SUBSISTENCE LAND USE
in
UPPER YUKON
PORCUPINE COMMUNITIES, ALASKA
DINJII NATS'AA NAN KAK ADAGWAANDAII

by

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ABSTRACT

This report documents the extent of land used for the harvest of wild resources by residents of the Upper Yukon-Porcupine communities of Arctic Village, Birch Creek, Chalkyitsik, Fort Yukon, and Venetie. Land use maps depict areas used over the lifetimes of residents currently living in those communities. A brief overview of historic and prehistoric land use patterns is included to provide a context for understanding contemporary use. A summary of use patterns of wild resources for the region, as well as the annual round of resource harvest activities for each community, is presented. Finally, factors which influence land and resource use patterns in the region and concerns of local residents about wild resources are discussed. The data for this report were gathered between 1980 and 1982 using formal and informal interviews and participant-observation. Land use by non-community based households, an important element in regional land use patterns, was not included in this report due to funding and time limitations.

The data presented in this report demonstrate that the residents of the study communities have used, and continue to use, extensive areas of the Upper Yukon-Porcupine region for the harvest of wild resources. Use of land for this purpose is an integral component of a mixed, subsistence-based socioeconomic system in the region. Much of the documented land use occurs within newly-created federal conservation areas, including the Yukon Flats and Arctic National Wildlife refuges.

Research has determined that relatively distinct and well-defined areas of contemporary land use exist for each study community. These areas of use fall within those described previously for traditional Gwich'in Athabaskan bands, providing evidence of continuity between past and present land use patterns. Residents occasionally travel beyond their community's area of use when large seasonal resource migrations of salmon or caribou are available. Respondents from Fort Yukon, furthermore, report use of areas which overlap those of certain other nearby communities, perhaps reflecting expanding pressure of a regional population center upon local resources or continuing sociocultural ties to outlying communities. Other factors which were determined to influence the nature and extent of community land use included resource dynamics, economic factors, social organization, and cultural traditions.

Both distribution and exchange patterns and elements of customary law were found to influence contemporary land and resource use. Sharing and exchange networks were documented both within and between communities in the region and to a lesser degree beyond the region. Arctic Village and Fort Yukon, in particular, were found to be major sources of caribou and salmon, respectively, for the region as a whole. Elements of customary law were identified pertaining to the use of land, harvest strategies, procurement methods, use of harvested resources, and conservation of resources and habitat. The report's conclusion suggests that resource managers examine the applicability and utility of customary law in addressing contemporary resource conservation issues.

ABSTRACT IN GWICH'IN ATHABASKAN

Dinjii Nats'aa Nan Kak Adagwaandaii

Jii t'ee nijin gwa'an Vashrąįį K'ǫǫ, Deenduu, Jalgiitsik, Gwichyaa Zhee, Vinihtąįį jidii gii'įį nijin gwa'an nagaazhrii, łuk keegii'in, khyąh gaadlii ts'a' nijin gwa'an jak gąąhtsii geegwaandak. Aiits'a' chan geegwaandak khaii, shin, shreenyaa, khaiits'a' nin niłehts'i' t'iichy'aa, łuk, gwanzhįh t'agąąchy'aa. Aiits'a' chan nan deegwąhtł'oo gwich'in nąįį eenjit vaghaii gweedhaa nilįį ts'a' jaghaii giit'ąąhchy'aa. Jii khaiinkǫǫ aii chan nats'aa jii gwich'in nąįį nats'aa t'eedagaa'in gwi-gwiheendal. Oil haa gwitr'it t'agwah'in nąįį, gas, oil haa duulee vadzaih iheendal ginyaa. Laraa kantii nąįį chan Deenduu chųų giveh'an iiheezųų ginyaa. Ch'izhii chan geegwaraandak, oonduk gwats'an naazhrii nąįį chan duulee tr'ikhit gwandaii lęįį gahaahkhwaa. Dinjii ch'atthąįį agwaa'ee nąįį duulee gwintł'oo gavaa nigwihee'aa. Law k'eejit ahtsii nąįį duulee dinjii eenjit ch'ijuk gwahahtsyaa.

Nan gwik'it teedanahotł'oo t'agwąąhchy'aa jii nan kan t'eedaraa'in eenjit. Jii nan gwik'it teedanahotł'oo tr'ahtsii dąį' tr'ookit kwaiik'it khatihgijii nąįį akoodarahnyaa aiitł'ee t'ee juu gaandaii nąįį aragookwat ts'a' geegwitr'it t'agwah'in. Zhehk'aa datthak kwaiik'it gwizhit ts'a' giriheekhyaa gwik'ee gwarandaii gaa Gwichyaa Zhee aii akwaa. Gwichyaa Zhee aii gwintsii geh'an ts'a' juu nan gwintł'oo t'ąąhchy'aa nąįį zhrih ts'a' girinhe'.

Jii nan gwik'it teedanahotł'oo aii t'ee kwaiik'it gwatsal gwa'an t'oonchy'aa. Dzaa gwa'an t'ee dinjii nąįį naraazhrii ginyaa, łuk keegii'in, ch'agąąhtsii, ts'a' khyąh gaadlii

gogwandaii gwizhit. Ch'izhii chan van, han, ddhah vakak gwigweech'in. Gwich'in oozhri' chan. Jii t'ee deegwąhtsii kwaiik'it dinjii nan haandaii geegwaandak. Duulee dinjii nan t'ąąhchy'aa datthak t'irinlik kwaa dǫhłįį. At'oohju' hee jii gwitr'it gakaagwarąąh'ąįį gwandaa gwitr'it gwarahaht-syaa goo'ąįį. Jii t'ee nijin dii-government t'eedaraa'in geenjit k'eedeegwaadhat ji' nats'aa jii nan t'eegwahaahchy'aa akǫǫ deegwąhtsii dinjii nan t'ąąhchy'aa gaagiheendaii aiits'a' deegwąhtsii dinjii eenjit gogwanlįį gaagiheendaii. Akoodi-gwinyaa chan kwaiik'it gwich'in nąįį nan k'eerąąhtii gwits'oonya' łuk, ch'atthąįį kwaii ts'a' nan chan.

Akǫǫ chan ch'atthąįį k'ąąhtii nąįį dinjii zhuh k'eegogohthat jidii ch'adai' gwik'it geedaa. Arctic Village gwich'in nąįį vadzaih eenjit rule gahtsii gwik'it dinjii nąįį nilįį zhyaa angahahtsyaa kwaa ts'a' nats'aa ninghit dąį' khyąh tee gwik'eegaahłii gwik'it. Jii jyahts'a' t'ee nihłaa gwitr'it t'aragwahah'yaa nin akǫǫ nan haa eenjit.

CONTENTS

LIST OF MAPS v

LIST OF FIGURES vi

LIST OF PHOTOGRAPHS vii

LIST OF TABLES ix

NOTE ON THE USE OF GWICH'IN ATHABASKAN xi

ACKNOWLEDGMENTS xiii

PHOTO ESSAY xv

CHAPTER 1. THE STUDY 1

Introduction 1
Purpose 3
Research Objectives 4
Background Literature 5
The Study Communities 5
Methodology 7
Data Analysis 12

CHAPTER 2. THE LAND AND THE PEOPLE:
A REGIONAL OVERVIEW 15

Environmental Setting 15
Historical Overview of Regional Land Use 22
Socioeconomic Overview 45

CHAPTER 3. RESOURCE USE SUMMARY FOR UPPER
YUKON-PORCUPINE COMMUNITIES 51

The Nature of Resource Use 51
Moose 51
Caribou 63
Dall Sheep 68
Bear 69
Wildfowl 70
Small Mammals 72
Fish 74
Furbearers 77
Fuel and Structural Materials 82
Vegetation 84

CHAPTER 4. ARCTIC VILLAGE LAND AND RESOURCE USE 87

Environmental Setting 87
Land Use Patterns Over Time 87
The Contemporary Community 94
Annual Cycle 97
Land Use Summary 101

CONTENTS
(Continued)

CHAPTER 5. BIRCH CREEK LAND AND RESOURCE USE 111

Environmental Setting 111
Land Use Patterns Over Time 111
The Contemporary Community 114
Annual Cycle 118
Land Use Summary 121

CHAPTER 6. CHALKYITSIK LAND AND RESOURCE USE 127

Environmental Setting 127
Land Use Patterns Over Time 127
The Contemporary Community 132
Annual Cycle 133
Land Use Summary 137

CHAPTER 7. FORT YUKON LAND AND RESOURCE USE 145

Environmental Setting 145
Land Use Patterns Over Time 145
The Contemporary Community 149
Annual Cycle 153
Land Use Summary 157

CHAPTER 8. VENETIE LAND AND RESOURCE USE 169

Environmental Setting 169
Land Use Patterns Over Time 170
The Contemporary Community 173
Annual Cycle 177
Land Use Summary 180

CHAPTER 9. REGIONAL LAND USE SUMMARY 187

Discussion 187
Regional Summary Map 188

CHAPTER 10. SOME FACTORS INFLUENCING
LAND AND RESOURCE USE 193

Influence of Resource Dynamics 194
Economic Factors 195
Social Interaction with the Land 198
Cultural Interaction with the Land 200
Sharing and Exchange of Resources 203
Customary Law 205
Local Concerns About Land and Resource Use 210
The Need for Further Research 217

REFERENCES CITED 219

MAPS

MAP 1	The Upper Yukon-Porcupine Region	2
MAP 2	Traditional Gwich'in Band Distribution	24
MAP 3	General Location of Historic and Cemetery Sites Identified Under ANCSA, Section 14(h)(1)	27
MAP 4	Gwich'in Caribou Fence Locations in Northeastern Alaska and Northern Yukon	29
MAP 5	The Fort Yukon Trapping Area in 1949	40
MAP 6	General Location of Native Allotment Applications	43
MAP 7	Land Status in the Upper Yukon-Porcupine Region, 1982	44
MAP 8	Territory of the Chandalar Gwich'in, 1920s	91
MAP 9A	Arctic Village Land Use	102
MAP 9B	Arctic Village Land Use	104
MAP 9C	Arctic Village Land Use	106
MAP 10	General Location of Arctic Village Place Names	109
MAP 11A	Birch Creek Land Use	122
MAP 11B	Birch Creek Land Use	123
MAP 11C	Birch Creek Land Use	124
MAP 12	General Location of Birch Creek Place Names	126
MAP 13A	Chalkyitsik Land Use	138
MAP 13B	Chalkyitsik Land Use	139
MAP 13C	Chalkȳitsik Land Use	140
MAP 14	General Location of Chalkyitsik Place Names	143
MAP 15A	Fort Yukon Land Use	158
MAP 15B	Fort Yukon Land Use	160
MAP 15C	Fort Yukon Land Use	162
MAP 16	General Location of Fort Yukon Place Names	167

MAPS
(Continued)

MAP 17A Venetie Land Use 181

MAP 17B Venetie Land Use 182

MAP 17C Venetie Land Use 183

MAP 18 General Location of Venetie Place Names 185

MAP 19 Regional Land Use Summary 188

FIGURES

FIGURE 1 Distribution of a Bull Moose Harvested by Two Fort Yukon Hunters, Fall 1981 59

FIGURE 2 Arctic Village Annual Cycle 98

FIGURE 3 Birch Creek Annual Cycle 119

FIGURE 4 Chalkyitsik Annual Cycle 134

FIGURE 5 Fort Yukon Annual Cycle 154

FIGURE 6 Venetie Annual Cycle 178

PHOTOGRAPHS

PLATE 1 Yukon Flats in Spring, with Yukon River in Foreground 15

PLATE 2 A Winter's Fur Harvest, Circa 1920s 36

PLATE 3 Loading Skin Boats on the Porcupine River, Circa 1920s 37

PLATE 4 Arctic Village Elder Spotting Caribou..... 86

PLATE 5 Hitching Up a Dog Team in Arctic Village..... 86

PLATE 6 Packing Caribou Near Old John Lake 96

PLATE 7 Birch Creek Village in Winter 115

PLATE 8 Muskrat Pelts Drying at Beaver Creek Camp 115

PLATE 9 Birch Creek Elder David James 116

PLATE 10 View of Chalkyitsik from Marten Hill 128

PLATE 11 Chalkyitsik Elder Reverend David Salmon Displaying Traditional Arrow Points 128

PLATE 12 Street Scene in Fort Yukon 150

PLATE 13 Chum Salmon Drying Along the Yukon River 150

PLATE 14 Fort Yukon Woman with Trapped Muskrat 151

PLATE 15 Community Store in Venetie..... 174

PLATE 16 Aerial View of Venetie..... 174

PLATE 17 Community Resource Experts in Venetie 175

PLATE 18 Oil Exploration Helicopter in Venetie..... 214

PLATE 19 Fort Yukon and Kaktovik Residents Assist with a Caribou Census..... 214

PLATE 20 Log Home Construction Project in Venetie 216

PLATE 21 Chartered Float Plane Used to Reach Spring Camp on Beaver Creek 216

PLATE 22 Child on Snowmachine in Venetie 218

TABLES

TABLE 1 Percentage of Households Providing Mapped Data, by Community 8

TABLE 2 Resource Categories Used in Map Biographies 9

TABLE 3 Climatic Data for Fort Yukon and Arctic Village, Alaska 17

TABLE 4 Population Census for the Upper Yukon-Porcupine Region, 1950-1980 45

TABLE 5 Population Size and Composition of Upper Yukon-Porcupine Communities, 1980 47

TABLE 6 Common, Gwich'in, and Scientific Names For Major Wild Resources Used in the Upper Yukon-Porcupine Region 52

TABLE 7 Selected Gwich'in Names for Moose (Alces alces) and Caribou (Rangifer tarandus) 56

TABLE 8 Historic Estimates of Moose Harvest by Upper Yukon-Porcupine Communities, 1942-1982 61

TABLE 9 Comparative Five-Year Chum Salmon Harvests for Fort Yukon, Alaska, 1961-1980 76

NOTE ON THE USE OF GWICH'IN ATHABASKAN

The reader will note that many words and phrases written in the Gwich'in Athabaskan language have been included in this report. The term "Gwich'in" was used instead of its frequently-used equivalent form, "Kutchin," in keeping with the practice of using the modern form of spelling developed by the Alaska Native Language Center (J. McGary, personal communication). A decision was made to include Gwich'in translations on the title page and in the abstract because the majority of those who live in the study communities are Gwich'in speakers. Other Gwich'in words and phrases are found in the text which provide the non-Gwich'in speaker with the equivalent name for resources or places commonly known in the region. It is important to note, however, that use of these terms only portrays a very limited amount of the environmental knowledge reflected in the native language of the region.

Gwich'in translations in the report were largely the work of Katherine Peter, formerly of the Alaska Native Language Center at the University of Alaska, Fairbanks. Mrs. Peter used the modern version of the Gwich'in orthography developed by Richard Mueller and the Alaska Native Language Center. Tone markings for Gwich'in phrases were not included because of limitations on time and funding.

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Subsistence Land Use in

Upper Yukon-Porcupine Communities, Alaska

Dinjii Nats'aa Nan Kak Adagwandaii

PHOTO ESSAY

PHOTOGRAPHS: Page xv, Venetie elder tanning a moosehide. Pages xvi through xviii (clockwise from upper left): Page xvi, preparing caribou meat for packing back to Arctic Village; setting a gillnet under the ice on the Black River near Chalkyitsik; Venetie man wearing a caribou-hide parka; making a rabbit snare near Chalkyitsik. Page xvii, white-fish and pike caught in a gillnet near Arctic Village; Venetie woman cutting salmon at a fishcamp on the Yukon River; skinning out a muskrat at a spring camp on Beaver Creek; checking a gillnet using a "rat" canoe near Arctic Village. Page xviii, spring muskrat camp near Fort Yukon; preparing a garden in Chalkyitsik; hunting caribou by snowmachine near Arctic Village.

CHAPTER 1

THE STUDY

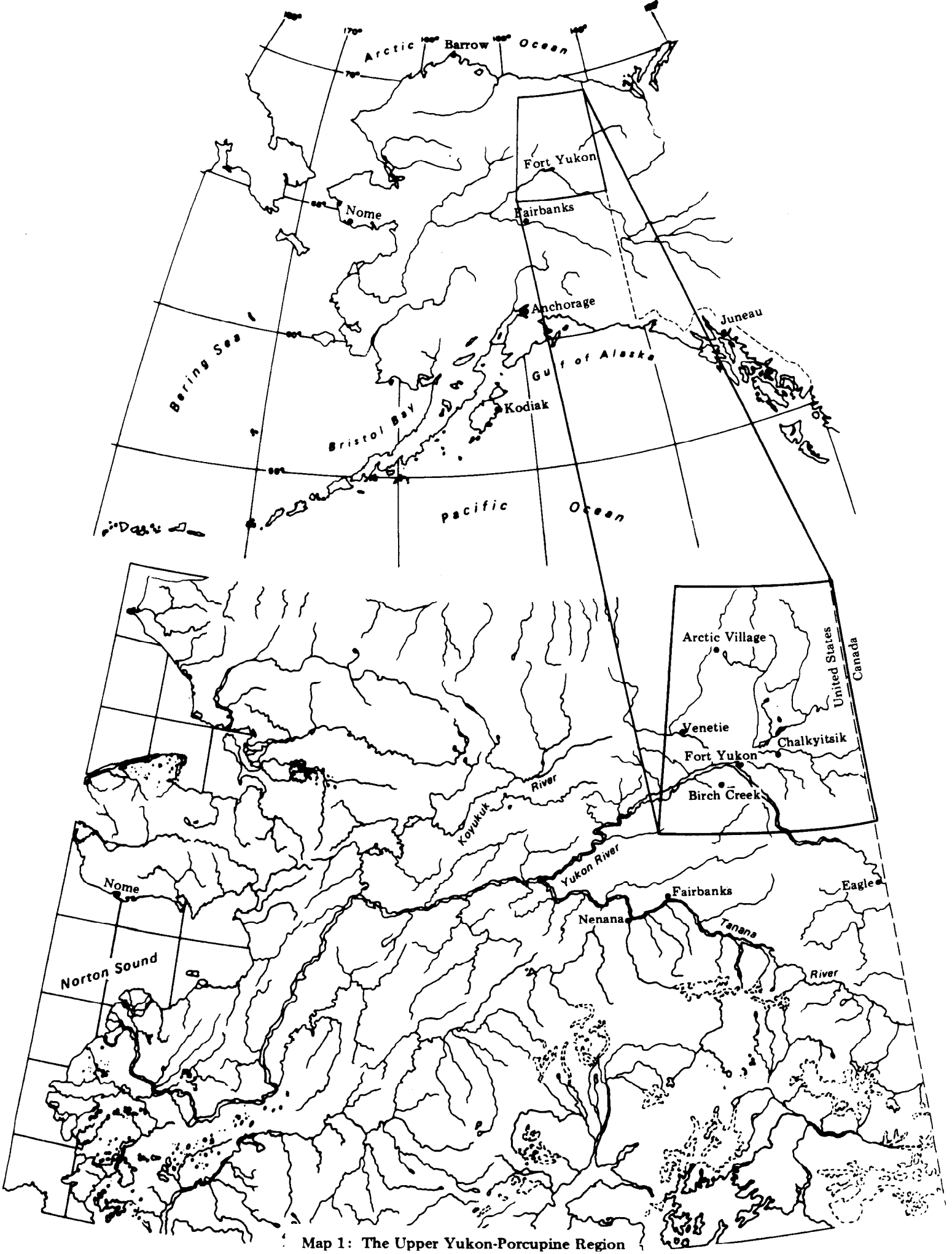
INTRODUCTION

This report documents the use of land for the harvest of wild resources by residents currently living in the Upper Yukon-Porcupine communities of Arctic Village, Birch Creek, Chalkyitsik, Fort Yukon, and Venetie during their lifetimes (Map 1). It also presents a brief overview of historic and prehistoric data designed to provide a context for understanding contemporary land and resource use. The intent of the report is to document the extent of land use by employing a methodology similar to that developed in Canada for the documentation of Inuit land use and occupancy (Freeman 1976). Patterns of resource utilization and the ecological, socioeconomic, and cultural factors which influence community-based land use are also discussed.

Use of wild resources in the region has been found to be an integral part of a subsistence-based socioeconomic system (Institute of Social and Economic Research 1978). Subsistence-based economies are "mixed" economies with both cash and subsistence sectors, and are based upon a domestic mode of production with a stable and complex seasonal round of harvest activities (Wolfe and Ellanna 1983:258).

Wild resources are also an integral component of complex and dynamic sociocultural systems. Sharing, gift-giving, trade, and barter bind families within both communities and the region. The social organization of villages, fishcamps, and hunting parties are linked to this relationship between people and the natural environment. The world view of many of the region's residents has been molded and shaped by centuries of living closely with the natural world.

Land use data in this report describe <u>community-based</u> use patterns. Not included in this report are use patterns of households located outside of the



Map 1: The Upper Yukon-Porcupine Region

five study communities. Because these households often make significant localized use of resources, a complete description of land use for the entire region will require documentation of these uses as well.

PURPOSE

The purpose of this report is to document the nature and extent of land use for the harvest of wild resources through time in the Upper Yukon-Porcupine region. Patterns of resource utilization and ecological trends that have influenced land use over time are also summarized, and ecological, socioeconomic, and cultural variables which may affect contemporary land and resource use are identified and analyzed.

The information developed in this study is directed to at least four audiences: 1) village and tribal councils and local residents; 2) regional nonprofit and profit-making Native corporations; 3) state and federal government agencies such as the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service; and 4) the community of scholars who have documented land and resource use in other areas of the North.

Understanding the nature of land and resource use over time is an essential precursor to planning and management for the conservation of natural resources in the region. Issues relating to resource conservation include: management of fish and wildlife resources such as the Porcupine Caribou Herd and Yukon Flats moose populations; continued utilization of the Yukon Flats and Arctic National Wildlife Refuges and adjacent areas for subsistence purposes; and habitat degredation due to industrial and/or agricultural development. The research was designed to complement documentation of land use already completed in the Canadian North (Freeman 1976; Brice-Bennett 1977; Brody 1982), and on Alaska's North Slope (Pedersen 1979).

A primary objective of the project was to encourage substantive involvement of local community resource experts in documentation of land and resource data.

Employment of these experts in each study community enhanced the quality of the data gathered and furthered the understanding of the purpose of the project. It also offered an opportunity for passing on the extensive and detailed knowledge of elders in the communities to younger generations.

RESEARCH OBJECTIVES

The research project had the following objectives:

(1) a review of the literature pertaining to land and resource use over time in the region, including sources on prehistory, history, ecology, ethnography, cultural traditions, regional planning, socioeconomics, and demography;

(2) documentation of the extent of community-based land use for the Upper Yukon-Porcupine communities of Arctic Village, Birch Creek, Chalkyitsik, Fort Yukon, and Venetie on maps at a scale of 1:250,000, using a uniform set of resource categories;

(3) documentation of Gwich'in Athabaskan place names for physical and cultural features identified by community residents;

(4) a brief overview of resource use patterns for each of the study communities, including information pertaining to the annual cycle of harvest activities, methods of harvest, estimates of the range of annual harvest, perceived trends in resource availability and utilization, and socioeconomic and cultural factors affecting land and resource use; and,

(5) preparation of a Upper Yukon-Porcupine regional land use summary report, including graphic presentation of data described above on base maps of 1:1,000,000 scale to be distributed to village and regional Native corporations, and tribal councils, state and federal agencies, and other interested parties.

BACKGROUND LITERATURE

Systematic documentation of land and resource use over time is lacking for the Upper Yukon-Porcupine region as a whole, although the literature does provide insight into prehistoric, historic, and contemporary use patterns. Several bibliographies incorporating references pertaining to this use have have been compiled for the region (Poppe 1971; Andrews 1977; Krauss and McGary 1980; McMillan 1981; Andersen 1983).

Major ethnographic sources useful for this research included Murray (1910), Osgood (1936), Hadleigh-West (1963), and McKennan (1965). Important references pertaining to use in the latter half of the twentieth century include Shimkin (1951, 1955), U.S. Fish and Wildlife Service (1964), Nelson (1973), Schneider (1976), and the Institute of Social and Economic Research (1978).

Archival research at the University of Alaska library in Fairbanks produced information on land use from a number of sources including Tritt (n.d.), White (n.d.), McDonald (n.d.), Murie (n.d.), and the Alaska Game Commission (n.d.). The Alaska Native Language Center library at the University of Alaska, Fairbanks was a source of transcribed oral literature and research notes from residents of the study communities. Key oral literature resources utilized in this study include Peter (1979, 1981) and Herbert (1982).

THE STUDY COMMUNITIES

The study communities of Arctic Village, Birch Creek, Chalkyitsik, Fort Yukon, and Venetie are located in the Upper Yukon-Porcupine region of Alaska (Map 1). This region includes the vast Yukon Flats and surrounding uplands, and the eastern portions of the Brooks Range south of the continental divide. The confluence of the Yukon and the Porcupine rivers lies near the center of this region. Other communities located in the Upper Yukon-Porcupine region, or considered by residents to have socioeconomic and cultural ties to the region, are Beaver, Central, Circle, Stevens Village, and, to a lesser degree,

Rampart and Old Crow, Yukon Territory. Limitations of the focus of the research, and on time and funding, precluded inclusion of detailed land use data from these communities in this report.

Arctic Village, a community of 111 persons in 1980 (U.S. Bureau of the Census 1980), is situated in a broad, relatively isolated valley shaped by the East Fork of the Chandalar River in the eastern Brooks Range. It is located in 68° 08'N, 145° 32'W, about 125 miles north of Fort Yukon. The community is distinctive in the region in that it lies in a mountainous area north of the Yukon Flats. While situated near the northern limits of the boreal forest, it is surrounded by lakes and small creeks in the valley of the Chandalar River's East Fork. Diverse vegetative communities provide habitat for a wide variety of wild resources, including migratory caribou, used by local residents.

Birch Creek village is located on the creek for which it is named near the center of the Yukon Flats. Situated at 66° 15'N, 145° 48'N, its population in 1980 consisted of 50 residents (U.S. Bureau of the Census 1980). This small community is surrounded by a vast network of lake, slough, and creek systems characteristic of the Yukon Flats. The topography surrounding the community is nearly flat, although to the south the White Mountains can be seen in the distance. Fort Yukon, the nearest community, is about 26 miles to the northeast.

Chalkyitsik is a community of 100 persons situated on the Black River near the eastern fringe of the Yukon Flats (U.S. Bureau of the Census 1980). It is located at 66° 39'N, 143° 43'W, about 50 miles east of Fort Yukon. While the area surrounding Chalkyitsik is characterized by extensive lake, river, and slough systems and nearly flat topography, to the east the terrain slowly rises toward rugged uplands near the headwaters of the Black River. The location of the community near the interface of the Flats and upland areas allows access to a variety of wild resources. The Porcupine River, also utilized by Chalkyitsik residents for resource harvesting, is accessible by winter trail or by boat in summer.

Fort Yukon is the largest community in the region and its primary administrative, economic, and transportation center. It had a population of 661 persons in 1980 and is situated near the confluence of the Yukon and Porcupine Rivers in the heart of the Yukon Flats (U.S. Bureau of the Census 1980). It is located at 66° 34'N, 145° 16'W, about 145 miles northeast of Fairbanks. Fort Yukon's location on the Yukon River traditionally made it an important transportation center as well as a focus for fishing, principally for salmon. It, too, is surrounded by an extensive network of lakes, rivers, and sloughs which provides habitat for resources such as moose, salmon, whitefish, bear, and muskrat.

The community of Venetie is situated on the Chandalar River and has a population of 132 persons in 1980 (U.S. Bureau of the Census 1980). It is located about 45 miles northwest of Fort Yukon at 67° 01'N, 146° 25'W. To the north the terrain rises to the foothills of the eastern Brooks Range. Nearby Venetie Lake is an important source of waterfowl and was historically an excellent place for fishing. Venetie's location on the northern fringe of the Yukon Flats allows harvest of resources from both "flats" and upland areas.

METHODOLOGY

Since the goals of the study involved descriptive community-based research, three primary methodologies were used to collect data:

(1) systematic land use mapping,

(2) formal and informal interviews, and

(3) participant observation of resource harvest activities.

Virtually all data were gathered while the researcher was in residence in the study communities during the period between October 1980 and March 1982.

Land Use Mapping. In order to systematically map land use, interviews were conducted with the heads of households in each community using a method

developed by Freeman (1976). Geographic areas where these residents had hunted, fished, trapped, or gathered wild resources from the community base during their lifetimes were mapped. This approach was selected, in part, because of the belief expressed by local residents that land use maps must show sufficient time depth to accurately portray land use in an environment where resources are dynamic. Furthermore, the use of a methodology similar to that used elsewhere in the North makes the data suitable for comparative studies.

Research efforts resulted in the development of an individual "map biography" for each head of household interviewed. Because of the large number of households and time constraints, a sample of household heads were interviewed in each community. Table 1 shows the percentage of heads of households interviewed by community. A majority of the heads of household were interviewed in Arctic Village, Birch Creek, and Chalyitsik, while 6 and 38 percent were interviewed respectively in Fort Yukon and Venetie.

TABLE 1

PERCENTAGE OF HOUSEHOLDS PROVIDING MAPPED DATA, BY COMMUNITY

Community	Date of Interviews	Number of Households[a] in Community at Time of Interviews	Number of Heads of Households Interviewed	Percentage of Households Interviewed
Arctic Village	Oct. 1980	18	11	61
Birch Creek	Feb. 1982	6	5	83
Chalkyitsik	Oct. 1981	13	8	62
Fort Yukon	Sept.-Nov. 1981	160[b]	10	6
Venetie	Feb. 1981	24	9	38
Totals		221	43	--

[a] "Household" means occupied dwelling unit
[b] Estimate of Fort Yukon City Manager (R. Carroll, personal communication)

Data were collected from both male and female heads of households. Because most heads of households were male, however, some under representation of uses by women may have occurred.

Individual map biographies were developed on mylar overlays using U.S. Geological Survey 1:250,000 series base maps. Colored pencils were used to delineate areal boundaries of use for each resource category. Table 2 presents the list of resource categories used in the map biographies. Interviews were tape recorded and generally lasted from one to three hours. Respondents were paid by the hour for their time, and each overlay was coded using a number rather than the individual's name to ensure confidentiality. Completed map

TABLE 2

RESOURCE CATEGORIES USED IN MAP BIOGRAPHIES

Category	Major Resources Included
1. Bear	black bear, grizzly bear
2. Caribou	caribou
3. Fuel and Structural Materials	white spruce, black spruce, birch
4. Fish	salmon, whitefish, pike, grayling, burbot, sucker, arctic char, lake trout, sheefish
5. Furbearer Hunting	muskrat, wolf
6. Furbearer Trapping	marten, lynx, beaver, wolf, wolverine, mink, fox, land otter
7. Moose	moose
8. Sheep	Dall sheep
9. Small Mammals	hare, ground squirrel, red squirrel, weasel, porcupine, marmot
10. Vegetation	berries, birch bark, roots
11. Wildfowl	geese, ducks, crane, grouse, ptarmigan, eggs

biographies for each of the study communities were then superimposed to create a composite map for each resource category.

The use of "informant recall" for data collection has been both accepted and used extensively in human ecological research (Arima 1976). Data recorded through the use of this technique have been found to be generally reliable and the method represents one of the few means of recording knowledge about the past in preliterate societies. An effort was made, however, to corroborate data obtained in interviews with other informants and the literature. For example, use of the Sheenjek River by Arctic Village residents over an extended period of time was corroborated in at least three independent literature sources. In other cases, direct observation of hunting, fishing, or trapping activities allowed first-hand verification. Of over 40 formal map interviews completed, only one case was found where adequate corroboration could not be obtained. That case was thus excluded from the summary data.

Interviews were conducted only with individuals whose primary residence was in one of the study communities. Land use by non-community-based households was not included. For this reason, and because a 100 percent sample was not achieved, the data presented on the maps included here should be considered only a minimal representation of actual land use in the Upper Yukon-Porcupine region. U.S. Fish and Wildlife Service personnel have been involved in documenting traplines used by many of these remote households (M. G. Sheldon: personal communication, November 1981). Areas outside of the region used by community residents were not recorded. For example, caribou hunting areas of a Venetie man who had hunted near Kotzebue during his residence there were not documented. All residents of the study communities were considered eligible respondents. While all of the communities are predominately Gwich'in Athabaskan ethnic or cultural affiliation were not determinants in selecting informants. Both Native and non-Native informants were interviewed.

The second component of the mapping effort involved interviews with knowledgeable informants in each community to document Gwich'in Athabaskan names for physical and cultural features on the landscape. Names for such physical features as lakes, rivers, and trails important in the local subsistence economy and cultural features such as the location of cabins, the site of historic and supernatural events, and contemporary resource use sites were recorded. Documentation of Native-named places has proven to be a valuable index of the depth and extent of environmental knowledge which persists in modern communities (Ritter 1976). Further, it demonstrates types of land use which may not otherwise emerge in interviews. Village councils were asked to identify the most knowledgeable persons for place name interviews. The interview usually involved from three to eight hours using 1:250,000 scale maps (and 1:63,600 scale when available) on which the named locations were marked. Place names were recorded both on tape and in writing. Transcribers from the community literate in both Gwich'in Athabaskan and English were hired and the tapes were translated by Katherine Peter (formerly of the Alaska Native Language Center). A separate and more detailed document presents this corpus of place names for the region (Caulfield and Peter 1983). This represents only a first step toward systmatic collection of place names, as additional work will be needed to fully compile, cross-check, and annotate names for the region.

Interviews. Formal and informal interviews about resource use over time were conducted with knowledgeable individuals in each community. Those selected for interviews were generally elders identified for the researchers by the village council. Interviews focused on the annual cycle of resource harvest activities, procurement methods, distribution and sharing, and the use of wild resources. Considerable data were also obtained pertaining to the socioeconomic and cultural significance of wild resources to residents in the study communities. Further, they helped to identify individual and community perceptions of resource and land management issues potentially affecting future use. In

these interviews recommendations for improving resource management in the region also were collected.

Participant-Observation. Direct involvement of the researcher in hunting, fishing, trapping, and gathering activities while in residence in each of the study communities proved to be a valuable source of information. Participation in caribou hunting and fishing activities near Arctic Village, for example, provided first-hand data about harvest strategies and methods. Presence as a guest at a community potlatch in Birch Creek offered the opportunity to learn more of the sociocultural importance of wild foods in that community and in the region. Meaningful informal interviews about the harvest, use, and significance of wild resources often took place after participating in activities such as pulling a fish net from under the ice, packing caribou meat to a hunting camp, or hauling wood.

A major component of the research design required involvement of local residents in community review and approval of the design itself, involvement in research efforts, and verification of data to ensure accuracy. Guidelines recently developed by the Association of Canadian Universities for Northern Studies served as a model for fostering community participation and review (Freeman 1981). These guidelines included review of research plans with, and receipt of approval from, the appropriate community governing entity. Further, they included recommendations for community review of research progress and the final product.

DATA ANALYSIS

Data from individual map biographies were initially compiled on maps at a scale of 1:250,000 and were then summarized for each study community on base maps of 1:1,000,000 prepared by the Arctic Environmental Information and Data Center (AEIDC). Mapped place name locations were plotted and compiled along with lists of names and translations on 1:250,000 scale maps. Data

portrayed on map biographies will remain confidential to protect individual respondents.

Interview and field data were compiled and organized by study community. A determination was made in the initial research design to present primary data at the community level, while providing an overview of resource use and historic land use data for the region as a whole.

CHAPTER 2

THE LAND AND THE PEOPLE: A REGIONAL OVERVIEW

ENVIRONMENTAL SETTING

Community land use in the Upper Yukon-Porcupine region occurs primarily within the Eastern Brooks Range, Porcupine Plateau, and Yukon Flats physiographic provinces as described by Wahrhaftig (1965). The expansive Yukon Flats are comprised of nearly flat to gently rolling floodplains made up of river-sorted gravels and wind-borne silt. This vast undulating area, which to the inexperienced eye has no geographic relief whatsoever, actually rises gently from an elevation of approximately 300 feet in the west to 600 feet in the east. The area below the 600-foot contour contains over 10,000 square miles of thaw lakes, braided streams, and marshy flats (King, White, Spencer, Lensink 1970:6).

PLATE 1 Yukon Flats in Spring, with Yukon River in Foreground.

While frozen for much of the year, the Yukon River shapes the character of this broad plain. Thousands of years of ice action, erosion, and meandering courses have created the familiar pattern of oxbow sloughs and islands. In prehistoric times the Flats were one of the few areas of Alaska which remained free of ice during the last glaciation, making it a refugium for Pleistocene mammals.

North of the Yukon Flats are the foothills and mountains which make up the eastern Brooks Range. Rising to heights of over 8,000 feet, these rugged mountains form the divide between Alaska's Interior and Arctic Slope. The Chandalar, Christian, Sheenjek, and Coleen rivers flow south from the continental divide, shaping the mountainous terrain and forming broad outwash fans which blend into the Yukon Flats. Large bodies of water situated north of the Flats, such as Old John Lake and Ackerman Lake, were created by ancient glacial activity.

From the east, the Porcupine River carves through the Porcupine Plateau, creating an impressive canyon 50 to 500 feet in depth in its upper reaches. The Black and Little Black rivers flow north and west through upland areas and then through the Yukon Flats before they reach the Porcupine River. To the south, Birch Creek rises from the Yukon-Tanana Uplands and flows in a northerly direction, meandering through an intricate maze of thaw lakes, oxbows, and sinks before it debouches into the Yukon River below Fort Yukon.

The climate of the region is one of extremes. Lying within the continental climatic zone, the region is characterized by extreme summer and winter temperatures and minimal precipitation. Fort Yukon holds the record for the highest recorded temperature in the state (100°F in June 1915) and commonly experiences some of the coldest temperatures as well. The record low for Fort Yukon is -75°F. Typically, the annual range of temperature variation in the region may be as much as 175 degrees, as shown in Table 3.

TABLE 3

CLIMATIC DATA FOR FORT YUKON AND ARCTIC VILLAGE, ALASKA

FORT YUKON: Elevation: 443'
Temperatures: Summer 34° to 72°F
Winter -29° to 18°F
Extremes -75° to 100°F
Precipitation: 7", including 45" of snow
Average Wind: 6.4 knots, calm 14%

ARCTIC VILLAGE: Elevation: 2,020'
Temperatures: Summer 32° to 67°F
Winter -49° to 10°F
Extremes -68° to 80°F
Precipitation: 10", including 58" of snow
Average Wind: No data

Source: Selkregg 1975

The Upper Yukon-Porcupine region is bisected by the Arctic Circle, where daylight is nearly continuous from mid-May until early August. Fort Yukon has about 700 hours more sunlight and "civil twilight" each year than does Washington D.C. (King, et al. 1970:7). During the long days of summer, time is cast loose from the constraints of "night" and "day" as most people know them. Human and non-human animals alike are more active during the cooler nights with their abundant twilight than during the hot insect-ridden days. Much of the precipitation which falls at this time of year is generated by often violent thunder and lightning storms which cause dramatic variation in the water level of tributaries to the Yukon River. Fires caused by lightning are common, often enveloping much of the Yukon Flats in smoke. The forest fires contribute to the dynamics of the environment by recycling important nutrients and creating new habitat.

As fall approaches, the nights lengthen and, lacking snow cover to reflect available light, the region experiences its darkest periods. Later, with a snow cover on the ground, moonlight and the aurora borealis can provide enough light for many activities such as trapping, snowmachine driving, and dog mushing to continue into night hours.

Freezeup on the Yukon River usually occurs in late October. At higher elevations snow and freezing temperatures can occur at virtually any time of the year. Often the interface between condensation of moist air from unfrozen rivers and the chilly temperatures of September and October fills the Yukon valley with fog.

The onset of snowfall, usually in October, means the long winter has arrived. During the extreme cold of December, January, and early February, ice fog created by community generators, home heating, and vehicles casts a pall over the larger settlements like Fort Yukon. Away from the settlements, a silence descends upon the land, shattered only by the cracking of a tree or the boom of contracting river ice.

As the sun creeps higher in the sky during late February and March, daytime temperatures moderate. Sunny days and yet cool temperatures make good traveling weather and the pace of activity for all life-forms quickens. Break-up begins with snowmelt, the arrival of snow buntings, and the appearance of buds on the willows. Break-up of the Yukon and the Porcupine rivers usually occurs in May, often causing local flooding. In May of 1982, for example, an ice jam downriver from Fort Yukon caused the Yukon River to overflow its banks, inundating nearly 50 percent of the homes with up to five feet of water.

Flora. The northern boreal forest covers much of the Upper Yukon-Porcupine region, carpeting most of the vast Yukon Flats and extending tendrils of forest into the foothills and valleys of the Brooks Range and surrounding uplands. Encompassed within this forest are diverse plant communities, including bottom land spruce-poplar forests, lowland and upland spruce-hardwood forests, lowbrush-bog and muskeg, and moist and alpine tundra.

The principal woody species found are white spruce (Picea glauca), black spruce (Picea mariana), white birch (Betula papyrifera), aspen (Populus tremuloides), poplar (Populus balsamifera), alder (Alnus sp.), and willow (Salix

sp.). A variety of shrubs, grasses, sedges, mosses, and lichens create a generally productive and complete ground cover. Aquatic vegetation thrives during summer in the warm waters of lakes, particularly those in the Yukon Flats.

When traveling through the region, the mosaic of micro-environments encountered is striking. Climax communities dominated by white spruce, birch, and balsam poplar are generally found along well-drained hillsides or riverbanks. Away from the rivers and in poorly-drained areas black spruce are often found interspersed with bog and muskeg vegetative communities. Along river bars, shrub thickets of willow and alder predominate creating excellent habitat for moose, snowshoe hare, and other species.

Moist tundra communities contain sedge tussocks, herbs such as fireweed, and a variety of low-growing shrubs and grasses. Summer travel through such areas is usually arduous. In higher elevations, particularly in the Brooks Range, alpine tundra provides habitat for caribou, Dall sheep, ground squirrels, and grizzly bear. Lichens, forbs, grasses, and shrubs are often found here clinging to barren, rocky, windswept slopes. Residents of the Upper Yukon-Porcupine region have traditionally utilized certain species of this local flora, including berries, roots, and other materials.

Fire plays a major role in shaping the ecological character of the region by disrupting climax communities and releasing nutrients necessary for regrowth. Low humidity and precipitation in summer allow lightning-caused fires to burn extensive areas, although in recent decades aggressive fire control efforts have modified historic burn patterns. Fire can also impact human communities through the occasional destruction of homes, cabins, and good trapping country. The role of fire in creating productive wildlife habitat, however, is becoming increasingly understood by land and resource managers.

Permanent ground ice, or permafrost, has a significant effect upon vegetation. The Upper Yukon-Porcupine region is characterized by continuous permafrost, which influences drainage, soil formation, plant growth, and landforming

processes. This permanently-frozen layer traps moisture near the surface, thus making this otherwise arid region lush with vegetation.

Fauna. The Upper Yukon-Porcupine region contains species of mammals common to both boreal forest and tundra ecosystems. That Gwich'in Athabaskans as a group were knowledgeable about the diversity of both the flora and fauna is indicated by the fact that a list of over 400 Gwich'in names for local plants and animals has been collected (Slobodin 1981:528).

In the boreal forest, moose (Alces alces) are of primary significance for contemporary use. During summer these large ungulates are often found both along rivers and at higher elevations. In winter moose more commonly feed on willows found on gravel bars and the meandering courses of rivers. Moose meat is a major component in the diet of many residents in the region, while the hide and other parts are utilized for clothing, handicrafts, tools and hunting implements.

Caribou (Rangifer tarandus), another important contemporary resource, generally calve in tundra ecosystems, but often winter in the boreal forest. Caribou feed primarily on lichens and are noted for their extensive migratory patterns. Animals harvested within the region are largely from the Porcupine Caribou Herd, although animals from the Central Arctic and Fortymile herds occasionally have also been utilized. Most caribou taken in the region in the past decade have been harvested near Arctic Village, Venetie, and along the Porcupine River. Residents of all study communities, however, have harvested caribou in the past on an opportunistic basis. Evidence of the prehistoric harvest of caribou is unmistakable, as indicated by the numerous caribou fences found in the region (Warbelow et al. 1975).

Dall sheep (Ovis dalli) live in the alpine tundra regions of both the Brooks Range and the Yukon-Tanana Uplands. Residents of Chalkyitsik also report the presence of sheep in the northernmost portion of the Ogilvie Mountains near the headwaters of the Black River. Sheep often winter on slopes blown

free of snow where food can be readily obtained. Contemporary and historic use of sheep is well documented for residents of Arctic Village (Hadleigh-West 1963; McKennan 1965; Warbelow et al. 1975). Historic use of sheep has been reported by residents of Venetie, Chalkyitsik, and Birch Creek as well.

Black bear (Ursus americanus) are ubiquitous in boreal forest zones, generally feeding upon berries and roots. They are rarely found in alpine tundra regions. Black bear are utilized for both human and dog food. Grizzly bear (Ursus arctos) are principally found in upland areas characterized by alpine or moist tundra. They are rarely utilized for food, but are shot if found disrupting camps and caches.

A variety of small mammals are a source of food and other resources for residents of the region, including the snowshoe hare (Lepus americanus), Arctic ground squirrel (Spermophilus undulatus), porcupine (Erethizon dorsatum), lynx (Felis canadensis), marten (Martes americana), beaver (Castor canadensis), and muskrat (Ondatra zibethicus). Other small mammals include marmot (Marmota caligata), red squirrel (Tamiasciurus hudsonicus), wolf (Canis lupus), red fox (Vulpes vulpes), wolverine (Gulo gulo), mink (Mustela vison), ermine (Mustela erminea) and least weasel (Mustela rixosa). Fur species such as marten, beaver, lynx, muskrat, mink, otter, wolverine, and wolf contribute to the subsistence economy of the region, while moles, shrews, and mice play an important role in natural systems.

Ducks and geese are an important source of food because they often represent the first fresh meat in spring when subsistence resources are traditionally in short supply. Grouse and ptarmigan are also important food species. Among the Gwich'in of Old Crow, Irving (1958) recorded Native names for 99 species of birds, many of which were utilized for human consumption. Other bird species are known to community residents by their behavioral patterns or because of cultural significance.

King salmon (Oncorhynchus tshawytscha) and chum or "dog" salmon (Oncorhynchus keta) are a significant source of human and dog food. Whitefish (Coregonus sp.), northern pike (Esox lucius), arctic char (Salvelinus alpinus), lake trout (Salvelinus namaycush), arctic grayling (Thymallus arcticus), inconnu or sheefish (Stenodus leucichthys), burbot (Lota lota), and suckers (Catostomus catostomus) are also utilized. While their availability may be subject to local variation, fish remain a relatively reliable resource in an environment not known for abundance. The harvest of fish further serves as a focus of almost year-round activity which has social, economic, and cultural significance.

Resource dynamics influence utilization of biotic resources by local residents. Species such as the snowshoe hare are known to undergo cyclical population fluctuations which influence predators, in this case both lynx and humans. Movement of game animals into new areas is well known to local residents. For example, moose were not common until the mid-twentieth century near Arctic Village. VanStone notes:

> During the mid-nineteenth century...moose [were] said to have been abundant in the vicinity of the Hudson's Bay Company post at Fort Yukon, a fact that was doubtless related to the absence of spruce and birch in the region and the abundance of willows on which the animals browse. There is considerable evidence that moose have gradually been spreading into the tundra north of the Yukon River and this movement has been associated with the extension of tall willows into this area (1974:21).

Similarly, the changing migration patterns of caribou have affected their use by certain communities. Chalkyitsik residents, for example, usually obtain caribou only every 10 to 15 years (Nelson 1973:113), but consistently harvest them when they are available.

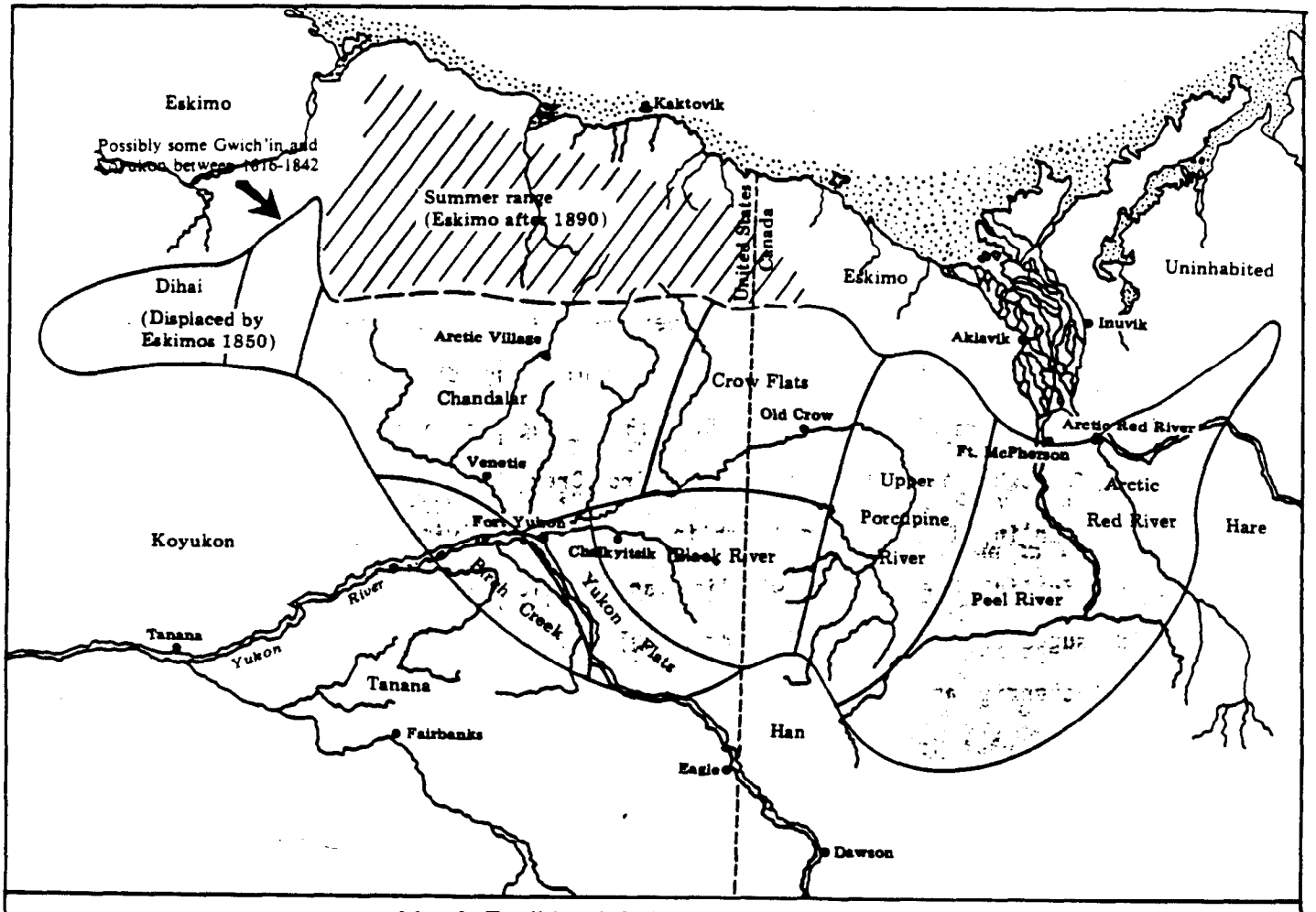
HISTORICAL OVERVIEW OF REGIONAL LAND USE

Residents of Arctic Village, Birch Creek, Chalkyitsik, Fort Yukon and Venetie are largely Gwich'in Athabaskan. The Gwich'in language is relatively distinct within the family of Athabaskan languages, a group which incorporates

a large continuous area in the interior of Alaska and western Canada and also includes southern Alberta, the Pacific coast, and the American southwest (Krauss and Golla 1981:67).

At the time of contact with Euroamericans, the Gwich'in were distributed throughout the area of the far north generally described by Osgood as "the region around the great bend of the Yukon River, eastward into the valley of the Mackenzie, north to the littoral of the Arctic Ocean held by the Eskimos, and south to roughly 65 degrees north" (1936a:14). At least nine and perhaps ten aboriginal Gwich'in bands have been reported (Map 2), each band centered in the drainage of a major river and exhibiting dialect differences from neighboring bands (Slobodin 1981:514-515). English names for these bands are as follows: Yukon Flats Gwich'in, Birch Creek Gwich'in, Chandalar Gwich'in, Dihai Gwich'in, Black River Gwich'in, Crow Flats Gwich'in, Upper Porcupine River Gwich'in, Peel River Gwich'in, and Arctic Red River Gwich'in. Krech (1978) suggests that a distinction should be made between the band on the Lower Mackenzie and those to the east. Five of these regional bands were centered in what is now the Upper Yukon-Porcupine region of Alaska. Andrews (1977:103) described this traditional distribution in Alaska as "extending roughly from the middle fork of the Koyukuk and the drainage of the Chandalar River, east to the drainages of the Sheenjek and Coleen rivers, the environs of the lower Porcupine and Black rivers as well as the entire Yukon Flats region" (1977:103). The historic Gwich'in land use area in Alaska, she notes, approximated 36,800 square miles. Neighboring aboriginal groups included the Inupiat Eskimo to the north and northwest, Koyukon Athabaskans to the west, Tanana and Han to the south, and the Hare to the east (Slobodin 1981:515).

The Dihaii Gwich'in (Dihai Kutchin) occupied an area north of the Yukon Flats and west of the Chandalar River. This area may have extended as far west as the Noatak and Kobuk Rivers during the early nineteenth century (Hall 1969; Slobodin 1981:515). The Dihaii were reported to have migrated east



Map 2: Traditional Gwich'in Band Distribution
(after Slobodin, 1981)

LEGEND

Gwich'in territory - 19th Century

Eskimo-Indian joint use area

after having troubled relations with Inupiat neighbors to the north and west. Remnants of this band were said to have been largely assimilated into the Yukon Flats and Chandalar bands by the end of the nineteenth century (Slobodin 1981:515). One of the last remaining Dihaii speakers, Johnny Frank, died in 1977 at the age of 98 (Mischler 1981:89).

The territory of the Neets'aįį Gwich'in (Chandalar Kutchin), according to McKennan (1965:16), "centered in the drainage of the East Fork of the Chandalar River [and] also included the headwaters, at least, of the Sheenjek River to the east, together with the intervening valley of the smaller Christian River." Andrews (1977:109) reports their territory also included the Coleen River.

The Gwichyaa Gwich'in (Yukon Flats Kutchin) inhabited the area along the Yukon River near its confluence with the Porcupine, extending upriver to include Sam Creek and the present site of Circle, and downriver to include the area around the mouth of the Chandalar River (Andrews 1977:105; Slobodin 1981:515). Semi-permanent fishing and hunting camps existed in this area, although some band members traveled to Fort Yukon during the mid-nineteenth century after its founding as a trading center.

The Deendu Gwich'in (Birch Creek Kutchin) were reported to have inhabited the area south of the Yukon River to the northern foothills of the White and Crazy Mountains, and perhaps west to include the vicinity south and west of the present village of Beaver (Andrews 1977:106). Although Osgood (1936:14-15) reports that "within twenty-five years of their first discovery, the Birch Creek Kutchin were annihilated by an epidemic of scarlet fever," reports from local elders reveal that the presence of another aboriginal band in the area may have caused some confusion about the fate of this Birch Creek band. These reports are discussed further in Chapter 5.

People living along the Porcupine and Black rivers within Alaska were known as the Dr'aanjik Gwich'in (Tranjik Kutchin) or "Black River people" (Nelson 1973:15-16; Slobodin 1981:515). Settlements of this band during the

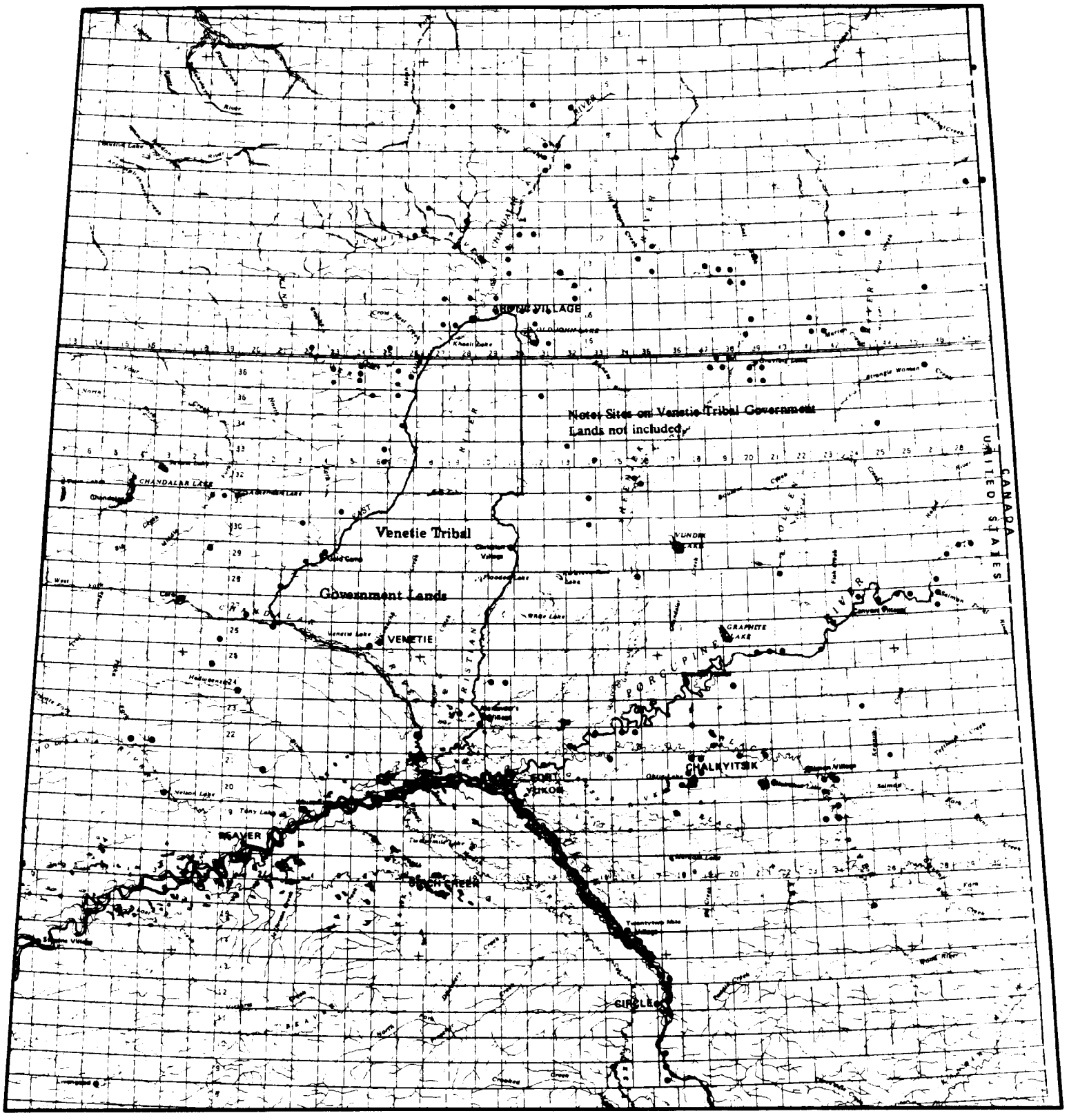
early historic and historic period included Shuman House, Burnt Paw, Old Rampart, Bluefish Lake, Ohtig Lake, Chalkyitsik, and Salmon Village (Andrews 1977:105).

The archeological record reveals evidence of the migration of early human populations across the Bering Sea "land bridge" into Alaska and the Yukon Territory thousands of years ago. Bone artifacts from along the Old Crow River in northern Yukon Territory have been suggested as evidence of man's presence 27,000 years ago (Morlan 1975; Andrews 1977; Dumond 1980). Undisputed evidence of human occupation dating to 14,000 years ago has been shown on the upper Bluefish River (Cinq-Mars 1979). Research by Hadleigh-West (1965) and Hall and McKennan (1973) provides evidence of human occupation of the Upper Yukon-Porcupine region perhaps dating from 4,000 to 6,000 years ago, but it has not been demonstrated that the materials found were proto-Gwich'in, nor have these materials been dated with any certainty (Andrews 1977:111).

Map 3 depicts the general location of historic and cemetery sites identified in the Upper Yukon-Porcupine region by Andrews (1977) under section 14(h) of the Alaska Native Claims Settlement Act (ANCSA). The inventory area for this study included all of the Doyon region, but only sites not on previously-selected native lands or lands otherwise encumbered were identified. Therefore, while 172 sites were identified in the Gwich'in subregion, many other sites were not inventoried because they were not available for selection under provisions of ANCSA. Sites identified on lands now owned by the Native Village of Venetie Tribal Government, for example, were not included by request of the tribal government.

Surveys and excavation by Hadleigh-West (1965) revealed several prehistoric and perhaps late prehistoric sites along the Yukon River near Circle at Medicine Lake, on Birch Creek, and near Burnt Paw on the lower Porcupine River. The most productive site, Twelve-Mile Bluff (located 12 miles down the Yukon from Circle), produced an artifact inventory consisting of side-notched

Base map adapted from Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska 1982.



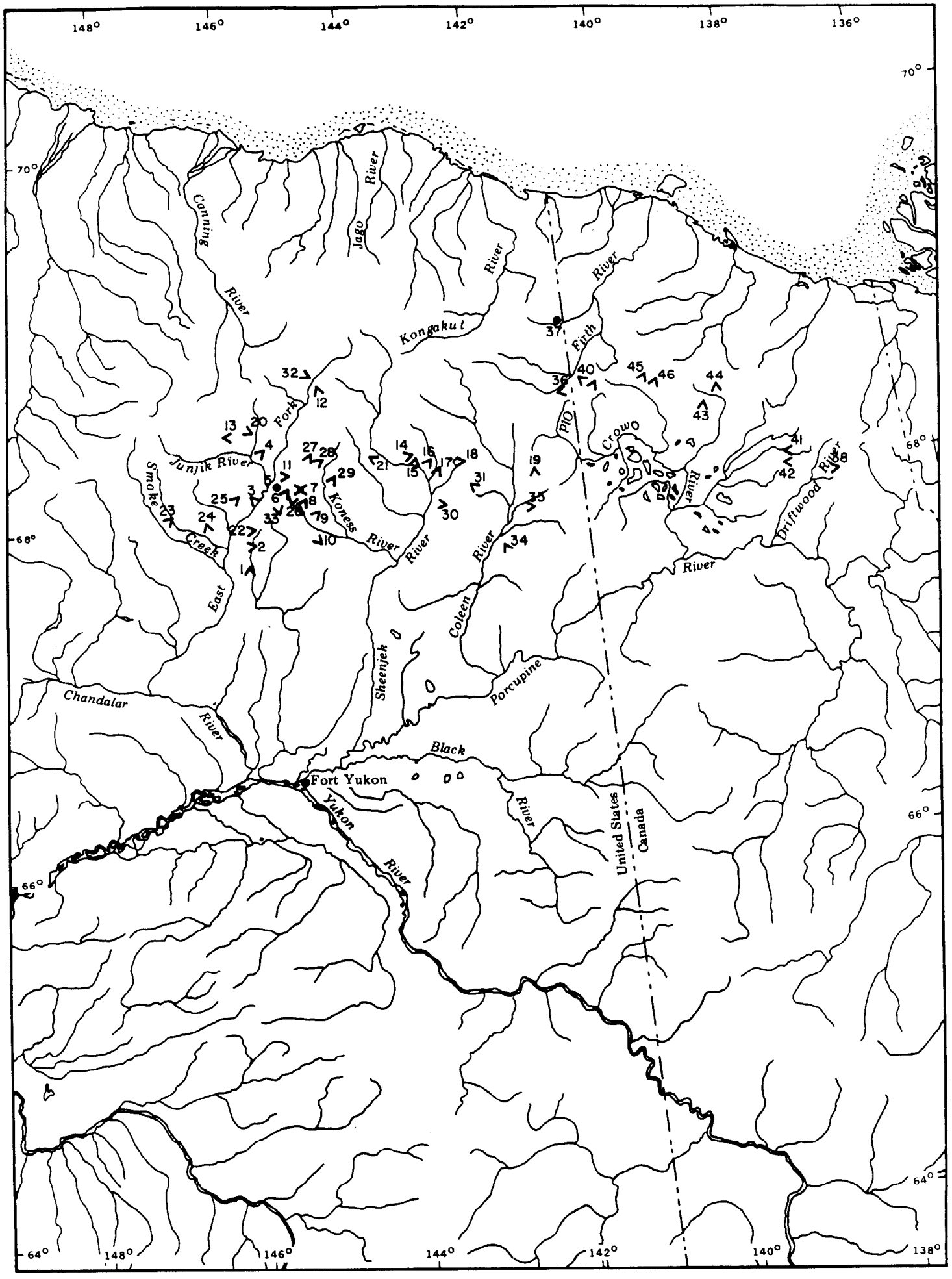
Map 3: General Location of Historic and Cemetery Sites Identified Under ANCSA, Section 14(h)(1); (based upon Andrews, 1977)

point fragments, bifacially flaked knives, end scrapers, side scrapers, notched pebble axes, gravers, and lithic debitage. Fire-cracked rocks associated with the site were likely used as boiling stones during a late prehistoric or early historic occupation. While accurate dating of the material found at Twelve-Mile Bluff was not completed, it resembles Tuktu material excavated near Anaktuvuk Pass dated at 4500 B.C. (Andrews 1977:116). Hadleigh-West (1965) also documented three prehistoric and historic fishcamps near Fort Yukon but no archeological material was found.

A recent archeological find at Marten Hill near Chalkyitsik included side-notched projectile points dating from approximately 4000 B.C. to 2000 B.C., and microblades perhaps indicating a date of as early as 10,000 B.C. (Mobley 1982:26). The site is of interest because of its antiquity and because the material inventory indicates that ancient inhabitants were trading and communicating with people living at great distances.

Hall and McKennan (1973) located 42 prehistoric sites at Old John Lake near Arctic Village during their survey at its northern and eastern perimeters. Artifacts included end scrapers, bifaces, burins, microblades, campus-type cores, core tablets, side-notched projectile points and bases, and a denticulate slate fragment. Side-notched points similar to those found at Old John Lake have been dated at 4500 B.C. at Anaktuvuk Pass and during the first millenium A.D. at Healy Lake (Andrews 1977:118). The survey also recorded a variety of historic cabins, tent frames, and caches.

Between 1971 and 1973, the remains of 46 Gwich'in caribou fences were located in northwestern Alaska and northern Yukon Territory as part of a baseline resource assessment undertaken in conjunction with the proposed Arctic Gas Natural Gas Pipeline project (Warbelow et al. 1975). Map 4 shows the location of these fences in Alaska and Canada. Use of caribou fences by Gwich'in residents of the Upper Yukon-Porcupine region has been documented by Richardson (1900), Murie (1935), Hadleigh-West (1963), and McKennan (1965). While the



Map 4: Traditional Gwich'in Caribou Fence Locations in North-Eastern Alaska and Northern Yukon (after Warbelow et al. 1975)

use of these fences in Alaska was said to have terminated around the turn of the century (Hadleigh-West 1963:131), fence locations provide a glimpse into the prehistoric and historic land use patterns of Gwich'in inhabitants of the Upper Yukon-Porcupine region. Historic use of caribou fences by the Birch Creek Gwich'in also has been documented during this research. Data are presented in Chapter 5 along with resource data for the community of Birch Creek.

An archeological survey was conducted by Dixon and Plaskett (1980) along the upper reaches of the Porcupine River within Alaska between 1978 and 1980. Sixty-seven sites were documented containing a variety of flakes, microblade segments, burins, projectile points, and other lithic artifacts. Their cultural affiliation and dates of origin, however, have not yet been determined.

While the archeological record for aboriginal inhabitants of the region may be limited, the Gwich'in have an extensive oral tradition which illuminates the "times of long ago." Legends featuring Ko'ehdan and Vasaagihdzak are compelling in contemporary Gwich'in cosmology just as are biblical stories in Judeo-Christian traditions. These oral traditions include tales of powerful shamans, legendary giants, and great events set against the backdrop of natural features and landmarks known to the Gwich'in of today. For example, John Fredson recorded this story of creation in 1923.

> A long time ago, they say, there was no land. Just one man was sitting on a raft, floating around. There was no land anywhere. There was only water and sky. A muskrat was traveling around with the man. When they had been floating around on the raft for a long time, they got tired of it. The man said, so they say, "With just the amount of earth that's under one's fingernails, I will make enough land to walk around on." Then the muskrat replied to the man, "Even though I live in the water, I still have never seen the bottom. I wonder how it would be if I went down farther?" "Try it," the man said.
>
> The muskrat beat the water with his narrow tail and was down a long time. After some time, he popped up. "I went lower than I usually go, but I got scared, and I hurried back up." After just a little while, saying "I'll try again," back in the water he went. After a longer time than he had spent before, again he came up nose first. "I think I saw earth,

> but just then I got out of breath, and I came back up quickly." After resting, he said, "I'll go down there again." After taking a great breath he dived into the water like a splashing rock. Now indeed he spent a long time down. Just as the man was thinking, "Surely he won't ever come out again," the muskrat regained the surface with great difficulty. He was out of breath and out of strength, and he fell over on the raft. After a little bit he sat up, saying "Here!" and handed the man a little bit of earth. And indeed they say this earth we now live on was made by medicine from the bit of earth. (Peter 1973)

Aboriginal land use in the region was centered around the harvest of large mammals, fish, and small game. While regional bands were generally centered within a river drainage, harvest areas varied widely (Slobodin 1981:514-515). Productive hunting areas for moose, caribou, or other mammals were well known to the Gwich'in. If moose or caribou were killed, hunters and their families would establish a camp near the kill site until the meat was either dried or consumed. The locations of fishcamps near sloughs, creeks, or lakes known for abundant and relatively predictable fish populations were more stable.

Harvest of large mammals, principally moose and caribou, varied depending upon the season and the terrain. Moose were taken with bow and arrow and through the use of fences containing snares (Nelson 1973:109). Caribou, likewise, were taken with spears and with bow and arrow after being ensnared in caribou fences (Hadleigh-West 1963; McKennan 1965; Warbelow et al. 1975).

Small mammals -- including hares, beaver, muskrat, tree squirrels, ground squirrels and porcupine -- were usually taken by deadfalls or snares. Ducks and geese were harvested with the use both of blunt arrows and an arrow having a tapered bone point (locally called a "water arrow"). Fish were taken using weirs, gill nets, hooks, spears, gaffs, and dip nets (Slobodin 1981:515-516).

Gwich'in resource use, however, remained subject to cycles of abundance and scarcity. McKennan (1964:27) reports that "although predictable fish runs allowed the Yukon Flats Kutchin to enjoy a certain stability unknown to peoples almost completely dependent on hunting, periods of starvation were known to all the Kutchin and, indeed, to most Athabaskans."

Trading relationships and conflict with neighboring groups grew in significance for the Gwich'in during the late precontact period (Slobodin 1981:528), affecting traditional land use patterns. The Neets'aii Gwich'in, for example, traveled to the Arctic Coast to trade with the Inupiat. Sheep, caribou, fish, and small game were harvested along travel routes traversing the Brooks Range. Conflict between the Dihaii Gwich'in and the Nunamiut Inupiat, on the other hand, led to the abandonment by the Dihaii of subsistence use areas in the central Brooks Range (Burch 1979:133).

Reports of explorers, missionaries, and traders provide a valuable record of traditional land use during the early contact period. The first recorded contact between the Gwich'in and Euroamericans occurred in July 1789 when Alexander Mackenzie's party encountered several families fishing along what later became known as the Mackenzie River (Osgood 1935:17). In 1844 John Bell of the Hudson's Bay Company initiated exploration of the Upper Yukon-Porcupine region in a journey from the Company's Peel River post down the Porcupine River to its confluence with the Yukon (Osgood 1935:17). While returning from the Yukon, Bell met three western Gwich'in Indians who lived on the Yukon:

> According to their accounts the country is rich in beaver, martens, bears, and moose deer, and the River abounds with salmon, the latter part of the summer being the season they are most plentiful, when they dry enough for winter consumption. (In Karamanski 1980:305)

Bell's informants reported that no traders were in the area but that manufactured goods -- determined to be of Russian origin -- had been obtained from traders lower on the Yukon River (Karamanski 1980:305).

In 1847 Alexander Hunter Murray left Fort McPherson and descended the Porcupine River to establish Fort Yukon on behalf of the Hudson's Bay Company (Wilson 1947:39). The establishment of the Hudson's Bay Company post at Fort Yukon signalled the beginning of continuous Euroamerican presence in the Upper

Yukon-Porcupine region. Describing the subsistence activities of the Gwich'in at Fort Yukon, Murray wrote:

> They spend the summer principally in fishing, and make a supply of dried trout and white fish for winter. The small rivers and narrow parts of lakes are barred with stakes, and large willow baskets placed to entrap the fish, sometimes immense hauls are made...In fall and winter they live on rabbits and moose, the moose are generally snared, very few of the Indians can kill them in any other way, but the animals are so plentiful that they are frequently shot... Towards spring most of them repair to the Carribeaux lands to make a supply of dried meat, but more particularly to procure skins for clothing, etc....(Murray 1910:89)

Ethnographic reports of subsequent traders, explorers and missionaries to the region include those of Kirby (1865), Hardisty (1867), Kennicott (1869), Whymper (1869), Jones (1872), Schwatka (1900), Raymond, (1900), Richardson (1900), and Sims (In Wesbrook 1969). While largely lacking detailed data pertaining to land use, these references provide ethnographic portraits of the Gwich'in during this early postcontact era.

The journals of the Archdeacon Robert McDonald, author of the first Gwich'in orthography and pioneer Anglican missionary, provide an extraordinary account of the extent of traditional land use in the Upper Yukon-Porcupine region during his residence in Fort Yukon between 1862 and 1871 (McDonald n.d.). McDonald reached Fort Yukon in September 1862 and, over the next 10 years, traveled extensively by dog team and boat to visit the Black River, Birch Creek, Crow Flats, and Chandalar Gwich'in, as well as Indians trading downriver at the confluence of the Yukon and the Tanana rivers. Starvation and death resulting from fluctuating resource availability and disease are recurrent themes in McDonald's journal entries. The Gwich'in of the region were struck by major epidemics in the 1860s and 1870s, causing substantial declines in population (Krech 1978:97; Slobodin 1981:529). The Hudson's Bay Company post itself was not immune to food shortages; McDonald's journal describes a five-day period one spring in which there was nothing to eat but undressed skins (Peake 1975:58).

The Gwich'in demonstrated adaptability to the uncertainties of their environment by incorporating trade for non-Native goods into their annual round of resource procurement activities. Despite his considerable influence with non-Native traders, for example, the respected Gwich'in chief Shahnyaatti' continued traditional hunting and fishing activities. In 1867 he was reported to be fishing in the "Rapids" area on the Yukon River below present-day Rampart, perhaps in conjunction with a trading journey to the Yukon and Tanana rivers (Dall 1970). Three years later, McDonald traveled downriver from Fort Yukon with Shahnyaatti' for just such a purpose (McDonald n.d.). In 1887, however, the Gwich'in chief was fishing at a camp on the Yukon River near Circle, which had recently been established as a supply point for miners (McConnell 1891: 136-D). These reports reflect both the mobility and adaptability of people living in an environment noted for having relatively scarce and unpredictable resources.

Captain Raymond's expedition to Fort Yukon in 1869 -- after the purchase of Alaska by the United States -- brought to a close the Hudson's Bay Company's presence at Fort Yukon. The Company moved its trading post in 1871, first to "Red Gate" near Howling Dog Canyon and later to Old Rampart, each time believing that it was in Canadian Territory (Fitzgerald 1944:221). Finally, in 1889, the company moved a third time to the site at Rampart House at the Canadian boundary.

By the turn of the century the Gwich'in had incorporated manufactured goods such as firearms, cloth, shoes, and sewing supplies into their way of life (Graburn and Strong 1973:19). The introduction of new technology such as firearms, ammunition, and gill nets were associated with changes in land and resource exploitation patterns and social organization. Hunting patterns for caribou, for example, became more individualized after firearms made the use of communal caribou fences unnecessary (Graburn and Strong 1973:19). The trading companies encouraged the capture of furbearing animals such as marten

and beaver, resulting in shifts from harvest patterns focused on food animals to one involving not only a nutritional component but also trade for imported goods. Mrs. Belle Herbert, an elderly woman of Chalkyitsik who died in 1982, is believed to have been born sometime between 1855 and 1877. She recounted the changes in harvest strategies which she witnessed during her lifetime:

> In those days people didn't spend much
> time visiting.
> They didn't visit much, they just hunted,
> that's all.
> We didn't hunt for furs, either.
> What would we hunt them for anyway?
> We didn't know about buying things.
> Finally, during my lifetime,
> we started hunting for furs, I think.
> Before then
> they used to do that upriver, and
> someone bought the furs, and they bought
> babiche,
> they bought caribou skins
> and caribou skins with the hair on,
> and also dried meat
> and the grease they made.
> Those are the things the trader
> bought and then they sold it.
> (Herbert 1982:199-200)

The gold stampedes in the late 1800s and early 1900s brought an influx of people into the traditional country of the Gwich'in. The number of steamboats on the Yukon River increased from 3 in 1892 to 35 in 1901. In 1901 alone, 25,000 tons of freight, primarily bound for the gold fields of the Klondike, were shipped from St. Michael (Shimkin 1951:5). Later, many disheartened veterans of the gold diggings sought livelihoods as trappers, storekeepers, and mail carriers, often marrying into Native communities and learning fishing and hunting skills from the Gwich'in. Vacant trapline areas may have been available to these individuals due to the decimation of the Gwich'in by disease (Shimkin 1951:5). While continuing a primary focus on hunting, fishing, and trapping, the Gwich'in and newcomers to the area found seasonal employment by cutting wood for the steamboats, building boats or freighting supplies (Shimkin 1951:5-6). At about this time the Episcopal Church, led by the Archdeacon

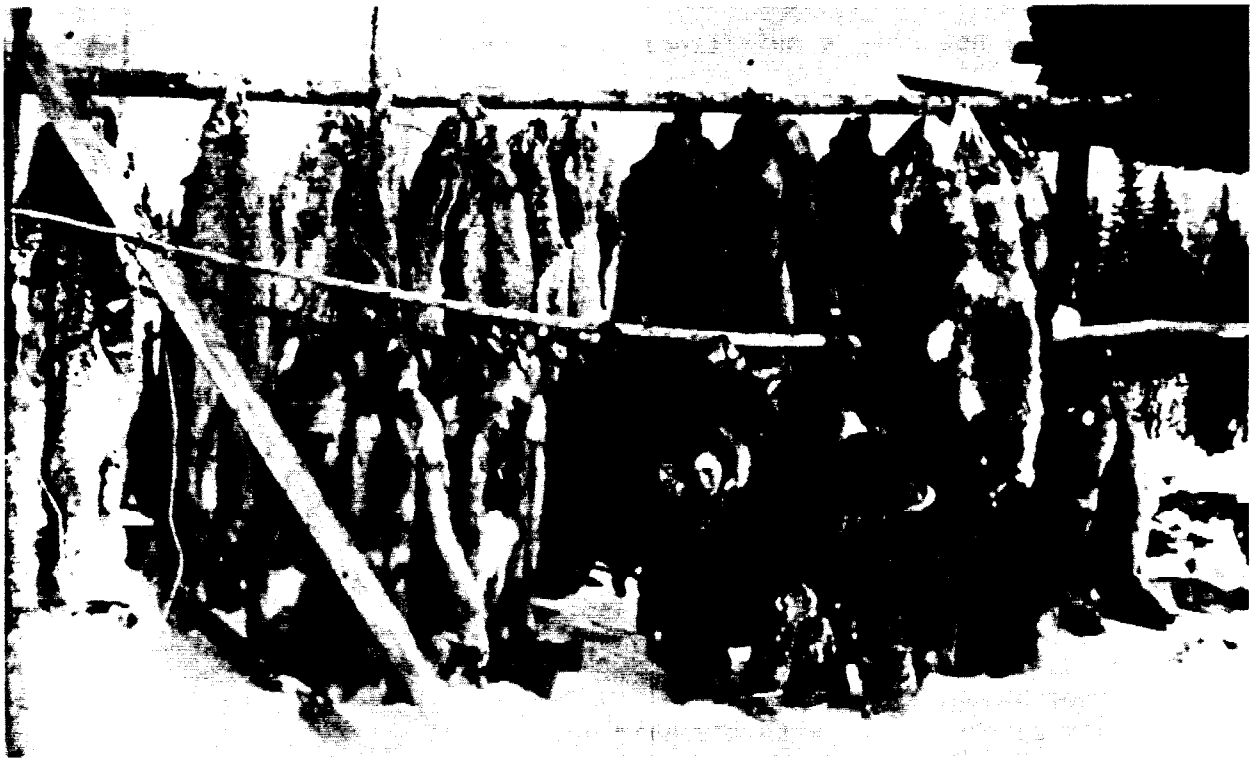


PLATE 2 A Winter's Fur Harvest, Circa 1920s (R. Carroll, Sr. collection).

Hudson Stuck, established a hospital in Fort Yukon, and missions and schools in several settlements.

During the 1920s family groups frequently spent winters on remote traplines and summers in larger settlements (Graburn and Strong 1973:19). A typical pattern in Fort Yukon was for entire families to load a year's supplies into a scow in late summer and push off for their trapping grounds, not to be seen again until after breakup the following spring. Evelyn Shore describes her family's preparations for traveling up the Black River for a winter of trapping:

> We never went out of Fort Yukon without a load on. The scow always held the grub supply for the winter, canned goods packed around the engine, flour and cornmeal on the floor in front of it--twelve hundred pounds of the one and five hundred of the other. Our thousand pounds of sugar went with the paper cartons and things easily damaged on top of the eight cases of gasoline, right behind the engine, with the dogs' fish on top of it all. The power boat carried twenty-eight cases of gasoline with twelve dogs

> riding on top of them and the cans we needed for feeding and watering the dogs scattered in every available space. (Shore 1954:60-61)

In remote trapline camps traditional hunting and fishing activities meshed easily with harvest of fur resources. When fur prices were low, local resource harvests remained a nutritional and cultural mainstay for most families. The collapse of the world fur market in 1914 and again in later years emphasized the precariousness of a cash economy based upon the exploitation of fur.

Osgood (1936a:170) observed during the 1930s that hunting and fishing remained the primary sources of obtaining food for the Gwich'in at that time. The harvest of wild resources continued to be the basis for ideological and belief systems as well. The population of Fort Yukon grew moderately during this period, from 500-550 in 1920 to 600-650 in 1940. Schools were fully

PLATE 3 Loading Skin Boats on the Porcupine River, Circa 1920's (R. Carroll, Sr. collection).

operating in Fort Yukon and were open intermittently in Chalkyitsik and Venetie. By 1939, Fort Yukon had a lodging and gambling establishment, a combined motion picture house and dance hall, three general stores, and one frame sawmill, a small boatyard, a primary school and Episcopal Mission, and a hospital (Shimkin 1951:6).

Under the leadership of John Fredson, a college-educated Gwich'in man who was a protege of the Archdeacon Hudson Stuck, the people of Venetie, Arctic Village, Christian Village and "Kachick" (K'aatsik), a small settlement near the mouth of the Chandalar River, received approval for the creation of the 1,480,000-acre "Chandalar Native Reserve" on May 20, 1943 (Lonner and Beard 1982:101). This action was based upon a 1936 amendment to the Indian Reorganization Act (IRA) of 1934 allowing for the creation of Indian reservations within Alaska on public lands which were "actually occupied" by Indians or Eskimos. The federal government's action represented the first formal recognition of lands actually occupied and used by a band of the Gwich'in in Alaska. While the communities voted to accept the new reservation in 1944, disagreement immediately arouse over boundaries of land "actually occupied." Petitions were made in later years to the Department of Interior seeking to enlarge the reserve to encompass lands reportedly used for hunting and fishing north of Arctic Village and west of Venetie (Lonner and Beard 1982:103).

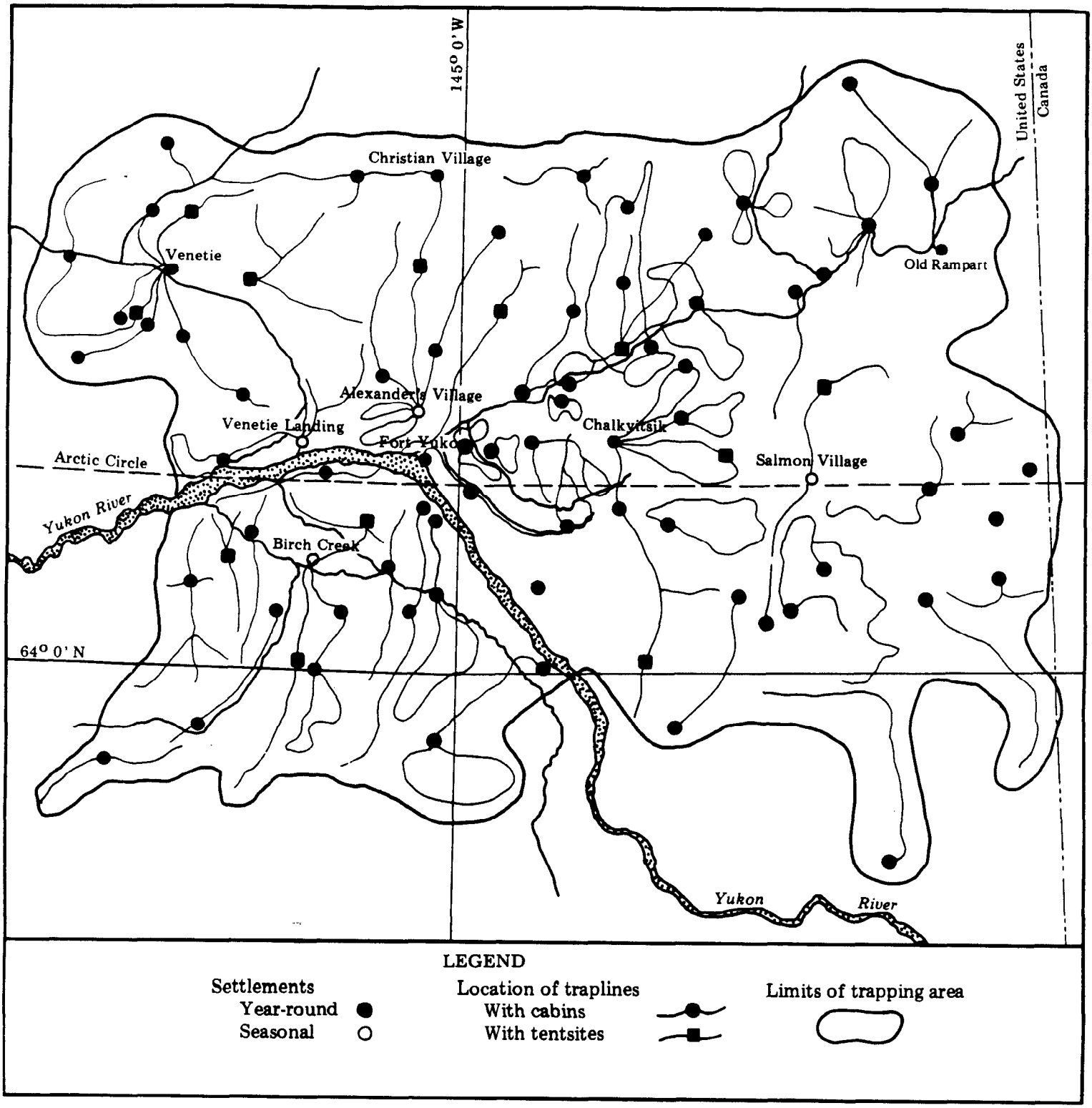
Shimkin described the economic and demographic characteristics of the Upper Yukon-Porcupine region during the 1940s, noting that for Fort Yukon in 1949, trapping, hunting, and fishing "supported nearly 70% of the population wholly or to a predominant degree" (Shimkin 1955:228). Direct governmental relief, the second major source of income, proved significant to a quarter of the population. Other sources of income included self-employment in occupations such as store owner or carpenter, wage and salary earners, gardening or handicrafts. A steady decline of available game (particularly caribou), improved trade through the reduction of isolation (principally due to the

airplane), and a sharp increase in financial and medical aid were cited by Shimkin as the most important factors of change in the area's economy during the decade of the 1940s.

Even as the availability of wage employment and new technology changed, especially in Fort Yukon, adaptive strategies of families continued to revolve around resource harvest activities. Shimkin's description of the seasonal round of production activities in 1949 reflects the primacy of those activities, coupled with involvement in the fur trade:

> The occupational cycle embraces movement from, say, Fort Yukon to a satellite camp such as Birch Creek Village, in mid-August or early September. During the fall, the trapper hunts moose or wild fowl, catches whitefish, chops wood, clears his trapline trails and repairs his line cabins. His womanfolk, if any, prepare and preserve food, dress hides and prepare clothing...and help care for the dogs. From November through February comes the season for intensive trapping, especially for marten, mink, fox and, later, beaver. Over this period the trapper makes the circuit of his traplines a half dozen times or more, each circuit being a three to ten-day trip in intense cold and darkness, sometimes without shelter other than a tent, and often on an empty stomach. If he can afford it, he flies to Fort Yukon for Christmas and the New Year potlatches. In March and April comes the muskrat season, a time of somewhat more social activity and better eating. By late May, he has picked up his traps and returned to Fort Yukon for summer loafing, broken by some salmon fishing with the help of a fish wheel, or possibly by gardening or wage work. (1955: 232-233)

Sixty-three traplines were documented by Shimkin in 1948-49 in the "Fort Yukon Trapping Area", which incorporates much of the Yukon Flats region including the drainages of the Porcupine, Black, Christian, Sheenjek, Coleen, and Chandalar rivers and Birch Creek (Map 5). The total number of traplines in the "Fort Yukon Trapping Area" in 1948-1949 was estimated at 80. Approximately 35 percent of the entire area was either unclaimed for trapping or inactive (Shimkin 1955:228-229). A household required a trapline of 20 to 100 miles in length or 60 to 200 square miles, according to Shimkin, and needed access to whitefish, moose, and muskrat harvest areas as well. Individual or group "titles" to traplines were recognized by both Native and non-Native trappers



Map 5: The Fort Yukon Trapping Area in 1949 (after Shimkin, 1955)

although they were not officially recognized by territorial authorities. Boundaries for hunting areas also existed, although they were apparently not documented (Shimkin 1955:228).

Serious declines in certain game populations were reported in the Yukon Flats region between 1938 and 1948 (Shimkin 1951:33). Caribou, which during the 1930s had been easily accessible in the Yukon Flats and upriver above Circle, declined precipitously by the 1940s. Moose populations, however, were reported to be steady in spite of "heavy" harvest of all food animals. Shimkin's survey indicated an annual harvest of 165 moose and 42 caribou in the Yukon Flats region during the twelve months from July 1948 to June 1949 (Shimkin 1951:34).

A major flood in the Yukon Flats in 1949 impacted land and resource utilization patterns. Effects of the flood included the alteration of residence patterns, an influx of government social programs, and a change in established social patterns including the gathering of people from throughout the region in Fort Yukon during early summer (Solomon n.d.). Statehood and the consolidation of Bureau of Indian Affairs and territorial schools in Fort Yukon in the late 1950s accelerated the decline of seasonal extended family camps as increased pressure was placed upon children to attend school.

In the 1960s, proposed construction of the Rampart Dam on the middle Yukon River created political controversy as it was a perceived threat to traditional social, economic, and cultural activities in the region (U.S. Fish and Wildlife Service 1964). Proposals for this hydroelectric project generated an outcry of concern about the effects of flooding upon both habitat essential to fish and wildlife resources and local communities dependent upon those resources. The project, however, was never constructed.

By the early 1970s, many of the region's residents had applied for Native allotments of up to 160 acres under provisions of the 1906 Native Allotment Act (U.S. Congress 1906). Application for a Native allotment required proof

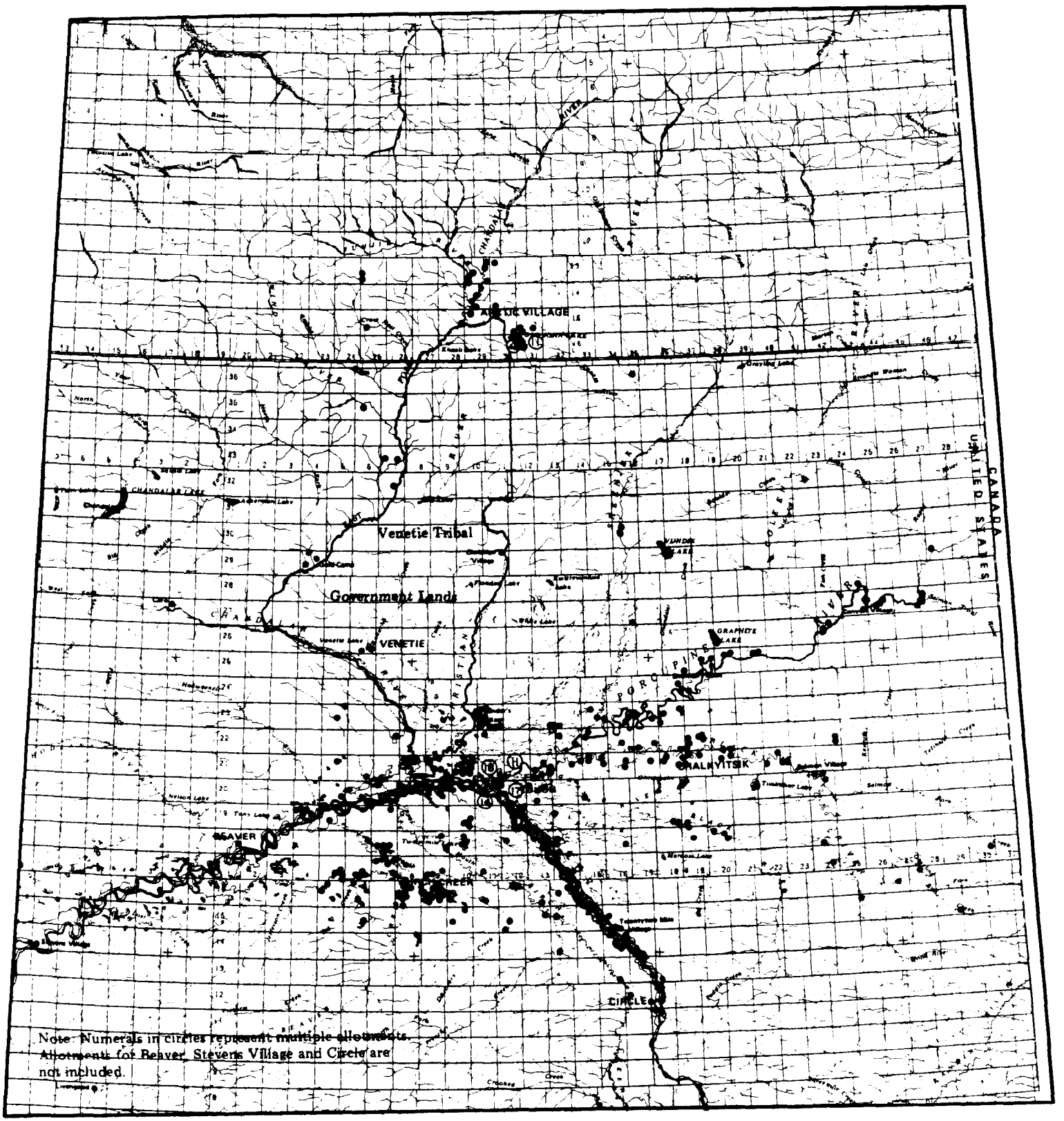
that the site had been utilized in the past. Generally these sites included fishcamps, hunting camps, or trapline cabins. Map 6 shows the general location of allotment applications filed by residents of the five study communities. Applications were not allowed for the Native Village of Venetie Tribal Government lands (the former Venetie Indian Reservation), because those lands had previously been withdrawn.

The Arctic National Wildlife Range was created in the early 1960s, and included areas of the eastern Brooks Range utilized by Arctic Village residents. It was the first of several "national interest" land withdrawals undertaken over the next two decades. Continued access to lands used for resource harvesting within the Upper Yukon-Porcupine region was a major concern expressed by residents during deliberations on ANCSA and the Alaska National Interest Lands Conservation Act (ANILCA) of 1980. Arctic Village and Venetie chose not to participate in the regional corporation structure established under ANCSA, but instead took title to lands which formerly comprised their reservation.

The enactment of ANCSA and ANILCA created a new context for subsistence land use in the region. Map 7 depicts land status in the Upper Yukon-Porcupine region as of 1982. Together, ANCSA and ANILCA created a complex patchwork of land classifications -- Native village or regional corporation lands, other private lands, state lands, and federal conservation areas. Specific provisions were included in ANILCA to protect the opportunity for continued resource harvest activities on the newly-created Yukon Flats National Wildlife Refuge, additions to the Arctic National Wildlife Refuge, and on other federal lands within Alaska (Kelso 1982:1).

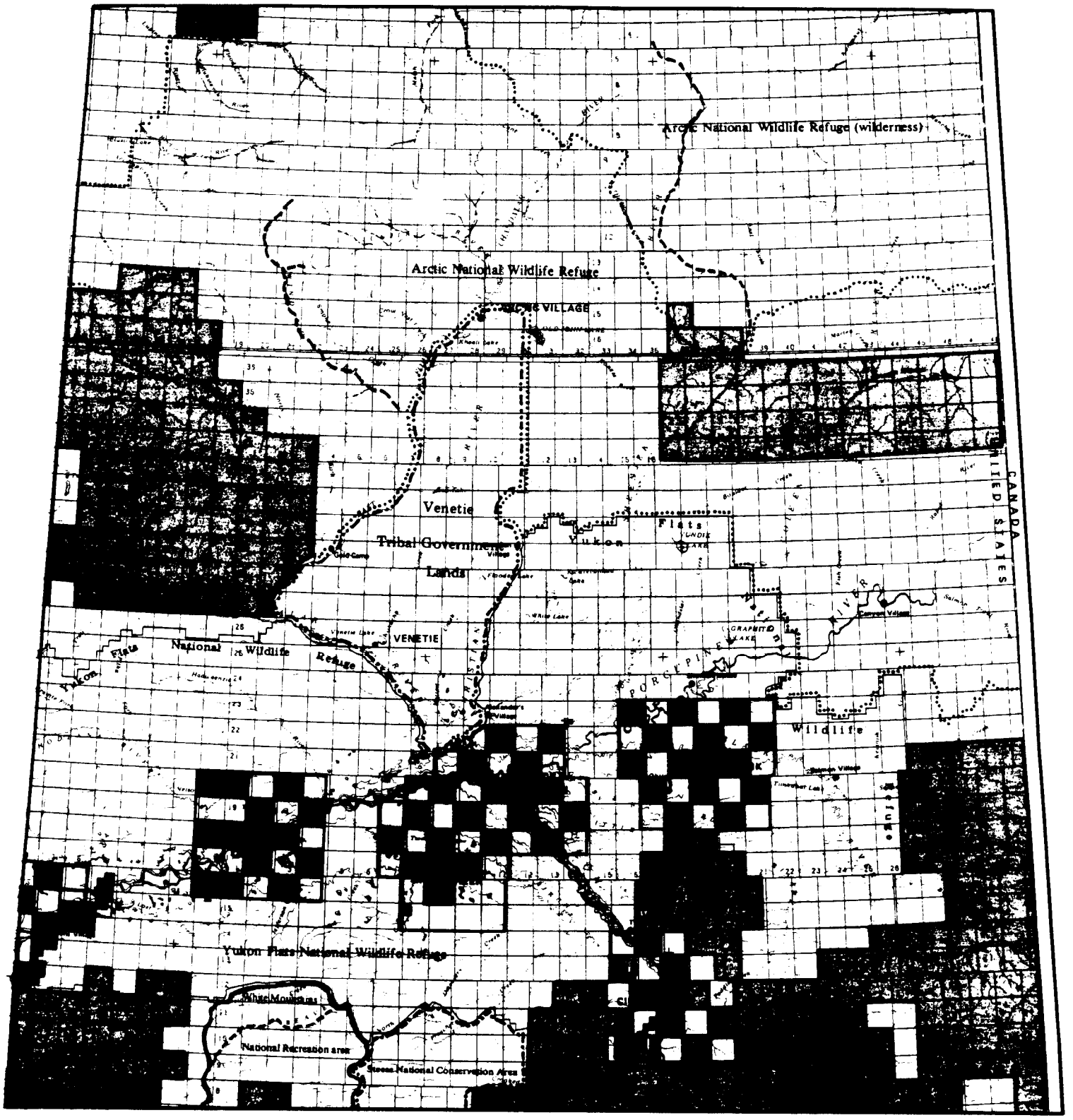
This historical overview for the Upper Yukon-Porcupine region has briefly described certain factors which have molded and shaped land and resource use over time. Understanding the historical dimensions of land and resource use provides a context for analyzing the role of land use in the mixed, subsistence-based socioeconomic system of today.

Base map adapted from Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska 1982



Map 6: General Location of Native Allotment Applications (As Of 7/1/82)

Environmental Information and Data Center, University of Alaska 1982.



Map 7: Land Status in the Upper Yukon-Porcupine Region, 1982

0 15 30 45 60 Miles

LEGEND

- State of Alaska land selections (including patented, tentatively approved, and applied for)
- Doyon, Ltd. Regional Corporation selections
- Wild and Scenic Rivers System
- Native village corporation selections

SOCIOECONOMIC OVERVIEW

Total aboriginal population for all Gwich'in bands in Alaska and Canada in the mid-nineteenth century has been estimated at 5,400 (Krech 1978:100). Shortly thereafter the population declined dramatically due to diseases introduced by Euroamericans (Slobodin 1981:529). A major outbreak of scarlet fever, for example, was believed to have caused extermination of the Birch Creek Gwich'in during the 1870s (Osgood 1936a:14-15). An influenza epidemic in Fort Yukon during the 1920s, similarly, was said to have killed many of the older people in that community (E. Williams n.d.).

Population census data for the communities of Arctic Village, Birch Creek, Chalkyitsik, Fort Yukon, and Venetie between 1950 and 1980 are presented in Table 4.

TABLE 4

POPULATION CENSUS IN THE UPPER YUKON-PORCUPINE REGION, 1950-1980

Community	1950	1960	1970	1980
Arctic Village	53	110	85	111
Birch Creek	—[a]	32	40-45[b]	32
Chalkyitsik	—[a]	27	130	100
Fort Yukon	446	701	448	619
Venetie	81	107	112	132
Totals	580[c]	977	820	994

Notes:

[a] No census figures available for Birch Creek or Chalkyitsik in 1950.

[b] 1970 Census shows no population for Birch Creek. Estimate cited in Yukon-Porcupine Regional Planning Study, Institute of Social and Economic Research, 1978:2:1.

[c] Not comparable to 1960-80 totals because of limited data.

Source: Except as noted, all data are from U.S. Bureau of the Census, 1980.

Strong population trends are difficult to discern for the region as a whole. The region's population appears to have remained relatively stable or shown only small increases from 1960 to 1980, reflecting balances between natural increases, deaths, and in- and out-migration (Institute of Social and Economic Research 1978:2:2). Population for the five study communities in 1980 was 994, while population for the entire Yukon Flats census subarea (which also includes Beaver, Circle, and Central) was 1,207 (U.S. Bureau of the Census 1980). Population figures for certain communities, however, have increased markedly during this period. For example, Fort Yukon's population grew from 446 in 1950 to 619 in 1980. Similarly, Chalkyitsik's population grew from 27 in 1960 to 100 in 1980. How much these increases can be attributed to improved census data collection or consolidation of smaller outlying camps into larger communities is not known. Alaska Natives comprised more than 80 percent of those residents in the Yukon Flats census subarea communities in 1980.

Migration from the Upper Yukon-Porcupine region to urban areas such as Fairbanks or to work locations on the North Slope appears to be on the increase, although workforce mobility remains much lower than among the non-Native population in Alaska (Institute of Social and Economic Research 1978:3:4). Emigration appears to be offset by a sizeable return migration from more populated areas to the smaller communities (Institute of Social and Economic Research 1978:2:2). Many residents who responded to a 1977 ISER survey (34 percent) sought work on pipeline-related projects outside the region between 1974 and 1977, for example, but later returned to their home communities (Institute of Social and Economic Research 1978:4:5). During the course of this research, some residents periodically left the village for to take nonlocal jobs, working long enough to obtain wage income to make purchases such as boats or snowmachines, or to generate enough cash to "get by" for the remainder of the year.

A recent evaluation of age and sex composition for nine communities in the Upper Yukon-Porcupine region indicates both a declining birth rate since 1960

and a propensity for smaller families. Household size for Natives in the region dropped from 5.1 to 1960 to 3.8 in 1977, and the average number of persons in Native families dropped from 6.1 to 4.5 during the same period (Institute of Social and Economic Research 1978:2:7). Population size and household composition data for the five study communities in 1980 are presented in Table 5.

Recent research has considerably expanded our understanding of socioeconomic systems in Alaska (Wolfe and Ellanna 1983). Such systems provide material and social support for a community or regional population through a set of

TABLE 5

POPULATION SIZE AND COMPOSITION OF
UPPER YUKON-PORCUPINE COMMUNITIES, 1980

Community	Population Size	Number of Households	Mean Household Size	Percent Alaska Native
Arctic Village	111	33	3.17	88.3
Birch Creek	32	13	2.46	96.9
Chalkyitsik	100	29	3.45	96.0
Fort Yukon	619	187	3.31	71.1
Venetie	132	36	3.67	97.7

Source: U.S. Bureau of the Census, 1980

interrelated elements, including identifiable socially-constituted groups, modes of production, and an economic resource base (Wolfe and Ellanna 1983:234-235).

The subsistence-based socioeconomic system, described by Wolfe and Ellanna, contrasts with other systems by focusing directly on food extraction. According to their research, a subsistence-based system is in part characterized by: 1) a "mixed economy" with mutually supportive "market" and "subsistence" sectors; 2) a "domestic mode of production" where extended kinship-based production units

control capital, land, and labor; 3) a stable and complex "seasonal round of production activities" within the community; 4) substantial non-commercial networks of sharing, distribution and exchange; 5) traditional systems of land use and occupancy; and 6) complex systems of beliefs, knowledge, and values associated with resource uses passed on between generations as the cultural and oral traditions and customs of a social group (Wolfe and Ellanna 1983:258).

The socioeconomic system found in the Upper Yukon-Porcupine region appears to have many of the attributes of a mixed, subsistence-based socioeconomic system. Current wage employment patterns, for example, reflect the fact that many wage employment opportunities are either seasonal or temporary. In 1976, an average of 51 percent of the work force was not employed in paid occupations at any one time (Institute of Social and Economic Research 1978:4:1). Fort Yukon residents professed a stronger desire for wage employment than did residents of smaller outlying communities, and younger people expressed greater preference for such employment. This latter point may be indicative less of a decline in the intensity of resource harvest activities than of a greater awareness of the necessity for cash in the procurement of resources using modern technology (Institute of Social and Economic Research 1978:5:3).

Evidence of a "mixed economy" in the region is reflected by the fact that strong preferences for combining involvement in both subsistence and market sectors have been expressed by local residents (Institute of Social and Economic Research 1978:5:2-3). During the course of this research, for example, several Arctic Village residents who worked on the North Slope or in Fairbanks returned to the community in the fall to participate in caribou hunting. Similarly, Fort Yukon residents holding full-time jobs took time off in order to hunt and fish in the fall, and to trap in the winter. These data reflect earlier findings which determined that resource harvest activities in the region could be successfully pursued even when a person was fully involved in wage employment (Institute of Social and Economic Research 1978:5:7). The diversity of harvest

has, in fact, been found to increase in households with cash incomes. Even with a greater degree of involvement in market sectors of the economy, residents in 1976 estimated that local resource harvests provided half or more of all household food in the region. University of Alaska researchers concluded that:

> subsistence activity in the Yukon-Porcupine region clearly remains an important component in the lives of its residents. While the amount of time spent on subsistence is not as great, on the average, as the amount of time spent on wage employment, the products of subsistence pursuits are perceived to provide half or more of the food consumed in most Native households of the region...The quality of subsistence measured in terms of diversity of take and equipment employed, may be actually enhanced by wage employment opportunities while the quantity of subsistence, measured either in terms of time or proportion of food provided becomes less critical. The future viability of subsistence, then, may primarily concern the continued availability of diverse subsistence resources, rather than the presence of new employment opportunities. (Institute of Social and Economic Research 1980:5:9-10)

Per capita income for the Upper Yukon-Porcupine region showed an increase during the period between 1960 and 1976, from $1,660 per capita in 1960 to $3,385 in 1976 (Institute of Social and Economic Research 1978:7:2). This figure is considerably lower than comparable statewide figures, which in 1976 was $8,047 per capita. The lack of a major economic base in the region other than that based upon local resource harvest activities, lack of education or job skills, poor health, and family responsibilities were found to be factors affecting involvement in the wage economy (Institute of Social and Economic Research 1978:7:2).

The cost of living in the Upper Yukon-Porcupine region is one of the highest in Alaska. In 1980 the cost of feeding a family of four with elementary school-aged children at home in Fort Yukon with purchased foods was estimated at $151.74 per week, 215 percent of the same figure for an average family in the United States as a whole (University of Alaska, Cooperative Extension Service 1981). Costs in outlying communities such as Arctic Village or

Chalkyitsik are considerably higher due to additional transportation costs and smaller markets (Institute of Social and Economic Research 1978:7:7).

Transfer payments from federal and state sources are an important component of the Upper Yukon-Porcupine economy. In 1979 the total federal and state per capita transfer payments contributed 13 percent of the per capita income of the Upper Yukon census division, in which the study communities are located (Goldsmith and Rowe 1982:12). Federal payments included social security, veterans benefits, Medicare, General Assistance, food stamps, and Aid to Families with Dependent Children (AFDC). Recent reductions in funding for federal transfer programs, such as General Assistance and AFDC, probably will decrease per capita and household incomes in the region.

Other elements common to subsistence-based socioeconomic systems have been identified in the region, and have been summarized elsewhere in this report. These include: the existence of a "domestic mode of production" (Chapter 3); a complex community-based seasonal round of production activities (Chapters 4 - 8); networks of sharing, distribution, and exchange (Chapter 10); traditional systems of land use and occupancy (Chapter 10); and a system of beliefs, knowledge, and values associated with resource uses passed on between generations (Chapter 10). Such findings suggest that the economy of the Upper Yukon-Porcupine region is centered around a mixed, subsistence-based socioeconomic system which has been described for other regions in rural Alaska (Wolfe and Ellanna 1983).

CHAPTER 3

RESOURCE USE SUMMARY FOR UPPER YUKON-PORCUPINE COMMUNITIES

THE NATURE OF RESOURCE USE

Wild renewable resources play an important role in the complex and dynamic subsistence-based economy of the region. Because patterns of resource utilization in the five study communities have many similarities -- including distribution of species, timing of utilization, methods and technology employed, harvest levels, types of use, and the relative significance of harvest -- general patterns are summarized for all communities in this chapter. Community maps depicting lands used for harvesting specific resources are presented in chapters 4 through 8. Major ecological factors influencing land and resource use for the region as a whole are summarized in Chapter 10.

The English, scientific, and Gwich'in Athabaskan names for major wild resources used in the Upper Yukon-Porcupine region are presented in Table 6 (Morrow 1980; Chapman and Feldhamer 1982; Nelson 1983). Gwich'in names were compiled from community resource experts and translated by Mrs. Katherine Peter. Names for many other species of plants and animals not listed here are part of the Gwich'in vocabulary as well, indicative of highly-developed store of environmental knowledge (Irving 1958).

MOOSE (Alces alces)

Moose represents the most desired and sought-after large mammal for all Upper Yukon-Porcupine communities except in Arctic Village, where caribou are a more significant resource. Nelson's observations pertaining to the significance of moose to the residents of Chalkyitsik holds true, with the above exception, for all of the communities studied:

TABLE 6

COMMON, GWICH'IN AND SCIENTIFIC NAMES
FOR MAJOR WILD RESOURCES USED
IN THE UPPER YUKON-PORCUPINE REGION

Common Name	Gwich'in Name	Scientific Name
Mammals		
moose	dinjik	Alces alces
caribou	vadzaih	Rangifer tarandus
Dall sheep	divii	Ovis dalli
black bear	shoh zhrąįį	Ursus americanus
grizzly bear	shih tthoo	Ursus arctos
porcupine	ts'it	Erethizon dorsatum
snowshoe hare	geh	Lepus americanus
red squirrel	dlak	Tamiasciurus hudsonicus
Arctic ground squirrel	tthah (tthaa)	Spermophilus undulatus
hoary marmot	ts'ee	Marmota caligata
mink	chihdzuu	Mustela vison
marten	tsuk	Martes americana
ermine	avii	Mustela erminea
lynx	ninjii	Felis canadensis
wolverine	natryah	Gulo gulo
wolf	zhoh	Canis lupus
fox (all)	neegǫǫ	Vulpes vulpes
red phase	neegǫǫ	—
cross phase	neegǫǫ neelzhrąįį	—
arctic	ch'iky'aa	Alopex lagopus
river otter	tryah'	Lutra canadensis
beaver	tsee	Castor canadensis
muskrat	dzan	Ondatra zibethicus
Birds		
mallard	neet'ak choo	Anas platyrhynchos
pintail	ch'iriinjaa	Anas acuta
American widgeon	chalvii	Anas americana
green-winged teal	chi'idzinh	Anas crecca
greater scaup	taiinchoo	Aythya marila
common goldeneye	chiik'įį	Bucephala clangula
bufflehead	tł'aandii	Bucephala albeola
white-winged scoter	njaa	Melanitta deglandi
white-fronted goose	deechy'ah	Anser albifrons
Canada goose	khaih	Branta canadensis
snow goose	gwigeh	Chen caerulescens
red-breasted merganser	trąh	Mergus serrator
common loon	daadząįį	Gavia immer
arctic loon	th'ałvit (ts'ałvit)	Gavia arctica
spruce grouse	dąįh	Canachites canadensis
ruffed grouse	treegwat	Bonasa umbellus
sharp-tailed grouse	ch'ahtal	Pedioecetes phasianellus

TABLE 6 Continued

Common Name	Gwich'in Name	Scientific Name
Birds cont'd		
willow ptarmigan	daagǫǫ	Lagopus lagopus
rock ptarmigan	daaky'aa	Lagopus mutus
sandhill crane	jyah	Grus canadensis
whistling swan	daazhrąįį	Olor columbianus
shoveler	dehdrik	Anas clypeata
oldsquaw	aahąąlak	Clangula hyemalis
harlequin	kiiteegwilik	Histrionicus histrionicus
surf scoter	deetree'aa	Melanitta perspicillata
Fish		
northern pike	iltin	Esox lucius
arctic grayling	shriijaa	Thymallus arcticus
chum salmon	hii (shii)	Oncorhynchus keta
king salmon	łuk choo	Oncorhynchus tshawytscha
coho salmon	needlįį	Oncorhynchus kisutch
lake trout	neerah'jik	Salvelinus namaycush
broad whitefish	chiishoo	Coregonus nasus
humpback whitefish	neeghan	Coregonus pidschian
round whitefish	khałtąį'	Prosopium cylindraceum
least cisco	ch'ootsik	Coregonus sardinella
arctic char	łuk dohohtr'į'	Salvelinus alpinus
longnose sucker	deets'at	Catostomus catostomus
burbot	chehłuk	Lota lota
sheefish	shryah	Stenodus leucichthys
Vegetation		
white spruce	ts'iivii	Picea glauca
black spruce	—	Picea mariana
paper birch	aat'oo	Betula papyrifera
birch bark	k'ii	—
balsam poplar	t'aa	Populus balsamifera
willow (sp.)	k'aii	Salix (sp.)
alder (sp.)	k'oh	Alnus (sp.)
bog blueberry	jak	Vaccinum uliginosum
bog cranberry	natł'at	Vaccinium vitis
highbush cranberry	trahkyaa	Viburnum edule
alpine bearberry	dandaih	Arctostaphylos alpina
nagoonberry	nakał	Rubus arcticus
crowberry	deenich'uh	Empetrum nigrum
dogwood	dzindee	Cornus stolonifera
"Indian potato"	trih	Hedysarum alpinum
wild rhubarb	ts'iiguu	Polygonum alaskanum
not known	dee'ii'ahshii	Boschniakia rossica
juniper (sp.)	deenich'uh t'an	Juniperus (sp.)
rosehips (wild rose)	nitsįh	Rosa acicularis

TABLE 6 Continued

Common Name	Gwich'in Name	Scientific Name
Vegetation cont'd		
labrador tea	ledii masket (?)	Ledum palustre
sphagnum moss	not known	Sphagnum (sp.)
sedge	not known	Carex (sp.)
anemone	not known	Anemone patens
wild chives	not known	Allium schoenoprasum

> It is impossible to say just how vital a role moose played in the traditional Kutchin economy, but there is little question about its importance to people today. The Chalkyitsik Kutchin consider moose the game in their country. They always want to have moose meat on hand, and if they run out they think and talk about how they will get more. 'Meat' is almost synonomous with moose. Whereas other animals may be considered delicacies or treats, moose is probably the one meat they could least think of doing without. During some years the volume of other foods, such as fish, may exceed the volume of moose, but the people still seem to consider it the most important. (Nelson 1973:85)

Moose are found throughout the Yukon Flats and surrounding uplands. According to Arctic Village residents, moose have become much more abundant in the foothills and valleys of the Brooks Range over the past 30 to 40 years. Residents report that moose leave the Yukon Flats in the fall after the first snow and by November are largely in the hills on the periphery of the Flats. In late winter or early spring they return to feed along rivers and on islands where willows are abundant.

Reports of elders who have hunted moose in the Upper Yukon-Porcupine region suggest that resource populations today are somewhat higher in the northern and eastern portion of the region -- near the Porcupine, Chandalar and Black rivers -- than in the south towards Birch Creek or west near Beaver and Stevens Village. Moose populations near Venetie, Chalkyitsik, Arctic Village, and perhaps Fort Yukon, are reported by these longterm observers as being somewhat higher today than 20 or 30 years ago.

The Gwich'in have an elaborate body of knowledge relating to moose hunting, butchering, distribution, and preparation (Nelson 1973:84-112). The variety of Gwich'in terms used to describe moose (Table 7) is a reflection of this extensive knowledge. Today moose are harvested principally during the fall (usually September), but also in the winter and in early spring. Bull moose are most sought after during the last three weeks of September prior to the rut when they have the most fat. At this time they are moving a great deal, and are more easily attracted for hunting. Hunters are conscious of moose "sign" throughout the summer, however, mindful that this information may be useful at a later date.

Fall hunting is nearly always conducted by riverboat, and moose are generally killed within one half-mile to a mile of a river. Typically, three or four hunters, usually relatives, travel together. Moose are located using a variety of visual, auditory, and tracking techniques. Bulls are often attracted through the use of a moose scapula scraped upon brush. Nelson (1973: 94) quotes an older Gwich'in hunter as saying "when I hear a moose rake his horns, that's my moose. No way to miss it if I got a moose bone [scapula] with me."

Moose hunters traveling by riverboat often use their knowledge of moose behavior and the land to their advantage. Some hunters consistently use small hills or bluffs as game lookouts to scan nearby flats or lakes. Camps are established on or near these lookouts. In several locations on the Black and Chandalar rivers, small wooden towers 10 to 15 feet in height have been constructed to spot moose or caribou. Other hunters know of mineral licks, burned areas, or particular microhabitats such as willow bars where moose often can be found. Almost half of the year's moose harvest in 1969-70 for Chalkyitsik was taken during the fall season, an estimate which appears to hold true today for other Upper Yukon-Porcupine communities (Nelson 1973:86).

Winter and spring hunting is generally conducted during November and from February through March, although moose occasionally are taken at any time meat

TABLE 7

SELECTED GWICH'IN NAMES FOR MOOSE (Alces alces)
AND CARIBOU (Rangifer tarandus)

Moose (all)	ʼdinjik
large bull	ch'izhir
medium bull	dijii
smaller bull	jyaagoo
smaller bull	dachan ch'ik
young bull	jaa'ałkhok
yearling	dąįį ch'its'ęęn zhii
cow	dizhuu
cow without calf	dizhuu viditsik kwaa
young cow	khadeetsik
calf	ditsik
newborn calf	daatsǫǫ
two cows together	dizhuu nihłaa niilzhii
Caribou (all)	vadzaih
bull caribou	vadzaih choo
smaller bull	dazhoo
smaller bull	khaii k'ee'ilik
smaller bull	dazhootsoo
bull in fall (prior to rut)	khąįn ts'an
bull in fall (during and after rut)	ch'atsun
young caribou	vak'oo ch'iin t'rat
cow caribou	vadzaih tsal
nursing cow with calf	ch'iyaht'ok
pregnant cow	tseegwildii
barren cow	vitseerohchii (or) tr'ii jii
cow without calf in winter	vadzaih njaa
yearling calf	khadąątsan
newborn calf	ch'igii

is in short supply. Moose tracks are more easily followed in snow, and freshly broken willows are a good sign that moose are in the area. Winter and spring hunting usually involves the use of a snowmachine and is often undertaken in conjunction with trapping. Some trappers make it a practice to hunt moose only after the first snow, when meat can be frozen and when traplines and cabins can be reached by snowmachine or dog team. Cow moose are considered

more desirable than bulls during winter and spring because of their high fat content. Bulls taken during these times are usually lean and tough.

Moose meat obtained in both fall and winter is usually eaten fresh or frozen for later use. In spring and occasionally at other times of the year the meat is cut into thin strips and dried. The recent introduction of freezers into many communities has expanded the practice of preserving meat by indoor freezing.

Field observations by this researcher indicate that moose taken in Upper Yukon-Porcupine communities during 1980 and 1981 were generally thoroughly utilized. Internal organs including the heart, kidneys, and intestines are considered delicacies and are generally reserved for older people or guests. The Gwich'in have at least four different names for parts of the intestine which are boiled and eaten. The ribs, brisket, and backstraps are highly favored and are shared with relatives, especially older people. The moose head is perhaps the greatest delicacy. It is occasionally roasted whole over an open fire but more commonly boiled for moosehead soup. Portions of the head, including the lips, eyelids, tongue, and nose, are combined with macaroni and vegetables to prepare this dish, which is relished at potlatches and other community gatherings.

Moose hides are an important source of leather for making clothing, footwear, and handicrafts. Hides of bulls are preferred for toboggan sides and footwear bottoms because of their thickness. Cow hides are generally thinner and more pliable, and are used for sewing and handicrafts. Tanning of moose hides has declined during recent years because of the availability of substitute materials. Tanning is still done, however, by some women. For example, one woman in Venetie tanned six hides in 1980, all of which were used for clothing or footwear. Other uses of moose include the shaping of bone from the lower leg for scraping skins and the use of the scapula as an attractor in hunting. Sinew from moose is still used today as thread for sewing.

Sharing of a moose, while reportedly not as extensive as in aboriginal times, still occurs within nuclear and extended-family groups according to informants. Figure 1 shows the distribution of a moose taken in 1981 by two residents of Fort Yukon, which included sharing with relatives in Fort Yukon, Venetie, Fairbanks, and Anchorage. In this example, two hunting partners who were brothers harvested a bull moose near Fort Yukon. Each partner kept one-third of the moose and gave the remaining third to their elderly parents who also live in Fort Yukon. One of the partners shared portions of the moose with his wife's mother and sister. Meat was also shared with a distant relative described as that hunter's "godfather", an elderly person in Fort Yukon with no close relatives, an unrelated friend in Fairbanks, and with Fort Yukon residents participating in potlatches at Christmas, New Year's and Spring Carnival. The other partner shared meat with distant relatives described as "godparents", a distant relative living in Fairbanks, and with other community members at a Fort Yukon potlatch. Meat was also given to the mother's sister's family living in Anchorage. The parents of the hunters distributed meat to the families of the hunter's father's brother, the mother's sister, and the mother's sister's son. A moosemeat dish was also contributed to a Fort Yukon potlatch.

Sharing by residents of smaller communities in the region is reported to be more extensive than in Fort Yukon. Nelson (1973:111) reported for Chalkyitsik that "each moose...brought into the village is eventually distributed among a number of households, and the hunter is probably lucky if he saves half of his take for himself." In 1981 portions of a moose taken by an Arctic Village resident were distributed to virtually every household in the community. The hunter was left with only one hind-quarter.

The cultural significance of moose is symbolized by a "first moose" potlatch held in Venetie in 1982. A 19-year-old man reportedly shot his first moose, which was distributed to the entire village to assure "good luck" in

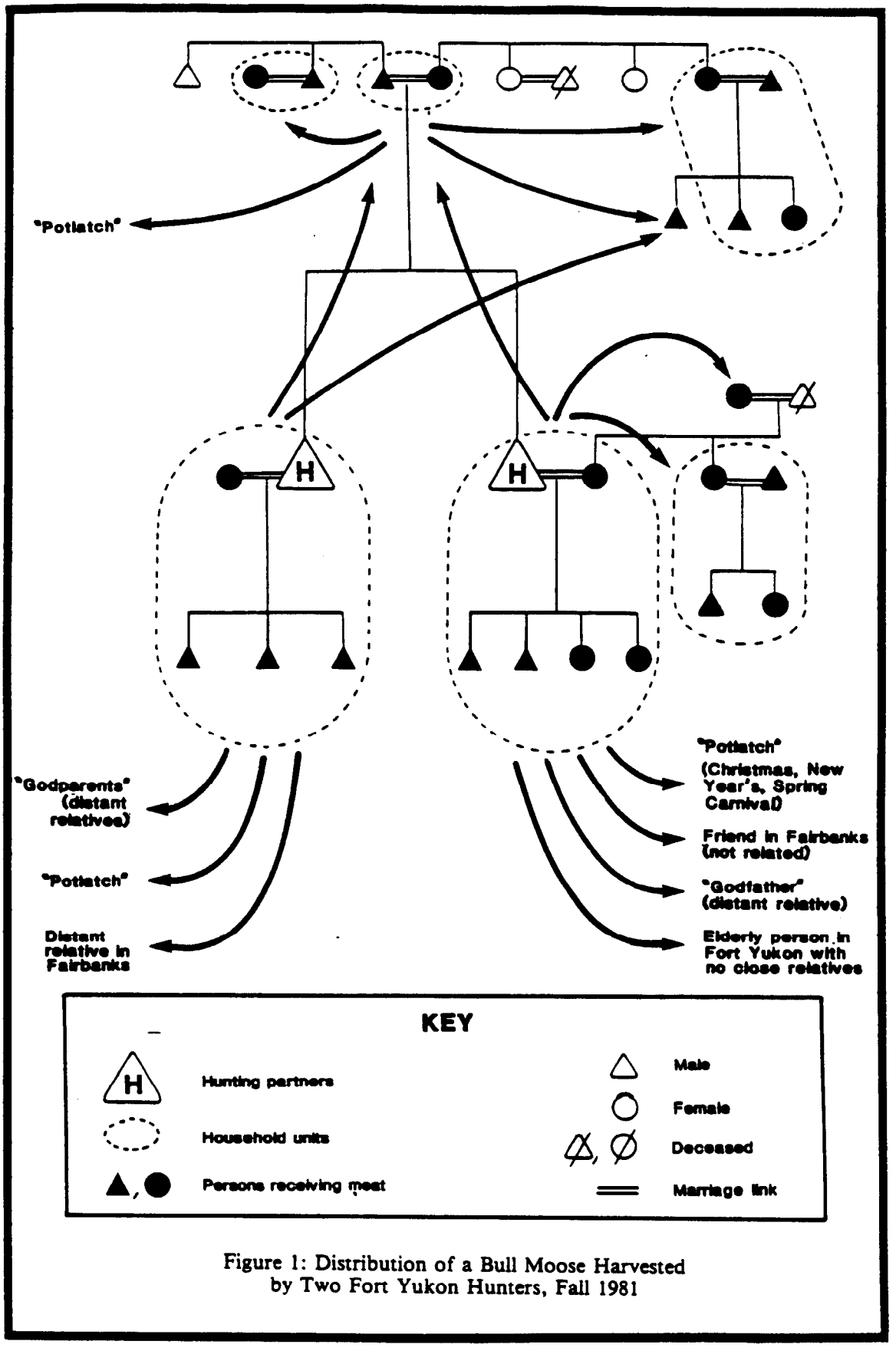


Figure 1: Distribution of a Bull Moose Harvested by Two Fort Yukon Hunters, Fall 1981

future hunting. The moose was carefully butchered and cleaned. Entrails were cleaned and were stuffed into a "bag" made from the moose's large stomach for storage. They were later removed, cut into small pieces, and boiled along with the meat. Over a two-day period the entire village was invited to the home of the young hunter's father who later reported that the entire moose had been given away. The hunter himself reported keeping none of the moose. Food served at the potlatch included moosehead soup, boiled moose meat and intestines, mesentary fat, fresh bread, pilot biscuits with butter, and canned fruit cocktail.

Literature sources provide an incomplete record of historical moose harvests in the Upper Yukon-Porcupine region (Table 8). For example, between November 1931 and October 1932 a territorial game warden stationed in Fort Yukon reported "a very healthy condition in the number of moose" in the Yukon Flats (Alaska Game Commission 1932:72). An estimated 45 moose were harvested in 1942 along the Yukon River between Stevens Village and Fort Yukon, and 30 were taken that year between Circle and the Canadian border (Alaska Game Commission 1942:6).

Shimkin (1955:222), writing of the Yukon Flats trapping area which included most trappers from Fort Yukon, Birch Creek, Chalkyitsik, and Venetie (Map 5), reported that "moose were overwhelmingly the most important game in 1948-49, providing some 80,000 pounds or about 50% of all meat and fish consumption by weight." In a separate report he documented harvest of 165 moose in the same area between July 1948 and June 1949 (Shimkin 1951:34). Rausch (1953:139) reported for Arctic Village that "not more than 3 or 4 moose are killed each year." Caribou, he noted, were more commonly used for subsistence purposes in that community.

In 1964 the U.S. Fish and Wildlife Service estimated that approximately 320 moose were taken annually by local residents in the proposed Rampart Dam impoundment area, with at least 40 additional moose taken by sport hunters

TABLE 8

HISTORIC ESTIMATES OF MOOSE HARVEST
BY UPPER YUKON-PORCUPINE COMMUNITIES
1942-1982

Harvest Period	Communities Included	Estimated Harvest	Source
Jan. - Dec. 1942	Beaver, Fort Yukon, Stevens Village -- [?]	45	Alaska Game Commission 1942
July 1948 - June 1949	Birch Creek, Chalkyitsik, Fort Yukon, Venetie	165	Shimkin 1955
1952 - 1953	Arctic Village	3-4	Rausch 1953
1964	Beaver, Chalkyitsik, Circle, Rampart, Stevens Village, Venetie	320	U.S. Fish and Wildlife Service 1964
1969 - 1970	Chalkyitsik	36-40	Nelson 1973
1970	"Yukon Flats"	360	King et al. 1970
1973	Arctic Village, Beaver, Birch Creek, Canyon Village, Central, Chalkyitsik, Fort Yukon, Stevens Village, Venetie	481[a]	U.S. Dept. of the Interior, Alaska Planning Group, 1974e
1976	Arctic Village, Beaver, Birch Creek, Chalkyitsik, Circle, Fort Yukon, Stevens, Village, Venetie	300-500	Institute of Social and Economic Research 1978
June 1981 - May 1982	Arctic Village, Beaver, Birch Creek, Chalkyitsik, Circle, Fort Yukon, Stevens Village	200-250	Division of Subsistence, Alaska Dept. of Fish and Game

[a] Estimate reported to be "subject to gross error" (U.S. Department of the Interior, Alaska Planning Group 1974e)

(U.S. Fish and Wildlife Service 1964:67-68). Villages included in this estimate were Beaver, Chalkyitsik, Circle, Fort Yukon, Rampart, Stevens, and Venetie.

Nelson (1973:111) estimated a kill of 36 to 40 moose in Chalkyitsik during 1969-70 for a population of some 95 people. This harvest took place in a year of extremely poor fish catches (Nelson 1973:68). At about the same time, another report estimated that about 360 moose were harvested annually in the Yukon Flats for a regional population of 1,200 people (King et al. 1970:27-28).

In 1973 the U.S. Fish and Wildlife Service (In U.S. Department of the Interior 1974e:99) reported an estimated yearly moose harvest of 481 animals for the "Yukon Flats Socio-economic Area" (Arctic Village, Beaver, Birch Creek, Canyon Village, Central, Chalkyitsik, Circle, Fort Yukon, Stevens Village, and Venetie). The report noted that "harvest data are for a period of several years, and are rough estimates only" and that data were "subject to gross error." The lack of rigorous verification of these 1973 harvest estimates has led both those collecting the data and local representatives to seriously question their reliability (C. Wentworth, personal communication, May 1982; Yukon Flats Fish and Game Advisory Committee, personal communication, February 1982). Another study in 1976 estimated a total annual harvest of from 300 to 500 moose for the communities of Arctic Village, Beaver, Birch Creek, Chalkyitsik, Circle, Fort Yukon, Stevens Village, and Venetie (Institute of Social and Economic Research 1978:13:1).

During this research key informants in the Upper Yukon-Porcupine communities of Arctic Village, Beaver, Birch Creek, Chalkyitsik, Circle, Fort Yukon, Stevens Village, and Venetie reported a harvest of between 200 and 250 moose for the period from June 1981 to May 1982. These estimates were compiled from reports of at least two resource experts in each community. Observations of the researcher while in most of the communities allowed for some field

verification. It should be noted that while these figures are believed to be reasonably accurate, they are estimates only.

CARIBOU (Rangifer tarandus)

Caribou (vadzaih) harvested by Upper Yukon-Porcupine communities are principally from the Porcupine Herd, although Central Arctic and Fortymile Herd animals may also be occasionally taken. Gwich'in names for different types of caribou are listed in Table 7.

The Porcupine Herd consists of about 110,000 animals (Whitten and Cameron 1980:ii). The annual migration typically includes a northward movement from the winter range in spring to the calving ground on the Arctic coastal plain of northeastern Alaska and Yukon Territory. In mid- to late summer a southerly dispersion generally occurs toward the herd's winter range in the boreal forest of the Chandalar region of Alaska and in the Yukon Territory of Canada.

Archdeacon Robert McDonald, a resident of Fort Yukon in the 1860s, documented the historic use of caribou in the region. Hudson's Bay Company men from Fort Yukon, he noted, obtained caribou from a "meat trading post in the Gens du Large (Chandalar Gwich'in) country" (McDonald n.d.:21 December 1862). During a journey to visit with the Chandalar Gwich'in in 1863 he described the use of a caribou fence:

> Accompanied the indians to the deer barriere [caribou-fence] to hunt deer. About 20 brought to the barriere, but nearly all broke through. I shot one and another was killed by Francois Boucher. (McDonald n.d.:24 March 1863)

In 1868 McDonald reported that the "majority of the Fort Yukon indians went off, some to the Netsi Kutchin to procure deer robes for winter clothing, others toward Black River" (n.d.:19 October 1868). In November of 1868 he noted that Black River Gwich'in were hunting caribou (McDonald n.d.:18 November 1868).

The consistent pattern of use of caribou by residents of the region is documented by Tritt (n.d.), Osgood (1936a), Carroll (1957), White (n.d.) and others. Michael Mason, an Englishman who lived in the Fort Yukon area in the early 1920s, described a trip with a Fort Yukon hunter up the Yukon River to the vicinity of Woodchopper Creek above Circle in fall of 1920 to obtain meat for Fort Yukon. "All day long," Mason reported, "up and down the river as far as the eye could reach, the water was full of bobbing horns, white, shaggy necks, and dark gray backs, the bank was a seething mass of running beasts, coming across on their way south" (1924:72). Historically, residents from as far away as Beaver traveled up the Yukon to the vicinity of Charley Creek [Kandik River] to obtain caribou meat (Schneider 1976:11). Caribou were particularly accessible to Fort Yukon hunters in the 1930s:

> Alaska Game Commission reports noted an ever increasingly number of caribou wintering near Fort Yukon and both on and around the Yukon Flats. Regular migrations took place across the Yukon River between Forth [sic] Yukon and Woodchopper late each fall, but these apparently stopped about 1935. (Skoog 1968:260)

During 1935 and 1936, caribou were reported north of Fort Yukon, Beaver, and Stevens Village (Alaska Game Commission 1936:84). Fort Yukon residents regularly traveled up the Yukon above Circle to harvest caribou at this time, although during 1936 and 1937 game warden McMullen reported that "the natives who went from [Fort Yukon] last fall to Circle returned with very few caribou" (Alaska Game Commission 1937:107). During 1938 and 1939, Fort Yukon residents reportedly took 150 caribou near that community (Alaska Game Commission 1939:36). According to Shimkin (1955:223), caribou had become a "rarity" in the Yukon Flats by 1948-49. However, in October 1957 Fort Yukon residents reportedly harvested 300 animals on the Porcupine River (U.S. Fish and Wildlife Service 1964:69).

During the last two decades caribou principally have been available in the region to hunters near Arctic Village and Venetie, and to a lesser extent

to Fort Yukon and Chalkyitsik hunters on the Porcupine River. Furthermore, hunters from Circle and Birch Creek have infrequently harvested caribou from scattered bands. Birch Creek residents report their last significant harvest of caribou near the village was in 1939 or 1940. Trappers, however, have occasionally harvested animals in the White Mountains since that time. A movement of the Porcupine Herd across the Yukon River in a broad front from Eagle to the Steese Highway occurred during the winter of 1981 and 1982. During that winter caribou were harvested by Circle, Eagle, Fort Yukon, and Chalkyitsik residents, as well as remote households in between.

Caribou harvests in the region today take place principally in the fall, winter, and spring. In Arctic Village caribou are usually first seen in mid-August migrating south from the coastal plain along wind-swept alpine ridges. Animals are taken at that time from hunting camps along timberline, from camps near fishing sites, and along rivers using boats. Harvested caribou are sometimes cached near hunting camps for up to several days while hunters obtain additional meat or begin transporting their harvest back to the community. Venetie residents sometimes travel up the Chandalar River by boat in August and September to hunt caribou. In August 1981 a Venetie hunter shot two caribou on such an upriver journey near Big Rock Mountain even before caribou had been available in Arctic Village.

In recent years Fort Yukon residents have harvested caribou along the Porcupine River near Canyon Village, usually in early September. In 1980, seven hunting parties made the long journey up the Porcupine by riverboat where they took between 50 and 75 animals. Nelson (1973:113) reported Chalkyitsik people also harvest fall caribou on occasion along the Porcupine River. Transportation to fall hunting areas usually involves travel by boat, on foot, and occasionally by aircraft. Bull caribou are selected in fall because of their high fat content and the prime condition of their hides. Young caribou

are occasionally taken in August as their thinner hide is desired for use in making parkas.

Caribou often remain available to Arctic Village and Venetie residents through the winter and spring. Between October and February, hunters usually select cows for harvest because they are fatter and better tasting than are bulls. After that time, either bulls or cows may be taken. Snowmachines are commonly used in harvest activities during this time of year. It is not uncommon for residents of other communities traveling to Arctic Village to hunt caribou with relatives, especially in spring.

Caribou meat is generally stored by freezing or drying, and is usually prepared by boiling. Occasionally it is also baked or fried. Dried meat continues to be a highly desired food item today. Caribou heads, considered a great delicacy, are either boiled, baked, or occasionally roasted over a fire. Intestines, which are prized for their fat, are cleaned, boiled, and eaten. Portions of the "stomach" are sometimes used as a container for holding mesentary fat for human consumption or for collecting blood to be used in soups or as dog food. Furthermore, hides of caribou are tanned and used for clothing, handicrafts, sleeping pads, or as bedding material in dog houses. Legskins are tanned for use in winter footwear. Caribou bones are sometimes cracked and boiled for marrow. In times of food shortage, hooves have been boiled to make a broth. Several elderly women in Arctic Village still keep the hooves of all caribou harvested by their families for this use.

Caribou are of major cultural significance to the Gwich'in people of the region. According to Slobodin:

> In mythic time, the Kutchin [Gwich'in] and the caribou lived in peaceful intimacy, although the people were even then hunters of other animals. When the people became differentiated, it was agreed that they would now hunt caribou. However, a vestige of the old relationship was to remain. Every caribou has a bit of the human heart...in him, and every human has a bit of caribou heart. Hence humans will always have partial knowledge of what caribou are thinking and feeling, but equally, caribou will have

> the same knowledge of humans. This is why caribou hunting is at times very easy, at other times very difficult. All hunted creatures are to be respected, but none, except the bear, more so than the caribou. (1981:526)

The importance of this cultural relationship is expressed through the oral traditions of the contemporary Gwich'in. According to Hadleigh-West who worked in Arctic Village:

> A great-grandfather of one informant was a shaman whose principal medicine animal was the caribou. He had a song with which he called the caribou in. It was sung only in times of severe distress when everyone was discouraged, and the people were threatened with starvation. The informant's grandmother who raised her said that she witnessed this performance. The medicine man was called upon to sing his song which he did. The next morning all the hunters went out with the shaman leading. He would reach down with his hand and bring up a live caribou. He would let that one go and it would disappear. That was done several times. Soon the men came to a group of caribou and started shooting and the threat of famine was over. (1963:196)

The failure of caribou to migrate near Arctic Village in 1979 prompted one resident to comment that "we're really sick when there's no caribou." At a community gathering held shortly thereafter the researcher was informed that the meal was "not a real potlatch" because moose was served instead of caribou. Elements of customary law regarding hunting behavior, care of meat, and distribution and exchange of caribou persist in several communities in the region and are discussed in Chapter 10.

Between July 1981 and June 1982, caribou from the Porcupine Herd were harvested in Alaska by residents of Arctic Village, Kaktovik, Venetie, Fort Yukon, Chalkyitsik, Circle, and Eagle, and by several remote households within the range of the herd. Arctic Village residents reported harvesting 300 to 400 animals during this time. Estimates of harvest provided by knowledgeable residents in other communities during this period included: Venetie, 50 to 75; Fort Yukon, 15 to 20; Chalkyitsik, 60 to 70; Eagle, 200 to 300; and Kaktovik, 43. The total Alaskan harvest for the period, therefore, was probably less than 1,000 animals.

DALL SHEEP (Ovis dalli)

Dall sheep (divii) are common in the eastern Brooks Range and are also reported by community residents to be found in the northern extension of the Ogilvie Mountains between the Yukon and Porcupine rivers and in the White Mountains near Beaver Creek.

The communities of Arctic Village, Venetie, Chalkyitsik, and Birch Creek have all historically harvested sheep, according to local informants, but in recent decades sheep have been taken almost solely by Arctic Village residents in the Brooks Range. A "longstanding" tradition of sheep hunting exists for Arctic Village (Jakimchuk 1974; Tritt n.d.; Peter 1981). Annual harvest for that community in recent years has probably averaged less than 10 animals. Traditionally sheep were taken using bow and arrow and, occasionally, snares. Sheep meat is stored by drying or by freezing, and is prepared as dry meat, by boiling, or by baking.

Sheep are generally taken near Arctic Village in early fall (late August or early September) or in early winter (November). Residents usually hunt sheep on foot from hunting camps or through the use of snowmachines. Occasionally chartered aircraft are used to reach sheep hunting areas. In early winter sheep are said to be easy to hunt, as they often move down off high rocky slopes into valleys. Sheep hunting requires considerable expenditures of time and energy to obtain a relatively small quantity of meat. In November 1981, for example, two hunters on snowmachines traveled over 100 miles from Arctic Village to obtain one sheep. Hunters returning with sheep meat, however, are afforded considerable prestige because the meat is said to be highly-desireable "Native food," particularly for the elders in the community. In Arctic Village, furthermore, an effort is made to have sheep meat available for the Christmas potlatch.

The continued availability of sheep, according to one Arctic Village resident, provides a sense of security much like "having money in the bank."

While large numbers of sheep are not taken, local residents take satisfaction in knowing that a relatively stable and accessible resource is nearby should the need arise. In a culture where "hungry times" are still fresh in the memory of elders, this knowledge is said to be of considerable significance.

BEAR (Ursus americanus/Ursus arctos)

Black bears (shoh zhraii) are utilized by all Upper Yukon-Porcupine communities except Arctic Village, where they are rarely found. Bears are common in the Yukon Flats and are a frequent sight along riverbanks and near fishcamps. Generally, the Gwich'in do not consider them dangerous, except perhaps in the spring (Nelson 1973:124).

Hunting of black bear takes place primarily in the spring and fall. In late April and early May, bears emerge from their dens and are easily hunted because they are less shy of humans than later in the fall. The meat at this time is desirable because bears still retain some of their winter fat. Spring is a particularly "lean" time of year for human food, and bear meat can often be an important food source until waterfowl arrive. Often bears are spotted along rivers after breakup near muskrat and fishing camps. At one such camp on Beaver Creek in spring of 1980, five bears, including two cubs, were encountered by Fort Yukon residents and two adult bears were killed. Both were shot in or near the camp and the meat was used for human and dog food.

In fall, usually September, black bear meat is fat and desirable. Often bears are killed in conjunction with moose hunting along rivers. Furthermore, den hunting, described by Nelson (1973:118-122), is still occasionally undertaken today. Bear meat is generally frozen or used fresh. It is usually boiled or fried, but in either case it must be fat to be considered suitable for human consumption. Hides are sometimes sold or are used for insulation around doors (Nelson 1973:127).

Grizzly bears (shih tthoo) are rarely used for food but are profoundly respected by people in Upper Yukon-Porcupine communities. They are quite common in upland areas, particularly near Arctic Village, but may be found nearly anywhere in the region. Grizzlies that are killed are usually "nuisance bears" which have disturbed caches or have come too close to camps or settlements. One grizzly was reportedly killed on a ridge near Arctic Village in fall of 1980 after it broke into a caribou meat cache. At a caribou hunting camp near Old John Lake during the same period, hunters demonstrated great concern about the presence of a grizzly which had disturbed another meat cache. The reported presence of a winter bear -- one which failed to den up -- near Arctic Village in November of 1981 was also a source of great concern in the community. Winter bears are believed by community residents to be quite dangerous. Hunters set out on snowmachines to kill the bear but were unable to find it.

WILDFOWL

Migratory waterfowl, grouse, and ptarmigan are highly valued food sources in all communities of the region. Ducks and geese are particularly abundant on the vast Yukon Flats, where a myriad of lakes, ponds, and rivers provide habitat for birds from all four major North American flyways (U.S. Department of the Interior, Alaska Planning Group 1974e:59).

Waterfowl usually are present in the Yukon Flats between late April and early October. In spring they have traditionally been one of the first sources of fresh meat available after the long winter. The first sought-after species to arrive, according to local informants, is usually the Canada goose (khaih), followed generally by pintail (ch'iriinjaa), American widgeon (chalvii), green-winged teal (chi'idzinh), scaup (taiinchoo), and common goldeneye (chiik-jj). Later arrivals, usually appearing about the first of June, are white-winged scoter (njaa), white-fronted goose (deechy'ah), and old squaw

(aahąalak). White-winged scoters (locally called "black ducks") are probably the most sought-after duck in spring because of their fat content and because their predictable behavior makes them easy targets. Other important resources include the mallard (neet'ak choo), bufflehead (tƗ'aandii), and snow goose (gwigeh).

Waterfowl hunting methods and preferences described by Nelson (1973:73-80) remain typical of those used today by all communities in the Yukon Flats. River hunting with boats is common particularly in spring just after breakup. Other methods of harvest include hunting on lakes using "rat canoes" made of spruce and canvas, hunting on land as waterfowl fly by, and hunting from blinds on or near larger water bodies such as Venetie Lake, Ohtig Lake, or other smaller lakes.

Spring waterfowl hunting is often an activity undertaken by small groups of young men in the community. During spring of 1981 the lives of young men in Venetie seemed to be dominated by a pattern of hunting through the dusky twilight of "night" and sleeping by day. Freshly-killed ducks were brought home and cleaned in the early morning, and all over the village bubbling pots of duck soup were being consumed. Ducks are frozen or dried to keep them for later use. In the past, duck eggs were collected for food, but this practice is reported to be rarely done today. A Fort Yukon resident reported that the last time he harvested duck eggs was in the mid-1950s.

Ruffed, spruce, and sharp-tailed grouse are all harvested in the region, usually on an opportunistic basis using .22 rifles or shotguns. Ptarmigan are also taken, particularly in the foothills and valleys of the Brooks Range and other upland areas. Hunting ptarmigan is an important component of the Arctic Village annual cycle, especially in spring before the arrival of waterfowl.

While the actual volume of meat provided today by wildfowl may not be great, its role in providing fresh meat during lean periods and providing

diversity in the diet should not be overlooked. As Nelson points out for aboriginal residents of the region:

> ...birds were one animal they always had a fair chance of finding. Thus, their role in the economy might have been much more important than is evident at first glance, because they could be a a crucial resource for getting the people through lean periods. (1973:83)

SMALL MAMMALS

Snowshoe hares (geh) are an extremely important and yet often overlooked resource found throughout the Upper Yukon-Porcupine region. Subject to marked population cycles, they epitomize the variability inherent in the boreal forest environment (Nelson 1973:131). Earlier observers noted the significance of hares for food in this environment:

> At times and in places the moose and the caribou, to say nothing of the black and the brown bear or the mountain-sheep, are plentiful...But at other times and places no big game will be found at all...and it is often just when a man is dependent on the country that the big game fails him. But, with an exception [during low cycles]...the rabbit never fails. (Stuck 1917:333)

Hares remain an important source of food both for humans and for dogs, particularly when large game such as moose and caribou are not available. They are hunted or snared, and, rarely, trapped. Hunting usually takes place in late August and September when their coloration and the absence of leaves make them more visible. "Rabbit drives," during which one hunter walks through willow stands to drive hares toward another hunter, are often conducted at this time. On the Black River above Chalkyitsik two people obtained many "rabbits" in this manner during the fall of 1981 by shooting them with .22 rifles as they walked through a willow thicket. Arctic Village residents return each fall to specific willow bars up the Chandalar River where "rabbit drives" are known to be productive. Hunting is also undertaken in late March and early April when the snowshoe hares are out sunning themselves (Nelson 1973:133).

Hares are most commonly obtained through the use of snares. A person may have a snare line of several miles near the village with sets usually made with number two picture wire. Checking a snare line is often done by older children, women, or the elderly. As well as providing food, it offers a rationale for exercise and for getting outdoors. Grouse, ptarmigan, or other small game may be taken at the same time.

"Rabbit" stew is common fare in many communities, and hare pelts are occasionally used in sewing or as boot or mitten liners. Hares are also considered good dog food, especially when they are abundant and when other dog food, especially fish, is not available. For example, two Black River trappers caught 600 hares using spring-pole snares in fall of 1981 which, when mixed with whitefish and pike, sustained nine working dogs all winter.

Arctic ground squirrels (tthah or tthaa) are of particular importance to the communities of Arctic Village and Venetie, where they are said to be most abundant, but are taken by residents near Fort Yukon, Birch Creek and Chalkyitsik as well. They are caught both during late April and early May, but are also trapped, snared, or shot using small-caliber rifles during summer and early fall. Ground squirrels are cooked by singeing them in a fire to burn off the hair, after which they are gutted and cooked or dried. Ground squirrels are valued especially by older people for their medicinal value.

Porcupine (ts'it) are found throughout the Upper Yukon-Porcupine region, although informants in Arctic Village and Venetie report a decline in numbers over the past several decades. They are highly desired for food because of their delicious meat and fat and are taken opportunistically in fall and winter. Quills are occasionally used for handicrafts. Marmot (ts'ee) or "whistlers" are occasionally hunted and snared, particularly near Arctic Village. Red squirrel (dlak) are seldom harvested.

FISH

Traditionally fish were one of the most reliable and abundant food resources in the Upper Yukon-Porcupine region, and this fact remains true today. In aboriginal times, the availability of fish often meant the difference between survival or starvation, and the harvest of fish was a major component of the annual cycle for most bands in the region. Nelson wrote of the Gwich'in:

> Of all the food resources exploited...fish are one of the richest and most reliable. In fact, it is reasonable to speculate that fish were the most important single resource during the aboriginal past, and in some years this is probably still true. (1973:55)

As in the past, a fishnet remains an important piece of equipment for traveling in the country today. A trapper whose family lived much of their life on the Black River remembers that the first thing his mother would do upon arrival at a new camp was to place a small net in the water. Today, fishcamps remain a focus for resource harvesting and sociocultural activities such as teaching traditional skills and values and relating oral traditions.

Species of fish which play a significant role in the local and regional economy include: king salmon (Łuk choo), chum salmon (khii or shii), coho salmon (nehdlįį), northern pike (iltin), whitefish (chiishoo, neeghan, khaŁtąį), arctic char (Łuk dohotr'į), sucker (deets'at), arctic grayling (shriijaa), lake trout (neerah'jik), sheefish (shryah), and burbot (cheŁuk).

Salmon are harvested primarily along the Yukon River, although chum salmon are also taken on the Chandalar, Black, and Porcupine rivers. King salmon arrive at Fort Yukon during the end of June and are generally caught with gillnets or fishwheels during the early part of July. Chum salmon arrive in August and continue to run until freeze-up. The most intensive fishing activity for chums takes place in late August and early September. Both gillnets and fishwheels are used to harvest the abundant chum salmon. Sheefish, burbot, and some whitefish species are often caught in fishwheels or nets in conjunction with salmon fishing.

King salmon are extremely oily and are usually cut into strips and hung to dry in smokehouses. King salmon heads are often split, dried, and used in soups. Most people disapprove of feeding king salmon to dogs, although entrails and scraps are sometimes used for dog food. Large-mesh (8-inch) gill nets, usually 60 feet in length, are most commonly used to catch kings in deep eddies.

Chums and coho are generally caught using a smaller-meshed (usually 6-inch) net than is used for kings. Chum nets are usually set in different eddies than are king nets because water levels are generally lower during the fall run. Fishwheels are also used, especially when large numbers of chums are desired for dog food. Several thousand chums may be split and dried on racks in the fall for dog food.

Whitefish are usually taken in late spring and in early fall for human consumption and for dog food, but are also harvested during winter and summer. Lake and creek systems having large runs of these fish are well known to area residents. Both gillnets and small fishtraps have traditionally been used to harvest these species in specific areas. In early winter, before the ice becomes too thick, gillnets are placed under the ice on rivers and lakes to catch whitefish, as well as grayling, pike, lake trout, and burbot. One such net (2-inch mesh) set overnight at Old John Lake near Arctic Village in November of 1980 yielded 2 large lake trout, 8 pike, and 15 whitefish. In the summer, 20 to 30 whitefish can be readily caught each day in a gillnet in many areas. A variety of nets may be used depending upon fishing locations and species sought. One Arctic Village man has six nets of varying size and length for particular fishing locations and species. At one particular spring fishing site he spreads mud on the top of the ice to speed the thawing process so that he can place his whitefish net in the lake.

Hook-and-line fishing provides residents with grayling, burbot, and pike during the summer. In the early and late winter people "jig" with a hook for grayling, pike, and sheefish, especially near the confluence of small streams and

larger rivers. A Chalkyitsik man caught 15 grayling through the ice in one three-hour period during November of 1981 in this manner. In other villages fishermen report catching 50 or more grayling per day. These fish are often distributed to several households in the community. Set hooks are also placed under the ice in rivers and lakes to catch burbot, pike, and lake trout.

The harvest of salmon in the region for non-commercial purposes declined substantially during the 1960s and early 1970s, due in part to the decline in the use of dogs for transportation (Alaska Department of Fish and Game, Division of Commercial Fisheries 1980). For example, the average number of chum salmon caught annually by Fort Yukon residents between 1961 and 1965 was 18,707. The equivalent annual catch dropped to 5,840 between 1966 and 1970. The decline in harvest was so pronounced, in fact, that Nelson (1973:70) observed that "a major institution of native Alaska, the summer fishcamp, has now almost disappeared. And soon the rows of drying racks, heavily laden with thousands of split and drying fish, will exist only in the stories of the old people." Ten years later (between 1976 and 1980), however, the equivalent annual catch had risen to 13,289 (Table 9).

TABLE 9

COMPARATIVE FIVE-YEAR CHUM SALMON HARVESTS
FOR FORT YUKON, ALASKA 1961-1980

Period	Total Chum Salmon Harvested	Average Annual Harvest Over Five-Year Period
1961 through 1965	93,535	18,707
1966 through 1970	29,199	5,840
1971 through 1975	27,769	5,554
1976 through 1980	66,447	13,289

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries 1980

Factors cited by local informants as contributing to the rebound in salmon harvests include growing costs of both human and dog food, the increasing number of dogs in the region, fluctuating involvement of local households in the wage economy, and the relative efficiency of obtaining salmon during years when they are abundant.

Fluctuations in resident fish populations as well as run size of anadromous species is not uncommon even for a resource generally as reliable as fish. In 1920, Hudson Stuck (1920:15) provided this account of a shortage of chum salmon:

> This year dog-food was exceedingly scarce. The salmon run, upon which dog-food entirely, and man-food largely, depends had been a partial failure in the previous summer. During the early summer, when the King Salmon ran, the Yukon had been persistently bank-full...The later runs of silver and dog-salmon scarce came at all--for what mysterious reason no one knows--and the whole fish catch had been the least within recent recollection.

Twenty years later Fitzgerald (1944:240), in his description of the environmental setting of the Porcupine Valley, reported that:

> ...in former years salmon were taken in great numbers along the Porcupine River, but the run has steadily decreased, and in recent years few are caught at any of the camps above the Lower Ramparts.

FURBEARERS

The Upper Yukon-Porcupine region has historically been one of the finest and most productive trapping regions in Alaska. Over 36,000 lakes and ponds in the Yukon Flats alone provide habitat for beaver, muskrat, mink, and land otter (U.S. Department of the Interior, Alaska Planning Group 1974e:40). Marten, wolverine, lynx, foxes and wolves are found in the Yukon Flats and surrounding uplands. Particular microenvironments are known for their abundance of certain species. Specific foothill areas, for example, are known throughout the region as "good marten country". Certain valleys reportedly are consistently productive trapping areas during the peak of lynx cycles.

Given this abundance, it is no wonder that for more than one hundred years trapping has been a significant economic, social, and cultural component of the way of life in the region. Trapping of furbearers is a valued source of income, cash obtained from the sale of furs allows trappers to obtain the equipment necessary to continue a way of life centered around harvest of wild resources. Meat from furbearers such as beaver, muskrat, and lynx is prized for its nutritional value. Additionally, certain pelts are used locally in the manufacture of clothing or handicrafts.

The pursuit of fur animals goes beyond simply economic and nutritional need. The successful trapper must have a wide-ranging knowledge of animal behavior, the intricacies of local geography, trapping techniques, winter transportation, resource cycles, and fur markets. The skills of a trapper are the skills associated with survival of many generations in the boreal forest. Trapping, therefore, reflects the integrity of longstanding human ecological relationships and is valued as both an economic and a cultural activity.

The significance of trapping in the economy of the region appears to have declined somewhat from earlier years. Fur prices apparently have an influence upon the extent of trapping activity. For example, the highest earnings of a Chalkyitsik trapper during 1969-1970 totalled 3,000 dollars (Nelson 1973:167). During 1980-81, however, unusual resource abundance and fur prices enabled a few exceptional trappers to make nearly 20 times that amount.

In 1981-82 marten (tsuk) were one of the most lucrative fur resources in the region. Generally found in more hilly country, marten are relatively easy to catch in "cubby" or "pole" sets using small number 1 or 1-1/2 steel traps. Marten pelts brought an average of 30 to 40 dollars each during this period, making it possible for even average trappers to obtain an income of at least several thousand dollars. It was not uncommon for a trapper during 1981-82 to catch 40 to 60 marten or more, and several reported taking over 200.

Lynx (ninjii) provided a major portion of a few trappers' incomes in 1981-82 and were an important supplement to the income of many others. Prices of 300 to 400 dollars were obtained for large lynx, and a few exceptionally skilled trappers harvested over 100 each in particularly productive areas. More commonly, a trapper might obtain about 10 lynx, complementing a diversified catch. One particularly successful lynx trapper in the region has four main trails on his trapline which require more than a week to establish each fall. He travels two or three days by dog team to check each trail on his line, using more than 200 traps and snares. A typical regimen involves checking lines for four to six days, with a subsequent layover of several days to skin fur and attend to camp duties.

Adult lynx are commonly taken in the early winter. More small "cats" are caught from January to March when lynx are moving around with their young. An early (December) harvest of younger, smaller lynx in 1981-82 caused several Upper Yukon-Porcupine trappers to speculate that lynx populations would soon decline. Lynx fur usually remains "prime" until the middle or end of March in the region. Lynx meat is quite often used both for human and/or dog food; it is often compared to turkey in flavor and texture.

Mink (chihdzuu) are trapped throughout the Yukon Flats, usually in the vicinity of lakes, ponds, rivers, and sloughs. Often they are found in conjunction with muskrats, a favored prey species. Trappers pursue mink most actively in the early winter when the fur is in prime condition. Cubby sets with number 1 or 1-1/2 traps are commonly used. In 1981-82 trappers obtained from 20 to 30 dollars for each mink pelt. Carcasses are generally not used except on occasion as dog food.

Beaver (tsee') are usually trapped and snared in February and March when the days are long and the weather is good for traveling. However, they are also taken in the fall, usually November, and as needed during other times of the year for food. Both snares and traps are used to harvest beaver. On

occasion they may also be shot with a rifle. The trapping and snaring of beaver requires considerable effort and knowledge of both animal behavior and local geography (Nelson 1973:249-261). Most informants report that beaver populations appear to be both increasing and expanding their range. Beaver have recently been taken north of Arctic Village near the Junjik River where previously, according to residents, they were rarely found.

Prices obtained for beaver pelts are not substantially greater than those obtained for species such as marten, which are more easily caught. When queried about the relatively intensive effort required to snare beaver through thick ice versus the ease of catching marten, a Fort Yukon trapper noted that beaver provide a variety of products. Pelts are sold or used for clothing, while the meat is quite fat and delicious. Beaver castor is also an important component in trapping bait, and beaver meat is in demand as a high-quality food for dog teams.

Muskrat (dzan) are found in lakes, rivers, and sloughs throughout the region, and are a primary focus for spring resource harvest activities. Muskrat trapping usually begins in March, when muskrat "push-ups" are visible on lake ice. Once "push-ups" are located, traps are placed inside and checked daily. Up to 250 sets may be made on a good rat lake (Nelson 1973:266). Traps are also set on feeding platforms in late spring, summer and fall.

Muskrat hunting begins as the spring thaw advances. In April hunters often shoot muskrats with .22 rifles from canoes as the animals are resting on the edge of lake ice. In May or early June a canoe-borne hunter can attract muskrats to within easy shooting range by producing a low squeaking noise similar to the sound a "rat" makes during the mating season. A good hunter learns to shoot a muskrat in the head so as not to decrease the value of the pelt.

During May of 1980 the author spent time at a muskrat camp on Beaver Creek with four Fort Yukon men. The night-long "twilight" was a time of active rat

hunting, while days were spent resting, skinning muskrats, fixing equipment, and tending to camp duties. One night's hunting by two of the men, each paddling a light-weight canvas-covered "rat canoe", yielded 100 muskrats, nearly all of which were shot through the head.

After they are harvested, muskrats are brought back to camp where they are skinned, the pelts stretched, and the carcasses gutted and hung to dry. The meat is used for human food or is sometimes fed to dogs. Tails are sometimes roasted over an open fire and then chewed as a treat by children. Muskrat pelts are also used for clothing.

Muskrat pelts brought between 4 and 6 dollars in 1981, in contrast to prices of a dollar or less recorded by Nelson (1973:270) in 1969. Increased prices have reportedly stirred renewed interest in muskrat harvest in recent years. Data from King et al. (1970) indicate that, on the average, approximately 35,800 muskrats were taken annually from the Yukon Flats between 1925 and 1962.

Other fur species harvested in the Upper Yukon-Porcupine region include wolverine (natryah), wolf (zhoh), red and cross fox (neegǫǫ tsoo and neegǫǫ neelzhrąįį), and land otter (tryah). Wolverine are generally found in upland areas surrounding the Yukon Flats; it is not uncommon for trappers on the upper Black, Porcupine, and Sheenjek rivers to catch up to 10 wolverines in any one year. Pelts are sold to fur buyers or used for parka ruffs and trim. Wolves are found throughout the region but, according to local residents, are not abundant. Near Arctic Village and Venetie, wolves are reported to be more common when caribou are present on their winter range. Wolves are taken using both traps and snares and with rifles. Wolf pelts are generally sold to fur buyers or are cut to make ruffs for parkas.

Foxes are ubiquitous in the Upper Yukon-Porcupine region and are trapped, snared, or shot when encountered. Number 2 and 3 traps are most commonly used

for fox; number 1 or 2 snares are also used. Sets are frequently made for fox near moose or caribou kill sites, where they often scavenge for food.

Red foxes are reported to be particularly abundant along the East Fork of the Chandalar River north of Arctic Village. In summer people enjoy watching adult animals with their kits and occasionally leave food scraps for them along the riverbank. Arctic foxes (ch'iky'aa) are rarely trapped in the region. One trapper on the upper Black River reportedly caught one some years ago, as did a trapper near Fort Yukon. River otter, too, are trapped only occasionally.

FUEL AND STRUCTURAL MATERIALS

White spruce (ts'iivii), found principally along major rivers in the Upper Yukon-Porcupine region, is used extensively for firewood, house logs, lumber, canoe frames, antenna poles, snare toggles, and many other purposes (Nelson 1977:207). Spruce boughs, pitch, bark, and roots also serve a variety of purposes, from tent floor coverings to medicinal uses. Nelson believes that "it is likely that more time and effort are devoted to the use of [white spruce] than to any other [resource], plant or animal, that is harvested by interior villages" (Nelson 1977:208).

After a decline during the last decade, the use of white spruce for both fuel and houselogs appears to be expanding in most of the study communities. Many households had converted to oil heat during the 1960s and early 1970s when fuel prices were relatively low. In recent years many households have returned to heating with wood, both because of cost and heating efficiency. Nearly all homes in Arctic Village, Venetie, and Chalkyitsik are heated with wood. In Birch Creek most homes are oil heated, while in Fort Yukon both oil and wood are used.

Firewood is generally gathered in winter using a snowmachine and toboggan, although trucks or all-terrain vehicles are also used. During spring, summer, and fall, when river transportation is possible, boats are used to transport

firewood or houselogs. Wood is either carried in the boat or is gathered into "rafts" which are floated to the community.

Locally-obtained spruce logs are used for construction of many new houses in the region. For example, a community-wide housing program in Venetie utilized logs obtained several miles up the Chandalar River. In addition, a new community hall and church in Venetie, as well as a community hall in Arctic Village, are also being constructed of spruce logs hauled in by a bulldozer and sled. Many local residents have expressed dissatisfaction with the heating efficiency of homes built of prefabricated materials in the past under government housing programs. Recent programs have encouraged the use of logs in home construction.

Paper birch (aat'oo) is an indigenous hardwood used occasionally for firewood but more often in the manufacture of equipment such as snowshoes, sleds, and toboggans. Straight-grained birch trees are particularly valued for these uses, and residents in most communities know the location of nearby stands of birch where these trees may be found. Birch is rare around Arctic Village, however, and residents sometimes look to relatives in Venetie to provide birch for snowshoes and sleds. Birch bark is used as tinder for starting fires and in making handicrafts. It is no longer used in the manufacture of canoes.

Balsam poplar and quaking aspen (t'aa) are used principally for smoking meat and fish and occasionally as firewood. Willow species (k'aii) and alder (k'oh) are used in the same way, as well as for smudges against insects and for the cooking of dog food (Nelson 1977:209). Willows are used both for smoking moose hides and for making a frame used in the tanning process. Before steel tools became available, willow and alder species were used as firewood because they were easily cut (Nelson 1977:209). Willow is also used for medicinal purposes.

VEGETATION

The principal species of vegetation used by local residents include bog blueberry (jak), lowbush cranberry (natʔ'at), highbush cranberry (trahkyaa), rosehips (nitsih), bearberry (dandaih), crowberry (deenich'uh), nagoonberry (nakaʔ), wild rhubarb (ts'iignu), "Indian potato" (trih), and labrador tea (ledii masket). Not all species are uniformly distributed through the region, however. For example, blueberries are more commonly found in upland areas near Arctic Village and Venetie. Wild rhubarb is abundant along the banks of streams and sloughs in the Yukon Flats. Lowbush cranberries and rosehips can be found throughout the region. The nagoonberry is most prevalent near Arctic Village. Berries are usually picked in July, August, or September and are generally eaten fresh, frozen, or are used in making jam.

Native medicinal practices, little known to those outside local communities, require certain plant materials. Spruce pitch, for example, is used on cuts, infection, and sores (Nelson 1973:37). Boschniakia rossica, known to the Gwich'in as dee'ii'ahshii, is used in making a medicinal steam bath. Leaves of another unidentified plant, called deenich'uh t'an, are boiled to make a juice which, when consumed, eases coughing.

Also used for medicine is powdery rock called tʔy'ah ky'uu, locally referred to as the "legend rock." Hadleigh-West (1963:86) suggests that this may be an arsenophyrite. Chalkyitsik residents report that, near their community, this rock is found only at certain places along the Porcupine River by those said to have a "special power." The rock is scraped to obtain a fine brownish-tan powder. Thongs of tanned skins are then soaked in a solution made by mixing the powder with water and wrapped around joints to cure arthritis and rheumatism. The powder is also used to make a medicinal tea.

Some local residents are reluctant to discuss the healing powers of "Indian medicine" for fear of ridicule or criticism from those who practice Western medicine. During the course of this research, the use of tʔy'ah ky'uu was

initially described by an older person as something done only in the past. During a subsequent visit, however, this person brought out a well-used sample -- carefully wrapped in plastic and newspaper -- and described its contemporary use. During his work in Chalkyitsik, Nelson (1973:41) noted that Indian and Western medicine were commonly used side-by-side. However, predictions that these usages of medicinal and food plants would disappear "in the near future" apparently have not proved true.

PLATE 4 Arctic Village Elder Spotting Caribou.

PLATE 5 Hitching Up a Dog Team in Arctic Village.

CHAPTER 4

ARCTIC VILLAGE LAND AND RESOURCE USE

ENVIRONMENTAL SETTING

Arctic Village (Vashrąjį K'ǫǫ), located at 68° 08'N latitude, 145° 31'W longitude, is situated in a broad river valley along the East Fork of the Chandalar River. The community differs from other Upper Yukon-Porcupine communities in that it is surrounded by the rugged mountains of the eastern Brooks Range which rise to heights of 6,000 feet. The Gwich'in name for the community means "steep bank creek," which refers to a small tributary of the East Fork, adjacent to the community, known for its abundant fish populations. Other nearby tributaries include the Junjik River, Smoke Creek, Ottertail Creek, and the Wind River.

Surrounding the community is a diverse and rich array of habitats. In the lowlands along the East Fork are an abundance of lakes and sloughs which support a variety of floral and faunal resources including waterfowl, muskrat, beaver, grayling, pike, and seasonally-abundant populations of whitefish. Riverine environments support populations of moose, hares, and other animals, while upland forest areas provide habitat for furbearers such as marten.

Nearby mountainous regions support certain tundra habitat types, fostering populations of sheep, ground squirrels, and perhaps most importantly, caribou. Old John Lake, a glacially-formed water body 5 miles long, is located 11 miles southeast of Arctic Village. It offers a productive source of lake trout, whitefish, and pike, and is located in the heart of the area used by the Porcupine Caribou Herd during its migrations.

LAND USE PATTERNS OVER TIME

The people of Arctic Village are members of the Neets'ąjį Gwich'in band, which historically has also been referred to as the Chandalar Kutchin, a

derivation from the French, "gens du large." The Neets'ąjį Gwich'in refer to themselves as a mountain people, differentiating from those living in the Yukon Flats to the south. Arctic Village people refer to their homeland as Neets'ąjį (Hadleigh-West 1959:xii).

The aboriginal territory of the Neets'ąjį Gwich'in had extended to the Coleen River (Hadleigh-West 1963:12, 268), and perhaps even to the Porcupine River (Dall 1970:430). McKennan (1965:16) cites the crest of the Brooks Range as the northern ecological boundary for the Gwich'in. The western boundaries of this territory did not extend into the Middle Fork of the Chandalar River, an area previously occupied by the Dihaii Gwich'in (McKennan 1965:16).

Archeological evidence has been uncovered at Old John Lake, located within the Neets'ąjį homeland, which exhibited similarities to other artifacts dating to perhaps 4,500 B.C. (Andrews 1977:118). Locations of caribou fences, caches, and meat butchering structures dating from the early historic period and probably earlier were documented by Warbelow et al. (1975). The Neets'ąjį Gwich'in, furthermore, have extensive oral traditions pertaining to their ancestors, the legendary past, and events which have taken place in their homeland (McKennan 1965; Peter 1981; Tritt n.d.).

Probably the first Euroamerican to visit the homeland of the Neets'-ąjį Gwich'in was Archdeacon Robert McDonald of the Anglican Church, who lived in Fort Yukon from 1862 to 1871 (Peake 1975:57, 59). Noting that the "Gens du Large" were apparently important providers of caribou meat for the fledgling settlement of Fort Yukon, McDonald decided to visit their camps in the spring of 1863. After three days of travel by dog team from Fort Yukon, the party "reached the deer spring-barriere [caribou fence] at sunset, and there found about half of the Gens du Large indians, from all of whom, [we] received a hearty welcome" (n.d.:20 March 1863). He went on to report that:

> the indians [are] encamped in a deep valley surrounded by mountains whose peaks tower up to the height of about 1500

> feet or more. The view around is grand. I take my stay among the Netsi Kutchin for a month or so. (n.d.:24 March 1863)

In a later journal entry, events which took place when the Neets'ąjį Gwich'in traveled on a trading expedition to the Arctic coast were documented:

> Francois Boucher and a party of indians returned from the seacoast. They saw one lodge of Eskimo, occupied by two men, two women, and two boys. They learnt from them that a ship was wrecked near the shore last autumn, but that the whole of the crew were saved, that they were rescued by another ship which wintered, as the Eskimo believe, about forty miles distant from their lodge--they had an arduous journey. The weather was cold, and without a fire the camps were wretched. (n.d.:11 April 1863)

The journals of the Reverend Albert Tritt (n.d.), a Neets'ąjį Gwich'in man born near the Sheenjek River in 1880, provide a glimpse into the early contact history of his people. Tritt's journals describe travels of Arctic Village people to Rampart House, Old Crow, the Arctic coast, the Coleen River, and Fort Yukon during the late 1880s and the 1890s. Families were also living on the Sheenjek River ("Salmon River") at that time. The first rifles used by the Neets'ąjį Gwich'in, according to Tritt, were obtained around 1889 through trading with the Inupiat to the north. After that time families which may have previously dispersed to caribou fences in the fall and winter apparently remained together because only a few rifles were available. Hadleigh-West reports that the first permanent residence was built at Arctic Village by Chief Christian in about 1908 (1963:223).

Trading relationships with the Inupiat to the north continued into the twentieth century (McKennan 1965:25). In 1909, Tritt reported that:

> everybody stayed over at Old John Lake and [had] a big feast. There were lots of people. Chief Christian made a potlatch. I made potlatch on Christmas, all Eskimo people was there that time. Old John was a layreader and I'm a fiddleman. (Tritt n.d.)

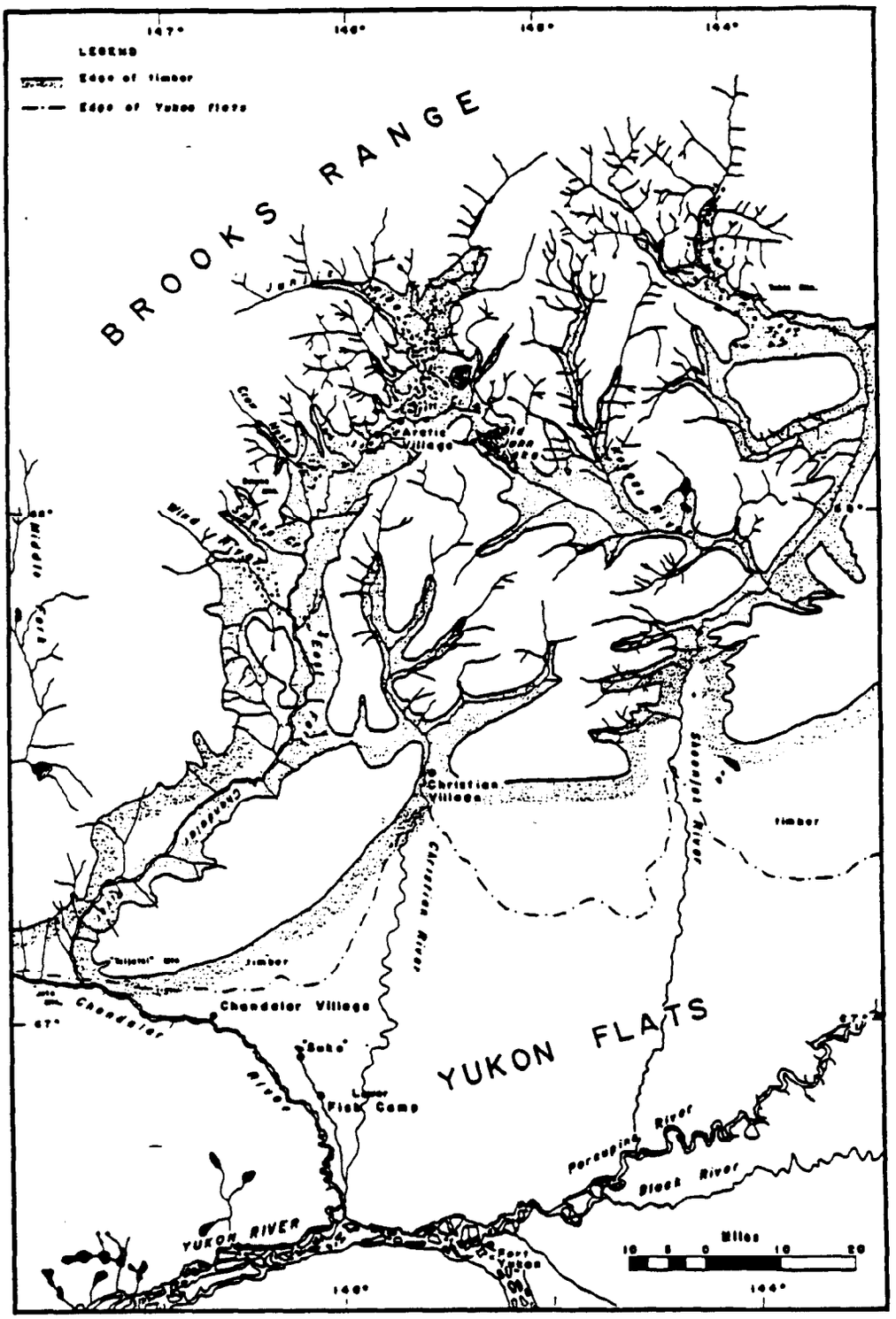
Edington's vivid account of the journey of Deputy Marshal Hansen to the contact the Neets'ąjį Gwich'in in 1910 reports that Inupiat were trading with the Indians, probably at Old John Lake (Edington 1930). Tritt reported visiting a

camp of 46 Inupiat living on the Sheenjek River at the mouth of Eskimo Creek in April 1930 (Andrews 1977:254). The last visit to the Arctic coast by Arctic Village residents on a traditional trading visit apparently occurred in the early 1920s (I. Tritt, Sr., personal communication, November 1980).

As firearms became more available after the turn of the century, the use of caribou fences reportedly declined (McKennan 1965; Warbelow et al. 1975:5). At the same time water transportation became more prevalent, providing new means of resource procurement (Hadleigh-West 1963:225). The organization of hunting groups changed as new technology was adopted, and large groups of people were no longer needed at the caribou fences. Also about the turn of the century some of the Neets'ąjį Gwich'in moved into the Yukon Flats to take up residence at a small settlement called T'sukǫǫ (McKennan 1965:16). Even though new technology was adopted by the Neets'ąjį Gwich'in, it is evident that patterns of extensive traditional land use persisted and that a strong attachment to their homeland remained. Evidence of this is provided by Alaska Game Commission wildlife agent Sam O. White, who lived in Fort Yukon during the 1920s. According to White:

> The Christian River tribe of indians was a fair sized bunch, probably 150 or 200 indians. At that time (mid-1920's) they were known to be most unfriendly to white men. They allowed no whites encroaching on their hunting and trapping grounds. Game and fur was plentiful, especially the ever present caribou. The white trappers of Fort Yukon respected the boundaries of their hunting grounds and did not interfere....(White n.d.)

Traditional resource use patterns of the Neets'ąjį Gwich'in remained largely intact at the time of McKennan's visit in 1933 (1965:28). At that time members of the band were living in three separate groups and had semi-permanent settlements at Arctic Village, Christian Village, and Venetie (McKennan 1965:19-20) (Map 8). Hunting and trapping activities at that time were centered around the East Fork of the Chandalar River and extended to the Christian River, Old John Lake, and the Koness River.



Map 8: Territory of the Chandalar Gwich'in, 1920s
(after Mertie, 1929)

In the late 1930s and 1940s several Neets'ąjj Gwich'in families lived at Sheenjek Village, a settlement located on the west bank of the Sheenjek River below White Snow Mountain (Zhah drin). Occupied until it was flooded in the 1940s, the settlement offered access to prime trapping, fishing, and hunting areas and was accessible by boat to Fort Yukon. Trails from Sheenjek Village led to Vundik Lake, Old Rampart, Christian Village, and Arctic Village (Andrews 1977:264).

Until the middle of the twentieth century, the Neets'ąjj Gwich'in continued a highly mobile way of life, utilizing semi-permanent settlements such as Arctic, Christian, Venetie and Sheenjek villages as well as seasonal camps at places such as Old John Lake, Wind River, T'sukǫǫ, Caribou House, T'eet'ree, and the Koness River. Occasionally families would move to Fort Yukon or Venetie for a period of time and then return to their homeland (Hadleigh-West 1963:17). While Mertie (1929:111) reported encountering no permanent settlements on the Sheenjek and Coleen rivers during his summer journey in the area in 1926, for example, it is clear that these areas were used prior to that at least on a seasonal basis.

The mobility and extent of traditional land use of the Neets'ąjj Gwich'in is reflected in the autobiography of Mrs. Katherine Peter, who lived in the Arctic Village area from the 1930s to the 1950s. Writing of life in the late 1930s, she notes:

> At that time [1937] there was no school and the men traveled around whenever the hunting was good. James Gilbert and his family, Gilbert Joseph and his wife, Sarah Simon and her children, Moses Sam and his family, and Gabriel Peter and his wife, these people were living around Christian Village and Round Mountain. From January 1937 on we did not see our territory again. We lived at Arctic Village and only the men went out in the territory...Then in May, the men gathered in one place, they all gathered in Arctic Village. From there they went up among the lakes for muskrat. Sometimes the families went too...About the middle of June, they were through hunting muskrats. Then they went to Arctic Village, in one place for the summer. They lived there until they would see the caribou. Meanwhile, on the lakes of the area, along the river, and along

> the creeks they set fishnets. All the time they scanned the territory with fieldglasses for caribou. (Peter 1981: 42-44)

A significant political event which would later influence land use patterns was the creation in 1943 of the 1.48-million-acre Chandalar Native Reserve, which included lands between Arctic Village, Christian Village, "Kachick" (K'aatsik), and Venetie (Lonner and Beard 1982:101). Largely through the efforts of John Fredson, a Native leader originally from Venetie, the reservation was established under provisions of the Indian Reorganization Act of 1934 (amended in 1936). Although residents voted to accept the Reserve in 1944, they petitioned the Department of the Interior in 1950 and again in 1957 to include lands to the north and west of the reservation. These lands were reportedly used for hunting, fishing, and trapping but had been left out of the original Reserve (Lonner and Beard 1982:101).

Continued traditional use of the Sheenjek River valley in the 1950s was indicated by naturalist Olaus Murie's encounter there in 1956 with two Arctic Village residents. Murie was there to assess the area's potential for a wildlife refuge (Murie n.d.). Trappers from Arctic Village have continued to use the Sheenjek River periodically up to the present time. Hadleigh-West (1963:268) noted, however, that by the 1960s the Neets'ąjį Gwich'in seldom traveled as far as the Coleen River.

Environmental studies related to the proposed Alaskan Arctic Gas Pipeline project, conducted during the early 1970s, resulted in a brief description of land use by Arctic Village residents, which included "longstanding" use of Flatrock, Cane, and Red Sheep creek drainages for sheep hunting, and the use of both the Chandalar and Sheenjek drainages for trapping and hunting (Jakimchuk 1974:39). Also during this time, Warbelow et al. (1975) documented the location of caribou fences and related structures.

By the early 1970s the use of dog teams for the harvest of resources had largely been supplanted by the use of snowmachines. The speed and range of

the snowmachine allowed resource users to travel great distances in much less time, albeit with some risk of becoming stranded by mechanical breakdown. The decline of dog teams also resulted in a reduction in the use of fish and caribou for dog food. At the same time, the need for cash increased, to allow purchase of a machine, gasoline, oil, and spare parts. However, in the late 1970s the number of dogs appeared to be once again on the increase, primarily for use in racing but also for checking traplines. In February 1981 there were approximately 60 working dogs in Arctic Village, and at least one musher flew to Fort Yukon to spend several weeks fishing for dog salmon to feed his team.

The enactment of the Alaska Native Claims Settlement Act (ANCSA) in 1971 affected the land status of the Chandalar Native Reserve by revoking Native reservations, extinguishing claims based upon aboriginal title relating to use and occupancy including hunting and fishing rights, and providing an option under which villages within existing Native reserves could obtain title to those lands (Lonnner and Beard 1982:102-3). Arctic Village joined Venetie in selecting the Reserve lands and jointly transferred their lands to the "Native Village of Venetie Tribal Government" in 1979 (Abeita 1980). In 1981 the tribal government again claimed an additional 3.4 million acres north and west of the former reservation lands based upon the previous 1950 and 1957 petitions to the Department of the Interior (Lonner and Beard 1982:102-3).

THE CONTEMPORARY COMMUNITY

In 1980, Arctic Village had a population of approximately 111 people (U.S. Bureau of the Census 1980). Facilities located in the village include the following: an elementary and high school serving about 40 students operated by the Yukon Flats School District; a village-owned store; a Public Health Service clinic; a post office; a laundry and shower facility (presently inoperable); a generator building; a community-operated lodge; a National Guard

armory; a community hall; the village council office; an Episcopal church; and a mission house. The community's 5,200-foot gravel airstrip has recently undergone major improvements. A gravel road connects the community with the airstrip and also extends east to the base of a nearby ridge. Water is currently carried from the Chandalar River. A system which provided lake water for domestic use froze in 1979 and remains inoperable. Solid waste is disposed of at a nearby dump, while sewage is collected in honey buckets and privies.

An electrification project begun in 1980 has expanded service to most households in the community at an initial monthly cost of 50 dollars each. Telephone service consists of a single Alascom phone in the council office, although plans are underway to expand this to individual homes. The Public Health Service clinic has a radiophone for emergency medical calls. Television was introduced in the community in 1981 and nearly all households now have a television set.

Full and part-time employment opportunities are limited, but include: a postmaster; school and village maintenance workers; a health aide, a store manager and assistant; three bilingual teaching aides; a council office manager; a school cook; and a National Guard armory caretaker. In 1981 seven men received income for National Guard training undertaken during the year. Other residents have received income as seasonal workers on construction projects, wildlife surveys, firefighting crews, or homemaking projects. In 1980 and 1981 up to six residents were working from July to September operating bulldozers, graders, or scrapers on the airport improvements project.

Unemployment insurance payments, social security benefits, and state welfare payments for Arctic Village residents totalled $34,540 in 1979 (Louis Berger and Associates 1982:2:37-39). Some households received foodstamps, which contributed to household buying power. Certain individuals also sold firewood at $35 a toboggan-load (about one-eighth cord), while others made

PLATE 6 Packing Caribou Near Old John Lake.

income through the sale of beadwork and handicrafts. Income derived from the sale of fur obtained through trapping is important for many households.

The cost of living in Arctic Village is substantially higher than Anchorage, Fairbanks, or Fort Yukon. One recent study found prices of food items to be 72 percent higher than those in Anchorage (Lonner and Beard 1982:141). Gasoline cost $4.00 per gallon, and 100 pounds of propane cost $110 in the fall of 1981. In August 1981 a pound of ground beef, when available, cost four dollars. A large box of pilot crackers cost $3.35; 10 pounds of Pillsbury All-Purpose Flour cost $6.50; and 25 pounds of Purina Dog Chow cost $21.30. Only a few residents buy commercial food products directly from Anchorage, Fairbanks, or Fort Yukon; air freight from Fairbanks is 50 cents per pound. The logistics of importing food, furthermore, severely limit the availability of fresh produce. Barges are unable to reach the community because of shallow water. Shipping delays often mean that the store will have only a few canned and dry goods available.

Arctic Village is served by two air carriers, providing service five days per week from Fort Yukon. Generally Cessna 206 and 207 aircraft are used, although larger aircraft are chartered to transport fuel and building materials. Oneway airfare from Arctic Village to Fairbanks costs about $100.

ANNUAL CYCLE

The seasonal cycle of resource harvest activities for Arctic Village from 1970 through 1982 is summarized below (Figure 2). Data presented in this summary are based both upon interviews with resource experts and observations by the researcher. It should be emphasized, however, that only the major activities are included in this summary and that other activities, such as hauling water or gathering firewood, may require considerable amounts of time over the entire year. Furthermore, considerable variation can occur

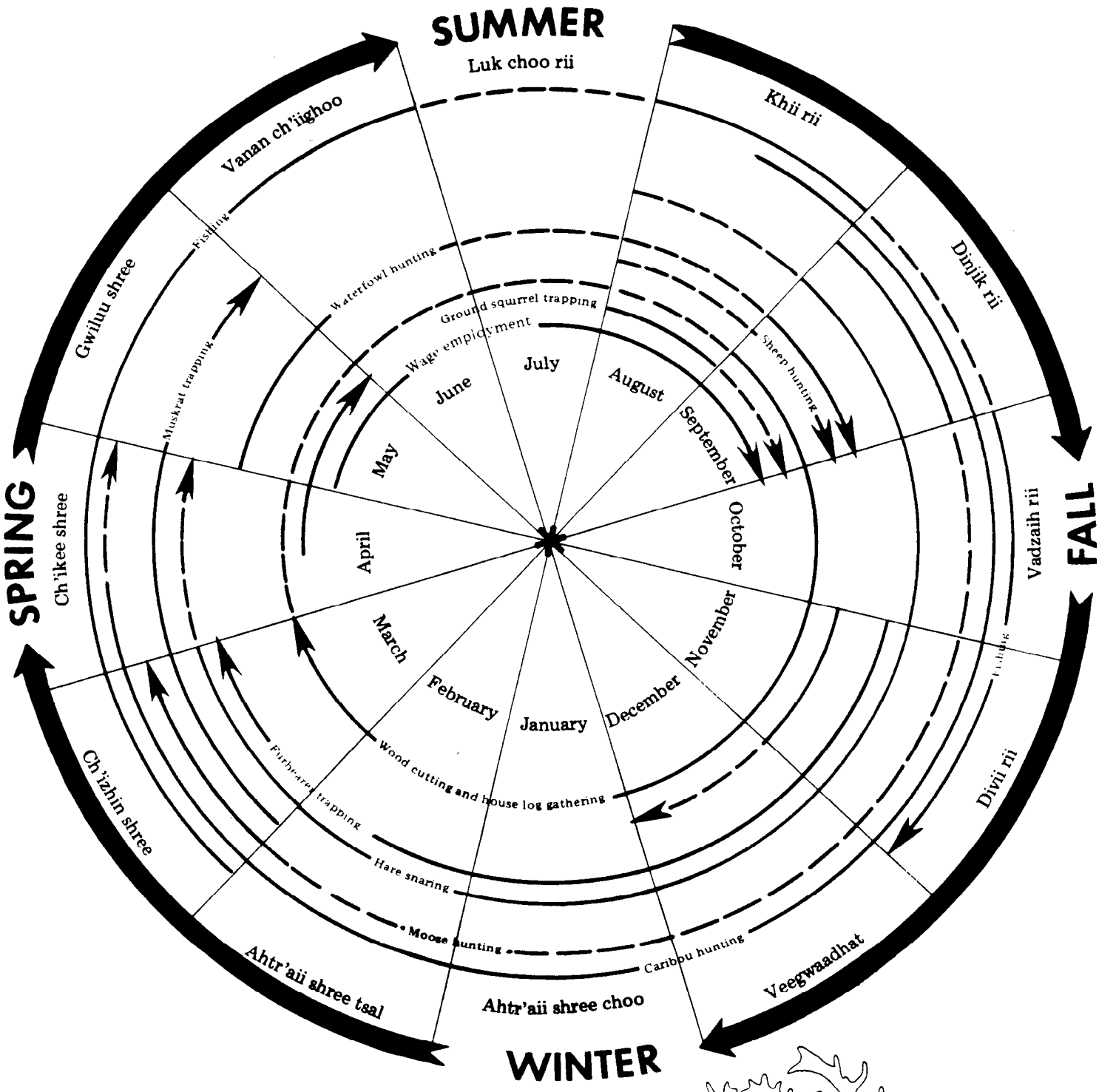


FIGURE 2

Arctic Village
Annual Cycle

Circa 1970-1982

Primary activity

Secondary activity

within the framework of this generalized cycle of activities for any given year.

Spring. Because of its location in the Brooks Range, Arctic Village experiences breakup and the arrival of migratory waterfowl -- traditional indicators that spring has arrived -- later than Yukon Flats communities. Breakup on the Chandalar River usually occurs in late May or early June. Waterfowl hunting begins on lakes and along the Chandalar River as the ice begins to melt. Muskrats are also hunted at this time, and gillnets are placed in rivers and lakes to obtain whitefish, pike, grayling, and suckers. Grayling are often caught in large numbers through the ice using hook-and-line. As warmer weather becomes more prevalent, residents begin construction projects, clean up their community, and begin seasonal wage jobs when available.

Summer. Fishing for whitefish, pike, grayling, suckers, and lake trout are primary summer activities. Both nets and hook-and-lines are used to harvest fish in the Chandalar River and on adjacent creeks and lakes. Old John Lake is an especially important lake for harvesting fish.

Caribou usually are available to Arctic Village residents by the middle of August north and east of the community on treeless ridges and near Old John Lake. Older men scan the countryside with binoculars for the first sign of caribou. Boat travelers on the Chandalar River stop at several wooden towers constructed along the banks to look for the migrating animals. At this time of year, boats are used to hunt caribou along rivers, while hunters on land travel by foot or use all-terrain vehicles.

Gathering of firewood continues throughout the summer for Arctic Village residents. Blueberries, lowbush cranberries, and nagoonberries are also collected. Summer employment on construction projects or firefighting provides cash income for some households.

Fall. The hunting of caribou, moose, ground squirrels, sheep, and waterfowl are primary fall activities. Bull caribou are harvested until freezeup

restricts travel, usually in late September. Moose are harvested using boats on the Chandalar and Junjik rivers. Sheep are sometimes taken, in recent years by traveling to hunting areas by means of chartered aircraft. Ground squirrels are hunted and trapped -- often by women and elderly persons -- on alpine ridges surrounding the community. Waterfowl are occasionally harvested before ice develops on lakes and streams. In addition, "rabbit drives" are sometimes undertaken to flush out hares from willow bars along rivers where they can be harvested for human food. Firewood and berries are gathered.

By late September freeze-up usually has begun, and travel becomes restricted until solid ice and a sufficient snow cover allow travel by snowmachine.

Winter. Once travel by snowmachine becomes possible, usually by mid-October, resource harvest activities expand once again. Caribou hunting resumes through the use of smowmachines. Caribou hunting continues through the winter depending upon local need and availability. Generally, caribou are no longer available to Arctic Village residents after mid- to late April.

Gillnets are placed under the ice on the Chandalar River, on Old John Lake, and on other nearby lakes for grayling, pike, whitefish, burbot, and lake trout. Residents also "jig" for grayling through holes in the ice on the Chandalar River, and use set hooks for pike, burbot, and lake trout. Fishing under the ice usually continues until December, after which the ice becomes too thick for efficient harvesting. Fishing with a hook-and-line for grayling is pursued once again in late winter, usually April and early May.

Sheep hunting takes place by snowmachine in early winter, especially near Ottertail Creek. Sheep meat is kept frozen or dried, and is usually saved for the elderly and for community potlatches.

In November, trappers begin to make sets for marten, fox, wolf, wolverine, and beaver. Some trappers travel long distances by snowmachine and occasionally by chartered airplane with their supplies and equipment to distant trapping areas. In recent years trappers have run lines as far as Alexander's Village,

Christian Village, and the Sheenjek River. Trappers continue checking their lines until about the end of March.

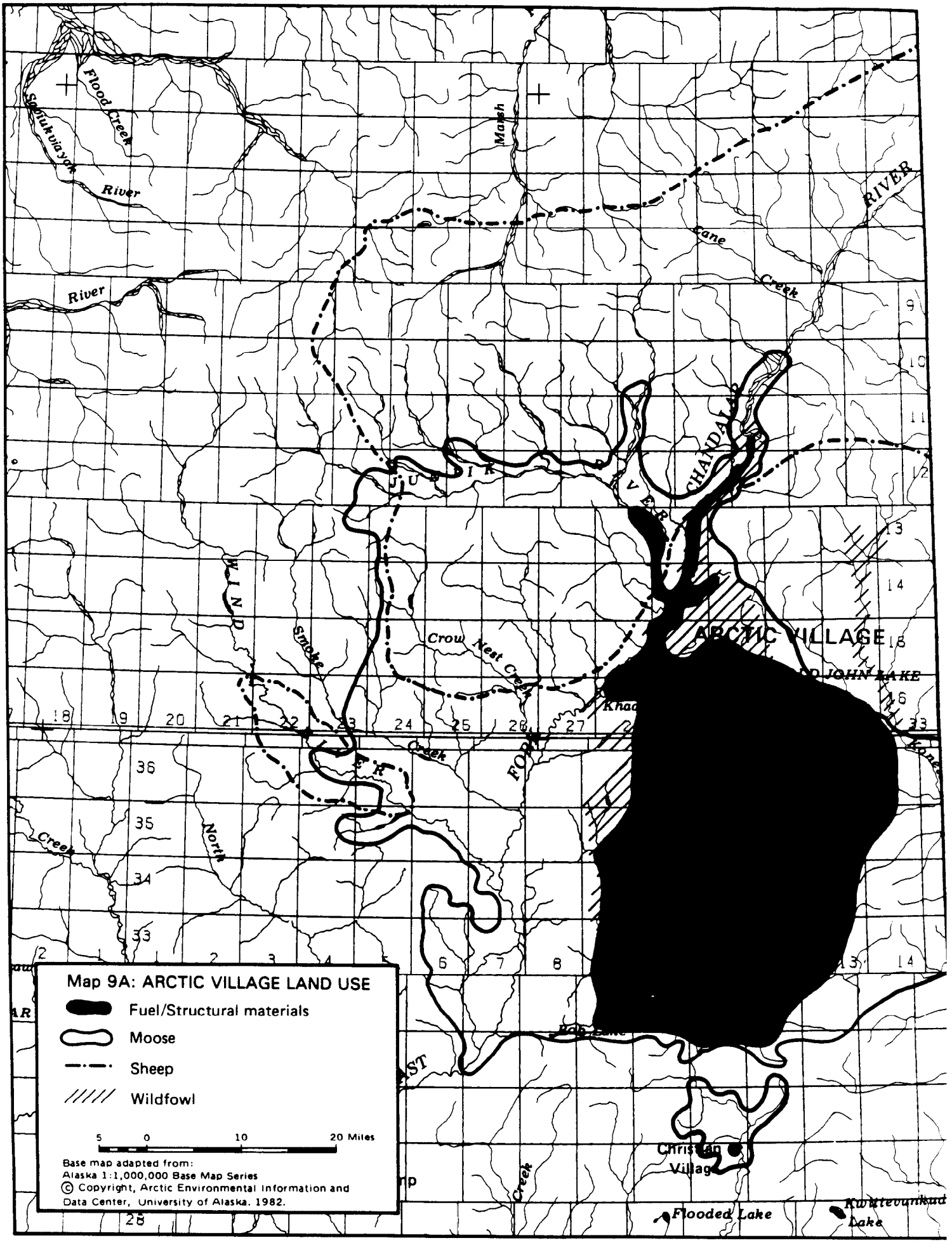
Trapping, snaring, or hunting of small game and fowl such as hares, porcupine, and ptarmigan provide variety to the local diet throughout the winter. Firewood gathering and water hauling also require constant attention in winter.

Late winter activities include spring caribou and occasional moose hunting, muskrat, beaver, and ground squirrel trapping and ptarmigan hunting. House logs are often sledded to the community for use in summer construction projects.

LAND USE SUMMARY

Maps 9A through 9C depict community-based land use during the lifetime of residents in Arctic Village. Factors which appear to have shaped recent land use patterns include the shift to a permanent settlement having a school and a post office, the availability of limited wage employment opportunities and government transfer payments, changes in resource distribution, the use of new technology such as high-powered rifles, outboard motors, and snowmachines, changing demographic patterns, and resource competition. While these and other factors may have influenced recent use patterns, the total area utilized has remained largely consistent with those of the past.

Caribou hunting areas utilized today fall largely within the drainage of the East Fork of the Chandalar River, including the Junjik river and smaller tributary creeks, and the Christian River drainage. Two men traveled by snowmachine, for example, up the Junjik River and over a divide into the drainages of Cane and Red Sheep creeks in 1981 in search of both caribou and sheep. In late summer of 1981 an Arctic Village family camped at the confluence of Red Sheep Creek and the East Fork to harvest both caribou and sheep. Trappers from Arctic Village who have traveled to Christian Village and the Sheenjek River by snowmachine in recent years have also harvested caribou. Arctic


Flood Creek
Sabiukviayak
River
River
Marsh
Lane
Creek
RIVER
CHANDALAR
JUNDIK
RIVER
WIND
Smoke
Crow Nest Creek
ARCTIC VILLAGE
JOHN LAKE
Creek
FORK
North
Creek
Christian Village
Flooded Lake
Kwittevunkud Lake
Map 9A: ARCTIC VILLAGE LAND USE
Fuel/Structural materials
Moose
Sheep
Wildfowl
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
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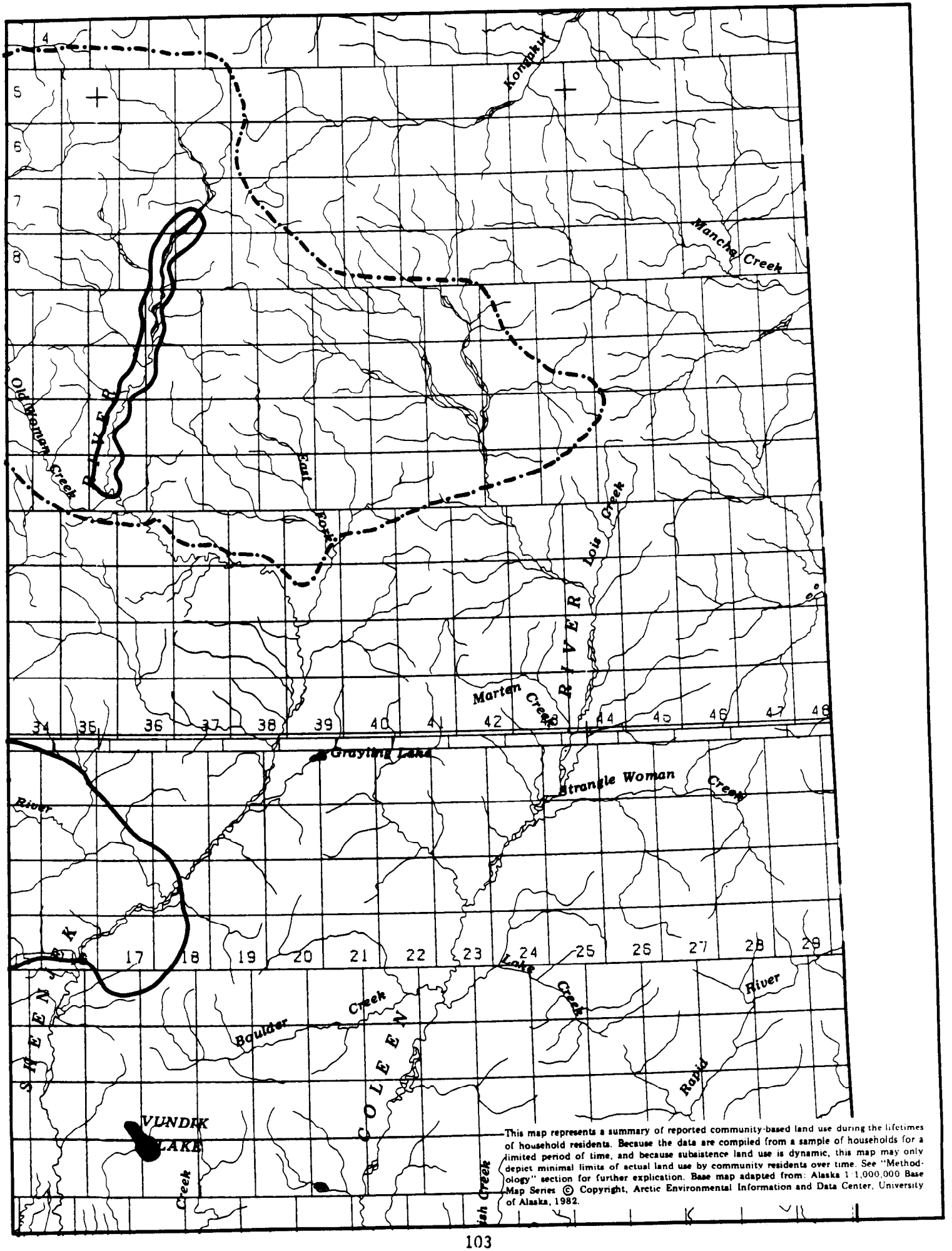
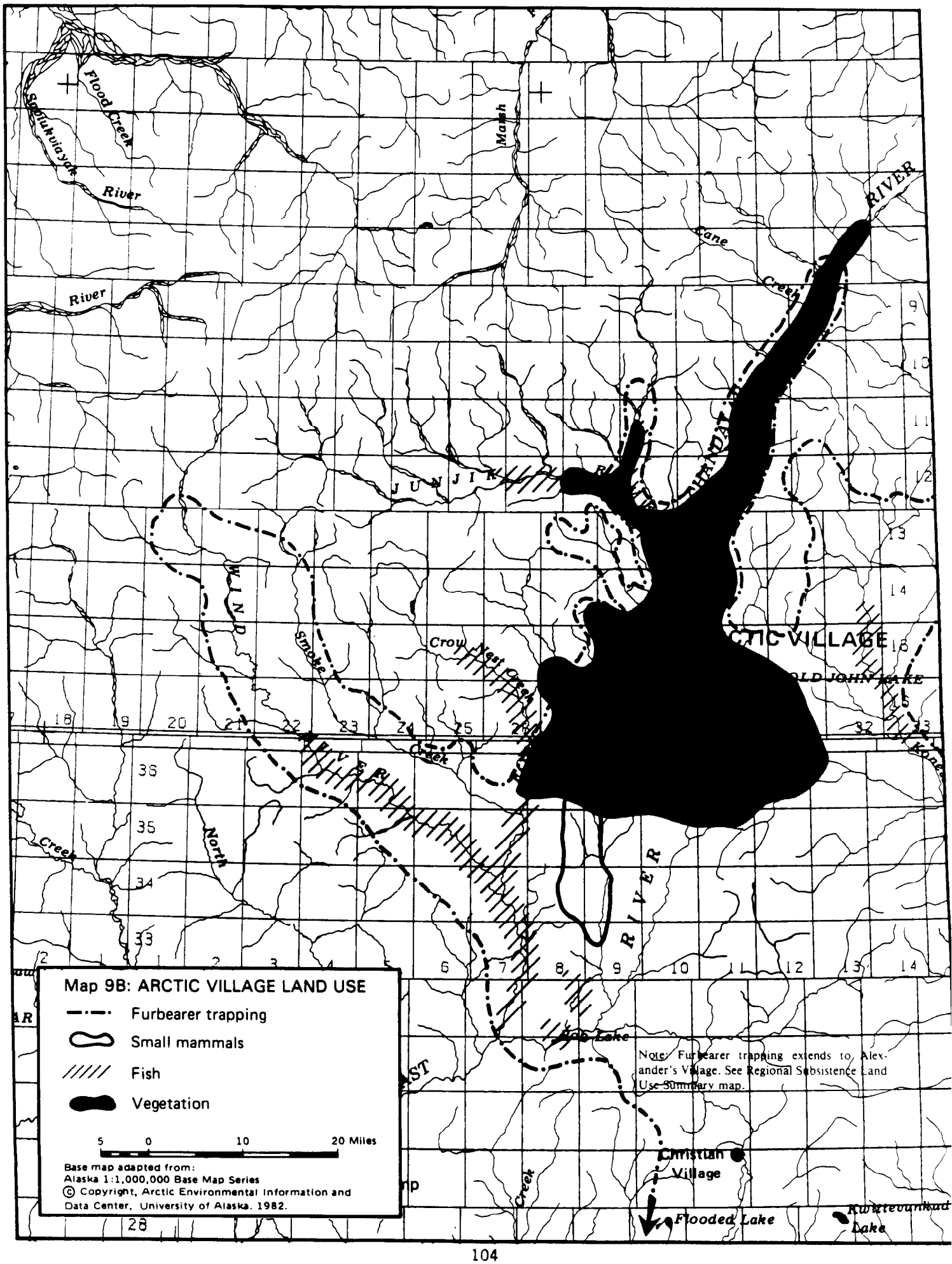
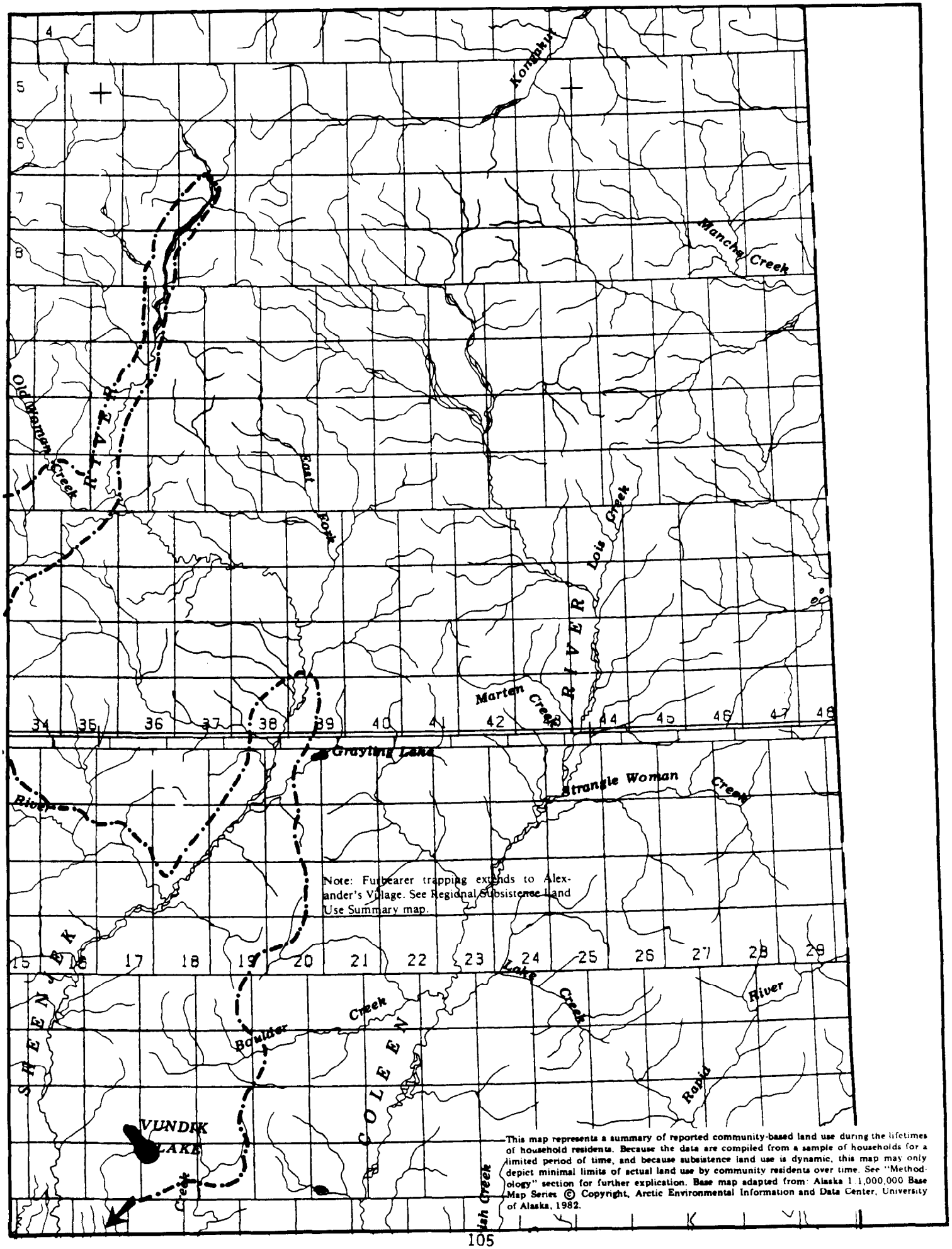


This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.


Flood Creek
Sabiukviayak
River
Marsh
River
Cane
Creek
RIVER
JUNJIK
WIND
Smoke
Crow Nest Creek
Creek
North
Creek
RIVER
ARCTIC VILLAGE
OLD JOHN LAKE
Rob Lake
Christian Village
Flooded Lake
Kwittevunkud Lake
Note: Furbearer trapping extends to Alexander's Village. See Regional Subsistence Land Use Summary map.
Map 9B: ARCTIC VILLAGE LAND USE
Furbearer trapping
Small mammals
Fish
Vegetation
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska. 1982.



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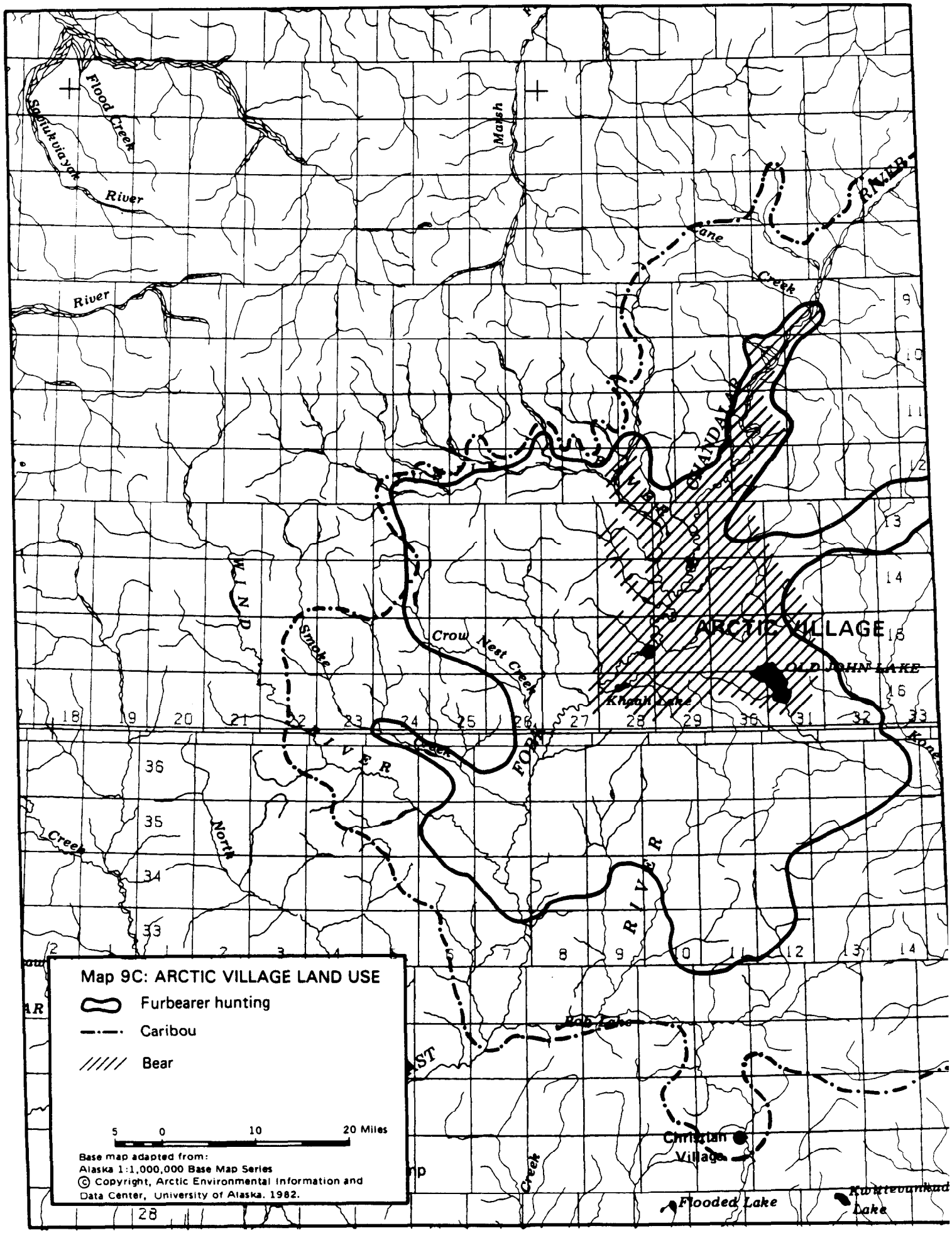
Map 9C: ARCTIC VILLAGE LAND USE
Furbearer hunting
Caribou
Bear
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
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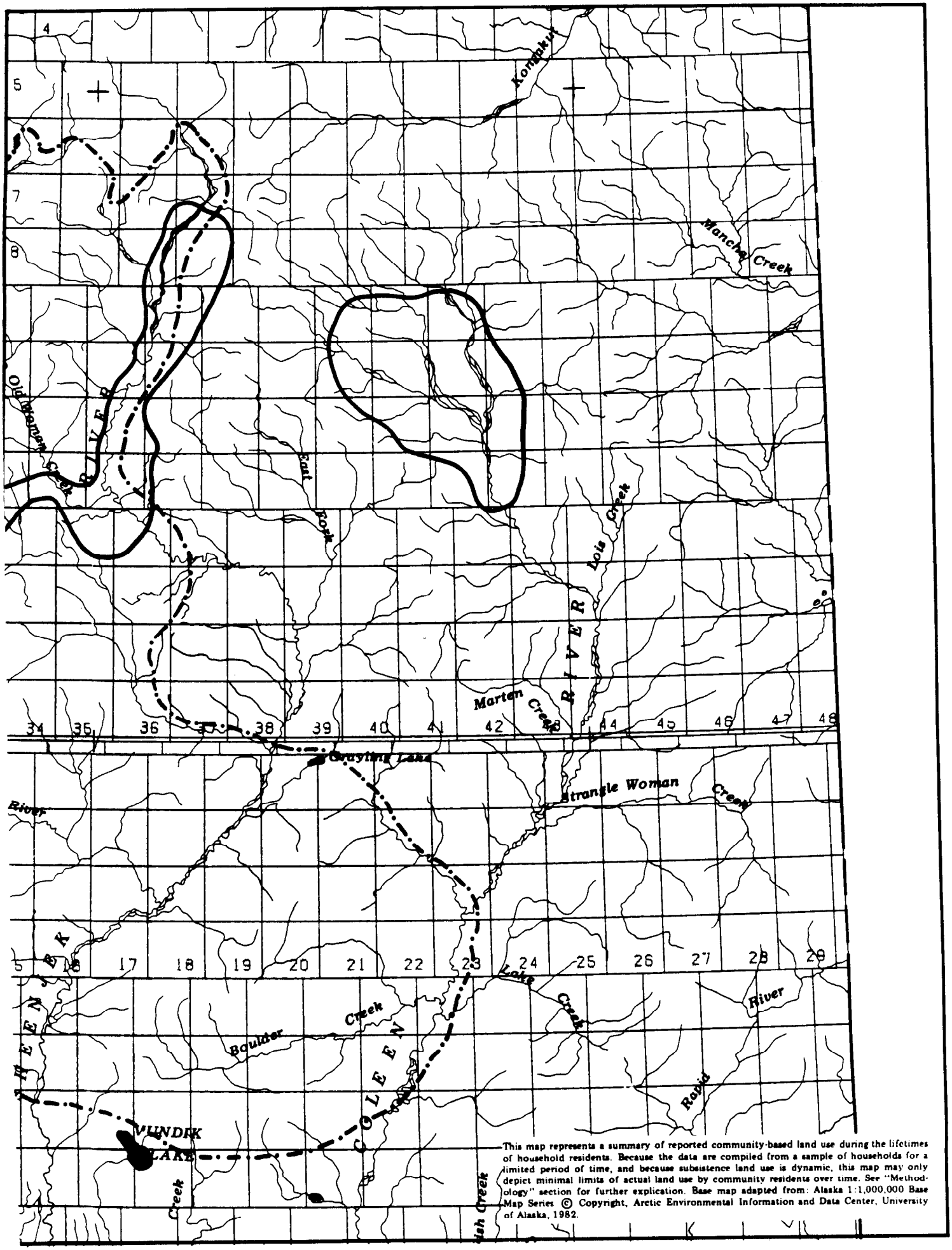
ARCTIC VILLAGE
OLD JOHN LAKE
Christian Village
Flooded Lake
Kwittevunkud Lake
Flood Creek
Sawiukviayak River
Marsh
Cane Creek
Crow Nest Creek
Smoke Creek
North Creek
Rob Lake
Khaah Lake
WIND RIVER
FORK
RIVER
CHANDALAR
RIVER



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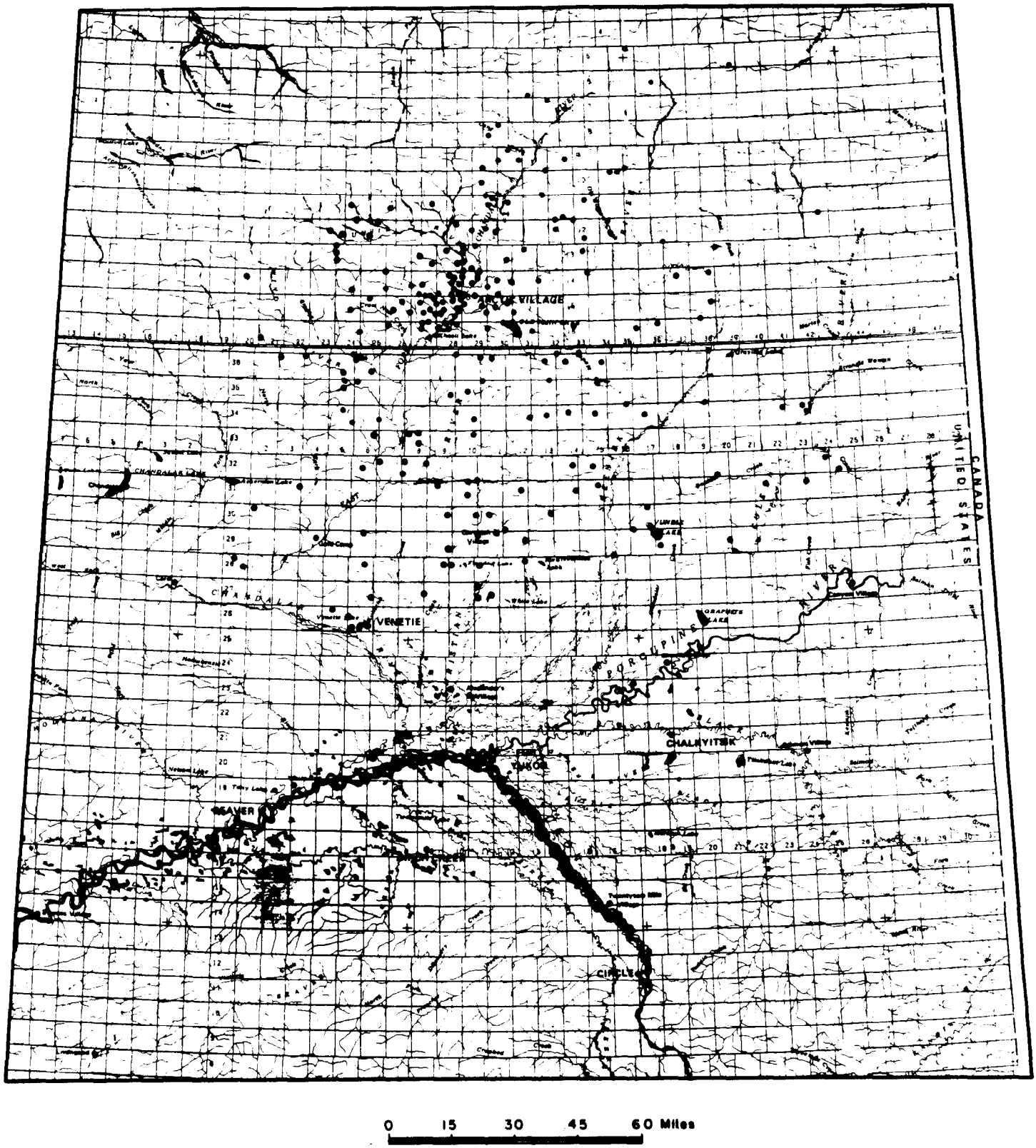
Village residents have hunted caribou as far to the east as the Coleen River during their lifetimes. In recent decades, however, this use has declined.

Hunting for moose using a boat usually occurs along the East Fork and the Junjik rivers. Hunters sometimes stop at several wooden towers located along their banks to scan the surrounding area for both moose and caribou. Moose are sometimes taken using a snowmachine in winter, either in the vicinity of the community or in upland areas to the east. The area around Christian Village is also known to be good for moose hunting.

Sheep hunting in fall principally takes place near the headwaters of the East Fork and on the Sheenjek River. In November and December sheep are usually harvested on tributaries of the East Fork, including Ottertail and Smoke creeks. Historically, sheep hunting also occurred during summer months in conjunction with the harvest of wolves taken under the bounty program.

Major fishing areas include the East Fork and its tributaries, Old John Lake, the Sheenjek and Christian rivers, and lakes near the community. Grayling are generally caught in rivers, while lake trout and an unusual land-locked population of arctic char are virtually always caught in specific lakes. Grayling are valued as a source of fresh food while residents are hunting in summer and fall. Hunters at one camp near Old John Lake in 1981, for example, regularly fished at a particularly productive net site to obtain whitefish, lake trout, and pike. In early winter, nets are placed under the ice in this same spot, and on the East Fork. Set hooks are also placed in the ice in these locations for pike and burbot. Waterfowl hunting, which sometimes occurs in conjunction with fishing, occurs principally on lakes and rivers in the East Fork valley and on Old John Lake.

Principal trapping areas used by Arctic Village residents include the East Fork valley above Brown Grass Lake, the Christian River extending to Christian Village and to near Alexander's Village, and the Sheenjek River north from Vundik Lake. The most productive trapping areas are said to be in the more heavily



Map 10: General Location of Arctic Village Place Names

forested areas south of Arctic Village. More intensive trapping activity focused in the Yukon Flats near Christian Village and Alexander's Village in recent years may be related to increasing prices paid for marten pelts.

The distribution of 226 Native-named places known to selected Arctic Village residents is depicted on Map 10 (Caulfield and Peter [in press]). Documented names include those of geographic features such as mountains, lakes, and rivers, cultural and historic sites, and features which have ecological significance, including the location of fish spawning areas and mineral licks. This distribution of names provides an index of the extent of environmental knowledge and traditional land use. For Arctic Village, the greatest concentration of names occurs from the East Fork valley east to the Christian and Sheenjek rivers. Named places, however, extended to beyond the Coleen River, south to Fort Yukon, west to the Wind River, and north to the crest of the Brooks Range.

CHAPTER 5

BIRCH CREEK LAND AND RESOURCE USE

ENVIRONMENTAL SETTING

Birch Creek village (Łiteet'aii), located at 66° 10'N latitude, 145° 49'W longitude, lies along the banks of the creek for which it is named. The Gwich'in name for Birch Creek village means "place where the water meets," describing its location near the confluence of Birch Creek with an important creek used for fishing which drains nearby lakes. The village is located approximately 26 air miles southwest of Fort Yukon.

Birch Creek village is surrounded by extensive lake, river, and slough systems characteristic of the vast Yukon Flats. Birch Creek flows circuitously through extensive areas of black spruce forests, brush, and muskeg before reaching the Yukon River. Larger spruce trees and birch can be found intermittently throughout the area. To the south the Flats give way to gently-rising uplands drained by small creeks originating in the White Mountains. This mountainous region, which forms the northern extension of the Yukon-Tanana Uplands, contains peaks rising to over 5,000 feet in elevation. The rivers, sloughs, portages, and lakes serve as a vast transportation network which provides access to a great diversity of fish and wildlife resources.

LAND USE PATTERNS OVER TIME

Birch Creek residents describe themselves as Dendu Gwich'in, although intermarriage with other bands is reported (Schneider 1976). The Dendu Gwich'in traditionally occupied much of the Yukon Flats south of the Yukon River to and including portions of the Crazy and White Mountains. According to ethnographic accounts, land south and east of the village of Beaver was also traditionally part of their territory (Andrews 1977:106). Semi-permanent camps existed in the area around present-day Birch Creek village, at the

upper and lower mouths of Birch Creek, and on larger lakes in the area (Andrews 1977:106).

Archdeacon Robert McDonald reported having visited camps on Birch Creek several times during his residence in early-day Fort Yukon, including a visit in November of 1862:

> Reached Bikkuinechatti's [a Birch Creek chief] camp at midday, and received a cordial welcome...there are here three tents of Indians, containing nine men, with women and children numbering in all about thirty. (McDonald n.d.:10 November 1862)

McDonald refers to a fishery on Birch Creek, probably for whitefish, which on one occasion provided 1,500 fish for the Hudson's Bay Company post at Fort Yukon (McDonald n.d.:10 November 1862). Murray (1910:64) refers to a "deep river...where the Indians make dried fish in summer" as a fishing location used by the Hudson's Bay Company; the editor of his journal suggests that this probably refers to Birch Creek or its tributary, Discovery Creek.

Osgood (1936:14-15) reports that "within twenty-five years of their first discovery, the Birch Creek Kutchin were annihilated by an epidemic of scarlet fever." However, Schneider (1976:213) takes exception to this noting that ethnographic accounts indicate use of the area from at least 1867 to the present by members of that band. According to Birch Creek Jimmy, an elder of the area who died in 1977, a son of the famous Gwich'in chief Shahnyaati' built a cabin in the late 1800s at the site of the Hudson's Bay Company fishcamp near the present location of Birch Creek village (Schneider 1976:213).

Another band of Gwich'in people known as the Gwit'ee Gwich'in reportedly lived along Birch Creek in former times, according to David James of Birch Creek. According to this account which was recounted by his father, Birch Creek Jimmy, the original Dendu Gwich'in were "mountain people" who lived principally in the foothills of the White Mountains in a manner "just like the Neets'-ąįį Gwich'in"--utilizing primarily caribou and sheep. The Gwit'ee Gwich'in were said to have been the band living along Birch Creek itself. Gwit'ee

Gwich'in means "people living under," perhaps referring to the fact that the band lived at the base of the White Mountains. According to informants, the name Dendu Gwich'in translates as "people of the other side," and is said to be a Gwichyaa Gwich'in name not traditionally used by this band to describe itself. Traditional use of the northern extent of the White Mountains by a band from the Birch Creek area is indicated by the report of a caribou and moose fence located on Vuu ddhaa, a mountain 3,338 feet in elevation south of Birch Creek (Caulfield and Peter [in press]), and by accounts of sheep hunting along Beaver Creek in the vicinity of Victoria Mountain before Birch Creek Jimmy's time.

In light of this account it is interesting to speculate whether Osgood's report of the extermination of the Birch Creek Gwich'in may have referred to only one of these bands, perhaps the Gwit'ee Gwich'in. While research into this matter is beyond the scope of this report, it is hoped that these accounts will contribute to the reconstruction of historical locations of 19th century Gwich'in bands.

Old Thomas, the son of the Gwich'in chief Shahnyaatti', erected a cabin at the site of the Hudson's Bay Company fishcamp in 1898, and his son-in-law and other family members moved to the site from the Black River country about 1900. Thomas was said to have made a good living in the Birch Creek area and, as often happened, incorporated his son's Black River relatives into the family, with rights of access to the resources in the Birch Creek area. This inter-relationship between bands is documented for other Upper Yukon-Porcupine communities as well, and continues to influence social, economic and cultural relationships in the region (Schneider 1976:218, 338).

In about 1916, Birch Creek residents moved several miles upriver from what is now known as the "old village" to the site of the present community. Schneider (1976:219) described the seasonal round of the Birch Creek people during the early part of the twentieth century, including seasonal visits to

Fort Yukon and Beaver, and the use of Beaver Creek, the Yukon River, and Birch Creek. Birch Creek village apparently remained a seasonal base for harvest activities as late as the early 1950s (Shimkin 1955:232-233). Since that time, with the creation of a school and then a village corporation, it has become a more permanent residence for people of the area.

THE CONTEMPORARY COMMUNITY

Birch Creek village today is a community of about 50 people living in approximately 10 households. The village consists of about 12 log houses, an elementary and secondary school, and a new village corporation building. Most homes are heated with oil, but many supplement with wood. In the winter of 1981-82 only one house was heated exclusively with wood. Water is drawn directly from Birch Creek before break-up and is stored in an 85,000-gallon tank for use by community residents. Domestic sewage is disposed of in privies, while solid waste is dumped and burned. Electricity is provided to most homes and buildings by Birch Creek Utilities Company, which is owned by the village council. The utility has three 30-KW generators; electrical costs per household usually range from $34 to $50 per month (E. Priest, personal communication, May 1982). There are two telephones in the village and cable television programming is available via satellite. A small store operates in the village, but on two occasions in 1981 available goods consisted only of staples such as beans, flour, and baking powder. Residents pay a small fee for use of a community freezer located in the Birch Creek Utilities Company generator building.

Transportation of supplies into Birch Creek is generally accomplished through the use of aircraft, which use the village's 1,700-foot gravel runway. A barge normally reaches Birch Creek once or twice each summer, once immediately after break-up and then occasionally in fall. Principal supplies transported by barge are building materials and fuel. In 1982 gasoline cost $3 per gallon

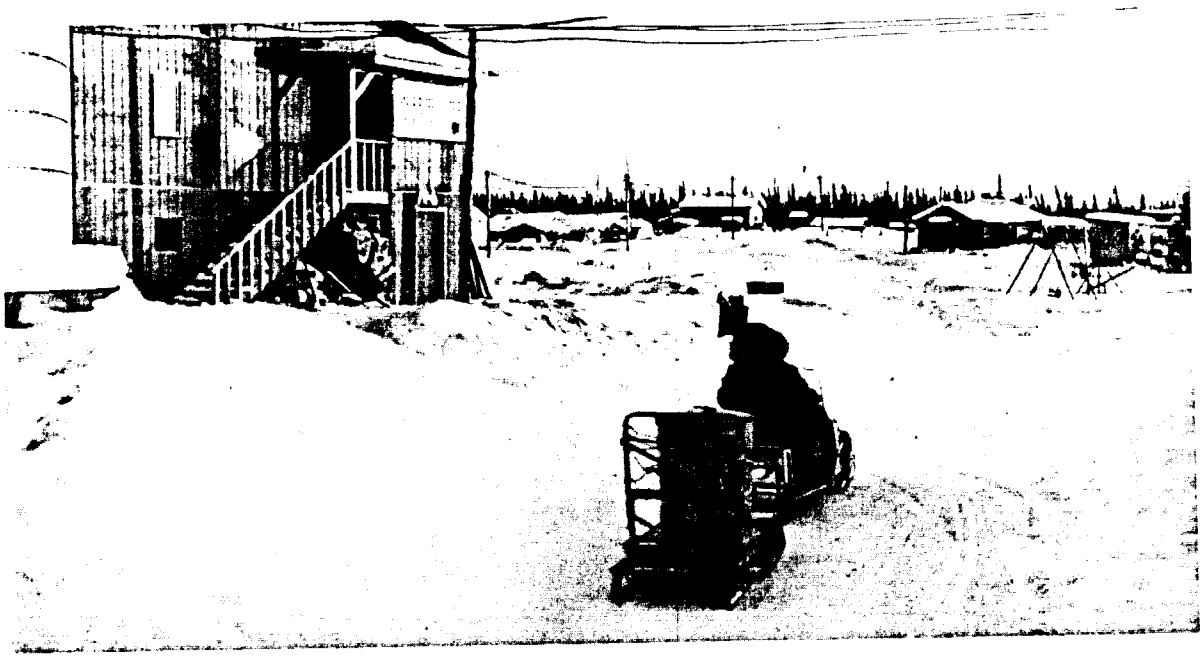


PLATE 7 Birch Creek Village in Winter.

PLATE 8 Muskrat Pelts Drying at Beaver Creek Camp.

PLATE 9 Birch Creek Elder David James.

in Birch Creek, No. 1 heating oil was $1.68 per gallon, and 100 pounds of propane cost $75. —

Wage income opportunities are extremely limited. Firefighting is a seasonal source of income for several households. Permanent employment in the village consists of one teacher for kindergarten through high school, one bilingual teacher, a village corporation business manager, and a village maintenance man. Part-time employment opportunities during the school year include a teacher's aide, a school lunch cook, and a school janitor. The village corporation and council both employ part-time secretaries. In addition, one Birch Creek resident has been hired part-time as a refuge management trainee by the U.S. Fish and Wildlife Service. In 1979, $6,577 were provided to Birch Creek residents through state welfare payments, unemployment compensation, and social security (Louis Berger and Associates 1982:2:37-39).

Birch Creek village is described by local residents as somewhat of an anomaly among communities in the region because it is essentially "one large family," with close kin relationships between households. The community reflects settlement patterns more common earlier in the twentieth century when small extended family groups lived away from larger settlements in resource-rich areas (Schneider 1976:246).

Sharing of resources is reported to be particularly strong among Birch Creek households. People in the community often participate in resource harvest activities as one extended family unit, with the exception of trapping and muskrat harvest activities. For example, according to informants, moose taken in the village are generally shared with all households. Similarly, fishing activities usually involve members of households working together. A single fishcamp located on the Yukon River is often used by members of all Birch Creek households.

ANNUAL CYCLE

The seasonal cycle of annual resource harvest activities for Birch Creek from 1970 through 1982 is summarized below (Figure 3). Data presented in this summary are derived both from interviews with resource experts and observations by the researcher. As noted above, only major activities are included, and considerable variation can occur from year to year.

Spring. The onset of snowmelt usually begins in about mid-April in the vicinity of Birch Creek. While travel becomes more difficult after the winter's snow turns to slush, migratory waterfowl begin to arrive signalling the renewal of a new season. Ducks, geese, and cranes begin to arrive about mid-April, stopping to rest primarily on ice-free margins of rivers and lakes. Waterfowl hunting begins as soon as birds arrive. Hunters occasionally scatter mud on the surface of certain lakes to attract waterfowl. Waterfowl are usually eaten fresh, or are dried or frozen.

Muskrat hunting is a major spring activity on lakes near the community. Hunters know particularly good places to find abundant muskrat populations, and harvest the small furbearers using canvas-covered canoes and small-calibered rifles. Gillnets are set in Birch and adjacent creeks and sloughs to obtain whitefish, pike, and suckers. The fish are eaten fresh or are stored by drying. House logs are sometimes cut upriver from the community at this time of year and floated down to the village for later use. Black bear may also be shot near camps or the community.

Summer. By the middle of June muskrat hunting subsides as the muskrat mating season progresses. Hunters at outlying muskrat camps return to Birch Creek. Certain waterfowl species -- especially "black ducks" or scoters -- continue to be harvested on larger lakes and near well-known canoe portages.

Near the end of June some household members usually travel by boat to fishcamps near the confluence of the Yukon River and the lower mouth of Birch Creek. Upon arrival, residents repair camp and caches, build fishwheels and

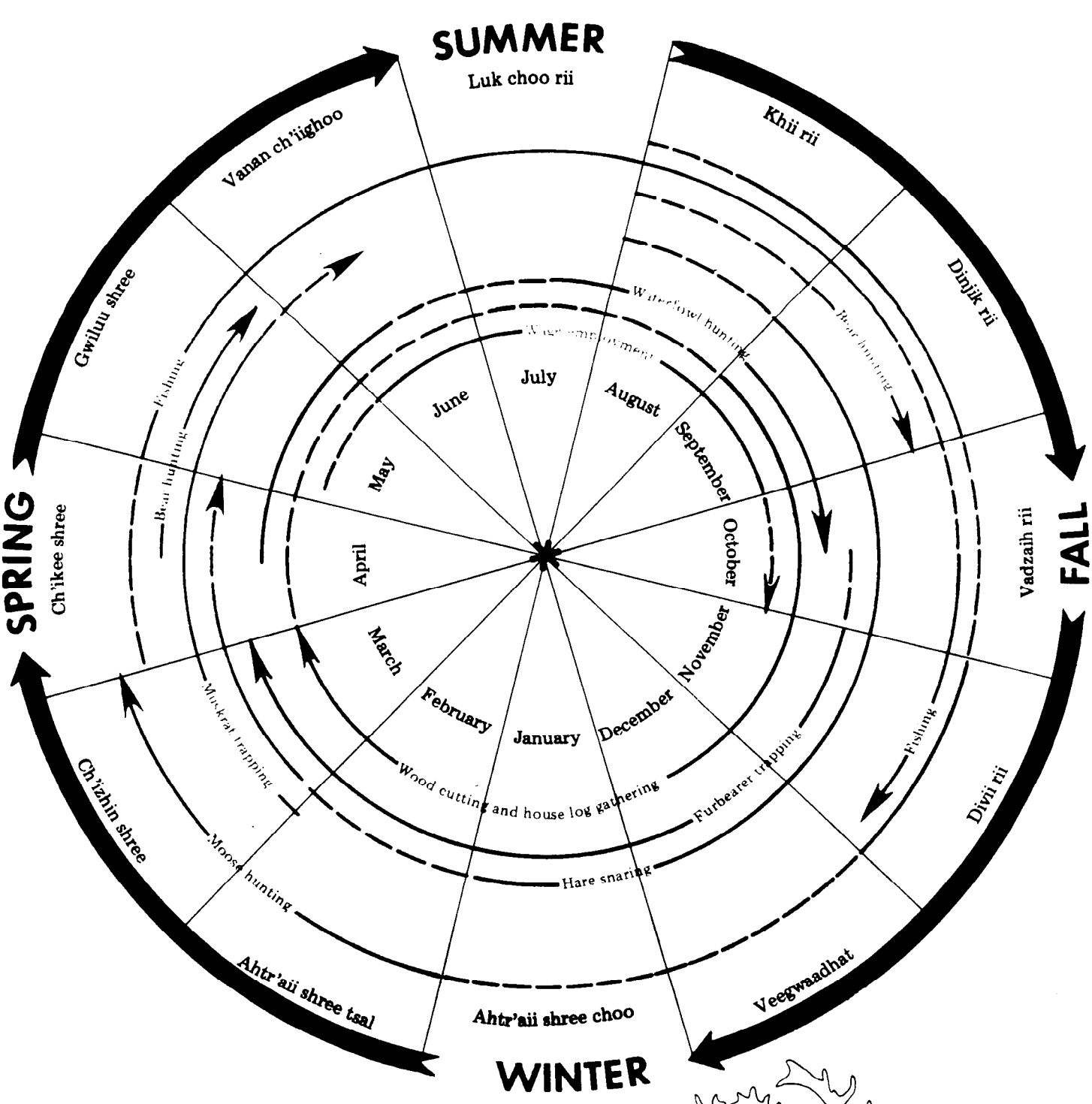


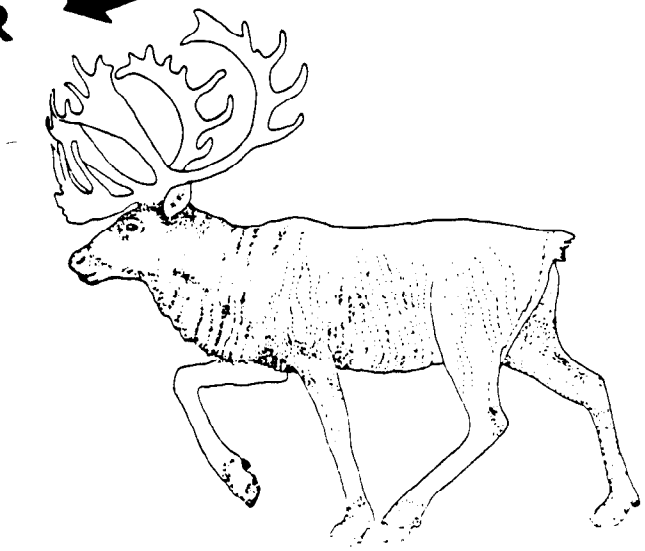
FIGURE 3

Birch Creek
Annual Cycle

Circa 1970-1982

Primary activity

Secondary activity



smokehouses, and prepare for the arrival of king salmon in early July. Whitefish and sheefish are also harvested in nets. Routine fishcamp activities such as checking nets, processing fish, gathering firewood, and visiting friends and relatives continue through the chum salmon run which usually begins in late July. Summer activities also include wage employment in firefighting or on construction projects when available.

Fall. By late August supplies of chum salmon have usually been stockpiled for the winter. Once an adequate fish harvest has been achieved, Birch Creek residents return to their community for hunting and to prepare for winter.

Moose and black bear hunting are the principal fall activities in Birch Crek, and usually occur upriver from the community along Birch Creek as far as Preacher Creek, or on Beaver Creek. Waterfowl and small mammals continue to be harvested until early October. Often firewood is gathered and stockpiled upriver from the community and then rafted down for use during the winter. Cranberries, blueberries, salmonberries, and rosehips are gathered for winter use. Nets are used in Birch Creek and nearby lakes to harvest whitefish, grayling, pike, and sheefish.

Winter. Freeze-up usually occurs in late October in the Birch Creek vicinity. Scoters are often hunted until that time. Fishtraps were traditionally used just before freeze-up to catch whitefish, grayling, sheefish, and pike. Historically, grayling were also speared as they passed through weirs under the ice on Birch Creek. Today residents place nets under the ice from October to December to catch whitefish, pike, and sheefish. Grayling are caught by "jigging" through holes in the ice.

By November traps are set for marten, lynx, mink, fox, weasel, wolverine, otter, and (occasionally) wolf. Beaver snares are set both in early and late winter. Trapping for most species continues until February or early March. Moose may occasionally be harvested in conjunction with trapping activity, usually in November and again in February or March. Gathering of firewood,

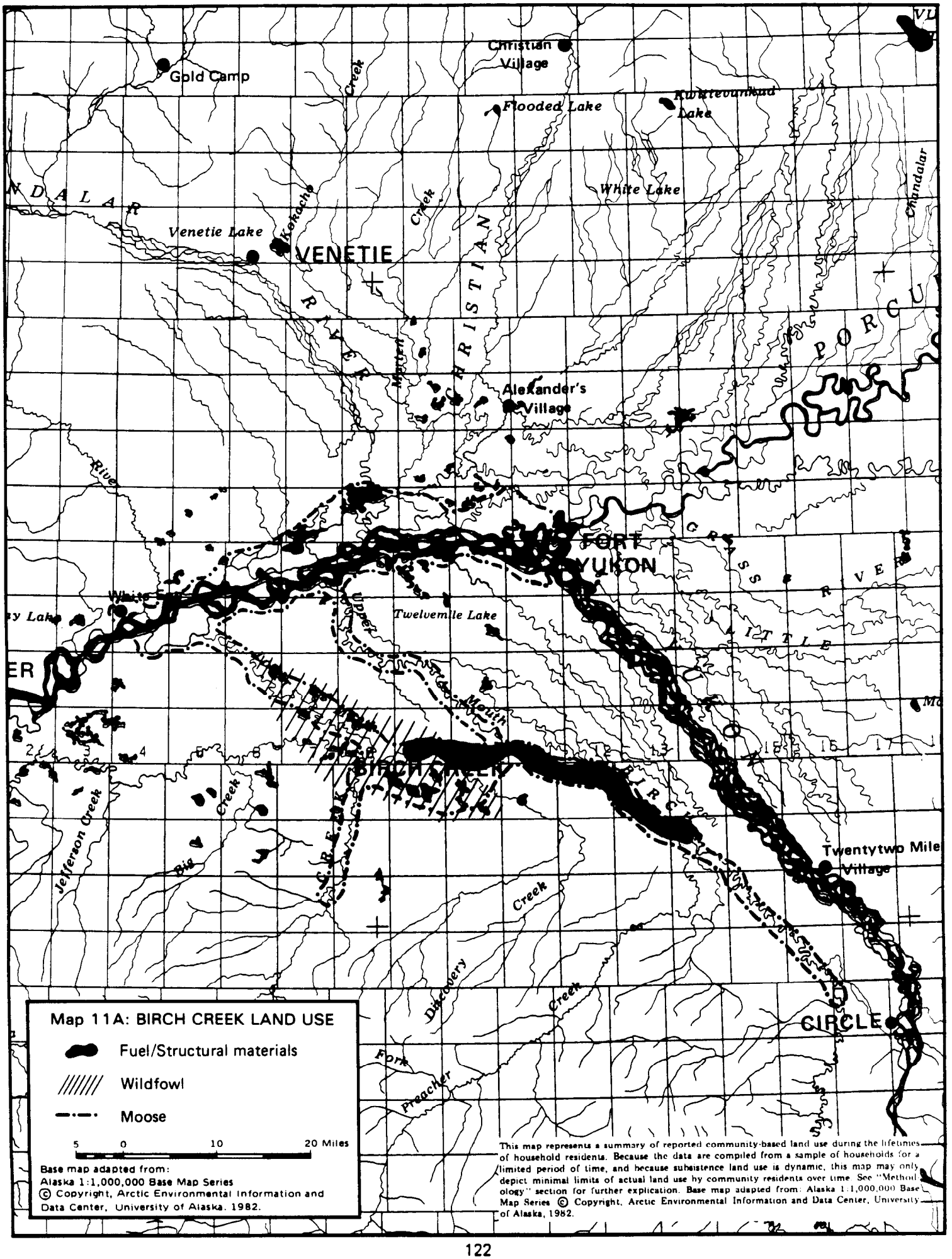
hauling water, community gatherings, and visiting occupy considerable amounts of time in winter. Grouse, ptarmigan, and hares are harvested when available.

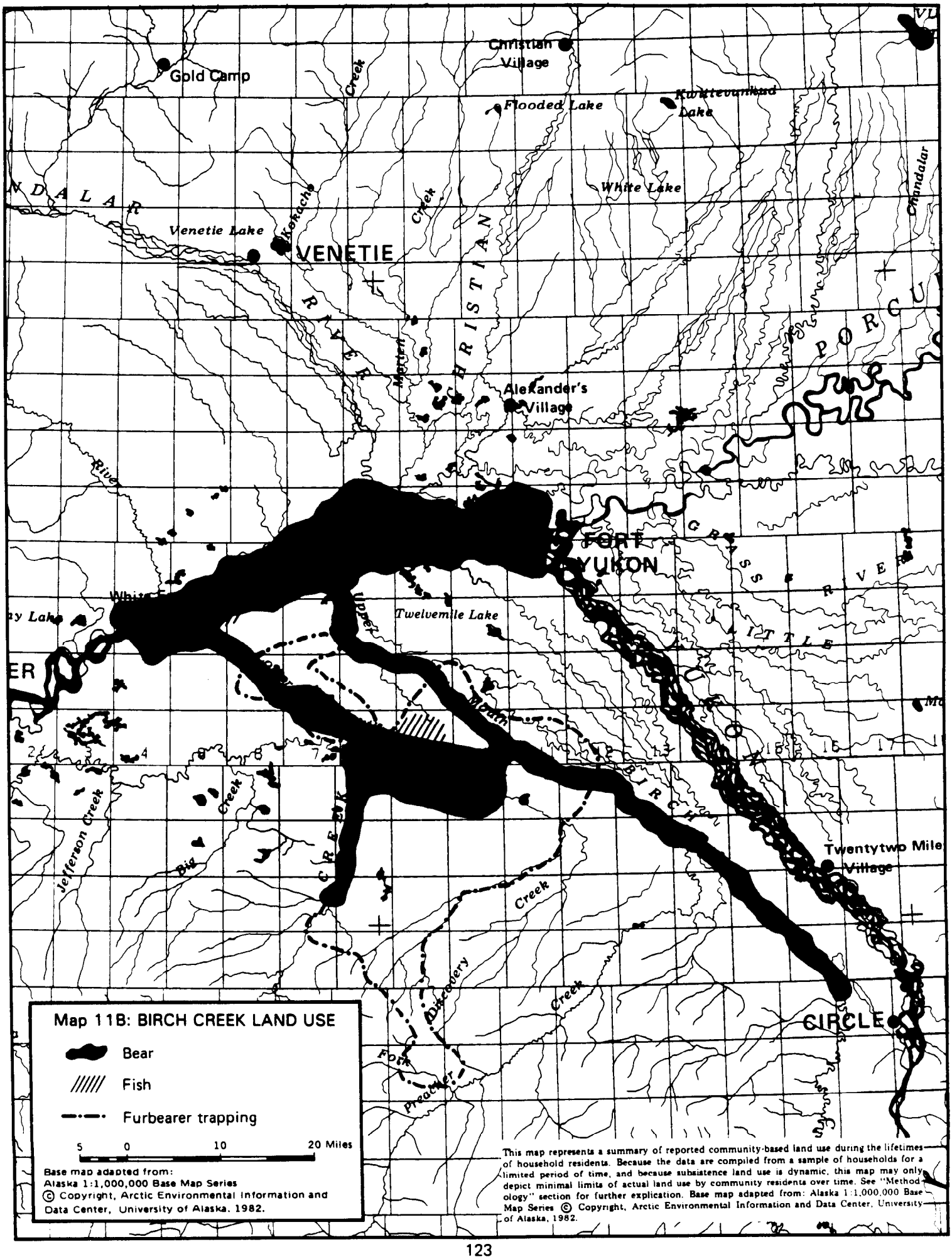
LAND USE SUMMARY

Community-based land use over the lifetime of Birch Creek residents is presented in maps 11A through 11C. Land use by Birch Creek residents is focused upon extensive lake, river and slough systems. Canoe portages, including those between Birch and Beaver creeks, between Birch Creek and the Yukon River, and between many smaller lakes and creeks are essential to this pattern of use. Detailed knowledge of geographical features in nearly flat terrain becomes essential for successful harvest of resources. In upland areas, trail systems known to local residents are used for trapping and hunting.

Most moose and black bear hunting by Birch Creek residents takes place on Birch Creek from the upper and lower mouths on the Yukon River upstream to the Steese Highway bridge, along the Yukon River between White Eye and Fort Yukon, and on Beaver Creek. Salmon fishing occurs principally at the lower mouth of Birch Creek on the Yukon River. Fishing for whitefish, grayling, sheefish, and pike occurs at specific net sites along Birch Creek at its tributaries and in lakes surrounding the community. Grayling fishing with a hook-and-line often occurs in conjunction with hunting, and extends the length of Birch Creek to where it is crossed by the Steese Highway bridge.

Muskrat and waterfowl hunting occur principally on the myriad of lakes, rivers, and sloughs surrounding Birch Creek village and extending downriver to the Yukon. The larger lakes south of Birch Creek village are particularly productive waterfowl hunting areas. Furbearer trapping takes place along established trails to the south of the village into the foothills of the White Mountains near the headwaters of Preacher Creek, along the upper and lower mouths of Birch Creek, and to the west along Beaver Creek. Gathering of firewood,


Christian Village
Gold Camp
Flooded Lake
Kwittevunkud Lake
White Lake
Chandalar
Venetie Lake
VENETIE
Kokacho
Creek
CHRISTIAN
RIVER
Alexander's Village
PORCU
FORT YUKON
GRASS RIVER
LITTLE
Twelvemile Lake
Upper
Mouth
BIRCH CREEK
Jefferson Creek
Big
Creek
Twentytwo Mile Village
Creek
Discovery
Creek
Fork
Preacher
CIRCLE
Map 11A: BIRCH CREEK LAND USE
Fuel/Structural materials
Wildfowl
Moose
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.
This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.


Christian Village
Gold Camp
Flooded Lake
Kwittevunkud Lake
White Lake
Venetie Lake
VENETIE
Kokacho
Creek
Marten
CHRISTIAN
RIVER
Alexander's Village
PORCU
Chandalar
River
FORT YUKON
GRASS RIVER
LITTLE
Twelvemile Lake
Upper
Mouth
BIRCH
CREEK
Jefferson Creek
Big
Creek
Twentytwo Mile Village
Discovery
Creek
Fork
Preacher
CIRCLE
Map 11B: BIRCH CREEK LAND USE
Bear
Fish
Furbearer trapping
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.
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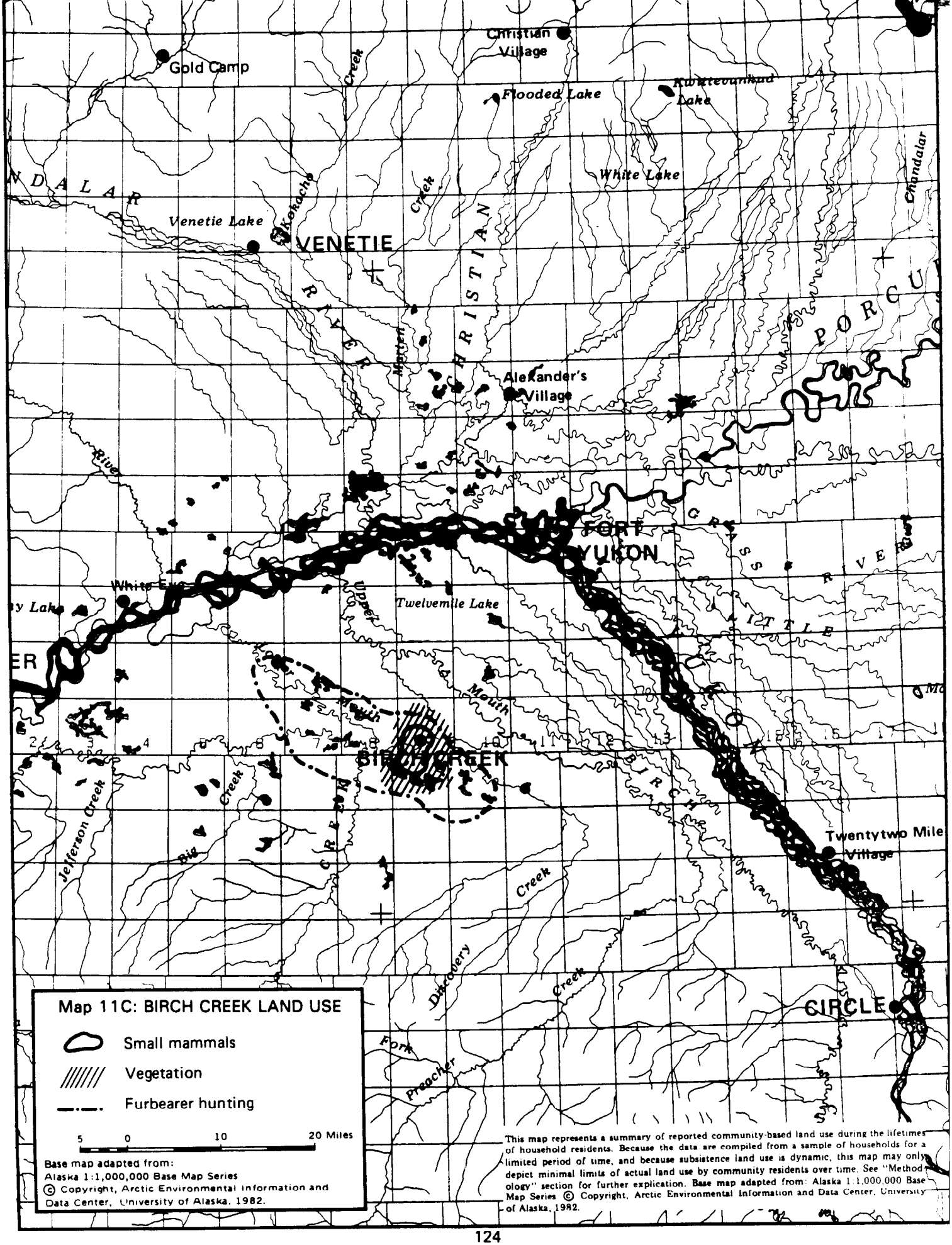
Christian Village
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White Lake
Chandalar
NDALAR
Kokacho
Creek
Venetie Lake
VENETIE
CHRISTIAN
RIVER
Morten
PORCU
Alexander's Village
River
FORT YUKON
GRASS RIVER
White Eye
Upper
Twelvemile Lake
LITTLE
ER
Mouth
BIRCH CREEK
BIRCH
Jefferson Creek
Big Creek
CREEK
Twentytwo Mile Village
Creek
Discovery
Creek
CIRCLE
Fork
Preacher
Map 11C: BIRCH CREEK LAND USE
Small mammals
Vegetation
Furbearer hunting
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.
This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.

berries, and house logs usually takes place at specific sites near the community and upriver along Birch Creek.

Fifty-two Native-named places have been documented for the community of Birch Creek (Caulfield and Peter [in press]) (Map 12). Named places include resource use sites, geographic travel routes including trails and key portages, and cultural and historic sites. Distribution of named places extends from the Yukon River south to the White Mountains, and west to Beaver Creek. The drainages of Birch and Beaver creeks south of the Yukon River contain the greatest concentrations of names.

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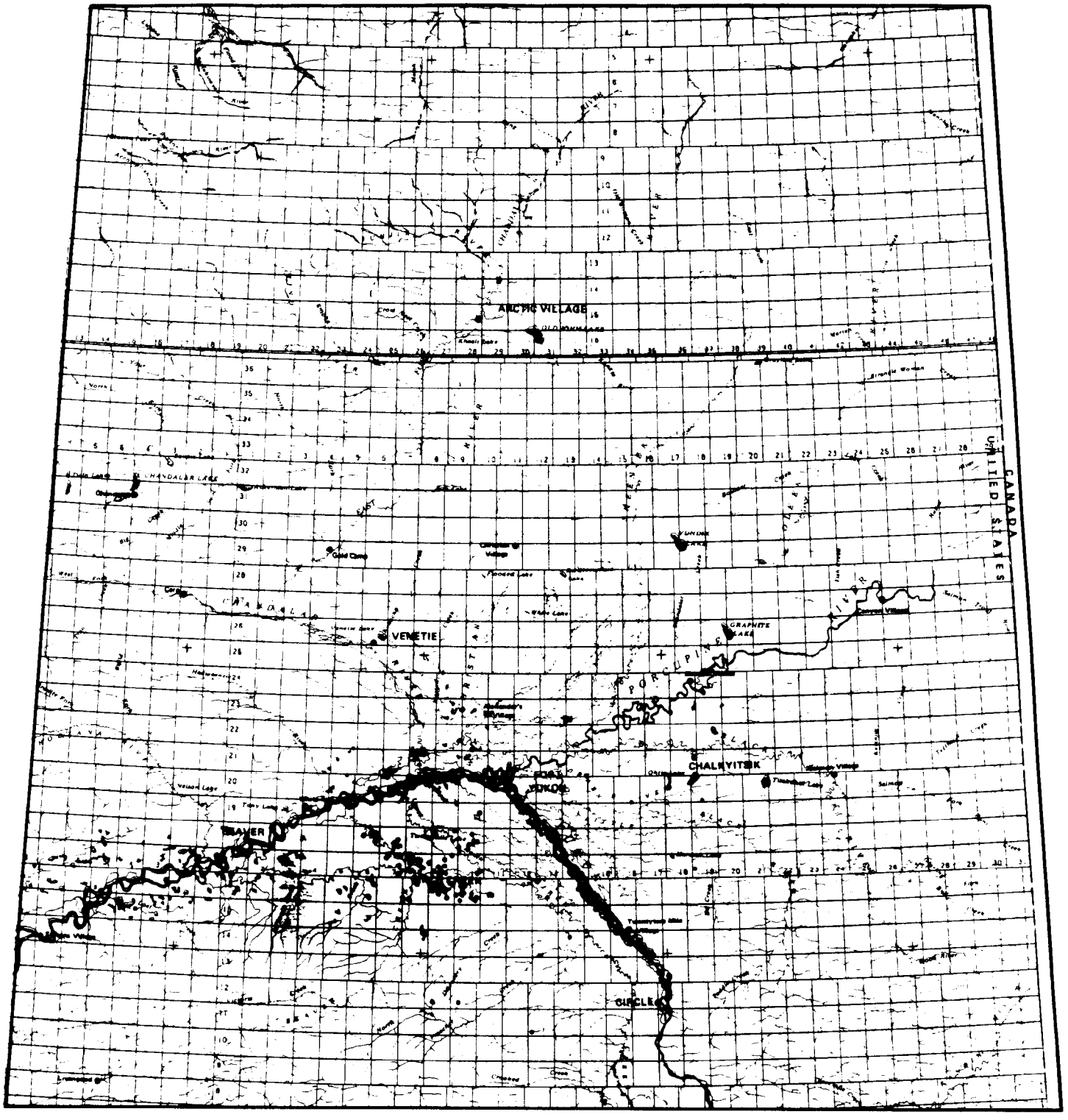


Map 12: General Location of Birch Creek Place Names

CHAPTER 6

CHALKYITSIK LAND AND RESOURCE USE

ENVIRONMENTAL SETTING

Chalkyitsik (Jalgiitsik) is located at 66° 30'N latitude, 143° 43'W longitude on the Black River, at the eastern fringe of the vast Yukon Flats. Fort Yukon lies about 50 miles to the west. The Gwich'in name for the community means "fish hooking place"; Chalkyitsik has traditionally been an important fishing site. The Black River, focus of much of the resource harvest activities of Chalkyitsik residents, originates in the rugged uplands which surround the Yukon Flats to the east and south. Just upriver from the community the river begins to change character and blend into the maze of sloughs, lakes, and creeks which make up the Flats. Several large lakes, including Ohtig and Tiinkdhul, are situated not far from the Black River and are used for hunting, fishing and trapping.

To the north of the community, the Porcupine River flows in a southwesterly direction from Canada to its confluence with the Yukon River near Fort Yukon. In winter a trail is broken from the village to the Porcupine River, providing access to important hunting, fishing, and trapping areas.

LAND USE PATTERNS OVER TIME

The people of Chalkyitsik describe themselves as Dr'aanjik Gwich'in, or "people living along cache-river [Salmon Fork of the Black River]." Only one or two families are said to be "real" Dr'aanjik Gwich'in, however, in the sense of having originated from the Black River itself. Ancestors of other village residents are said to have come from the Yukon Flats, Chandalar, and Upper Porcupine bands (Nelson 1973:17).

Archeological excavations near Old Crow and along the Porcupine River demonstrate great antiquity in the use and occupancy of the region near

PLATE 10 View of Chalkyitsik from Marten Hill.

PLATE 11 Chalkyitsik Elder Reverend David Salmon Displaying Traditional Arrow Points.

Chalkyitsik (Morlan 1975; Dixon and Plaskett 1980). Recent archeological finds on Marten Hill, adjacent to the village of Chalkyitsik, possibly date to as early as 10,000 B.C. (Mobley 1982:26).

Elders among the Dr'aanjik Gwich'in remember a highly mobile way of life, living at the headwaters of the Black River from autumn until spring and then floating downriver to fish in summer (Nelson 1973:17; Peter 1979; Herbert 1982). Moose, caribou, and sheep were harvested during winter in this mountainous country while prodigious populations of fish, especially whitefish, on the Black River provided a relatively stable source of food. Chalkyitsik elders report that nearby Ohtig Lake was used extensively for waterfowl harvesting during aboriginal times.

Early explorers in the region, including Hardisty (1867) and Cadzow (1925), provide only brief reference to the Dr'aanjik Gwich'in. Cadzow's account, cited in Nelson (1973:16), notes that:

> along the headwaters of the Black River, are found the Tranjik-Kutchin, the "Cache River People," who take their name from the number of caches or stages built along the stream on which they live....The Tranjik-Kutchin are famed as snarers of moose, building pounds similar to those used by the Vuntit-Kutchin for capturing caribou.

Archdeacon McDonald reported encountering Black River people in Fort Yukon and on the Porcupine River in 1863 (McDonald n.d.:2 July 1863). He again met them on subsequent journeys to the Black River and on the Porcupine River in 1865, 1866, and 1868. He encountered 67 people in one Black River camp in 1868. During McDonald's residence at Rampart House after 1871, he regularly encountered Black River people trading there (McDonald n.d.:5 May 1871). Old Rampart was utilized by Black River band members for trading and social activities, according to Andrews (1977:292).

The seasonal round of Black River peple during the latter part of the nineteenth century was described by one elder as follows:

> We went up the Black River together. Way up to the head of it...for we were going to stay there for the winter....

> We had a village there [at the mouth of the Salmon Fork]. When we went up there we used three or four dogs in harnesses. We pulled the boat with a rope....Then we travel up and sometime we killed a moose, so we stayed over more than a day (usually two days). So the men went up hunting. They were there about ten to fifteen days. They made a skin-boat and they came back down. They had lots of meat and dry meat....After they did that, around the bend up river a little creek was coming down. They follow it up. Hot water is coming down the creek from the mountain. It's real hot. So right there there is lots of fish. Red winter salmon, dog salmon...there were lots. We made a hook [gaff] that long. We are hooking them with that. In just one day we killed lots. After that we put up a cache for it....When it is a little bit frozen we turned it over again...then we went back down....We have enough meat until April, so they quit everything and they are going to the trapline. They trapped all winter, so there was lots of fur. (Ross n.d.)

Around the turn of the twentieth century the Dr'aanjik Gwich'in began to settle in Salmon Village, about 70 miles upriver from present-day Chalkyitsik. The first permanent log structure was built there in 1901 by William Salmon, a Canadian indian who passed through the area on a trip from Old Rampart to Dawson (Andrews 1977:286). According to local accounts, he found marten "as thick as rabbits" in the area. He later married a Black River woman and returned to settle permanently at Salmon Village. Eventually over 20 houses were constructed (Andrews 1977:286).

The Dr'aanjik Gwich'in continued to live both at Salmon Village and at seasonal trapping and fishing camps (Nelson 1973:17). Trappers based in Salmon Village traveled as far south as the Kandik River and Step Mountain in search of fur in the 1920s. Archdeacon Hudson Stuck met a man named Gabriel (probably Paul Gabriel) trapping 40 miles up the Coleen River from the Porcupine River in 1918 (Stuck 1920:345). Salmon Village proved to be located in a resource-rich area; caribou were often available on nearby "Niggerhead Mountain" and chum salmon were gaffed in the fall at spawning areas on Kiivinjik. In addition, a productive fence for snaring moose was located on the hill immediately to the east of the village.

Chalkyitsik was a traditional seasonal fishing camp which, by the late 1930s, had four cabins (Nelson 1973:17). In about 1940 a boat loaded with materials to build a school at Salmon Village had to unload at Chalkyitisk due to low water. Several Salmon Village families moved to Chalkyitsik and, in 1941, built the school there (Nelson 1973:17). Some families continued to live much of the year at trapping or fishing camps on the Porcupine and Black rivers at such places as Shuman House, "Old Village", Ddhahtee, Canyon Village, Burnt Paw, "John Steven's place", Salmon Village, and Grayling Fork. From 1961 to about 1967 several Dr'aanjik Gwich'in families lived at Canyon Village on the Porcupine River, although most moved back to either Fort Yukon or Chalkyitsik by the end of the decade (Peter 1979:99-100). By the time Nelson worked in the area in 1969-70 most of the Black River people had moved from outlying camps to Chalkyitsik (Nelson 1973:19). At that time there were 26 houses, a store, two churches, and a community hall in the village (Nelson 1973:19).

Chalkyitsik proved to be located in an environment with relatively abundant populations of fish and waterfowl. According to Nelson (1973:18):

> the main reason for the aboriginal settlement [at Chalkyitsik] was the presence of an abundant source of whitefish, which run down the nearby creek during the fall. The village is also on a sharp and very deep bend in the Black River, which the people say is about the best fish-netting spot along its entire course. Waterfowl hunting is excellent at Chalkyitsik because it is situated amid an ideal combination of lakes and other features of the landscape, which creates exceptionally good conditions for shooting ducks and geese during their spring and fall migrations.

For example, studies conducted in Chalkyitsik in 1960 revealed a harvest of about 3,000 salmon and 4,000 whitefish and sheefish by Chalkyitsik residents (U.S. Fish and Wildlife Service 1964:37). Most of the salmon caught in that year were chums, which were dried for dog food. The whitefish and sheefish were primarily for human consumption. In addition to fish and waterfowl, moose and caribou were also accessible to Chalkyitsik residents along both the Black and Porcupine rivers.

THE CONTEMPORARY COMMUNITY

In 1980 Chalkyitsik was reported to have a population of 100 people (U.S. Bureau of the Census 1980). In that year the Chalkyitsik school, operated by the Yukon Flats School District, had 26 students and two teachers for elementary and secondary levels. The school has electric power provided by two generators. Health care is provided by a local health aide in a small clinic building. A single Alascom telephone is located in the village council office, although efforts are under way to provide each home with telephone service. A satellite radio is available for medical emergencies.

About 31 houses, not all in use, exist in Chalkyitsik; virtually all are heated with wood. Only the village council office and the school are heated with oil. Water is hauled year round from the Black River. Most homes use privies, although the school and several other buildings are connected to a sewage lagoon. At least four households rely on private electrical generators, although efforts are under way to provide electricity to all households. Satellite television programming is available in the community. At the present time, most homes use Coleman lanterns for light and propane for cooking.

Facilities in the community include a store owned by the village corporation, a post office, three churches (Episcopal, Assembly of God, and Baptist), an elementary and secondary school, and the village council office. The community has a 2,500 foot runway and is served by two air services. Barge service from Fort Yukon is limited by water levels, but usually one or two trips are made each summer.

Full-time wage employment opportunities in the community include a postmaster, store manager, council office clerk, and health aide. Full-time positions during the school year include two teachers, a maintenance person, a cook, and two bilingual instructors. Summer firefighting and construction jobs provide seasonal income. The construction of equipment, such as snowshoes,

sleds, or boats, and clothing or beadwork, provides important income for certain households.

The sale of firewood, at $100 dollars a cord, provides income for a few families during winter months. Alaska state welfare payments, unemployment compensation, and social security payments made to Chalkyitsik residents in 1979 totalled $39,139 dollars (Louis Berger and Associates 1982:2:37-39).

Furbearer trapping has reportedly increased in recent years, providing cash income to a number of households. According to local residents, a resurgence of interest in trapping is due in part to high fur prices and a lack of alternative employment opportunities. In 1981, two Chalkyitsik trappers commented that the scarcity of firefighting and construction jobs, coupled with a recent decline in government transfer payments, were reasons for their expanded trapping activity.

The use of dogs by Chalkyitsik residents for trapping appears to have remained stable since Nelson's (1973) work in 1969-70. He noted that four men in Chalkyitsik depended entirely on dogs for transportation, while four others used them in conjunction with a snowmachine (Nelson 1973:176). In 1981-82 four men used dog transportation almost exclusively, while five others used them less frequently in conjunction with snowmachines.

ANNUAL CYCLE

The annual cycle of resource harvest activities for Chalkyitsik from 1970 to 1982 is summarized below (Figure 4). As in previous chapters, annual cycle data were compiled from interviews with resource experts in the community and from observations by the researcher. Only major activities are included in the summary, however, and considerable yearly variations can occur.

Spring. Breakup of rivers in the area around Chalkyitsik usually occurs in mid- to late April, similar to patterns elsewhere in the Yukon Flats.

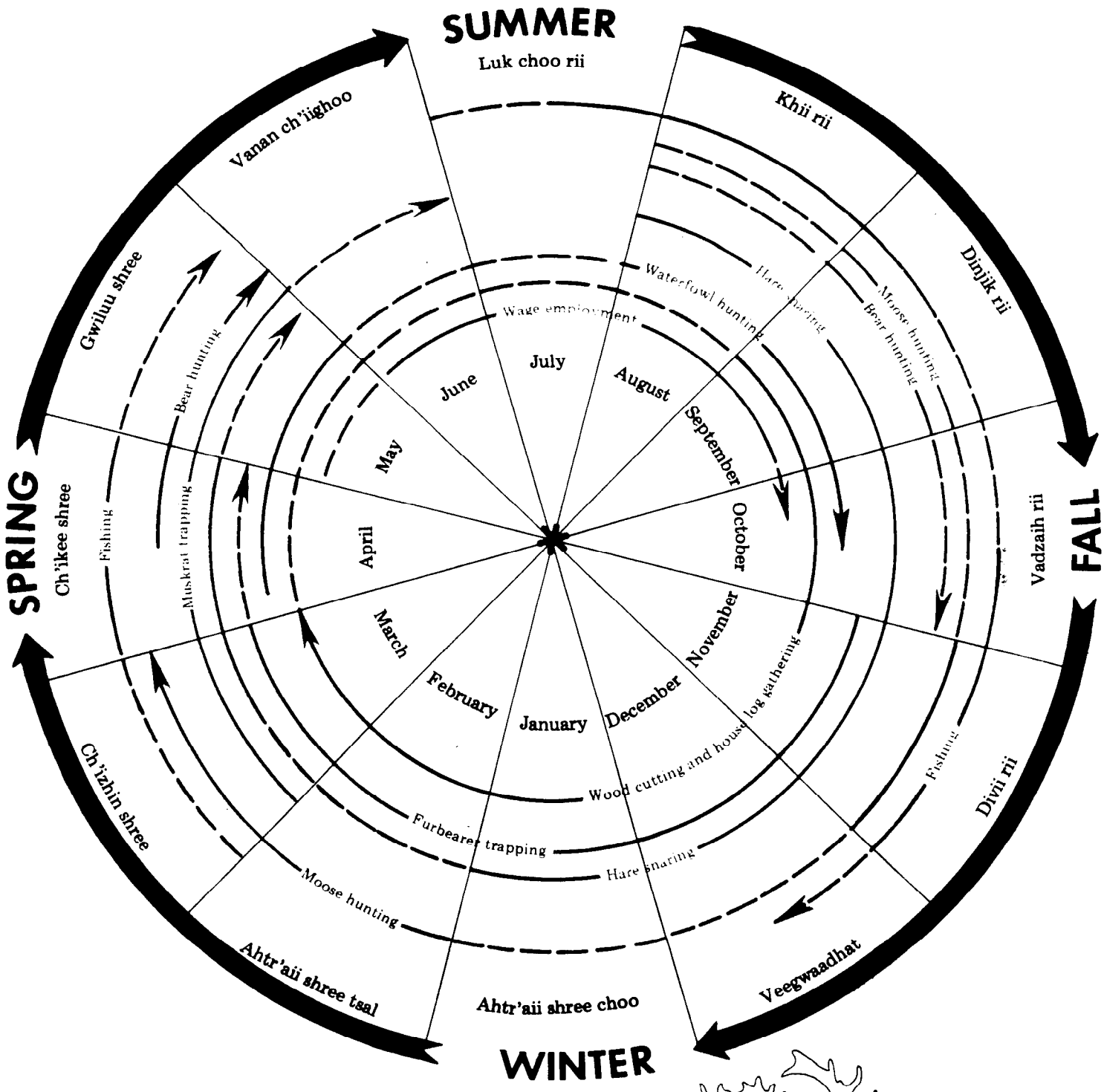


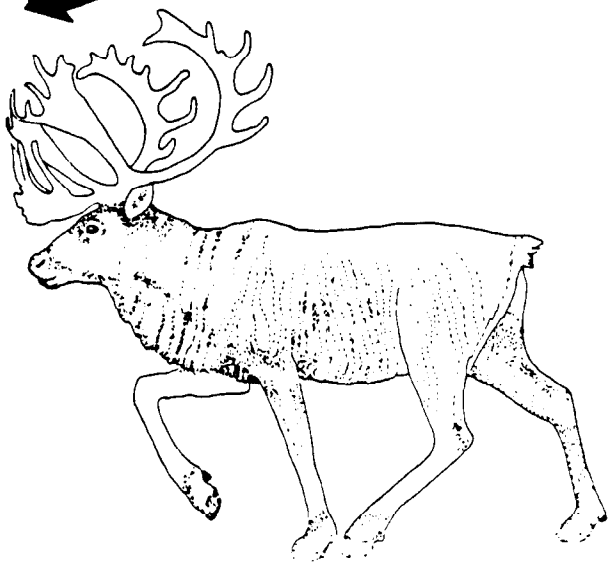
FIGURE 4

Chalkyitsik
Annual Cycle

Circa 1970-1982

Primary activity

Secondary activity



Waterfowl and muskrat harvesting become a central focus for Chalkyitsik residents. Ohtig Lake and specific places near the village and along the Black River are known to be favorable areas for hunting ducks and geese. Muskrats are harvested on the multitude of lakes near the community through the use of small canvas-covered canoes and small-caliber rifles. Nets are placed in lakes and rivers after breakup to obtain both whitefish and pike. Black bears which have recently emerged from hibernation are sometimes shot near spring camps or in the vicinity of Chalkyitsik itself.

Summer. Harvest of waterfowl, especially white-winged scoters, occurs until about mid-June. Fishing for whitefish and pike continues throughout the summer. In August gillnets and occasionally fishwheels are used to harvest chum salmon as well as whitefish and pike from the Black River. Residents owning dog teams often fish for chum salmon on the Black River or travel to the Yukon River near Fort Yukon to obtain salmon.

Summer is also an important time for obtaining cash income from seasonal construction employment or firefighting. Some Chalkyitsik residents spend considerable time tending gardens in the community as well. Waterfowl, grouse, hares, or other small game may be harvested throughout the summer as an occasional supplement to local diets. Berries are often gathered near the village in late summer.

Fall. Hunting of moose and black bear are a central focus of fall harvest activities in Chalkyitsik. Groups of several moose hunters usually travel by boat along the Black River and the Salmon Fork in search of moose. Black bears may be taken in conjunction with moose hunting. Caribou are occasionally taken in fall by Chalkyitsik hunters, usually along the Porcupine River or near the mountainous headwaters of the Black River.

Fishing for chum salmon, whitefish, and pike continue into the fall using nets in the Black River. In some years large numbers of whitefish have been

harvested in a small creek near Chalkyitsik. Grayling are sometimes caught using a hook-and-line, often in conjunction with hunting activity.

Waterfowl hunting continues near Chalkyitsik until birds are no longer available. Berries and other vegetation are gathered and store for winter use, and firewood is stockpiled for use during winter.

Winter. Freeze-up usually occurs during October, restricting travel until sufficient ice forms on lakes and rivers. Once ice on the Black River and nearby lakes becomes thick enough, nets are set under the ice for whitefish and pike. In the fall of 1981, five gillnets had been placed under the ice on the Black River in front of Chalkyitsik. Residents "jigged" for grayling through holes in the ice near the mouths of small streams, and also set out hooks to harvest burbot. Fishing through the ice usually continues until November or December, depending largely upon weather conditions and harvest success.

Soon after snowfall occurs, Chalkyitsik residents set out snare lines for hares. Some residents also hunt "rabbits" along willow bars, taking advantage of their still-mottled coloration. Bears are occasionally harvested in the dens in early winter, though the extent of this practice in recent years is not known.

During November trapping begins for marten, mink, lynx, beaver, wolf, and fox. Commonly-used traplines extend up the Black and Little Black rivers, north to the Porcupine and Coleen rivers, and west as far as the Sucker River. Trapping continues usually until about mid-March, although beaver and muskrat trapping become most important during February and March.

Moose hunting sometimes occurs in conjunction with trapping, especially in November and during February and March. Caribou are occasionally harvested during spring and are valued as a source of variety in local diets.

The gathering of firewood and hauling water are continual requirements throughout the winter. Small game and fowl, including grouse and ptarmigan,

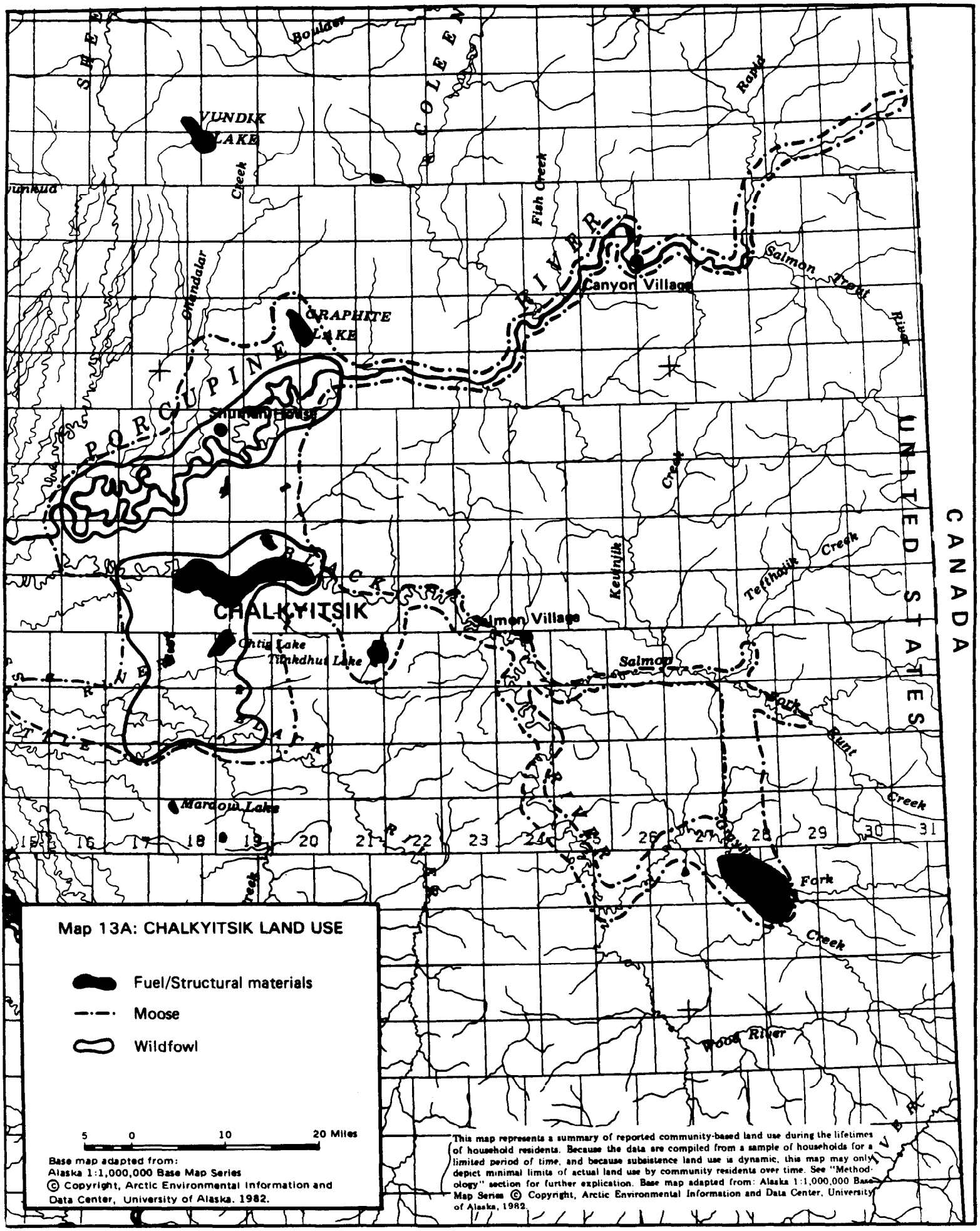
are occasionally harvested during winter months. In late winter, usually April, grayling are caught through the ice using hook-and-line.

LAND USE SUMMARY

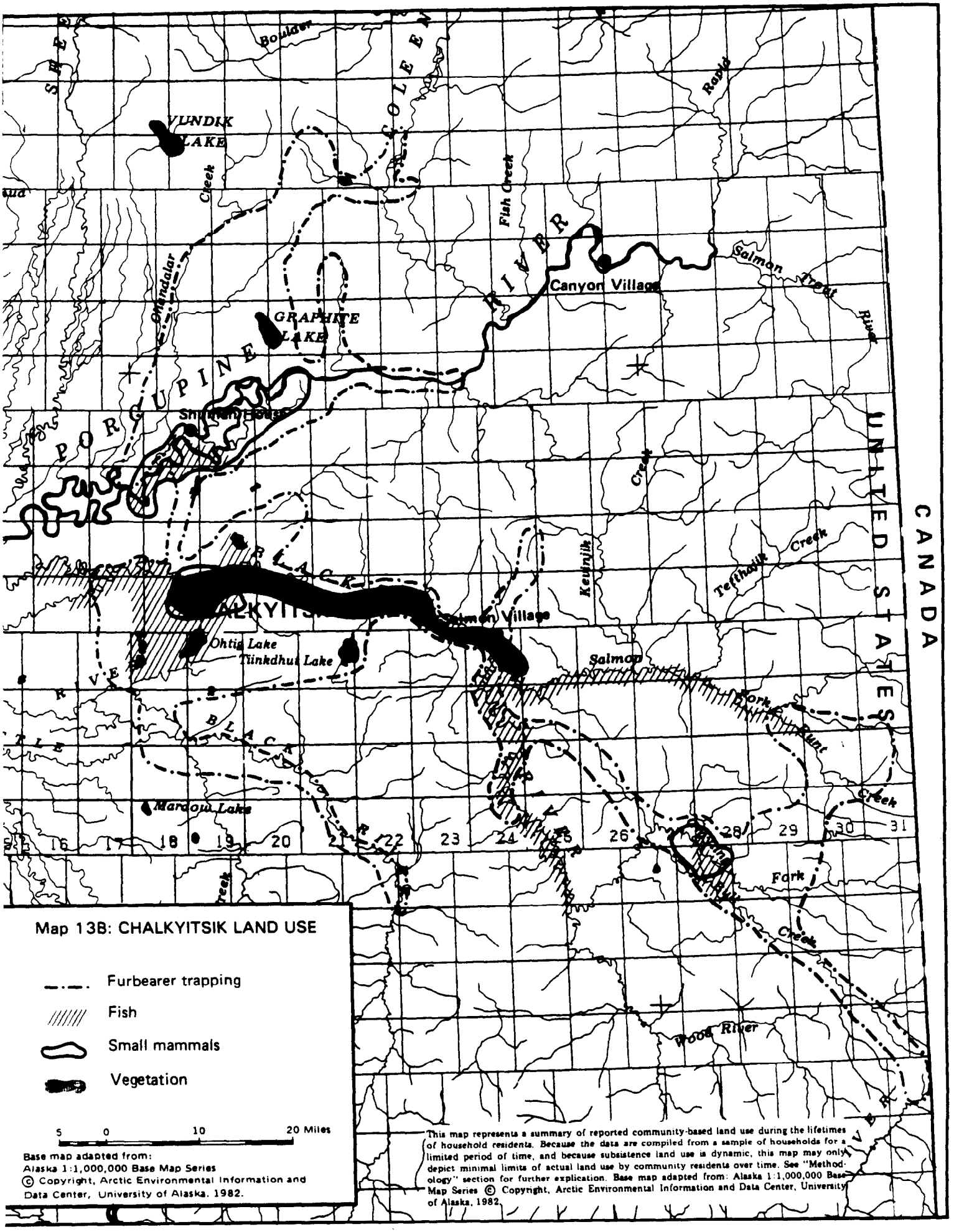
Land use data compiled from Chalkyitsik residents are depicted in Maps 13A through 13C. These maps show continued use of the 19th century territory of the Dr'aanjik Gwich'in, including the Black and Little Black river drainages, the Porcupine River to the Canadian border, and the lower Coleen River. The Black and Porcupine rivers are particularly important to Chalkyitsik residents, both for the resources which they provide and as transportation routes to other harvest areas.

Chalkyitsik moose hunting activity generally occurs on the Black and Salmon Fork rivers, on the Porcupine River, and in grassy, meadow-like areas to the south of the community. On the Black River, hunters travel by boat, generally from the vicinity of "Englishshoe Bar" upstream to above Kiivinjik Creek on the Salmon Fork. Moose are also taken by Chalkyitsik trappers at outlying camps on the Black, Little Black, and Porcupine rivers.

Caribou are occasionally harvested by Chalkyitsik hunters, especially in fall and spring, when the opportunity arises and meat supplies are low. Nelson (1973: 113) reported that Chalkyitsik hunters sometimes obtained caribou on the Porcupine River, in other areas of the herd's winter range, or in trade with people on the Chandalar River. During the course of this research, Chalkyitsik residents harvested caribou on the Porcupine River and near the headwaters of the Salmon and Grayling forks of the Black River in both fall and winter. Furthermore, In the spring of 1982 caribou migrated immediately adjacent to the community of Chalkyitsik -- an infrequent occurence -- where they were harvested by local hunters.



Boulder
VUNDIK LAKE
Creek
Fish Creek
Rapid
Salmon Trout River
Canyon Village
GRAPHITE LAKE
PORCUPINE RIVER
Shuman House
Creek
Keuinjik
Tetthajik Creek
UNITED STATES
CANADA
CHALKYITSIK
Salmon Village
Ohtig Lake
Tinkdhut Lake
Salmon
Fork
Runt
Creek
Mardow Lake
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
Fork
Creek
Woos River
Map 13A: CHALKYITSIK LAND USE
Fuel/Structural materials
Moose
Wildfowl
5
0
10
20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska. 1982.
This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.



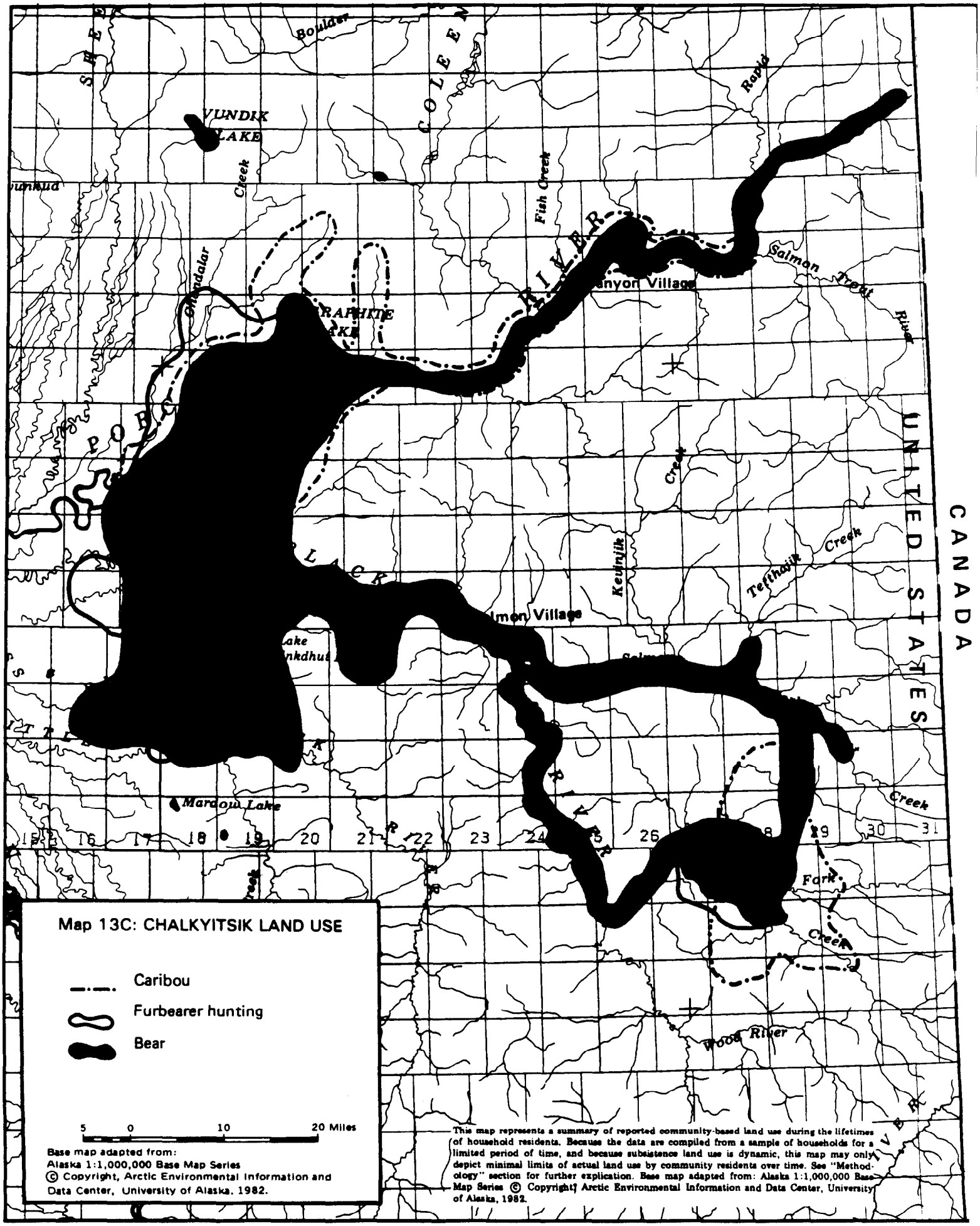
Map 13B: CHALKYITSIK LAND USE

- Furbearer trapping
- Fish
- Small mammals
- Vegetation

5 0 10 20 Miles

Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.

This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.



Map 13C: CHALKYITSIK LAND USE

Caribou

Furbearer hunting

Bear

5 0 10 20 Miles

Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.

This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright] Arctic Environmental Information and Data Center, University of Alaska, 1982.

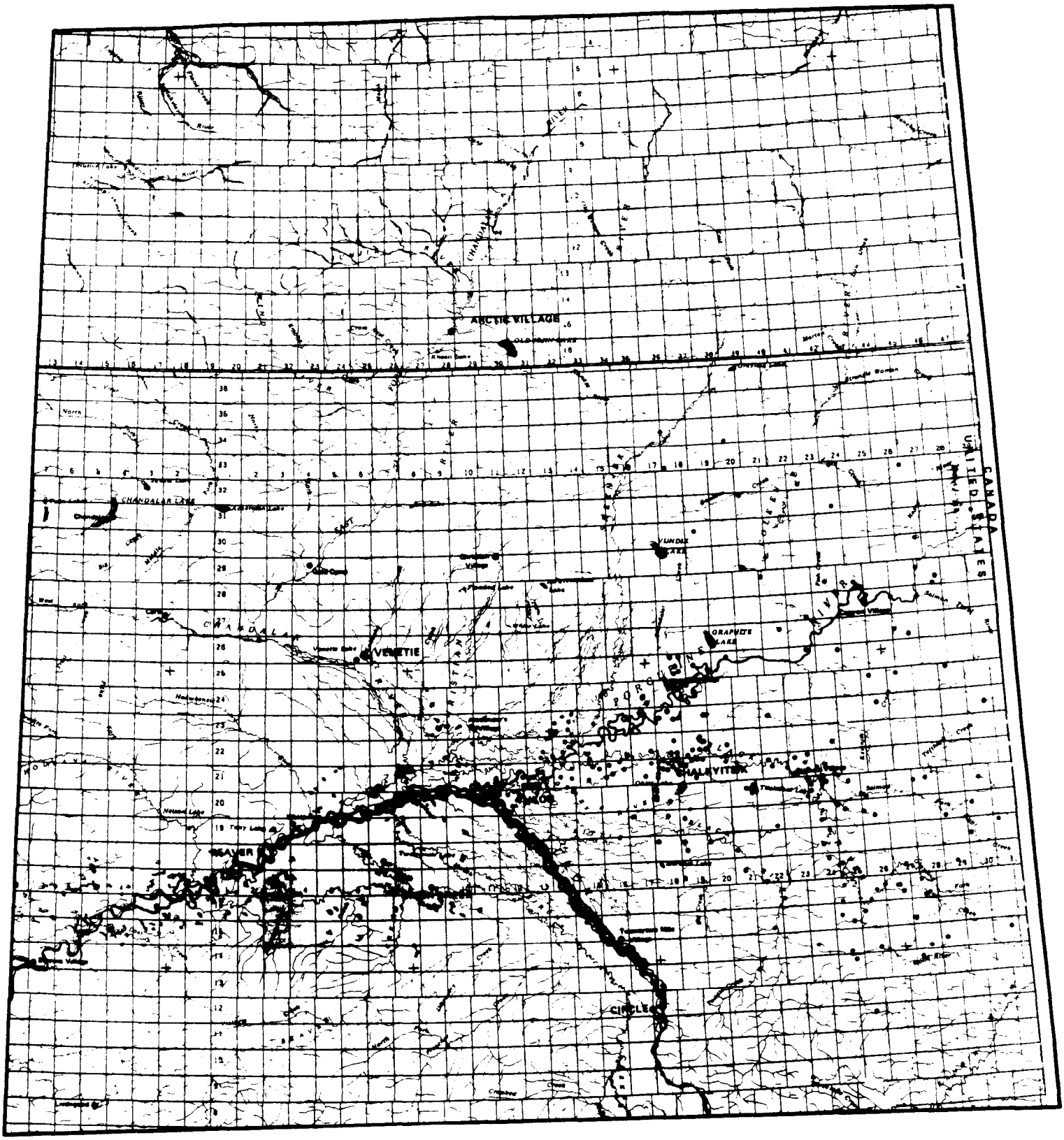
Dall sheep, according to local reports, were historically harvested by Dr'aanjik Gwich'in hunters in mountains at the head of the Salmon Fork of the Black River. Hunters traveled upstream to the head of navigation in small canoes, and then proceeded overland to sheep hunting areas. However, none of the residents interviewed in Chalkyitsik during this research had ever hunted sheep in this area.

Trappers from Chalkyitsik travel considerable distances on the Black, Little Black, Salmon Fork, Porcupine and Coleen rivers in search of fur. For example, in the fall of 1981 two trappers traveled over 150 miles by boat from Chalkyitsik to reach their winter camp. After a winter of trapping by dog team, they returned to Chalkyitsik the following March using dogs. Other trappers have seasonal camps at places such as Shuman House and "Old Village" on the Porcupine River, on both the Grayling and Salmon forks of the Black River, and on the lower sections of the Black and Little Black rivers.

Muskrat and waterfowl harvest activities occur principally in spring and early summer. They are centered in the extensive lake, creek, and slough systems found from the area just north of the Porcupine River south to the vicinity of the Little Black and Grass rivers. Ohtig Lake is a particularly productive hunting area for waterfowl. Marten Hill near Chalkyitsik is known to be good for hunting waterfowl as birds fly low over the terrain.

The Black River and its tributaries are the most productive sources of fish for residents of Chalkyitsik. Salmon, whitefish, burbot, and pike are caught with gillnets in the main river. Grayling are also taken, both in nets and with hook-and-line, especially in conjunction with other resource harvest activities such as moose hunting. A small creek entering the Black River just upstream from Chalkyitsik is a particularly prolific source of whitefish and pike in the spring and fall. Pike and whitefish are also taken in larger lakes near the community.

The distribution of 235 Native-named places known to Chalkyitsik residents is presented on Map 14 (Caulfield and Peter [in press]). Named places include those identifying geographic features, historic and cultural sites, resource use sites, and important travel routes. The names reflect the richness of environmental knowledge retained in the oral traditions of the Chalkyitsik people and provide insight into the extent of traditional land use in the Black River area.



Map 14: General Location of Chalkyitsik Place Names

CHAPTER 7

FORT YUKON LAND AND RESOURCE USE

ENVIRONMENTAL SETTING

Fort Yukon, largest of the communities in the Upper Yukon-Porcupine region, is situated at 66° 34'N latitude, 145° 18'W longitude in the heart of the Yukon Flats. Fort Yukon's Gwich'in name, Gwichyaa Zhee, means "house in the flats." Located near the confluence of the Yukon and Porcupine rivers, the community has historically served as a gathering place for the Gwich'in and neighboring peoples. In more recent times, it has served as an important trading, supply, transportation, and administrative center.

Fort Yukon's central location in the Yukon Flats has fostered expansive land and resource use patterns. It is surrounded by a vast lake-covered floodplain containing bottomland spruce-poplar and lowland spruce-hardwood forests, as well as lowbrush bog and muskeg communities. The Yukon Flats provide habitat for abundant aquatic species such as muskrat, beaver, whitefish, and waterfowl. The Yukon and Porcupine rivers serve as vital transportation corridors which provide access to upland areas which are used for harvesting moose, caribou and other species. Fisheries resources in the Yukon and Porcupine rivers and their tributaries provide a major source of food for Fort Yukon and, because of the interrelationship of all Upper Yukon-Porcupine communities, other communities as well.

LAND USE PATTERNS OVER TIME

Fort Yukon area residents are known as the Gwichyaa Gwich'in, or "dwellers on the flats" (Slobodin 1981:532). The aboriginal territory of the Gwichyaa Gwich'in included the Yukon Flats south of the lower reaches of the Chandalar and Sheenjek rivers and extending up the Yukon River to the vicinity of Circle (Andrews 1977:105). Prior to the arrival of the Hudson's Bay Company, members

of the band lived in semi-permanent camps both along the Yukon River and in the surrounding area (Andrews 1977:105). Even in aboriginal times the confluence of the Yukon and the Porcupine rivers was considered a gathering place. According to Stuck (1914b:3).

> Fort Yukon is the oldest spot on the river where English-speaking whites established themselves...but it had been long before that the native rendezvous for the inhabitants of this part of the Yukon, and of the many streams which are tributary to the Yukon hereabouts.

The original Hudson's Bay Company post at Fort Yukon was established by Alexander Murray in 1847. Three years earlier John Bell had been the first English-speaking visitor to the Upper Yukon-Porcupine region. Both Bell and Murray had begun their journey on the Mackenzie River and had descended to the Yukon by way of the Porcupine River (Wilson 1947:38). The Native inhabitants whom Murray encountered at the site of Fort Yukon had already established trade relationships with the Russians on the middle Yukon (Wilson 1947:38). Others had traded at Fort McPherson or with people in the Tanana and Copper River areas (Schneider 1976:45).

Archdeacon Robert McDonald of the Anglican Church, who lived in Fort Yukon between 1862 and 1871 described the interaction of various Gwich'in bands at Fort Yukon including those from the Chandalar and Black rivers and from Birch Creek (McDonald:n.d.). He also described patterns of resource sharing and exchange prevalent among bands in the region. For example, McDonald and other residents received moose, caribou, and fish from outlying bands while living in Fort Yukon. He also reported that Hudson's Bay Company personnel from Fort Yukon traveled to Birch Creek and the Chandalar country to obtain meat for the settlement (McDonald n.d.:23 April 1863). The Archdeacon also accompanied the Gwichyaa Gwich'in on a trading expedition to the confluence of the Yukon and Tanana rivers (McDonald n.d.:31 May 1870).

Explorers, traders, and missionaries visiting Fork Yukon after the sale of Alaska in 1867 provide glimpses of the extent of post-contact traditional

land use. Whymper (1869:177-178) encountered members of several different bands at Fort Yukon in 1867 and reported finding "indians camped everywhere by the banks" of the Yukon fishing for salmon. In 1869, Raymond (1900:28) reported meeting the renowned Gwich'in chief Shahnyaati' in the lower ramparts of the Yukon nearly 200 miles below Fort Yukon.

As Fort Yukon grew, people were drawn to the settlement by the opportunities for trade. By 1873 the Alaska Commercial Company began operating a steamer on the Yukon River and established a store at Fort Yukon (Shimkin 1951:4). Disease also became widespread, reducing the region's Native population (Shimkin 1951:4).

Gold strikes, first on Birch Creek and the Fortymile River, and then in 1897 in the Klondike region, brought new people and goods to the area. The expanded availability of goods changed the economic patterns and material culture of the region's inhabitants. Many Gwichyaa Gwich'in found seasonal wage employment in cutting wood for steamboats, hauling freight, or working as stevedores (Shimkin 1951:5).

Family-centered trapping, in which extended families became associated with particular areas, was the predominant pattern between 1900 and 1930 (Schneider 1976: 214). Trappers would spend the winter with their extended family at distant camps and then return to Fort Yukon to fish or to work for wages in summer. Thus, land use patterns were modified with changing social patterns. According to McKennan (1970:314-315), "more and more, the Native's economic life came to center around the individualistic activities of the nuclear family, rather than the earlier collective activities of the large band...." Seasonal camps comprised of one or more families, such as Alexander's Village, Twentytwo Mile Village, Old Rampart, "Boxcar," and "Sixteenmile," continued to play important roles in hunting, fishing, and trapping patterns in the early twentieth century (Andrews 1977:303-304). The influx of non-Native persons to the region, who often became integrated into the area's trapping and subsistence

economy became more pronounced during this period (Ward n.d.; Carroll 1957; Shore 1954).

During the 1930s fur prices and production remained fairly stable. The population of Fort Yukon grew to between 600-650 people by 1940 (Shimkin 1951:6). A significant drop in fur prices in the late 1940s contributed to a decline in the local economy. Marten prices dropped from $35 to $22 and muskrat pelts declined in value from $2.25 to $.90 (Shimkin 1951:7). Government transfer payments to the elderly, disabled, and to dependent children increased (Shimkin 1951:7).

During this period, Fort Yukon trappers and hunters often traveled considerable distances to harvest resources through the use of dog teams and riverboats. Fort Yukon hunters traveled up the Yukon River to above Circle to harvest caribou (Mason 1924). Hunters also traveled up the Porcupine River to harvest caribou near Canyon Village and Old Rampart. Fort Yukon trappers traveled as far as the Old Crow Flats in Yukon Territory in search of fur (Carroll 1957:79-93). Enforcement of customs regulations at the Canadian border reportedly caused disruption of customary trade and harvest activities by Yukon Flats people along the upper Porcupine River.

The effects of the Fort Yukon flood of 1949 accelerated changing community patterns and increased the role of government assistance in the lives of residents (Williams n.d.). Prior to the flood, residents from throughout the region gathered each year in Fort Yukon in early summer to visit and trade. By the mid-1950s, however, this practice had largely declined, and traditional governing institutions had been modified (Williams n.d.). Consolidation of the Bureau of Indian Affairs (BIA) and territorial schools in the 1950s and an increased emphasis on compulsory education accelerated a trend toward families remaining in Fort Yukon rather than establishing seasonal camps. Decreased mobility and expansion of the cash sector of the economy meant that many Fort Yukon children no longer grew up in a setting where procurement of wild

resources was a major focus of daily life (Solomon n.d.). Despite the growth of market sectors in the economy and the expansion of community facilities such as schools and a post office, many Fort Yukon families continued to utilize wild resources as part of a mixed subsistence-based economy.

A few families attempted to establish a permanent base at Canyon Village on the Porcupine River in the 1960s because of dissatisfaction with life in Fort Yukon. By the end of the decade, however, most had returned to Fort Yukon or Chalkyitsik, reportedly due to the high cost of transporting supplies and equipment (S. Francis, personal communication, October 1981).

THE CONTEMPORARY COMMUNITY

In 1980 Fort Yukon had a total population of 661 people (U.S. Bureau of the Census 1980). Census data with the exception of that for 1960, show a pattern of steady growth in the community since the late 1800s. Fort Yukon today is the administrative, transportation, communication, and economic center for the Upper Yukon-Porcupine region (Darbyshire and Associates 1979:13). It is organized as a second class city and provides both fire and police protection to its citizens. Other facilities in the community include: a community center; a Public Health Service clinic; a National Guard armory; a Bureau of Land Management fire control station; the Yukon Flats School District administration building; elementary and secondary schools; several stores; a small hotel; state and city office buildings; State Trooper housing; University of Alaska Rural Education Center; three churches; a bulk fuel plant; a Native corporation office building; the Lions Club center; and a museum. The U.S. Air Force maintains a communications site on the outskirts of the community.

Electric power and telephone service are provided by private utilities, and satellite cable television is available. Water from a well is available from a central distribution point, and a laundry facility exists in the

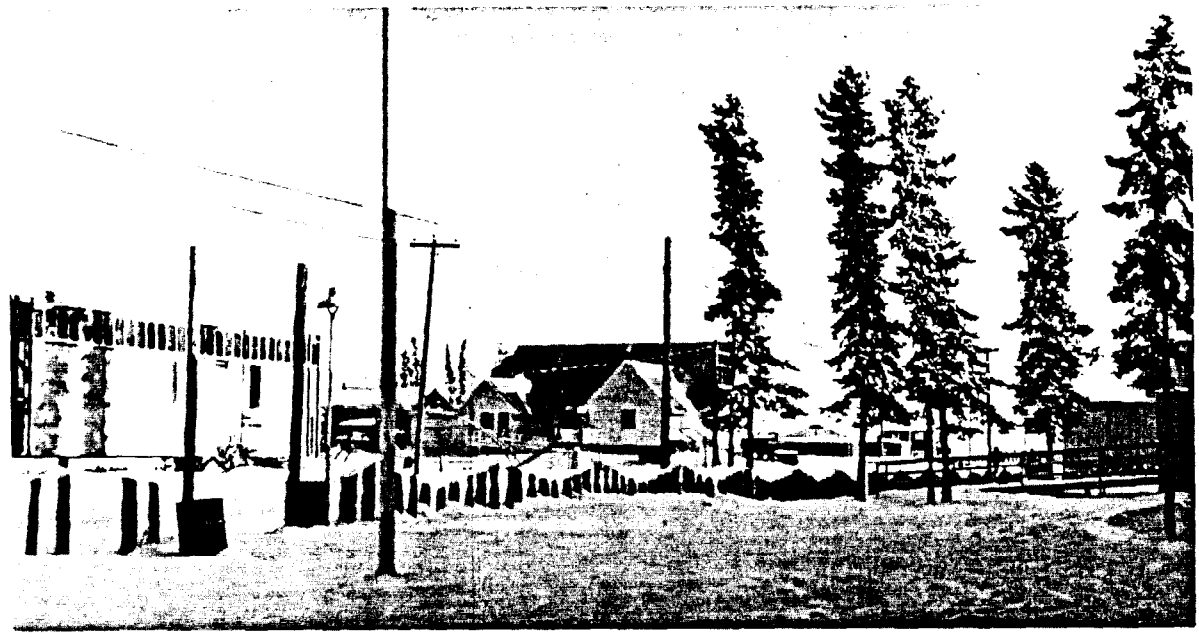


PLATE 12 Street Scene in Fort Yukon.

PLATE 13 Chum Salmon Drying Along the Yukon River.

PLATE 14 Fort Yukon Woman with Trapped Muskrat.

community center. Sewage is disposed of in privies, while solid waste is consolidated at the city dump.

The Yukon Flats School District operates both elementary and secondary education facilities in Fort Yukon. The University of Alaska offers courses through the Cross-Cultural Education Development program (X-CED) and a branch of its Rural Education Center. Health care is provided by the Public Health Service clinic; the nearest hospital facility is located in Fairbanks.

Fort Yukon has a 5,000-foot gravel runway maintained by the State of Alaska. Two commercial airlines provide service to Fairbanks and to outlying "bush" communities. Charter service is available for landing on floats, wheels, or skiis. Barge service is provided by Yutana Barge Lines of Nenana and the Yukon Navigation Company during the summer months.

The economy of Fort Yukon is a blend of both cash and subsistence components. A survey conducted in 1978 by the University of Alaska found that wage employment opportunities tended to be more prevalent in Fort Yukon than in other communities in the region (Institute of Social and Economic Research 1978:5:3). Preferences for subsistence activities over wage employment reportedly were less strong in Fort Yukon than in other communities in the region (Institute of Social and Economic Research 1978:5:6). While Fort Yukon Native residents reported spending less time in resource harvest activities each year than did residents of other communities, the diversity of their subsistence take was reported to be greater (Institute of Social and Economic Research 1978:5:6). This research determined that the quality of "subsistence pursuits," measured in terms of the diversity of resources taken and equipment utilized, may actually have been enhanced by these wage employment opportunities even as the quantity of resources harvested declined (Institute of Social and Economic Research 1978: 5-9). Possible explanations for this may include use of better technology for resource harvesting made possible by income from wage employment or the fact that a diversity of resources are available to

residents due to Fort Yukon's central location in the region. Fort Yukon is a transportation center in the region, allowing residents ready access to major river corridors and air taxi services.

Fort Yukon had a higher proportion of professional-technical, managerial-administrative, and sales-clerical employment opportunities than did the remainder of the region, according to the survey by the Institute of Social and Economic Research (1978:6:4). As a result, employment for some residents tends to be less seasonal in nature, and earnings are higher.

The complementary interaction of the market and subsistence components of the mixed economy, however, are reflected in the fact that the U.S. Fish and Wildlife Service in 1976 estimated that at least 50 percent of the meat and fish consumed in Fort Yukon were derived from local resources (U.S. Fish and Wildlife Service 1976:6). Interviews with Fort Yukon residents suggest an expansion of resource harvest efforts since the early 1970s. Noncommercial harvests of salmon, for example, have generally increased in Fort Yukon during the 1970s (Alaska Department of Fish and Game, Division of Commercial Fisheries 1980:89-91) (Table 6). Interview data gathered in Fort Yukon suggest that the number of persons engaged in trapping as well as the amount of trapping effort may also have increased during this period.

ANNUAL CYCLE

The annual cycle of resource harvest activities for Fort Yukon from 1970 to 1982 is summarized below (Figure 5). Data presented in this summary were compiled from interviews with local resource experts and from observations by the researcher. The annual cycle summary includes only major harvest activities and may vary from year to year.

Spring. Breakup usually begins in mid-April in the Yukon Flats area, and migratory waterfowl appear soon after that time. Ducks and geese are avidly sought by Fort Yukon residents because they offer the first fresh meat of spring.

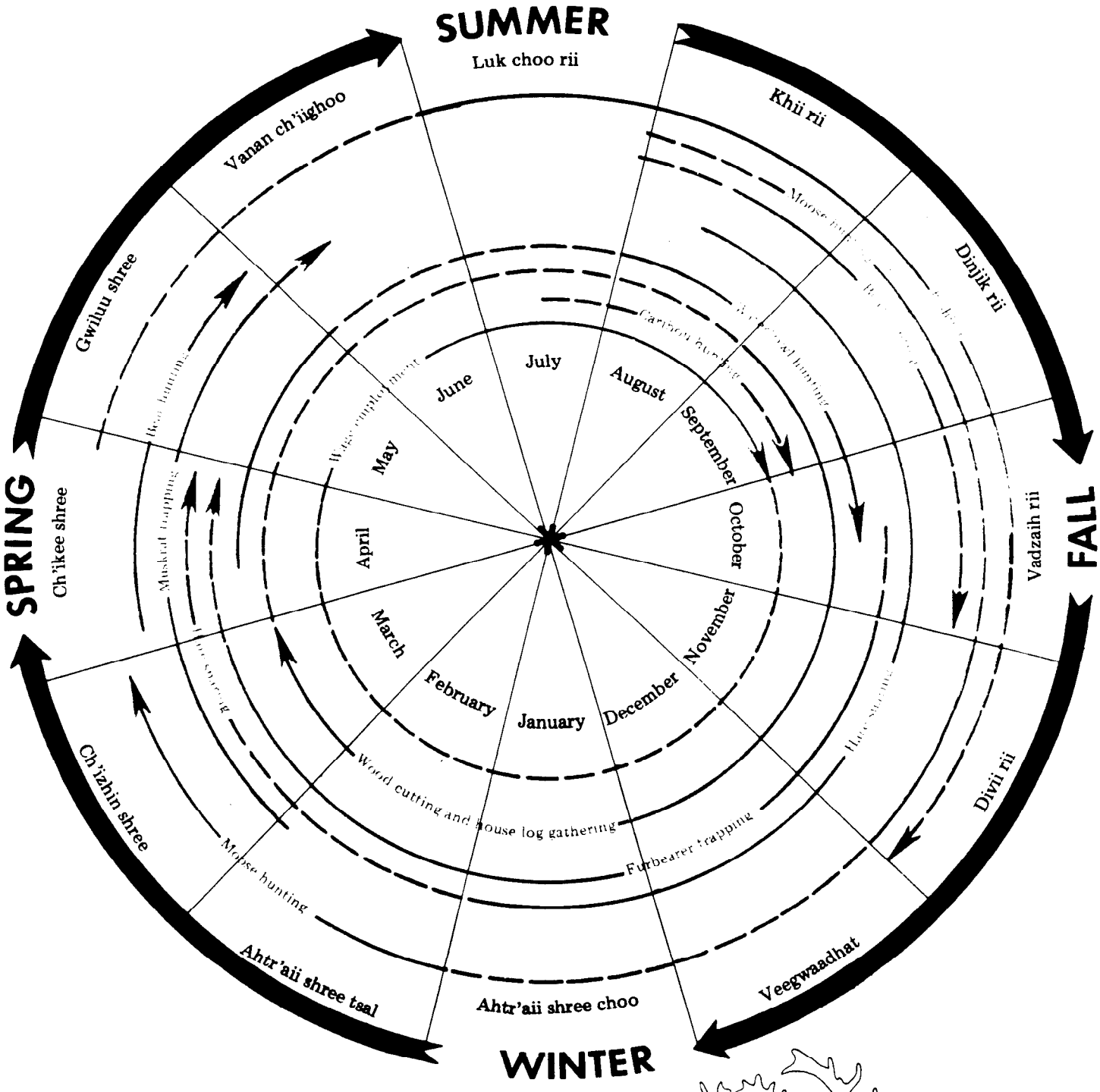


FIGURE 5

Fort Yukon
Annual Cycle

Circa 1970-1982

Primary activity

Secondary activity

Residents living in spring tent camps harvest waterfowl on small lakes and streams. Others living in Fort Yukon at this time of year seek waterfowl along rivers and lakes close to the community.

Muskrat hunting is also an important spring activity. Some hunters establish muskrat camps on isolated lakes in late winter before breakup begins. They then "spring out" at these camps, remaining there during breakup to trap and then hunt muskrat and waterfowl. Black bear are also occasionally taken near these camps or, after the rivers become free of ice, along the banks of watercourses.

Fishnets are placed in small creeks and sloughs near the Yukon and Porcupine rivers to catch whitefish, sucker, and pike. By June waterfowl and muskrat hunting decline and the focus of activity centers around preparation for salmon fishing. Boats, outboard motors, and nets are pulled out of storage and repaired for use during the brief summer months. Some residents cut house logs along the Yukon and Porcupine rivers upstream from Fort Yukon and raft them down to the community during high water for later use.

Summer. Many Fort Yukon residents travel on the Yukon or Porcupien rivers to establish fishcamps before the arrival of king salmon around the first of July. Others remain in Fort Yukon but make daily trips to check their nets. King salmon are caught using gillnets and occasionally fishwheels. Fishing families are busy checking nets and wheels, cutting and processing fish, making king salmon "strips," and tending smokehouses. Daily activities often include the repair of equipment such as outboard motors and fishnets, and gathering firewood for smokehouses and cooking fires. Small game or fowl are sometimes harvested if available, and considerable time is spent visiting friends and relatives in nearby camps.

These patterns of fishing activity continue after the first week of August when chum salmon usually arrive in the Fort Yukon area. Chum salmon are more commonly caught in fishwheels, and are split and dried on racks made of local

materials. By late summer, blueberries, cranberries, rosehips, and other vegetation are harvested for use during the long winter months.

Seasonal wage employment in firefighting or construction jobs is an important summer activity as well. Usually workers return to Fort Yukon, however, before the fall season of hunting begins. Some families in Fort Yukon also grow large gardens which provide vegetables for use in the winter.

Fall. Moose hunting, and to a lesser extent, caribou hunting are the focus of harvest activities during late August and September. Fort Yukon hunters often travel by boat in search of moose in particularly good areas along the Yukon River downstream as far as White Eye or the lower mouth of Birch Creek, up Birch Creek, or up the Yukon towards Twentytwo Mile near Circle. Others travel up the Porcupine River or its tributaries, such as the lower portion of the Sheenjek, Coleen, or Black rivers to harvest moose. Black bear may also be harvested in conjunction with moose hunting. Caribou hunting usually occurs in mid-September near Canyon Village or Old Rampart as animals from the Porcupine Caribou Herd cross the Porcupine River.

Fishing for chum and coho salmon continues until freeze-up in late fall, especially by those households having sled dogs. Whitefish and pike are also taken with nets, and grayling are caught using hook-and-line. Waterfowl are harvested as long as they are available, but not as intensively as in spring. Some Fort Yukon residents begin to gather firewood, berries, or other vegetation, or engage in hunting hares by means of "rabbit drives."

Winter. Freezeup of small lakes and streams in the Fort Yukon area usually occurs in mid-October. The Yukon and Porcupine rivers, however, usually do not freeze until November or even December. After the ice thickens and sufficient snow exists for using snowmachines, trappers set out their lines for marten, mink, beaver, lynx, wolf, fox, and wolverine. In addition, trappers are engaged in the upkeep of trapline cabins, hauling supplies to camps, and preparing for market. Beaver snares are used principally in early and late

winter. Other species are usually sought until mid-March. Snare lines for hares are checked regularly both by trappers and by Fort Yukon residents. Grouse or ptarmigan are occasionally harvested when encountered.

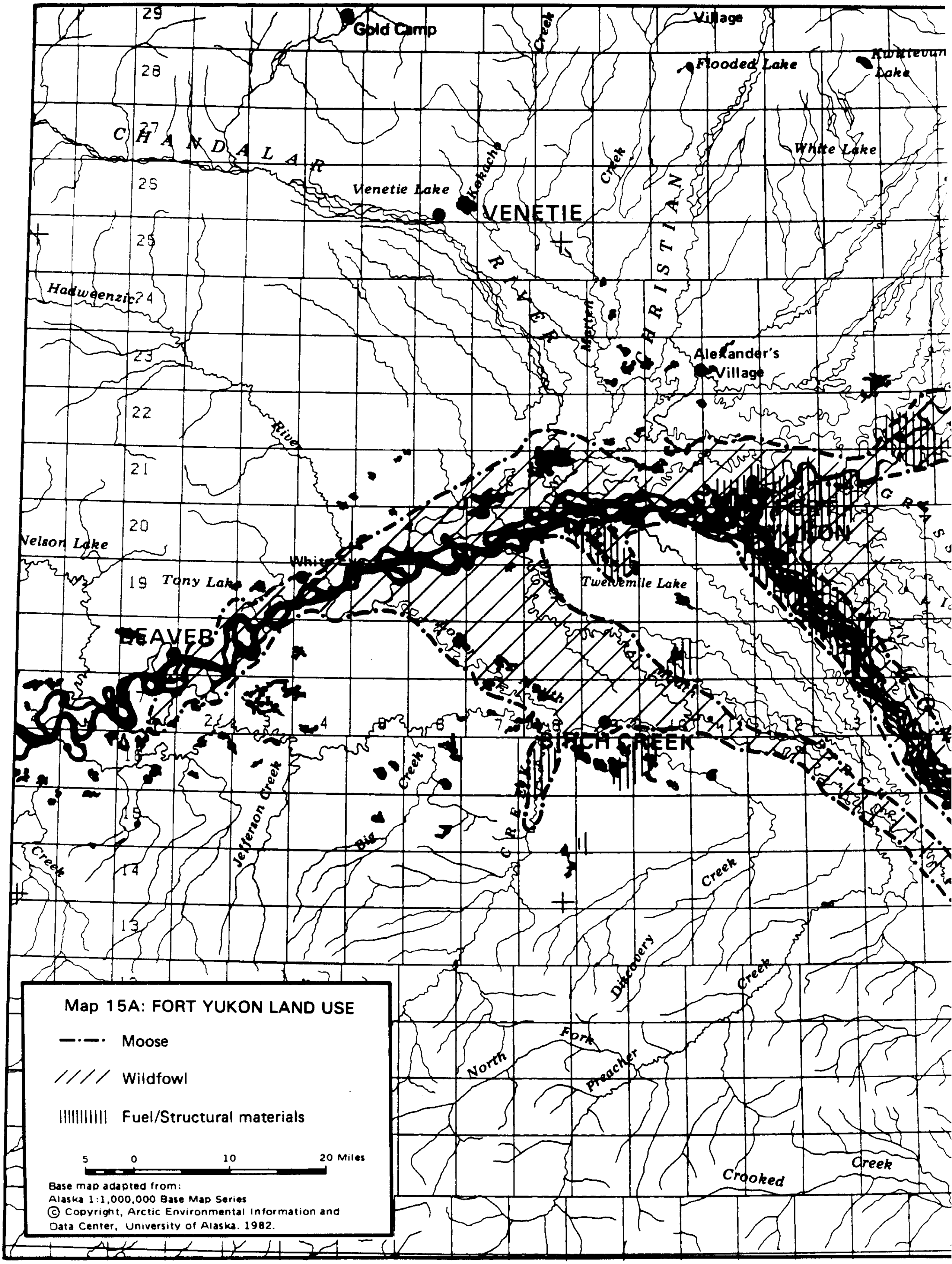
Fishing under the ice for whitefish, pike, and suckers sometimes is undertaken just after freezeup. Fish are kept frozen for both human and dog consumption. Firewood gathering and water hauling remain regular chores for most households throughout the winter.

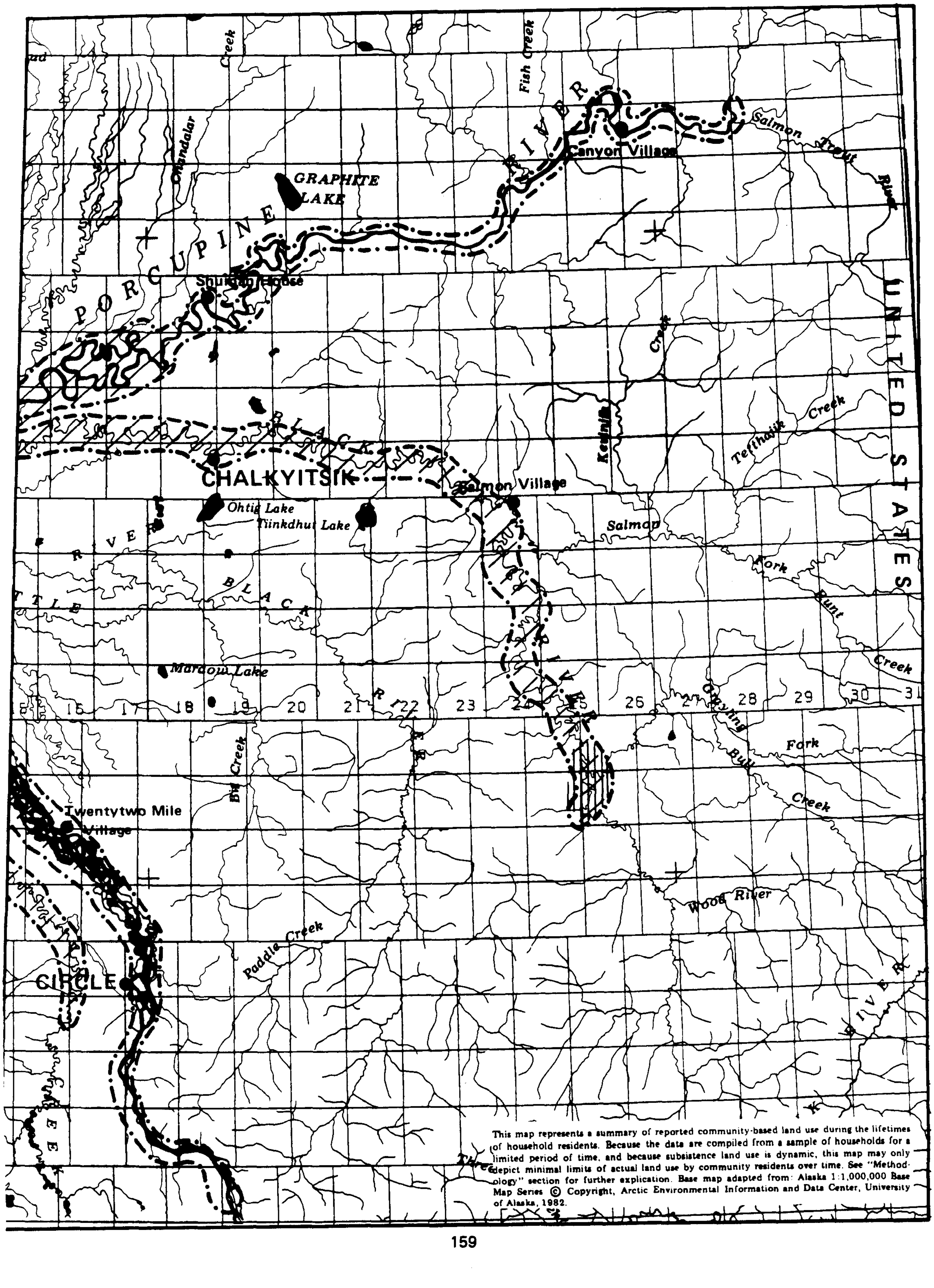
Moose are sometimes harvested during winter, usually in November or again during February and March. Often trappers in remote areas wait until early winter to harvest moose so that meat can be kept frozen. Spring moose are occasionally taken to provide meat for the summer months.

In late winter, trappers turn their attention to beaver snaring and trapping and then to muskrat trapping. Grayling are caught through holes in the ice using hook-and-line as late as early April.

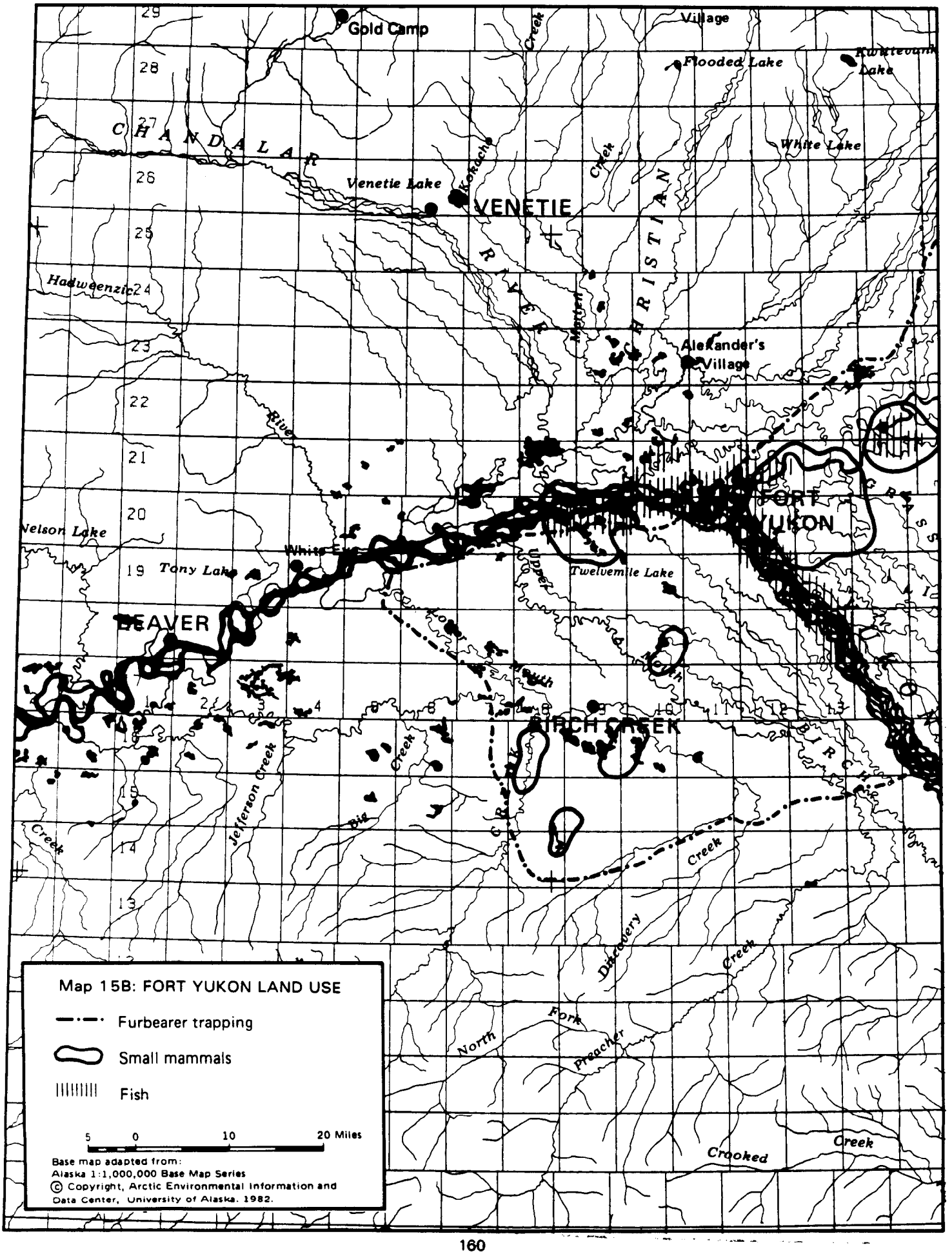
LAND USE SUMMARY

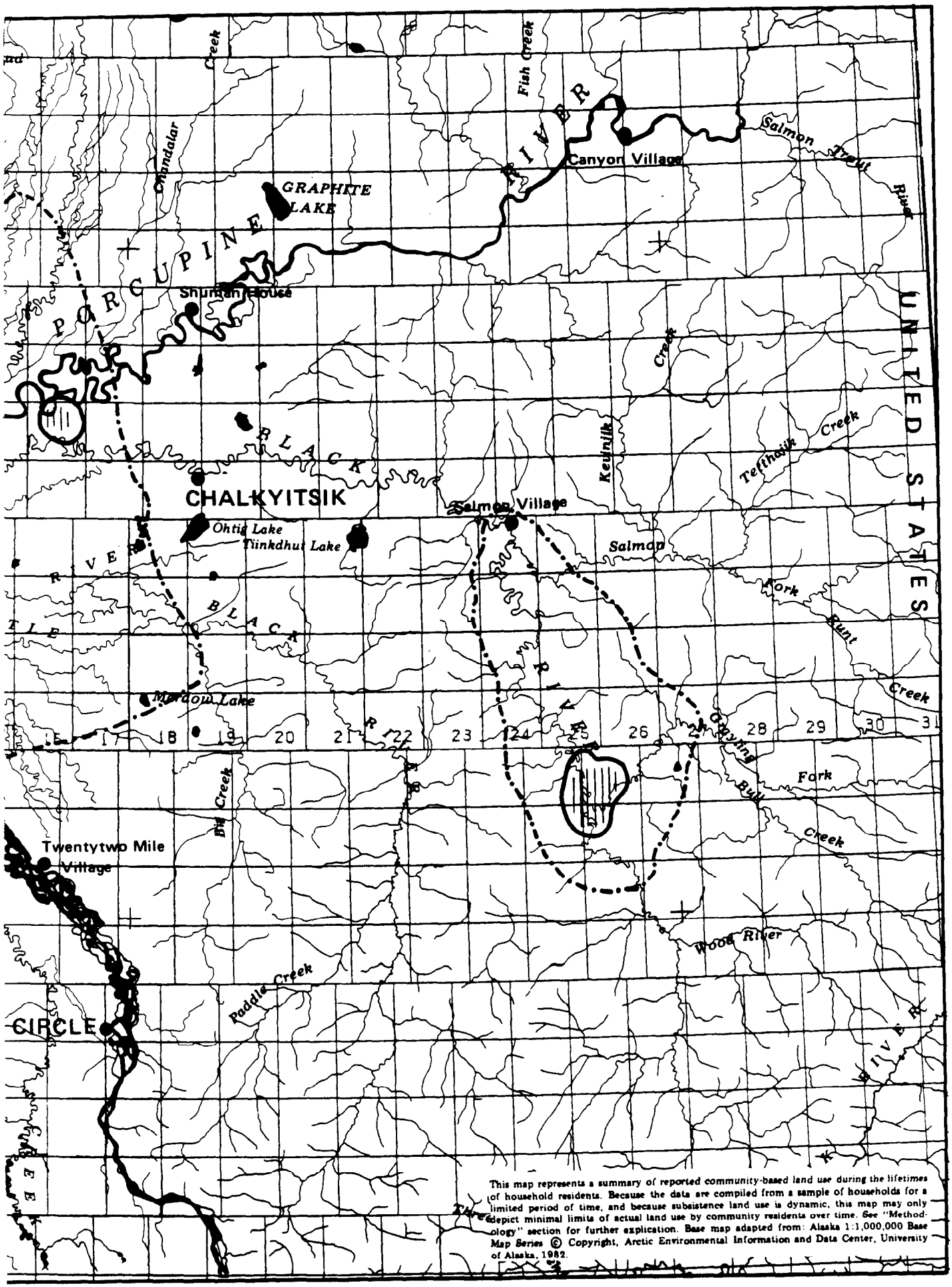
Areas of land use utilized by selected Fort Yukon households are depicted in Maps 15A through 15C. Because of the large size of the community and time constraints, only six percent of all households in Fort Yukon were interviewed to obtain mapped land use data (see Methodology, Chapter 1). Households selected were those reported by local residents to be most active in their use of land for resource harvest purposes. Because of these limitations, land use data presented here should be considered only a minimal representation of actual land use. For example, the use of Alexander's Village, a seasonal camp north of Fort Yukon, has been documented in the literature for both historic and contemporary periods (Andrews 1977:303). However, because of the limitations stated above this use is not reflected on the maps. Similarly, use of caribou hunting area upriver of Circle by Fort Yukon residents, also documented in the literature (Mason 1924; Alaska Game Commission n.d.), is not included.


Map 15A: FORT YUKON LAND USE
Moose
Wildfowl
Fuel/Structural materials
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska. 1982.
Gold Camp
Village
Flooded Lake
White Lake
CHANDALAR
Venetie Lake
VENETIE
CHRISTIAN
RIVER
Alexander's Village
Nelson Lake
Tony Lake
Twelvemile Lake
BEAVER
BIRCH CREEK
Jefferson Creek
Big Creek
Creek
Discovery
North Fork
Preacher
Crooked Creek

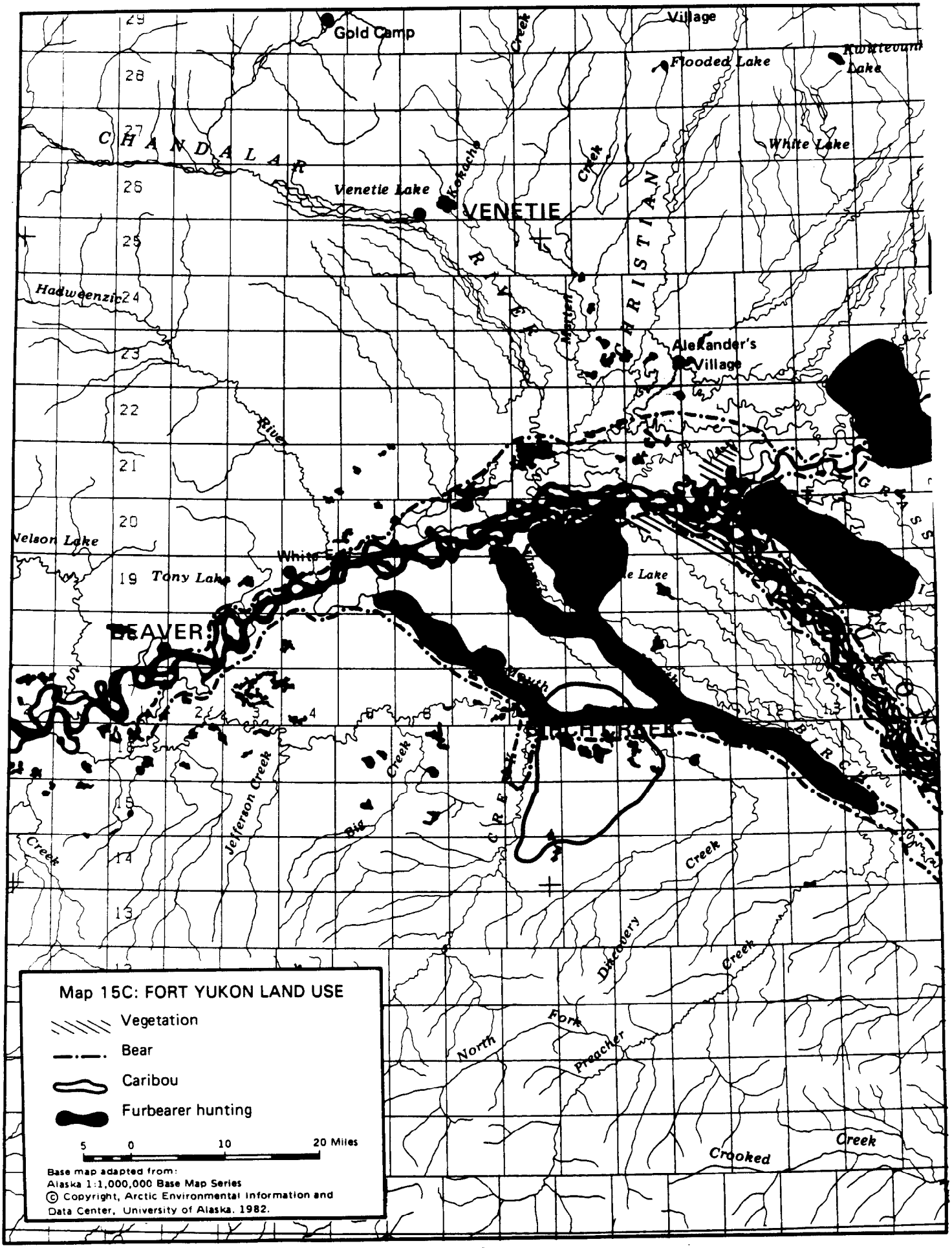


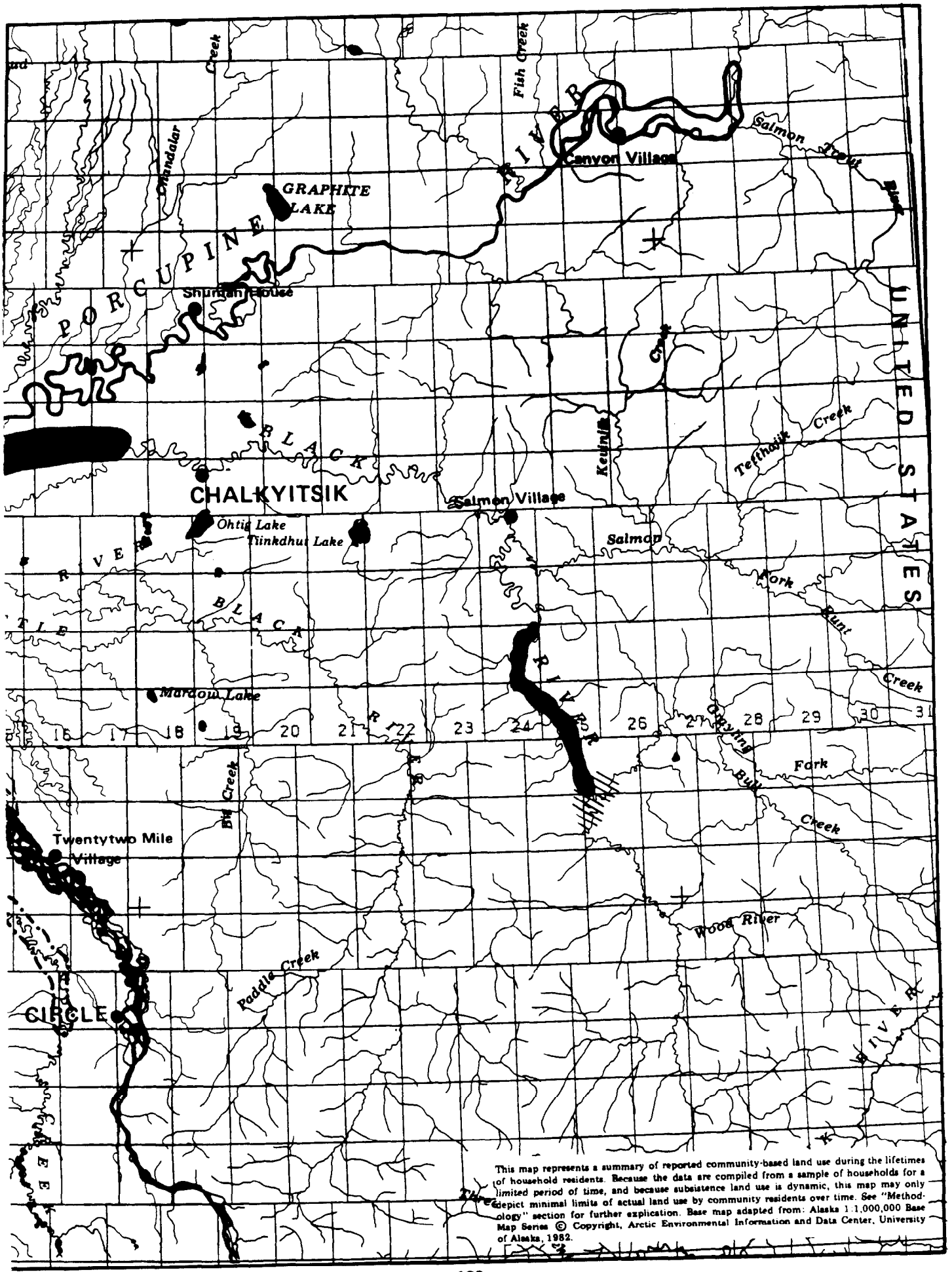
This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.


Gold Camp
Village
Flooded Lake
Kwittevunk Lake
White Lake
CHANDALAR
Venetie Lake
Kokacho
VENETIE
RIVER
CHRISTIAN
Creek
Hadweenzic
Alexander's Village
River
FORT YUKON
Nelson Lake
White Eye
Tony Lake
Upper
Twelvemile Lake
BEAVER
Lower
Mouth
BIRCH CREEK
Jefferson Creek
Big
Creek
Creek
Discovery
Creek
North
Fork
Preacher
Crooked
Creek
Map 15B: FORT YUKON LAND USE
Furbearer trapping
Small mammals
Fish
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska. 1982.



This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.


Gold Camp
Village
Flooded Lake
Kwittevunk Lake
White Lake
CHANDALAR
Venetie Lake
VENETIE
Kokacho
Creek
RIVER
CHRISTIAN
Hadweenzic
Alexander's Village
River
Nelson Lake
Tony Lake
BEAVER
Jefferson Creek
Big
Creek
Creek
Discovery
Creek
North
Fork
Preacher
Crooked
Creek
Map 15C: FORT YUKON LAND USE
Vegetation
Bear
Caribou
Furbearer hunting
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska. 1982.



This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.

Areas reported to be used by Fort Yukon residents for moose and bear hunting include the Yukon, Porcupine, lower Sheenjek, and Black rivers, and Birch Creek. Moose hunters reported that they usually travel downriver on the Yukon as far as White Eye, although one household member reported hunting below Beaver. On occasion, hunters have traveled up the Yukon River as far as the mouth of the Charley River. Moose hunting activity was reported as far up the Porcupine River as Old Rampart. Fort Yukon hunters also search for moose on Birch Creek from its lower mouth upriver to the bridge at the Steese Highway. Most Fort Yukon-based moose hunting on the Black River occurs below the vicinity of "Englishshoe Bar". Above this area, moose hunting is generally undertaken only by one extended family from Fort Yukon, which travels by boat each autumn to their trapping area in the upper Black River.

In recent years, some Fort Yukon hunters have traveled up the Porcupine River to the vicinity of Canyon Village and Old Rampart to hunt caribou, usually in September. Changing migration patterns have reduced the availability of caribou in areas previously hunted along the Yukon River above Circle. However, several caribou were reportedly harvested by Fort Yukon residents along the Yukon River between Circle and Fort Yukon in the spring and summer of 1982.

Salmon fishing by Fort Yukon residents generally occurs along the Yukon River. A number of fishcamps are concentrated between 12 and 16 miles down the Yukon River from Fort Yukon. Others are scattered upriver, extending to near the site of Twentytwo Mile Village. Fishing sites for other species such as whitefish, pike, grayling, sucker, burbot, and sheefish, exist on the Yukon, Porcupine, Sheenjek, Black, Grass, and Sucker rivers, and on nearby lakes.

Fort Yukon residents reported use of traplines up the Porcupine river to near Shuman House, up the Yukon River to near Twentytwo Mile Village, and on the Grass, Sucker, and Little Black rivers. Several trappers based in Fort Yukon utilize portions of the upper Black River, while others use areas along Birch and Beaver creeks. For example, one trapper regularly drove his snowmachine from

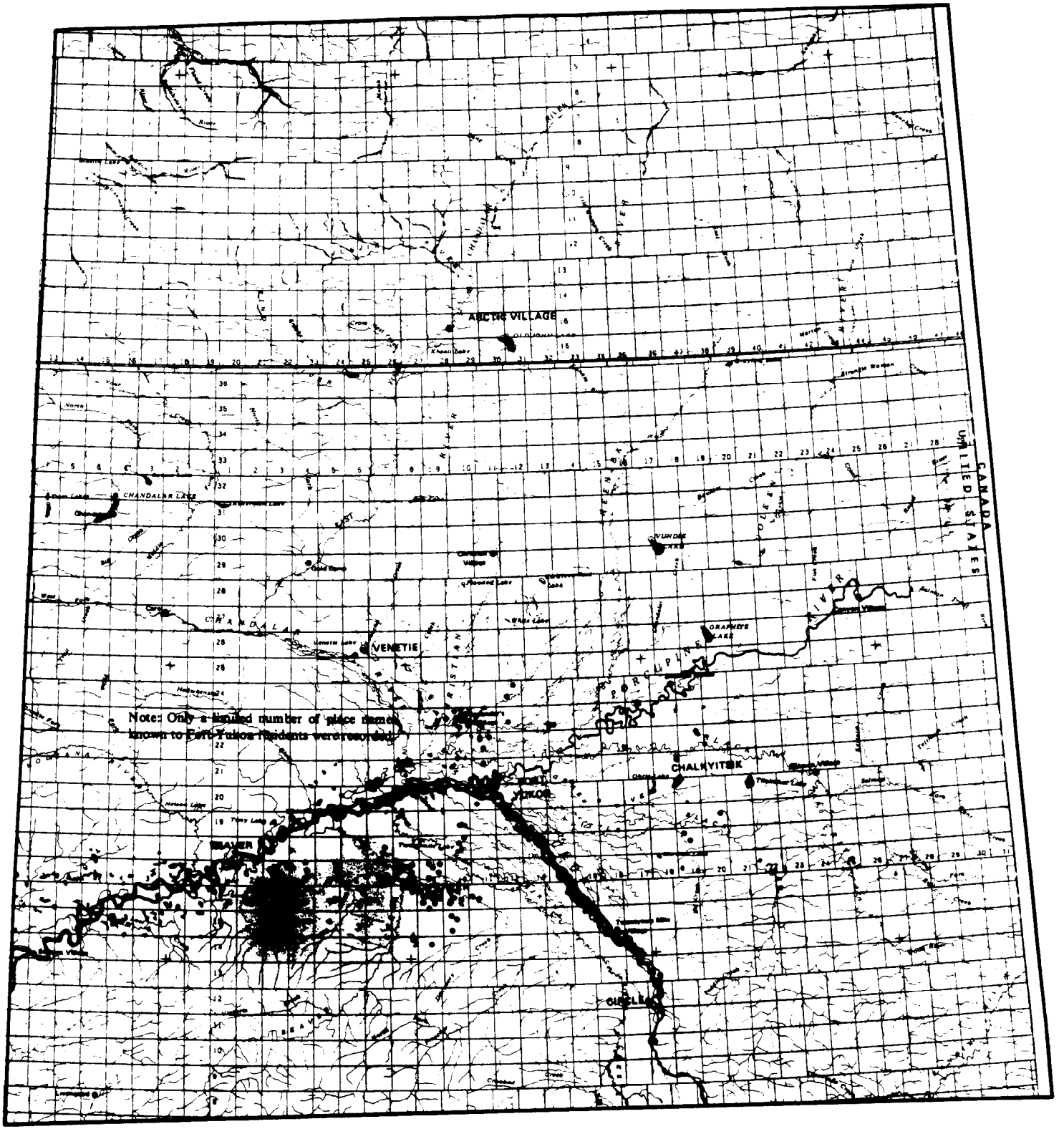
Fort Yukon to Beaver Creek in winter of 1981-82, remaining there through break-up to hunt muskrats and waterfowl. In June 1982 he floated down Beaver Creek to the community of Beaver and "hitched" an aircraft charter back to Fort Yukon. Fort Yukon also serves as a supply center for households living full-time near distant traplines throughout the region, including those on the Coleen, Sheenjek, Porcupine, Chandalar, and Black rivers and on Birch Creek. Because this research was community-based data from these remote households were not included on the maps.

The Porcupine River is utilized by Fort Yukon residents for moose, bear, waterfowl, and caribou hunting. It is also used for fishing, gathering house-logs and firewood, and berry picking. The Porcupine also serves as a transportation route for travel to Chalkyitsik, Old Crow, and to upland resource use areas. Clear water, expansive gravel bars, and a relatively good channel, make it a desirable setting for outdoor activities in summer including as picking berries or teaching a youngster how to operate a boat.

Land use maps compiled from Fort Yukon households are of particular interest because they reflect the diversity and mobility of the community's residents. Many people in Fort Yukon today have kinship ties to outlying communities and occasionally utilize these areas for hunting and fishing. For example, members of one Fort Yukon household who grew up in Birch Creek often return to this area for fall moose hunting and for trapping. Another extended family which grew up in a winter camp 100 miles from Fort Yukon travel long distances with a riverboat or by chartered aircraft to trap, hunt, and fish in the area used by their family for several generations. Thus, improved technology enables many families to continue use of an area while at the same time retaining a home base in the larger community. New equipment is purchased and maintained with cash received from wage employment and trapping. Fort Yukon's location near the confluence of the Yukon and Porcupine rivers, and the availability of

transportation services such as air taxis, contribute to these diversified patterns of land use.

Only 79 Native-named places were initially recorded from Fort Yukon residents during the course of this research (Caulfield and Peter [in press]) (Map 16). Key informants said to be knowledgable about local place names were not available while data gathering efforts were underway. Consequently, the distribution of recorded names presented in Map 16 must be considered incomplete until further work is conducted. Informants providing names were reported to be most knowledgeable about those in the Birch Creek and Alexander's Village areas. Names reflecting knowledge of other areas, including the Porcupine and Yukon rivers upstream from Fort Yukon remain to be collected. Chalkyitsik residents provided some names of places along the Porcupine River, which were presented in Chapter 6.



Map 16: General Location of Fort Yukon Place Names

CHAPTER 8

VENETIE LAND AND RESOURCE USE

ENVIRONMENTAL SETTING

The village of Venetie (Viinihtaii) is situated at 67° 01'N latitude, 146° 25'W longitude on the north side of the Chandalar River. Venetie is approximately 45 air miles northwest of Fort Yukon and about the same distance by river from the mouth of the Chandalar River. Its name means "trail comes down between two hills," describing its location at the intersection of a game trail with the Chandalar River (Caulfield and Peter [in press]). Venetie's location on the Yukon Flats near the foothills of the Brooks Range provides access to resources found in the extensive lake, river, and slough systems of the Flats themselves, and resources of the upland region such as caribou. Not surprisingly, Venetie residents take advantage of this diversity, utilizing land south toward the Yukon River and north into the Brooks Range.

Upriver from the community, the East and Middle forks of the Chandalar River extend north into the treeless alpine tundra regions of the Brooks Range. To the east the Christian River flows circuitously from the uplands between the Sheenjek and Chandalar rivers to its confluence with the Yukon below Fort Yukon. The vast Yukon Flats extend to the west of the community, toward a cluster of small lakes known as van ląįį and to the Hadweenzic and Hodzana rivers. The Chandalar River flows southeasterly past Venetie toward its confluence with the Yukon River. Like residents in other communities of the region, the people of Venetie utilize the Yukon both as a transportation route and as a source of fish, especially salmon. Large lakes -- including Venetie, Ackerman, and Vunittsieh -- play an important role in resource harvests. Although declining water levels have apparently thwarted the historic harvest of whitefish from Venetie Lake, it is utilized today for hunting, particularly for waterfowl. Ackerman Lake is a source of lake trout, whitefish, and pike

and is used as a seasonal camp for fishing, hunting of moose and caribou, and trapping. The intricate and extensive lake, river, and creek systems to the south and east of Venetie provide relatively reliable sources of wild foods. Whitefish, muskrat, waterfowl, and furbearers are important resources harvested there.

LAND USE PATTERNS OVER TIME

Venetie today is largely comprised of descendants of the Neets'ąjį Gwich'-in, although some residents reportedly are descendants of the Gwichyaa Gwich'in and the little-known Dihaii Gwich'in bands (Andrews 1977:105). The Dihaii Gwich'in were a band orginally occupying the region between the Middle Fork of the Koyukuk River and the Chandalar River, south into the Yukon Flats area (Andrews 1977:103).

Venetie, known to early explorers as "Old Robert's Village" or "Chandalar Village," was founded about 1895 by a man named Old Robert (McKennan 1965:16). He settled near fishing sites which had been used by his father, who was a Dihaii Gwich'in (McKennan 1965:19-20). Informants today report that Old Robert chose this location because of the availability of chum salmon in the Chandalar River and of whitefish and waterfowl from Venetie Lake. Moose and caribou were also available, and a moose-snaring fence was used near Venetie Lake around the turn of the century.

Venetie was only one of several settlements used by the Neets'ąjį Gwich'in in the Yukon Flats around the turn of the century. Other settlements used during this period were Tsuk'ǫǫ, a fishing site located about 12 miles east of Venetie, Ti'itree, or "Lower Fish Camp", located about five miles south of Tsuk'ǫǫ, and K'ahtsik, located near the mouth of the Chandalar River (McKennan 1965:19). A geologist exploring the Chandalar River for the U.S. Geological Survey in 1899 reported finding people living at a village, presumably K'ahtsik, seven miles above the confluence of the Chandalar and Yukon rivers:

> Chandalar River natives number about 50 in all. A small settlement, of which the nucleus is a couple of cabins, is found in the flats about 7 miles above the mouth of the river. Most of the natives, however, live beyond the flats, in the mountainous part of the country. Their principal village is on East Fork, remote from the influence of the Yukon travel and traffic. (Schrader 1900: 457)

These settlements likely were utilized on a seasonal basis, consistent with a pattern exhibited by other bands in the region. For example, Schrader (1900:457) noted that these people spent:

> a few months during the coldest part of the winter...in log cabins or winter tents, and the remainder of the year in roaming about, wherever game or fish may furnish food.

He also noted the use of travel routes along Lake and Grave creeks and along the Swift and Middle forks as having been "used only by the natives in their hunting and fishing trips" (Schrader 1900:454). The Swift River trail was reportedly used by "Chandalar River natives" to travel to Fort Hamlin on the Yukon River near present-day Stevens Village to trade (Schrader 1900:454). The assistance provided Schrader by local residents in making the portage from the Chandalar to the Koyukuk River suggests that they were familiar with the area (Schrader 1900:449).

Archdeacon Hudson Stuck, traveling by dog team from Fort Yukon in 1905, visited Venetie and found a "settlement of half a dozen cabins and twenty-five or thirty souls" (Stuck 1914a:27). He also reported the outbreak of a diptheria epidemic in the community. The gold rush to the Chandalar country in 1906-07 expanded contact between Venetie residents and the outside world. Caro, a mining camp upriver from Venetie, quickly exploded into a town of nearly 40 cabins, a recording office, a post office, roadhouses, a store, and a saloon (Andrews 1977:279). Another store, located near the head of navigation for small supply boats on the Chandalar River, was built near the mouth of the East Fork. Native people from the area, including Robert John and his family, visited and traded at these settlements (Schneider 1976:369). However, by 1910

the Chandalar gold rush was largely "played out" and Caro was almost completely abandoned (Schneider 1976:369).

A later visit by Stuck to Robert John's camp at Tsuk'qq in 1917 provides a portrait of the relative abundance of specific resource sites:

> In a short time [we] were in Robert John's comfortable two-roomed cabin....A couple more families were housed within a stone's throw, so that the place was quite a settlement. There was a good fishing stream nearby, firewood was handy, potato and turnip patches had been cultivated, and it was in a good region for moose and not far from the threshold of the caribou country....(Stuck 1920:12)

In February of 1928 wildlife agent Sam O. White visited Venetie by dog team, reporting that he "gave [a] talk to natives on laws as they want to know....Say first game warden ever [to] visit them. Population 50" (White n.d.:8 February 1928). Geologist J.B. Mertie (1929:96) also reported visiting the community, noting that the Chandalar River was navigable in motor boats as far as the village. During his visit to Venetie in 1933, anthropologist Robert McKennan found that the territory utilized included the fishing sites referenced above plus hunting and trapping areas in the northern portion of the Yukon Flats and in the southern edges of the Brooks Range (McKennan 1965: 19-20). At that time, Venetie had a population of 63 people.

During the late 1930s and early 1940s efforts of local residents led to the creation in of the 1.48-million-acre Chandalar Native Reserve (Lonner and Beard 1982:101). At about the same time a school was opened in Venetie, and families which previously had lived in outlying camps moved to the village so that their children could attend school. Eventually an airstrip, post office, and a store were built, and the population continued to grow.

Shimkin's map of the Fort Yukon trapping area (Map 5) shows the extent of trapping activity near Venetie in 1948-49 (Shimkin 1955:230). Included are traplines extending north up the East Fork, west along the main Chandalar river, and south toward the Hadweenzic River. Venetie families continued to live much of the year in the community during the 1950s and 1960s but traveled

to seasonal camps for fishing, hunting, or trapping. A notable exception to this pattern was Johnny Frank who, with his wife Sarah, continued to live on the East Fork at "Gold Camp" until his death in 1977 (Mischler 1981:89).

The advent of the snowmachine in the 1960s allowed trappers and hunters to travel great distances in less time, enabling them to continue utilizing areas which had been occupied seasonally. The corresponding decline in the use of dog teams reduced demand for large quantities of fish for dog food. The number of dogs in Venetie increased again in the late 1970s, primarily for use in racing. Correspondingly, fishing for dog food has increased, according to informants, although not to previous levels.

The airplane was also adopted as an occasional means of transport to areas previously occupied seasonally. Ackerman Lake, for example, was traditionally used as a seasonal hunting camp for moose, caribou, and sheep by Venetie residents. Today, a few residents travel there by aircraft in summer, but more commonly use snowmachines in winter. Similarly, Venetie residents sometimes fly on scheduled aircraft to Arctic Village to hunt caribou with relatives. In the early 1980s a Venetie resident obtained a pilot's license and began flying from the community.

THE CONTEMPORARY COMMUNITY

Venetie had a population of 132 people in 1980 (U.S. Bureau of the Census 1980). The community has over 48 homes, many of which are new 30-by-40 foot log structures built under a Bureau of Indian Affairs housing program. All houses are heated with wood and have electricity. The new log structures also have running water and indoor plumbing with individual septic tanks and drainfields.

The village has an elementary school currently operated by the Bureau of Indian Affairs, and a high school operated by the Yukon Flats School District. In 1981-82 the elementary school had 43 students with 2 teachers; the

PLATE 15 Community Store in Venetie.

PLATE 16 Aerial View of Venetie.

PLATE 17 Community Resource Experts in Venetie.

high school had 12 students and two full-time teachers. Other facilities in Venetie include two stores, an Episcopal church, the village council office, a generator building, a community hall, and a post office. The village has a 4,000-foot gravel runway capable of handling Hercules C-130 aircraft. Two air services provide scheduled flights to and from Fort Yukon five days a week.

Wage employment opportunities in Venetie are limited and often seasonal in nature. Firefighting and construction jobs continue to be a major source of wage income. Construction of the new log homes employed a number of Venetie residents on a seasonal basis during the summers of 1979 through 1981. Oil exploration employment in the spring and summer of 1981 involved between 8 and 10 people. Full-time wage employment opportunities include two bilingual teaching aides, a school maintenance worker, a health aide, a school cook, a postmaster, and a store manager. Part-time employment included seasonal construction worker, council office manager, National Guard, and Youth Conservation Corps worker. Handicrafts and beadwork provide important sources of income for some families. Alaska state welfare payments, unemployment compensation, and social security benefits paid to Venetie residents totalled $40,384 in 1979 (Louis Berger and Associates 1982:2-37,38,39). In March 1981 gasoline in Venetie cost $3.20 per gallon. Electricity was billed at a flat rate of $30 per month for each home. Firewood cost $90 per cord delivered to one's home.

In 1981 an Oklahoma-based oil company undertook petroleum exploration activities on lands owned by the Native Village of Venetie Tribal Government. Seismic exploration began in the spring of 1981 and continued through the summer. Two helicopters and a camp of over 40 persons were based in Venetie during that period. The tribal government reportedly placed constraints on the nature of the exploration activities, including requirements that helicopters rather than tracked vehicles be used and that seismic lines avoid

critical habitat for wildlife and fish (P. Williams, personal communication, March 1981). The results of exploration activities had not been made public as of winter 1982.

ANNUAL CYCLE

The annual cycle of resource harvest activities for Venetie from 1970 to 1982 is summarized below (Figure 6). Annual cycle data were compiled from interviews with resource experts and from observations by the researcher. Only major activities are included, however, and variation can occur in the annual cycle from year to year.

Spring. The hunting of waterfowl usually begins in early May as open water appears on streams and on the margins of lakes. Venetie residents in spring muskrat camps harvest both muskrat and waterfowl until early June. Waterfowl hunters remaining in Venetie utilize Venetie Lake and sites along the Chandalar River for harvest activities.

Once ice has left rivers and small streams, gillnets are placed in the water to harvest whitefish, pike, and suckers. Ground squirrels are trapped or hunted in upland areas near the community. Black bear are also taken occasionally when encountered along rivers or near the community. Some Venetie families prepare to make the journey down to the mouth of the Chandalar River by boat to fishcamps along the Yukon River, where salmon will be harvested.

Summer. Some Venetie families move to the Yukon River to fish for king and chum salmon by mid-June. Before the arrival of king salmon in early July, fishcamp occupants are busy preparing boats, outboard motors, nets, and camps for fishing. Those remaining in Venetie continue to fish for whitefish, pike, grayling, suckers, and burbot in the Chandalar River and in adjacent lakes and and creeks throughout the summer. Fishing on the Yukon River for king salmon occurs mostly in July, and chum salmon harvests usually occur during August and early September. Chum salmon are also caught with nets on the Chandalar River

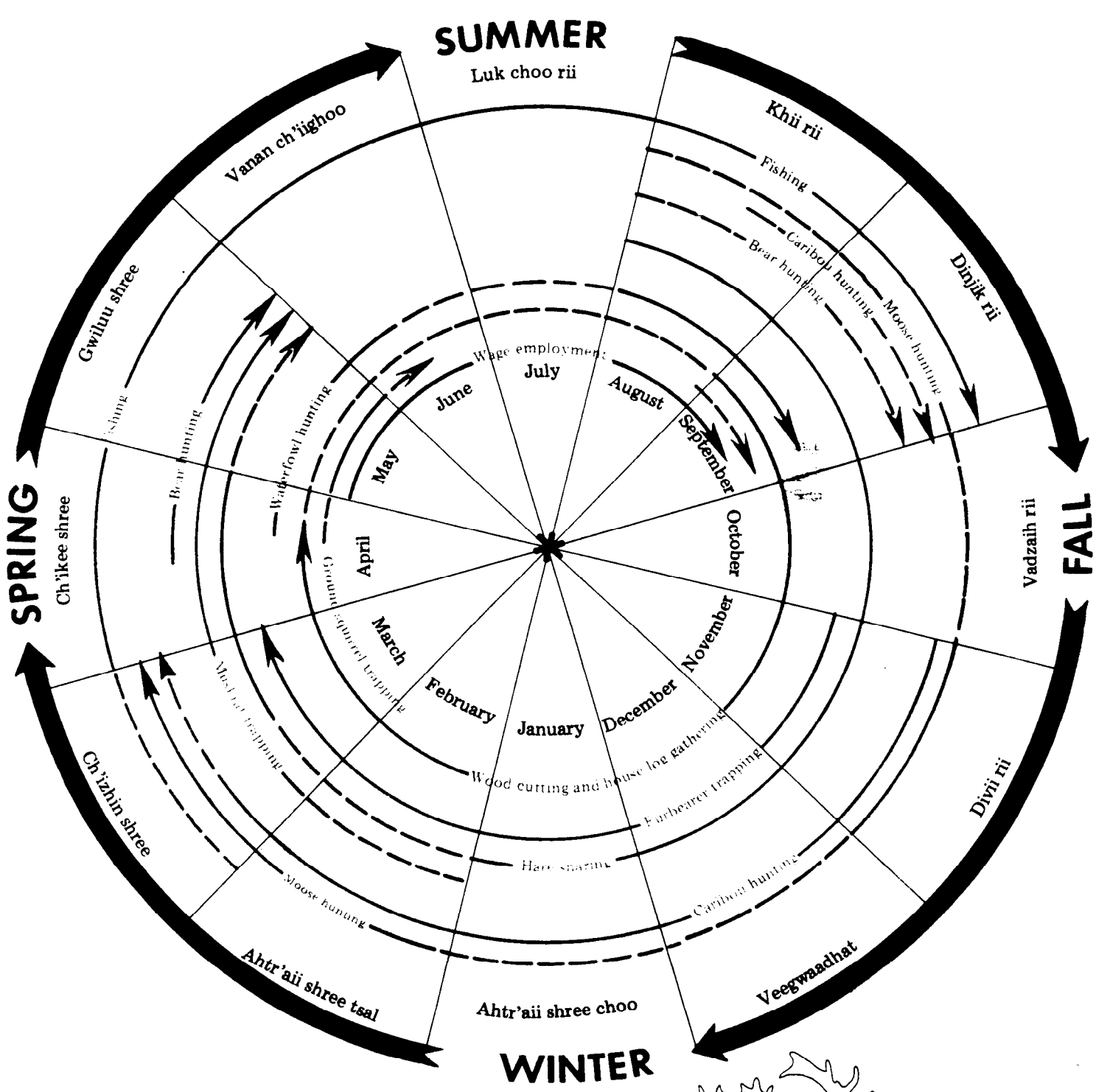


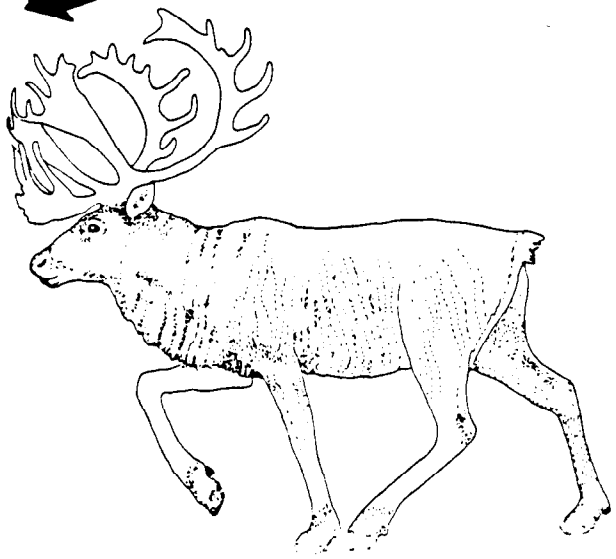
FIGURE 6

Venetie
Annual Cycle

Circa 1970-1982

Primary activity

Secondary activity



near Venetie, beginning in mid-August. Chums are split, dried, and used for dog food.

Other summer activities include growing gardens, gathering berries and rosehips, fishing for grayling, and hauling in logs for use in construction of new homes and community buildings. Seasonal wage employment in firefighting, oil and gas exploration activities, or construction is also undertaken.

In late summer, usually August, caribou may be enountered along the Chandalar River's East Fork. Hunters occasionally harvest caribou along the river while traveling in boats.

Fall. Moose hunting and fishing for salmon and whitefish are major fall activities. Hunters often travel along the Chandalar River using riverboats in search of moose, camping at specific places known for concentrations of game. Moose meat is either eaten fresh or dried or frozen for use during winter. Caribou may occasionally be harvested in fall as well.

Chum salmon fishing continues on the Chandalar River near Venetie until freezeup in early October. Salmon are dried or frozen for use principally as dog food. Gillnets are also placed at the mouths of particular small streams to obtain whitefish in the fall.

Hunting near the community in fall often yields hares, ground squirrels, grouse, and black bears. Cranberries are gathered for use in winter, and fireweed is collected for home heating.

Winter. Trapping activities begin in earnest in November. Prior to that, trappers are busy preparing equipment and cabins for use during the winter season. The primary species sought by Venetie trappers are marten, mink, beaver, lynx, fox, wolf, and muskrat. Snare lines are also set around the outskirts of Venetie to obtain hares throughout the long winter. Grayling are caught through the ice using hook-and-line in early winter.

In November and early December moose may occasionally be harvested by hunters on snowmachines. In some years caribou are available to Venetie hunters.

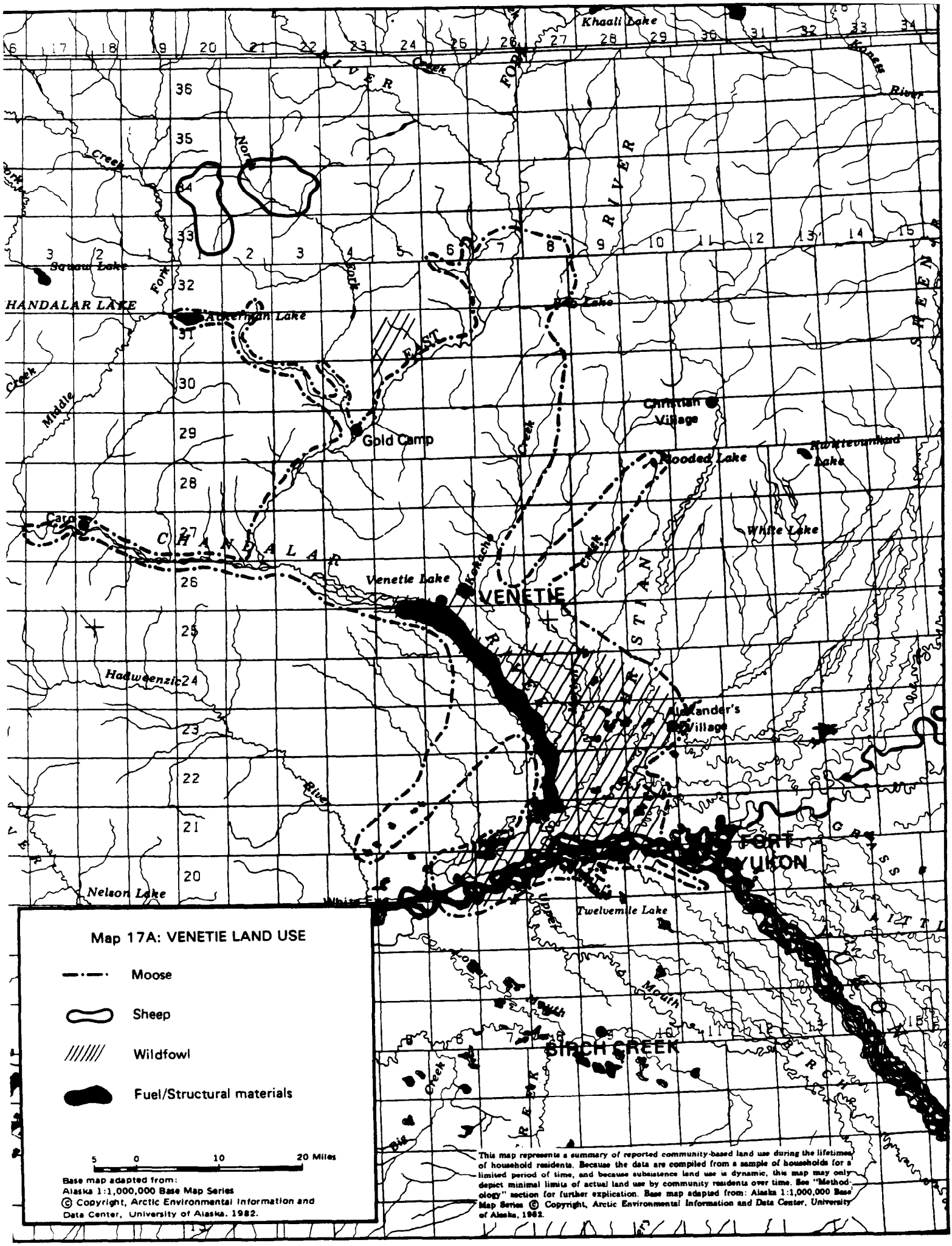
north of the community near Gold Camp, Marten Hill, or along the Middle Fork of the Chandalar River near Ackerman Lake. Hunters on snowmachines seek out these animals throughout the winter.

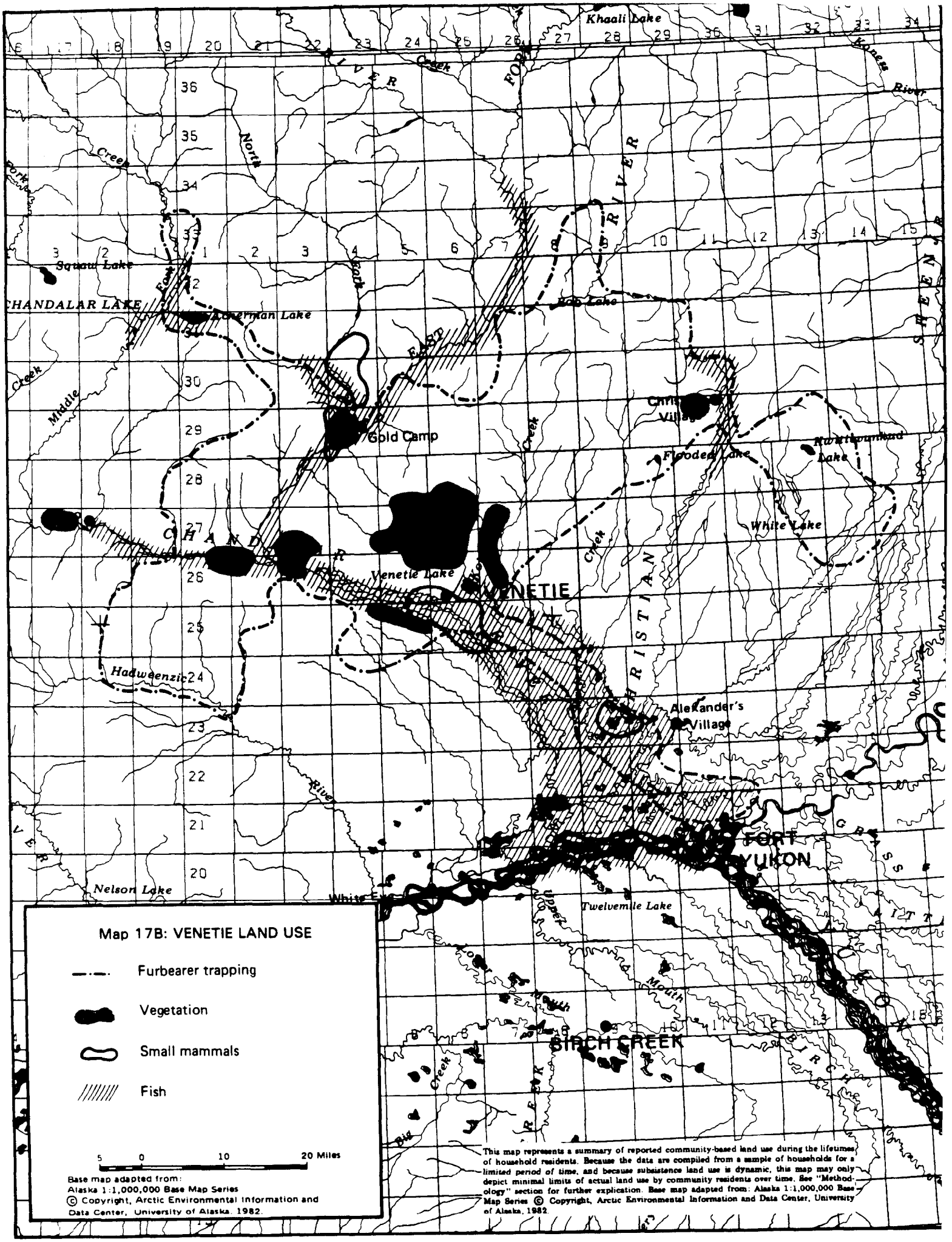
In February and March trapping and snaring activity turns more toward the harvest of beaver and muskrat. Moose or caribou may also be harvested on occasion during these months to be used later in the spring and summer. A few hunters may travel by mailplane to hunt caribou with their relatives near Arctic Village at this time, especially in years when caribou are not available near Venetie.

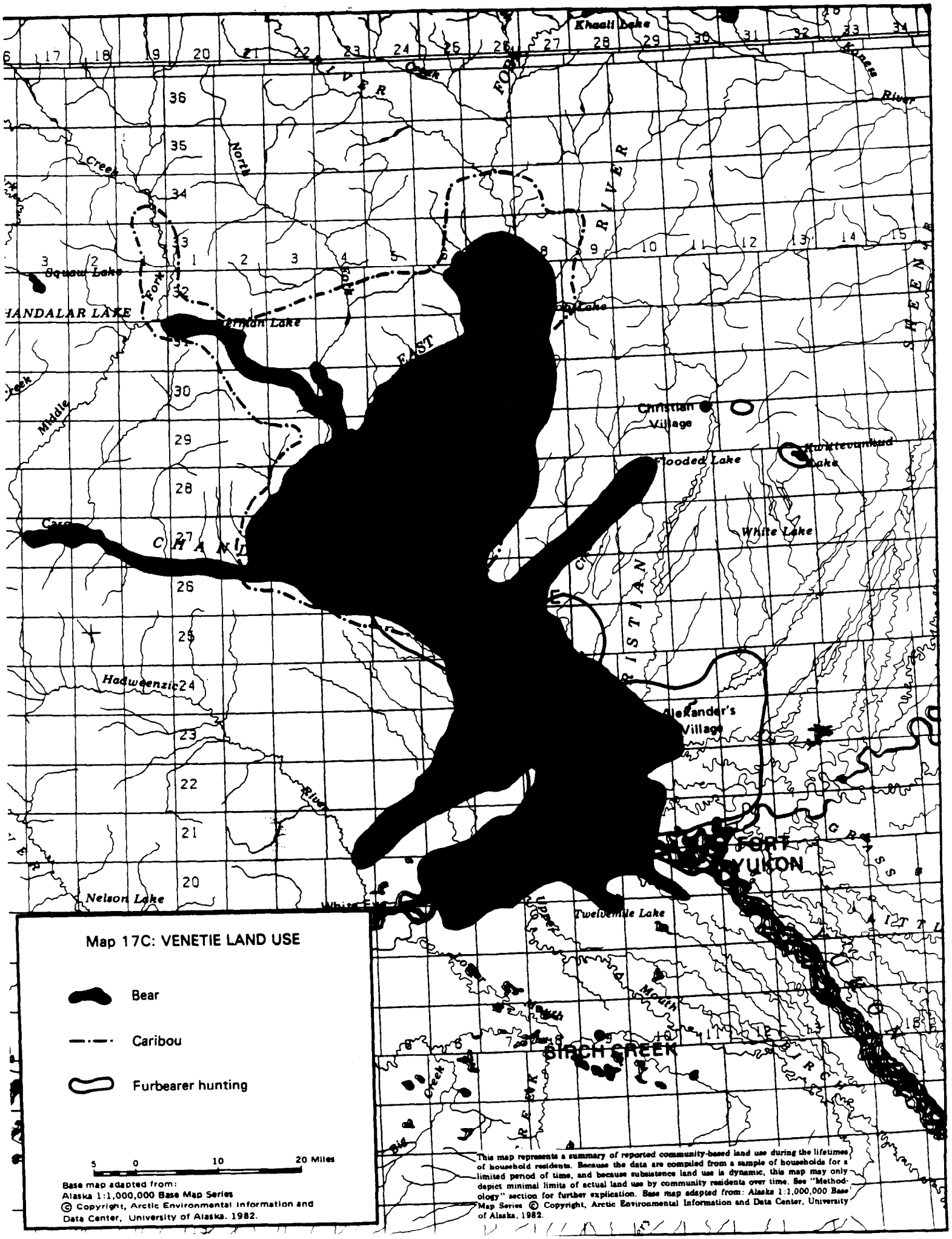
LAND USE SUMMARY

Land use data for Venetie are summarized on Maps 17A through 17C. The area of use reported by Venetie residents extends from fishcamps on the south side of the Yukon River near the mouth of the Chandalar, north to the East Fork of the Chandalar River near Big Rock Mountain. The use area extends west of the Chandalar River to include the area known as van laii near the Hadweenzic River, and then north to include the Ackerman Lake area and the Middle Fork of the Chandalar River. Residents reach Ackerman Lake in summer by traveling up the Middle Fork using a riverboat, or by floatplane. During winter, travel is by snowmachine through Gold Camp. In the past, areas of the Middle Fork drainage upstream of Ackerman Lake have been used for trapping and for sheep, moose, and caribou hunting.

Use of the East Fork drainage, principally for hunting moose and caribou and for trapping, is primarily concentrated around Gold Camp and downriver from Big Rock Mountain and Brown Grass Lake. Above these areas, Arctic Village residents pursue trapping and hunting activities. Low water during fall hunting usually restricts moose hunting on the main course of the Chandalar River to areas downstream of the Middle and West forks. Christian Village is used as a seasonal trapping camp and for moose and caribou hunting.


Khaali Lake
Squaw Lake
CHANDALAR LAKE
Ackerman Lake
Gold Camp
Christian Village
Flooded Lake
Kwittevunkud Lake
White Lake
Caro
CHANDALAR
Venetie Lake
VENETIE
Hadweenzic
Alexander's Village
FORT YUKON
Nelson Lake
Twelvemile Lake
BIRCH CREEK
Map 17A: VENETIE LAND USE
Moose
Sheep
Wildfowl
Fuel/Structural materials
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.
This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.

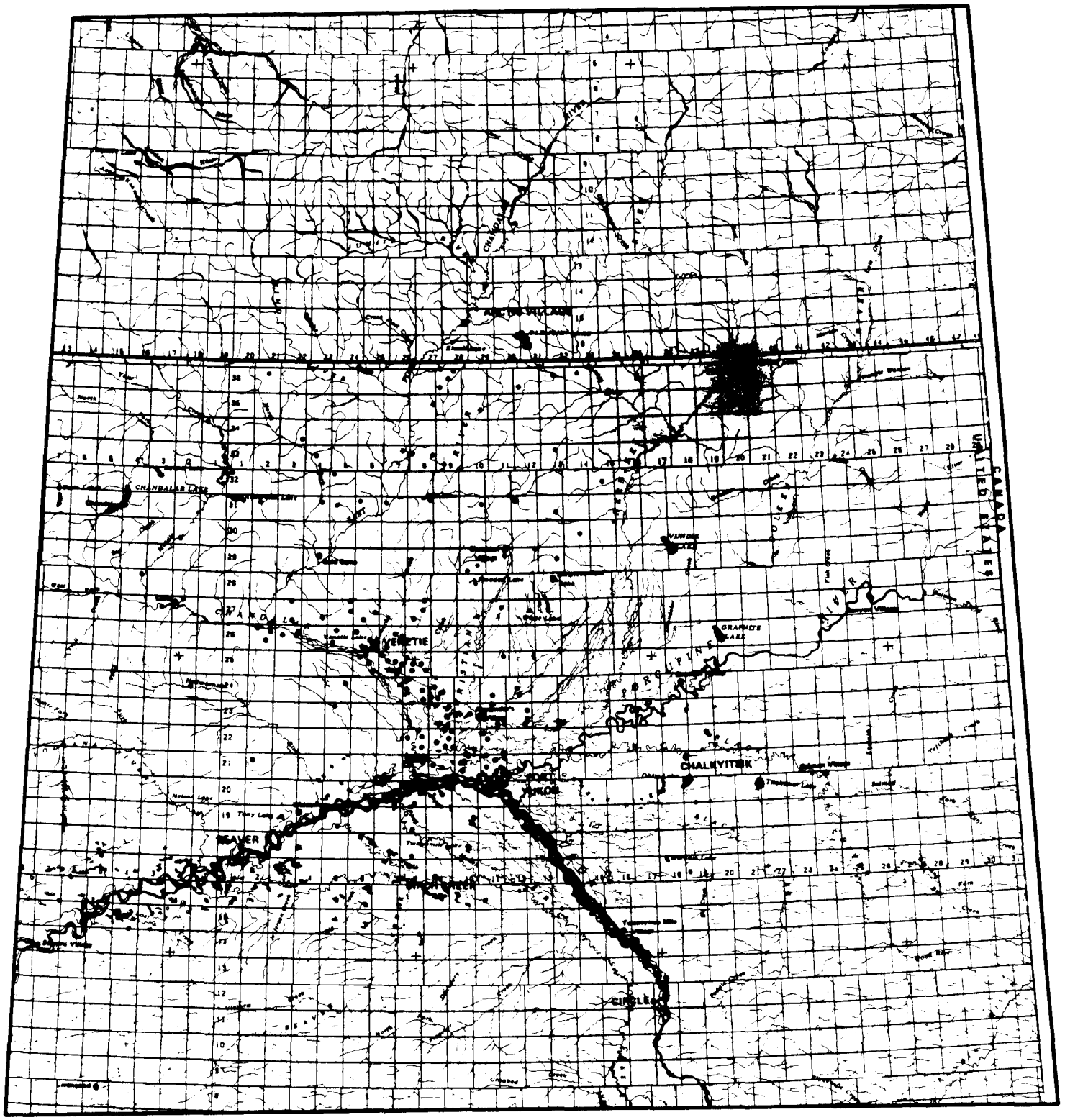

Khaali Lake
Squaw Lake
CHANDALAR LAKE
Ackerman Lake
Gold Camp
Venetie Lake
VENETIE
Hadweenzic
Alexander's Village
FORT YUKON
Nelson Lake
Twelvemile Lake
BIRCH CREEK
Flooded Lake
White Lake
Map 17B: VENETIE LAND USE
Furbearer trapping
Vegetation
Small mammals
Fish
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.
This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.


Map 17C: VENETIE LAND USE
Bear
Caribou
Furbearer hunting
5 0 10 20 Miles
Base map adapted from:
Alaska 1:1,000,000 Base Map Series
© Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.
This map represents a summary of reported community-based land use during the lifetimes of household residents. Because the data are compiled from a sample of households for a limited period of time, and because subsistence land use is dynamic, this map may only depict minimal limits of actual land use by community residents over time. See "Methodology" section for further explication. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.
Khaali Lake
Squaw Lake
Christian Village
Flooded Lake
White Lake
Hadweenzic
Nelson Lake
Twelvemile Lake
FORT YUKON
BIRCH CREEK

Trapping from Christian Village extends as far east as Kwittevunkud Lake and Alexander's Village. Both Venetie and Arctic Village trappers use the Christian Village area. The extensive lake and slough systems lying between the Christian and Chandalar rivers are utilized for fishing, trapping, hunting, and gathering. Trails from Venetie to both Fort Yukon and Christian Village wind through this area, linking the village with seasonal camps such as K'ahtsik, Ti'itree, and Tsuk'oo.

Place names recorded from Venetie residents mirror these areas of traditional land use (Caulfield and Peter [in press]) (Map 18). The 208 names collected during 1981 are most densely concentrated in Yukon Flats south and east of Venetie and along the Chandalar River. Named places also extend north along the East and Middle forks of the Chandalar River. Place names were recorded as far east as the Sheenjek and Christian rivers.

Base map compiled from ... Environmental Information and Data Center, University of Alaska 1982.



Map 18: General Location of Venetie Place Names

CHAPTER 9

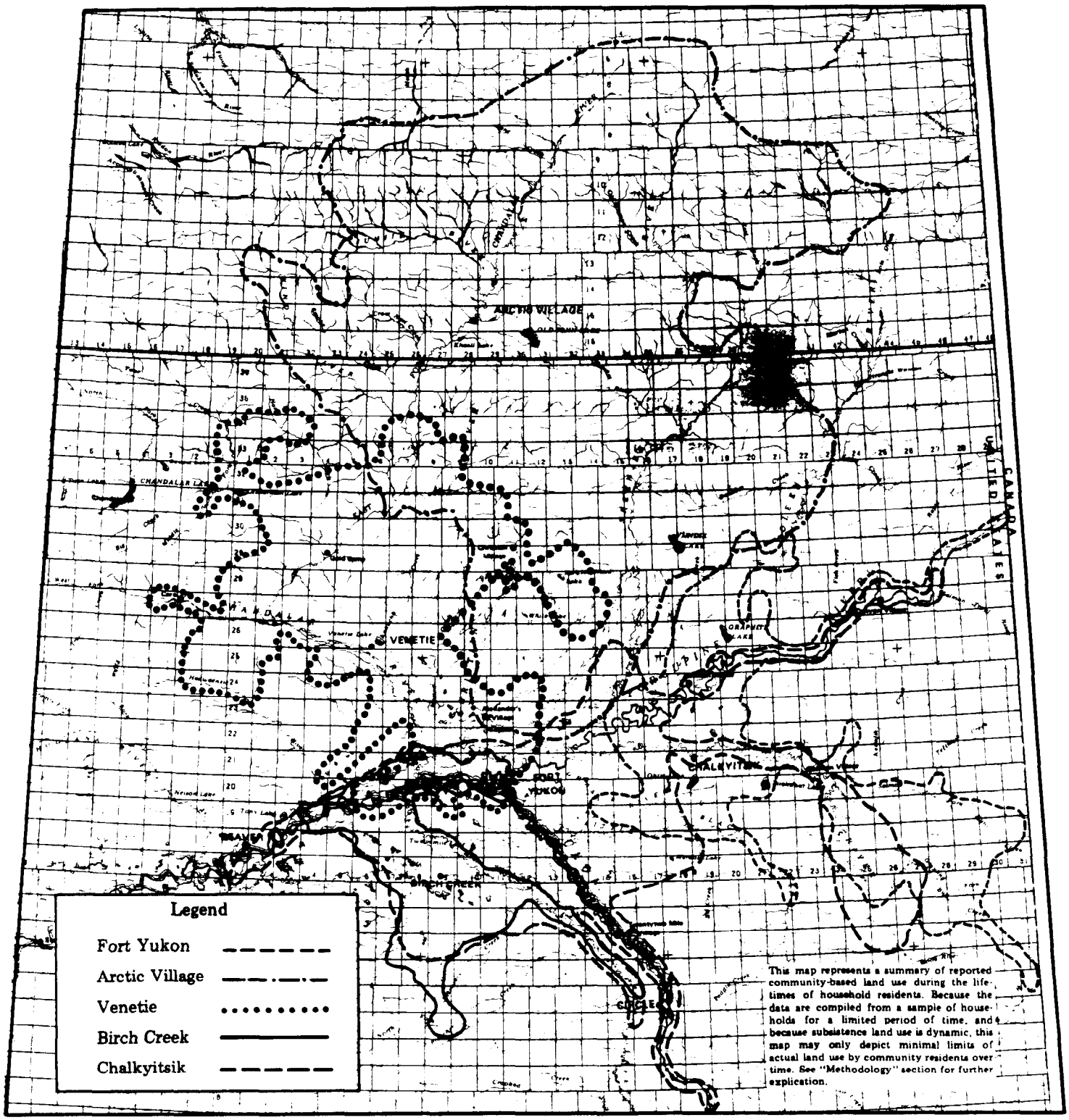
REGIONAL LAND USE SUMMARY

A regional summary of land use areas reportedly utilized by residents of the five Upper Yukon-Porcupine commmunities is depicted on Map 19. Review of this summary map coupled with analysis of historic data presented above, provides a portrait of land use over time in the Upper Yukon-Porcupine region. Limitations presented in Chapter 1 regarding the methodology of data collection require that caution be exercised in the use of this map, since it likely underrepresents areas actually used in the region.

Several observations about the nature and extent of land use in the region can be drawn from the summary map. First, it is evident that residents of the five study communities have made, and continue to make, extensive use of the Upper Yukon-Porcupine region for the harvest of wild resources. Wild resources in the region are known to be widely dispersed or only seasonally abundant. Land use patterns reflect this fact and, consequently, extensive areas are utilized to obtain necessary resources. Certain resources, especially fish and caribou, require more intensive site-specific land use within the larger area of use. Data pertaining to the distributions of Native-named places known to community residents also mirror reported areas of use quite closely, providing evidence that traditional knowledge of these areas persists.

A second observation is that areas mapped by residents of the study communities largely fall within those areas utilized by 19th century Gwich'in bands at the time of their first contact with Euroamericans (Map 2). These bands were traditionally centered in the drainages of major rivers (Slobodin 1981: 514-515). Contemporary land use data suggest that this pattern has continued to the present day. For example, land use by Arctic Village and Venetie residents incorporates much of the Chandalar River drainage with the exception of the North and West forks. Use by residents of the communities of Chalkyitsik

Base map adapted from Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska 1982.



Map 19: Regional Land Use Summary

and Birch Creek is generally centered in the Black River and Birch Creek drainages respectively. Documentation of Native-named places for each community provides evidence of this fidelity with respect to land use areas (Caulfield and Peter [in press]). Thus, while residence patterns in these areas may have changed over time, from seasonally-mobile use to community-based sedentism, the general areas utilized appear consistent with those used in the past.

A third observation derived from the data is that relatively little overlap occurs in the areas used, with the possible exception of Fort Yukon. For example, Arctic Village residents report the use of the East Fork of the Chandalar River extending downriver as far as Big Rock Mountain and Brown Grass Lake. South of this general area, Venetie residents engage in hunting, fishing, trapping, and gathering activities. Similarly, the Black River above the vicinity of "Englishshoe Bar" is generally used by Chalkyitsik residents. Downriver from that vicinity, Fort Yukon residents are the primary users. Local residents articulate their awareness of these generalized use areas. Chalkyitsik's area, for example, is loosely referred to as "the Black River country." Similarly, Arctic Village's area of use is often referred to as "the Chandalar country." One Fort Yukon resident whose outboard motor broke down on the Yukon River while moose hunting in the fall had to resort to floating downriver to the village of Beaver, which is located outside of Fort Yukon's area of use. He reported that those who met him on the bank in Beaver gave him a cool reception until he made it clear that he was not hunting in their use area but that his boat had simply broken down.

At least two variations in this general pattern of use may exist. The first involves areas in the region which have abundant seasonal concentrations of migratory resources, especially salmon and caribou. Some residents from the communities of Arctic Village, Birch Creek, Chalkyitsik, and Venetie currently travel to seasonal fish camps along the Yukon River to harvest king and chum salmon. Arctic Village and Birch Creek residents only have access to

meager salmon runs near their communities. While residents of the other communities may obtain some salmon locally, they move to the Yukon River in order to obtain rich king salmon suitable for making salmon strips or to catch large numbers of chum salmon, especially for use as dog food. Fishing families from Birch Creek and Venetie typically occupy their own fishcamps located downriver from Fort Yukon. Families from other communities generally join with Fort Yukon relatives to fish. Thus, residents of the four outlying communities harvest salmon at specific times and places on the Yukon River within the area generally used by residents of Fort Yukon.

In another example, residents of Fort Yukon and Chalkyitsik at times share the same areas for hunting migratory caribou from the Porcupine Herd when the animals cross the Porcupine River near the Canadian border in the fall. Similarly, when caribou are available near Arctic Village, especially in the spring, residents from each of the other study communities on occasion have traveled there to hunt.

The use area of Fort Yukon residents possibly represents another varient from the pattern of discrete, community use areas. Fort Yukon residents reported using areas which were also utilized by residents of other communities. For example, Fort Yukon hunters reported hunting moose on Birch Creek from its mouth at the Yukon River upstream to the Steese Highway bridge crossing, an area typically used by Birch Creek residents. Similarly, several Fort Yukon hunters report use of the upper Black River typically used by Chalkyitsik hunters.

Several possible explanations account for this variation in land use reported by Fort Yukon residents. First, it may be attributed to households now located in Fort Yukon which previously had been located in or near another community. In these cases, members of the household continue to utilize areas where they had hunted, fished, or trapped near their previous community of residence. For example, one Fort Yukon household is headed by an adult male

who was born in Birch Creek village and who trapped in earlier years near that community. The sons of this man have continued to utilize both traplines and muskrat hunting areas previously used by their father, but from their residence in Fort Yukon. While the younger household members must travel greater distances to their traplines and camps, they can do so in part because of the availability of more sophisticated technology in the form of snowmachines and, occasionally, by means of an air taxi charter. Seasonal involvement in wage employment available in Fort Yukon by members of this household makes possible the use of this technology, and the continued use of traditional areas. The snowmachine and other forms of modern technology may be a key factor in the persistence of traditional use areas, therefore, despite the concentration of population in settlements like Fort Yukon.

Similarly, the use of the upper Black River by several Fort Yukon residents reflects the activities of one extended family which previously had lived there throughout the year. In this case, some family members are involved in wage employment at Fort Yukon while others from the immediate and extended family travel up the Porcupine and Black rivers each fall to spend the winter trapping, hunting, and fishing. Involvement of certain family members in wage employment provides an economic buffer for occasional times when trapping does not provide adequate cash income for the family.

A second possible factor affecting Fort Yukon use areas may be that expanded hunting, fishing and trapping pressure, or a declining local resource base, is forcing Fort Yukon residents to travel further for certain wild resources. In particular, moose are not abundant near Fort Yukon, and some residents have reported that they must travel greater distances in recent years to successfully harvest them. Factors which may be involved in expanding pressure on the resource include a growth in local population, changing harvest technology, or

competition from non-local users. Other factors may influence resource availability, such as changing habitat, predation (including human harvest), disease, or declining productivity.

In summary, the regional land use map reveals that: 1) community residents continue to utilize extensive areas of the Upper Yukon-Porcupine region for the harvest of wild resources; 2) these areas are generally consistent with patterns of historic use; and 3) relatively discrete use areas exist for each community, with only limited overlap. Documentation of community land use patterns is only the first step in understanding dynamics of use throughout the region, however. Additional research and analysis will be required to understand the determinants of a community's total use area, including spatial and temporal variations, the relative productivity of the total use area, and customary law and practices influencing the use of an area by extended families or by communities.

CHAPTER 10

SOME FACTORS INFLUENCING LAND AND RESOURCE USE

Planning and management of lands and resources in the Upper Yukon-Porcupine region requires an appreciation for the breadth and complexity of economic, social, and cultural factors which shape their use. The nature of these factors influences how people in the region interact with their environment. Most of those living in the study communities are Gwich'in Athabaskans, whose culture has been shaped by intimate interaction with the land and its resources for generations. Other residents, generally of Euroamerican origin, have moved to the region and have become socialized into the traditional round of trapping, hunting, or fishing activities. For many of these residents as well, a strong relationship with the land and wild resources has developed through years spent in local communities, on remote traplines, or in fishcamps.

Recent statutory actions generated from outside the region -- including the creation of new federal conservation areas under the Alaska National Interest Lands Conservation Act (ANILCA) and new land ownership patterns created through the Alaska Native Claims Settlement Act (ANCSA) -- are changing the way land is perceived both within and outside the region. Until very recently, use of the land was limited only by indigenous laws and practices. New laws have now brought concepts of private ownership, trespass, use permits, and licenses which reflect a different social, political and jural land systems. Traditional perceptions and relationships to land persist side by side with these introduced concepts. For example, the use of traplines, muskrat hunting areas, and fishcamps continue to be controlled through custom and traditions, while the harvest and use of wild resources are often influenced by elements of customary law. The purpose of this chapter is to provide an overview of several of these factors and to briefly present perceptions and concerns of local residents regarding critical land and resource issues.

INFLUENCE OF RESOURCE DYNAMICS

The dynamic nature of wild resources influences land and resource use patterns in the Upper Yukon-Porcupine region. The study communities are encompassed within the boreal forest, an ecological community characterized by both spatially-diffuse and highly-localized resources. Human survival has required adaptation to long-term resource population cycles, the migratory nature of certain critical food resources, and changing habitat. Adaptation to each of these variables and to the climatic extremes of the subarctic has, in turn, shaped economic, social, and cultural interactions with the land.

Long-term population cycles for certain species living in northern environments, such as the hare and lynx, have been documented (Nelson 1983). Key informants in the Upper Yukon-Porcupine region believe they have observed long-term trends in the population dynamics of other resources as well, including moose and caribou. Moose populations, according to these informants, are believed to be slowly increasing in the eastern portions of the Yukon Flats, while in the western portion of the Flats near Stevens Village and Beaver they are believed to be in decline. Arctic Village elders have observed a steady increase in moose populations near that community over the last 40 to 50 years, perhaps related to changing habitat. In the minds of some residents, recent changes in the migratory patterns of caribou are related to cyclical population fluctuations which accounted for similar patterns during the 1930s.

The degree of predictability of resource abundance also shapes land and resource use patterns. Species such as waterfowl and salmon follow relatively predictable patterns in their migrations. Fishing families know where and when salmon usually can be caught along the Yukon River and regularly establish camps there. In contrast, migrations of caribou, while often following a general pattern, are often locally unpredictable, requiring hunters to venture great distances when the animals cannot be obtained near a community. The timing of the caribou crossings on the Porcupine River can greatly influence

their availability to Fort Yukon or Chalkyitsik hunters. Ice formation on the river in the fall sometimes forces hunters in boats to return home empty-handed prior to the caribou crossing.

Changes in habitat due to natural succession, fire, the effects of other species, and other factors can shape land use patterns. The increase of moose near Arctic Village noted above may be due to the increased availability of browse along river valleys in the Brooks Range. Some residents in the region believe that the Porcupine Caribou Herd may not be migrating through the Yukon Flats to the extent they have in the past, in part due to increasingly dense vegetation. For example, Venetie residents believe that the area south and west of their community has become "too brushy" for large numbers of caribou. Many hunters report that declining water levels in the multitude of lakes and ponds in the Yukon Flats are responsible for reduced muskrat populations. Near Venetie and Arctic Village residents report that productive whitefish streams have become increasingly choked with vegetation which restrict fishs migrations. In addition, fire can create new habitat beneficial to certain food resources such as moose, but in the short term may negatively affect trapping areas and destroy camps, caches, and cabins.

Manipulation of the local environment to enhance resource availability is not unknown. In the past, Chalkyitsik residents have removed new beaver dams blocking migrations of whitefish in nearby streams. Birch Creek and Arctic Village residents have placed mud on top of lake ice during break-up to enhance melting and attract waterfowl.

ECONOMIC FACTORS

Economic factors shaping land and resource use often receive the most attention because they generally are the most easily understood, especially from the viewpoint of an "outsider" to the region. Today food from the land figures significantly in the diet of most households in the region. Recent

reports indicate that from 50 percent to 90 percent of all food consumed in Upper Yukon-Porcupine households is derived from local resources (U.S. Fish and Wildlife Service 1976; Institute of Social and Economic Research 1978; Lonner and Beard 1982). Substitutes for locally derived foods and raw materials commonly are unobtainable or prohibitively expensive to purchase. Therefore, products of local resource harvests enhance economic diversity and stability for communities distant from supply centers.

Specific types of land use may be spatially generalized or site-specific (Nelson 1979:30). Each type of use requires an extensive and detailed array of environmental knowledge, including an understanding of local geography, weather, resource harvest methods, utilization techniques, and animal behavior. Generalized land use implies a broad range of knowledge about a community's use, including the resources which may be found there and the necessary harvest technology and skills. Site-specific use in the same area implies knowledge of particular resource harvest locations and the optimum timing and method of harvest. Examples of knowledge related to site-specific land and resource use may include knowing which small round hill is ideally situated for spotting moose in the vast Yukon Flats, where mineral licks commonly used by sheep are located, how terrain influences local caribou migrations, and where ducks often fly over local terrain within shooting distance. It means knowing the locations and names of lakes and streams which can provide fish even during "hungry" times. And it means making judgments about weather and traveling conditions, such as knowing where overflow might be present in warm weather or when river ice is thick enough to support the weight of a person setting a fishnet. Such knowledge remains essential to the continuance of the subsistence-based socioeconomic system, contemporarily as in the past.

Continued access to areas of both generalized and site-specific land use is considered essential for the continuance of local resource harvest opportunities by residents of the region. Economic uncertainty fostered by ecological

constraints, limited involvement in to the wage economy, and minimal alternative resources requires that access be maintained even to areas and resources not utilized for some time. The land and its resources provide security, much like "money in the bank", when other alternatives are not available. It is in this sense, for example, that Arctic Village residents speak of the importance of sheep to their livelihood. While perhaps less than 10 sheep are currently taken in a year, Dall sheep are considered a vital component of an array of resources which may at any time become unobtainable.

The use of traplines is responsive to several economic and ecological factors. When fur prices are high, furbearer populations are abundant, or other economic opportunities are not available, trapping activity increases. For example, on the Black River above Chalkyitsik no trappers spent the entire season at outlying camps when Dr. Richard Nelson lived in that community in 1969 and 1970 (R. Nelson, personal communication, May 1982). However, in 1981-82 at least 12 persons in 6 households wintered in the area. Many of these trappers used traplines which, although left dormant for a period of time, had been used by their families for several generations. Rising fur prices and the lack of alternative employment opportunities were reportedly the principal reasons for the expanded effort. For example, a lynx pelt brought only $20 to $30 in 1971, while in 1982 a comparable pelt was sold for $400 or more. The majority of these trappers utilized dog teams as their primary mode of transportation on the trapline in 1981-82.

The relative security found in some communities today is unprecedented. Many older people, who have seen freedom from hunger emerge within their lifetimes, remain convinced that this period will not last. They are convinced that things will change once again, either in their lifetime or in that of their children. In response to this concern, older women in Arctic Village continue to stockpile the hooves and bones of caribou, which can be boiled to make soup in times of hardship. Elders in the study communities express the

belief that knowledge of use of the land and wild resources must be passed on to younger generations to ensure economic and cultural survival in the future.

SOCIAL INTERACTION WITH THE LAND

Gwich'in Athabaskan social organization, including systems of kinship, social groupings within the band structure, age and sex roles, and partnership arrangements have been molded by interaction with the land and wild resources over generations and, in turn, have shaped contemporary use patterns (Slobodin 1981:520). The extended family traditionally was fundamental to Gwich'in social organization. Beyond this, other kin- and non-kin-based groups occurred, including paired family households and other intraband groupings. Extended family groups occupied certain areas and sites within the range of the larger band. Larger groupings traditionally came together for hunting, fishing, trading, rituals, and warfare (Slobodin 1981:520). Shimkin (1955:229) found that traplines in the region in 1948-49 were dominated by patrilineal lineages and their extensions. According to local informants, this pattern continues to shape land and resource use today. An elderly Chalkyitsik man, for example, traveled with his son in 1981 to the upper Black River to show the younger man the location of line cabins, tent sites, productive trap and snare locations, and areas where food resources such as moose and caribou could be found. Partnerships for purposes of trapping and hunting between kin-related men have also been documented in local communities (Nelson 1973:151; Schneider 1976:467).

Kinship ties influence the use of resource sites, such as fishcamps and muskrat hunting areas. For example, occupants of a fishcamp 12 miles below Fort Yukon on the Yukon River in 1981 consisted of relatives from both Fort Yukon and Venetie. As noted earlier, Birch Creek households, which are related as a large extended family group, often use a common salmon fishcamp at the lower mouth of Birch Creek. Age and sex roles also are reflected in land and

resource use patterns. Men more often engage in hunting large game, trapping, and checking nets. Women more often are involved in the processing of wild foods, hunting or snaring small game, preparing clothing, gathering berries or other vegetation, and handling routine child-rearing functions. Younger people often haul water, gather firewood, and hunt for older persons.

Social interactions with the land can be expressed at the personal, extended family, or community level. At the personal level a child growing up in Gwich'in culture quickly develops a relationship to "place" -- a community, a particular fishcamp, or a certain bank of willows where one first snares a "rabbit". These settings often become intimately familiar, just as a child growing up in an urban area may come to know in some detail the local neighborhood.

Often a parent or a relative plays a significant role in providing the child with the knowledge and tools necessary for living in that environment. For example, the son of an Arctic Village man had already been provided with a canoe, two rifles, a shotgun, and an abundance of ammunition by the time that he was only two years old. In 1981 the parents of a young man in Venetie, who had just obtained his first moose, sponsored a community potlatch to help ensure future success in hunting.

Interaction with the land can provide an individual and community sense of psychological well-being. Even after extended time away from the region, while serving in the military, working in Fairbanks, or going away to school, familiar areas such as fishcamps or traplines can be essential touchstones in the life of an individual. In times of stress or anxiety, returning to these familiar places can offer respite from the pressures of a demanding world.

Within the extended family and the community as a whole, the land serves as a focus for social activity -- be it at fishcamp on the Yukon River, at a sheep hunting camp near the headwaters of the East Fork of the Chandalar River, or trapping with a partner in a cabin at the upper reaches of the Black River. By traveling with other community members a person expands his or her environmental

knowledge. Sharing and exchange of resources such as moose, caribou, or fish, reinforce kinship ties within the extended family and the community. One Fort Yukon woman, Katherine Peter, expressed her beliefs about the importance of this sharing for Native people:

> The theme of Indian people is "giving" because it wasn't like where some people can go to supermarkets. They shared what they killed; even today people share with loved ones away from home or friends in distant places. (Peter, personal communication, May 1982)

CULTURAL INTERACTION WITH THE LAND

Despite the belief of many that land in the Upper Yukon-Porcupine region is "wilderness" lacking the imprint of human activity, Native residents view it as a homeland rich in cultural and historical significance. Because Native cultural ties to the land are transmitted primarily through Gwich'in Athabaskan oral traditions, it is often difficult for a non-Native observer to understand their significance. This is especially true because so little tangible evidence of these cultural ties are visible on the landscape. An old log cache, grave site, or cabin may provide the only physical evidence of the presence of humankind. Nevertheless, to understand land use today, one must look beyond the mechanics of trapping, or whether caribou leg-skin boots are still worn, to recognize the contemporary significance of these cultural ties. Naturalist Olaus Murie, who was instrumental in the creation of the Arctic National Wildlife Refuge, reflected on these ideas after rediscovering an Indian grave along the Sheenjek River in 1956:

> There were four posts, with carved pointed tops, and we took pictures of this grave....Why do we like to contemplate a place like that, especially an Indian grave? I suppose each one of us has differing thoughts. But we seem to want to look backwards in history, to view the origin of things; an instinctive urge to trace our route of travel....As we sat there on the open hilltop beside the Indian grave, it seemed as if we had a wide view of Arctic life. (n.d.:37)

Traditions of the Gwich'in people provide insight into this link between culture and land use. Recent publications such as the life story of the late Belle Herbert entitled Shaandaa: In My Lifetime (Herbert 1982), or Neets'-ąįį Gwiindaii: Living in the Chandalar Country by Katherine Peter (Peter 1982) provide evidence of these traditions. Maps of Gwich'in place names provide documentation of the extent of environmental knowledge and traditional land use, and names which accompany physical features of the landscape often relate to cultural events in the history of local residents.

Historical and cultural sites provide further evidence of the depth of cultural interaction with the land. Campsites, cabins, caches, or harvest sites may appear abandoned but often are components of contemporary use patterns. The isolated gravesite found by Murie may have been the only physical evidence of the lives of generations of people who hunted, fished, raised families, and died in that area. Many sites documented by Andrews (1977) showed evidence of continuity through prehistoric, historic, and contemporary use.

The homeland of the Gwich'in has been a setting for supernatural events which are known to many today but, because of a strong sense of cultural privacy, are rarely discussed with "outsiders". Campsites of the legendary Vasagihdzak, for example, the only survivor of an ancient flood who traveled down the Porcupine and Yukon rivers, are known along those rivers today (Andrews 1977: 295). Deacon Rock, a pillar jutting up in the middle of the Porcupine River, was the site of a skirmish between the Gwich'in and an ancient enemy. According to elders in Chalkyitsik, a shaman among the Gwich'in swept his people into the air and set them down on the rock, out of reach of the arrows of their enemy. Additionally, Ohtig and Tiikdhul lakes near Chalkyitsik are believed by the Gwich'in to have been formed by the footprints of a legendary giant. The reluctance of the Gwich'in to openly express these beliefs to strangers stems in part from criticism and ridicule leveled at them by early explorers and missionaries.

Still, belief in these supernatural events persists, often shaping responses to contemporary issues. For example, while in Venetie the author was told a story about Venetie Lake, located about a mile from the community, which for many years was a rich source of whitefish. Until about the 1940s, community residents used small fishtraps and nets to harvest these fish. After that time, however, the stream which fed the lake shifted course and bypassed the lake entirely. The resultant drop in water levels of both the lake and the outlet stream connecting it to the Chandalar River reportedly caused a decline in the whitefish population. However, an informal suggestion by a fisheries biologist in 1981 that rechanneling of the stream might rebuild whitefish populations was greeted by a mixed response. According to local residents and Gwich'in oral traditions, the stream course was actually changed as a result of a dispute between two shamans, one of whom changed the stream course to spite the other who fished on the lake. To suggest that this action could be so easily "undone" may have appeared foolhardy or presumptuous to local people.

In another example, an elderly woman of Arctic Village expressed objections to collaring and tagging of caribou after having had a dream in which caribou came to her and told her that the brightly-colored radio collars and tags used were detrimental to the animals. Furthermore, the use of aircraft and helicopters to closely track these animals was said to harass the herd. These and other culturally-derived beliefs shape the response of many local residents to contemporary issues. The extent to which they continue to be significant remains to be seen, but recognition that cultural traditions, values, and beliefs quite different from Euroamerican traditions persist today is important in reaching a consensus about contemporary land and resource issues.

SHARING AND EXCHANGE OF RESOURCES

The sharing and exchange of locally derived resources has been documented at the community, regional, and interregional levels since the first Euro-americans explored the Upper Yukon-Porcupine region. In 1864, Archdeacon Robert McDonald noted that caribou obtained from the "Chandalar people" was the only resource available during a food shortage at Fort Yukon (McDonald n.d.:1 April 1864). He noted that Fort Yukon inhabitants obtained moose meat from outlying camps in the Yukon Flats and received fish from Birch Creek residents. McDonald also described trading journeys of Native residents beyond the region, to both the Arctic coast and down the Yukon River to its confluence with the Tanana River.

Sharing and exchange of locally-derived products continues in the region today. Certain communities, especially Arctic Village and Fort Yukon, serve as regional providers of localized resources. When caribou are available near Arctic Village, meat is shared not only with relatives in Venetie where kinship ties appear especially strong, but also with all other communities in the region. Small amounts of caribou meat may also be sent to the elderly confined in the hospital in Fairbanks or to university students living away from home. Residents of other communities with relatives in Arctic Village occasionally travel to that community and hunt caribou when they are available. A resident of another community may pay for the gas, oil, and ammunition used by an Arctic Village relative to hunt caribou and then pay the costs of shipping the meat.

Fort Yukon residents commonly share salmon, particularly king salmon, with residents of Arctic Village and, to a lesser extent, of other communities. Fort Yukon's location on the Yukon River makes it relatively easy for residents to obtain enough salmon to share with relatives in other communities. Moose meat is also occasionally shared between relatives in each of the communities in the region, especially when local moose populations are in short supply. Lumber made from birch obtained near Venetie or Fort Yukon is sometimes shipped

to Arctic Village residents for use in making dog sleds or toboggans. Garden produce from Fort Yukon and Venetie is also shared with Arctic Village residents, who live in an area where growing gardens is difficult. Pelts from furbearers trapped in outlying areas are sometimes sold to residents of Fort Yukon or other communities for use in making clothing or handicrafts. In the past, some trappers from the region have sent wolverine pelts to stores in Barrow because of the demand there for wolverine parka ruffs.

While the total amount of particular products exchanged between communities may not be great, the economic, social, and cultural values of this sharing and exchange cannot be overlooked. These patterns reflect a continuation of practices which, for Native people, extend back to aboriginal times. In many cases, the only difference in the contemporary pattern may be the fact that shipment of products between communities is principally by aircraft, while in the past products were transported by dog team or pack dogs.

Exchange and sharing between relatives and friends also occur within communities. In particular, residents of Arctic Village, Birch Creek, and Venetie report that locally-harvested products are often widely shared. Moose harvested near those communities during the course of this study appeared to be distributed to most households. In Fort Yukon, sharing of meat is reported to occur within closely related extended family units, according to local informants. The distribution of a moose harvested by two Fort Yukon men in 1981 (described in Chapter 3) provides one example of this. Meat was primarily shared between the households of two brothers who hunted together, and their elderly parents. However, secondary distributions extended to the hunter's in-laws, aunts, uncles, cousins, a nephew and "godparents". Some meat was also provided to unrelated friends.

In Fort Yukon, as in all of the study communities, potlatch gatherings are an occasion during which food is shared within the community. The meat of large and small game, especially moose, caribou, fish, and wildfowl, figures

prominently in most community potlatches. Soups made from moose or caribou heads are considered special delicacies, as are fatty portions of intestines and internal organs. Certain animals such as Dall sheep in Arctic Village, are usually eaten only by elders. The parts of other animals, such as the brisket, heart, kidneys and ribs of moose, are usually reserved for older people, especially if moose are in short supply.

CUSTOMARY LAW

Traditional management practices governing the use of land and wild food resources by the Gwich'in continue to influence use of these resources in the region today. Customary law includes social and religious practices designed "in fact if not in direct intent to conserve essential resources" (Usher 1981: 58). Traditional management regimes incorporating customary law have been described for other indigenous peoples of the North by Feit (1973), Usher (1981), Berkes (1981), and Nelson (1983).

The existence of customary law does not imply that Native people were or are "natural" conservationists or that the overharvest of resources cannot occur. Furthermore, the extent of traditional management practices in the past is not known, and it would be difficult to determine whether these contemporary practices are more or less effective than in the past. However, the existence of these practices provides potential opportunities for developing realistic and locally-acceptable resource management programs capable of protecting resource values while providing continued opportunities for local use. Contemporary applications of customary law in the Upper Yukon-Porcupine region address the use both of land and wild resources. Documentation of these laws presented below should be considered only preliminary pending more indepth research.

The first element of customary law in the region is that each community appears to have a prescribed area of use which, though not totally exclusive

in nature, places limits upon use of the land by non-community residents. Land use data presented in the regional summary (Map 19) depict these generalized areas. The fact that relatively little overlap occurs in use areas with the possible exception of Fort Yukon noted above provides evidence for this observation.

Secondly, individual extended family groups appear to be most knowledgeable about particular drainages or other subareas within the bounds of the larger community use area. Members of these family groups commonly are the most informed about local environmental conditions in the subarea and usually are most familiar with the Native-named places there. During mapping interviews, researchers were repeatedly referred to a particular family for detailed information about an area because it was "their country." These subareas may correspond with prescribed family-based trapping areas used earlier in this century. Mechanisms exist to control access to these subareas, including traplines, muskrat hunting areas, and fishing sites located there. Traplines continue to be exchanged in the region, and permission of the extended family is virtually always required for use of resource sites within a trapping area. Even after extended periods in which use of a trapline is suspended, members of the family group may continue to assert control over it.

A third element of customary law are rules concerning resource utilization near certain local communities. For example, in March of 1981 a majority of Arctic Village residents in a general meeting approved limits on the harvest of caribou and procedures to be followed in processing and transporting caribou meat. These written rules, which were designed to apply to all persons hunting in the vicinity of Arctic Village, were said to mirror longstanding unwritten conventions. Copies of these written rules, which were reexamined and then affirmed once again in a general meeting held in January of 1982, were sent both to other communities in the region and to air taxi operators involved in transporting meat. The text of the rules is as follows:

At a duly called general meeting held on March 6, 1981, where a majority of Arctic Village residents were present, and through their discussion and findings, [residents] have agreed to petition [for] some regulation for fair management for the taking of caribou in [the] Arctic Village area.

The following will be the procedures and limits, restricted to residents and non-residents, to be implemented and enforced by the Arctic Village Council and residents, effective March 6, 1981.

A. CARIBOU MEAT MUST NOT BE SOLD

B. LIMITS

I. Non-residents

2 caribou.
Hunters will have a guide from village.
Hunters will register with Council.
This does not include special events [e.g. potlatch, etc.] request.

II. Residents

5 caribou.
Caribou meat must be butchered properly before transporting to village, and [hunters must] clean butchery area.
Meat will be contained in boxes or bags when shipped by plane.
Hunters will use high powered rifles.
All caribou must be brought into the village.

[signed by 46 Arctic Village residents]

Residents of Arctic Village report that prescriptions about butchering in the field and the "cleaning" of the kill site by covering it with fresh snow stem from beliefs about the proper treatment of caribou "spirits". Limits on non-residents apply to all persons who do not live in the community, and are designed to control the harvest activities of, and number of caribou taken by, persons visiting the community. Arctic Village households are limited to five caribou during one hunting trip, in the belief that this is a reasonable number to be properly butchered and transported one at a time. Other rules relating to the harvest of caribou in Arctic Village pertain to prohibitions against feeding caribou meat to dogs, with the exception of bones, scraps, or unuseable

meat. Furthermore, when caribou first appear near the community, customary law prescribes that the first group of caribou are to be allowed to pass by without interference. The belief is that once caribou migrate through without being killed, others will follow believing that the route is safe. The failure of caribou to appear near the community during one fall in the late 1970s was attributed by local elders to a violation of this customary law by one individual.

Further evidence of this third element of customary law was documented in Venetie in November of 1981. Caribou had been observed north of the community by a community resident traveling on a scheduled flight between Venetie and Arctic Village. Venetie's village council chief called a general meeting of all community residents, at which time a consensus was reached that hunting should not begin until greater numbers of caribou were observed in the area. About three weeks later considerably more caribou were observed, and the village council approved the harvest. The next morning two hunters on snowmachines left in search of caribou.

A fourth element of customary law in the region is an expressed prohibition against waste of wild resources and a belief that harvested animals should be fully utilized. During the course of this research, no instances of deliberate or large-scale waste were documented. The utilization of harvested animals appeared quite thorough, including the use of the head, intestines, and most organs of both moose and caribou.

A fifth element of customary law involves protection of wildlife habitat and important use areas. Effects of industrial development are only beginning to be felt in the region, but concern about protecting critical habitat has been expressed in at least one community. Oil exploration undertaken on private lands owned by the Native Village of Venetie Tribal Government were reportedly restricted by the insistence of elders in the community that seismic exploration not be conducted near productive fishing areas. This application of customary

law to contemporary issues reportedly required seismic crews to utilize helicopters rather than tracked vehicles.

In summary, customary law continues to influence local use of land and resources in the region. Self-limiting principles appear to be guidelines for appropriate behavior, enforced through social pressure by community and tribal councils, and by local residents themselves. Occasionally, violations are also reported to state or federal wildlife enforcement personnel. Social pressures against the improper use or care of meat have, in the past, been a contributing factor in cases in which individuals have actually had to move away from a community.

Violations of customary law do occur, according to local residents. Soon after the Arctic Village caribou rules were instituted, a Venetie resident visiting relatives in Arctic Village took more than his two allotted caribou. Arctic Village council members reportedly contacted him and asked to count the number of caribou which had been taken. The hunter was then informed of the limit but allowed to keep the meat. However, members of the village council drove snowmachines to the kill sites to ensure that no meat was left behind and that the area had been covered over. They were also present when the meat was loaded into an airplane to see that it was properly packaged.

In the Canadian North, similar traditional management mechanisms and the land tenure system upon which they depend were found to be fragile (Berkes 1981:172). Disruption in that system occurred when: 1) sociopolitical control was lost over resources leading to open-access common property conditions (such as through the introduction of roads); 2) rapid technological change took place; 3) commercialization of a resource occurred; and 4) when there was pressure from rapid human population growth. However, historic and contemporary evidence from Canada suggests that such perturbations are not necessarily permanent (Berkes 1981:172).

The extent to which these or other elements of customary law will shape the use of land and resources in the future remains unclear. Some argue that this body of law is ineffective and that it will continue to decline in significance. Others believe it represents an untried opportunity for development of realistic and locally-acceptable resource management programs for the conservation of wild resources. Usher (1981:68) goes so far as to suggest that:

> the atrophy of customary law is not a function of its intrinsic inability to cope with change, rather it is a consequence of deliberate suppression. Too often, among native people today, customary law is elaborated only in the minds of the elders as something that worked well long ago. The challenge to native communities now is to seek the guidance of the elders, the cooperation of the young, in order to make customary law relevant again. What does customary law have to say about the use of airplanes and snowmobiles, and about intersettlement trade or commercial fishing? And how would these laws be enforced? Surely it is in the interest of wildlife managers to find out, by encouraging and supporting this process, and by assisting in it if asked.

LOCAL CONCERNS ABOUT LAND AND RESOURCE USE

This section of the report summarizes predominant concerns and perceptions of local residents about land and resource uses in the region which were identified during the course of the research. No effort is made to analyze or evaluate these concerns; they are presented here only so that they can be addressed in future discussions regarding planning and management of land and resources in the region.

The Value of Subsistence-based Socioeconomic Systems. Most local residents stress the importance of the subsistence-based socioeconomic system to their way of life. This system is a mixture of both subsistence and cash components which together have economic, nutritional, social, and cultural significance. Local residents, both Native and non-Native, have had to adapt to changing economic and environmental settings. According to one observer, Athabaskan

culture in particular reflects "a readiness to adapt to new environments, to use different resources, and to seize new technological advantages" (Brody 1982:86). These processes of adaptation continue today. The mixed economy allows local residents to expand their economic opportunities and decrease uncertainty, and it provides an important buffer for a region tenuously linked to external economies.

To many of the region's residents, the mixed, subsistence-based economy is simply 'the way people live today.' Few would argue that the degree of economic dependence upon wild resources is as it was in their grandfather's time. And very few would choose to return to the uncertainty of the "old days." Yet access to local resources provides economic security in a world where economic "booms" typically come and go.

Elders in the region express concern about the future of this way of life. They speak about those young people who do not know how to make a living "off the land." They worry about what will happen if their children's lives are suddenly or even slowly disrupted. And they believe quite confidently that such disruptions will take place, if not in their lifetimes, then in the lives of their children. It is in this sense, perhaps, that the use of local resources and land has its greatest significance and most compelling meaning. Use of traditional places and resources represents a touchstone with the past and a sense of security for the future, a hedge against the uncertainties of a changing world.

There is a certain sense of frustration and futility among local residents in trying to convey these thoughts to "outsiders." Said one man at a recent public hearing, "there are a lot of people coming into our territory -- I think I'm repeating myself -- [and] a lot of times we make these statements but I keep saying them until somebody pays attention to them and understands what I'm saying." On another occasion an elder from Arctic Village said, "we only have three [congressional] representatives from the state of Alaska and you got many

other people in the lower 48...The word "subsistence" doesn't mean anything to the legislative people down there. We depend on the caribou, and they think it's a joke."

Concern About Habitat Protection. While the region as a whole has experienced relatively few direct impacts from large-scale industrial development, community leaders have begun to express concern about certain potential projects which could affect local resources. The protection of the calving ground of the Porcupine Caribou Herd has been identified by regional leaders as a matter of utmost concern. According to these leaders, congressionally-mandated oil exploration on the calving grounds in Alaska have added immediacy to the need for enhanced habitat protection. The Reverend Trimble Gilbert, speaking for Arctic Village, noted:

> Caribou is the most important thing to Arctic Village. If we don't have any caribou, I don't know how we're going to live. In the calving ground, we don't want any development...I want to see the Porcupine caribou protected for future generations. (Tanana Chiefs Conference 1980:2-3)

In order to advocate for conservation of the herd and to ensure user participation in its management, Athabaskan and Inupiat residents of Alaska and Canada created in 1982 their own "International Porcupine Caribou Commission" comprised of users of the herd. A primary purpose of the commission, according to local leaders, is to advocate for an international agreement between the United States and Canada for the conservation of the Porcupine Caribou Herd.

Recent studies have only begun to assess the environmental and sociocultural impacts of Arctic Slope oil and gas exploration on the Porcupine Herd and those who utilize it. A report by the Arctic Environmental Information and Data Center (1982) identifies potential effects of Arctic Slope exploration activities upon cultural values, social and political organization, and the economy, facilities, and services of Arctic Village and Kaktovik. Oil and gas

exploration on private lands in the region could have environmental, economic, and sociocultural effects upon local communities and resources as well.

Birch Creek village residents and the Yukon Flats Fish and Game Advisory Committee, furthermore, have repeatedly expressed concern about the decline of water quality in Birch Creek due to mining activities upstream. Local residents believe that increased turbidity in the creek poses a threat to fish and wildlife resources, continued subsistence uses, and the community water supply.

Concern About Resource Competition. The actions of non-local hunters and recreationists are viewed with concern by some local residents. For example, in August 1982 expanded hunting and guiding activity near Arctic Village reportedly caused residents there to request that air taxi operators not use the community airstrip for transporting non-local hunters and recreationists.

Additionally, an increase in moose hunting on Birch Creek near the Steese Highway bridge was cited by Birch Creek residents as a major reason for a decline in local moose populations. One Birch Creek resident reported encountering seven riverboats carrying non-local hunters between the bridge and the mouth of Preacher Creek during moose season in 1981. The Alaska Board of Game took action in 1983 to institute a limited registration permit hunt for moose in the area near Birch Creek, Beaver, and Stevens Village in Game Management Unit 25D. The action also included a restriction on the use of aircraft in hunting moose.

General objections also seem to be raised about "trophy" hunting and the practices of certain guides and non-local hunters. Some local residents believe that non-local hunters are reducing game populations and that noise from increased aircraft and boat activity drives game away from hunting areas. Recreational users are sometimes accused of breaking into trapping cabins and removing the contents, stealing fish from nets and wheels, or otherwise disrupting ongoing subsistence activities. Particularly sensitive areas for

PLATE 18 Oil Exploration Helicopter in Venetie.

PLATE 19 Fort Yukon and Kaktovik Residents Assist with a Caribou Census.

potential conflict include the Yukon and Porcupine rivers, Birch and Beaver creeks, and the Chandalar River near Arctic Village and Venetie. Assuming that growth in recreational use continues, resource management policies may need to address ways of minimizing conflicts betwen legitimate recreational uses and local activities.

An issue of increasing concern in the region involves the allocation of salmon in the Yukon and Porcupine rivers and their tributaries between commercial and subsistence uses. Conflicts over the allocation of salmon appear to be increasing, and residents of the region have expressed the belief that subsistence needs be met before commercial harvest guidelines are changed.

Concern About Access to Local Resources. Residents from all the study communities harvest resources on lands within both the Yukon Flats and Arctic National Wildlife Refuges, with the exception of Birch Creek, which uses lands in the Yukon Flats refuge only. The legislative intent of Congress in creating these refuges included as a basic purpose "the opportunity for continued subsistence uses by local residents" subject to provisions for the conservation of fish and wildlife populations and their habitats (U.S. Congress 1980). Still, there remains a concern among many of the region's residents that regulations imposed to manage these refuges could further restrict local uses. As one Arctic Village man noted:

> People are now to a place where they are afraid to go out and live their native way of life, because of game wardens, because of regulations, they are afraid to go out and live like we're supposed to...we wish for the older people, while they're still living to eat in their traditional lifestyle, and if we can fix it up today, so that they can continue to live in the way that they're accustomed to, without being afraid of outside prosecution or outside pressure (cited in Lonner and Beard 1982:158)

The land use maps developed for this report document the fact that extensive areas of these wildlife refuges are currently utilized for customary and traditional harvests of local resources. Use patterns have evolved over time in

PLATE 20 Log Home Construction Project in Venetie.

PLATE 21 Chartered Float Plane Used to Reach Spring Camp on Beaver Creek.

response to many factors, including resource availability, economic imperatives, and social and cultural factors. Patterns of use extend beyond boundaries of lands recently designated for ownership by village or regional Native corporations, or by tribal governments.

Mapped data presented in this report illustrate the minimal extent of these uses, and can be used to assess the potential effects of new state and federal policies and regulations upon access to lands and resources currently used. State land disposals in important local use areas such as Old John and Ackerman lakes, on the Middle Fork and the main segment of the Chandalar River, on the Sheenjek and Koness rivers, or in the upper Black River drainage, could significantly affect local harvest activities.

THE NEED FOR FURTHER RESEARCH

The focus of this report has been limited to describing community-based land and resource use over time. Because of limitations in the research design, and because these uses are dynamic, additional research will be needed to provide data necessary for management of resources in the region. Therefore, this research should be considered only a baseline effort.

Additional research addressing the role of natural resource use in local economies is necessary. Detailed evaluations of the economic, social, nutritional, and cultural significance of natural resouces in each community should be conducted and regularly updated. Further documentation of specific resource use areas and sites should be undertaken, especially in areas where the effects of industrial development and other land use changes can be anticipated. Documentation of variations in future land use should also be carried out. Baseline documentation of land use can be extended to other communities in northeastern Alaska, including Circle, Beaver and Stevens Village in the Yukon Flats. Documentation of both land and resource use by non-community households should also be undertaken.

PLATE 22 Child on Snowmachine in Venetie

This report has briefly described the nature of resource sharing, barter, and exchange in the region. Further research on this subject should provide a better understanding of the interrelationships which exist within and between communities in the region. Identification of harvest task groups and kinship ties between communities would be important to this effort.

Customary law has been determined to play a role in shaping patterns of land and resource use in the region. Additional research regarding the nature and significance of this body of law may provide avenues for locally acceptable resource conservation measures. Such research might encourage local residents and resource managers alike to think about the applicability and utility of customary law in a contemporary setting. Fostering the application of customary law to contemporary land and resource issues may help bridge barriers hindering progress toward conservation of natural resources in the Upper Yukon-Porcupine region.

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