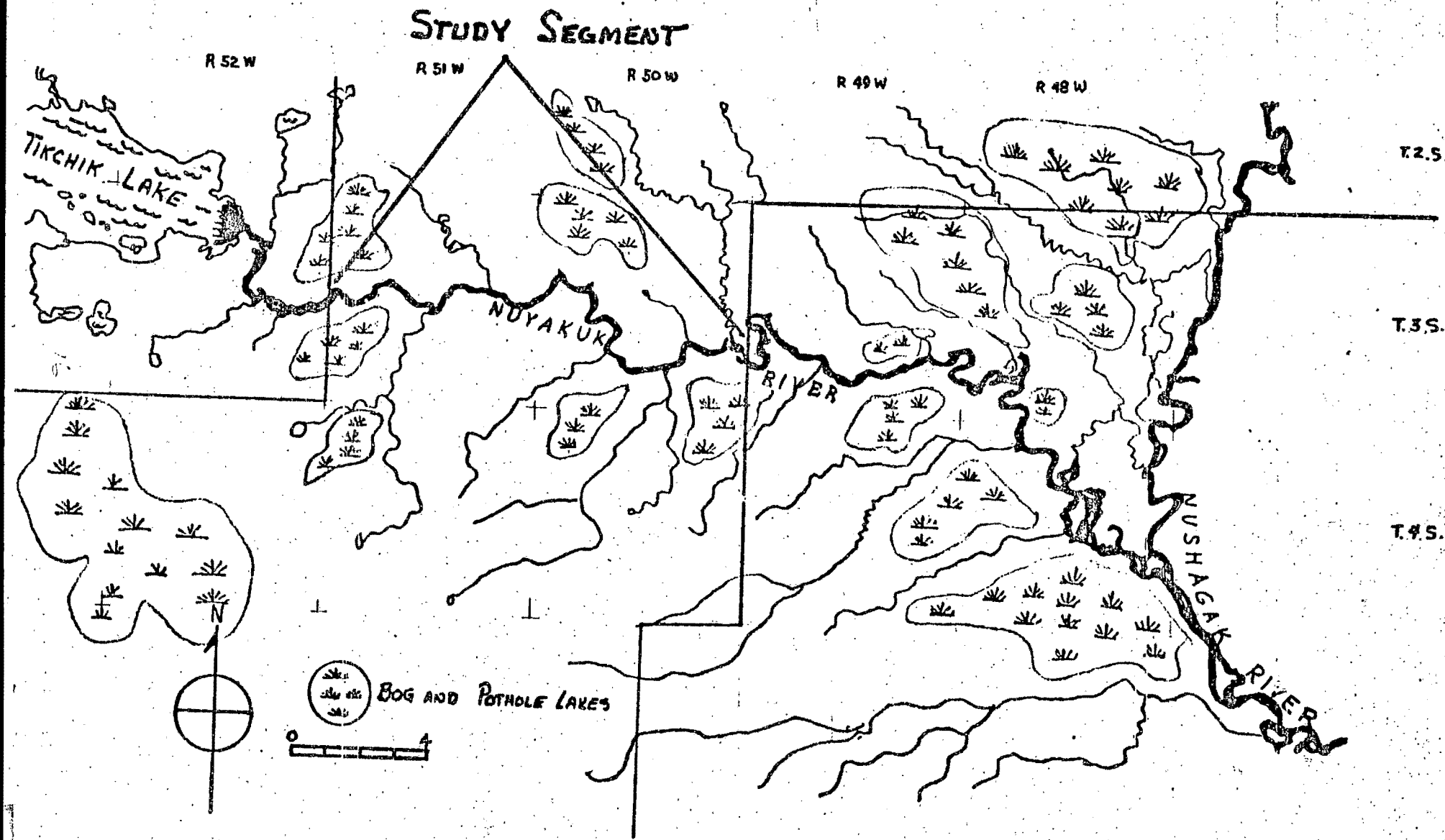


FIGURE 4 STUDY SEGMENT



## Water Rights, Navigability and Riverbed Ownership

There are no adjudicated water rights in the study corridor.

Under the Alaska Statehood Act the State of Alaska owns the streambeds and controls the water rights of all "navigable" waters of the state. Under preliminary criteria established by the State it would appear the entire length of the Nuyakuk River may be considered navigable. Neither the State or the U.S. Army Corps of Engineers has as yet determined the river to be navigable. The river has historically been used as a transportation corridor, despite the three sets of rapids on the upper end.

### Access

#### Existing

Existing access to both the Nuyakuk River in particular and the upper Nushagak area in general is by river, air or foot. There are no roads to or within the study area. Because it provides a connecting link between the Tikchik Lakes Systems and the Nushagak River, the Nuyakuk has served as a transportation waterway for hundreds of years. With the advent of safe economical air travel, the airplane has become an important and major means of access to the area. While there are no developed landing strips in or along the study segment, some wheel plane access is available on gravel bars or bar<sup>e</sup> ridges. Most airplane access however is by float plane.

Power boats have no difficulty navigating the lower 37 miles of the river but the upper 6 miles require portage or lining in the vicinity of the three sets of rapids.

There are no developed trails along the river however there are believed to be several informal "natural" trails that parallel the river. The use and extent of these undeveloped trails is unknown.

#### Potential

In addition to continued boating, air and foot access, the area may eventually have road access.

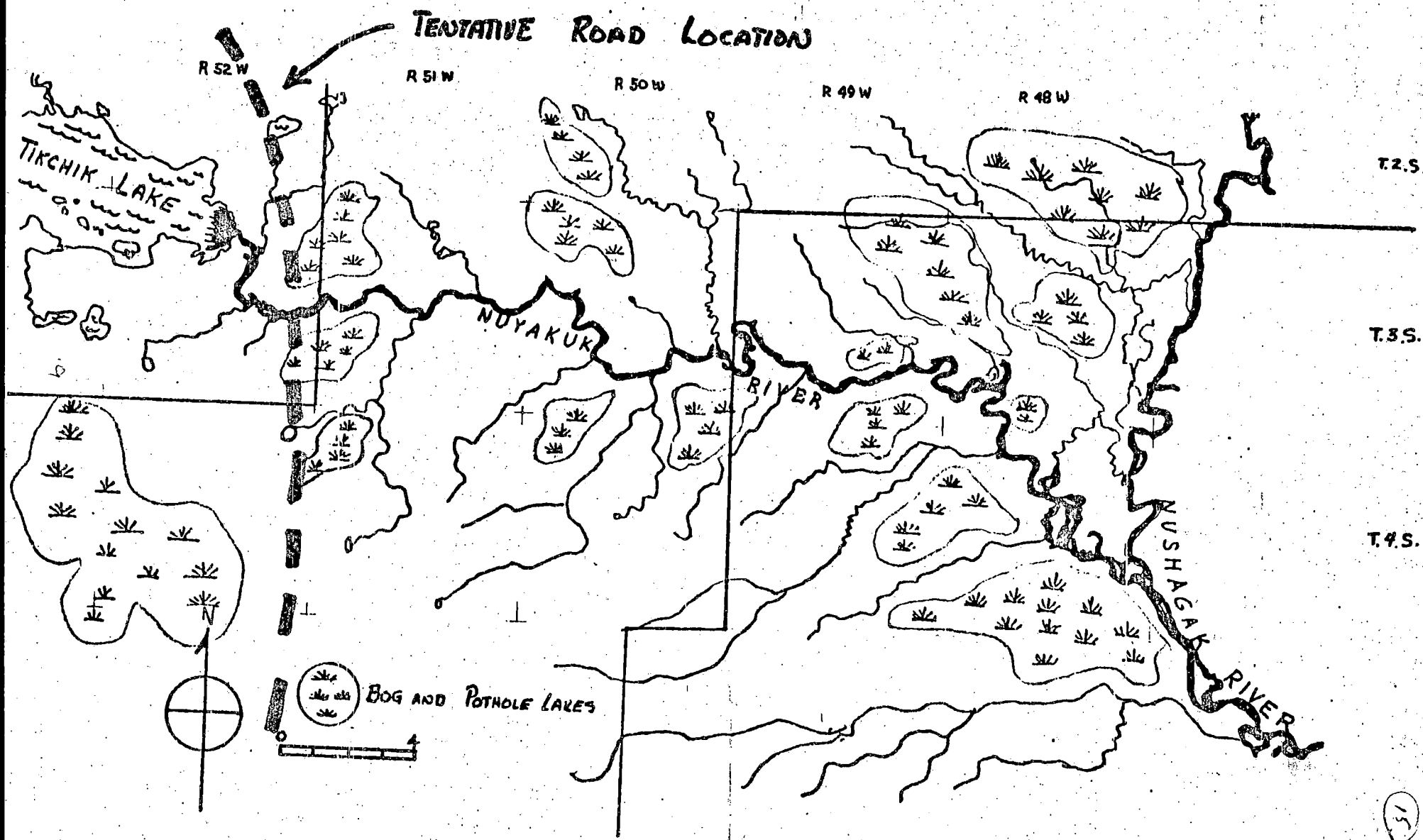
The Alaska Department of Highways has tentatively identified a highway from north to south through this area that would cross the river within several miles of the Tikchik Lake outlet (Fig. 5). The potential road has received only very preliminary consideration and is believed substantial alterations in the area's economy and population would have to occur before the road could be justified.

#### Geology and Soils

##### Geology

The Nuyakuk River lies in the Nusagak subdistrict of an area known as the Bristol Bay-Nushagak lowlands. The Nushagak district is a large wide valley which was covered by glacial deposits as a result of Pleistocene glaciation. The Tikchik Lakes which give rise to the Nuyakuk lie on the western edge of this district. The lakes themselves

FIGURE 5 POTENTIAL ROAD LOCATION





were once alpine valleys of the Wood River Mountains which through geologic time have subsided to form long, deep lakes whose western shores lie in a steep fiord-like mountain setting. The eastern end of the lakes generally marks the beginning of the Nushagak district. There are no major mountains in the Nushagak district, and the only relief is an occasional hill or ridge. Strong erosive forces in the past, mostly glaciation, have reduced the Nushagak area to a flat plateau covered to varying depths with unconsolidated glacial debris. In the river's upper reaches nearer the mountains to the west, the river has cut through the glacial material to bedrock. Where this has occurred, rapids have formed. The remainder of the river flows within cut banks of ever diminishing height until near the mouth the river appears to overflow its channel into a swampy lowland.

#### Soils

Soils in the immediate vicinity of the Nuyakuk River are characterized as moderately deep deposits of silt overlying large areas of well graded sandy gravel, large areas of which have become exposed.<sup>1</sup> Along the lower section of the river, the soil is mostly a deep interbedded silt, sand and gravel mixture.

Soils have not been typed and mapped along the study segment. Extrapolation of soil fertility from similar adjacent

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<sup>1</sup>

Grumman Ecosystems Corp; Ibid: 1971

areas indicates a low fertility due to low nitrogen content. Soil pH is neutral to slightly acid. None of the soils in the area are considered to have significant agricultural potential.

### Vegetation

Flora along the study segment is characterized by a<sup>1</sup>  
open low growing spruce forest.

This vegetation type is characteristic of poorly drained lowlands and areas underlain by permafrost. Open stands of black spruce and bogs dominate. The black spruce is slow growing and seldom exceeds 8 inches in diameter. A thick moss mat often of sphagnum mosses, sedges, grasses and heath or ericaceous shrubs usually make up the subordinate vegetation. Associated with the black spruce in the wet bottom lands is the slow growing tamarack. As with the black spruce, it is of little commercial value, seldom reaching a diameter of more than 6 inches. Paper birch and an occasional white spruce may be present in better drained sites, such as along the river. Table 4 lists the most common species found in the area.

Vegetation along the study segment closely parallels the area as a whole. The upper stretches of the segment are flanked by open black spruce stands which close and mix with hardwoods and tamarack in the river's lower reaches.

1

Viereck, L.A. and Little, E.L. 1972; Alaska Trees and Shrubs Agriculture Handbook #410

Near the mouth of the river brush species become more prominent. Both trees and underbrush are thicker in the immediate vicinity of the river than adjacent uplands.

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Table 4. Common Tree and Brush Species Along The Nuyakuk River, Alaska

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TREES: black spruce  
tamarack  
paper birch  
white spruce

COMMON SHRUBS:  
red-fruit bearberry  
crowberry  
Labrador-tea  
prickly rose  
willow  
bog blueberry  
mountain cranberry

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### Wildlife and Fishery

#### Wildlife

Major big game species along the Nuyakuk River include moose, brown bear, black bear and caribou.

The entire length of the river is considered to be fair to good moose range. Areas along the river and adjacent pothole lakes are the preferred habitat areas.

Substantial populations of brown bear inhabit the river, with highest concentrations during salmon runs. Black bear are also present but in lower numbers.

The river lies on the western edge of the Mulchata Caribou Range. Although the river is not heavily used by the herd, substantial numbers of animals may be found in its vicinity during certain periods of the annual migration. Although little is known of this herd its size is estimated at about 5,000 animals.

Small fur bearers such as wolf, wolverine, muskrat, beaver, fox, weasel, otter, lynx, squirrel and rabbit also inhabit the river area.

The entire Nuyakuk River area is a favorable waterfowl and seabird nesting and molting area. Large numbers of birds use the area during the summer months.

A large number of songbirds may be found in the area in the summer but like the waterfowl, most are transient and do not remain year around.

Raptors such as the bald eagle, golden eagle and rough-legged hawk are present in small numbers.

Willow ptarmigan is the only upland gamebird present in significant numbers.

The river is not considered to be a critical habitat area for any of the big game species. Summer use of the river is considered to be relatively important to the region's overall waterfowl production. Numerous potholes and the river itself are considered in good summer waterfowl habitat.

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1

Alaska' Wildlife and Habitat, Alaska Department of Fish and Game, 1973.

There are no known occurrences of rare and endangered species in the area.

### Fishery

The river is considered to be a very important salmon stream. While some spawning occurs in the upper reaches of the river, its main value is as an avenue to the many spawning areas in the Tikchik lakes chain.

Runs of pink, red, silver, king and chum salmon use the river. The majority of the Bristol Bay pink salmon run utilizes this river.

In addition to salmon, the river supports resident populations of whitefish, grayling, lake trout, rainbow trout, arctic char, dolly varden, smelt and pike.

### History and Archeology

Little is known of the historical or archeological values of the Bristol Bay area even though it has been inhabited for hundreds of years. Almost nothing is known of the Nuyakuk River area but it is believed that it closely parallels the larger Bristol bay area. In their 1971 study<sup>1</sup> of the Wood River - Tikchik Lakes area, Grumman Ecosystems Corporation related the following:

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1

Grumman Ecosystems Corporation, 1971, A Resource Inventory and Evaluation of the Recreation Potential of the Wood River-Tikchik Lake area of Alaska, Vol I.

"Natural barriers surrounding the Wood River - Tikchik Lake area shielded it from investigation for many years although we know Eskimo families travelled and hunted in the area and that at least one long-term settlement at Tikchik eventually attracted Europeans. Knowledge of native history in the area is limited to several ethnographic studies and some limited archaeological exploration. There is little doubt that an intensive oral history project initiated in the area would provide new data and perhaps greater insight into these historical patterns of settlement and use.

The patterns of the later movements of people to the Bristol Bay-Kvichak Bay - Nushagak Bay area have followed periods of exploration and exploitation. There has been limited mineral exploitation in the area; however, a potential offshore petroleum industry may change this picture in the future.

Little is known of the early visits of Europeans until Captain James Cook entered Bristol Bay in July 1778, and while he correctly postulated the existence of a river system at the head of the bay, his crew did not actually reach, and therefore apparently did not actually observe, the Kvichak or Nushagak Rivers.

The contacts with the Russian fur traders known as promyshlennik, who plundered the coastal villages for men and goods to improve their fur trade, planted the seed of hatred and fear of Russians that eventually prevailed all along the coast. Research has not yet revealed written record of these contacts, but the remains of trade goods and cultural vestiges from the Russians are mute evidence of their presence. Russian influence in the area began in 1818 when the Korsakovsky expedition explored the mouths of the Nushagak and Wood Rivers, and established a post called Alexandrovski on the east bank of the Nushagak River eight miles below the mouth. In 1829, Ivan Fillipovich Vasiliev led a party from Alexandrovski Redoubt to explore the western tributary of Nushagak. During the trip, he apparently visited the now abandoned village of the Kuskwogmiut called Tuska (probably Tikchik.) He explored along Lakes Tikchik and Chauekuktuli, and the following year ascended the Nushagak and reached the Kuskokwim via the Holitna River.

25

In 1832, Fedor Kolmakov followed the route of Vasiliev to the Kuskokwim and opened a potential new fur trade area.

Although Hiermonk Nikolai of the Russian Orthodox Church apparently visited the area and travelled as far as Tikchik Village in 1851, the missionary influence on this area remained a weak factor for many years. A Russian Orthodox Church was established at Wood River Village 65 years later.

The rivers Nushagak, Kvichak, Mulchatna, and Holitna were important natural pathways to the Interior, but few scientific parties working in this region followed these routes until the early 1900's when a Department of Agriculture biological survey was conducted under Wilfred H. Osgood. A reindeer introduction experiment was conducted on the Nushagak in 1905, and in 1907, the U.S. Bureau of Fisheries began a long and continuing study of the salmon spawning areas of the region.

Only two significant studies of the general area, by Osgood in 1902 (a biological reconnaissance) and Mertie in 1935 (a geological reconnaissance), were made prior to this evaluation. However, an excellent cultural overview of the region is provided by Van Stone's 1967 ethnographic history of the Nushagak River area. There is little doubt that additional information will be developed by new studies of historical pathways and settlements in the area.

The following chronology highlights pre-World War II activity in the Nushagak River area (place names are shown on Fig. 6..

- 1791 (?) Dmitri Ivanovich Bocharov explored some of the Alaska Peninsula and may have reached the Nushagak River.
- 1793 (?) Aleksei Ivanov ascended the Nushagak and crossed the mountains to the Holitna.
- 1818 The Korsakovsky expedition (Russian-American Company) explored the mouths of the Nushagak and Wood Rivers and a post (Alexandrovski) was established along the east bank of Nushagak Bay some eight miles below the mouth of the river.

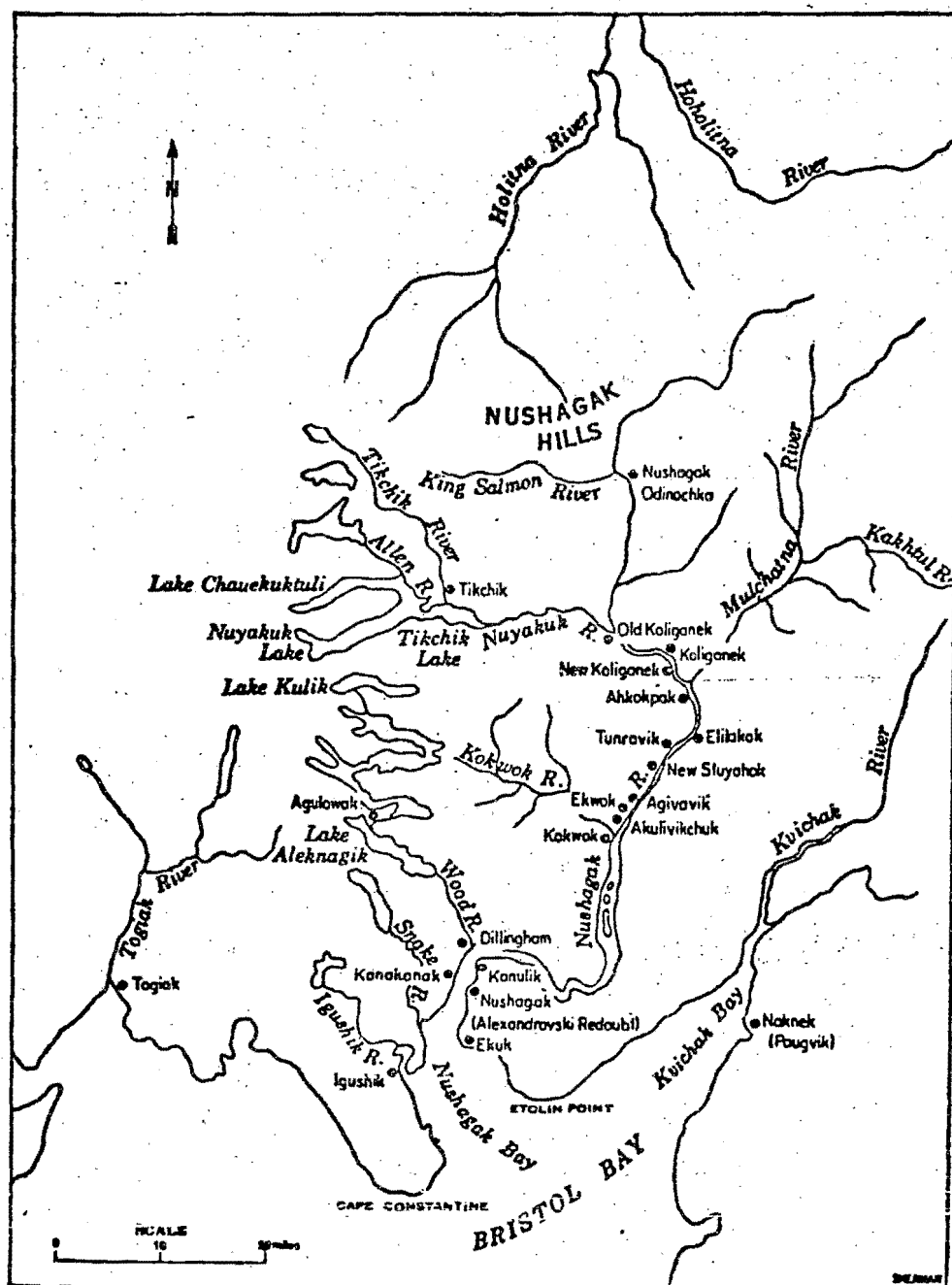


FIG. 6. THE NUSHAGAK RIVER AREA (VAN STONE 1967)



- 1829 Ivan Filippovich Vasiliev (from Alexandrovski Redoubt) explored a western tributary of the Nushagak (possibly the Nuyakuk River) and Lakes Tikchik and Chauekuktuli--he apparently visited a Kuskwogmiut settlement called Tuska (most likely the abandoned village of Tikchik) in late summer. The same party later ascended the Wood River Lakes.
- 1830 Vasiliev ascended the Nushagak and reached the Kuskokwim via the Holitna.
- 1832 Fedor Kolmakov followed the route of Vaillev to the Kuskokwim.
- 1851 A missionary, Hiermonk Nikolai of the Russian Orthodox Church, apparently visited Tikchik Lake.
- 1868 U.S. Revenue Steamer WAYANDA, carrying a scientific party, visited Nushagak following the 1867 sale of Alaska to the United States.
- 1881 Nushagak was established as a station of the Signal Service of the United States Army--one of the station observers, Charles L. McKay, apparently ascended the Wood River to Lake Aleknagik during the period 1883-1886.
- 1885 The Alaska Packing Company established a cannery at what is now Dillingham.
- 1886 The Bristol Bay Canning Company established a cannery at Kanakanak.
- 1887 A prospecting party ascended the Nushagak and Mulchatna Rivers.
- 1890 Ivan Petroff, enumerator of the Tenth Federal Census, made an unsuccessful attempt to ascend the Nushagak in early spring.
- 1891 William C. Greenfield, compiling data for the Eleventh Federal Census, ascended the Holitna River and descended the Nushagak.

- 1901      A survey party descended the Mulchatna and Nushagak Rivers (seeking a railroad right-of-way).
- 1902      Wilfred H. Osgood, from the Biological Survey of the U.S. Department of Agriculture descended the Nushagak.
- 1905      A territorial school was established at Kanakanak.
- 1907      Members of the U.S. Bureau of Fisheries visited the Wood River Lakes, the Nushagak and Nuyakuk Rivers, and the lower Tikchik Lakes, beginning a long history of study of the salmon spawning areas of the region.
- 1916      A Russian Orthodox Church was established at Wood River Village near the mouth of the river.
- 1918-19    An influenza epidemic struck the Nushagak region.
- 1919      A native hospital was established at Kanakanak.
- 1923      Ward T. Bower of the Bureau of Fisheries ascended the Nushagak and Nuyakuk Rivers to study the salmon spawning grounds of the Tikchik Lakes.
- 1930      The Seventh Day Adventists founded a colony (still in existence) at the eastern end of Lake Aleknagik.
- 1931      Anthropologists Ales Hrdlicka ascended the Nushagak and Mulchatna Rivers.
- 1935      John B. Mertie of the U.S. Geological Survey explored the entire area of the Wood River and Tikchik Lake region as well as the Nushagak Hills and upper Mulchatna River."

## Recreation

### Resources

The Nuyakuk River's combination of both turbulent and placid waters, wildlife, excellent fishing and spacious wild character

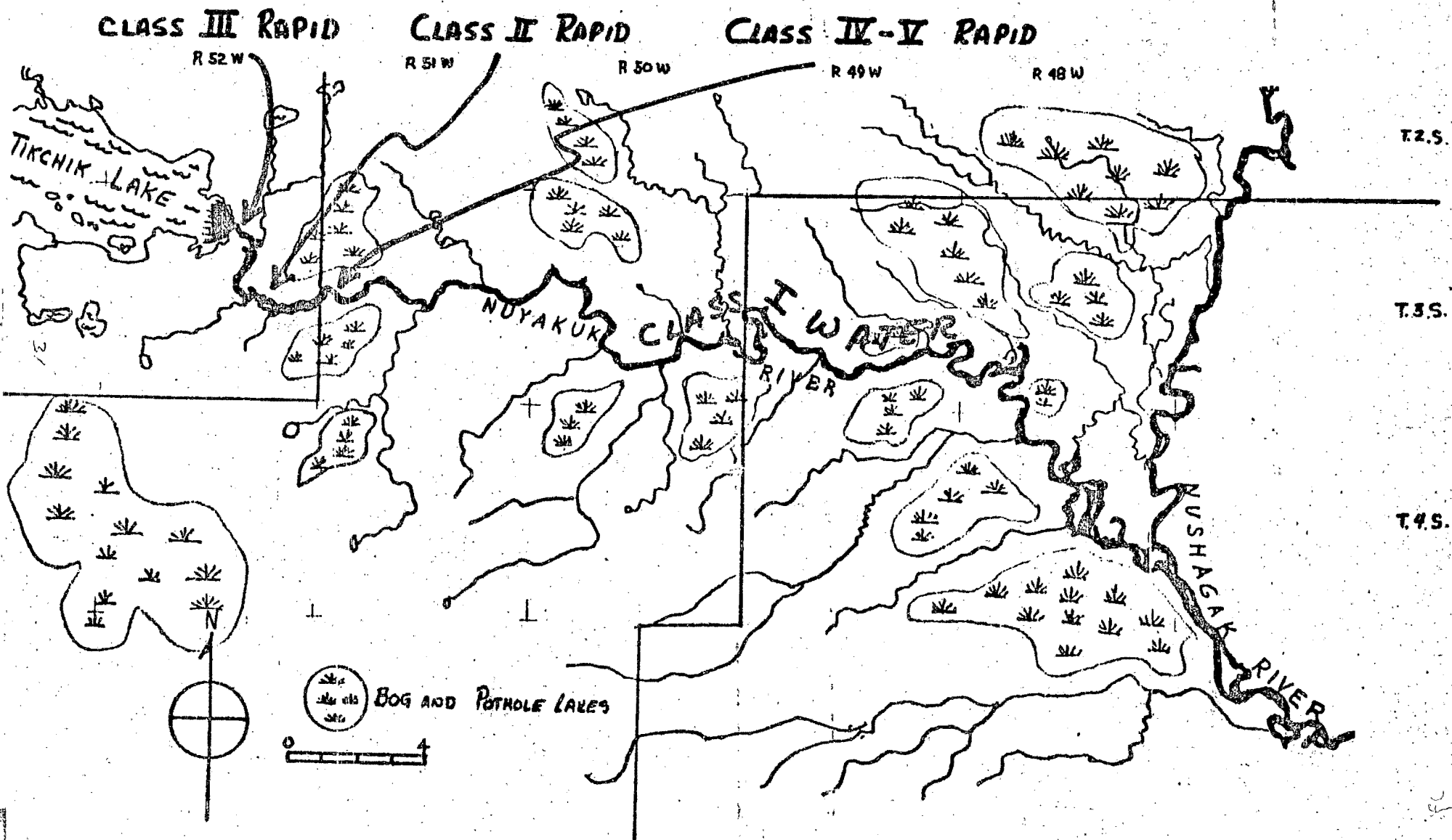
combine to create an excellent recreation resource.

From the standpoint of a recreation experience along the river, the user could expect to observe considerable evidence of wildlife including wolves, moose, brown and black bear, caribou and numerous small game and fur animals. A wide variety of bird-life, including waterfowl and sea birds abound in the area. The number and variety of wildlife observed would depend upon the time of year and the part of the river visited.

Opportunities for boating with powerboats or float boats (canoes, kayaks, rafts) is excellent. Current in the river varies from 2 to 7 m.p.h. and sufficient water is present during the entire recreation season for most forms of boating. The three sets of rapids on the river present both an obstacle and an opportunity. For the power boater they are an impediment to travel that may require portage or lining. To the floatboater they can provide whitewater thrills although one set of rapids will have to be lined or portaged by most floatboaters as well.

Rating of the white-water boating characteristics of the Nuyakuk River on the International Difficulty Rating (Appendix \_\_) is Class I with one set of rapids at Class III near the headwaters at the Tikchik Lake outlet, a class II rapid approximately 3 miles further downstream, both outside the study segment, and a Class IV-V rapid six miles below the lake (Fig. 7 ) and with in the study segment. The remainder of the river is placid Class I water.

FIGURE 7 RAPIDS ON NUYAKUK RIVER



Ratings were made on the basis of a loaded, open canoe. Use of a kayak or closed canoe, or an open canoe without camping gear would reduce the overall ratings. The above ratings were based upon what are assumed to be typical summer conditions.

Overall skill level is rated as "Intermediate" because of the distance from assistance in the event of accident (Appendix \_\_\_\_).

#### Existing Uses

Primary recreational use of the river occurs from June to October coinciding with breakup and freeze-up. Due to the lack of roads in the area, access is by aircraft, boat or occasionally foot. Because there are no developed airstrips and only occasional places for wheel aircraft to land, most air access is by float plane.

Unobstructed powerboat access is available upriver as far as the large rapid about 6 miles below Tikchik Lake.

Access is recapped at this point to illustrate why the area is presently little used. The cost of both aircraft and boat access is substantial hence the economics of getting to the area has kept use low. Although no specific use figures are available for the river, fishing and hunting appear to be the most prominent forms of recreation. The river enjoys a good reputation as a sport fishery for grayling and trophy class rainbow trout. Large northern pike are known to frequent the lower end of the river.

The area to the east of the Nuyakuk in the Lake Iliamna region contains some of the finest fishing in Alaska. Because the Lake Iliamna region is closer to Anchorage, the nearest large population center, most of the fly-in fishermen use the rivers and lakes in that region rather than continue on to Bristol Bay to fish. To the west of the Nuyakuk are the Wood River-Tikchik Lakes chain and several guiding operations and lodges draw fishermen away from the Nuyakuk to fish the rivers and lakes in that chain. As a result of the fishing pressure on both sides, the Nuyakuk is not heavily used even though it has an excellent fishery.

An occasional float boater or wilderness camper may use the river, but such use is very limited at this time. While the area has a beautiful setting, only the large rapid offers any unique scenery along the river so photography is only an incidental recreational pursuit. Overall use of the area is very light.

#### Future Use

The State of Alaska has recently acquired the Wood River-Tikchik Lakes Chain and is expected to develop the region as a prime Alaskan recreation area. With development of this resource, use should increase dramatically on the Nuyakuk River. The rivers position of being the major drainage route to the Tikchik Lake country and as a boat accessible waterway into the area account for this projected future growth.

Although all but 4 1/2 miles of the river lie outside of the state's holdings, the river is expected to figure significantly in the state's overall development plans. As the Alaska Native Claims Settlement Act transfers land to private ownership and the state continues to select land under the statehood act, remaining federal land is expected to receive increasingly heavier recreational use.

The Nuyakuk River is no exception to this prediction. If the State of Alaska carries through with tentative plans to build a road into the area, even more use can be expected. If this were to happen, boating, especially floatboating would be expected to increase substantially.

Although no developed hiking trails exist along the river, there are a number of areas where such facilities could be developed, possibly in conjunction with the Wood River-Tikchik Lakes chain to the west.

Although camping would generally be associated with other recreational uses, some people engage in this activity as an end in itself. There are numerous areas for primitive camping sites along the river.

#### Limitations

Limitations to future recreation use include adverse weather, access and the mosquito. Of these limitations, access appears to be the most significant. The high cost of getting to the area has kept use low. This is expected to

remain the case unless overland transportation to the area becomes available. Even if a road is built, use is not expected to be high. The nearest large population center is Anchorage, some 300 miles to the northeast. There are no roads to the Bristol Bay area from Anchorage so air access is still necessary even if a road is built from the Bristol Bay area to the river.

Weather is another factor limiting recreation. In winter, severe temperatures and strong winds tend to limit use of the area. In the summer a strong maritime influence from Bristol Bay and the Bering Sea extend inland unimpeded by mountains to produce many rainy, foggy cold windy days, a combination, not enjoyed by most recreationists.

Still another limitation to recreation is the mosquito. The large number of pothole lakes and swampy areas of standing water give rise to tremendous populations of mosquitos and other biting insects such as white sox. In the numbers produced in this part of Alaska, they can make almost any recreation endeavor unbearable at certain times of the year.

The proposed Nuyakuk hydroelectric project would have a serious effect on the river. By significantly reducing streamflow much of the river's natural beauty would be lost. In addition the salmon runs would be either destroyed or seriously reduced and the other river fishery could be expected to suffer a like fate.



UNITED STATES GOVERNMENT

# Memorandum

D4225 Alaska  
(W&SRS)

TO : Assistant Director Eastman

DATE: May 25, 1973

FROM : Alaska Task Force Leader

SUBJECT: Porcupine Wild and Scenic River Report

Enclosed are two copies of a preliminary draft of Chapters IV and V of the subject report. A copy of this draft has been provided to NWRO and BLM, BSF&W, NPS and FS planning teams in Anchorage. Chapter IV will be distributed to study team participants.

It is emphasized that the conclusion and recommendations are based only on aerial examinations and office review of available information. On-site field inspection of the river is scheduled for this summer. Following the field work the enclosed draft will be revised as appropriate and the remaining portions of the report completed.

  
Jules V. Tileston

2 enclosures

cc: WASO/Fred Strack



S P E C I A L   N O T I C E

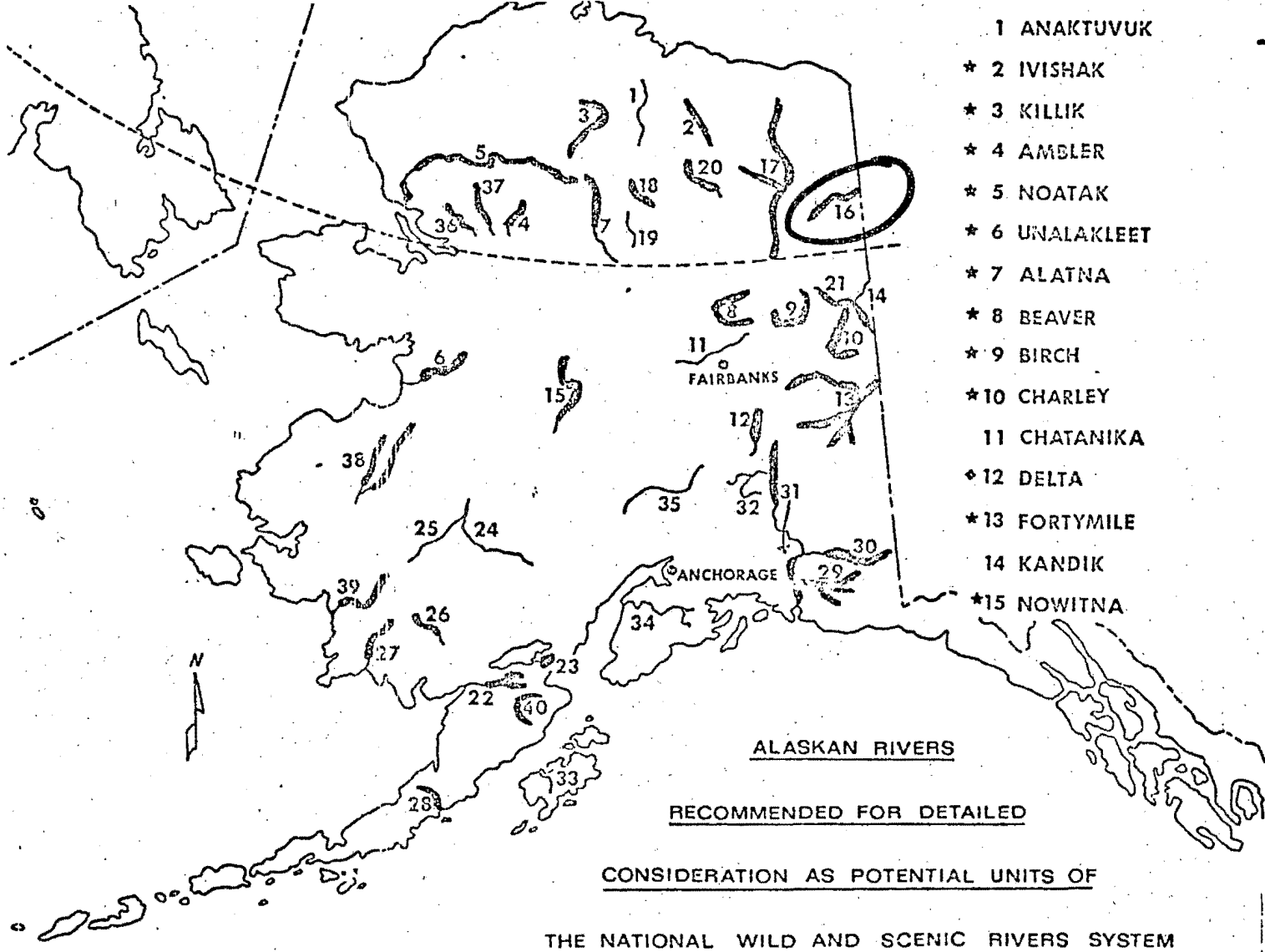
Draft: Porcupine River Wild and Scenic River Report

The enclosed material is based upon the following premise:

The Canyon Village Native Village Withdrawal listed in Section 11 (b)(1) of the Alaska Native Claims settlement Act (P.L. 92-203) will not be found to satisfy the requirements of Section 3(c) of the aforementioned act.

At the present time, the Canyon Village enrollment is below the 25 inhabitants necessary to qualify the village for selection rights under ANCSA. With native enrollment completed as of March 31, 1973, it appears the Canyon Village withdrawal will be dropped. The withdrawal has not however been dropped as of this date.

In the event the village withdrawal is retained this report will have to be revised accordingly.



1 ANAKTUVUK

\* 2 IVISHAK

\* 3 KILLIK

\* 4 AMBLER

\* 5 NOATAK

\* 6 UNALAKLEET

\* 7 ALATNA

\* 8 BEAVER

\* 9 BIRCH

\* 10 CHARLEY

11 CHATANIKA

♦ 12 DELTA

\* 13 FORTYMILE

14 KANDIK

\* 15 NOWITNA

\* 16 PORCUPINE

\* 17 SHEENJEK-KONESS

\* 18 TINAYGUK

19 WILD

\* 20 WIND

\* 21 YUKON

\* 22 ALAGNAK

\* 23 COPPER (ILIAMNA)

24 HOHOLITNA

25 HOLITNA

\* 26 NUYAKUK

\* 27 TOGIAK

\* 28 ANIAKCHAK

\* 29 BREMNER

\* 30 CHITINA

\* 31 COPPER

♦ 32 GULKANA

33 KARLUK

34 KENAI-RUSSIAN,  
SWANSON R.-SWAN LK.

35 SUSITNA

♦ 36 SQUIRREL

♦ 37 SALMON

♦ 38 ANDREAFSKY

♦ 39 KANEKTOK

♦ 40 AMERICAN CREEK

BOR, OCTOBER, 1972

\* ALL OR SUBSTANTIAL PORTIONS CLASSIFIED UNDER 17(d)(2) OF ANCSA, SEPT. 1972

♦ RIVERS WHERE DETAILED STUDIES HAVE BEEN REQUESTED

— 31 Priority Rivers

V.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Careful review of available information together with on-site inspection shows that the 90 miles segment of the Porcupine River and its immediate environment from the U.S.-Cnaada border to John Herberts Village (T. 25 N., R. 21 E.):

- Is a large clear-water, free-flowing river without impoundment, straightening, rip-rap or other modifications of the waterway.
- Is long enough to provide a meaningful outdoor recreation experience.
- Has sufficient volume of high quality water during normal years to permit full enjoyment of available outdoor recreation potential.
- Has magnificent scenery and primitive character which although modified in places by early human habitation retains an overall wild character.
- Possesses an outstandingly remarkable combination of high quality recreational, geologic, fish and wildlife, historic and other similar values.
- Is capable of being managed to protect both people and the resource; has significant values which can be interpreted to the public; and will support a high quality outdoor recreation experience at the desired level of use.

- Supports a salmon run which is a valuable commercial and subsistence fishery resource,
- Has potential for the construction of a hydroelectric water project with a capacity of 265,000 kilowatts of continuous power which if constructed would inundate the upper 7 miles of the study segment and alter the flow of the rest of the study segment. A second hydroelectric project, the Rampart Canyon Dam on the Yukon River would create a reservoir which would inundate the lower 60 miles of the study segment.
- Has no known mineral values.
- Has no commercial timber potentials.
- Has existing and potential public outdoor recreation values which are not duplicated in the nearby Sheenjek River or the other 39 Alaskan free-flowing rivers identified by the Bureau of Outdoor Recreation as having high potential for inclusion in the National Wild and Scenic Rivers System.
- Is an area where there is a continuing Federal interest in the short and long-range management of public resources and there is significant potential for coordinated management of these resources with portions of the river in Canada to form a recreational waterway of international value.
- Is an area rich in history exhibiting relics of early

fur trapping and trading (Hudson's Bay Company) which led to settlement of interior Alaska.

It is further concluded that:

- ① Development of the recreation resources of the Porcupine River is consistent with the Alaska Statewide Comprehensive Outdoor Recreation Plan (1970)
- ② The river offers exceptional potential as a boating waterway, being able to support both powerboats and floatbaots (canoes, kayaks, rafts) during the entire ice free season.
- ③ There are high fish and wildlife (especially waterfowl) values along the river.
- ④ In its existing condition, the 90 mile study segment of the Porcupine River together with its immediate environment fully meets the attributes and criteria established for a scenic river as defined by Section 2 (b)(2) of the Wild and Scenic River Act (P.L. 90-542).

#### Recommendations

It is recommended that the 90 mile segment of the Porcupine River and approximately 116,000 acres of its immediate environment:

- ① Be included in the National Wild and Scenic Rivers System as a federally administered component unless incorporated in the proposed Yukon Flats National Wildlife Refuge.

● Be administered as a scenic river as defined by Section 2 (b)(2) of the Wild and Scenic Rivers Act (P.L. 90-542); the Guidelines for Evaluating Wild, Scenic and Recreational River areas Proposed for Inclusion in the National Wild and Scenic Rivers System under Section 2, Public Law 90-542. (February 1970); and the conceptual river plan contained in this report.

● Be administered by the Federal agency having primary management responsibility for the adjacent land area.

It is further recommended that:

● Within one-year from the date of the act including the Porcupine River and its immediate environment in the National Wild and Scenic Rivers System, the administering agency in cooperation with the state and users establish detailed lateral boundaries and prepare a plan for necessary development and administration of the area within the concepts set forth in this report.

● Overall administrative arrangement retain the option for active participation with Canada should they desire at a later date to establish in international recreation waterway on the Porcupine River.

● A regular system of monitoring recreational and other human uses of the river and its immediate environment be established to assure long-term maintenance of a high quality environment.

- Subject to existing, valid rights, lands lying in the formal river corridor, to be defined by the administering agency, be withdrawn from all forms of appropriation under the public land laws including the mining and mineral leasing laws.
- Areas of special historic, archeologic and wildlife significance (especially nesting areas of the rare and endangered Peregrine Falcon) be preserved to protect their special values in a manner consistent with the rivers scenic character.
- Recreational and subsistence use of fish and wildlife resources be allowed within the framework of appropriate State and Federal laws, provided such use is consistent with management objectives on adjacent lands.



#### IV.

#### DESCRIPTION AND ANALYSIS

##### River Setting

The Porcupine River is one of the largest upstream tributaries of the Yukon River. The river has its source in the Yukon Territory, Canada approximately 120 miles northeast of Eagle, Alaska (Fig. 1). From its headwaters in the Ogilvie Mountains the river flows northeast then west approximately 260 miles to the U.S.-Canadian border. From the border the river flows southwest for approximately 210 river miles (130 airmiles) to its mouth on the Yukon River at Fork Yukon.

The portion of the river considered by this report includes the 90 miles of river from the border to John Herbert's village an area generally considered as the upper and lower "Ramparts" (Fig. 2). The U.S. Geologic Survey recognized three separate topographic zones along the study segment (Fig. 3). They are: Upper Ramparts, Coleen Lowlands, and Lower Ramparts.

The upper Ramparts extend from the international boundary to Red Gate, a distance of about 40 river miles. This section is characterized by nearly continuous cliff walls, which range in height from more than 500 feet near the boundary to 250 feet at the mouth of the Salmon Trout River.

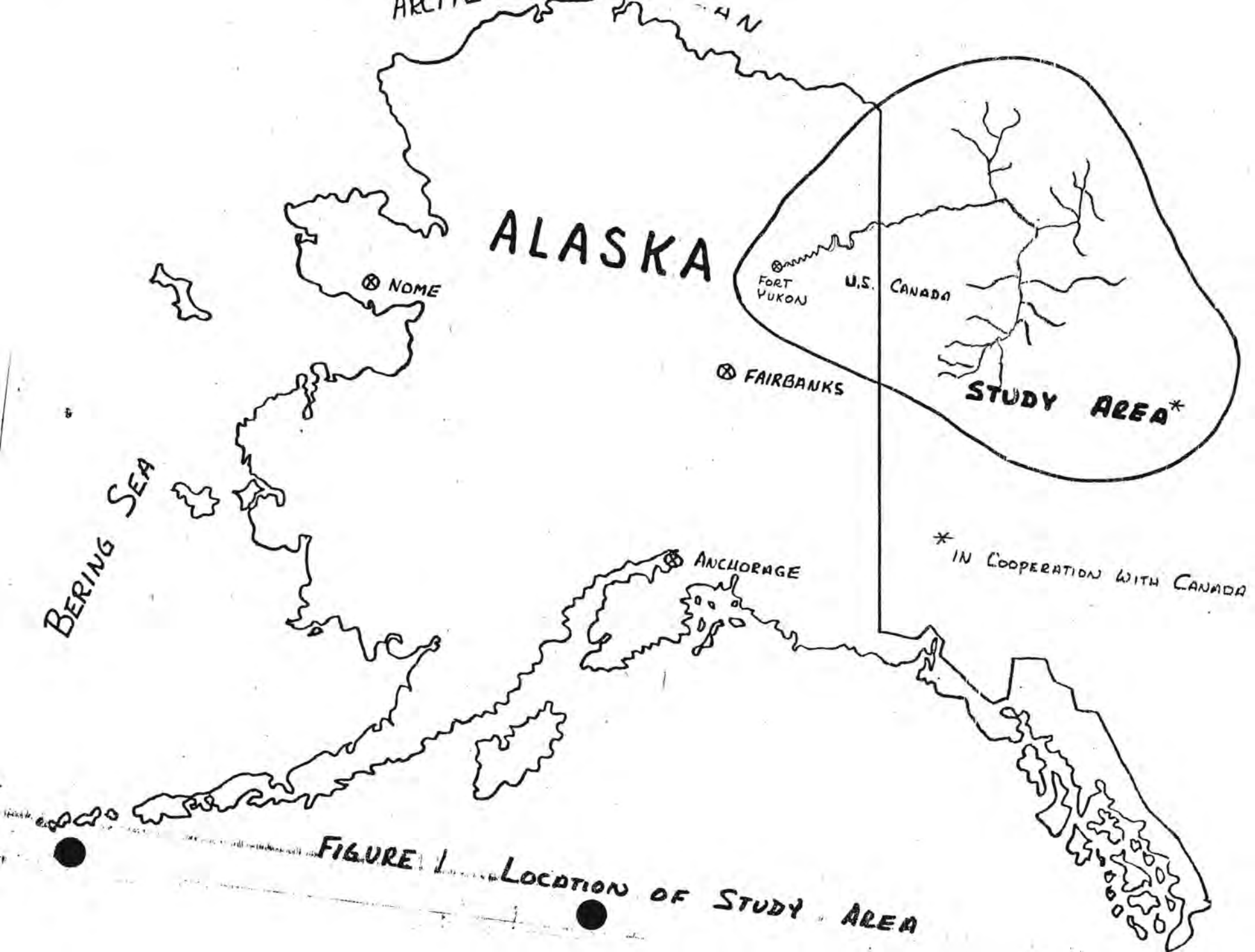
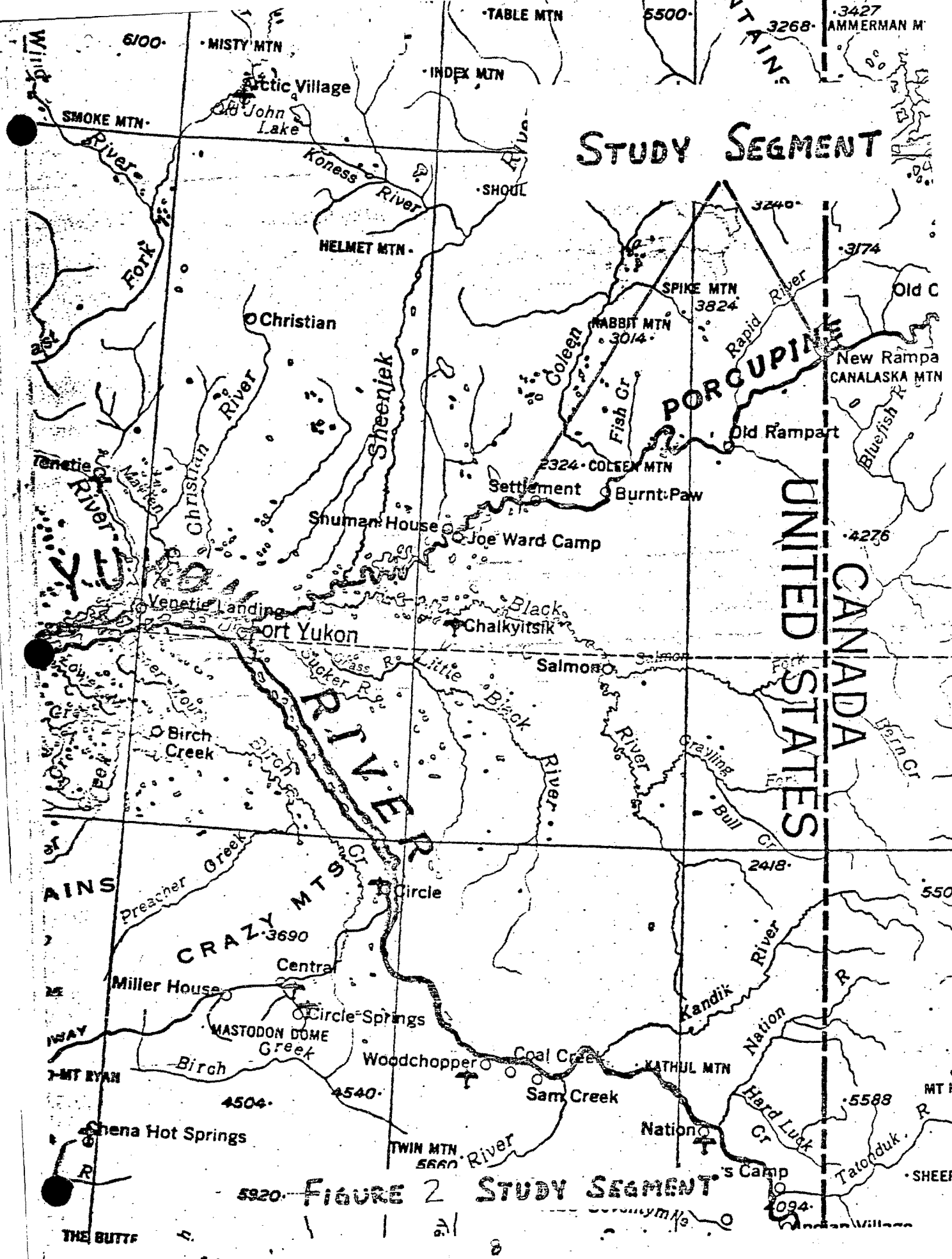
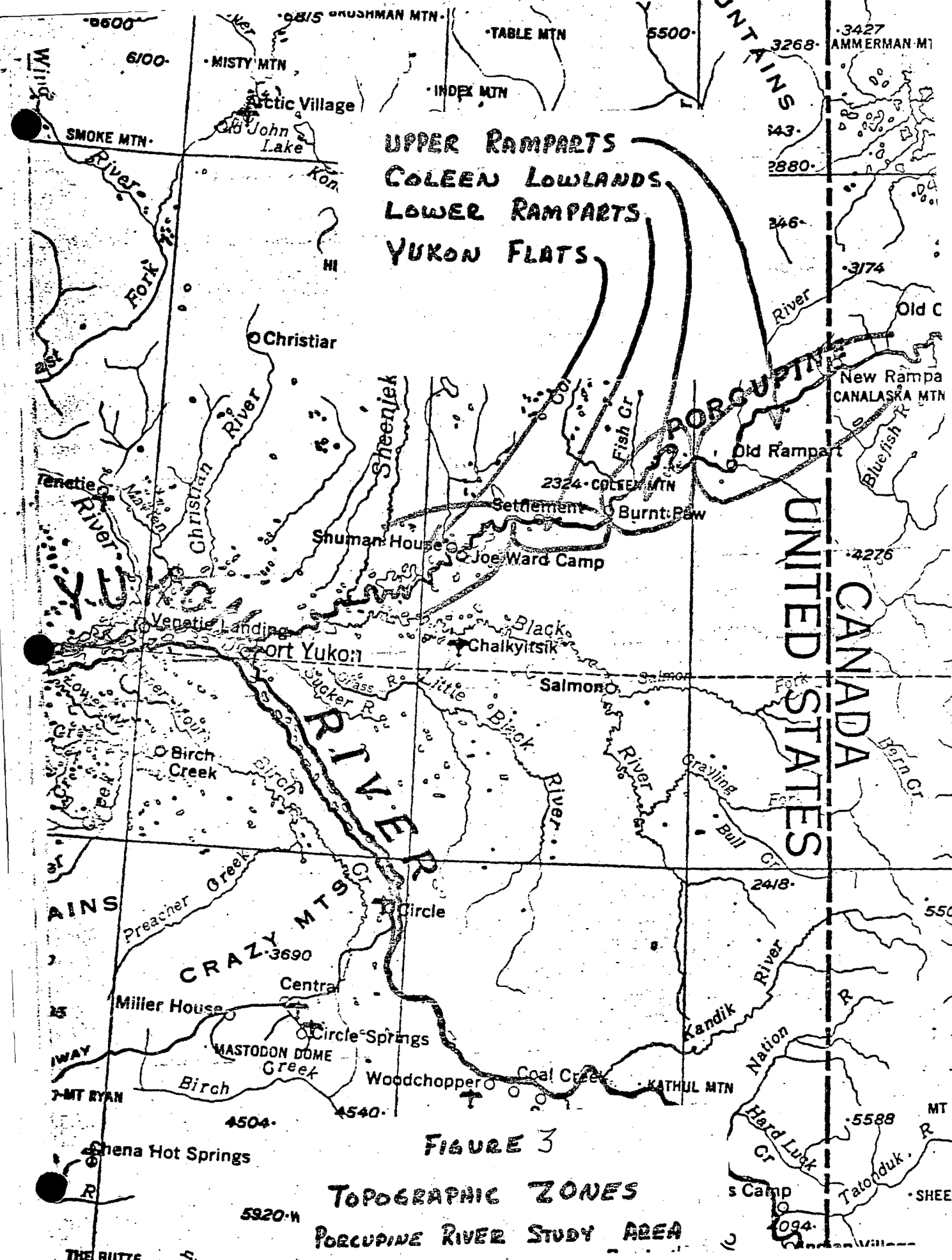


FIGURE 1 LOCATION OF STUDY AREA



5920. **FIGURE 2 STUDY SEGMENT**



R. G. McConnell<sup>2</sup> of the Canadian Geological Survey, in describing his trip down the Porcupine in 1888 wrote:

"The Ramparts is a local name employed by traders to designate a contracted, walled valley or canyon. The portion of the valley of the Porcupine which passes under this name is exceedingly picturesque. In the upper part the banks rise steeply from the waters' edge on both sides to heights of from 300 to 500 feet and their green slopes are everywhere broken by shattered pinnacles and bold crags and cliffs of brilliantly tinted dolomites and quartzites standing almost on edge. As we descend, the enclosing walls become higher and steeper, and the lighter shades are replaced by more somber hues. Some miles above Rapid River a band of basalt, edged with vertical cliffs, appears above and gradually descends the banks of the canyon until it reaches the bottom, and from this on, the gorge is bordered by even, precipitous walls carved out of this rock. The uniformity of this part of the valley is interrupted at intervals by deep gashes cut by tributary streams through the basalt covering. Of these the principal one is Rapid River, which enters the Porcupine about 7 miles above the post [Old Rampart]. A mile below Rapid River is the Halfway Pillar, a projecting column of rock, which was supposed by traders to be equidistant from Lapierre House (Upper limit of navigability in Canada) and Fort Yukon."

With the exception of one small island that lies just east of the boundary, the Porcupine River through the Upper Ramparts is confined to one channel. At normal water there are 12 riffles or small rapids on this stretch of the river. In two of these the current is swift enough to cause trouble for the inexperienced boatsman, especially if his craft is heavily loaded.

<sup>2</sup>

McConnell, R.G. Report on an exploration in the Yukon and Mackenzie Basin, N.W.T.S. Canada Geol. Survey Annual Report, Vol. 4, 1891.

The first of these two riffles is just below Old Rampart, where the river in its narrow valley floor crosses at right angles over a coarse gravel bar and flows against a high rock cliff on the right bank. The other riffle likely to cause trouble is about halfway between Old Rampart and the mouth of Rapid River, where the river flows swiftly in a wide shallow channel over coarse gravel and boulders. Many of the other riffles are short and swift but not even the two mentioned above cause the experienced boatman much difficulty unless the water is very low. Between the riffles are stretches of river with a current of only 2 to 4 miles per hour. The longest of these is a stretch of about 8 miles at the lower end of the Upper Ramparts.

Extensive gravel bars exposed at normal water are not numerous in the Upper Ramparts, and as a rule the stream gravels are rather coarse. Large bars of fine sand and silt occur at two places, on the right side, just above the mouth of Rapid River and 1 mile above the Mouth of Cambell River. The Red Gate, which marks the lower end of the Upper Ramparts is of interest as a landmark. It is so named because of the red coloration in the canyon walls, which are almost vertical for 300 feet or more above the river. At the time of the Hudson's Bay Company's activities on the Porcupine

- River, the south wall of the Red Gate was known as Howling Dog Rock. The dogs used in tracking freight barges upstream were unable to haul loaded boats past this vertical cliff and while the boats were being pulled up by men with long ropes the dogs had to scramble up the steep back slope of the rock and down again to join the party, or would remain behind and howl.

The Coleen Lowlands section of the Porcupine extends from the Red Gate downstream for a distance of 35 miles to the upstream entrance to the Lower Ramparts. The river gradient through the lowland area is noticeably less than in the Upper Ramparts, but because of numerous wide gravel bars and narrow channels around the islands this stretch of river is difficult to navigate in powerboats at low water. Four miles below Red Gate a wide gravel bar known locally as Martins Bar, splits the river into several swift channels. During the low water of midsummer this area can be troublesome for boaters with power craft but poses little problems for floatboaters.

Just below Martin's Bar the river turns abruptly north, flanked on the left by a 60-foot cut bank. This bend, known as the Fishhook Bend, is a large meander of the river across a wide flood plain and is about 12 miles long. In the northwestern part is a tundra and brush covered island about 1 1/2 miles long, around which the river channels are

shallow and, in places, swift. A number of mud slides appear to be filling the right channel. On the western side of the bend the river splits again into two channels around a timber covered island, which is being cut away rapidly on the upstream side, filling one channel with snags and "sweepers." Between the lower end of Fishhook Bend and the mouth of the Coleen River, a large tributary from the north, the river divides in several places, forming large gravel bars and attaining a maximum width of 200 yards at normal water. The banks bordering the floodplain of the river are from 30 to 80 feet high. About one mile below the mouth of the Coleen River the shoulder of a submerged bedrock reef is exposed in midstream during low water, and a mile below this rock is a large, timber covered island. At low water a gravel bar on the north side of the island has been used as a landing strip for small aircraft. For 10 miles below the island the river is confined to one channel at normal water.

The lower Rampart section of the river extends from a point about 15 miles below the mouth of the Coleen River to the eastern edge of the Yukon Flats, a distance by river of about 15 miles. Through the Lower Ramparts, the river is nearly straight and has an estimated current speed of about 3 m.p.h. Cliffs 50 to 60 feet high, composed mainly of limestone with thin beds of black shale and quartzite, border



the river. The color contrasts in the canyon walls produce a striking effect. The end of the Lower Ramparts, at John Herbert's village, marks the lower boundary of the study segment. Below this point the river enters the Yukon Flats, an area of meandering watercourses with numerous loops turns and channels flowing through heavily timbered often bog-like terrain, on its way to the Yukon.

#### Streamflow

In 1964 the U.S. Geologic Survey established a stream gauging station on the Porcupine River at John Hubert's Village, the lower boundary of the study segment.

Above this point, the drainage area for the Porcupine River is approximately 29,500 square miles, most of which lie in Canada. According to U.S.G.S.<sup>1</sup> the average river flow at this station (5-year average) is 13,200 cfs (9,563,000 acre-ft per year). Maximum stream flow occurs in late May and early June as a result of spring breakup and snow melt. Rain induced high water can be expected several times during the summer. Daily flows as high as 217,000 cfs during the early summer and as low as 700 cfs in dead of winter have been recorded.

Because of extensive areas of permafrost in the drainage basin which prevents moisture absorption, runoff following rain storms can raise the river dramatically. In his trip

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<sup>1</sup>

U.S.G.S. Water Resources Data for Alaska, 1970

down the Porcupine in 1965, McCutcheon<sup>1</sup> reports the river rose 12 feet in 36 hours in the upper Ramparts. In the confining walls of the canyons such fluctuation can cause serious problems for boaters.

Through the study segment the river gradient shows an average drop of 6 1/2 feet per mile.<sup>2</sup> For the most part of the river is characterized by Class I water (International Difficulty Scale, Appendix \_\_\_) with an occasional class II rapid that can be Class III under certain water conditions (either higher or lower than normal).

#### Water Quality

Water quality data is lacking. However, it is assumed that overall water quality is good. Analysis of a single water sample collected near Fort Yukon in June 1970<sup>3</sup> indicate no substances present that would in any way alter customary uses of the water.

During May and June the river carries a substantial silt load as a result of spring run-off. By mid summer water is generally clear to moderately clear and remains so for the rest of the summer except for brief periods when rains wash debris into the river. All major and minor tributaries to the study segment are clearwater streams. Several of the smaller streams and the Black River contribute water

<sup>1</sup>

McCutcheon, Steve, Adventure on the Porcupine, Alaska Sportsman Magazine July 1966-Jan 1967.

<sup>2</sup>

Fitzgerald, Gerald; Reconnaissance of Porcupine Valley, Alaska, 1944 U.S.G.S. Bull. 933-D

<sup>3</sup>

U.S.G.S. Water Resources Data for Alaska, 1970

with a tea-like or brownish cast as a result of flowing through extensive peat bog areas. This coloration however, does not effect normal water use.

The various settlements and cabins along the river, including the village of Old Crow in Canada appear to contribute negligible amounts of man-made pollution to the river. There are no mining, lumbering or agricultural operations in the area to contribute to the rivers natural silt load.

Water temperature in the Porcupine varies from about 32° F. under the ice in winter to the mid 50's in the latter part of the summer.

#### Land Use

Existing land uses within 5 miles of the study segment of the Porcupine River are similar to those of the region as a whole. The entire area is generally a primitive environment with only occasional and minor man caused intrusions. Less than one percent of the lands along the river are occupied by dwellings and there are no roads. There are no mining areas and only subsistence timber cutting has ever taken place.

At present, the only existing land uses of importance appear to be residences and subsistence activities.

## Residences

There are only twelve known cabins along the study segment and of this number \_\_\_\_ are currently occupied. Of these twelve, these are two each at Old Camp, Canyon Village and John Herbert's Village, three at old Rampart and the remaining three are found one each at Fishhook Bend, Burnt Paw and the mouth of Rat Creek. All twelve are or would be habitable with minor work. Of this number however, only \_\_\_\_ appear as being used on any sort of a regular basis. Past use of these cabins was generally for trade, hunting fishing and trapping or river travel purposes. Present use is believed limited to hunting and/or fishing. Few, if any, new residences are anticipated along the river and none are expected in the study segment.

## Subsistence

Because of its natural attractions for game animals and its fishery resource, the river figures importantly in the regional subsistence pattern. The slopes and draws along the canyon walls and the river floodplain harbor populations of moose, caribou and other game animals and birds. The river itself yeilds fish to both net and hook and serves as a focal point for waterfowl. Because access to the Porcupine Valley is usually via riverboat, the areas nearest the river usually sustain the majority of subsistence activities.

In addition to fish and wildlife, the canyon walls and floodplain are important berry picking areas. Timber cutting for building materials and firewood is also concentrated in the river corridor due to the necessity to move the wood up or downstream by water.

Because of the almost total lack of habitation in the study area, subsistence users probably come up-river from Fort Yukon.

Unless significant alternations in the areas economy or population occurs, these subsistence values are expected to remain unchanged.

#### Other Land Uses

While no mineral values of commercial interest have been discovered along or within the study segment, the possibility of petroleum resources does exist. Preliminary indications through work by the U.S. Geologic Survey and several oil compaines indicates that areas to the south and to the southwest of the study segment contain geologic features conducive to petroleum production. No petroleum finds have been made in these areas. On the basis of these nearby petroleum prossibilities, future discoveries along the Porcupine cannot be ruled out.

While occasional small stands of timber of merchantable size are located along the river, most of these occur below the study segment. Because of the limited size of these

stands and the distance from processing and marketing points, none of the timber resources of the study segment are considered commercial. Unless access and human use of the area is altered dramatically, timber use in the area is expected to remain unaltered.

Other potential land uses of the Porcupine Valley include roads and water resource developments and both of these topics are discussed in later sections.

#### Water Resource Developments

There are no existing or authorized water resource development projects on the Porcupine River. There are however, two potential hydroelectric projects that would have serious effects on the Porcupine River's free-flowing status (Fig. 4).

The first of these is the Proposed Rampart Canyon Project downstream on the Yukon River. If constructed this dam would flood the lower 180 miles of the Porcupine (lower 60 miles of the study segment) to approximately Old Rampart. In their 1971 report on the proposed Rampart project, the U.S. Army Corps of Engineers recommends against construction of the project at this time.

The second of these projects involves the construction of a dam on the Porcupine in the Upper Ramparts area about 12 miles below the Canadian border. The drainage area above the damsite is about 23,400 square miles with almost all of it lying in Canada.

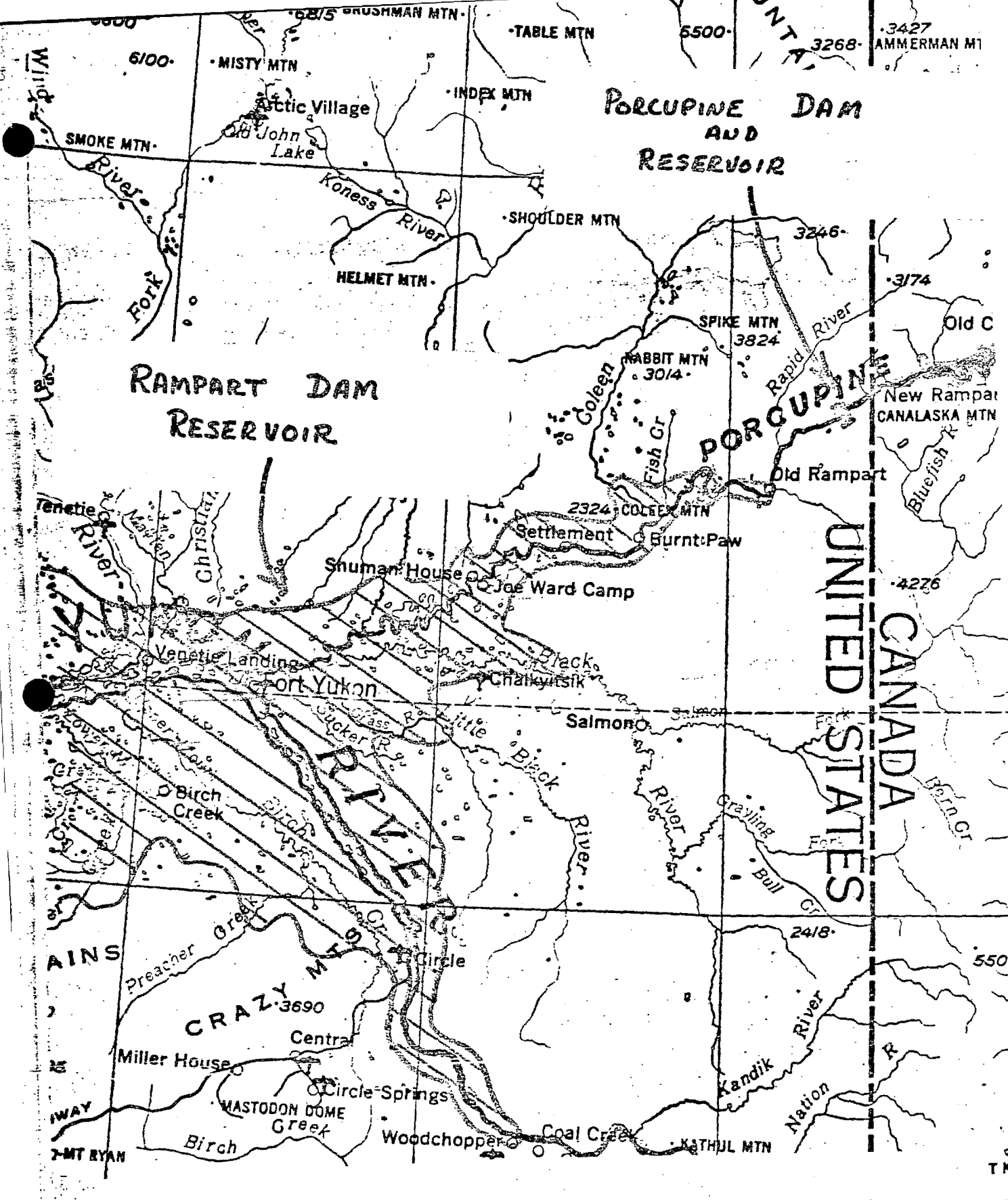


FIGURE 4 POTENTIAL HYDROELECTRIC PROJECTS

Inventory grade plans assume a concrete arch dam with a maximum height above foundations of about 400 feet and a crest length of about 1600 feet. Water supply is estimated at 9.1 million acres feet per year, average. The reservoir would affect 7 square miles in the U.S. and have a shoreline of 46 miles. A much larger portion of the reservoir would be in Canada.

The project would provide 100% regulation of the river and produce an estimated firm energy potential of 2.32 billion kilowatts with a 50 percent load factor. Annual value of the power would be around \$15 to \$20 million assuming a power cost of from 7 to 10 mills/kilowatt hour. Project construction costs (1965 Price Base) would be \$240 million. Present day construction costs are estimated to be 50% higher.<sup>1</sup>

At the present time there are no active studies or proposals to develop the project.

Because of its strategic location with respect to storage of upper Yukon basin flows the project is considered significant in any long range plans for the Yukon basin.

Any decision to develop or not develop the Porcupine site would be made on the basis of joint U.S. and Canada consideration of the resources involved and long range need and alternatives for conservation and development within the Yukon River basin as a whole.

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<sup>1</sup>

Source: Alaska Power Administration



It is not known how either the Porcupine or Ramparts projects fit into the long range power needs identified by the State or how the projects fit into the Statewide water plan which is just now being considered as a planning activity under the aegis of the Water Resources Planning Act, P. L. 89-80.

#### Land Ownership

There is no privately owned land within a corridor extending one mile back from each bank of the river through the study segment.

Within the study segment are 13 pending native applications under the 1906 Native Allotment Act. Final adjudication of these applications has not been made by the Bureau of Land Management.

The remainder of the river corridor lies either in federal ownership as Section 17 (d)(2) lands or tentative Native village withdrawal as designated by the Secretary of the Interior in March, 1972. \_\_\_ of the 13 Native allotment filing fall within the native village withdrawal lands. Along the study segment, 40 miles of the river lie in the Sec. 17 (d)(2) classification and 50 miles lie within the native village withdrawal classification. Figure 5 shows this ownership graphically.

The entire study segment is currently managed by the Bureau of Land Management.

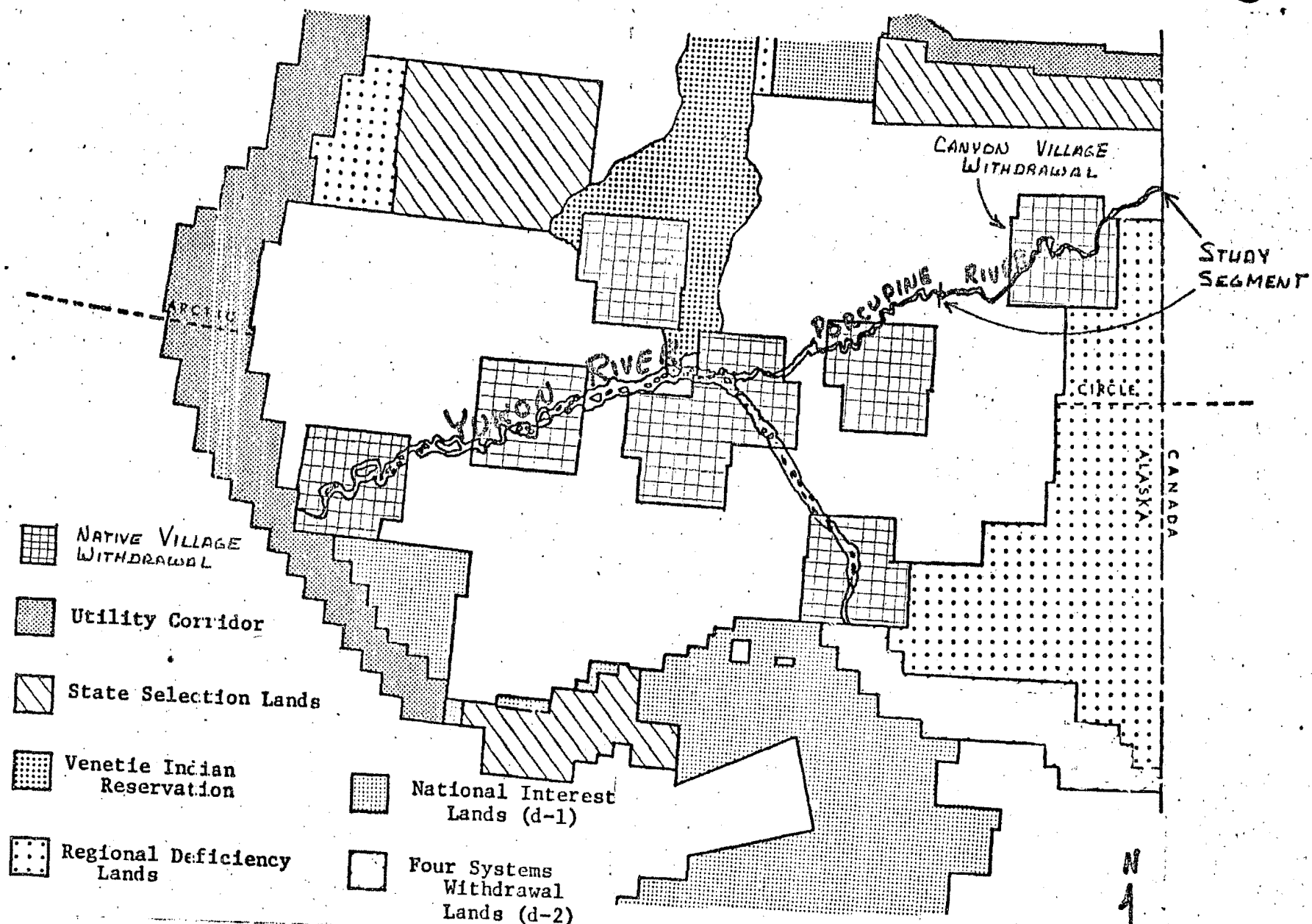


FIGURE 5 LAND STATUS

SCALE: 1 IN = 25 MI

In terms of potential land ownership, the entire study corridor is presently withdrawn under P.L.O. 3520 as a power site withdrawal for the potential Rampart Canyon hydroelectric project. Under the Alaska Native Claims Settlement Act, the study corridor lies within lands being studied by the U.S. Forest Service for a potential national forest and by the Bureau of Sport Fisheries and Wildlife as an addition to the national refuge system. In addition, the Bureau of Land Management has an interest in the area and would be the manager of the federal land if it is not added to either of the two national conservation systems (d)(2) listed above but instead is retained in federal ownership as "public interest, (d)(1) land "

#### Water Rights, Navigability and Riverbed Ownership

There are no adjudicated water rights in the study corridor.

Under the Alaska Statehood Act the State of Alaska owns the stream beds and controls the water rights of all "navigable" waters of the State. Under preliminary criteria developed by the state, the entire length of the Porcupine River in the U.S. may be considered navigable. In addition to the States' determination. The Army Corps of Engineers considers the river navigable all the way to La Pierre House, some 250 miles into Canada. The river has historically been used as the prime means of transportation in the area, and river boats and barges still ply its waters.

In addition, the Treaty of Washington between the United States and Great Britain (dated May 8, 1871) guarantees Canada navigation rights from her territory on the Porcupine, Yukon, and Stikine Rivers through Alaska to tide water.

## Access

### Existing

Existing access to both the Porcupine area in general and the study segment in particular is by river, air or foot. There are no roads to or within the study area. The river has historically provided the major means of access to the area. Riverboats both powered and non-powered have been using the river for many decades. Modern riverboats are still quite common on the river and up-river barge traffic is the major means of supply to the village of Old Crow in Canada.

Several old trails are believed to venture into the area but their location and use is unknown. Winter use of the frozen river by dog sled and snowmachines is possible but the extent of such use is unknown.

With the advent of the airplane, access to the area was greatly facilitated. While there are no developed airstrips on the study segment, float plane access is relatively easy. In addition, several of the gravel bars in the study reach are accessible by wheel aircraft during certain times of the year.

### Potential

In addition to continued use of riverboats, aircraft and foot travel, the area may eventually have road access.

The Alaska Department of Highways has tentatively identified a highway from north to south crossing the river

in the vicinity of Burnt Paw (Fig. 6). A spur to this road would take off from the highway on the south bank of the river and roughly parallel the river to old Rampart and continue on into Canada. This potential road has received only very preliminary consideration and its eventual construction would require substantial alternations in the area economy and/or population to justify construction. Because of the canyon-like character of the study segment, it is anticipated the road would lie on the high plateaus above the river and would enter the study segment only if crossings were necessary.

#### Geology and Soils

Geology of the lower Porcupine River is closely linked to the adjacent Yukon Flats. Overall, the river flows through an area of deep (Approx. 300 ft) Lacustrine (Lake) silt and silty sand deposits of late tertiary to early Quaternary age which are overlain by deep alluvial deposits which form the extensive alluvial fans, terraces and flood plains so common in the Yukon Flats. This overlying material ranged in age from early to middle Pliocene.

Moving upriver, the overlying alluvial material becomes more shallow and the river in many places cuts through to the buried bedrock.

The bedrock shows considerable variety, being composed mostly of undifferentiated Ordovician, Cambrian, Devonian, Silurian sedimentary rock (mostly limestone and dolomite)

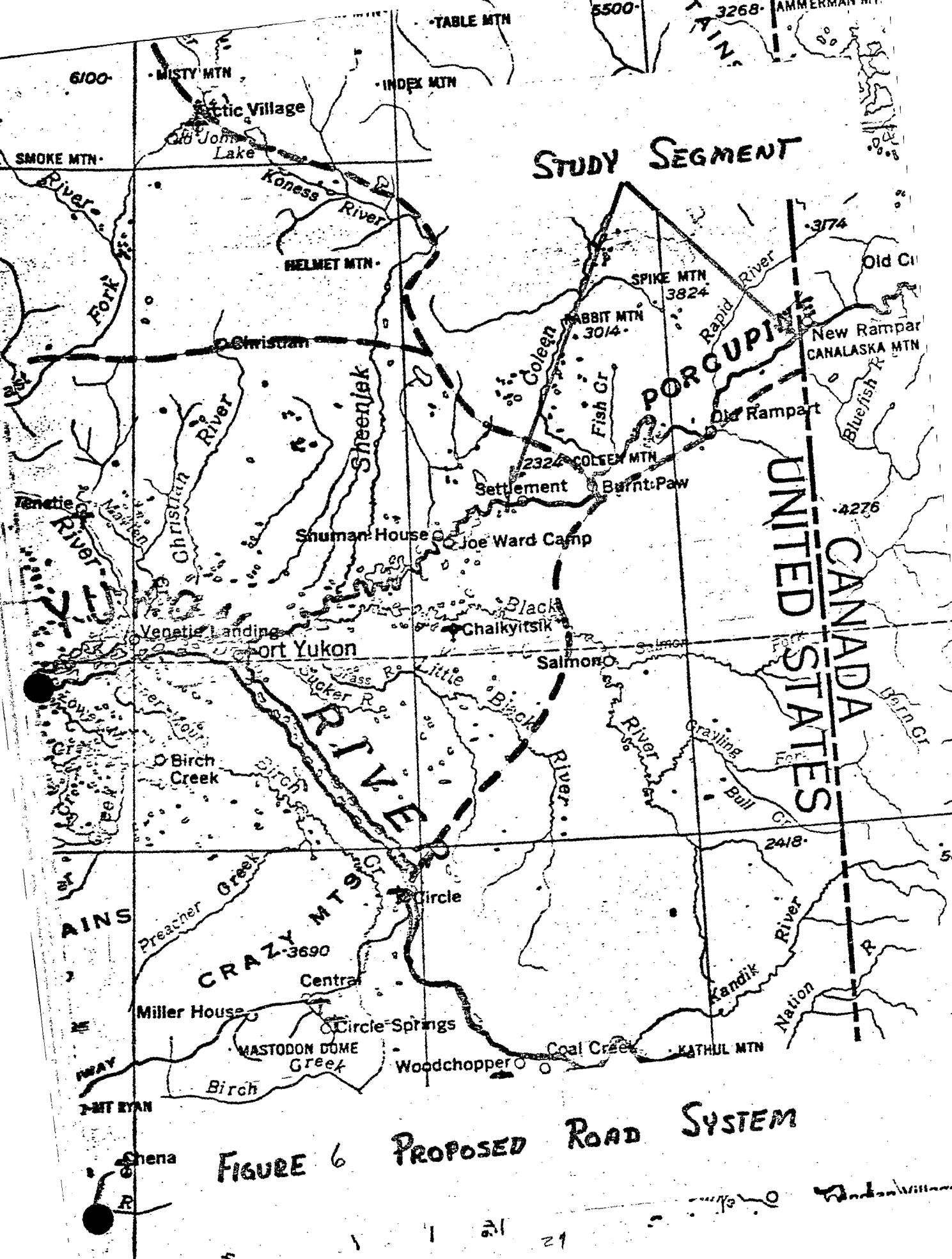


FIGURE 6 PROPOSED ROAD SYSTEM

with occasional mafic (volcanic) intrusions. It is through this area of exposed bedrock that the river carves the Porcupine Canyon (Ramparts) that adds so much to the river's scenic quality.

Soils along the study segment are generally shallow and stoney. Soil profiles are poorly developed due to frequent flooding within the canyon floodplain.

### Vegetation

Flora along the study segment is characterized by two basic vegetation types.<sup>1</sup> The first of these is a closed spruce-hardwood forest which extends from the river mouth upstream to the vicinity of Burnt Paw. This type is characterized by stands of white spruce in association with quaking aspen, paper birch and balsam poplar. Shrubs found with the major tree species include bearberry, crowberry, labrador-tea, prickly rose and numerous species of willow.

Because the river is generally in a canyon or fairly deep cut bank, vegetation immediately adjacent to the river exhibits some significant differences from that found on the plateau above the river. Higher concentrations of poplar grow along the water course and because of better drainage along the river, birch are more prominent than on much of the upland area. Trees are scrubby and stunted on the

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<sup>1</sup> Viereck, L.A. and Little E.L., 1972; Alaska Trees and Shrubs, Agriculture Handbook #410

uplands but may attain a diameter of two feet or more in stringers along the river. The timber line is about 1,500 feet above sea level so most of the rolling hills below the Upper Ramparts are wooded.

Large areas in the Porcupine Valley have been burned over by forest or brush fires at one time or another and stands of virgin timber have been replaced by second growths of spruce, poplar or birch.<sup>1</sup>

A few red raspberries are found, usually at abandoned camp or cabin sites and blueberries are plentiful during July and August on most of the upland hills from Mount Marr to the international boundary. The low-bush cranberry grows over the same hills, but the red currant is restricted to heavily timbered areas along the valley floor.

#### Wildlife and Fishery

##### Wildlife

Major big game species along the Porcupine include moose, grizzly bear, black bear, caribou and Dall Sheep.

Most of the flats area and significant portions of the flood plain along the Porcupine provides good moose range. Moose populations in the upper Porcupine are smaller due to lack of suitable habitat in the canyon areas. Birch and aspen, characteristic of the secondary stage of forest

1

Fitzgerald, Gerald: Reconnaissance of Porcupine Valley, Alaska, 1944 U.S.G.S. Bull. 933-D



sucession following fire and willow, a pioneer species on sand and gravel bars are preferred foods and their location determines the moose distribution. The area from Burnt Paw downstream is considered important moose winter range.

Black and grizzly bear occur in moderate densities throughout the flats, flood plains and surrounding hills. In alpine areas surrounding the lowlands, the total bear population may be lower but grizzlies become relatively more abundant. Bear populations probably have remained relatively constant since hunting is not significant and fire has been the only factor known to have effected their environment.

Caribou along the river are part of the Porcupine herd, second largest in Alaska and estimated at 140,000 animals. This herd represents about 23 percent of the total caribou population of the state. The herd ranges over a large area in their migrations from Canada to the north slope of the Brooks Range. The entire study segment lies within this migration route. During August and September, thousands of these animals cross the Porcupine just downstream from Old Ramparts. Caribou use the area both in summer and winter but the largest concentrations occur during the late summer migration.

Dall Sheep in small numbers are reported to be present in the vicinity of Salmon trout River and immediately north of the Porcupine around Spike Mountain.<sup>1</sup>

<sup>1</sup>

Fitzgerald, Gerald: Reconnaissance of Porcupine Valley, Alaska, 1944 U.S.G.S. Bull 933-D

In addition to the big game species listed above, the river and its immediate environs support sizeable populations of fur-bearers such as beaver, muskrat, mink, otters, martin red squirrel, weasel, wolverine, lynx, red fox, coyote and the magnificent arctic wolf. Spacial distribution of these species is generally dependent upon specific habitat requirements, most of which can be found in close proximity to the river.

One hundred and thirty species of birds have been identified in the Yukon Flats just downstream from the study segment. Most are migratory but a few remain year around. Twenty species of waterfowl nest in the flats and contribute significantly to sport hunting in Canada, the United States and Mexico. The Yukon Flats is one of Alaska's most productive waterfowl areas, contributing an estimated 2.1 million birds annually. While bird concentrations are higher in the Yukon Flats and lower Porcupine, substantial numbers of birds do use the study segment wherever habitat conditions are right

Of particular significance is the existance of prime habitat for the rare and endangered American Peregrine Falcon (Falco peregrines anatum) within the study segment. The entire upper section of the river, especially the Upper Ramparts, has been identified as one of the best nesting areas for this rare bird in all of Alaska.

Other raptors such as bald and golden eagles, osprey, red-tailed hawks and great horned owls nest along the river wherever suitable cliffs are available.

Upland game birds in the area include spruce grouse and willow ptarmigan and they may be found throughout the study reach.

#### Fish

Fish resources of the Porcupine River include both anadromous and resident species. Coho, Chinook and Chum salmon use the river as an avenue to spawning beds in the Porcupine's tributaries both in the U.S. and Canada. It is believed some of these fish migrate the furthest of any salmon in North America.

In addition to the salmon, the river contains Arctic grayling, inconnu (sheefish), northern pike, burbot, suckers, cisco and several varieties of whitefish.

#### History and Archeology

Little is known of historical or archeological values along the river. The area downstream along the lower Porcupine and Yukon river however, has had some research and it is fairly safe to assume that many of the occurrences in the area apply to the upriver section as well. The area in question comprise's the Yukon Flats which is situated across the route traversed by ancestors of the American Indian. It could well be that wood and wildlife of the flats played a key role in the aboriginal population of America.

Indians of the Yukon Flats are a part of the Kutchin people occupying the Upper Yukon and a portion of the Mackenzie River Valley. They are of the Athapascan tribes, hunters who ranged through much of western North America from Alaska to Mexico relying on fish and game as they moved seasonally from fish camp to hunting territories. Prior to white settlement, the Indians had extensive trade routes up and down both the Porcupine and Yukon rivers and across the mountains both north and south to the coasts.

An abundance of fur-bearing animals in the area was the key to early settlement by the white man. Russians discovered the mouth of the Yukon River in 1834 and in 1841 established the post of Nulato, approximately 350 miles southwest of the Yukon Flats. The first white man to reach the Yukon Flats was John Bell of the Hudson's Bay Company traveling from the Mackenzie River in 1845. Two years later, Alexander Murray established Fort Yukon for the Hudson's Bay Company at the confluence of the Porcupine and Yukon Rivers. Fort Yukon was the first English speaking community in Alaska.

Bell and Murray found several hundred Indians occupying the banks of the Yukon River and its tributaries. These were the Kutchakutchin or "People of the Yukon Flats." After the establishment of the Hudson's Bay Post, the fur trade became a dominant element in the region's economy.

In some years Murray bought as many as 8,000 marten and a variety of other furs from the Indians. Company officials described Fort Yukon as the most valuable Hudson's Bay Post west of the Rockies.

Alaska was purchased by the United State from Russia in 1867 but the Hudson's Bay Company continued business at Fort Yukon for two years until Captain Raymond, U.S. Army, took possession for the United States.

In order to retain their lucrative fur trade, in 1869 the Hudson's Bay company moved their post up the Porcupine to Howling Dog Rock in the mistaken belief they were out of the U.S. into Canada. They operated the post for 15 years until a new survey showed them to be still in the U.S. In 1887 they were again forced to move their post and moved upriver again to the present site of Old Rampart. The post operated for one year until a new survey showed they were still in the U.S. In 1889, they dismantled the post and re-established it in Canada at new Rampart.

In the early 1880's prospectors reached the Yukon Valley over the Chilkoot Pass from Juneau. By 1886 the business of supplying gold seekers superseded fur trading in the economy of the Yukon and Porcupine River trades. In 1893 gold was discovered on the eastern edge of the Yukon Flats at Birch Creek, and Circle City was born. For three yeras Circle City with a population of over 1,000

white men was the largest settlement on the Yukon and the largest community ever on the Yukon Flats.

The gold rush period provided Indians an opportunity for employment as hunters, packers, and laborers. However, the great gold strikes of the Klondike and Nome soon drained off much of the population, and Fort Yukon again became the principal community.

As gold was depleted and fur prices increased, a new breed of white trappers settled in the area, taking advantage of transportation facilities established by the gold miners. Although the Indian continued to derive much of his living from the land, a high demand for fur and labor enabled him to acquire an assortment of useful items.

Firearms, knives, steel traps, fish nets, and eventually boat engines were incorporated into the hunting economy. School teachers, missionaries, government agencies, and modern technology have had an increasing impact on Native life. In recent years the assimilation of Natives into the white economy has been rapid.

Fort Yukon was an important fur center in the 1920's when fur was "King" in Alaska. It was, in fact, the greatest collecting point for fur in all of Alaska. World War II ended the heyday of furs on the Yukon Flats and the trade has been sustained since by a diminishing number of Caucasian old timers and Indians. Prices for wild fur

generally remain low as a result of competition with synthetics and rance furs. Wages in other parts of Alaska on the other hand have increased steadily, removing the inducement for young people to take up the rigorous life of the trapper.

Historic features of particular interest include the village of Fort Yukon, the abandoned Hudson's Bay Trading Post at Old Rampart, and the historic trail from Fairbanks to Wiseman that crosses the western part of the Flats in the vicinity of Beaver.

Because of the length of the past Native habitation of the area it is possible that sites of archeological value do exist along the study segment. Due to the lack of archeological research in the area the location of these sites if they do exist is unknown.

### Recreation

#### Resources

The upper Porcupine Valley's unusual array of open space, frontier atmosphere, wildlife, fisheries, history and canyon scenery combine to create an exceptional recreation resource.

Fish and Wildlife values are high.

From the standpoint of a recreation experience along the Porcupine River, it is reasonable to expect to observe considerable evidence of wildlife including wolves, moose, caribou, black and grizzly bears and numerous small game and fur animals, including beaver. A wide variety of bird-

life, including waterfowl and several rare and endangered species are found. The number and variety of wildlife observed would depend upon the time of year and the part of the drainage visited.

Special geologic features may be found throughout the "ramparts" areas. In addition to the fascinating scenery offered by the combination of unusual rock shapes and colors in the ramparts there are numerous areas that provide significant opportunities for geologic study and rock-hounding.

Opportunities for boating with power craft or float boats (canoes, kayaks, rafts) is excellent. Current in the river varies from 2-4 miles per hour and sufficient water is present during the entire recreation season for most forms of boating.

Rating of the white-water boating characteristics of the Alaskan portion of the Porcupine River on the International Difficulty Rating (Appendix \_\_) is Class II with limited areas of III. Rating were made on the basis of a loaded, open canoe. Use of a kayak or closed canoe, or an open canoe without camping gear would reduce the overall ratings. It is important to remember, however, that ratings are a function of equipment x skill x water level. Therefore, the above ratings are based upon what are assumed to be typical summer conditions.



Overall skill level is rated at "Intermediate" because of the distance from assistance in the event of accident (Appendix ).

#### Existing Uses

Primary recreational use of the river occurs from May to October coinciding with break-up and freeze-up. Because of the lack of economical overland access (no roads) access to the area is by air or boat. Since there are no permanent air strips, air access is by float plane or occasionally wheel aircraft when large enough gravel bars are present. Boat access can be expensive (gasoline prices can exceed \$2.00 per gallon) and under certain water conditions (especially high water) can be dangerous.

Access is recapped to point out that because of the monetary considerations involved, current recreational use of the river is very light. Although no recreation use figures are available, hunting for big game and unscheduled fishing associated with the hunting appear to be the most prominent forms of recreation. An occasional floatboater or wilderness camper may use the river but such occurrences are rare.

#### Future Use

The Porcupine River is rich in high quality outdoor recreation opportunities. These include floatboating (canoeing, kayaking, rafting) hiking, nature study, camping and visiting areas of special geologic or historic significance.

As a floatboat area, the river is excellent. It offers

spectacular scenery through the rugged ramparts yet does not require extensive boating experience for safe and enjoyable use.

Although no maintained hiking trails exist, there are a number of areas where such facilities could be developed. Many of these trails could also be designed to accommodate winter use by dog sled or snow machine. A number of the side drainages and settlements along the study segments could be connected or opened up through a combination of hiking trails and power or float boat access.

Although camping would generally be associated with all other recreational uses, some people engage in this activity as an end in itself. There are numerous areas for primitive camping sites along the river.

If the tentatively identified highway is constructed, the special values associated with the scenery in the ramparts could be expected to be a strong drawing attraction for the river. With the advent of unimproved access substantially larger numbers of visitors engaging in all pursuits could be expected.

#### Limitations

Limitations to future recreation use include adverse winter weather, fire danger, access and the mosquito. When considering Alaska as a whole, these limitations are minor. Of major consequence, however, would be the conflict between

wild and scenic river values and potential water resource development projects.

The Rampart canyon project would flood all but about 30 miles of the U.S. portion of the Porcupine leaving most of the river as one large reservoir subject to periodic water fluctuations. The Porcupine dam project would only inundate about 12 miles of the Porcupine in the U.S. but regulatory effect on the river would have a serious impact on the rivers existing primitive character, mostly through moderation of water level fluctuations.

BOB STEVENS

PRELIMINARY

CHAPTER IV

SHEENJEK RIVER

PRELIMINARY RESOURCE ANALYSIS

JUNE 1973

River Setting

The Sheenjek River begins its 205+ mile southward course to the Porcupine River high in the glaciers and icefields of the Romanzof Mountains, a northeastern branch of the Brooks Range (Fig. 3). Although spawned by glaciers, the river's numerous clearwater tributaries quickly convert it to a typical clearwater stream. In its southward flight, the river passes through three distinctive physiographic provinces (Fig. 4). The upper 55 miles of the river above Lobo Lake lie within an alpine province formed by the mountains on the south slope of the Brooks Range. The province was extensively glaciated in past times and is characterized by U-shaped main valleys, hanging side valleys and high, steep relief with peaks ranging from 5000 to over 8000 feet. At Lobo Lake the valley floor is approximately three miles wide and consists mainly of open meadows between scattered stands of white spruce. Proceeding up river the valley gradually narrows. The last stand of spruce occurs about thirty miles above Lobo Lake. Beyond this point the valley is alpine tundra until in the far upper reaches, the river bed becomes a jumble of rocks and boulders with gushing streams descending

FIGURE 3 SHEENJEK-KONESS RIVERS - STUDY AREA

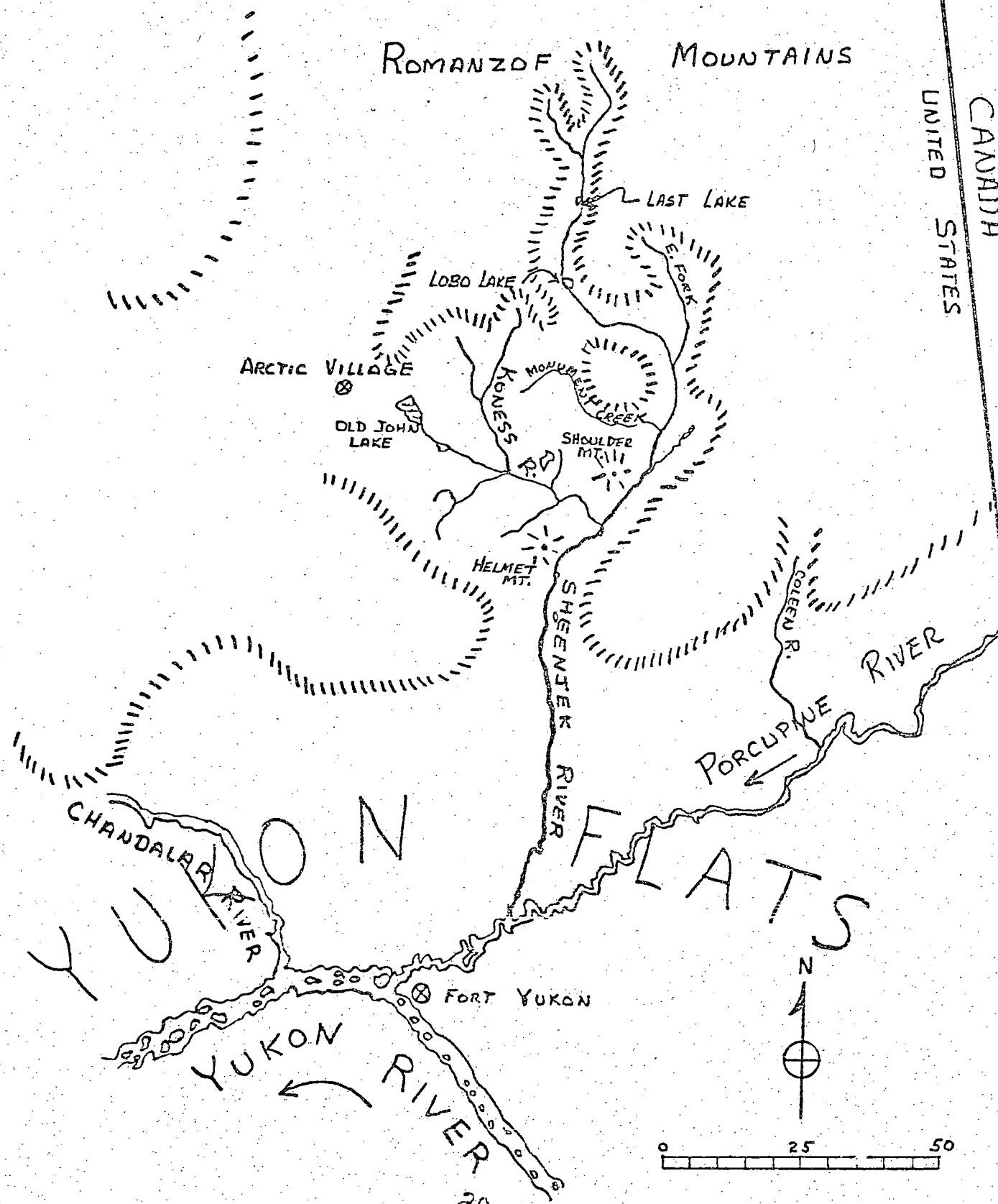
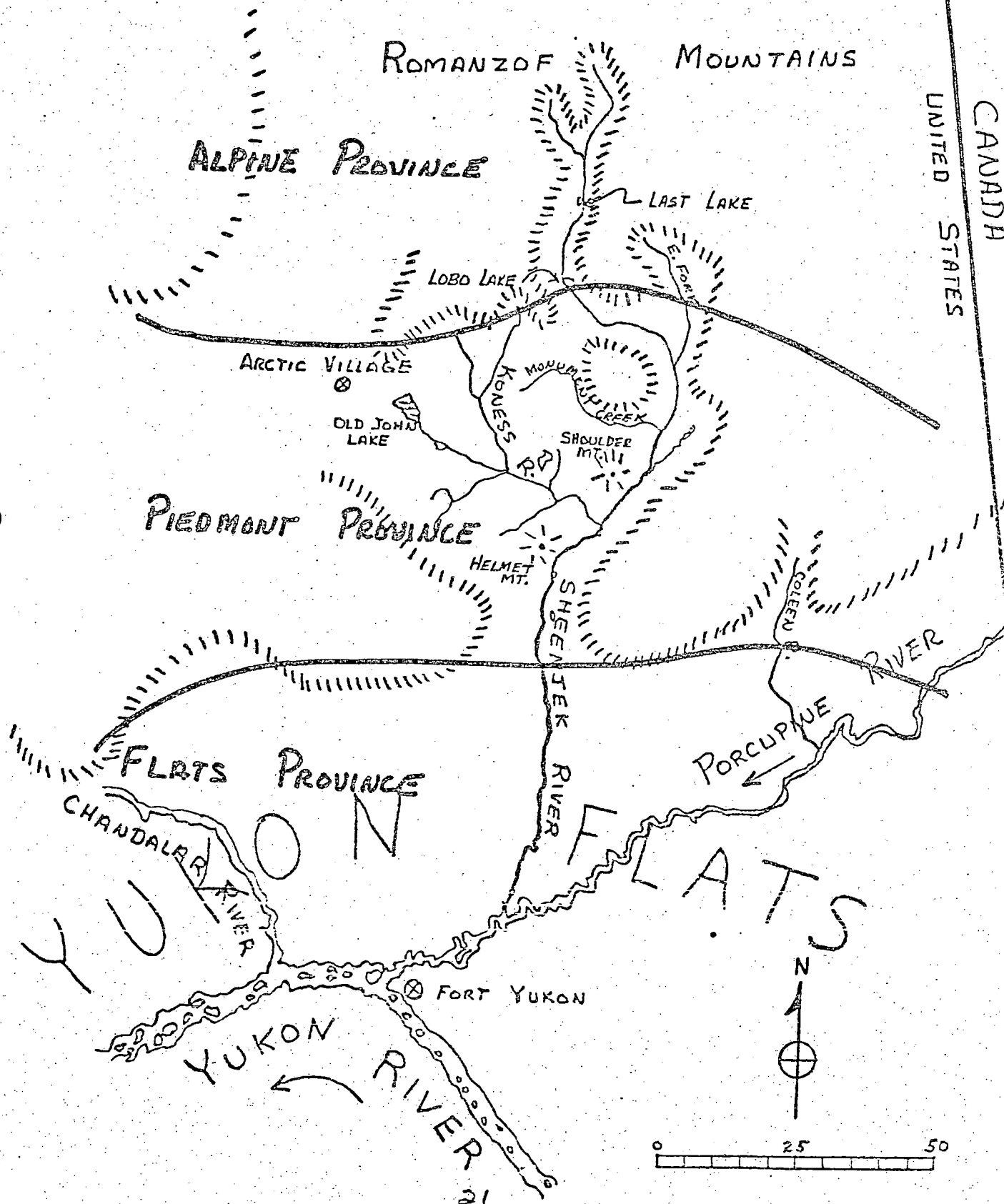


FIGURE 4 APPROXIMATE BOUNDARIES OF  
PHYSIOGRAPHIC PROVINCES



from the steep, talus-covered peaks of the Arctic divide to form the main river.

Below Lobo Lake the character of the Sheenjek changes abruptly. It is at this point the river enters the piedmont province, an area of rolling hills with occasional prominent peaks. This province extends from the southern boundary of the high mountains of the Brooks Range southward about seventy miles. Approximately 75 miles of the Sheenjek's length lie within this zone. Below Lobo Lake the valley broadens and merges gradually with distant hills with elevations ranging between 2000 and 4000 feet. Areas of tundra are still present on the valley floor, but moving downstream the forest becomes dominant. Near the junction of the main stem and the East Fork of the river the tundra meadows disappears and the valley becomes heavily forested with spruce, poplar, willow and birch. Extensive open meadows are present on the higher hills above 2,500 feet. Approximately 40 miles below Lobo Lake, Monument Creek enters the Sheenjek from the West. Monument Creek forms the southwest boundary of the Arctic National Wildlife Range. Above Monument Creek the river lies entirely within the Arctic National Wildlife Range. Below Monument Creek the valley narrows as the river flows between Shoulder and Helmet Mountains on the west and Seven Dikes Mountain on the east. At one point the



valley constricts to less than a half mile as the river flows past steep rock buttes with scrubby spruce clinging in their crevices. This is one of the more interesting areas of the piedmont province. The Shoulder-Helmet Mountain region is the only area south of the alpine zone where extensive high country is present close to the main river. Open spruce-birch forest covers the lower slopes, gradually giving way to dry tundra meadows. Helmet Mountain is most striking. Its peak, at 3,343 feet is a sharp protuberance of igneous rock rising from a round base, giving the mountain the appearance of a German Helmet. Shoulder Mountain is a flat, mesa-like mountain whose highest point rises to nearly 3,570 feet.

Below Helmet Mountain the river passes from the piedmont province into a third zone identified as a "flats" province. The lower 70 miles of the Sheenjek to its mouth lie within this zone. Here the river's elevation is between 500 and 700 feet. The flats form a broad, forested alluvial plain, almost devoid of relief, containing numerous lakes, potholes, and oxbows. Extensive areas of swamp and muskeg are present. Fine strands of spruce, aspen, cottonwood and birch grow throughout the area, especially along the stream courses and around lakes.

Through the flats, the Sheenjek winds a tortuous course. It is confined largely to a single channel with numerous meanders and banks of peat and silt. Occasionally the bank has eroded or collapsed, exposing underlying permafrost and masses of ground ice. In these lower reaches, views are almost always restricted by bank vegetation. When the current is relatively slow (4 to 6 m.p.h.) in the lower reaches, the numerous oxbows and sloughs provide an expanded watercourse for canoe exploration with numerous opportunities to view the wildlife of the area.

The Koness River like the Sheenjek begins in the alpine province but unlike the Sheenjek, its origins are not glacial. It quickly passes into the piedmont province and flows southeast for 70 miles to its mouth on the Sheenjek, midway between Sholder and Helmet Mountains. The Koness River flows along a less steep gradient than the Koness in the peidment province and as such is characterized by slightly more meandering and more of a marsh type of habitat than the Sheenjek in this province. The Koness is also much smaller than the Sheenjek and does not appear canoeable except below its confluence with Vanticlese Creek during all but the earliest part of the recreation season.

## Vegetation

As previously stated, the Sheenjek flows through three distinct physiographic provinces. In the alpine province, the vegetation is primarily open meadows of alpine tundra with occasional stands of white spruce. Willows form the major streambank vegetation. Proceeding upstream the spruce disappears about 30 miles above Lobo Lake leaving only the tundra and clumps of willows. In the headwaters the landscape is generally barren rock with occasional small patches of tundra. In the summer the meadows of this zone are lush and green. Over sixty varieties of wildflowers bloom during these months.

In the piedmont zone areas of tundra are still present on the valley floor but the forest becomes increasingly dominant. Open and scattered stands of spruce, often in concert with birch and willow mark the watercourse. Occasional stands of spruce move out to the valley walls but tundra forms the major vegetative complex away from the immediate environs of the river. Moving downstream the forest becomes more dense and widespread until the tundra is found only as occasional patches or meadows near the southern boundary of this zone.

Along the river in the flats province, the tundra occurs only rarely while a mixed forest of spruce, birch,

cottonwood, aspen and willow blanket the valley floor. An understory vegetation of grasses and sedges accompanies the forest. Numerous old oxbows and sloughs give the immediate river area a marsh or muskeg habitat.

The Koness river lies entirely within the piedmont province and the vegetation along this river closely resembles the vegetative complex found in the piedmont section of the Sheenjek River. Open tundra meadows with scattered stands of spruce, birch and willow along the watercourse dominate. Moving from the headwaters downstream the tundra ecotype gradually gives way to larger and more dense forest stands. As along the Sheenjek, the Koness valley floor also contains some areas of sedge and grass mixed with the forest.

#### Geology & Soils

The peaks around the Sheenjek headwaters are among the highest and most heavily glaciated in Arctic Alaska. The alpin province was extensively glaciated in past times and is characterized by U-shaped main valleys, hanging side valleys and high, steep relief with peaks ranging from 5000 to over 8000 feet. Limestone is the main material composing the mountains. Valley walls are often bare slopes with large accumulations of talus and little or no soil.

Geologically, the piedmont zone is composed mainly of chert, a sedimentary rock. Mostly, it is light to dark gray in color, with some black and red varieties present. In places, igneous rock has intruded into the basic chert formation. Shoulder and Helmet Mountains contain significant areas of exposed igneous rock. A variety of quartz is conspicuously common on Shoulder Mountain. In contrast with the alpine province, the piedmont zone does not appear to have been affected by glaciation during the Pleistocene. Soils in the piedmont zone are generally thicker and more widespread. Both the alpine and piedmont zones lie within the region of continuous permafrost.

The flats province is generally a lowlands area of vast alluvial deposits (outwash fans) of varying thickness. Exposed bedrock is rare and the valley floor is composed primarily of peat, gravel and silt. The flats province lies in an area of discontinuous permafrost (permafrost found in pockets).

In all three provinces, past glacial action and/or freezing and thawing are the major soil producing mechanisms. In general, the upland soils are shallow, rocky and of only medium fertility. In the flats province the soil is generally silty, deep, and contains a high degree of organic matter resulting in good fertility.

Geologic and soil formations along the Koness River are essentially the same as exist in the piedmont zone along the Sheenjek River. A basic chert material with occasional igneous intrusions typify the area. Soils are shallow and rocky for the most part with more depth, silt and organic matter immediately adjacent to the river.

### Climate

Climate along the Sheenjek and Koness rivers is typical of that found along the south slope of the Brooks Range and Yukon flats. Winters are extremely cold with temperatures often in the  $-25^{\circ}$  to  $-35^{\circ}$  F. range. Temperatures in the flats area average below freezing seven months of the year. Summers on the other hand are mild and warm with little or no precipitation. Summer (mid-May through September) temperatures are in the 60's and 70's with occasional highs into the 80's. Summer temperatures are somewhat cooler moving upriver into the piedmont and alpine provinces.

Annual average precipitation in the flats is less than seven inches; upriver in the mountains it probably approaches 10 to 12 inches. Rivers become free of ice by early June and freeze again in October. Most precipitation falls in the form of snow.

Long hours of daylight accompany the mild summer weather. This abundance of sunlight produces growing conditions ideal for rapid development of vegetation.

## River Flow Characteristics

In its headwaters, the Sheenjek is a typical mountain stream with a steep gradient and numerous rapids, riffles and boulders. About 25 miles downstream from its glacial origin, the river enters an area of numerous lakes and muskeg meadows. It loses much of its braided character and becomes wide and flat with numerous islands lying between well defined channel banks. For 20 miles the river flows through this wide channel and island area and then gradually its gradient increases and the river narrows and picks up speed. With increased speed, the river splits repeatedly into two or more channels and oxbows, swampy muskegs and overflow areas become common. Near Monument Creek the river leaves the swampy muskeg area and flows through an area of numerous gravel bars along a well drained valley floor. In this area the river is swift and braided with broad expanses of open sand and gravel bars. About 15 miles below the mouth of the Koness river, the Sheenjek leaves this gravel bar area and enters the upper reaches of the Yukon flats. In the remaining 80+ miles of the river, the Sheenjek slows becoming increasingly placid and wide with cut banks of peat and silt. In this "flats" area the river shows the strong meander patterns characteristic of major Yukon flats tributaries. During normal summer water

conditions, there are no major rapids but numerous riffles and pools may be found from the piedmont province upstream.

The Koness river, though not a large stream at ordinary stages of water, drains a large and diverse area. In its headwaters the river is a typical braided stream of steep to moderate gradient. Approximately 30 miles from its headwaters the Koness becomes a meandering river with moderate gradient and a cut bank channel. About 13 miles from its mouth the Koness flows through a narrow canyon-like valley between Shoulder and Helmet Mountains but remains a meandering stream bordered by sand and gravel bars.

The water in both rivers is Class I (International Difficulty Rating) with an occasional rapid of Class II in the upper reaches. The Sheenjek River is canoeable from Last Lake and the Koness River from the mouth of Vanticlese Creek.

Maps indicate both rivers drop between 15 and 20 feet per mile in the piedmont zone. The Sheenjek drops between 2 and 6 feet per mile in the flats zone. Both rivers exhibit current speeds of 5 to 7 m.p.h. on the average. Both rivers produce maximum flows shortly after break-up (early to mid-June) and lowest flow levels during the dead of winter (Jan-Feb) while they are frozen over.

#### Water Quality

Water quality of both rivers is excellent. Man-made



pollution is non-existent due to lack of habitation or commercial (mining, grazing, timber) activities. Both rivers carry a moderate sediment load following break-up but usually flow clear by July. The Sheenjek and Kones Rivers, like most rivers in the Yukon Basin contain surface water of the calcium bicarbonate type. Content of dissolved solids on both rivers is low, reflecting only natural background conditions. Water quality is totally suitable for all forms of human usage that would be associated with wild or scenic river activities.

## EXISTING LAND USES

The entire study segment of both rivers flows through a "wilderness" environment. No farming, mining, lumbering, or grazing is or has been undertaken. Only four cabins are known to exist along the study segment and \_\_\_\_\_ are currently being used. Use of these cabins in the past has been associated with trapping and subsistence hunting and fishing. There are no roads, trails, powerlines, pipelines, established airstrips or other environmental intrusions within the study corridor.

There are no known commercial mining deposits in the study corridor, however, the area has not been heavily prospected, especially with modern techniques.

The upper Sheenjek (above Monument Creek) lies within the Arctic National Wildlife Range. As with the surrounding refuge lands, the river corridor within the refuge is managed to preserve the unique wildlife, wilderness and recreational values found in this area of northeastern Alaska. While wildlife values receive primary management attention, preservations of the entire biotic community in its existing wilderness condition is an overall management goal.

Below the wildlife refuge, the river flowed through unreserved public domain land until enactment of the

Alaska Native Claims Settlement Act (P.L. 92-203) in December, 1971. Since enactment of P.L. 92-203, selections have been made for a utility corridor, state selection, public interest, [(d)(1)] and National Conservation System [(d)(2)] lands. While preliminary selections have been made, no management or use other than basic resource protection (fire) has taken place and the area has remained in a wild state under Bureau of Land Management administration.

The area has been used for subsistence hunting and fishing since antiquity. Natives from Fort Yukon and Arctic Village are known to hunt and fish along both the Sheenjek and Koness. Caribou comprise the most sought after species.

The lower 55+ miles of the Sheenjek is currently withdrawn under P.L.O. 3520 as power site withdrawal for the proposed Ramparts Canyon Hydroelectric project on the Yukon River. No activities other than exploration and data gathering has taken place under this withdrawal. In their 1971 report on the proposed Rampart project, the U.S. Army Corps of Engineers recommends against construction of the project at this time.

#### LAND OWNERSHIP

Federal land along the Sheenjek river falls into two ownership categories: 1) land in the Arctic National Wildlife Range, 2) land currently owned by the Federal

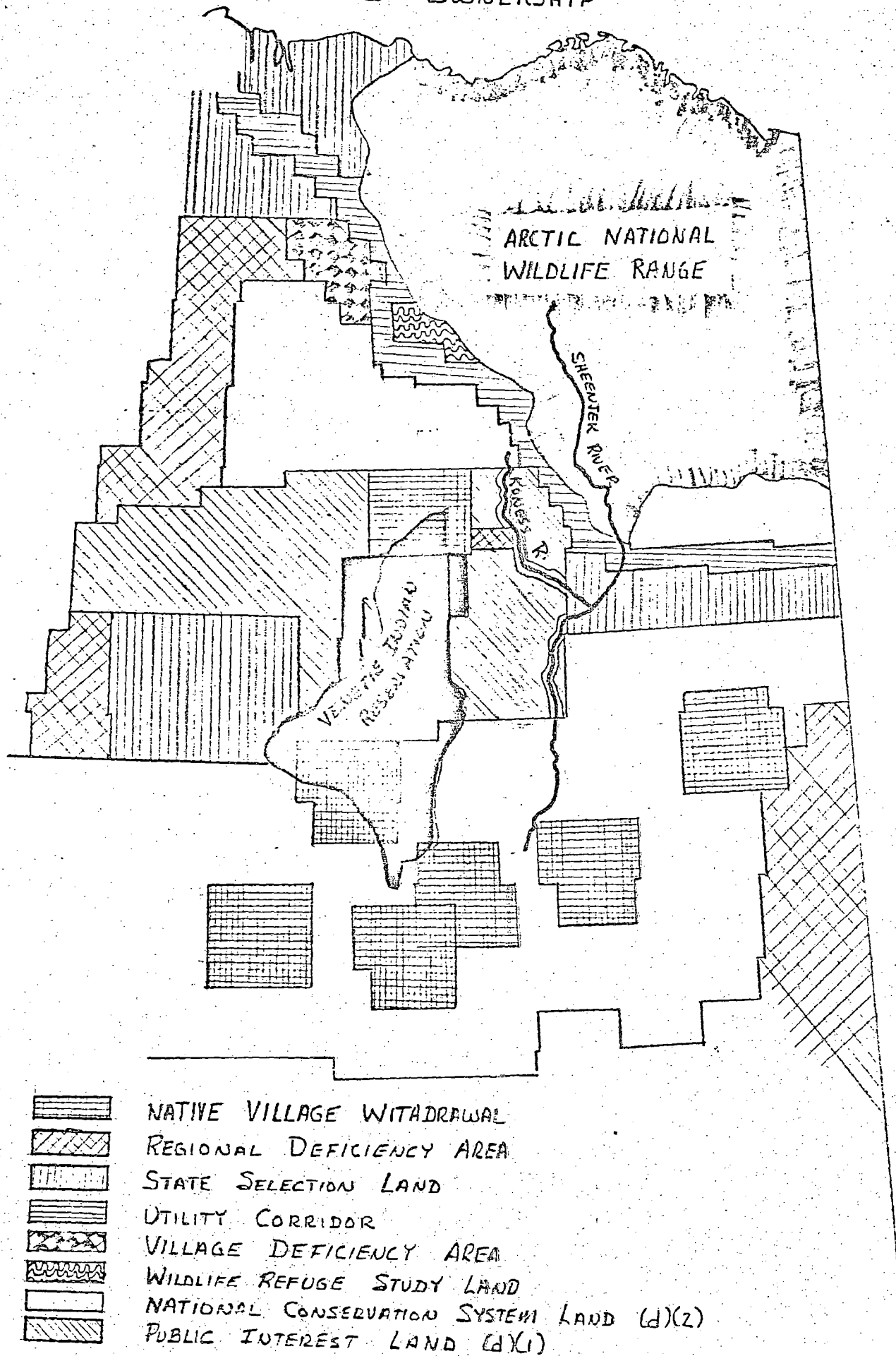
government and administered by BLM but that is being allotted to various specific federal uses or disposal under the ANCSA and Alaska Statehood Act (Fig. 5).

1) Arctic National Wildlife Range -- The upper 96 miles of the Sheenjek flow through the Arctic National Wildlife Range. The Range was created in 1960 and has been under management by the U.S. Bureau of Sport Fisheries and Wildlife since that time.

2) Other federal lands where state ownership and/or federal management and classification are underway -- The following is a sequential summary of prospective land ownership and management proposed by the Secretary of the Interior by his withdrawal of September 1972 under the provisions of ANCSA, September 1972, downstream from the Arctic National Wildlife Range to the Porcupine River.

a. Utility Corridor -- A six-mile wide utility corridor running from west to east across the Sheenjek River. The river enters this corridor at T. 36 N., R. 20 E. and flows southwest for 8 miles, crossing the corridor at a slight angle. The corridor has been withdrawn for a potential gas pipeline and transportation route.

# LAND OWNERSHIP



b. State Selection Land -- At T35N, R19E, the river enters a block of land selected by the State under the Alaska Statehood Act. Patent to this land has been withheld pending completion of the ANCSA. Until patent is issued the Bureau of Land Management will continue to manage this land with assistance from BSF&W who has negotiated a cooperative agreement with the State to manage the wildlife values on this land. Approximately 26 miles of the Sheenjek lie within this ownership.

c. (d)(2) corridor through (d)(1) lands -- at T33N, R16E the river re-enters land withdrawn for federal purposes. This land is a large block of (d)(1) (public interest) land however, the river is bracketed by a 2 mile wide corridor (one mile back from each bank) which has been designated as (d)(2) (National Conservation System) lands for the express purpose of retaining a temporary category for wild and scenic river study. The river flows almost due south for approximately 25 miles in this (d)(2) corridor land.

d. (d)(1) Public Interest Land -- at T29S, R16E the river crosses a small block of (d)(1) lands. It is believed this one township was intended to have a (d)(2) corridor along the river but was omitted through oversight. Six miles of the river lie within this ownership.

e. (d)(2) National Conservation Systems Lands --  
at T28N, R16E the river enters (d)(2) lands and flows  
through this ownership for the remaining approximately  
44 miles to its mouth on the Porcupine River.

Within the above described lands withdrawn under  
ANCSA are a number of applications for land patent or lease  
that predate the ANCSA. There are however no existing  
privately patented lands. These applications start  
approximately 55 miles above the mouth and occur in random  
fashion downstream. These applications include one trade and  
manufacture (T & M) sites, seven native allotments and  
nineteen oil and gas lease applications, the latter of which  
cover extensive acreages along the lower 25 miles of the  
river. In addition to these pending applications, lands  
along the lower 44 miles of the river were all withdrawn by  
the Secretary of the Interior under P.L.O. 3520 as a power  
site withdrawal for the proposed Rampart Canyon Hydroelectric  
project. Other than the above listed applications or with-  
drawals there are no known land or mining claims  
influencing potential wild or scenic river status.

The Konesha River headwaters in (d)(1) lands and almost  
immediately enters a (d)(2) corridor. The river with its  
(d)(2) corridor flows south and then southeast within the  
surrounding (d)(1) lands. At one point (Northeast corner

OF T. 16 S., R. 17 E. the river crosses into Native Village Withdrawal lands for approximately one mile and then reenters the (d)(1) block (still within a (d)(2) corridor) as it continues its southeastern course. At T. 35 N., R. 17 E., the river passes into a block of State selection land. The river remains in the state selected land for the remaining 12 miles to its mouth on the Sheenjek River.

#### ACCESS TO THE RIVER

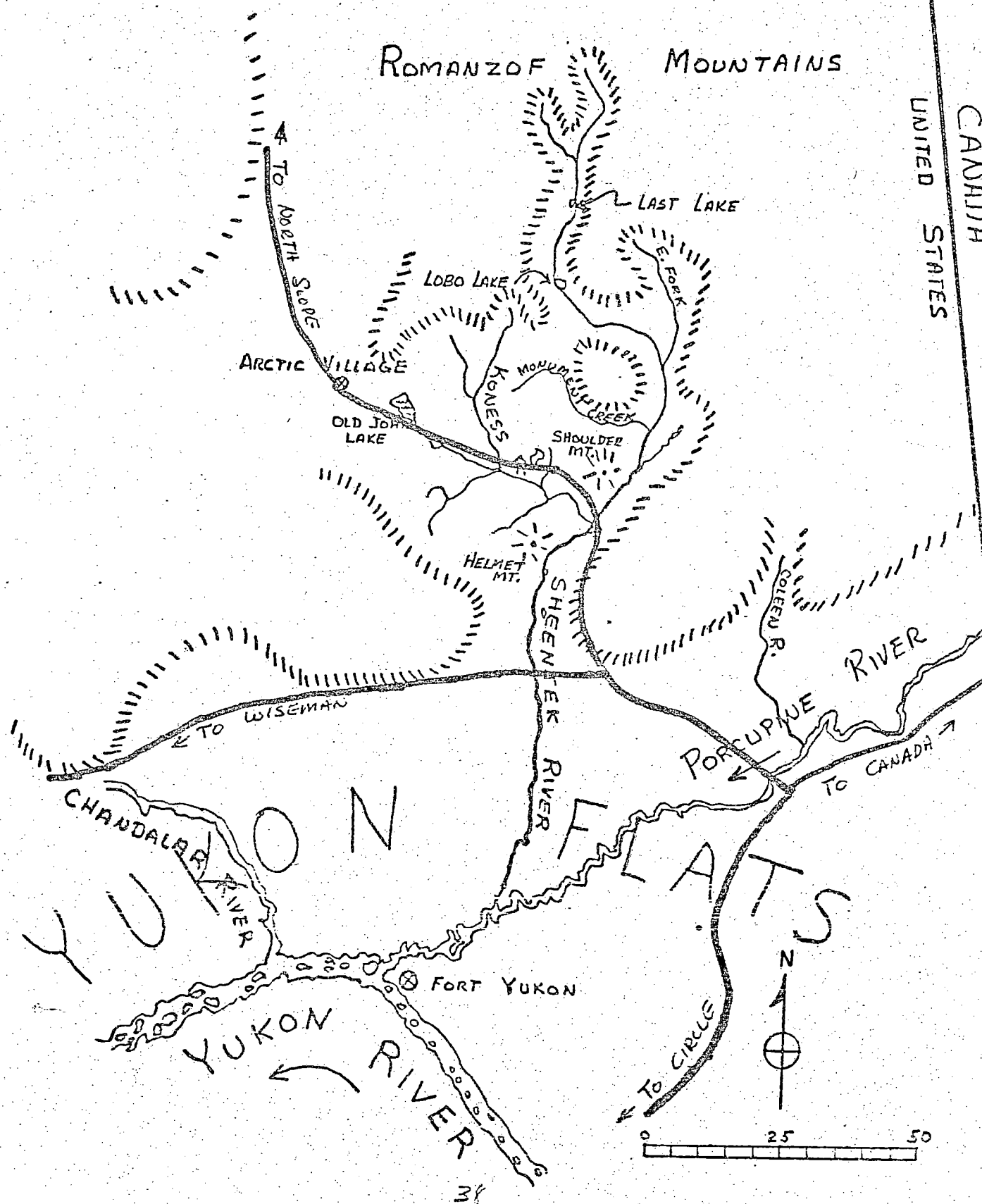
There are no established roads or trails to or within the study area. Access to the upper reaches of both rivers is almost exclusively by air or overland by foot. The lower reaches of the Sheenjek (mouth to approximately river mile 70) is accessible by power boat during high water but only with considerable dragging over gravel and sand bars.

Winter access to and through the area by dog sled or snow machine is possible and probable but the extent of such use is unknown.

Although there are no roads in the area, long range plans by the Alaska Department of Highways identify a possible highway approaching the Sheenjek from the southeast and crossing the river near the mouth of the Koness River and then proceeding up the Koness to the



FIGURE 6 POSSIBLE FUTURE HIGHWAY SYSTEM  
AS ENVISIONED BY ALASKA DEPT. OF  
HIGHWAYS



vicinity of Arctic Village (Fig. 6). This possible route has only been tentatively identified on long-term plans and no specifics are available at this time.

#### WATER RIGHTS, NAVIGABILITY AND RIVERBED OWNERSHIP

Under the 1959 act granting Alaska statehood, the state was granted ownership and control of navigable waters of the state. The question of navigability on the Sheenjek has never been resolved. The U.S. Army Corps of Engineers has assessed the navigability of a number of the state's rivers but has not made a determination for the Sheenjek. Under criteria being developed by the State to determine "navigability" and hence ownership, the Sheenjek would be navigable from its mouth upstream for \_\_\_\_\_ river miles. ?

There are no recorded rights or applications for appropriation of the river's waters.

#### RECREATION RESOURCES AND VALUES

The recreation values associated with the area under study consist of camping, hiking, mountain climbing, canoeing, nature study, photography, fishing and hunting in an unsurpassed wilderness setting.

The rivers of the south slope of the Brooks Range rank among the finest in the United States for wilderness canoeing. The Sheenjek River is no exception. For the

traveler using powerboat, canoe, kayak or inflatable boat, the river provides an avenue through a vast primeval land. Terrain adjoining the river and its many side valleys, which would otherwise be almost inaccessible, may be easily explored by foot. The Sheenjek is navigable by canoe or float boat from Last Lake and surrounded by the high peaks of the Brooks Range just 30 miles from the Arctic Divide. Beyond Last Lake the rugged peaks of the divide are easily accessible by foot, and below it the Sheenjek winds its way toward the Porcupine through 170+ miles of wilderness. From the mountain rimmed tundra meadows of the alpine zone, vegetation gradually gives way to lush spruce-poplar-birch forest as the river enters the piedmont zone. Further downstream the rolling foothills merge into the broad plain of the Yukon Flats.

Throughout its length, the Sheenjek is a delight to travel. Dry, open bars afford fine camping and ample firewood. Clear, quiet pools provide plump grayling for the angler. Fascinating wildlife and varied scenery are always available to engage the traveler. Experiencing the wild music of the wolf, the lonely cry of the loon, or the beavers report are daily occurrences. Moose and bear are often seen along the water's edge and at certain times of the year caribou in large numbers are present

In the Yukon Flats the river passes an occasional cabin, relics of the fur trapping days. Some are still intact, preserved by their remoteness and isolation. Worn, rusty traps, musty books, handmade furniture and primitive household items testify to man's onetime presence and the hard, lonely life he led.

In general summertime recreational activities can be carried out from June through September. Long hours of almost perpetual daylight add to the pleasure of being in the Arctic during the summer months.

In March and April the climate would be ideal for touring on skis or snowshoes. Arctic Village would be an excellent jumping-off point for this activity. Terrain of the alpine and piedmont zones is well suited for winter touring. A rare adventure awaits those who choose to travel this wild country during the snow season.

Access to the region is available by charter plane from Fairbanks, or Fort Yukon; both are served by commercial airlines. Lakes in the upper reaches of the Sheenjek are less than one and a half hours flying time from Fort Yukon.

Of special interest is the Arctic National Wildlife Range through which the upper 96 miles of the Sheenjek flows. The Range is a strong recreational drawing attraction for the area. The Range is far from being

just a wildlife refuge. It is a large (8,900,000 acres) block of land encompassing a wide spectrum of pristine Arctic and Subarctic habitats. Whole biotic communities of plants and animals exist undisturbed making the area a living arctic laboratory. The Range is a favorite visiting place of wilderness enthusiastic and others who seek the enjoyment of wild things in wild places. The Bureau of Sports Fisheries and Wildlife, which manages the area, endeavors to preserve the Range's wild character by limiting man's influences to a bare minimum consistent with sound wildlife management and recreational enjoyment of the area. Within these guidelines, the visitor can find a multitude of activities from hunting to nature study to fulfill his recreational desires.

#### HISTORICAL AND ARCHEOLOGICAL VALUES

Almost nothing is known of historical or archeological values along the river. The area downstream along the Porcupine and Yukon rivers however, has had some research and it is fairly safe to assume that many of the occurrences in the area spilled over or included the Sheenjek. The area in question is the Yukon Flats which is situated across the route traversed by ancestors of the Amercian Indian. It could well be that wood and wildlife of the flats played a key role in the aboriginal

populations of America. Indians of the Yukon Flats are a part of the Kutchin people occupying the Upper Yukon and a portion of the Mackenzie River Valley. They are of the Athapascan tribes, hunters who ranged through much of western North America from Alaska to Mexico relying on fish and game as they moved seasonally from fish camp to hunting territories. Prior to white settlement, the Indians had extensive trade routes up and down the river and across the mountains both north and south to the coasts.

An abundance of fur-bearing animals of the Yukon Flats was the key to early settlement by the white man. Russians discovered the mouth of the Yukon River in 1834 and in 1841 established the post of Nulato, approximately 350 miles southwest of the Yukon Flats. The first white man to reach the Yukon Flats was John Bell of the Hudson's Bay Company traveling from the Mackenzie River in 1845. Two years later, Alexander Murray established Fort Yukon for the Hudsons Bay Company at the confluence of the Porcupine and Yukon Rivers. Fort Yukon was the first English speaking community in Alaska.

Bell and Murray found several hundred Indians occupying the banks of the Yukon River and its tributaries. These were the Kutchakutchin or "People of the Yukon Flats." After the establishment of the Hudson's

Bay Post, the fur trade became a dominant element in the region's economy. In some years Murray bought as many as 8,000 marten and a variety of other furs from the Indians. Company officials described Fort Yukon as the most valuable Hudson's Bay Post west of the Rockies.

Alaska was purchased by the United States from Russia in 1867 but the Hudson's Bay Company continued business at Fort Yukon for two years until Captain Raymond, U.S. Army, took possession for the United States.

In the early 1880's prospectors reached the Yukon Valley over the Chilkoot Pass from Juneau. By 1886 the business of supplying gold seekers superseded fur trading in the economy of the Yukon River traders. In 1893 gold was discovered on the eastern edge of the Yukon Flats at Birch Creek, and Circle City was born. For three years Circle City with a population of over 1,000 white men was the largest settlement on the Yukon and the largest community ever on the Yukon Flats.

The gold rush period provided Indians an opportunity for employment as hunters, packers, and laborers. However, the great gold strikes of the Klondike and Nome soon drained off much of the population, and Fort Yukon again became the principal community.

As gold was depleted and fur prices increased, a new breed of white trappers settled in the area, taking advantage of transportation facilities established by the gold miners. Although the Indian continued to derive much of his living from the land, a high demand for fur and labor enabled him to acquire an assortment of useful items. Firearms, knives, steel traps, fish nets, and eventually boat engines were incorporated into hunting economy. School teachers, missionaries, government agencies, and modern technology have had an increasing impact on Native life. In recent years the assimilation of Natives into the white economy has been rapid.

Fort Yukon was an important fur center in the 1920's when fur was "King" in Alaska. It was, in fact, the greatest collecting point for fur in all of Alaska. World War II ended the heyday of furs on the Yukon Flats and the trade has been sustained since by a diminishing number of Caucasian old timers and Indians. Prices for wild fur generally remained low as a result of competition with synthetics and ranch furs. Wages in other parts of Alaska on the other hand have increased steadily, removing the inducement for young people to take up the rigorous life of the trapper.

Historic features of particular interest include the village of Fort Yukon, the abandoned Hudson's Bay



Trading Post at Old Rampart, and the historic trail from Fairbanks to Wiseman that crosses the western part of the Flats in the vicinity of Beaver.

#### FISH AND WILDLIFE VALUES

The Sheenjek along its course from the mountains of the Arctic National Wildlife Range to the swamps and muskeg of the Yukon Flats harbor a large and diverse population of animals. Wildlife in the Arctic National Wildlife Range along include some 139 bird species and 39 species of mammals. In addition to the large numbers of waterfowl and seabirds found along the river, especially in the flats area, the river hosts sizeable populations of moose, wolf, grizzly bear, Dall Sheep and caribou. The rare peregrine falcon may also be found in the area.

The Porcupine Caribou herd, second largest in the state, (120,000+), uses both the Sheenjek and Koness Rivers as wintering grounds and as a migration route from Canada to calving grounds on the North Slope of the Brooks Range.

Heavy concentrations of Grizzly Bear are known to inhabit the upper area of the Sheenjek in the vicinity of Last Lake. This area is also known to be a significant denning area for the bears.

Moose are found throughout the area with heaviest concentrations along the rivers and valley bottoms which provide significant winter habitat. Concentrations occur seasonally in preferred habitat areas such as willow stands, old burns and wet flats.

Wolves inhabit the entire length of the river and their numbers vary as a result of the distribution of moose, caribou and sheep. In general, welfare of the prey dictates the welfare, population and distribution of wolves.

Dall Sheep are found along the upper reaches of the river but generally distribute themselves on the slope and uplands away from the river proper. Little is known of the sheep population but hunters are believed to harvest approximately 120 animals in the area each year.

The Yukon Flats through which the lower Sheenjek flows is one of North America's best waterfowl production areas. Breeding ducks in densities of over 100 per square mile are common. The lower 65 miles of the Sheenjek provides suitable waterfowl habitat and is believed to account for significant numbers of the areas annual production.

Both the Sheenjek and the Kones support populations of grayling, northern pike, whitefish and runs of chum

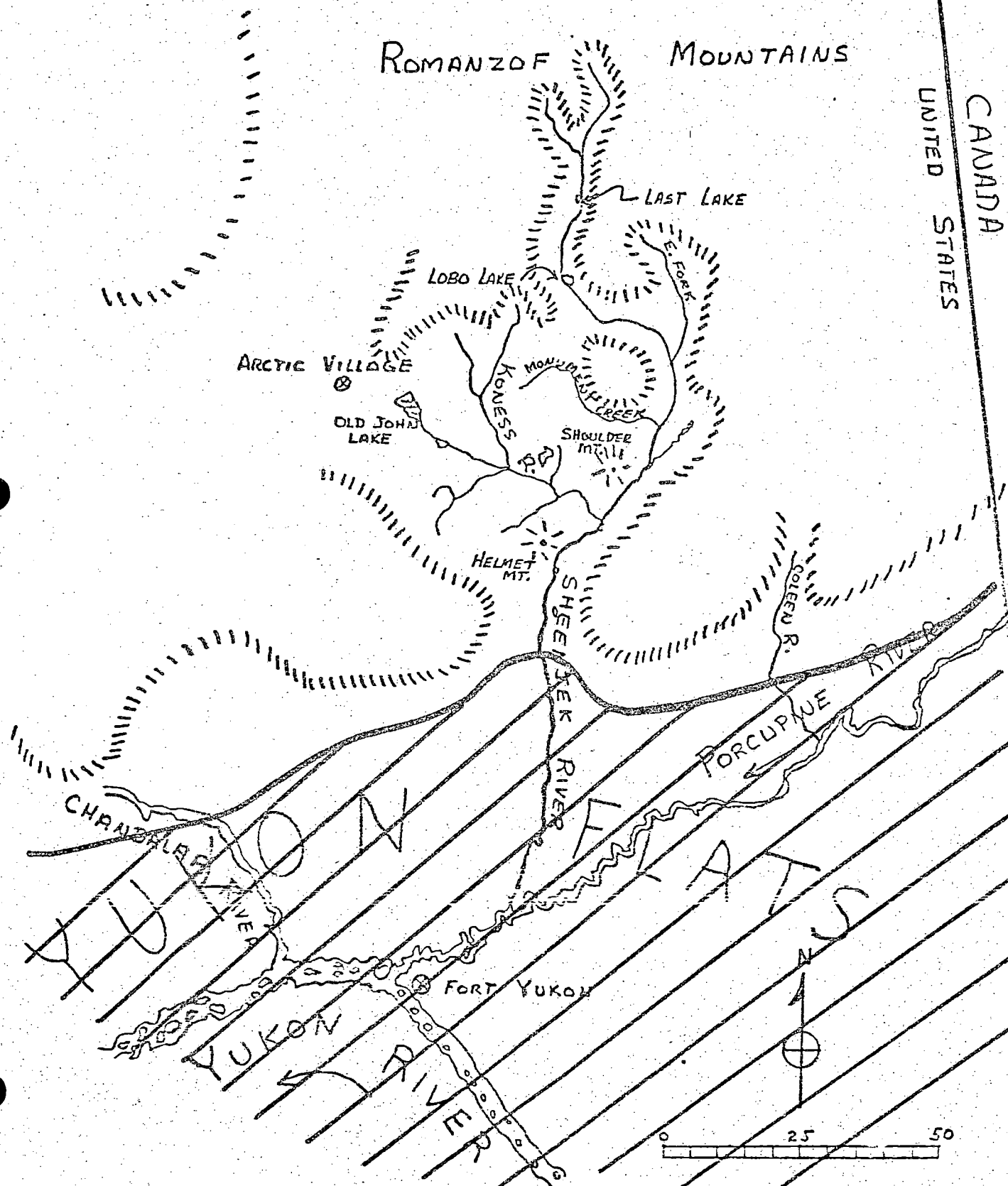
salmon. Subsistence and sport fishing are believed to be light however, because of the areas remoteness.

#### LIMITATIONS TO RECREATION

The largest limitation to recreational use of the river results from the cost and difficulty of access. Whether or not this limitation is good or bad depends ultimately on what values the river is to be managed for. If the values are to be wild and pristine, well developed access may be a hinderance to these management objectives. On the other hand, for recreationists to use the river, they much have a means of access. At present, boats, hiking and aircraft are the only menas of getting to the river during the summer recreation season. Snow machines and dog sleds may be used once the river freezes over.

In terms of the amount of recreational use possible, the fragile nature of the resource itself is a form of limitation. Delicate plant communities in conjunction with extensive areas of permafrost which turns into a quagmire if its surface insulation is removed makes surface disturbance a major environmental hazard. Construction of roads or trails and any permanent recreationa facilities would have to be limited to areas where surface disturbance and permafrost thawing could

FIGURE 7 POSSIBLE RESERVOIR POOL FROM  
RAMPART DAM



be held to a minimum.

Potential limitations to recreation include the users themselves. It is quite possible that large numbers of recreationists in the river area would degrade or destroy the pristine environment and the primitive experience of the user. The most outstanding values of the river areas could be lost through overuse.

The effects on recreation by possible future construction of Rampart Dam are not fully known (Fig. 7). Such activities as hiking, canoeing, and winter sports probably would be affected minimally. However, game and fish populations, vegetation and even climate could be altered significantly, thus affecting hunting, fishing, nature study, and the like.

The harsh Arctic climate serves as a form of limitation by allowing only a relatively short season for the major recreational uses (June through August). Freezing temperatures have been recorded in all months but July. Water temperatures remain cool all summer, prohibiting prolonged water contact uses.

Although summer precipitation is low, humidity is high and much standing water is present in the area. These waters give rise to hordes of mosquitoes and flies causing discomfort to recreationists much of the summer.

UNITED STATES GOVERNMENT

# Memorandum

*Clay Hardy*

D4225 Alaska  
(W&SRS)

TO : Assistant Director Eastman

DATE: MAY 28 1973

FROM : Alaska Task Force Leader

SUBJECT: Sheenjek River Wild and Scenic River Report

Enclosed are two copies of a preliminary draft of the subject report. A copy of the report has been provided to NWRO and BLM, BSF&W, NPS and FS planning teams in Anchorage. Chapters III and IV will be distributed to study team participants.

It is emphasized that the conclusions and recommendations are based upon an aerial examination on June 13 and 16, 1972 and office review of available information. Field examination is scheduled for mid-June.

This draft of the report was completed prior to finalization of the overall study format, hence some sections will appear out of place. Following field inspections the report will be revised as appropriate and redrafted in the new format. Missing appendices and photos will be supplied with the final draft.

*Jules V. Tileston*  
Jules V. Tileston

2 Enclosures

cc: WASO/Fred Strack



I.

INTRODUCTION

On October 2, 1968, the Congress of the United States enacted the Wild and Scenic Rivers Act, Public Law 90-542. In this Act the Congress declared it

" . . . to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environment possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in a free-flowing condition, that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes."

On December 18, 1971, the Congress passed the Alaska Native Claims Settlement Act, Public Law 92-203. In this act [Section 17 (d)(2)] the Secretary of the Interior was directed to withdraw up to 80 million acres of public land in Alaska deemed suitable for addition to or creation as units of the National Park, Forest, Wildlife Refuge, and Wild and Scenic Rivers System. In response to the Secretary's direction the Alaska Task Force of the Bureau of Outdoor

Recreation was created to study potential wild and scenic rivers in the federal lands. The Sheenjek-Koness River is one of 31 rivers identified by the Alaska Task Force as warranting study for possible inclusion in the National Wild and Scenic Rivers System. Under direction from the Secretary of the Interior, and authority and guidance from the Wild and Scenic Rivers act, this report was prepared to determine the suitability of the river for inclusion in the national system and, if it is to be included, recommendations pertaining to the administration and management of the river and its environment.

### Background

Previous studies in the region have been limited in both number and scope. The few studies that have been undertaken have been concerned primarily with specific resource features such as wildlife or mineral exploration. With the possible exception of studies undertaken in conjunction with creation of the Arctic National Wildlife Range in 1960 and those prepared as part of the data collection for the proposed Rampart Canyon Hydroelectric project in 1971, no in-depth studies of the area have been made. At the present time, overall studies of the region are underway by the U.S. Forest Service, and Bureau of Sport Fisheries and Wildlife as part of their efforts to assess lands for possible future national forest or national wildlife refuge purposes under section 17 (d)(2) of the ANCSA of 1971.



In the only known reference to wild or scenic river values, the 1970 Alaska Statewide Comprehensive Outdoor Recreation Plan (SCORP) identified the Sheenjek River as one of 66 rivers identified by BLM warranting future study.

#### Conduct of the Study

The conduct of the river evaluations conducted under the Wild and Scenic Rivers Act is viewed as a cooperative venture of the U.S. Departments of the Interior and Agriculture and the appropriate State and local agencies. For the study of the Sheenjek-Koness Rivers, the Bureau of Outdoor Recreation, Alaska Task Force was assigned the responsibility for organizing an interagency study team. In June of 1972, the task force became operational and in June and July of 1973, specific field examinations relative to this report were conducted.

During the conduct of the study a large number of Federal, State and local agencies, groups and individuals were consulted. Many of these interests also reviewed earlier drafts of this report. The following agencies and groups are gratefully acknowledged for their participation on the interagency study team for the Sheenjek-Koness Rivers or for providing valuable assistance to the team: Bureau of Land Management, Bureau of Sport Fisheries and Wildlife, U.S. Geologic Survey, U.S. Army Corps of Engineers, Alaska Power Administration, U.S.

Bureau of Mines, U.S. Forest Service, Environmental  
Protection Agency, Alaska Department of Fish and Game,  
Alaska Department of Fish and Game, Alaska Department of  
Highways, DOYON Ltd., (Regional Native Corporation),  
Fairbanks Environmental Center, University of Alaska,  
Fairbanks.

## II. SUMMARY OF FINDINGS AND RECOMMENDATIONS

This study has revealed that the 200 miles of the Sheenjek River from its headwaters in the glaciers of the Romanzof Mountains to its mouth on the Porcupine River possess those values which qualify it for inclusion in the national wild and scenic rivers system. The study segment fulfills the requirements of the Wild and Scenic Rivers Act, and meets the supplemental criteria established jointly by the Secretary of the Interior and the Secretary of Agriculture, as published in Guidelines for Evaluating Wild, Scenic and Recreational River areas proposed for Inclusion in the National Wild and Scenic Rivers System Under Section 2 Public Law 90-542, February 1970.

The Kones River, the Sheenjek's main tributary, was examined and found not to possess those same values that qualify the Sheenjek for inclusion in the national system. As a result the Kones River is not considered worthy for inclusion in the national system and the recommendations in this report apply only to the Sheenjek River.

The Sheenjek River is an area of exceptional scenic beauty and primitive river values. In the course of its southward flight to its mouth on the Porcupine River the Sheenjek spans three separate physiographic provinces (alpine, piedmont and flats), provides magnificent views of the Brooks Range, and flows through an area of exceptionally high waterfowl production. Along its entire length,

the river flows through a scenic pristine wilderness where the only evidence of man is the rare occurrence of an abandon trappers cabin from a bygone era.

The river spans three distinct physiographic provinces, starting with its headwaters in an alpine region on the south slope of the Brooks Range. From the rugged, steep tundra valleys of the alpine zone the river flows into a piedmont area characterized by rolling hills and broad U-shaped valleys with streambank borders of willow, poplar, spruce and birch. Away from the river, arctic tundra dominates the landscape. Below the piedmont zone the river enters the upper reaches of the Yukon Flats. In this region, the river meanders broadly as it traces its course across miles of a broad outwash fan forested with thick stands of spruce, willow, poplar and birch. In the flats, the river slows and numerous cut banks and old sloughs line its course. Forest vegetation is rank and views from the river are usually restricted.

Along its entire length are found undisturbed examples of complete ecological communities exactly as nature has created them. Its value as a living laboratory housing such a large segment of undisturbed arctic biota is unique. Wildlife abound in the area with wolf, grizzly, and black bear, moose, caribou and Dall Sheep being the major big game species. The Porcupine caribou herd, Alaska's second largest (120,000+) moves across and along the river during

migrations between Canada and calving grounds in the Brooks Range. Numerous species of small furbearers and songbirds as well as an occasional rare and endangered peregrine falcon also are present. Along the lower stretches of the river waterfowl nest and breed in profusion. Breeding ducks in the area often exceed 100 per square mile. The whole Yukon Flats area is estimated to produce over two million waterfowl annually to the fall flight.

Arctic grayling is the most common fish in the river and can be found through out its length. In the lower sections, Northern Pike, whitefish and an occasional inconnu (Sheefish) can be found. The word "Sheenjék" means salmon in the local Indian language and the river supports a sizeable spawning population of Chum salmon.

No roads exist anywhere along the river and the area is as yet only rarely scarred by ATV tracks. Long range highway proposals identify the possibility of a highway crossing the river in the vicinity of the mouth of the Koness River but such plans are highly speculative and even if constructed, it would have only a minor effect on the rivers overall wild character.

There are no dams proposed for the river, however, the lower 55 miles of the river is currently under a power site withdrawal for reservoir purposes in connection with the proposed Ramparts Canyon hydroelectric projects, many

miles downstream on the Yukon River.

There are no known commercial mining deposits or patents in the river corridor, however, oil exploration leases have been requested along the lower 50+ miles of the river in flats area.

Habitation along the river has always been extremely light with only an occasional trapper calling the area home. There are no agricultural, mining or lumbering activities taking place within a two mile corridor spanning the river. A total of only 4 cabins, clustered at two locations are known to exist along the river and none of these are permanently inhabited.

Recreation potential along the river is exceptional. The combination of spectacular scenery, interesting geology, undisturbed flora and fauna and the rivers existing wild character all combine to provide a unique, high quality recreation experience. River travel, hunting, fishing, photography and nature study are the most popular recreation pursuits. Although present recreational use is light because of difficulty of access and distance to the nearest large population centers, use of the river's recreational features can be expected to increase as pressures on other Alaskan recreation areas increases.

## Recommendations

To preserve the Sheenjek River in its existing free-flowing state and to protect and enhance its natural values, it is recommended:

1. The Sheenjek River from its headwaters to its mouth be managed to preserve and enhance its wild river values and that all management objectives be aimed at preservation of the river's existing qualities.

2. The river be managed by the federal agency designated to administer the larger adjacent land area through which it flows.

3. The river in its entirety, including that portion in the Arctic National Wildlife Range, be added to the National Wild and Scenic Rivers System as a wild river area unless all, or substantial portions, of the river are included in the proposed Arctic Extension and Yukon Flats National Wildlife Refuges.

4. The administering Federal agency have a period of one year from the date the Sheenjek River is added to the National Wild and Scenic Rivers System to establish appropriate lateral boundaries and develop management and development plans consistent with the objectives set forth in this report.

5. Approximately 223,000 acres of land comprising the river's immediate environment should be included. This averages approximately one mile back from the river's

6. That areas of historic, archeologic or special ecological significance be preserved to protect their special values in a manner consistent with the river's wild character.

7. That the rare and endangered peregrine falcon receive special management attention wherever found along the river.

8. That recreational and subsistence use of fish and wildlife resource be allowed within the framework of appropriate State and Federal laws, provided such use as consistent with management objectives on adjacent land area.



### III

### REGIONAL SETTING

#### Landscape

The Sheenjek and Kones Rivers lie in a broad hydrologic basin in the northeastern corner of the state (Fig 2). The region lies between the Brooks Range on the north and the Yukon River on the south; abuts Canada to the east and is bounded by the Koyukuk-Yukon divide on the west.

The southern half of the region encompasses a large part of the Yukon and Porcupine Rivers. North of these flats and uplands the terrain rises gradually to foothills and mountains of the Brooks Range. The region essentially encompasses all of one huge drainage basin of the Yukon River. Several smaller rivers drain the southern Brooks Range and the Yukon-Porcupine uplands.

Weather is strongly continental with some of the highest and lowest temperatures in the state being recorded at Fort Yukon. Lowlands support typical boreal forests of spruce, birch and aspen, expanses of black spruce bog and numerous lakes and swamps. Fire is an important ecological factor in the region. As elevations increase north toward the Brooks Range, timber rapidly thins and disappears except in major river valleys.

Subalpine vegetation occupies the foothills and lower mountain slopes. Arctic alpine tundra begins at about 2000 foot elevation. Upper mountain slopes are relatively regged and barren.

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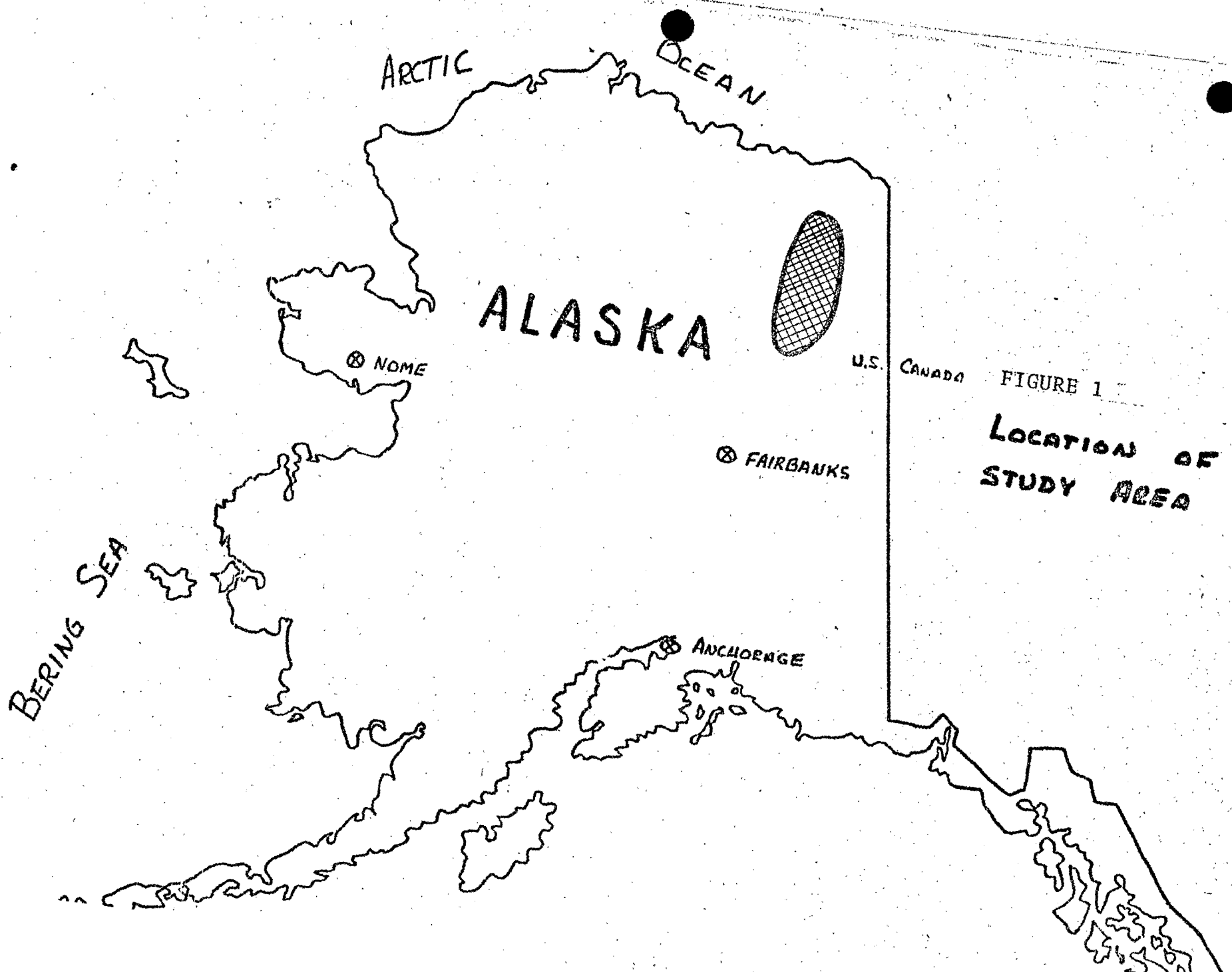


FIGURE 1  
LOCATION OF  
STUDY AREA

Wildlife is abundant in the region with especially large populations of waterfowl in the lowlands or flats area.

#### Economy and Population

The region contains approximately 1,300 persons scattered in 10 villages. Fort Yukon, service center for the area, contains about half of these people. Approximately 90 percent of the areas residents are Athabascan Indians. Non-Native residents live principally in Fort Yukon, Circle and Central.

The economy of the area is composed of three major factors: subsistence, cash and public assistance.

The subsistence portion of the economy consists of the food procurement activities (hunting, fishing and gathering plant stuffs) that supply the food and heating requirements of the area's residents. This is a very important part of the regions economy even though its cash values is very difficult to assess. Because of the high cost of imported commodities, resident diets rely heavily of subsistence procurement.

The cash sector of the economy is small and results chiefly from trapping and the few summer jobs available to area residents. The cash economy has taken on added importance in the past few years with the advent of items such as snow machines, oil heaters and electric utilities, all of which require petroleum fuels and replacement parts which must be imported.

Small amounts of cash are also generated by Native handicrafts and government employment.

Because of the rather poor economic climate of the area, substantial portions of the population (30-50 percent) depend upon public assistance for all or part of each year. Assistance comes principally in the form of state welfare, BIA welfare and food stamps.

#### Transportation

Aircraft is the primary means of transportation to all the villages on the Yukon Flats, with the exception of Circle at the southern rim of the region which is the northern terminus of the Steese Highway. Presently, no improved roads exist north of the Yukon River.

The proposed trans-Alaska pipeline and its associated road are anticipated to cross the Yukon River in the southwest corner of the region. If this happens, the Yukon Flats will be road accessible at both ends and recreational river traffic can be expected to increase.

Boat traffic on the various large rivers of the region is common and has been a historical use of such rivers. Since the advent of stream power, the rivers have been regularly plied by barges and river boats. Barges are still the prime means of import of most commodities into the area.

Surface transportation has only been tentatively identified for the region. These rough plans contemplate roads connecting Circle with Fort Yukon and Chalkyitsik and Canyon Village with Arctic Village and Canada via old Rampart. It is believed these roads are many years in the future.

#### Recreation Resources

Recreational potential for the region is great but largely untapped. Current use consists of limited sports fishing, hunting, tourism, and canoeing on the Yukon and its major tributaries. Photography is an important adjunct to all these activities. Excluding resident natives, recreational use of the area is probably fewer than 2,000 visits per year.

In addition to the unrealized opportunities for hunting and fishing, a large potential exists for other recreation opportunities. Numerous lake and river systems present opportunity for canoe routes following ancient trails used by Indians. Hiking along sled trails or on higher terrain presents a unique wildlands recreational challenge. Ancient Indian villages and historical settlements and trapper's cabins present a fascinating historical insight into the area.

#### Recreation Resource Needs

The Alaska Statewide Comprehensive Outdoor Recreation Plan (SCORP) states:

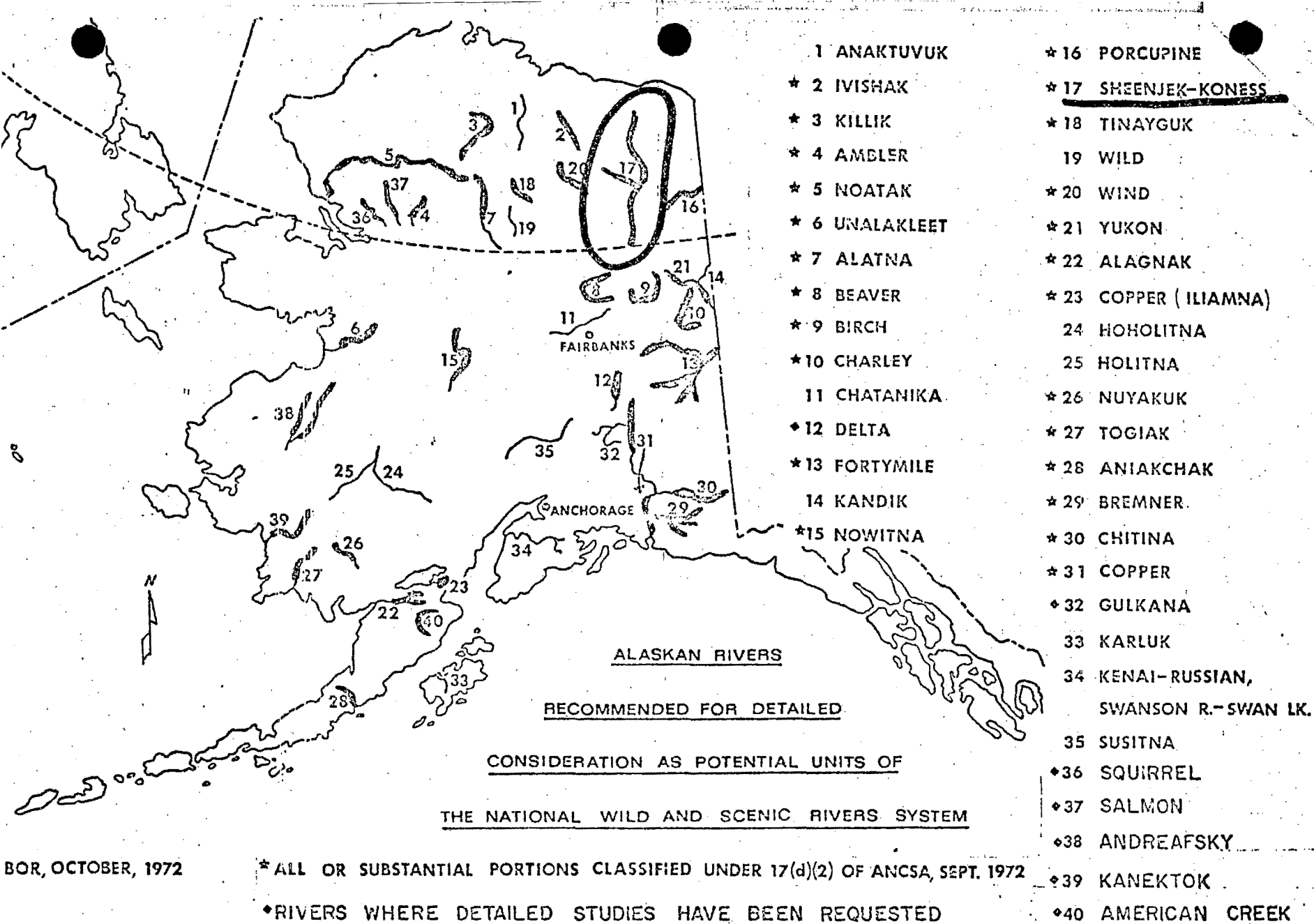
"While most of Alaska's 365 million acres of mountains, forests, tundra and waters are currently available for outdoor recreation activities, only 48 million acres (13% of the total area) have been reserved for public use, with emphasis on environmental preservation and recreation, such as national forest and private resorts. Moreover, only small portions of these reserves are managed solely for their recreational and scenic qualities, such as national and state parks."

The SCORP indicates a great need for additional recreational resources in the state to satisfy local, statewide, and out-of-state demand. In Volume I of the SCORP (p. 27) it is stated"

"The analysis of recreation needs indicates a major need for trail development in Alaska, particularly in view of the high cost of other means of access. Trail-related activities (including canoeing) also constitute by far the most popular form of recreation in the State, and a strong system of trails would provide not only trail recreation (such as hiking and horseback riding) but also badly needed access to remote areas for other recreational pursuits (such as camping, fishing and hunting).

Trail-related activities in Alaska have been found to constitute by far the most popular recreation pursuit. The State of Alaska estimates that by 1985 trail-related activities -- a form of outdoor recreation in which 83 percent of residents and nonresidents participate -- will increase by 249 percent above the 1967 demand for such activities. The State further anticipates that trail-related activities will maintain its top ranking as the most popular activity. Included in "trail-related" activities are canoe trails.

The Sheenjek-Koness has been identified by the Bureau of Outdoor Recreation as one of 40 Alaskan rivers having high potential for inclusion in the National Wild and Scenic Rivers System. Of these 40 select Alaska free-flowing rivers, 15 (including the Sheenjek-Konesss) are located within the 220,000 square mile Alaskan portion of the Yukon River drainage. In close proximity of Sheenjek are the Porcupine and Wind Rivers. Each of these are distinctive. These differences are summarized in Appendix ).



BOR, OCTOBER, 1972

— 31 Priority Rivers

**FIGURE 2. POTENTIAL ALASKA WILD AND SCENIC RIVERS**



#### IV.

#### DESCRIPTION AND ANALYSIS

##### River Setting

The Sheenjek River begins its 205+ mile southward course to the Porcupine River high in the glaciers and icefields of the Romanzof Mountains, a northeastern branch of the Brooks Range (Fig. 3). Although spawned by glaciers, the river's numerous clearwater tributaries quickly convert it to a typical clearwater stream. In its southward flight, the river passes through three distinctive physiographic provinces (Fig. 4). The upper 55 miles of the river above Lobo Lake lie within an alpine province formed by the mountains on the south slope of the Brooks Range. The province was extensively glaciated in past times and is characterized by U-shaped main valleys, hanging side valleys and high, steep relief with peaks ranging from 5000 to over 8000 feet. At Lobo Lake the valley floor is approximately three miles wide and consists mainly of open meadows between scattered stands of white spruce. Proceeding up river the valley gradually narrows. The last stand of spruce occurs about thirty miles above Lobo Lake. Beyond this point the valley is alpine tundra until in the far upper reaches, the river bed becomes a jumble of rocks and boulders with gushing streams descending

FIGURE 3 SHEENJEK-KONESS RIVERS - STUDY AREA

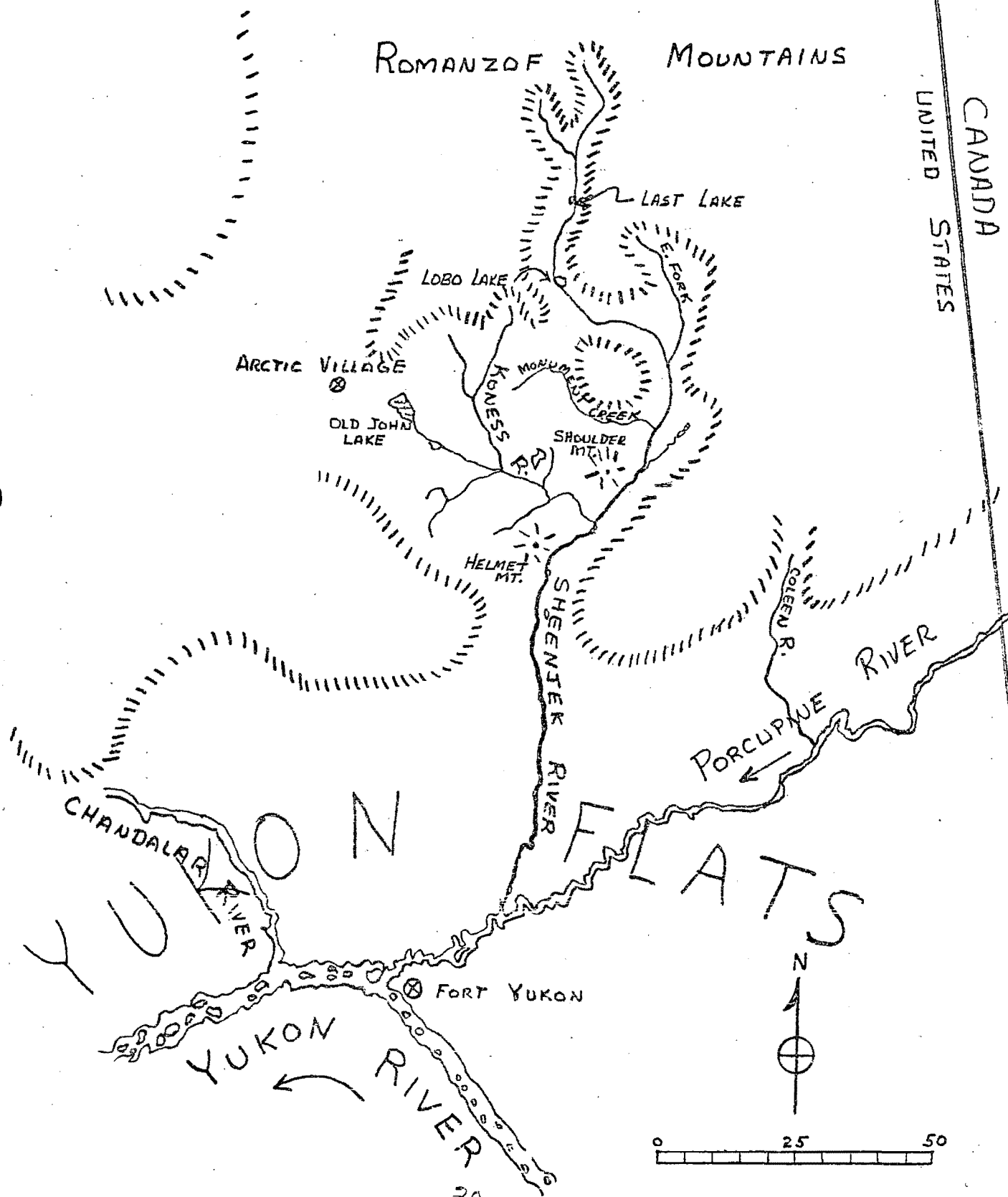
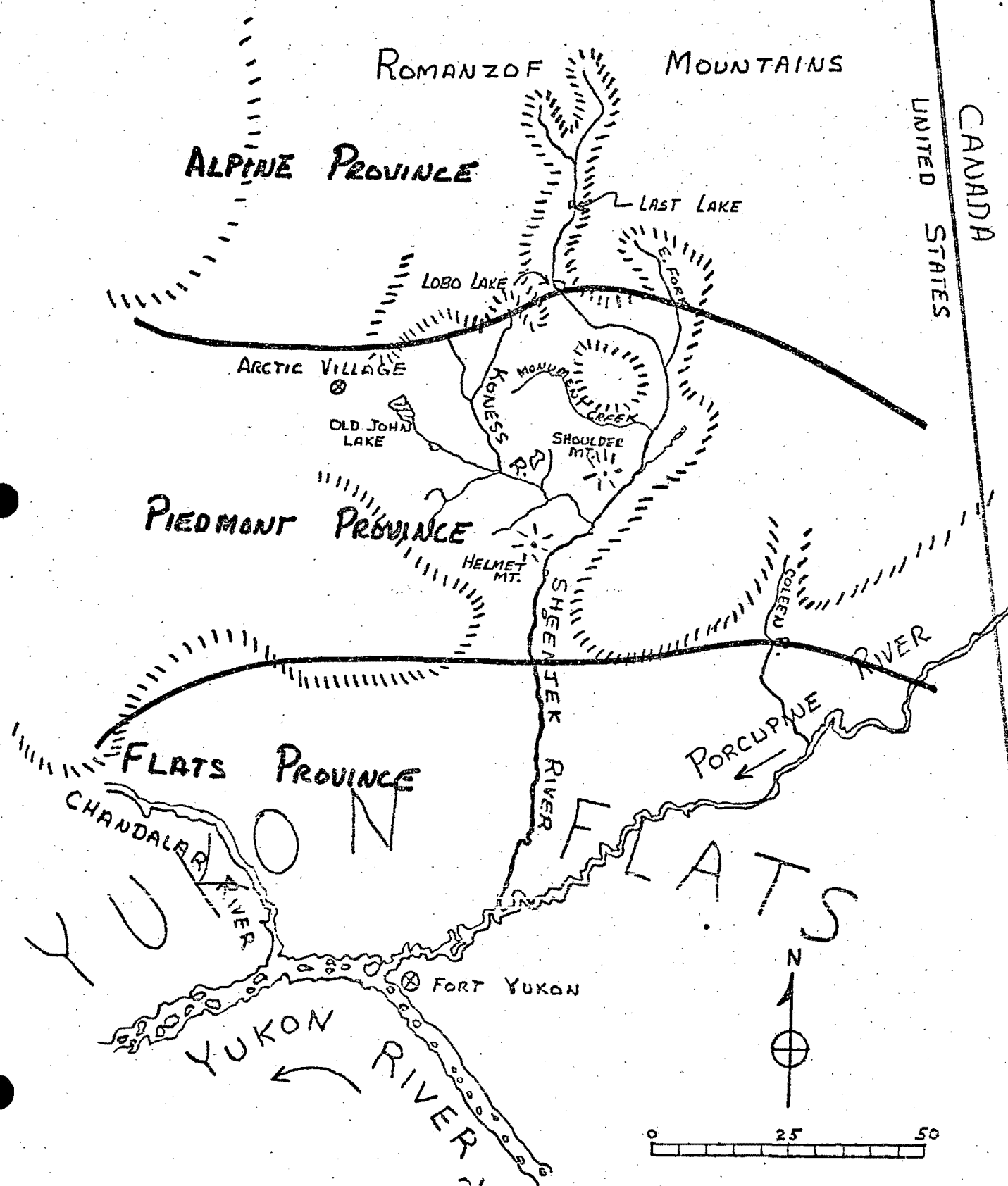


FIGURE 4 APPROXIMATE BOUNDARIES OF  
PHYSIOGRAPHIC PROVINCES



from the steep, talus-covered peaks of the Arctic divide to form the main river.

Below Lobo Lake the character of the Sheenjek changes abruptly. It is at this point the river enters the piedmont province, an area of rolling hills with occasional prominent peaks. This province extends from the southern boundary of the high mountains of the Brooks Range southward about seventy miles. Approximately 75 miles of the Sheenjek's length lie within this zone. Below Lobo Lake the valley broadens and merges gradually with distant hills with elevations ranging between 2,000 and 4,000 feet. Areas of tundra are still present on the valley floor, but moving downstream the forest becomes dominant. Near the junction of the main stem and the East Fork of the river the tundra meadows disappears and the valley becomes heavily forested with spruce, poplar, willow and birch. Extensive open meadows are present on the higher hills above 2,500 feet. Approximately 40 miles below Lobo Lake, Monument Creek enters the Sheenjek from the West. Monument Creek forms the southwest boundary of the Arctic National Wildlife Range. Above Monument Creek the river lies entirely within the Arctic National Wildlife Range. Below Monument Creek the valley narrows as the river flows between Shoulder and Helmet Mountains on the west and Seven Dikes Mountain on the east. At one point the

valley constricts to less than a half mile as the river flows past steep rock buttes with scrubby spruce clinging in their crevices. This is one of the more interesting areas of the piedmont province. The Shoulder-Helmet Mountain region is the only area south of the alpine zone where extensive high country is present close to the main river. Open spruce-birch forest covers the lower slopes, gradually giving way to dry tundra meadows. Helmet Mountain is most striking. Its peak, at 3,343 feet is a sharp protuberance of igneous rock rising from a round base, giving the mountain the appearance of a Germain Helmet. Shoulder Mountain is a flat, mesa-like mountain whose highest point rises to nearly 3,570 feet.

Below Helmet Mountain the river passes from the piedmont province into a third zone identified as a "flats" province. The lower 70 miles of the Sheenjek to its mouth lie within this zone. Here the river's elevation is between 500 and 700 feet. The flats form a broad, forested alluvial plain, almost devoid of relief, containing numerous lakes, potholes, and oxbows. Extensive areas of swamp and muskeg are present. Fine strands of spruce, aspen, cottonwood and birch grow throughout the area, especially along the stream courses and around lakes.

Through the flats, the Sheenjek winds a tortuous course. It is confined largely to a single channel with numerous meanders and banks of peat and silt. Occasionally the bank has eroded or collapsed, exposing underlying permafrost and masses of ground ice. In these lower reaches, views are almost always restricted by bank vegetation. When the current is relatively slow (4 to 6 m.p.h.) in the lower reaches, the numerous oxbows and sloughs provide an expanded watercourse for canoe exploration with numerous opportunities to view the wildlife of the area.

The Koneess River like the Sheenjek begins in the alpine province but unlike the Sheenjek, its origins are not glacial. It quickly passes into the piedmont province and flows southeast for 70 miles to its mouth on the Sheenjek, midway between Sholder and Helmet Mountains. The Koneess River flows along a less steep gradient than the Koneess in the peidment province and as such is characterized by slightly more meandering and more of a marsh type of habitat than the Sheenjek in this province. The Koneess is also much smaller than the Sheenjek and does not appear canoeable except below its confluence with Vanticlese Creek during all but the earliest part of the recreation season.

## Vegetation

As previously stated, the Sheenjek flows through three distinct physiographic provinces. In the alpine province, the vegetation is primarily open meadows of alpine tundra with occasional stands of white spruce. Willows form the major streambank vegetation. Proceeding upstream the spruce disappears about 30 miles above Lobo Lake leaving only the tundra and clumps of willows. In the headwaters the landscape is generally barren rock with occasional small patches of tundra. In the summer the meadows of this zone are lush and green. Over sixty varieties of wildflowers bloom during these months.

In the piedmont zone areas of tundra are still present on the valley floor but the forest becomes increasingly dominant. Open and scattered stands of spruce, often in concert with birch and willow mark the watercourse. Occasional stands of spruce move out to the valley walls but tundra forms the major vegetative complex away from the immediate environs of the river. Moving downstream the forest becomes more dense and widespread until the tundra is found only as occasional patches or meadows near the southern boundary of this zone.

Along the river in the flats province, the tundra occurs only rarely while a mixed forest of spruce, birch,

cottonwood, aspen and willow blanket the valley floor. An understory vegetation of grasses and sedges accompanies the forest. Numerous old oxbows and sloughs give the immediate river area a marsh or muskeg habitat.

The Koness river lies entirely within the piedmont province and the vegetation along this river closely resembles the vegetative complex found in the piedmont section of the Sheenjek River. Open tundra meadows with scattered stands of spruce, birch and willow along the watercourse dominate. Moving from the headwaters downstream the tundra ecotype gradually gives way to larger and more dense forest stands. As along the Sheenjek, the Koness valley floor also contains some areas of sedge and grass mixed with the forest.

#### Geology & Soils

The peaks around the Sheenjek headwaters are among the highest and most heavily glaciated in Arctic Alaska. The alpine province was extensively glaciated in past times and is characterized by U-shaped main valleys, hanging side valleys and high, steep relief with peaks ranging from 5000 to over 8000 feet. Limestone is the main material composing the mountains. Valley walls are often bare slopes with large accumulations of talus and little or no soil.



Geologically, the piedmont zone is composed mainly of chert, a sedimentary rock. Mostly, it is light to dark gray in color, with some black and red varieties present. In places, igneous rock has intruded into the basic chert formation. Shoulder and Helmet Mountains contain significant areas of exposed igneous rock. A variety of quartz is conspicuously common on Shoulder Mountain. In contrast with the alpine province, the piedmont zone does not appear to have been affected by glaciation during the Pleistocene. Soils in the piedmont zone are generally thicker and more widespread. Both the alpine and piedmont zones lie within the region of continuous permafrost.

The flats province is generally a lowlands area of vast alluvial deposits (outwash fans) of varying thickness. Exposed bedrock is rare and the valley floor is composed primarily of peat, gravel and silt. The flats province lies in an area of discontinuous permafrost (permafrost found in pockets).

In all three provinces, past glacial action and/or freezing and thawing are the major soil producing mechanisms. In general, the upland soils are shallow, rocky and of only medium fertility. In the flats province the soil is generally silty, deep, and contains a high degree of organic matter resulting in good fertility.

Geologic and soil formations along the Koness River are essentially the same as exist in the piedmont zone along the Sheenjek River. A basic chert material with occasional igneous intrusions typify the area. Soils are shallow and rocky for the most part with more depth, silt and organic matter immediately adjacent to the river.

### Climate

Climate along the Sheenjek and Koness rivers is typical of that found along the south slope of the Brooks Range and Yukon flats. Winters are extremely cold with temperatures often in the  $-25^{\circ}$  to  $-35^{\circ}$  F. range. Temperatures in the flats area average below freezing seven months of the year. Summers on the other hand are mild and warm with little or no precipitation. Summer (mid-May through September) temperatures are in the 60's and 70's with occasional highs into the 80's. Summer temperatures are somewhat cooler moving upriver into the piedmont and alpine provinces.

Annual average precipitation in the flats is less than seven inches; upriver in the mountains it probably approaches 10 to 12 inches. Rivers become free of ice by early June and freeze again in October. Most precipitation falls in the form of snow.

Long hours of daylight accompany the mild summer weather. This abundance of sunlight produces growing conditions ideal for rapid development of vegetation.

## River Flow Characteristics

In its headwaters, the Sheenjek is a typical mountain stream with a steep gradient and numerous rapids, riffles and boulders. About 25 miles downstream from its glacial origin, the river enters an area of numerous lakes and muskeg meadows. It loses much of its braided character and becomes wide and flat with numerous islands lying between well defined channel banks. For 20 miles the river flows through this wide channel and island area and then gradually its gradient increases and the river narrows and picks up speed. With increased speed, the river splits repeatedly into two or more channels and oxbows, swampy muskegs and overflow areas become common. Near Monument Creek the river leaves the swampy muskeg area and flows through an area of numerous gravel bars along a well drained valley floor. In this area the river is swift and braided with broad expanses of open sand and gravel bars. About 15 miles below the mouth of the Konesh river, the Sheenjek leaves this gravel bar area and enters the upper reaches of the Yukon flats. In the remaining 80+ miles of the river, the Sheenjek slows becoming increasingly placid and wide with cut banks of peat and silt. In this "flats" area the river shows the strong meander patterns characteristic of major Yukon flats tributaries. During normal summer water

conditions, there are no major rapids but numerous riffles and pools may be found from the piedmont province upstream.

The Koneess river, though not a large stream at ordinary stages of water, drains a large and diverse area. In its headwaters the river is a typical braided stream of steep to moderate gradient. Approximately 30 miles from its headwaters the Koneess becomes a meandering river with moderate gradient and a cut bank channel. About 13 miles from its mouth the Koneess flows through a narrow canyon-like valley between Shoulder and Helmet Mountains but remains a meandering stream bordered by sand and gravel bars.

The water in both rivers is Class I (International Difficulty Rating) with an occasional rapid of Class II in the upper reaches. The Sheenjek River is canoeable from Last Lake and the Koneess River from the mouth of Vanticlese Creek.

Maps indicate both rivers drop between 15 and 20 feet per mile in the piedmont zone. The Sheenjek drops between 2 and 6 feet per mile in the flats zone. Both rivers exhibit current speeds of 5 to 7 m.p.h. on the average. Both rivers produce maximum flows shortly after break-up (early to mid-June) and lowest flow levels during the dead of winter (Jan-Feb) while they are frozen over.

#### Water Quality

Water quality of both rivers is excellent. Man-made

pollution is non-existent due to lack of habitation or commercial (mining, grazing, timber) activities. Both rivers carry a moderate sediment load following break-up but usually flow clear by July. The Sheenjek and Koness Rivers, like most rivers in the Yukon Basin contain surface water of the calcium bicarbonate type. Content of dissolved solids on both rivers is low, reflecting only natural background conditions. Water quality is totally suitable for all forms of human usage that would be associated with wild or scenic river activities.

## EXISTING LAND USES

The entire study segment of both rivers flows through a "wilderness" environment. No farming, mining, lumbering, or grazing is or has been undertaken. Only four cabins are known to exist along the study segment and \_\_\_\_\_ are currently being used. Use of these cabins in the past has been associated with trapping and subsistence hunting and fishing. There are no roads, trails, powerlines, pipelines, established airstrips or other environmental intrusions within the study corridor.

There are no known commercial mining deposits in the study corridor, however, the area has not been heavily prospected, especially with modern techniques.

The upper Sheenjek (above Monument Creek) lies within the Arctic National Wildlife Range. As with the surrounding refuge lands, the river corridor within the refuge is managed to preserve the unique wildlife, wilderness and recreational values found in this area of northeastern Alaska. While wildlife values receive primary management attention, preservations of the entire biotic community in its existing wilderness condition is an overall management goal.

Below the wildlife refuge, the river flowed through unreserved public domain land until enactment of the

Alaska Native Claims Settlement Act (P.L. 92-203) in December, 1971. Since enactment of P.L. 92-203, selections have been made for a utility corridor, state selection, public interest, [(d)(1)] and National Conservation System [(d)(2)] lands. While preliminary selections have been made, no management or use other than basic resource protection (fire) has taken place and the area has remained in a wild state under Bureau of Land Management administration.

The area has been used for subsistence hunting and fishing since antiquity. Natives from Fort Yukon and Arctic Village are known to hunt and fish along both the Sheenjek and Koness. Caribou comprise the most sought after species.

The lower 55+ miles of the Sheenjek is currently withdrawn under P.L.O. 3520 as power site withdrawal for the proposed Ramparts Canyon Hydroelectric project on the Yukon River. No activities other than exploration and data gathering has taken place under this withdrawal. In their 1971 report on the proposed Rampart project, the U.S. Army Corps of Engineers recommends against construction of the project at this time.

#### LAND OWNERSHIP

Federal land along the Sheenjek river falls into two ownership categories: 1) land in the Arctic National Wildlife Range, 2) land currently owned by the Federal

government and administered by BLM but that is being allotted to various specific federal uses or disposal under the ANCSA and Alaska Statehood Act (Fig. 5).

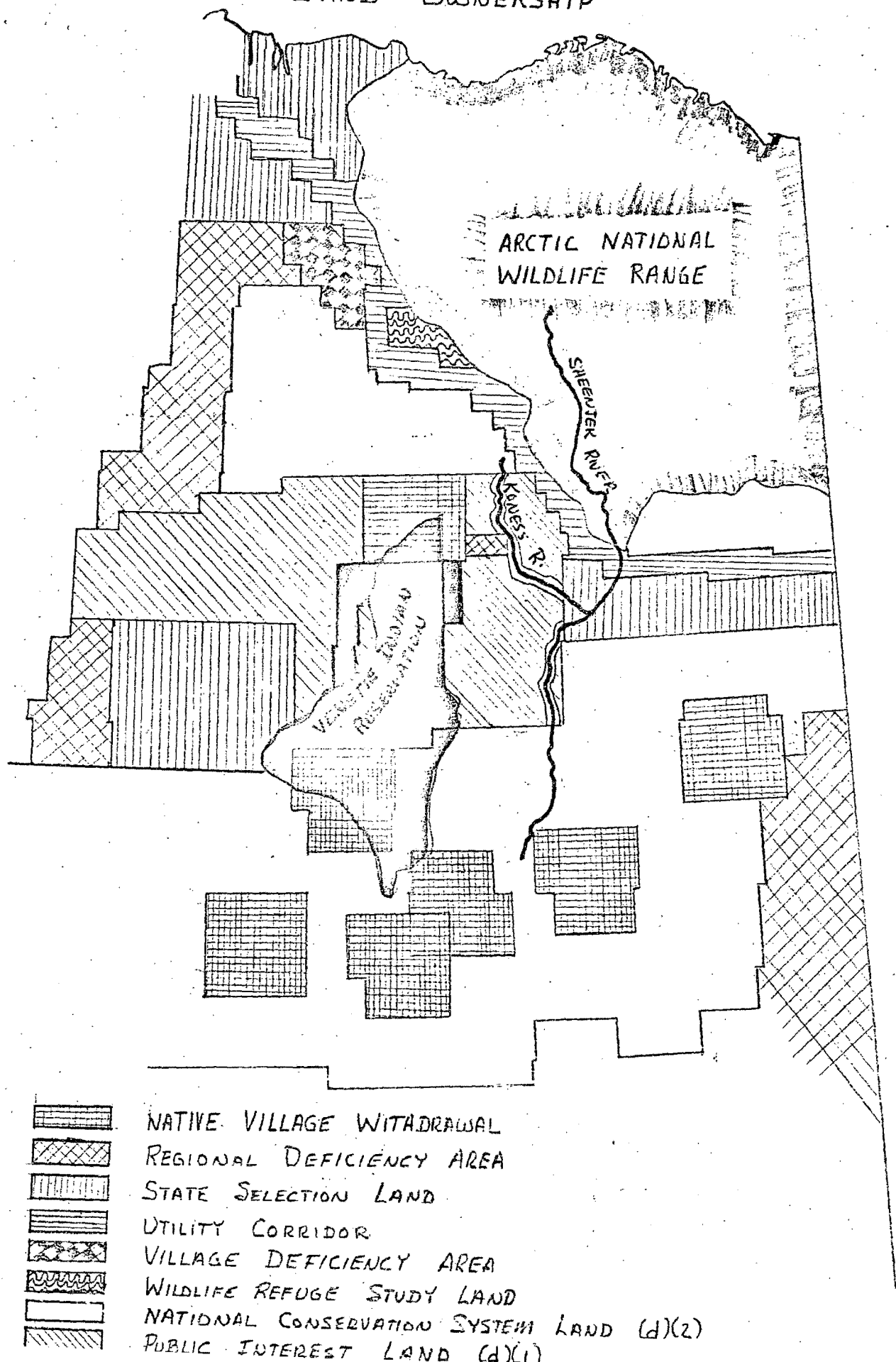
1) Arctic National Wildlife Range -- The upper 96 miles of the Sheenjek flow through the Arctic National Wildlife Range. The Range was created in 1960 and has been under management by the U.S. Bureau of Sport Fisheries and Wildlife since that time.

2) Other federal lands where state ownership and/or federal management and classification are underway -- The following is a sequential summary of prospective land ownership and management proposed by the Secretary of the Interior by his withdrawal of September 1972 under the provisions of ANCSA, September 1972, downstream from the Arctic National Wildlife Range to the Porcupine River.

a. Utility Corridor -- A six-mile wide utility corridor running from west to east across the Sheenjek River. The river enters this corridor at T. 36 N., R. 20 E. and flows southwest for 8 miles, crossing the corridor at a slight angle. The corridor has been withdrawn for a potential gas pipeline and transportation route.



FIGURE 5 LAND OWNERSHIP



b. State Selection Land -- At T35N, R19E, the river enters a block of land selected by the State under the Alaska Statehood Act. Patent to this land has been withheld pending completion of the ANCSA. Until patent is issued the Bureau of Land Management will continue to manage this land with assistance from BSF&W who has negotiated a cooperative agreement with the State to manage the wildlife values on this land. Approximately 26 miles of the Sheenjek lie within this ownership.

c. (d)(2) corridor through (d)(1) lands -- at T33N, R16E the river re-enters land withdrawn for federal purposes. This land is a large block of (d)(1) (public interest) land however, the river is bracketed by a 2 mile wide corridor (one mile back from each bank) which has been designated as (d)(2) (National Conservation System) lands for the express purpose of retaining a temporary category for wild and scenic river study. The river flows almost due south for approximately 25 miles in this (d)(2) corridor land.

d. (d)(1) Public Interest Land -- at T29S, R16E the river crosses a small block of (d)(1) lands. It is believed this one township was intended to have a (d)(2) corridor along the river but was omitted through oversight. Six miles of the river lie within this ownership.

e. (d)(2) National Conservation Systems Lands --  
at T28N, R16E the river enters (d)(2) lands and flows  
through this ownership for the remaining approximately  
44 miles to its mouth on the Porcupine River.

Within the above described lands withdrawn under  
ANCSA are a number of applications for land patent or lease  
that predate the ANCSA. There are however no existing  
privately patented lands. These applications start  
approximately 55 miles above the mouth and occur in random  
fashion downstream. These applications include one trade and  
manufacture (T & M) sites, seven native allotments and  
nineteen oil and gas lease applications, the latter of which  
cover extensive acreages along the lower 25 miles of the  
river. In addition to these pending applications, lands  
along the lower 44 miles of the river were all withdrawn by  
the Secretary of the Interior under P.L.O. 3520 as a power  
site withdrawal for the proposed Rampart Canyon Hydroelectric  
project. Other than the above listed applications or with-  
drawals there are no known land or mining claims  
influencing potential wild or scenic river status.

The Konesha River headwaters in (d)(1) lands and almost  
immediately enters a (d)(2) corridor. The river with its  
(d)(2) corridor flows south and then southeast within the  
surrounding (d)(1) lands. At one point (Northeast corner

OF T. 16 S., R. 17 E. the river crosses into Native Village Withdrawal lands for approximately one mile and then reenters the (d)(1) block (still within a (d)(2) corridor) as it continues its southeastern course. At T. 35 N., R. 17 E., the river passes into a block of State selection land. The river remains in the state selected land for the remaining 12 miles to its mouth on the Sheenjek River.

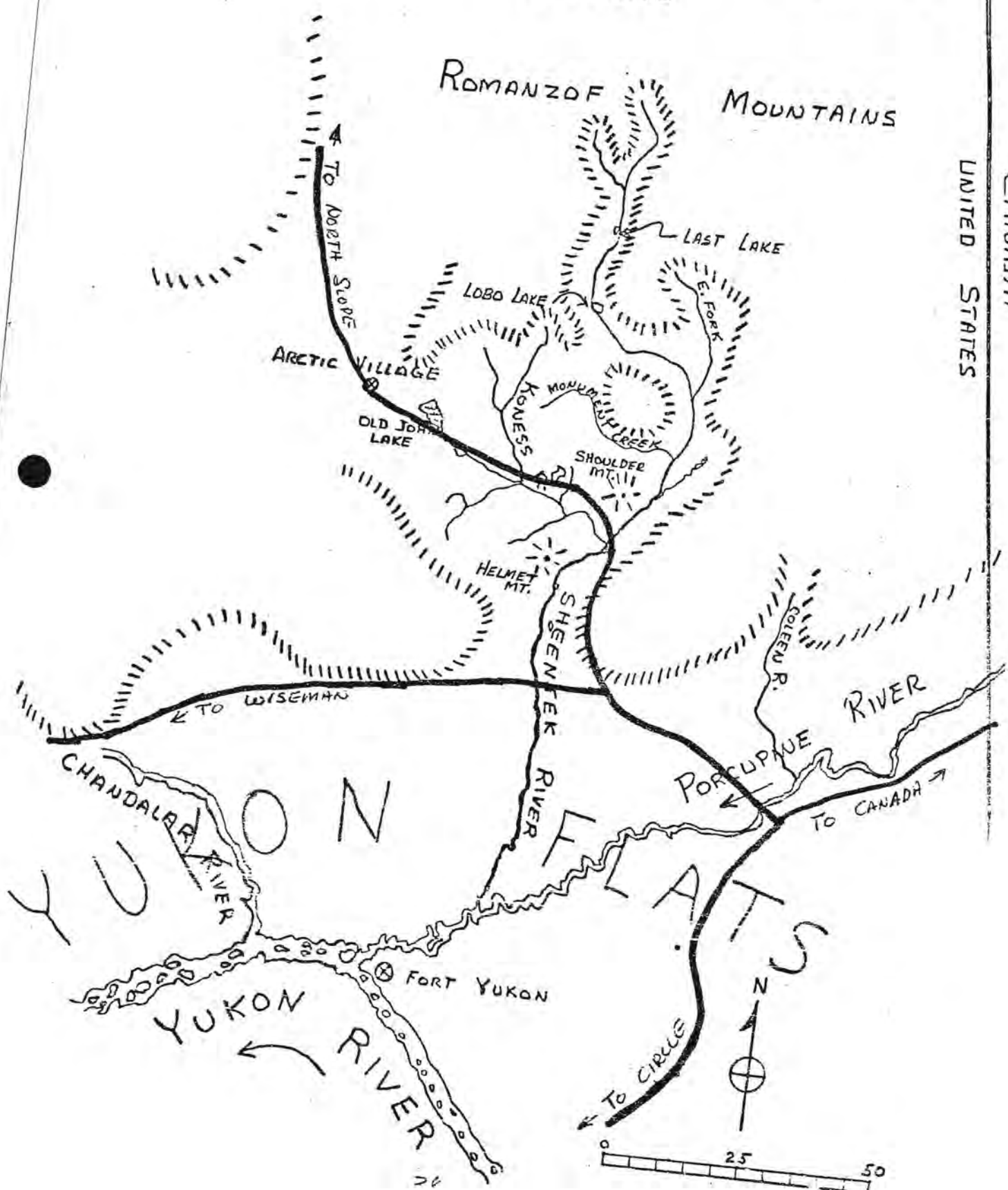
#### ACCESS TO THE RIVER

There are no established roads or trails to or within the study area. Access to the upper reaches of both rivers is almost exclusively by air or overland by foot. The lower reaches of the Sheenjek (mouth to approximately river mile 70) is accessible by power boat during high water but only with considerable dragging over gravel and sand bars.

Winter access to and through the area by dog sled or snow machine is possible and probable but the extent of such use is unknown.

Although there are no roads in the area, long range plans by the Alaska Department of Highways identify a possible highway approaching the Sheenjek from the southeast and crossing the river near the mouth of the Koness River and then proceeding up the Koness to the

FIGURE 6 POSSIBLE FUTURE HIGHWAY SYSTEM  
AS ENVISIONED BY ALASKA DEPT. OF  
HIGHWAYS



vicinity of Arctic Village (Fig. 6). This possible route has only been tentatively identified on long-term plans and no specifics are available at this time.

#### WATER RIGHTS, NAVIGABILITY AND RIVERBED OWNERSHIP

Under the 1959 act granting Alaska statehood, the state was granted ownership and control of navigable waters of the state. The question of navigability on the Sheenjek has never been resolved. The U.S. Army Corps of Engineers has assessed the navigability of a number of the state's rivers but has not made a determination for the Sheenjek. Under criteria being developed by the State to determine "navigability" and hence ownership, the Sheenjek would be navigable from its mouth upstream for \_\_\_\_\_ river miles. ?

There are no recorded rights or applications for appropriation of the river's waters.

#### RECREATION RESOURCES AND VALUES

The recreation values associated with the area under study consist of camping, hiking, mountain climbing, canoeing, nature study, photography, fishing and hunting in an unsurpassed wilderness setting.

The rivers of the south slope of the Brooks Range rank among the finest in the United States for wilderness canoeing. The Sheenjek River is no exception. For the

traveler using powerboat, canoe, kayak or inflatable boat, the river provides an avenue through a vast primeval land. Terrain adjoining the river and its many side valleys, which would otherwise be almost inaccessible, may be easily explored by foot. The Sheenjek is navigable by canoe or float boat from Last Lake and surrounded by the high peaks of the Brooks Range just 30 miles from the Arctic Divide. Beyond Last Lake the rugged peaks of the divide are easily accessible by foot, and below it the Sheenjek winds its way toward the Porcupine through 170+ miles of wilderness. From the mountain rimmed tundra meadows of the alpine zone, vegetation gradually gives way to lush spruce-poplar-birch forest as the river enters the piedmont zone. Further downstream the rolling foothills merge into the broad plain of the Yukon Flats.

Throughout its length, the Sheenjek is a delight to travel. Dry, open bars afford fine camping and ample firewood. Clear, quiet pools provide plump grayling for the angler. Fascinating wildlife and varied scenery are always available to engage the traveler. Experiencing the wild music of the wolf, the lonely cry of the loon, or the beavers report are daily occurrences. Moose and bear are often seen along the water's edge and at certain times of the year caribou in large numbers are present

In the Yukon Flats the river passes an occasional cabin, relics of the fur trapping days. Some are still intact, preserved by their remoteness and isolation. Worn, rusty traps, musty books, handmade furniture and primitive household items testify to man's onetime presence and the hard, lonely life he led.

In general summertime recreational activities can be carried out from June through September. Long hours of almost perpetual daylight add to the pleasure of being in the Arctic during the summer months.

In March and April the climate would be ideal for touring on skis or snowshoes. Arctic Village would be an excellent jumping-off point for this activity. Terrain of the alpine and piedmont zones is well suited for winter touring. A rare adventure awaits those who choose to travel this wild country during the snow season.

Access to the region is available by charter plane from Fairbanks, or Fort Yukon; both are served by commercial airlines. Lakes in the upper reaches of the Sheenjek are less than one and a half hours flying time from Fort Yukon.

Of special interest is the Arctic National Wildlife Range through which the upper 96 miles of the Sheenjek flows. The Range is a strong recreational drawing attraction for the area. The Range is far from being



just a wildlife refuge. It is a large (8,900,000 acres) block of land encompassing a wide spectrum of pristine Arctic and Subarctic habitats. Whole biotic communities of plants and animals exist undisturbed making the area a living arctic laboratory. The Range is a favorite visiting place of wilderness enthusiasts and others who seek the enjoyment of wild things in wild places. The Bureau of Sports Fisheries and Wildlife, which manages the area, endeavors to preserve the Range's wild character by limiting man's influences to a bare minimum consistent with sound wildlife management and recreational enjoyment of the area. Within these guidelines, the visitor can find a multitude of activities from hunting to nature study to fulfill his recreational desires.

#### HISTORICAL AND ARCHEOLOGICAL VALUES

Almost nothing is known of historical or archeological values along the river. The area downstream along the Porcupine and Yukon rivers however, has had some research and it is fairly safe to assume that many of the occurrences in the area spilled over or included the Sheenjek. The area in question is the Yukon Flats which is situated across the route traversed by ancestors of the Amercian Indian. It could well be that wood and wildlife of the flats played a key role in the aboriginal

populations of America. Indians of the Yukon Flats are a part of the Kutchin people occupying the Upper Yukon and a portion of the Mackenzie River Valley. They are of the Athapascan tribes, hunters who ranged through much of western North America from Alaska to Mexico relying on fish and game as they moved seasonally from fish camp to hunting territories. Prior to white settlement, the Indians had extensive trade routes up and down the river and across the mountains both north and south to the coasts.

An abundance of fur-bearing animals of the Yukon Flats was the key to early settlement by the white man. Russians discovered the mouth of the Yukon River in 1834 and in 1841 established the post of Nulato, approximately 350 miles southwest of the Yukon Flats. The first white man to reach the Yukon Flats was John Bell of the Hudson's Bay Company traveling from the Mackenzie River in 1845. Two years later, Alexander Murray established Fort Yukon for the Hudsons Bay Company at the confluence of the Porcupine and Yukon Rivers. Fort Yukon was the first English speaking community in Alaska.

Bell and Murray found several hundred Indians occupying the banks of the Yukon River and its tributaries. These were the Kutchakutchin or "People of the Yukon Flats." After the establishment of the Hudson's

Bay Post, the fur trade became a dominant element in the region's economy. In some years Murray bought as many as 8,000 marten and a variety of other furs from the Indians. Company officials described Fort Yukon as the most valuable Hudson's Bay Post west of the Rockies.

Alaska was purchased by the United States from Russia in 1867 but the Hudson's Bay Company continued business at Fort Yukon for two years until Captain Raymond, U.S. Army, took possession for the United States.

In the early 1880's prospectors reached the Yukon Valley over the Chilkoot Pass from Juneau. By 1886 the business of supplying gold seekers superseded fur trading in the economy of the Yukon River traders. In 1893 gold was discovered on the eastern edge of the Yukon Flats at Birch Creek, and Circle City was born. For three years Circle City with a population of over 1,000 white men was the largest settlement on the Yukon and the largest community ever on the Yukon Flats.

The gold rush period provided Indians an opportunity for employment as hunters, packers, and laborers. However, the great gold strikes of the Klondike and Nome soon drained off much of the population, and Fort Yukon again became the principal community.

As gold was depleted and fur prices increased, a new breed of white trappers settled in the area, taking advantage of transportation facilities established by the gold miners. Although the Indian continued to derive much of his living from the land, a high demand for fur and labor enabled him to acquire an assortment of useful items. Firearms, knives, steel traps, fish nets, and eventually boat engines were incorporated into hunting economy. School teachers, missionaries, government agencies, and modern technology have had an increasing impact on Native life. In recent years the assimilation of Natives into the white economy has been rapid.

Fort Yukon was an important fur center in the 1920's when fur was "King" in Alaska. It was, in fact, the greatest collecting point for fur in all of Alaska. World War II ended the heyday of furs on the Yukon Flats and the trade has been sustained since by a diminishing number of Caucasian old timers and Indians. Prices for wild fur generally remained low as a result of competition with synthetics and ranch furs. Wages in other parts of Alaska on the other hand have increased steadily, removing the inducement for young people to take up the rigorous life of the trapper.

Historic features of particular interest include the village of Fort Yukon, the abandoned Hudson's Bay

Trading Post at Old Rampart, and the historic trail from Fairbanks to Wiseman that crosses the western part of the Flats in the vicinity of Beaver.

#### FISH AND WILDLIFE VALUES

The Sheenjek along its course from the mountains of the Arctic National Wildlife Range to the swamps and muskeg of the Yukon Flats harbor a large and diverse population of animals. Wildlife in the Arctic National Wildlife Range along include some 139 bird species and 39 species of mammals. In addition to the large numbers of waterfowl and seabirds found along the river, especially in the flats area, the river hosts sizeable populations of moose, wolf, grizzly bear, Dall Sheep and caribou. The rare peregrine falcon may also be found in the area.

The Porcupine Caribou herd, second largest in the state, (120,000+), uses both the Sheenjek and Koness Rivers as wintering grounds and as a migration route from Canada to calving grounds on the North Slope of the Brooks Range.

Heavy concentrations of Grizzly Bear are known to inhabit the upper area of the Sheenjek in the vicinity of Last Lake. This area is also known to be a significant denning area for the bears.

Moose are found throughout the area with heaviest concentrations along the rivers and valley bottoms which provide significant winter habitat. Concentrations occur seasonally in preferred habitat areas such as willow stands, old burns and wet flats.

Wolves inhabit the entire length of the river and their numbers vary as a result of the distribution of moose, caribou and sheep. In general, welfare of the prey dictates the welfare, population and distribution of wolves.

Dall Sheep are found along the upper reaches of the river but generally distribute themselves on the slope and uplands away from the river proper. Little is known of the sheep population but hunters are believed to harvest approximately 120 animals in the area each year.

The Yukon Flats through which the lower Sheenjek flows is one of North America's best waterfowl production areas. Breeding ducks in densities of over 100 per square mile are common. The lower 65 miles of the Sheenjek provides suitable waterfowl habitat and is believed to account for significant numbers of the areas annual production.

Both the Sheenjek and the Koness support populations of grayling, northern pike, whitefish and runs of chum

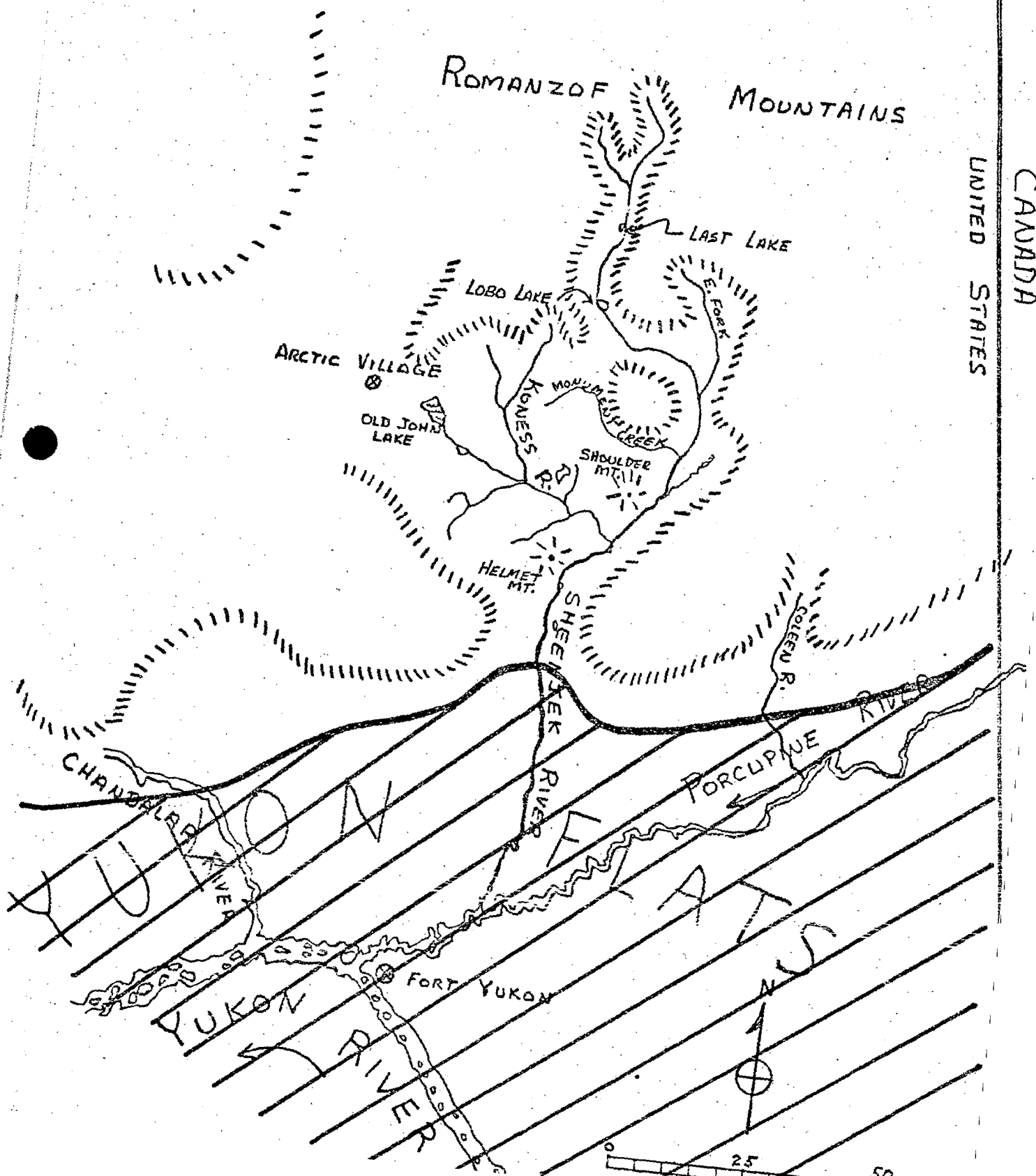
salmon. Subsistence and sport fishing are believed to be light however, because of the areas remoteness.

### LIMITATIONS TO RECREATION

The largest limitation to recreational use of the river results from the cost and difficulty of access. Whether or not this limitation is good or bad depends ultimately on what values the river is to be managed for. If the values are to be wild and pristine, well developed access may be a hinderance to these management objectives. On the other hand, for recreationists to use the river, they much have a means of access. At present, boats, hiking and aircraft are the only means of getting to the river during the summer recreation season. Snow machines and dog sleds may be used once the river freezes over.

In terms of the amount of recreational use possible, the fragile nature of the resource itself is a form of limitation. Delicate plant communities in conjunction with extensive areas of permafrost which turns into a quagmire if its surface insulation is removed makes surface disturbance a major environmental hazard. Construction of roads or trails and any permanent recreational facilities would have to be limited to areas where surface disturbance and permafrost thawing could

FIGURE 7 POSSIBLE RESERVOIR POOL FROM  
RAMPART DAM





be held to a minimum.

Potential limitations to recreation include the users themselves. It is quite possible that large numbers of recreationists in the river area would degrade or destroy the pristine environment and the primitive experience of the user. The most outstanding values of the river areas could be lost through overuse.

The effects on recreation by possible future construction of Rampart Dam are not fully known (Fig. 7). Such activities as hiking, canoeing, and winter sports probably would be affected minimally. However, game and fish populations, vegetation and even climate could be altered significantly, thus affecting hunting, fishing, nature study, and the like.

The harsh Arctic climate serves as a form of limitation by allowing only a relatively short season for the major recreational uses (June through August). Freezing temperatures have been recorded in all months but July. Water temperatures remain cool all summer, prohibiting prolonged water contact uses.

Although summer precipitation is low, humidity is high and much standing water is present in the area. These waters give rise to hordes of mosquitoes and flies causing discomfort to recreationists much of the summer.

## V. CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

Careful review of available information together with on-site inspection shows that the 200 miles of the Sheenjek River from its headwaters in the Arctic National Wildlife Range to its mouth on the Porcupine River:

- Is a medium size clearwater, free-flowing river without impoundment and with no straightening, rip-rapping or other modification of the waterway.
- Is long enough to provide a meaningful outdoor recreation experience
- Has sufficient volume of high quality water during normal years to permit full enjoyment of available outdoor recreation potentials.
- Possesses an outstandingly remarkable combination of high quality scenic, scientific, recreational, geologic, fish and wildlife and other similar values.
- Is capable of being managed to protect both people and the resource; has significant values which can be interpreted to the public; and will support a high quality outdoor recreation experience at the desired level of use.
- Supports a salmon run of value to both subsistence and commercial downstream fishermen.

- Has no known mineral potential.
- Has no commercial timber values.
- Has existing and potential public outdoor recreation values which are not duplicated in the nearby Porcupine or Wind River areas or the other 37 Alaskan free-flowing rivers identified by the Bureau of Outdoor Recreation as having high potential for inclusion in the National Wild and Scenic Rivers System.
- Is in an area where there is a continuing Federal interest in the short-and-long-range management of public resources and there is significant potential for coordinated management of these resources with the lands along the river owned by the State of Alaska.

It is further concluded:

- In its existing condition the entire Sheenjek River together with its immediate environment fully meets the attributes and criteria established for a wild river as defined by Section 2 (b)(i) of the Wild and Scenic Rivers Act (P.L. 90-542).

It is also the conclusion of this report that the Kones River which is the major tributary of the Sheenjek River:

- Does not possess the same outstandingly remarkable scenic, recreational, fish and wildlife values

that distinguish the Sheenjek River.

- Does not generally possess sufficient volume of water during normal years to permit full enjoyment of recreation values.

#### Recommendations

It is recommended that 177 miles of the Sheenjek River in two segments (Segment 1--Headwaters to State land at T. 35 N., R. 19 E; Segment 2--Section 17 (d)(2) boundary at T. 33 N., R. 16 E., to mouth of river) together with approximately 227,000 acres of its immediate environment.

- Be included in the National Wild and Scenic Rivers System as a Federally administered component unless all or a substantial portion is incorporated in the proposed Arctic National Wildlife Range extension of the proposed Yukon Flats National Wildlife Range.

- Be administered by the Federal agency having primary responsibility for management of the adjacent area.

It is further recommended that:

- Within one year from the date of the act including the Sheenjek River and its immediate environment in the National Wild and Scenic Rivers System, the administering agency in cooperation with the state and users establish detailed lateral boundaries

and prepare a plan for necessary development and administration of the area with the concepts set forth in this report.

⑤ A regular system of monitoring recreational and other human uses of the river's immediate environment be established to assure long-term maintenance of a high quality environment.

⑥ Subject to existing valid rights, the minerals within the immediate environment of the river (generally within one mile of the river bank) be withdrawn from all forms of appropriation under the mining laws and from operation of the mineral leasing laws including in both cases, amendments thereto.

⑦ Be administered as a wild river as defined by Section (2)(b)(i) of the Wild and Scenic Rivers Act (P.L. 90-542); the Guidelines for Evaluating Wild, Scenic and Recreational River areas Proposed for inclusion in the National Wild and Scenic Rivers System Under Section 2, Public Law 90-542, and the conceptual river plan contained in this report.

⑧ Recreational and subsistence use of fish and wildlife resources be allowed within the framework of appropriate State and Federal laws, provided such use is consistent with management objectives on adjacent lands.

It is also recommended that:

- The Koness River not be included as a Federally administered component of the National Wild and Scenic Rivers System.

## VI.

### RECOMMENDED RIVER PLAN

This conceptual management plan is designed to provide the designated administering agency with recommended policies and guidelines for the administration of the Sheenjek River as part of the National Wild and Scenic Rivers System. The boundaries and developments discussed are presented as general recommendations and should not be construed as being the complete or final plan for the river.

#### AREA

The proposed plan is for a wild river program for the entire Sheenjek from its headwaters in the glaciers of the Romanzof Mountains to its mouth on the Porcupine River. With the exception of approximately 26 miles of river in state land, the river's 200 mile length lies in federal ownership. Ninety-six miles lie in the Arctic National Wildlife Range and the remaining length of the river lies in federal lands withdrawn under the ANCSA of 1971 (P.L. 92-203) as utility corridor, National Conservation System lands (d)(2) and national interest lands (d)(1).

Lands adjacent to the river that comprise a potential management corridor for protection of the river environment total approximately 223,000 acres, all of which are in federal ownership. This acreage figure is only a

rough estimate and it is expected that the administering agency will refine it as specific planning for the river proceeds.

#### APPROPRIATE BOUNDARIES

Lateral boundaries for the study segment should be established to provide protection for the primary visual corridor along the river. The primary visual corridor may generally be defined as the area seen from the river and the river bank. This distance does not generally extend further than one to two miles back from the river bank. It is proposed that Congress establish upstream and downstream boundaries for the wild river and direct the administering agency to develop specific lateral boundaries as part of the detailed management and development plans for the river area. In the case of the Sheenjek River it is felt specific boundaries can be established within a corridor averaging one mile back from each bank. It is expected that areas with restricted views will require only a narrow corridor while other areas with distant vistas or areas of unique or special biological, archeologic or ecologic significance may require a corridor of up to two miles.

#### ACQUISITION POLICY AND LAND USE CONTROLS

Inasmuch as almost all lands adjacent to the study segment are under federal control, acquisition policy is



of only minimal concern. Land use control on the other hand is very important to the maintenance of the river's existing wild character of the river is closely tied to adjacent land areas, it is recommended that careful consideration of the Sheenjek's wild river values, especially as effect views from the river be given priority attention in management of adjacent land. Of special concern are activities such as logging, mining, grazing and future transportation routes.

#### DEVELOPMENT

Because the Sheenjek River's existing wild values are considered to represent the highest and best use of the area from a wild and scenic river viewpoint, the recommended development plan consists of maintaining the river's undisturbed wild state while providing only the bare minimum of recreation facilities needed for appropriate visitor use and river protection. Under this plan, no new developments on, or conspicuously visible from, the river would be constructed except by permit and only after consideration of impacts on the existing environment. Access to the study segment would be by river, air, or by carefully chosen, inconspicuous foot trails. No facilities for overland vehicular traffic would be provided as part of this plan. However, should the State ultimately

construct a highway access program as presently envisioned, carefully selected crossings of the Sheenjek River would be compatible with the primary objectives of retention of existing free-flowing values.

VII. DIRECT OR INDIRECT CHANGES UPON EXISTING ECONOMIC OR SOCIAL CONDITIONS SHOULD A WILD RIVER BE ESTABLISHED

There are no known adverse effects upon existing economic or social use of the Sheenjek River area.

Long-range benefits would accrue to local and State residents who depend upon fish and wildlife resources of the area for subsistence purposes through protection of the natural features and conditions which are responsible for existing fish and wildlife populations.

Local and State economies potentially would benefit by attracting visitors who would need specialized equipment, transportation and guiding services to use the natural resources of the Sheenjek Wild River and its immediate environment.

The proposed action would place the Sheenjek River into a select, small group of free-flowing rivers throughout the nation. This designation would attract a greater number of visitors to the local area and the State. Such visitors would be expected to stay longer and contribute a greater amount to the local and State economy because of the specialized equipment and greater time needed to enjoy the river and its environment.

At the present time there are no base data to compare the economic impact of public recreation in the Sheenjek River area since the absence of public support or service facilities requires present users to purchase supplies

and equipment before arriving at the Sheenjek River, Alaska, with similar opportunities at free-flowing river areas elsewhere it appears that impacts to the local and state economics should be substantial as indicated in Table 1.

It is important to remember that these expenditures are for the duration of the specific trip only and that transportation costs to and from the area are excluded. Also in Alaska these would be adjusted upwards significantly because of the higher overall costs and for specialized transportation requirements such as long car shuttles and in some cases cost of air access into the specific river area.

**Table 1**      **Comparison of Recreation Expenditures at Selected  
Free-Flowing River Areas Comparable to the  
Sheenjek River, Alaska**

Area	Cost per trip <u>1/</u>	Daily Cost per person
<u>Canoe/Kayak (family)</u>		
Eel River, Ca.	\$280 <u>2/</u>	\$13.33 <u>3/</u>
Klamath River, Ca.	320 <u>2/</u>	26.66 <u>4/</u>
Trinity-Klamath Rivers, Ca.	285 <u>2/</u>	26.66 <u>4/</u>
Kipawa Area, Quebec, Canada	360 <u>2/</u>	13.33 <u>5/</u>
<u>Canoe/Kayak (individual)</u>		
Buffalo River, Ark. <u>6/</u>	\$120	\$20.00
Chilikadrotna River, Mulchatna, Ak.	485-375	53.88-75.00
Chulitna River, Ak.	70	35.00
Current River, Mo. <u>6/</u>	110	15.71
Deska River, Ak.	185	37.00
Kenai Area, Ak.	365	20.27
Lewis & Clark Waterway, Mont.	140	17.50
Little Susitna River, AK.	65	32.50
Salmon, Middle Fork, Ida. <u>6/</u>	285	47.50
SNAKE River, Wyo.	135	13.20
Yukon River, Ak.	280	40.00
<u>Hiking (individual)</u>		
Wrangell Mtns., Ak.	\$330	\$19.41

- 1/ Excludes all transportation and related costs of food and lodging while in transit to and from home and river area.
- 2/ 2 adults, 1 child, ea.
- 3/ Additional child \$60 for entire trip.
- 4/ Additional child \$80 for entire trip.
- 5/ Additional child \$110 for entire trip.
- 6/ Unit of the National Wild and Scenic Rivers System or related river conservation program.

PRELIMINARY  
SHEENJEK-KONESS RIVERS, ALASKA

Based upon an aerial reconnaissance during June, 1972, and a review of available information, the Sheenjek and its tributary Koneess River have been found to possess those qualities necessary for inclusion in the National Wild and Scenic River's System in that:

- The river is in a free-flowing natural condition.
- The river is of sufficient length to provide a meaningful experience to the river user.
- There is sufficient volume of water during normal years to permit, during the recreation season, full enjoyment of river related outdoor recreation activities.
- The river and its immediate environment possess outstandingly remarkable values.
- Water quality is excellent.
- The river and its immediate environment are capable of being managed to protect and interpret special values and protect the user.

The Sheenjek River originates in the southeast corner of the Brooks Range and flows south for 200 miles to its confluence on the Porcupine River. The Koneess River originates at the south side of the Brooks Range to the west of the Sheenjek and flows south and east for 72 miles to

intersect the Sheenjek near its mid-point. Both rivers are non-glacial, meandering, and run clear by mid-summer. The upper reaches of both rivers flow through tundra lands in broad mostly flat, mature valleys. Spruce, aspen and birch in scattered stands along the river bank mix with the tundra in the middle and lower middle sections of the river. In the lower reaches, the forest stands become more extensive and the tundra gives way more to old oxbows and a bog type cover.

Rugged, talus sloped mountains surround the headwaters of *THE SHEENJEK*. Low hills and in a few places, bluffs rise above the river in the upper and middle sections. In the lower reaches the river flows into a broad, flat valley dotted with hundreds of lakes. This lower area in fact being an extension of the Yukon flats. Views along most of the river except the mountainous headwaters offer spectacular views of the nearby Brooks Range. Many small lakes dot the middle and lower sections of the Sheenjek.

The area abounds with wildlife. Dall sheep, moose, grizzly and black bear, wolves, caribou and small fur bearers are found along the river. The river also provides significant waterfowl habitat, hosting large flocks of ducks and geese during the summer months. The river itself supports populations of grayling, pike, whitefish and runs of chum salmon.



In its southward course, the river flows from headwaters in the Arctic National Wildlife Range into a federally withdrawn utility corridor near Grayling Lake (T36N, R20E). The river leaves the utility corridor at T35N, R19E and enters state protected land then veers southwest finally leaving state land at T33N, R16E and enters a 2 mile wide (d)(2) corridor through (d)(1) lands. The river then proceeds almost due south remaining in the 2 mile corridor until reaching T29N, R16E where the river enters (d)(1) lands for one township before entering (d)(2) lands for the remainder of its length to its mouth of the Porcupine River. The one township of (d)(1) land appears to have been an oversight in 2 mile wild river study corridor designation. The oversight has been brought to the attention of *THE JOINT FEDERAL-STATE LAND USE PLANNING TEAM*. The Koness River headwaters in Native withdrawal land and flows south into Native regional deficiency lands and at T36N, R33E the river enters a 2 mile W&SR corridor through (d)(1) lands. The river continues in the 2 mile corridor as it flows southeast until it reaches the state patented land at T35N, R17E. The confluence of the Koness and Sheejek rivers occurs in T34N, R18E some 12 miles inside the state patented land block.

An interagency field task force is being formed to analyze available field data, provide further input, participate in field investigations and assist in report drafting. Representatives of the Bureau of Outdoor Recreation, National Park Service, Bureau of Sport Fisheries and Wildlife, Bureau of Land Management, Alaska Power Administration, U.S. Forest Service and Alaska Department of Fish and Game have expressed their desire to participate in the study. Several other government agencies and the local Native Regional Corporation, (DOYON LTD.) have also been invited to participate.

On the basis of a June aerial inspection, analysis of existing information and interviews with persons who have been on the river, a background picture of this primitive river and its surroundings is beginning to emerge. The river appears to possess "outstandingly remarkable" qualities in the form of unique scenic and fish and wildlife values coupled with a primitive setting capable of being interpreted and managed to provide a high quality recreation opportunity in a wild setting.

The river itself varies from a small, swift, clear-water stream in the headwaters to an often sluggish, meandering river in the lower stretches as it flows through an extension of the Yukon "flats" on its way to its mouth

on the Porcupine River. In between, the river is characterized by alternate stretches of swift and lazy water. For the most part, the river flows in a cut-bank channel with a gravel bed through a relatively flat valley. Because the valley is usually wide and surrounding hills are low, excellent views to the nearby Brooks Range are possible along most of the upper and middle parts of the river. In the lower reaches vegetation along the river often restricts distant views.

There are currently no roads or trails along or across the river. Long range plans, however, identify a possible transportation corridor crossing the Sheejek near the mouth of the Koness and then proceeding up the Koness to the vicinity of Arctic Village. This possible corridor has only been tentatively identified on long term plans and no specifics are available at this time.

Mineral exploration has been light in the area and no significant finds along either river have been located. <sup>(1927)</sup> Early explorations by USGS <sup>OR DEVELOP</sup> indicate the area is probably not significantly mineralized and that past glacial action in the valley has disturbed and covered bedrock to the extent that prospecting in the area is at best a low priority affair. NO NEW INFORMATION CONTRADICTING THIS ASSUMPTION HAS BEEN UNCOVERED.

Special wildlife values along the river include the

upper Sheenjek and entire Kones River lands which constitute an important part of the winter range of the Porcupine Caribou herd. Populations of peregrine <sup>FALCON</sup> and gyrfalcon, osprey and golden eagles also inhabit the area. The river is also known to host a good wolf population.

Access to the area is presently by air or by power boat from Fort Yukon by way of the Porcupine River. In general power boats can easily travel the first 75 miles of river. Beyond that point, lining would be necessary in places but a power boat could proceed an additional 20-25 miles. The Kones River is generally considered too small for power boat travel. Numerous lakes in the upper middle and lower sections of the Sheenjek offer excellent landing sites for float planes. In a few places, smooth gravel bars offer landing sites for wheel aircraft.

Habitation along the river has always been sparse and remains so today. Cabins may be found near river miles 75 and 95 and on the Kones River near Old Man Lake some 35+ miles above its mouth. Use of these cabins has been associated with limited hunting and trapping in the area.

Recreational use of the river includes rafting, canoeing, kayaking, power boating, fishing and hunting. In addition to river travel, recreation opportunities include hiking, primitive camping, photography and nature study.

A hydroelectric power project (Rampart Dam) on the Yukon River would cause flooding of approximately \_\_\_\_\_ miles of the lower Sheenjek River if constructed. No transmission lines or service roads for the dam are anticipated along the Sheenjek. The U.S. Army Corps of Engineers in their 1971 report on the dam recommended the project not be undertaken at this time due to economic factors and environmental and fish and wildlife considerations.

A two township-wide utility corridor crosses the mid section of the river a short distance above the Koness confluence with the Sheenjek. The corridor runs from north slope oil fields to the Canadian border and offers a potential pipeline route to Canada. No specific plans for use of this corridor are currently available, however, the Bureau of Land Management is in the process of preparing management guidelines for the area.

Following completion of the field work, the interagency task force will determine if the river should be added to the NW&SRS as a federally administered component. Preliminary indications are that a corridor one mile from mean high water on each side will be sufficient to protect the wild and scenic aspects of this river. Final determination of boundaries, however, will be worked out for the final report by the interagency task force.

At the present time, only lands along the river designated as (d)(1), (d)(2), utility corridor or Arctic National Wildlife Refuge will be given detailed consideration for inclusion in the NW&SRS system.

## OUTLINE OF REPORT

I. Introduction - Include authorization and purpose for study:  
P.L. 90-542, Wild and Scenic Rivers Act.

II. Summary of findings and recommendations.

III. Brief description of region surrounding river. Region might include the river basin or a group of political units within a given distance of the river (e.g. 100 miles). Include location map. Describe rationale for regional boundaries selected.

A. Describe generally the region's physical features, including topography, land and water use, and transportation facilities.

B. Population

1. Present - Numbers, distribution, density, percent urban (cite sources).

2. Projected for mid-range target date (e.g. for 1980 and 2000) Cite sources and/or technique used.

C. Economy

1. Describe present components of the region's economy. Refer to employment data where available. Cite sources.

2. Describe expected major shifts in economic activity. Cite sources.

D. Describe public and private recreation resources available in region. Include: (1) Acres of recreation land by BOR classification; (2) Miles of free-flowing rivers now protected; (3) Lakes and reservoirs now available for public recreation, under construction.



and authorized, in miles of shoreline and surface acres of water (list individual projects and lakes); and (4) existing or proposed State or local scenic riverways or scenic river programs.

IV. Description and evaluation of the study river or river segment.

- A. Length, width, depth, seasonal flow, gradient profile, the physical setting of the river.
- B. Water quality. Refer to existing or proposed water quality standards and types and sources of pollution.
- C. Describe and delineate on map major existing land use categories along river and its related adjacent land area. Use standard terminology for land use classifications, such as developed (residential, commercial, industrial), cultivated, grass or pasture, forest, shrub, water, or naturally barren. Show in tabular form the categories used on the map by acres and percent of total area.
- D. Present uses of river. Include existing, authorized and proposed water resources developments that affect the river. Describe how this aspect of the study was coordinated with any water resources planning activities pursuant to the Water Resources Planning Act, P.L. 89-80.
- E. Describe and show in tabular form land ownership along river and its related adjacent land area by acres and percent of total.
1. Federal (by agency)
  2. State (by agency)
  3. Other public (by agency)
  4. Quasi-public (by agency)
  5. Private (show as an overall category rather than individual ownerships unless a large portion is under a single ownership, such as a power company, which is pertinent to the conclusions of the report).



individual owner. Include the acreage of individual parcels of private land on the map.

Map

- F. Access to river and related adjacent land area. Show on map existing highway system in area, including bridges, ferries, etc.
- G. Describe water rights and ownership of river bottom. Discuss problems that might be encountered.
- H. Describe significant outdoor recreation resources and opportunities (existing or potential).
- I. Describe significant historical, archaeological, fish and wildlife, etc., resources and values.
- J. Describe existing or potential limitations to recreation (e.g., water quality, climate, low flows, land development, dams, mine exploitation, timber foresting).

V. Evaluation and Recommendation - On basis of above factors, determine and discuss the river's qualification for inclusion in the National System. Particular emphasis must be given to: (1) quality of the river; (2) availability of significant recreation opportunities (existing or potential); and (3) recreation supply of free-flowing and slack water in region (III D) surrounding river. If the river so qualifies, recommend either A or B; if not, proceed to C.

- A. Inclusion in the National Wild and Scenic Rivers System as a river to be wholly or partially administered by the Federal government and which requires Congressional authorization. Describe and justify proposed classification (scenic, wild or recreation) and management (Federal, Federal-State and/or local). Continue with VI, VII and VIII.

wild or recreational river, i.e., one which is so designated by the legislature of the State and which is to be permanently administered as a part of the National System without expense to the United States - (See Section 2 (a)(ii) of P.L. 90-542). If inclusion in the National System as a State designated river is proposed, describe in general terms (1) appropriate boundaries (2) significant recreation characteristics and opportunities (3) appropriate levels of development and (4) means of protection. Then conclude report with VIII.

- C. If the river does not qualify for inclusion in the National System and the river and its related lands are found to contain several areas worthy of public protection or development for recreation, describe in general terms the boundaries of these areas, their significant characteristics, and possible means of protection. Then conclude report with VIII.

## VI. River Master Plan

- A. Give precise goals for river preservation. Include desired optimum level of visitor use.
- B. Delineate on map proposed use zones for river. Use standard terminology in defining and naming use zones, such as recreation, development and access zones; agrarian zones; historical, archaeological, ecological, or geological zones; limited resource use zones (e.g., where restricted forestry or present land use practices might be continued); and developed (residential, commercial, industrial) zones.

Describe the zones used, indicate their landscape management requirements and provide rationale. The zones must, of course, conform to the

proposed classification (scenic, wild or recreational) of the river as defined in Section 2(b) of P.L. 90-542.

C. Describe and delineate on appropriate map land acquisition and control zones based on requirements of the use zones in B.

map

1. Fee acquisition (not more than an average of 100 acres/mile of river).
2. Easement acquisition (describe in detail provisions of easements contemplated). Fee and easement acquisition should not total more than an average of 320 acres per mile on both sides of the river. *(NOT Applicable in Alaska)*
3. Local and/or State zoning (describe in detail type of provisions of zoning contemplated, and how it would be administered. Describe present zoning now in effect along river).
4. Table should summarize acreage in these above categories.

D. Recreation development plan. Describe, delineate on map, and justify. Include:

map

1. Developed recreation areas and estimated costs. Identify role of private sector, if any.
  2. Access points and estimated costs.
  3. Transportation (highway) network and estimated costs.
- E. Administrative arrangements for river. Explain and justify. Consider the following alternatives for administration:

1. Federal
2. Federal-State and/or local
3. Other such as Compact Commissions.

Specify the administering Federal agency or agencies.

F. Costs for FY +1 through +5 for the recommended river plan (in current dollars).

1. Acquisition

(a) fee acres and dollars

(b) easement acres and dollars

2. Development

3. Administrative - man years, et. al.

G. Describe the extent to which Master Plan development has been coordinated with, and is in accord with, other water resources planning involving the same river pursuant to the Water Resource Planning Act.

H. Describe any proposals for water projects, water right acquisitions, land management or rehabilitation needs, pollution control needs, etc. that should be effected outside the area in order to protect or enhance the free-flowing river and environment. Show estimated costs and anticipated effects of such proposals.

VII. Economic effects of inclusion in the National System

A. Reasonably foreseeable potential uses of the river area that would be created or enhanced.

1. Projected recreation use, by significant activity, for

1980 and 2000, assuming the recommended development occurs

2. Likely economic benefits, assuming the recommended develop

occurs. Include any benefits on local taxation for each unit of government involved.

- B. Existing or reasonably foreseeable potential non-recreational uses of the river area which would be curtailed or eliminated and resultant reduction in direct and indirect benefits.
- C. Summarize general benefits of A as opposed to the disadvantages of B.

#### VIII. Appendix

- A. Photographs. Cover all phases of the river resource: prominent geological and natural areas, encroachments and impoundments, areas most suitable for limited development, general views, etc. They should be 8" x 10" black and white, glossy finish.
- B. Map IV E and others as appropriate. As a rule, the maps, except IV E, should accompany the text.
- C. Methodology, including study duration.
- D. Study team members.



UNITED STATES GOVERNMENT

# Memorandum

*Clay Hardy*

TO : Assistant Director Eastman

DATE: June 2, 1973

FROM : Leader Alaska Task Force

SUBJECT: Copper River (Iliamna) Wild and Scenic River Report

Enclosed are Chapters IV and V of the subject report.

It is emphasized that these are preliminary as data has been developed on the basis of office review and overflights on June 29 and October 31, 1972.

Field inspection is scheduled during the first of July. Representatives of the BLM, FS, BSF&W, ADF&G, ADG and Natives plan to participate in the field examination. At the conclusion of the field effort the report will be completed and may be substantially revised to reflect new information.

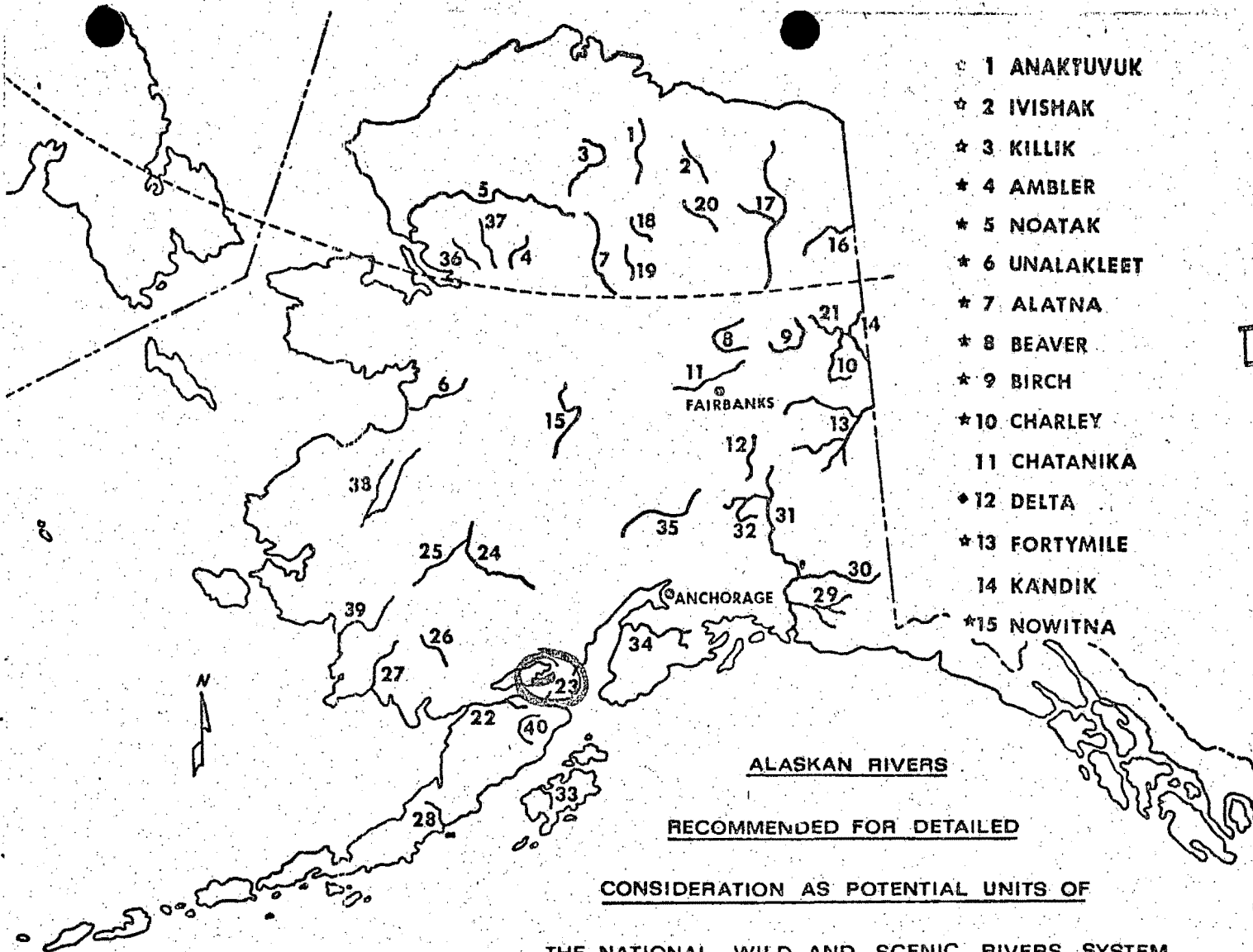
Chapters IV and V have been provided NWRO, NPS, BLM, BSF&W and FS. Also Chapter IV will be distributed to study participants.

*Jules V. Tileston*  
Jules V. Tileston

2 Enclosures

cc: Fred Strack





- 1 ANAKTUVUK
- 2 IVISHAK
- 3 KILLIK
- 4 AMBLER
- 5 NOATAK
- 6 UNALAKLEET
- 7 ALATNA
- 8 BEAVER
- 9 BIRCH
- 10 CHARLEY
- 11 CHATANIKA
- 12 DELTA
- 13 FORTY MILE
- 14 KANDIK
- 15 NOWITNA

- 16 PORCUPINE
- 17 SHEENJEK-KONESS
- 18 TINAYGUK
- 19 WILD
- 20 WIND
- 21 YUKON
- 22 ALAGNAK
- 23 COPPER (ILIAMNA)
- 24 HOHOLITNA
- 25 HOLITNA
- 26 NUYAKUK
- 27 TOGIAC
- 28 ANIAKCHAK
- 29 BREMNER
- 30 CHITINA
- 31 COPPER
- 32 GULKANA
- 33 KARLUK
- 34 KENAI-RUSSIAN, SWANSON R.-SWAN LK.
- 35 SUSITNA
- 36 SQUIRREL
- 37 SALMON
- 38 ANDREAFSKY
- 39 KANEKTOK
- 40 AMERICAN CREEK

BOR, OCTOBER, 1972

"ALL OR SUBSTANTIAL PORTIONS CLASSIFIED UNDER 17(d)(2) OF ANCSA, SEPT. 1972

"RIVERS WHERE DETAILED STUDIES HAVE BEEN REQUESTED

Conclusions

The conclusion of this study is that the entire Copper River including Meadow Lake and Silver and Ptarmigan Creeks and their immediate environments possess values which qualify them for inclusion in the National Wild and Scenic Rivers System.

Careful review of available information, together with on-site inspection shows that:

- It is a clear, free-flowing river without impoundment, straightening, rip-rapping or other modification of the waterway.
- The river is long enough to provide a meaningful outdoor recreation experience.
- There is sufficient volume of high quality water during normal years to permit full enjoyment of the outdoor recreation potentials of the Copper River.
- The Copper River and its headwater areas and their immediate environments possess an outstandingly remarkable combination of scenic, recreational, geologic, fish and wildlife, scientific and other similar values.
- The overall setting is primitive and pleasing to the eye without significant visual evidence of man's activities.



- Fishery for sport purposes and red salmon spawning are the dominant resource uses in the Copper River basin.
- There are no commercial timber values within the immediate river environment.
- Values, both existing and potential, associated with the 12 miles of the middle river environment are not sufficient to warrant inclusion in the National Wild and Scenic Rivers System on their own merit.

#### Recommendations

It is recommended that:

- The 12 mile portion of the middle Copper River withdrawn as part of a larger block of land under Sec. 17 (d) (2) ANCSA be retained in Federal ownership.
- The adjacent Federal land manager maintain the existing environment of the river area.
- The Federal land manager work with upstream and downstream land owners to determine the desirability and feasibility of developing a coordinated, comprehensive management plan for the entire river area.
- Any lands in the immediate environment of upstream or downstream river areas not selected by Natives be retained in Federal ownership until such time as a comprehensive plan has been developed for the entire river.

● At such time as land status is firm, the entire river area be reconsidered for possible addition to the National Wild and Scenic Rivers System with the active participation of all concerned land owners.

#### IV.

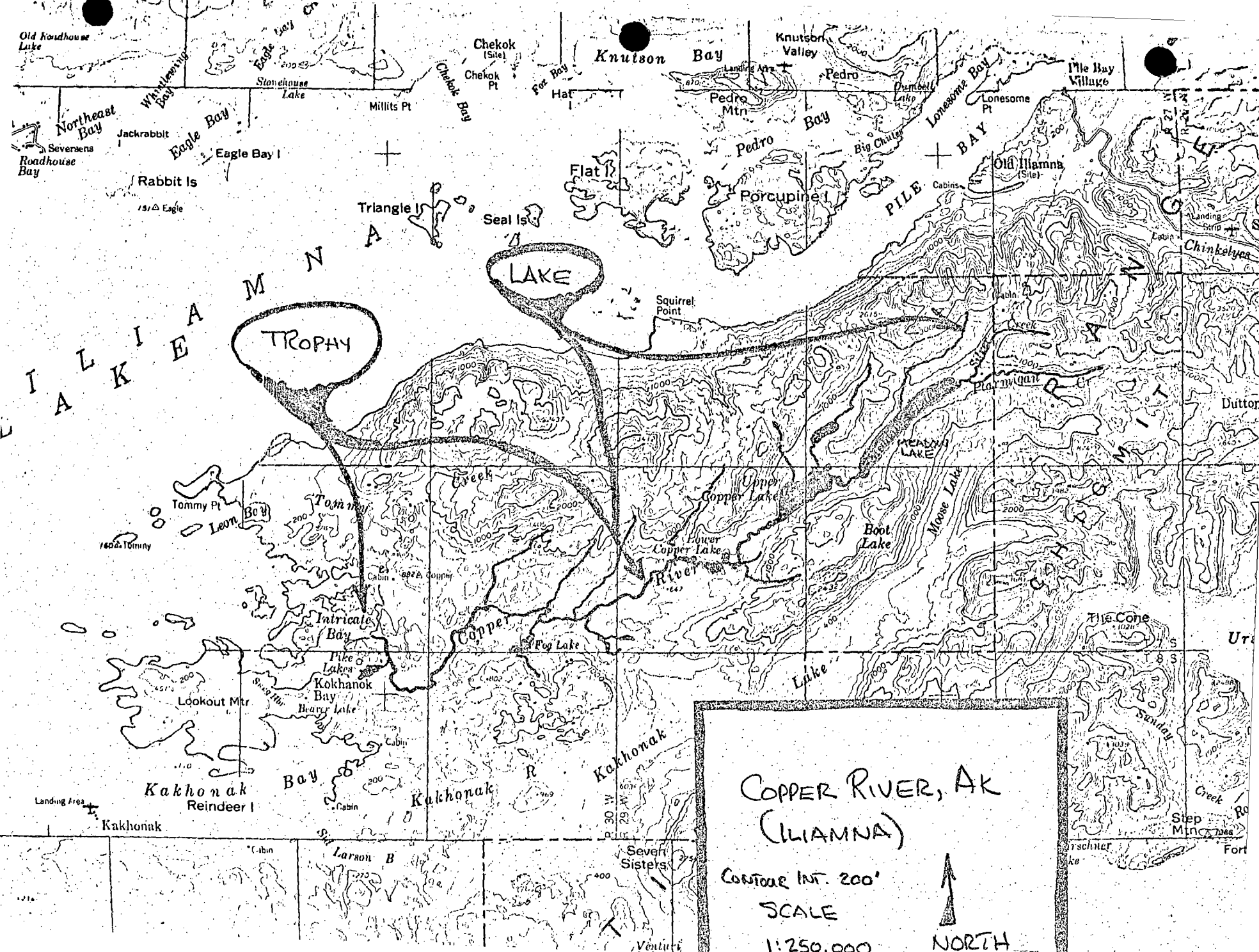
#### DESCRIPTION AND ANALYSIS

##### River Setting

The Copper River is a small, clear free-flowing stream flowing southwesterly some 21 miles from its source at Meadow Lake through Upper and Lower Copper Lakes to the west shore of Lake Iliamna. The lanceolate basin is at its widest less than 6 miles wide and has an area of 128 square miles. Including its uppermost tributaries, Silver and Ptarmigan Creeks (4 and 6 miles long, respectively) they are approximately 60 miles of streams and interconnected lakes in the basin. All except Silver and Ptarmigan Creeks are apparently too small to warrant names.

The Copper River flows through a stream-cut valley through rolling hills forming the western flanks of the Chigmit Mountains. The Chigmit Mountains are part of the Aleutian Range. In broad perspective the Copper River is the interconnection between several large lakes on the principal drainage pattern and is fed by smaller lakes in tributary lakes. Only the mainstream lakes are named.

Topographically and hydrographically the river can be divided into two distinctive parts separated by a waterfall. The upper or Lake portion comprises the upper 3/4 of the basin while the remainder is the Trophy portion (Fig. ).



The Lake area, as its name implies, is dominated by lakes and of the 16 miles of the Copper River drainage considered to comprise the main river,  $\frac{1}{10}$  10 miles, or 62.5 percent, are lake. Meadow Lake, the uppermost and largest is approximately 4 1/2 miles long and averages approximately 1/2 mile in width. Its elevation is 564 feet m.s.l. or 499 feet above the surface of Lake Iliamna. Its tributaries, Silver and Ptarmigan Creeks, rise at elevations of approximately 2,500 and 14,00 feet m.s.l. respectively. The Copper River is just recognizable as a river as it is spawned as a dashing torrent dropping 74 feet in less than 1/2 mile before entering Upper Copper Lake. Upper Copper Lake is somewhat fan shaped, 3 miles long and almost 1 mile wide at its widest section. From the outlet of Upper Copper Lake the River drops another 100 feet in 1 1/2 miles to Lower Copper Lake. This last mainstream lake is in reality a series of 2, perhaps 3 irregular interconnected lakes approximately 2 1/2 miles long which are generally less than 1/2 mile in width. Approximately 4 miles downstream from the outlet of Lower Copper Lake, the River cascades over a 32 foot high crescent shaped waterfall. Except for the lakes, and the 4 miles of river immediately upstream from the waterfall, the river appears to be too steep, small and boulder choked to be boatable.

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Source: Alaska Dictionary of Place Names, U.S.G.S. P.P. #567

The Trophy portion of the Copper River includes the remaining 12 mile segment between the waterfall and Lake Iliamna. Here the river is between 50 and 120 feet wide and from 6 inches to 12 feet deep. The Trophy area is suitable for small motor powered boats.

#### Stream Flow

There are no stream guaging stations on the Copper River. However several observations of the Trophy area indicate a water velocity of 3.2 feet per second and a single observation in September of 480 cfs approximately 6 miles downstream from the waterfall.<sup>1/</sup>

Water temperature in August 1961 was 12.7° C. <sup>1/</sup>

Because of the large headwater lake areas, it is assumed that water volumes remain relatively constant throughout the spring, summer and fall. The probability of storm induced high flows, however, appears to be good because of the small size of the basin.

Current in the headwater River interconnections between lakes is swift. Average gradient, exclusive of the lakes is as follows:

Silver Creek . . . . .	.184	feet per mile
Ptarmigan Creek . . . . .	.139	" " "
Meadow Lake-Upper Copper Lake . . . . .	.150	" " "
Upper Copper Lake-Lower Copper Lake . . . . .	.67	" " "
Lower Copper Lake-Falls . . . . .	.20	" " "
Falls-Lake Iliamna . . . . .	.17	" " "

<sup>1</sup>

Spawning Ground Catalog of the Kvichak River System, Bristol Bay, Alaska. USF&WS. SSR-F #488. 1964 p. 134.

<sup>2</sup>

Computed on basis of USGS topographic maps, scale 1:63,360. Most of drop on Silver and Ptarmigan Creek occurs in upper areas. Throughout the remainder of the river area drops are relatively uniform with the exception of the single 32 foot waterfall.

## Water Quality

Data on water quality is lacking. It is assumed that overall water quality is excellent because there are no permanent habitations or intensive uses of the resources of the Copper River basin.

There is no evidence of floating debris, undesirable aquatic life or other objectionable substances.

Although water is abundant and of good quality, there may be objectionable odors and taste in late July in the Trophy area because of the large numbers of decaying salmon.

## Land Use

There are no known intensive uses of the land or water of the Copper River Basin.

There are no permanent homes, roads or established industrial or agricultural activities. There is no commercial timber harvest.

There is an established guiding camp near the mouth of the Copper River and three cabins are noted along Silver Creek on the U.S.G.S. 1:63,360 scale maps. These maps also note the presence of "native trail" from Old Iliamna to the head of Meadow Lake via Silver Creek and out of the basin to the east via Ptarmigan Creek.

## Forestry

Dense spruce forests mixed with birch and cottonwood dominate the lower 2/3 of the Copper River basin. White spruce range from 40 to 80 feet in height and 8 to 16 inches in diameter. Black spruce range from 15 to 40 feet in height and 3 to 6 inches in diameter.

Commercial forest land -- that capable of annually producing 20 cubic feet of usable wood per acre is present. Because of difficult topography and extensive lake areas it appears questionable whether there is sufficient timber in the immediate environment of the Copper River to sustain an economic commercial timber harvest.

Trees have been cut for personal uses such as construction of cabins and for fuel.

#### Mining

The upper portions of the Copper River basin are located in a mineralized area. In 1971, the Bureau of Mines reported that there were 10+ claims for lead, zinc, gold and silver along Silver Creek and 20 claims for iron and copper near the headwaters of Ptarmigan Creek. At that time these 30+ claims were considered "...to have been actively held since 1968." <sup>1/</sup> There are no known placer mining operations

There has been no historic production of minerals in the Copper River basin. However, the general area has been identified as one where copper, molybdenum, silver, lead, zinc and coal may be present.

#### Fishery

The Trophy area of the Copper River is a significant and major red salmon spawning area. An estimated 10 percent of the total Kvichak escapement (1956) red salmon runs originate

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<sup>1</sup> Letter to Bureau of Land Management, Alaska State office, from Bureau of Mines, Juneau, January 22, 1971



in the 12 mile long Trophy area. As noted in the preceeding chapter, the Kivichak drainage, which includes the Copper River, produces an average of 33 percent of the total red salmon catch of the United States and 16 percent of the world catch.

Escapement of red salmon from the Copper River range from 10,000 to 1,000,000, with salmon in the river from July 10 to September 20. The peak spawning period is from August 15 to September 1. There are 102 acres of spawning area in the river with the lower 6 miles classified as "excellent" and some "suitable" area for the remaining 6 miles. Spawning occurs to the falls and in numerous side channels in the lower 3 miles. In years of low abundance the lower 6 miles are most heavily used for spawning. Three tributaries in the Trophy area support red salmon runs, but little is known about them.<sup>1/</sup>

#### Guiding

Guiding for sports fishing and hunting, especially the former, is a regular established use in the Trophy area. The extent of such use, however, is not known.

#### Subsistence

There are no native populations within the river basin. It is assumed however that trapping and perhaps fishing and hunting still occur. The presence of the "native trail" located in the headwaters of Meadow Lake and the proximity

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<sup>1</sup>

Source: U.S.D.I. SSR-F No. 448. 1964 pp. 134-135

of Old Iliamna (8 miles northeast of Meadow Lake), now abandoned, indicate at least historic subsistence use of the river area. The extent of such use is not known.

#### Water Resource Developments

There are no existing or authorized water resource projects. There has been no dredging, rip-rapping or straightening of the stream bed or banks.

A potential hydroelectric project has been identified and in a 1915 a powersite withdrawal (PSR 485) protected potential power sites in the region. The Lake Iliamna project, if constructed, would inundate approximately the lower seven miles of the Copper River.

The Lake Iliamna hydroelectric project has been identified by the Alaska Power Administration as one that would be desirable "... only if compatible with the fisheries aspects."

This project according to the Alaska Power Administration, is among the more favorable hydroelectric potentials found in a statewide inventory. On the basis of cost and size the Iliamna Project is one of the two best sites in the Bristol Bay region.

The Lake Iliamna Project involves construction of a dam on the Kvichak River about 28 miles downstream from Lake Iliamna and 40 miles from Bristol Bay. The inventory

plan includes an earth dam with a crest elevation of 170 feet and would raise the existing level of Lake Iliamna-- Alaska's largest--some 103 feet. The new "lake" would have a surface area of 1,090 square miles at maximum surface elevation of 150 feet m.s.l. and contain a total of 76.45 million acre-feet of storage. A firm energy potential of about 3.3,000 kilowatts at 50 percent annual load factor with energy of about 1.37 billion kilowatt-hours annually. Value of the power would probably exceed \$20 million with an estimated construction cost of \$330 million.<sup>1/</sup>

Current construction costs would be approximately 50 percent greater. The Alaska Power Administration notes that the Iliamna Project would have significant fish, wildlife, and navigational impacts.

Studies have been of inventory grade evaluations as a single-purpose hydroelectric development. No studies of impacts on fish, wildlife, or other aspects have been made.

There are no active proposals to develop the Iliamna Project.

#### Land Ownership

At present the land in the Copper River basin is in Federal ownership and administered by the Bureau of Land Management.

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Costs are on Oct. 1965 price base and represent a very preliminary reconnaissance.

The headwaters area including all but the lower 1/2 mile of Meadow Lake have been withdrawn by the Secretary of the Interior under the provisions of ANCSA for potential selection by Natives. A similar withdrawal includes all of the Trophy area, the falls and approximately 3/4 miles of the River immediately upstream from the falls. The remaining 12 miles--3+ miles of the Copper River immediately downstream from Lower Copper Lake, Copper Lake. The connection between Lower and Upper Copper Lakes and all but about 1/4 mile of shore line on Upper Copper Lake and the connection from Meadow Lake--have been withdrawn under the provisions of Sec. 17 (d)(2) ANCSA as part of a large block of land.

There are no pending applications under the 1906 Native Allotment Act within the middle 12 mile segment of the Copper River withdrawn under Sec. 17 (d)(2) ANCSA.

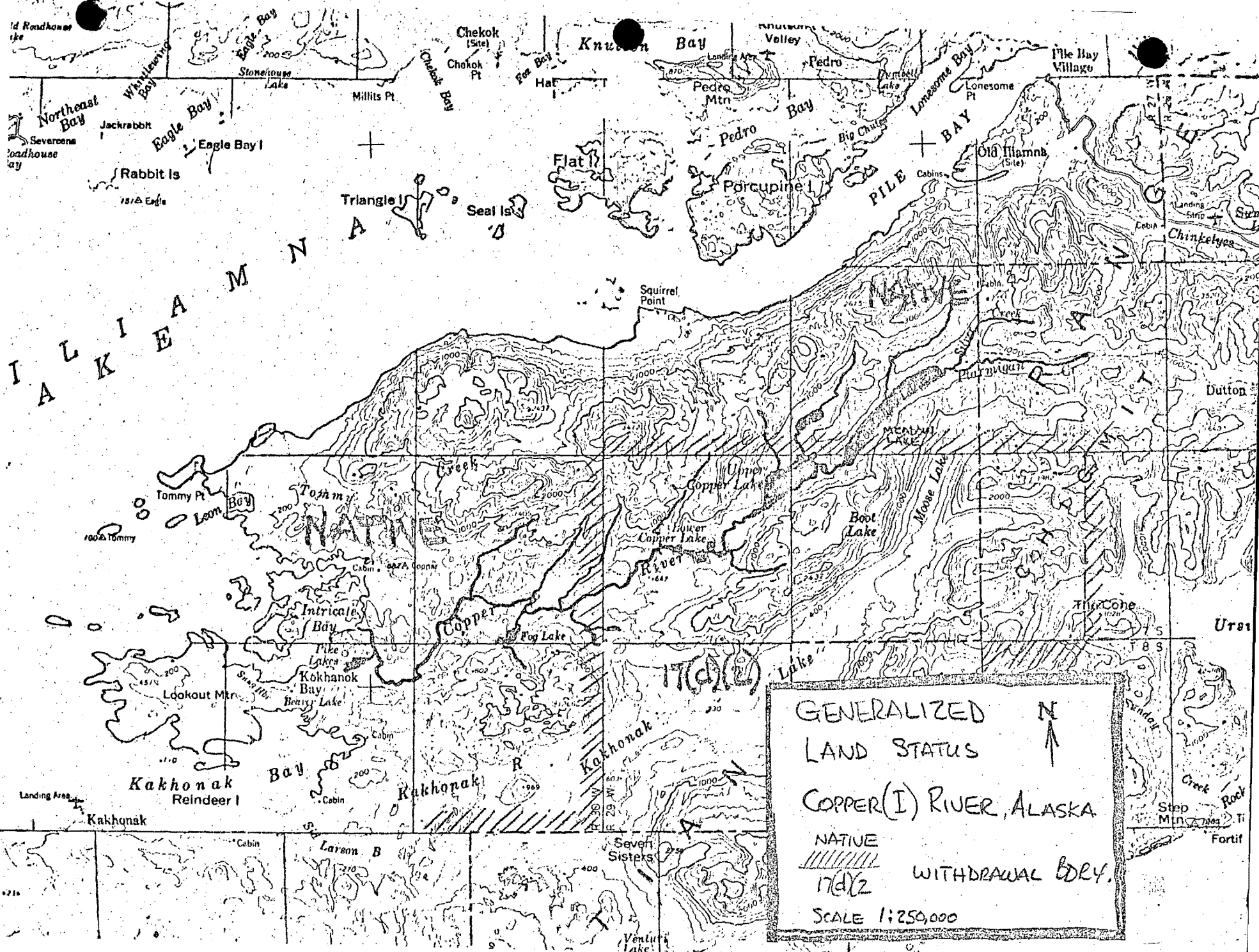
Figure shows the general relationship of these withdrawals.

A substantial segment of the river bed including the lakes may be in State ownership.

#### Water Rights, Navigability and Riverbed Ownership

There are no adjudicated water rights in the Copper River basin. The river is not considered navigable under criteria established by the U.S. Army Corps of Engineers.

Under the Alaska Statehood Act. The State of Alaska owns the streambeds of all "navigable" waters of the State.



Final determination of the streambed ownership has not been made. But under preliminary criteria developed by the state to determine "navigability" it would appear that all of the Trophy area and the three lakes--Lower, Upper Copper and Meadow--would be considered "navigable."

### Access

Access throughout the Copper River basin is difficult.

#### Existing

A "Native trail" shown on the 1:63,3600 scale U.S.G.S. maps between Old Iliamna (an abandoned native village) and the Cook Inlet via Silver and Ptarmigan Creeks is the only land access to the river area.

Access to the lower 12 mile Trophy area is possible by small power boat, but extensive weedy areas near the mouth of the river prohibit direct access by large motor vessels.

As is the case in most of Alaska, the primary means of access is by air. Float-planes can land in the lower river area and on the upper lake areas.

#### Potential

No potential highway access to the Copper River has been identified or proposed.

### Geology and Soils

#### Geology

The Copper River is near the approximate boundary of the Alaskan Range (southern part) and the Aleutian Range

physiographic provinces. Extensive systems of valley glaciers have radiated from the higher mountains and appear to have been a significant factor in the formation of the Copper River valley.

Most of the area is underlain by granitic batholiths and the geology of the area is comprised of a complex mixture of sedimentary, metamorphic and volcanic deposits.

#### Soils

Soils are shallow, coarse and gravelly.

Permafrost occurs at higher elevations and in lowland areas where deeper fine grained soils have preserved isolated relic areas of permafrost.

#### Climate

Lake Iliamna has a pronounced effect on the climate of the Copper River.

Temperatures to 90° F. in the summer and to -47° F. represent the annual temperature range. The seasonal freeze-free period averages 124 days annually and generally extends from late May to late September.

Surface winds are strong with velocities 25 m.p.h. or greater 11 percent of the time. Winds in excess of 30 m.p.h. generally do not occur in the summer.

Precipitation averages approximately 26 inches. Of that, snowfall ranges between 37 and 106 inches and averages 65 inches. Rain is relatively evenly distributed throughout the summer with maximum precipitation in August and September.

## Vegetation

Vegetation within the immediate environment falls into two primary types: alpine tundra and upland spruce hardwood.

Alpine tundra characterizes the headwater areas. Here barren rocks are interspersed with low mat herbaceous and shrubby plants. White mountain-avens may cover entire ridges and slopes which together with moss-champion, black exytrope, arctic sandwort and several grasses and sedges help stabilize the thin soil. Also these provide a profusion of color during the time when the many wild flowers are in bloom.

Upland spruce-hardwood forests are comprised of white spruce, black spruce, quaking aspen, balsam poplar and white birch. Tree root depths are generally shallow. The river bank through this type is frequently bordered with dense thickets of willow, alder and birch.

## Wildlife and Fishery

### Wildlife

Information developed by the Alaska Department of Fish and Game <sup>1/</sup> notes that black bear and moose are randomly distributed throughout the area.

Brown bear are concentrated along the river--especially in the salmon spawning areas.

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<sup>1</sup>

Alaska's Wildlife and Habitat. January 1973



Wolverine and wolf are present.

Caribou are not present.

Furbearers are scattered throughout.

The overall area is considered a waterfowl nesting and molting habitat. Mallards, widgeon, green-winged teal, shoveller's and harlequins are the dominate waterfowl.

Spruce grouse are present.

The area is rich in birdlife. Some 103 species of birds have been identified as being present in the Lake Iliamna area. It is expected that many of these species could be observed in the Copper River drainage.

Three types of ptarmigan--white-tailed, rock and willow--are assumed to be present.

#### Fishery

In addition to the red salmon, the Copper River supports a high quality fishery comprised of Dolly Varden, rainbow, whitefish and northern pike.

Sport fishing regulations single out the lower 12 miles of the select river areas in the Kvichak River drainage as a Trophy Fish area which attracts sports fishermen on a world wide basis.

Primary trophy fish are rainbow trout, char and grayling. Under the State designation, trophy waters are managed to protect both the fishery and the setting. Existing trophy waters appear to result from low harvest pressure rather than

high productivity of the water. A ten pound trophy trout is between 8 and 12 years old and a grayling in excess of three pounds is about 7 and 9 years of age.

Estimates of sport fishing pressure is not available. However, it is believed that the mouth of the river receives considerable use from fly-in fishermen. A popular method for fishing the River is to float the lower two miles between Upper Pike Lake and the mouth.

The Lake portion of the Copper River is not known for its sport fishery. It is not known whether this is because the fishing is poor in comparison to the trophy portion, there are low fish population densities, or simply because there is no fishing pressure.

#### Rare and Endangered Species

The American peregrine falcon (Falco peregrines anatum) is believed to be present. This bird is listed as rare by the Department of the Interior.

#### History and Archeology

Because the native inhabitants of the Iliamna area were fortunate enough to reside in an environment where fish and, to a lesser degree, game were relatively plentiful many of the villages were able to maintain semisedentary states of between 50 and 200 people.

There are no known villages in the Copper River drainage and Old Iliamna just to the north was abandoned by its Eskimo inhabitants about 1935.

## Recreation

The free-flowing Copper River together with its immediate environment offer distinctive, high quality outdoor recreation opportunities to persons desiring a primitive setting with little evidence of man's activities.

Today the Copper River, except for the lower several miles, is little used for recreational purposes.

The recreation season extends from late May to November with most use associated with fishing and hunting.

Opportunities for boating, hiking and camping in a primitive setting are excellent.

Photography, nature and geologic study, and wildlife observation potentials are noteworthy.

### Limitations.

The primary limitation is the cost of access in terms of both time and money. This same limitation, however, appears to be largely responsible for the existing high quality environment.

A potential limitation to future public use of the river environment will be the transfer of land into private ownership under the provisions of ANCSA. Much of the head-water area have been withdrawn for potential selection by Natives.

