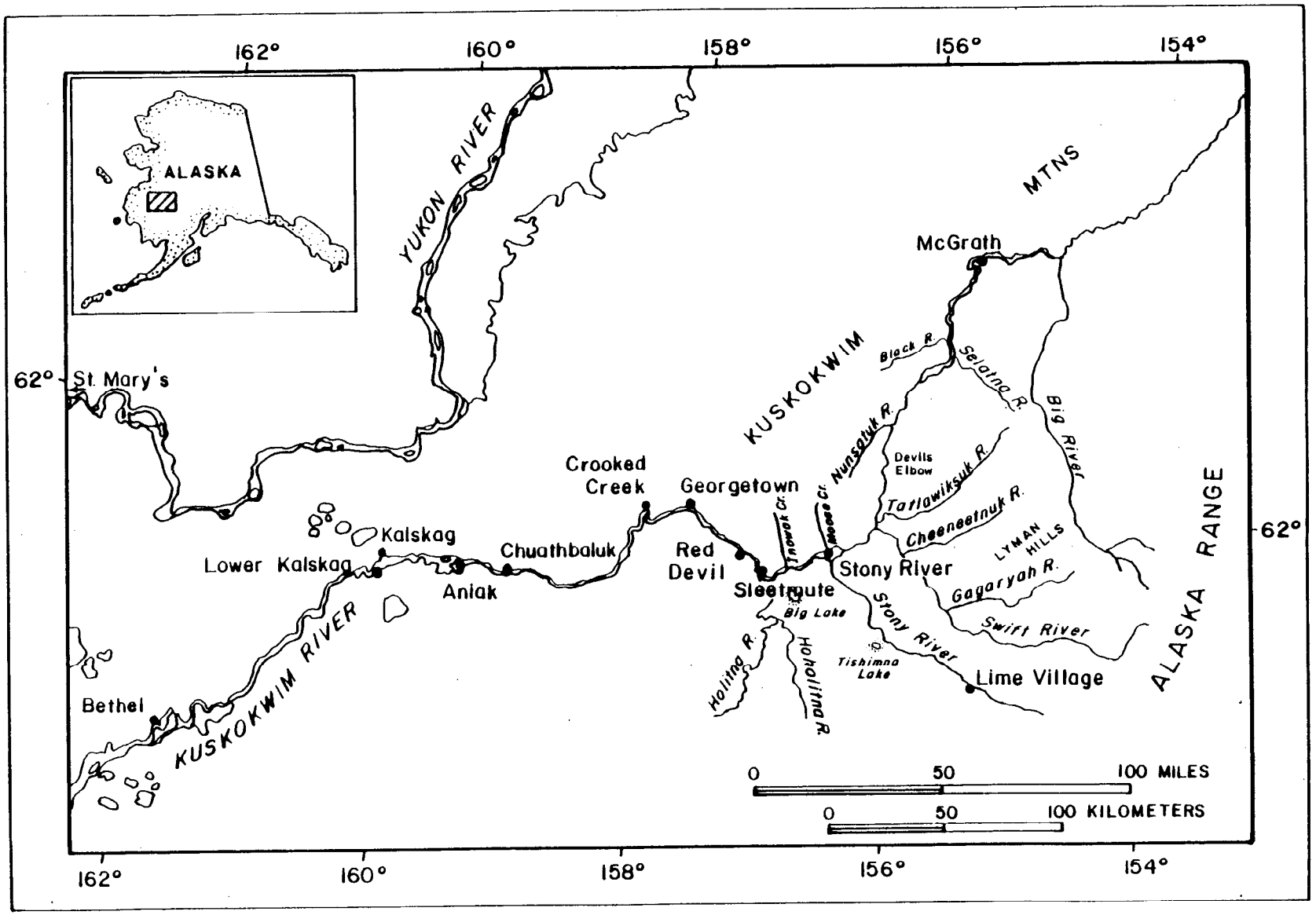
WILD RESOURCE USE AND ECONOMY OF STONY RIVER VILLAGE

by

Priscilla Russell Kari

Technical Paper No. 108

Alaska Department of Fish and Game
Division of Subsistence
Juneau, Alaska
March 1985



Stony River: the regional and local area.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACKNOWLEDGEMENTS

The author sincerely thanks the residents of Stony River and a nearby homesite for their hospitality and for contributing their knowledge and time which made this report possible. It was a privilege to learn from them.

I especially want to acknowledge the contribution the late Gusty Mikhael made. During the period of this research, he was in his mid-eighties and the oldest resident of the community. He is remembered by many for his generosity, vitality, and extensive knowledge regarding his country. He spoke six languages and was no doubt one of the most polyglot Alaskans of the late twentieth century. He was a traditional storyteller and a song leader of the Russian Orthodox Church.

I would like to express my deep appreciation to my co-worker Raymond Peterson who was largely responsible for mapping the wild resource use areas for this report. He also assisted with interviews and by reading an earlier draft of the report.

I sincerely thank Elizabeth Andrews in developing the research project and reviewing and editing the final report. The assistance of Linda Ellanna and Terry Haynes in reviewing the report is gratefully acknowledged. I also thank Karen Thompsen very much for typing and proofreading the report, and Mildred Russell for proofreading it. I especially thank James Kari and Steven A. Jacobson for providing linguistic and place name data and James Kari for proofreading it. The work of Betsy Sturm, Renee Patten, and Gary Nichols for drafting the figures for this report is much appreciated.

CHAPTER 1

INTRODUCTION

PURPOSE

The purpose of this report is to document the contemporary local economy of Stony River village. The Alaska Department of Fish and Game, Division of Subsistence, undertook the study in order to obtain baseline information necessary for agency assessment of the possible impacts of the Holitna Basin Oil and Gas Lease Sale Number 46 and proposed land disposals in the area used for resource harvest by Stony River village residents. Other objectives included the procurement of data that relates to other development and regulatory changes which may influence the areas used for resource harvest by the study group.

METHODOLOGY AND BACKGROUND

The report portrays the contemporary local economy of Stony River based on information obtained through participant observation, informal interviews, and mapping of resource use areas. The study formally occurred between October 1983 and April 1984. Before the study began, the primary researcher had relatively long-term contact with Stony River village residents. Also, she recently undertook formal subsistence-related research in the adjacent Lime Village area (P. Kari 1983). She was assisted with the research for this report by Raymond Peterson, a

long-term resident of the central Kuskokwim area employed by the Division of Subsistence, Alaska Department of Fish and Game, who had recently done similar work in a nearby community. During the period of this study, the primary researcher made four field trips to the community of Stony River village, ranging in length from one to two weeks. Her co-worker also made a number of trips to the village.

The two researchers made a preliminary visit to Stony River village in September, 1983, to discuss the proposed study and to identify local land and resource issues. They contacted members of almost all households, with whom they talked concerning the aforementioned subjects. The community held a meeting soon after the initial visit and approved the project.

During the visits of the formal study, one or more members of all households participated in the project to varying degrees. Information was also collected from a long-term family of the local area which does not live in Stony River. Methods used to conduct the study were mapping of research use areas, informal interviews, and participation in activities relevant to the project. The mapped time period is circa 1900-1983 and the description of activities is for the contemporary period. Most areas mapped have been used in contemporary times.

The high degree of involvement of most households in wild resource harvest activities impressed the author. Members of the older generation, who are very knowledgeable about traditional practices, attempt to pass their information and abilities on to the younger people in the community. This has resulted in a younger generation that is actively involved in subsistence activities.

PRIOR RESEARCH

Detailed subsistence information for the study area examined in this report is scant. According to Snow (1981), the only data of this type were provided by Zagoskin's (1967) early report. Snow (1981) provides a brief, relatively detailed summary of subsistence activities for both the Kuskokwim and Yukon Ingalik. Stickney (1980 and 1981) conducted food surveys in the central Kuskokwim area which included Stony River village. Charnley (1984) prepared a comprehensive study of wild resource activities in the neighboring communities of Sleetmute and Chuathbaluk. P. Kari (1983) provided information of this nature for Lime Village, a community located on the Stony River approximately 60 miles from Stony River village. Kari and Kari (1982) summarized major Tanaina village sites and land use areas.

CHAPTER 2

THE PEOPLE AND SETTING

INTRODUCTION

Stony River village is a rural Alaskan community situated in the Kuskokwim subregion of southcentral Alaska. Between October 1983 and April 1984, the period covered in this study, approximately 70 persons inhabited the village, the majority of whom are predominantly of mixed Athabaskan and Yup'ik ancestry. The economy today includes the harvesting of local resources primarily for home use, the exchange of raw and processed goods both within the village and among other communities, cash obtained through wage employment, the sale of fur and handicrafts, and government transfer payments. The backbone of the economy is the procurement of local resources obtained by hunting, fishing, gathering, and trapping.

LOCATION AND REGIONAL SETTING

Stony River village is situated on an island near the north bank of the Kuskokwim River, approximately one mile north of the mouth of the Stony River in southwestern Alaska. Located within the Kuskokwim Bay subregion (Selkregg 1974), it lies in the upper reaches of the central Kuskokwim River basin. The central Kuskokwim River area extends from Lower Kalskag to Stony River village and includes Lime Village on the Stony River (see Frontispiece).

Stony River village is located about 20 air miles or about 35 river miles east of Sleetmute. Stony River is approximately 100 air miles east of Aniak, the commercial and service center of the central Kuskokwim area. Downriver between Sleetmute and Aniak there are other central Kuskokwim year-round settlements, including Red Devil, Georgetown, Crooked Creek, and Chuathbaluk. Bethel, the largest community of the Kuskokwim Bay subregion, lies approximately 180 air miles southwest of Stony River in the lower Kuskokwim area. McGrath, the major center of the upper Kuskokwim area, is north of Stony River village a distance of about 84 air miles. Lime Village, the only other community in relative proximity to Stony River village is located about 60 air miles up the Stony River.

HISTORICAL AND LINGUISTIC SETTING

Ethnic and linguistic relationships in the central Kuskokwim area are complex and reflect dynamic population shifts in the historic period. Stony River village is the modern contact point between Yup'ik Eskimo and three distinct Athabaskan languages: Kuskokwim Ingalik (more properly Deg Hit'an), Dena'ina, and Upper Kuskokwim. The following linguistic discussion is from J. Kari (pers. comm. 1984). Yup'ik has gradually expanded eastward up the Kuskokwim, absorbing small populations of Kuskokwim Ingalik speakers (Oswalt 1962). At the time of historic contact there may have been Athabaskan speakers as far downriver as Lower Kalskag. In the past 30 years, some of the last speakers of Kuskokwim Ingalik from Georgetown, Crooked Creek, and Sleetmute have passed away. Yup'ik population increase and upriver

expansion has taken place in the context of the absorption and rapid demise of small Athabaskan groups on the middle Kuskokwim that formerly resided in two- and three-family units in a continuous network along the river.

Today there is considerable multilingualism in Stony River village between Yup'ik and the three distinct Athabaskan languages. It appears that all the Athabaskan speakers can understand Yup'ik and some speak it fluently. Many, but not all, of the Yup'ik speakers can understand one or more of the Athabaskan languages but tend not to speak them. Significantly, there is a zone of joint Yup'ik-Ingalik geographic place names (the same place with two names) between Kolmakov and the Swift River; Appendix 1 is a discussion of native place names in the central Kuskokwim and Stony River land use area. The "patriarch" of Stony River, Gusty Mikhael, is one of the most polyglot natives in Alaska, speaking Yup'ik (his mother's language), Ingalik, Dena'ina, and Upper Kuskokwim, plus English and Russian. He also is a song leader in the Orthodox church. He prefers Yup'ik when telling stories, but can shift rapidly into precise conversational registers of each of the neighboring Athabaskan languages. Eskimo and Athabaskan languages share boundaries around the circumference of Alaska, but there may be no point of contact with as high a degree of Eskimo-Athabaskan multilingualism in modern Alaska as Stony River.

There are today only about six people dominant in Kuskokwim Ingalik. These people live both at Stony River and Lime Village. There is a high degree of dialect variation in surface phonology among the ten or so Kuskokwim Ingalik speakers who have been surveyed. This variation reflects the rapid absorption of remnant populations into

different speech communities (Yup'ik, Dena'ina, Upper Kuskokwim, English).

The prehistory of the Ingalik language area is an intriguing topic which has received little attention. The modern language straddles both the Yukon and Kuskokwim rivers, and there is close mutual intelligibility between these two areas. There must have been close contact between the populations of the Yukon and Kuskokwim up until the recent past. Interestingly, Gusty Mikhael refers to the Kuskokwim Ingalik language as the "Yukon" language, implying a recent incursion of Ingalik from the Yukon to the Kuskokwim.

As of 1900, the Upper Kuskokwim language boundary was probably at the mouth of the Tatlawiksak River and included the headwaters of the Big River to the east (Fig. 1). Following the devastation of the village of Vinasale during the 1918 influenza epidemic, a few families went upriver to Nikolai and others moved downriver to the vicinity of Stony River. The site of Vinasale on the Kuskokwim River is approximately 90 air miles from Stony River. There appears to be an Ingalikized variety of Upper Kuskokwim spoken by a few people who survived the flu epidemic and moved downriver to Tthaghoy, "Big Sinka's," ten miles above Stony River. It should be noted that a large area used for subsistence harvests surrounding the site of Vinasale has gradually been depopulated.

While the downriver boundary of Kuskokwim Ingalik has been receding eastward, the upriver boundaries are relatively stable. Kuskokwim Ingalik and Dena'ina boundaries meet on the lower Stony River at the site of Xutthet at Tishimna Lake (Fig. 1) or "Whitefish" (Kari 1983). This village used to consist of predominantly Ingalik-speaking

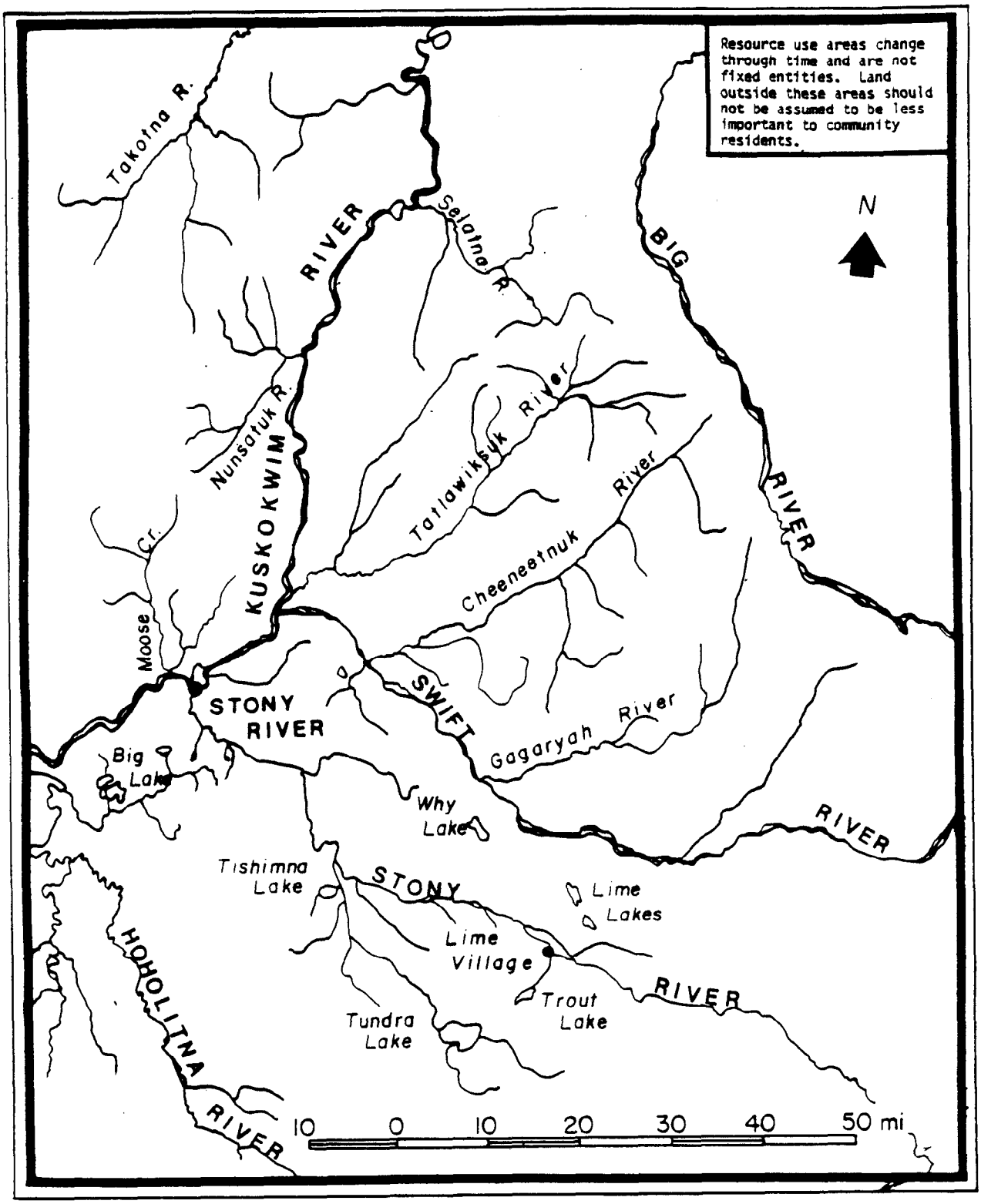


Figure 1. Stony River: the local area.

residents. The location continues to be regularly used by families from Lime Village that are primarily Ingalik-Dena'ina by intermarriage. On the lower Swift River, the Dena'ina-Ingalik boundary is at the Gagaryah River.

According to Zagoskin (1967), Vasiliy Ivanov was the first Russian explorer to reach the central Kuskokwim area in the early 1790s by descending the Holitna River. Since that time, the non-native presence in the area has increased significantly (also see Hrdlicka 1943; Oswalt 1962 and 1980; VanStone and Goddard 1981; Snow 1981; Kari and Kari 1982; and Charnley 1984 for further discussion of the history of the central Kuskokwim area).

The first non-native to settle at the present location of Stony River village was probably a white trader named Ora Barnhardt who ran a store there during the first part of this century (Oswalt 1980; Stony River residents pers. comm. 1983). He was replaced in the late 1930s by the trader, Reginald M. White, who apparently also became the local airline representative and postmaster. Ricks (1965) states that a post office began operating in 1935 at Stony River. Following White's death in 1961, Diane and Robert Carpenter (now of Bethel) managed the store for several years. According to Oswalt (1980:79) the year-round settlement of Stony River was founded in 1960-61 when local Eskimos and Indians and other Indians from Lime Village built cabins near the store and lived in them on a year-round basis.

TRADITIONAL AND CONTEMPORARY LAND USE AREA

The traditional land use area of the majority of Stony River people is bounded on the west by the Kuskokwim Mountains on the west bank of the Kuskokwim River (Fig. 1). Use of the slopes and the streams that drain into the Kuskokwim River occurs. Inowak Creek on the north side of the Kuskokwim River and Big Lake and nearby Muskrat Creek on the south side are geographical landmarks for a western border. Tishimna Lake denotes a southern limit for their land use area west of the Stony River, and Why Lake, located approximately 55 air miles from the Kuskokwim River, is a landmark between the Stony and Swift rivers. North of the Swift River, the Lyman Hills and the Big River frame an eastern boundary approximately to the Selatna River in the north (Fig. 1). The Black River that drains into the Kuskokwim River near Vinasale is at the upper reaches of a northern border. The Kuskokwim Mountains form a western boundary.

The focus of Stony River residents' land use area today is the central Kuskokwim River from Inowak and Moose creeks to and including the Nunsatuk and Tatlawiksuk rivers, the lower and mid-portions of the Swift River and its tributaries (the Gagaryah and Cheenentnuk rivers), and the lower Stony River up to Black Creek near Tishimna Lake and west to Big Lake and Muskrat Creek (Fig. 1).

Although boundaries have been described in order to identify the primary land use area of the Stony River residents, this does not mean that they were or are fixed perimeters beyond which people do not travel for resource harvesting. Land on the limits of a use area in particular was, and is today, often a zone which received combined use by adjacent

groups, as appears true today for border lands between Stony River people and their neighbors. Examples include the Tishimna Lake area and the lands immediately east of the lower Holitna River (see Oswalt 1962 for further discussion of this subject).

The traditional land use areas of two Athabaskan groups and one Eskimo group border that of Stony River residents. Down the Kuskokwim from Stony River village, Yup'ik Eskimo people predominate, although many of the inhabitants of the central Kuskokwim communities, similar to Stony River residents, are of mixed ancestry today. Lime Villagers who share a southern border with Stony River residents, are predominantly of Dena'ina (Tanaina) Athabaskan descent. Upper Kuskokwim-speaking Athabaskans who now reside primarily in the villages of Telida and Nikolai on the upper tributaries of the Kuskokwim River to the north customarily used areas north of the Swift River such as Vinasale, and continue to use areas in the vicinity of the Big River (Fig. 1).

THE COMMUNITY: FACILITIES AND SERVICES

During the period of this study, October 1983 through May 1984, about 20 buildings, most of wood frame or log construction, were occupied by approximately 70 Stony River residents. Some homes have been built privately while others have been constructed through a Bureau of Indian Affairs (BIA) housing project, two being completed in 1983. Outbuildings, including sheds, caches, steambaths, and privies, accompany many of the homes. One man lived in a 10 x 12 foot canvas tent within the village during the 1983-84 winter season. Other village structures included a school, community hall, health clinic, general

store/residence, post office/residence, community powerhouse, and an uncompleted Russian Orthodox Church.

The school, built in the 1960s and presently managed by the Kuspuk School District, services kindergarten, primary and secondary age students. According to school personnel, student enrollment flucuated between 25 and 30 persons during the 1983-84 school year. During the 1983-84 school year, staff included three teachers, two teacher-aides, one cook, and one custodian. All but the teacher positions were filled by long-term residents of the village. A Johnson-O'Malley (JOM) preschool program operating during this period also provided part-time employment.

Since 1982, the village has been serviced by a central electric power system through the Middle Kuskokwim Electric Cooperative. While electricity is the primary source of light for the village, wood and oil burning stoves supply heat for most buldings. There is no central sewage disposal system or central water distribution system in Stony River. The school, health clinic, and majority of residences have wells, however, and most of these were installed in 1983 through a grant from the State of Alaska.

During the late winter of 1983, private telephone service became available to Stony River people through Bush-tell Inc. based in Aniak. Prior to that time, the village had a single telephone provided by Alascom, Inc. Radiophones continue to be used as a means of communication, especially to points outside the village. Most households own televisions and radios, which are another means of receiving communication beyond the local area.

Weather permitting, Stony River residents receive mail five days a week by air from Aniak. The service is a very important one for the village, as it not only delivers essential supplies, but provides relatively inexpensive transportation for residents to and from Aniak, the commercial hub of the area. Aniak is a link to the larger communities of Anchorage and Bethel, where residents frequently travel to obtain medical care and other professional services. A resident health aide provides Stony River people with emergency and first aid assistance.

REGIONAL AND INTERREGIONAL TRAVEL

Stony River villagers travel out of the local area primarily by means of small aircraft, boat, snowmachine, and occasionally dog team. A few roads exist in the village, but no highway system connects the central Kuskokwim communities. The Kuskokwim River was traditionally, and continues to be, a major travel route for residents of the area. Today the main vehicles of transport on the river are boats and barges during the open-water season and snowmachine and dog team in the winter. Small aircraft, which were in fairly common use in the area by the late 1940s, provide a faster but more expensive method of transportation year-round. Although Stony River residents today depend heavily on air transportation throughout the year for regional and interregional travel, they use it somewhat less during the summer months when water transport is possible.

Stony River residents use the scheduled plane service, chartered aircraft, jets (where available) to travel to the larger communities of

Anchorage, Aniak, Bethel, and McGrath in order to obtain professional services not available in the village, to purchase groceries and other supplies, and to visit relatives and friends. The "mail plane" operating out of Aniak offers relatively inexpensive transportation and is used heavily by many residents to reduce travel expenses.

During the period of this study, Harold's Air Service had scheduled flights Monday through Friday between Aniak and Stony River, with intermediate stops in Crooked Creek, Red Devil, and Sleetmute. It hauled passengers, mail, and supplies by small aircraft, weather permitting. The cost of a seat on the mail plane from Aniak to Stony River was $45 one-way during the 1983-84 winter season. To charter a 207 aircraft between Aniak and Stony River one-way travel cost $290. Small commercial air taxis also offer charter service year-round out of Aniak, Sleetmute, Red Devil, and McGrath. The price of an air charter on a 180 aircraft for one-way travel between McGrath and Stony River was $170 in April 1984. Jet service out of Anchorage which connects with Aniak and Bethel was offered by Wien Air Alaska during the study period. The round-trip coach fare between Anchorage and Aniak was $300 in March 1984.

Especially during the summer months, the Kuskokwim River is an extremely important transportation artery for residents of the three subregions through which it flows--the lower Kuskokwim, central Kuskokwim, and upper Kuskokwim. Small, privately-owned boats are the most common vehicles on the river during the open-water season. They are used for harvesting resources, hauling supplies and visiting friends and relatives both within and between the three subregions. Stony River people frequently travel by private boat to other central Kuskokwim

communities, especially Sleetmute, Red Devil, Crooked Creek, and Aniak, and occasionally as far as Bethel, located on the lower Kuskokwim, and McGrath on the upper Kuskokwim. Most frequently Stony River residents tend to travel upriver from their village for harvesting activities and downriver for social, commercial, employment and professional needs, and to obtain wage work. Between Stony River and McGrath, both along the Kuskokwim River and inland from it on both sides, there is little human population and therefore less competition for resources. Also, the traditional territory of families today who are from the vicinity of Stony River village is more upriver than downriver from the village.

Besides frequenting the Kuskokwim in private boats during the open-water season, Stony River people use many of its tributaries to obtain resources and gain access to other portions of their land use area. They also travel occasionally by boat up the Stony River to Lime Village to trade and socialize. Heavily-used sidestreams include the Swift, Cheeneetnuk, Tatlawiksuk, Gagaryah, Nunsatuk, and Stony rivers, and Moose Creek (Fig. 1).

During the winter months, air transportation is frequently used by Stony River people for both regional and interregional travel. Poor snow and ice conditions that occur commonly on the central Kuskokwim River produce difficult and hazardous conditions that make it a less desirable travel route in the winter than during the open-water season when boat transportation is possible. Stony River residents make occasional trips by snowmachine and less often by dog team downriver to other central Kuskokwim communities for purposes of trading, buying and selling, and socializing. A central Kuskokwim resident estimated it cost approximately $30 in gas and oil to drive by snowmachine between

Aniak and Stony River one way. One Stony River man with relatives in Bethel notes that he normally makes several trips each year by snowmachine to this lower Kuskokwim community. People commonly travel into the upper Kuskokwim area by snowmachine, occasionally as far as Deacon's Landing, approximately 15 air miles above the mouth of the Nunsatuk River. Frequent visits are made to a family living approximately ten river miles above Stony River village. Infrequent travel occurs between Stony River and Lime Village by snowmachine during the winter months for socializing and trading purposes. At least one Stony River party traveled to Lime Village during January 1984 to participate in Russian Orthodox Christmas activities there.

A number of major barge lines operating out of Bethel provide an additional means of transporting freight to Stony River and other Kuskokwim communities during the open water season. According to a barge employee, three companies serviced Stony River and the upper Kuskokwim during the 1983 summer season. Fuel is the primary commodity delivered to Stony River, although people also order other supplies, particularly bulk items such as vehicles and building materials.

DEMOGRAPHY

The United States Census counts taken in Stony River village showed a population of 74 persons in 1970 and 62 in 1980 (U.S. Dept. of Commerce 1981). During the period of this study, approximately 70 persons in 20 households resided in the community. Included in this count were 14 people belonging to three households who had not originated in the area and did not have kinship affiliations with native

people of the area. The majority of residents were of mixed Athabaskan and Yup'ik descent and members of families with long-term occupancy in the central Kuskokwim area. English and Yup'ik were the dominant languages of the village, with Dena'ina and Ingalik Athabaskan being spoken by a small minority of the population.

The population of the village did not fluctuate significantly during the study from October 1983 through April 1984. The village has a relatively more stable population during the winter months than in the summer, when residents are more likely to seek employment outside the area. For example, during the summer of 1983, the members of at least two households were employed outside the area and did not reside in the community. Table 1 and the following discussion describes the demographic composition of Stony River village in March 1984.

Using Table 1 as an indicator, Stony River village can be said to have a very young population with approximately two-thirds of the population under 30 years of age. About half the residents are under 19 years of age and 15 percent less than 6 years old. Slightly under one-third of the population is in the 30 to 59-year old category, while approximately 5 percent is 60 years or older. In this report, the term "elder" applies to persons in the latter category. Male and female ratios are similar except for categories under 6 years old and over 60, in which males significantly outnumber females.

TABLE 1. AGE AND SEX COMPOSITION, STONY RIVER VILLAGE, MARCH 1984

Age Class	Males	Females	Total Percentages
60-85	(5.8%) 4 ****	0 (0%)	5.8
50-59	(2.9%) 2 **	*** 3 (4.3%)	7.2
40-49	(7.3%) 5 *****	**** 4 (5.8%)	13.1
30-39	(4.3%) 3 ***	** 2 (2.9%)	7.2
20-29	(5.8%) 4 ****	**** 4 (5.8%)	11.6
13-19	(7.3%) 5 *****	******** 8 (11.6%)	18.8
6-12	(8.7%) 6 ******	******** 8 (11.6%)	20.3
0-5	(11.6%) 8 ********	*** 3 (4.34%)	15.9

Number of People

N = 69

37 (53.7%) 32 (46.3%)

ENVIRONMENT

Setting

Both environmentally and in terms of human use, the Kuskokwim River is the most focal geographical feature within the land use area of Stony River villagers. The Kuskokwim River, the second largest river in the state, flows 500 miles from its headwaters in the Alaska Range to its mouth in Kuskokwim Bay. Stony River residents make extensive use of the river between Inowak Creek and the Nunsatak River for subsistence

purposes. The village itself is located approximately one mile above the mouth of the Stony River.

Within the land use area of Stony River, the Kuskokwim River is bordered on its west bank by the Kuskokwim Mountains and on its east bank by the Kuskokwim Mountains and Holitna Lowlands. The Kuskokwim Mountains, a series of rolling hills, rise between 2,000 to 4,000 feet high, while the Holitna Lowlands have an elevation of between 250 to 600 feet (Selkregg 1974). Tributaries of the Kuskokwim River which drain the land use area of Stony River residents include the Nunsatuk, Tatlawiksuk, Swift, and Stony rivers, as described eariler.

Plant Communities

The six primary vegetation categories defined by Viereck and Little (1972) that occur within the area used by Stony River residents are described in this section. Important animal resources are noted also.

(1) Closed Spruce - Hardwood Forests: This relatively dense, tall forest which occurs on moderate to well-drained sites at low to mid-elevations is common in the Kuskokwim Mountains. Spruce, paper birch, aspen and cottonwood dominate, the latter being most abundant in floodplains. Animal resources are varied within the forest environment, and some, including moose, caribou, bear, wolf, red fox and wolverine, travel widely and may occur there intermittently or only during certain seasons. Snowshoe hare, marten, mink, lynx, porcupine, and grouse are other locally-significant animals of this forest type.

(2) Open, Low Growing Spruce Forests: Lowlands with poor drainage and north-facing slopes are typical of this system which dominates the

Holitna Lowlands. Although black spruce prevails, tamarack, paper birch and various species of willow also occur. Trees are frequently scattered and interspersed with treeless bogs. Locally the open areas within the forest are referred to as "tundra." Caribou, which frequent this environment, are more easily available to Stony River people here than in the alpine and moist tundra systems where they also occur.

(3) Shrub Thickets: This system exists primarily in transitional areas such as between the beach and the forest and on mountains between the treeline and alpine tundra. It also occurs in areas where vegetation has been altered or destroyed by flood, fire, or avalanche. Dense thickets of willow are often found along streams and on river islands and provide prime feed for moose, snowshoe hare, and ruffed grouse. Dense alder growth frequently exists between the treeline and alpine tundra, where it provides habitat for bear and other animals.

(4) Treeless Bogs: This vegetative type occurs generally in wet, flat basins and exists primarily in the Holitna Lowlands within the land use area of Stony River people. Tree growth is for the most part non-existent due to a wet peaty substrate that is commonly underlain by permafrost. The frequent ponds and areas of standing water provide summer food for moose and habitat for some types of waterfowl including cranes.

(5) Moist Tundra: Trees are conspicuously absent in this low growing type. Shrubs do not always dominate, but where they do, they consist primarily of various willow species, alder, dwarf birch, blueberry and other heath family members. Cotton grass and other sedges also frequent the environment. The soil is characteristically wet and peaty and underlain by permafrost. Moist tundra, which is prevalent in

the foothills and lower elevations of the Alaska Range, is rare within the contemporary land use area of Stony River people. Animals such as caribou, bear, and wolves range within this environment.

(6) Alpine Tundra: Dominant types of vegetation of this treeless environment are moss, lichen, and woody and herbaceous plants that form mats. The soil, where it exists at all over the rock and rubble, is thin and often dry. Within the land use area of Stony River, alpine tundra is present both in the Alaska Range and its foothills and in the highest portions of the Kuskokwim Mountains. In the past, Stony River village elders traveled to the Alaska Range to harvest dall sheep, ground squirrels, and hoary marmots. In contemporary times, caribou, bear, ptarmigan, and a variety of edible fruit producing plants have been the main resources harvested from this environment primarily within the Kuskokwim Mountains.

CLIMATE AND WEATHER

Stony River village people's land use area is located in the continental climatic zone of Alaska. This large interior region is generally characterized by extreme winter and summer temperatures, low precipitation, and light surface winds except in isolated locations (Selkregg 1974). However, a portion of the western boundary of the land use area experiences a mountain transitional climate characterized by greater temperature variations throughout the day and year than the continental climate. Residents note weather systems both from the mountains and from the coast, which also has a transitional climate

affect the area. Thus, precipitation is greater and temperatures more moderate in this area than in the central interior.

Official long-term weather information does not exist for Stony River village. It has been recorded for Sleetmute, a community located about 20 miles downriver from Stony River, also located in a continental climatic zone. Table 2 presents temperature and precipitation data for Sleetmute.

The summers in the vicinity of Stony River village are normally warm to hot, with most cloudy and rainy days occurring in August and September. Residents noted that the late spring and summer of 1983 were warm and somewhat drier than usual, with rain occurring intermittently throughout the season and not for long periods at a time. They said that the weather was good for the growth and ripening of berries and for drying fish. In June the sun is above the horizon for about 20 hours a day with no complete period of darkness occurring from May through July. On the other hand, in December sunshine is absent for approximately 20 hours of each 24-hour period.

The first freezing temperatures normally occur in late August or early September. The mean date of the first fall occurrence of 32°F for Sleetmute is August 28 (Selkregg 1974). Some snow usually appears at least by late September or early October at Stony River village, although residents say that snowfall is greatest in late December, January, February, and March. Rain is reportedly possible any month, including the winter, although it is more likely to occur in the early winter months than in mid- or late winter.

The smaller bodies of water normally freeze over in October or by early November, but freezing of the main channel of the Kuskokwim near

TABLE 2. TEMPERATURE AND PRECIPITATION IN THE VICINITY OF STONY RIVER VILLAGE

Sleetmute (10 years ca. 1962-1972)
Average Temperature:
Summer 37° to 66°F.
Winter -12° to 24°F.
Extremes -58° to 90°F.
Average Precipitation:
21" including 81" snow

From: Selkregg, L. 1974. Alaska Regional Profiles, Southwest Region, Anchorage: University of Alaska, page 14

Stony River normally does not occur until late November or early December. The Kuskokwim River between Sleetmute and the Swift River freezes later than segments above and below it. This is due in part to the large sidestreams--the Swift, Stony, and Holitna rivers dumping into it in this area. For example, by mid-November 1983 the Kuskokwim River was reported frozen from Devil's Elbow to McGrath and open from Devil's Elbow to just below Sleetmute.

In 1983 ice started running in the main channel of the Kuskokwim River near the end of the second week in October. One resident commented that he had not previously seen so little running ice that late. Weather which had been well above zero earlier in the month dipped to between -10°F and -20°F for about a week during the last half of October.

November 1983 was warmer than normal with temperatures often well above 0°F. During the second part of the month, 40°F temperatures and rain occurred for several days. The main channel of the Kuskokwim River stayed open until after Thanksgiving and did not freeze well until early December.

The heaviest snowfall and coldest weather occurred in January and February 1983 as residents had predicted it would if it were a normal year. During a 10-day period in mid-February, temperatures stayed between -10°F and -50°F for most of the time with snow occurring frequently. Residents said that the snowfall this year was heavier than usual, making it difficult for them to hunt and trap long distances from the village.

Some snow and sub-zero temperatures were reported to have occurred during the first part of March. Above-freezing temperatures and

sunshine during the day with below-freezing temperatures at night were experienced frequently during the latter part of March and early April. These conditions, which normally occur in March and April, produced a crust on the snow during the night and morning hours, thereby creating good traveling conditions. Break-up of ice is produced by temperatures increasingly staying above freezing and continues through April, with the Kuskokwim River in the vicinity of Stony River village normally opening in early May.

CHAPTER 3

THE ECONOMY OF STONY RIVER VILLAGE

INTRODUCTION

The contemporary Stony River economy consists of a combination of closely integrated components. A major sector is the harvesting and processing of local resources for local use. These resources are obtained through hunting, fishing, trapping, and plant gathering activities. Work groups are made up of members from single or multiple household units that frequently are kin-related.

Cash income is a second primary component of the economy which both supplements and supports the livelihood gained through land use activities. Cash income is derived from a combination of wage work, the sale of fur and handicrafts, and government transfer payments. The relative instability of the community's cash income, which is generally low, is compensated for largely by the harvest of local resources.

A third element of the economy is the exchange of both local and commercial resources within and beyond the village. The transfer of goods occurs through sharing, trading, borrowing, lending, and selling. Local land resources are not commonly sold and are usually shared or traded along kinship lines. Commercial commodities of especially high value are more regularly exchanged for cash both within and outside the local economy.

SEASONAL ROUND OF HARVESTING ACTIVITIES

Stony River people base their annual cycle on a seasonal pattern of resource harvesting and processing activities (Fig. 2). Alterations in the pattern may occur from year to year for a variety of reasons, including fluctuations in resource availability, poor weather and travel conditions, altered hunting regulations, and job availability. In spite of changes, in part resulting from imposed hunting restrictions, technological changes, and the involvement in wage employment, Stony River residents have maintained an annual round of resource harvest activities that resembles traditional patterns of land and resource use.

The year is composed of two primary seasons: the open-water season (May to October or November) and the closed-water season (November or December to May). Two lesser seasons, break-up (March or April to May) and freeze-up (October to November or December), are transitional periods between the two primary seasons. The kinds of local transportation used and the types of resource activities pursued are strongly influenced by these seasons. During the open-water season, boat and foot are the main transportation modes, while snowmachine, dog team, and walking are the chief methods used during the closed-water season. During break-up and freeze-up, travel continues by the same types of transportation but is restricted due to poor and changing ice, snow, and ground conditions. A description of the land use and other work activities of Stony River people during the year is presented below. Appendix 2 is a glossary of terms for selected species utilized by Stony River residents. In the spring, Stony River villagers prepare for the open water fishing season by repairing boats, outboard motors,

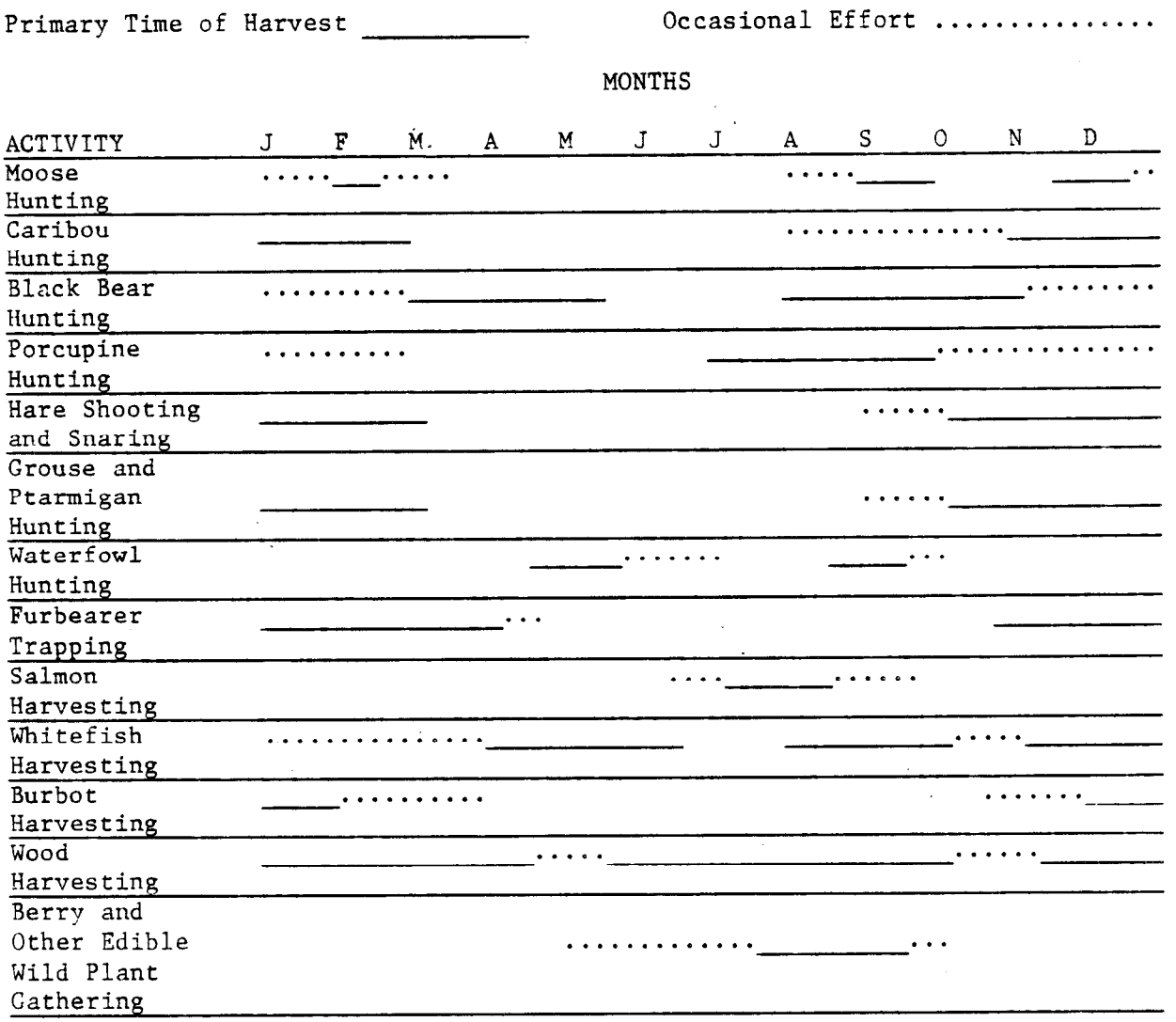


Fig 2. The annual cycle of harvest activities of Stony River residents for selected species, 1980-1984.

fishwheels and nets, or constructing and purchasing new ones. Fresh supplies of fuel are also ordered. Once the ice stops running, fishwheels and nets are set in the Kuskokwim and Stony rivers to procure the fish then available, including whitefish, grayling, pike, and other non-salmonid species. When the sheefish run is at its peak in the central Kuskokwim area during May and June, people harvest these large whitefish with drift and set nets. They are a welcome change in the diet from burbot and the other species of fish harvested during the winter months. Fish camps are made ready for use and gardens are prepared and planted. Also at this time, people seek summer employment and anticipate jobs they have already secured.

People who maintain overnight salmon camps normally do not move to them until the onset of heavy salmon runs, usually in mid-June. For the majority of Stony River households, the harvesting and processing of salmon is the focus of activity from June into August. It is an intense period because the salmon normally appear in large numbers and provide one of the most important food staples in the Stony River economy.

Especially during the spring, summer, and fall seasons, plants are gathered for a variety of purposes, including firewood, food, medicine, the production of handicrafts, and the construction of buildings. For example, birchbark is peeled during the summer and made into baskets and other containers. After the first fall frost, the roots of the "wild potato" (Hedysarum alpinum) are dug in quantity and eaten fresh or stored for future use. Berries are the plant food gathered in the largest quantities by the most households.

Berry picking begins in July and in some years may continue into October. Parties generally travel by boat and on foot to localities

where berries grow most abundantly. Because lowbush "salmonberries," (Rubus chamaemorus) an especially favored fruit, flourish in swampy terrain often not easily accessible by boat or on foot, people sometimes charter a small plane to a good area to pick them. They may set up camp and stay for several days in order to obtain a large quantity.

Summer is the season when wage employment opportunities are most available in the central Kuskokwim area. One or more members of most Stony River households generally engage in wage work at this time. People also commonly travel to other Kuskokwim communities by boat to transport supplies and to socialize with relatives and friends. Occasionally trips are made also to Lime Village.

Late summer and fall is also a busy period, with activities focusing on the harvesting of large game animals, particularly moose. Moose hunting during this time is one of the single most important activities of the entire year, as a household's winter livelihood depends heavily on the large supply of meat a moose supplies. During this time, large numbers of non-local hunters also enter the area for hunting purposes, seriously disrupting local harvesting efforts according to Stony River residents.

Besides moose, residents also hunt caribou and black bear during this season, although they are less sought after than are moose. People also harvest waterfowl, gather large supplies of wood, and set nets for salmon, whitefish and other non-salmonid fish species. They finish harvesting and processing the produce from their gardens, attempt to complete outdoor construction projects, and continue preparations for winter.

Stony River residents depend on frozen waterways for much of their winter travel via snowmachines and dog teams. While river sloughs and the small streams and ponds may freeze solid enough for travel as early as late October, the main Kuskokwim River near the village often does not freeze sufficiently until late November or early December. Once the ice starts to run heavily in the Kuskokwim River, people are largely confined to travel by snowmachine, dog team, and foot between the islands and the mainland on the right side of the village along sloughs, streams, and connecting trails. Their land use activities consist primarily of hauling wood, setting beaver snares, and maintaining short traplines. Trappers who can afford to sometimes charter small aircraft during this period to less accessible and less crowded trapping grounds.

Fishing is also an important activity during this season. People spend considerable time spearing whitefish with leisters from the shorefast ice or occasionally from boats. They also hook grayling, pike, and whitefish through shorefast river ice and in frozen sloughs. Set nets also are placed under the ice in the river at this time. During some years, lampreys, locally known as "eels," are harvested through the river ice with long sticks.

Besides trapping, fishing and wood harvesting, Stony River people also spend considerable time hunting small game, especially grouse and rabbits, during the late fall and early winter. Legal moose hunting seasons occur in a portion of their land use area in November and December. While members from at least some households hunt during this time, poor travel conditions often restrict their efforts. For the same reason, most caribou hunting occurs after the river freezes.

Stony River residents wait in anticipation for the solid ice of the main river to reach them and stay informed of its daily movements. When it reaches near Inowak Creek, they haul additional wood and pull traps from the other islands and mainland in preparation for the high water and flooding of sloughs that the ice brings as it reaches the vicinity of the village. Depending on how cold temperatures are, several days to a week may pass before the ice is finally safe for travel. In 1983, the main Kuskokwim River was sufficiently frozen by early December for travel to the mainland on the left side of the village.

After the Kuskokwim River freezes solid enough for travel to the left bank, land use activities become more diversified and widespread. People normally travel by snowmachine and dog team to more distant trapping grounds especially along the Kuskokwim, Swift, Gagaryah, Cheenetnuk, Nunsatuk, and Stony rivers (Fig. 1). Trappers may stay out for several weeks to a month perhaps returning occasionally to the village to obtain supplies or sell furs. Women spend considerable time, especially during the winter, tanning and sewing furs.

Another winter activity is caribou hunting, which takes place primarily in the open country between the Swift, Gagaryah, and Cheenetnuk rivers and between the lower Stony and Holitna rivers during the regulatory seasons. In late November and December, people place fish traps under the ice in the Kuskokwim with which they primarily catch burbot. For households with wood-burning stoves, wood harvesting continues to be a time-consuming activity throughout the winter months.

By late December and early January, activities focus on the Christmas and New Year holidays, with people conducting most activities from the village base. The majority of Stony residents are of the

Russian Orthodox faith and celebrate Christmas on the dates of both the Russian Orthodox and Roman calendars, although the Russian holidays are of greater importance to them. Gift-giving, visiting, and feasting are central activities of these holidays. Both the village as a whole and individual households host large dinners with food saved especially for this time.

After the holidays, people again disperse to pursue hunting and trapping activities. Trappers may return to the same area they trapped before Christmas or they may use an alternate area. As was true before Christmas, marten and beaver continue to be the primary furbearers harvested. Stony River people also trap fox, mink, land otter, ermine, wolverine, and lynx, normally in significantly fewer numbers than beaver and marten. Besides caribou hunting during the open season, most households participate in the February moose season, as was true in 1984. People continue to harvest burbot, whitefish, and other non-salmonid fish species with traps under the ice.

Late winter and early spring (March and April) are characterized by increasing light and warmth and are welcomed by Stony River residents. In late March and April, crusting on snow occurs during which temperatures reach above freezing for part of the day and dip below freezing at night. The occurrence of above and below freezing temperatures within this short time period produces a hard crust on the snow which is excellent for fast, easy transportation by dog sled, snowmachine, and on foot.

Black bear hunting is an important activity both at this time and after break-up when transportation is by boat. Black bears provide a substantial amount of meat during a period when other large game animals

are not as available due primarily to game regulations. Muskrat and waterfowl harvesting is another spring activity pursued by Stony River people both before and after break-up. It is sometimes combined with fishing for whitefish, pike, and other non-salmonid species by placing set nets under the ice and hooking through the ice before the ice goes out. Nets are placed at the mouths of streams. People continue to harvest wood up until the latter stage of break-up, obtaining an especially large supply before that time.

WAGE EMPLOYMENT AND CASH INCOME

Throughout most of rural Alaska including Stony River, economic, technological, and social changes require that households have a source of cash income to supplement their land use activities. Cash is produced through wage work, the sale of handicrafts, the sale of fur gained through trapping, and government assistance programs. Following is a discussion of how this cash income is generated.

The limited job opportunities available to Stony River residents in the village are often seasonal and/or part time. One of the earliest means of employment in Stony River was a sawmill owned by a present-day resident of the community. It operated between 1959 and 1974 during the summer months and produced approximately 80,000 to 100,000 board feet annually. The Bureau of Land Management (BLM) has been a long-term employer of Stony River residents as firefighters during the summer. This work is not available every year, however, as was the case in 1983. For many years canneries in Naknek, Bethel, and St. Mary's have provided jobs for Stony River people.

Especially in recent years, some cash income in the village has been generated through public employment programs such as the federally funded Comprehensive Employment Training Act (CETA) and Johnson O'Malley (JOM) programs, and through programs provided by the Kuskokwim Native Association (KNA) and the Association of Village Council Presidents (AVCP). The community hall and Russian Orthodox Church were built through jobs provided by CETA funding. The school, which originated in the 1960s and is presently managed by the Kuspuk School District, has also employed some local residents. During the 1983-84 school year, the school provided a part-time teacher's aide position which was filled by local residents. The JOM program sponsored a part-time preschool job which a local resident held.

Positions available on a year-round basis that were filled by local residents in 1983 and 1984 included a part-time health aide and a part-time custodian for the clinic, both funded through the Yukon Kuskokwim Health Corporation, a full-time post office employee, a full-time light plant operator, and a social services fee agent. A year-round position, airfield maintenance, which has been filled by a Stony River resident since the early 1960s, was provided by the Alaska Department of Transportation. A small general store was operated by one family in the village.

Seasonal jobs in the village filled by residents during the 1983 summer and fall seasons included the construction of a BIA house, installation of wells and/or pumps in the majority of homes through a state grant, and the preparation of garden sites, a KNA-sponsored project for school children. One man worked as a licensed game guide.

Some Stony River people find it necessary or desirable to seek seasonal employment outside of the village particularly in the summer months. For example, during 1983 several Stony River men worked for a barge line based in Bethel. One man, now a pilot, has followed this line of work for about 18 years. At least one resident did cannery work during the summer of 1983. No commercial canneries exist on the Kuskokwim River closer to Stony River than Bethel. Another resident worked for a fish buyer at St. Mary's on the Yukon River.

At least one member of most Stony River households worked for wages part-time, full-time, or seasonally during the period of this study and the preceding summer. In not less than four households, two members were employed at the same time for at least a portion of the period.

Trapping continues to be an important source of a Stony River family's income as it was in the past. Raw and tanned furs and articles made from fur are sold. Earnings are also derived from the home manufacture of items made of other local materials, especially wood. Residents carve bowls and spoons and construct sleds and boats out of spruce, birch, and other types of wood. They also manufacture traditional-style knives possessing handles of moose and caribou horn. Several local persons are especially well known in the central Kuskokwim area and elsewhere for this type of work. At least one woman of the village is highly skilled in crafting baskets and other items from birchbark. Fur and handmade items are not only sold but also traded and kept for home use.

Residents estimate that trapping and the sale of handicrafts during years of average productivity may provide a household with between $1,000 and $2,000 or bartered items of this value. Earnings were

reported to be lower than normal for the 1983-84 trapping season, discussed below.

Government assistance programs including Old Age Assistance, Aid to Families with Dependent Children, and unemployment provided some Stony River households with additional cash income during the summer of 1983 and the 1983-84 winter season. Besides cash, assistance in the form of food stamps, fuel, and medical aid have also been received by Stony River families in recent years.

The average income of Stony River households is estimated to range between $5,000 and $12,000 a year based on our interview data. Households with higher than average cash earnings normally extend their monetary income beyond the immediate family to relatives having lesser cash earnings. This is done by providing commercial goods and transportation and lending expensive equipment necessary in the harvesting of local resources. Therefore, the system of sharing, which is prevalent in the noncommercial component of the economy, reaches at least indirectly into the cash sector of the economy.

THE COST OF LIVING

The limited accessibility of Stony River by surface transportation and its distance from major service and transportation centers create high living costs for community residents. The greatest expense for most Stony River families is transportation, including the cost of commercial air service, and maintenance and fuel for private transportation. Fuel for home heating, technology for local production, and groceries and other household supplies are also primary costs for Stony

River households (Table 3). Following is a discussion of some of these costs. Non-local travel costs were discussed earlier.

Stony River villagers obtain commercial supplies by air as mail and air freight and through charters from McGrath, Sleetmute, Aniak, Bethel, and Anchorage. They also use scheduled flights to Aniak, Anchorage, and Bethel for this purpose. Except for items ordered through parcel post, goods received through air transport are generally more expensive than those obtained by barge or private boat during the open-water season or by snowmachine during the winter. For example, a package weighing 70 pounds transported parcel post from Aniak to Stony River in March 1983 cost $5.16. Delivered first class it cost $34.91. The post office does not accept packages weighing over 70 pounds. The price for air freight from Aniak to Stony River via Harold's Air Service was $27 for one hundred pounds or less. Over that amount the rate per hundred pounds was $23.

During the 1983-84 winter season, a small general store in Stony River, privately owned and operated by a local family, also provided residents with commercial goods that are in high demand. It sold groceries, clothing, fuel, chain saws, and other miscellaneous items. The selection is limited and goods are frequently in low supply. The owners mail order many of their supplies from Anchorage in order to reduce costs, and they obtain bulk fuel by barge from Bethel during the summer months. By using these less expensive means of transportion to obtain their goods, the store owners note that they reduce their own costs and are able to offer lower prices to their customers than if they had the supplies air freighted or chartered. The owners say their store is also an attempt to save Stony River village residents expensive

TABLE 3. PRICE LISTINGS FOR SELECTED GOODS AT THE ALASKA COMMERCIAL COMPANY, ANIAK, ALASKA--MARCH 1984

Grocery Items	Cost
3 lbs elbow macaroni	$ 3.39
25 lbs Calrose rice	16.45
6 lbs Crisco vegetable shortening	9.95
48 fl oz Crisco oil	6.65
50 lbs Gold Medal flour	51.00
25 lbs C&H granulated sugar	19.95
13 fl oz Carnation milk	1.05
3 lbs Hills Bros. coffee (regular)	13.95
100 Lipton tea bags	4.89
3.4 lbs Milkman powder	10.89
1 lb canned Darigold butter	4.65
1 lb 20 oz Tang	3.35

Chainsaws	Cost
Homelite XL12	$ 419.00
Homelite 330	429.95
Homelite 240	339.95

Other	Cost
No. 1 traps/dozen	$ 63.00
or each	5.25
1 roll nongalvanized chicken wire 4' x 50'	49.95
Coleman lantern, Model 200	61.95
Coleman stove, Model 426 (3-burner)	108.00
Coleman stove, Model 425 (2-burner)	79.00
Large 35 MIK Truetemper Woodslasher Axe	27.49

Snowmachines	Cost
Arctic Cat - Pantari	$3,495.00
John Deere Snowfire	2,795.00

Boats	Cost
Flat-bottom, 18' aluminum Craft	$2,395.00
Semi-bottom, 16' aluminum Lund	2,675.00

Outboard Motors	Cost
Yamaha 25 horsepower	$1,970.00
Evinrude 25 horsepower	1,930.00
Evinrude 35 horsepower	2,175.00

Guns	Cost
.22 automatic rifle	$ 149.95
12-gauge shotgun	419.95
.30-.06 rifle	475.95

charters to other communities to obtain supplies. Table 3 presents prices of selected grocery items in Aniak in March 1984.

Most bulk fuel reaches Stony River by barge during the summer months. Individual households, the store, and a community organization buy fuel in bulk to save on the high cost of air freight to the village. During 1983, one barge company reportedly charged $1.86 per gallon, including freight, for gas sold in bulk at Stony River village. The bulk rate for home heating oil including freight was $1.52 per gallon.

Buyers of bulk fuel often sell it in the village in smaller quantities to residents and visitors. During the 1983 fall season, five gallons of gasoline sold for $11.00 in Stony River, while one drum of gasoline cost about $115 and "Blazo" (white gasoline) sold for $5 per gallon. During the winter of 1983-84, the local store sold five gallons of gasoline for $11.50, one quart of motor oil for $2.25, five gallons of mixed gasoline for $13.50, and one gallon of "blazo" for $5.00.

One Stony River household reported buying 9 drums of gasoline from a barge during the summer of 1983 which cost more than $1,000. The household is composed of six members who drive several snowmachines as their primary means of local winter transportation. Eight drums were reportedly used between fall and mid-winter for resource harvest activities. In the spring, the family planned to order five drums of gasoline by barge for boat transportation in the summer.

Another family, which owns one snowmachine but uses dogs as its main method of transportation, estimated it used about one drum of gas each winter. Four family members operate the snowmachine and run the dogs. A third household which depends on one snowmachine as its primary means of transportation estimated it used five drums of gas for local

travel during the 1983-84 winter season. The machine is used by four members of the family.

Families occasionally air charter fuel, especially in the late winter and spring when local supplies are exhausted. The cost of chartering two drums of gas from Aniak to Stony River village in March 1984 via Harold's Air Service was $290 for the charter and $283.80 for the fuel, a total of $573.80.

Several Stony River village families heat their homes exclusively with oil which they order by barge. Members of one household estimated that they use between 15 and 20 drums a year to heat their 1,000 square-foot house at a cost of about $100 a drum during 1983. During the month of November 1983, they used approximately two drums of oil.

About one-half the Stony River households during the 1983-84 winter season used Coleman stoves fueled by "Blazo," in combination with wood, for cooking in their homes. People also commonly use Coleman stoves while traveling and camping. The head of one household, which used a combination of wood and blazo for cooking, estimated that he used four or five one-gallon cans during a winter. The local store sold it for $5 a gallon during the winter of 1983-84.

The village has had a central electric power system since 1982 serviced through the Middle Kuskokwim Electric Cooperative. All households but one received the service during the 1983-84 winter season and used it primarily for home lighting. Most families surveyed said their monthly electric bill was about $20.00.

One resident who heats two homes, a 1,000 square-foot frame house and a 16 x 20 foot log cabin, estimates that he pays between $200 and $300 a month during the winter for all utilities. The larger house is

heated by oil at a cost of between $100 and $200 a month, while the small house is heated solely by wood at very little cost. The main cooking source for the combined households are Coleman stoves fueled by white gas, reportedly at a cost of about $50 for January 1984. The electric bill for both homes in the winter months is about $50. Besides the lights, several televisions, a number of electric appliances, and a freezer are run by electricity.

Snowmachines are a vital part of the Stony River economy, as they and foot travel are the primary modes of winter transportation within the community's land use area. Snowmachines are also used for occasional travel to other central Kuskokwim communities. Only one household did not possess a working snowmachine during the 1983-84 winter season, while approximately a third, mostly larger families, owned two or more. People obtain them by barge, air freight, air charter, and by driving them up the Kuskokwim River from other central Kuskokwim communities. Occasionally, second-hand machines are sold or traded within the village. Snowmachines are a major expense for Stony River residents, who say they have a life normally of two to four years depending on how well they are maintained and how much they are driven. One household, which air chartered a small snowmachine from McGrath in the fall of 1983, said they paid $300 for transportation and over $1,000 for the new vehicle. The head of another household said he air freighted a small snowmachine from Aniak during the fall of 1983. He paid $70 for transportation costs and $1,800 for the machine. A third person said he purchased a secondhand Polaris 340 by barge from Bethel at the cost of $1,200. Within the village, one Stony River man bought a used snowmachine from another resident, unrelated as kin, for $850.

Table 3 presents the prices of selected snowmachines in Aniak in March 1984.

Small privately-owned boats and travel by foot are the main means of summer transportation for Stony River residents within their land use area. The two methods are often combined especially for hunting and gathering purposes. Boats are also used frequently for travel to other central Kuskokwim comunities. Wooden boats are occasionally made in the village at less cost than commercially purchased boats. Commercially-made aluminum and fiberglass boats are normally purchased new or secondhand from other communities. Used boats are also sometimes sold or traded for within the village. They most frequently reach the village by being driven there. If well cared for, both wooden and commercially-made boats are estimated to commonly have a life of about ten years.

One household bought a used aluminum boat from a store in Sleetmute six years ago for $700. This boat was still in use during the 1983 open water season. The family drove the boat up to Stony River village. Another man recently bought a secondhand aluminum boat within the village for $1,000.

Outboard motors are normally purchased separately from a boat and are another major expense for Stony River households. A new motor is said to have a life of three to five years if maintained properly. Often the lower unit and other parts of the motor need replacement within the life of an engine. Due to the shallow depth of most streams in the area, the propeller of a boat commonly must be replaced one or more times during a season at a cost of $60 to $70 each time. Because

of the heavy silt content of the Kuskokwim River, a boat owner normally must purchase a new water pump each season at a price of $30 to $50.

One Stony River resident bought a new 25 horsepower Marina from McGrath three years ago for $1,800. The motor, which was not operative during the 1983 fall season, reportedly had its lower unit replaced within its life at a cost of $600. Another Stony River person purchased a new 35 horsepower outboard motor from a store in Aniak for about $2,000 in the spring of 1983. Prices of selected boats and motors are presented in Table 3.

Besides the cost of purchasing, maintaining, and operating boats and snowmachines, Stony River residents must also buy other relatively expensive technology currently needed for obtaining local resources. These items include traps and snares, chainsaws and axes, fish nets, and wire used in the construction of fishwheels and fish traps. At a minimum, most Stony River households own one large and one small rifle and a shotgun. Following is a discussion of the cost of some of these items. Selected firearm prices are presented in Table 3.

Most households which depend on wood as their primary source of heat possess more than one chainsaw. People find this practical because several members of a household may need to cut wood at the same time. Furthermore, when chainsaws are used frequently and for long hours as they are by Stony River residents, they are often in need of repair. Parts may have to be ordered from outside of the village, often taking a week or more to arrive. Having a second chainsaw allows a household to continue its wood harvesting if one machine breaks down. People normally obtain chainsaws from McGrath or Aniak and occasionally

Anchorage. The local store began carrying chainsaws during the 1983-84 winter season at the request of residents.

One man obtained a large chainsaw for $300 from McGrath by air charter in the fall of 1983. Another man obtained a Homelite 240 when he was in Anchorage on business for $200 during the same season. A third household bought a X1 Homelite 12 in Red Devil for the price of $395. As the man provided his own ground transportation, travel costs were minimal.

Most Stony River trappers normally buy some new snares and traps at least every several years. Residents say that if traps are removed after a person is finished trapping, they will have a significantly longer life than if they are left in the ground. Although trappers prefer to pull them to save on expenses, they are not always able to do so because of poor weather and traveling conditions. There is also some loss of both traps and snares to animals who break or drag them.

Groceries and other household supplies form a third major expense category for Stony River households, especially those with large families. While residents estimate that at least 80 to 90 percent of their protein and high energy foods are obtained year-round through hunting, trapping and fishing, the natural environment provides few edible resources with readily available high sugar and starch content. Although half or more of the households have gardens during the summer and the majority of families harvest some wild plants for food each season, most of the high sugar and starch foods which people eat are not harvested locally. These are purchased at the local store and from commercial grocers in other central Kuskokwim communities, McGrath, and Anchorage. Groceries are obtained primarily by mail, air charter, and

private ground transportation. Most households use a combination of these means. Coffee, tea, sugar, salt, rice, macaroni, canned or powdered milk, lard, cooking oil, and butter or margarine are staples in the majority of households. Eggs, powdered and canned drinks, and a variety of canned foods are also commonly used. Prices of selected grocery items are presented in Table 3.

The amount of commercial and locally-harvested foods consumed varies among households and is influenced by a family's income, the composition of a household's members, and to a lesser extent the harvesting skills members possess. Households with low incomes tend to eat less commercial foods than those with higher incomes, in part because they lack the purchasing power to obtain them. On the other hand, households with high incomes do not necessarily eat less locally harvested foods than other families. A high percentage of the income of most households is spent on technological items used in harvesting local resources and for fuel to operate them. Families with higher incomes are able to spend more money on technological items and fuel and are generally better equipped to obtain local food. Thus, they can generally afford to share their harvest more widely and in larger amounts than families with low incomes.

PATTERNS OF EXCHANGE

A traditional system of exchange which distributes local resources and, to a lesser extent, commercial goods primarily but not exclusively along kinship lines is an integral part of the economy of Stony River village today. Methods of distributing goods include sharing, trading,

and borrowing and lending. Such exchanges serve to strengthen friendships, recycle goods, and save people cash, which is normally in low supply. Both primary and secondary systems of distribution facilitate the exchange of resources. Goods also reach beyond the village to other communities through this system. Reports by Charnley (1983 and 1984) and Stickney (1981) provide further discussion concerning traditional exchange patterns in the central Kuskokwim area.

Large game animals and fish, the basis of the non-commercial sector of the Stony River economy, are exchanged most frequently within the community. Small edible game is also shared, especially when procured in significant numbers. Meals are commonly shared by households, especially during holidays when fresh meat is harvested or special dishes such as "native ice cream" called akutaq in Yup'ik are prepared. Commercial goods are sometimes given or traded, although not as frequently as are local resources. The higher the monetary value of a commercial item, the more likely it is to be exchanged for cash.

Game Animals

Although the majority of Stony River households hunt moose and, to a lesser extent, caribou and black bear during the established seasons, some are unsuccessful or do not have the equipment to hunt. Meat is commonly given or occasionally loaned by successful hunters to households unable to obtain meat themselves. It is also proper etiquette for a person in need to ask kin or friends for food. Another practice is for a successful, well-equipped hunter to assist a needy individual in obtaining meat by helping him hunt. A third alternative is to lend a

person the necessary equipment so that he can hunt on his own. It is customary for successful hunters especially to share with elders and to give them favored parts of an animal, a common occurrence in Stony River. It is also a traditional practice among both Athabaskan and Yup'ik peoples for a young person to give away his first kill. During the early winter 1983 caribou season, a young adolescent male shot his first caribou and presented it to his grandfather. The same customs are observed for other land use activities, such as fishing, which is discussed below in this section.

Moose is both the primary meat staple of Stony River residents and the animal resource most commonly shared among them. A single moose is distributed widely throughout the village, especially during holidays and funerals and on occasions when the meat supply of the entire village is low. During the period of this study, regulatory seasons occurred in September, November, December, and February within the land use areas of Stony River residents. Most households bagged a moose in the early fall and mid-winter seasons, but not in November, due primarily to poor traveling conditions. Based on recall data, this pattern appears to be similar to other recent years.

It is common for a household that has harvested a moose to give small portions of the animal, such as a leg, to needy households. It is customary for households without meat to be provided for in this fashion by a number of other households so that they obtain an ample supply of meat. Occasionally a hunter who has a more than adequate supply of meat will give an unsuccessful household a half or whole animal. These methods of sharing are also practiced for caribou and black bear, which are normally harvested in significant numbers by Stony River villagers.

The following examples illustrate the sharing of large game animals by Stony River people:

Example 1: An elder who is the head of a household of six obtained one moose late in the 1983 fall season with the assistance of a brother. Another brother who procured one early in the season gave the elder a portion of his moose before the elder obtained one. Poor traveling conditions prevented the elder from harvesting a moose in November and illness kept him from hunting during the 1984 February season. Two successful hunters during the February season, a brother and a man unrelated as kin, each shared meat with the unsuccessful household. Another unrelated household also gave the family a leg of caribou.

Example 2: During the 1983 November moose season, a man whose household had not obtained a moose during the fall season went with another Stony River resident not related as kin by boat to hunt moose. After a moose was sighted, the two men left the boat and hunted the animal on foot. They harvested it about one quarter of a mile from the beach and packed it out the same evening. The man who had not harvested a moose during the fall season was given the entire animal, which he shared with two closely-related households. His partner had harvested a moose during the fall season and did not have a great need for the meat.

Example 3: One household which was unsuccessful during all four legal seasons in obtaining moose was provided meat by a variety of households throughout the 1983-84 winter season. Donors included the household of a brother-in-law, cousins of at least two separate households, and a family not related as kin. The household was also given moose meat during the fall by a Lime Village resident. It also received pieces of caribou meat from various households on different occasions during the 1983-84 winter season.

Example 4: During the early winter of 1982, a party of five adult relatives traveled up the Kuskokwim River in order to spear whitefish and hunt moose. The river was still open and two of the party, an elder and his son, went by boat in which they hauled a snowmachine. The three remaining persons, one son, a daughter of the elder, and her spouse traveled on the shore ice and beach by snowmachine. At the mouth of the Swift River they speared approximately 200 fish which they put in a common pile and later divided among themselves and members of the community.

The same day they left the fish at the spearing location and traveled by boat and snowmachine upriver to the Tatlawiksuk River where they camped overnight. In the morning the party shot two moose which were feeding in the brush close

to the river. The moose were divided so that each of the four households represented received half a moose.

Example 5: Several years ago during the winter caribou season, four Stony River men each driving a snowmachine went up the Stony River together to the vicinity of Tishimina Lake. After spending the night in a cabin in the area, they hunted until each had obtained caribou. They returned to the cabin taking all parts of the animals including the head and intestines. The hunters stayed a second night in the cabin and returned back to the village the next day with their harvest. It is reported that the animals were divided among the majority of households of the community.

Small game are also shared particularly when they are procured in large numbers. For example, a young adolescent male harvested approximately 40 grouse during the fall and early winter of 1984. Besides his own household, he shared them with his grandfather and other related members.

Fish

As is true of the large game animals, Stony River residents share fish, an equally important component of their resource economy. During the summer people normally work as single or extended family units in harvesting and processing large quantities of fish. People unable to obtain fish are given it, especially in the summer when there are large numbers of relatively easily procured fish. If a person lacks his own fish camp or equipment, he or she may be invited by a party to share in the work of their fish camp so that he or she may obtain fish. For example, a single male without his own camp worked at his father's camp during the summer of 1983 and "earned" fish for his household. His total share of the fish was not taken at the end of the summer but

stored in his father's cache from which he obtained it when needed. The son had his own net but shared the use of his father's fishwheel.

People with camps but without equipment or a net or wheel site may be loaned them by a relative or friend or allowed a share from someone else's fishwheel or net. For example, one family who normally fishes at a summer camp outside the village, but has a net site near the village, loaned another family the use of the net site for several years. Another household without a wheel or convenient net site during the 1983 summer season was told to take what fish they wanted from another household's wheel.

Because of the labor expended, processed fish is more valuable and not as readily shared as fresh fish. Smoke and air drying and freezing is the most common method of preserving summer fish; fish processed by these methods are more commonly bartered for than fresh fish. For example, one woman traded some of her smoked fish to another woman from Stony River for groceries. She is well-known in the area for processing high quality smoked salmon. Because of this people from other communities trade for or occasionally purchase fish from her. She also gives a significant amount of fish away to relatives and friends.

Hooking and spearing, fishing methods used primarily in the late fall and early winter, do not consistently yield the large numbers of fish that nets and fishwheels do in a season. Also, these methods do not necessarily demand close cooperation between individuals, expensive equipment, or private fishing sites. An individual may choose to fish alone, with a partner, or in a group. The fish he catches is generally used within his own household, but any surplus he catches may be shared outside his immediate family.

Example 1: During the early winter of 1982, two brothers speared approximately 100 whitefish in a day and an evening when the run was at its peak. Each community household reportedly received at least several of the fish.

Example 2: During mid-November 1983, an aunt and uncle took their niece and a friend who wanted to learn to spear whitefish by snowmachine to the shorefast ice near the village. The run was slack and only the more experienced aunt and uncle caught several. They gave one of the fish to their niece, who made "native ice cream" which she shared with her immediate family and other guests who came to the house that day including an aunt and cousin.

Burbot, locally referred to as lush, is an important winter food for both humans and dogs. Fish traps and fences, which harvest primarily burbot during the winter months, are constructed and situated each year with considerable effort. Significant work and time are involved in harvesting the fish, since the basket which holds the fish has to be chopped out of the ice to retrieve the fish. Several households usually participate in constructing and maintaining a trap and are therefore entitled to a share of the fish. Households that have access to a trap often give, trade, or occasionally sell fish to households that do not have access to a trap. Small amounts are usually given away, while large numbers may be traded or sold. For example, in 1983 a couple who maintains a fish trap each winter was assisted by the woman's brother in constructing and placing a fence and trap. The man in turn helped his brother-in-law build and set his own fence. An unrelated man supplied the wire for the first party's fence and trap and also assisted in building it. He was compensated with a share of the harvested fish.

Stony River residents occasionally place set nets under the ice in the late fall and early winter and in the spring before break-up. As is

true of burbot traps, people who assist in placing and checking the nets are entitled to a share of the fish. The oldest man in the village had the only net set under the ice during the 1983 fall-winter season. He was reportedly assisted with it by relatives and friends. The fish obtained was shared widely throughout the village both along kinship and friendship lines.

Services

People also exchange both local resources and commercial goods for services as the following examples illustrate:

> Example 1: Several years ago, a woman had 40 beaver skins needing cleaning when she came home from an extended trip. In exchange for the help provided by two of her sisters in skinning them, she gave them each a quantity of the meat.
>
> Example 2: During the 1983-84 winter season, one man particularly adept at repairing snowmachines frequently traded his services for resources. At times he was compensated with fish and other natural resources.
>
> Example 3: The female head of a household was given a piece of moose meat in exchange for taking care of the children of a cousin who belonged to another household.

Commercial Goods and Commercial Enterprises

Within the local economy of Stony River, commercial goods of significant monetary value are not as likely to be given away or traded for as are natural resources. The greater the cash value of an item, the more likely it is that it will be sold. However, sharing and trading of commercial goods does exist in the community. For example, a

niece traded her uncle 40 gallons of gasoline for a used boat. Another Stony River resident traded a sled for 17 gallons of gasoline and a marten for 10 gallons of gasoline.

Stony River residents extend their traditional practice of barter to commerical enterprises, fur being one of the most frequently traded goods both today and in the past. Former store owners of the community had a history of exchanging furs for groceries, as was true of other central Kuskokwim commercial enterprises. One long-term trader of the area today is said to give a person a better deal for his furs if he trades them for supplies at his store instead of selling them for cash.

Borrowing and Lending

The borrowing and lending of items between individuals and households is an integral part of the social and economic life of Stony River. It is a necessity because there is a limited supply of material goods in the village, which is distantly located from major commercial centers. Items most frequently borrowed are those which are essential to the daily functioning of a household.

> Example 1: A couple which owns three sleds allows them to be frequently borrowed. They loaned a close relative of a separate household the use of one of the sleds for the entire winter of 1983-84.
>
> Example 2: During the mid-winter of 1983, a man and his wife lent a friend, who had no functioning transportation of his own, a snowmachine so that he could obtain smoked fish from a family that lived outside of the village. In return for his use of the snowmachine, the borrower gave the family some of the smoked fish.

Exchange Between Communities

Sharing and exchange of local resources and other goods occurs between Stony River people and residents of other communities outside of the commercial economy. These exchanges appear to take place most frequently but not exclusively among relatives. Following are some examples of exchanges of resources between the residents of Stony River and other communities:

Example 1: In the late winter of 1983, relatives in Sleetmute gave a Stony River family some burbot before they had their fish trap operating.

Example 2: A family of the local area gave a Red Devil resident smoked salmon and meat in exchange for his repairing their light plant.

Example 3: During the 1983 fall moose season, a Lime Village man reportedly gave two Stony River families, both related to him as kin, portions of a moose his young son had caught. It was the first moose the pre-adolescent boy had harvested.

Example 4: Several years ago during the fall caribou season, a Stony River man gave a caribou to a man who was visiting from Bethel. The visitor was the brother of his son-in-law.

Example 5: A Lime Village family who occasionally visits Stony River brings fish and meat to a relative with whom they overnight.

Example 6: In 1984 a family included in this study gave a couple who visited them from Aniak several pieces of tanned moose skin. At another time, they gave them smoked salmon and meat.

Example 7: During the winter of 1983, a funeral potlatch occurred in Stony River to which Lime Villagers, related to the deceased, contributed a moose. The meat was distributed among households of the village and cooked and served for the occasion.

Example 8: One Stony River woman gave her son-in-law who lives in Bethel a marten hat she made in exchange for a secondhand 25 horsepower outboard motor he gave her during the summer of 1983.

CHAPTER 4

TRAVEL IN THE STONY RIVER LAND USE AREA

INTRODUCTION

Traditionally and historically, central and upper Kuskokwim people traveled on foot and with dogs during the closed-water season using waterways and trails, and on foot and by birchbark canoe and moose skin boat during the open-water season (see Charnley [1984] for further discussion of this subject). Middle-aged and elderly Stony River people especially have used most of these modes of travel during their lifetimes. For example, some middle-aged residents recalled how as children and young adults they traveled in the early spring overland from the Kuskokwim River to the Swift River by dog team, returning home after break-up by way of the Kuskokwim River in a large moose skin boat. Seal skin boats from the coast have also been used by Stony River people within their local area.

As was true in the past, Stony River villagers today still have a strong riverine orientation and are heavily dependent on the Kuskokwim River and other large streams for many of their activities. These waterways, of which the Kuskokwim River is the largest and most important, serve both as major transportation corridors and as providers of essential resources. Today local travel occurs primarily by snowmachine, dogs, and on foot during the closed-water season and by boat and on foot during the open-water season. A minority of Stony

River households owns trucks and all-terrain vehicles, which are mainly used within the village for transporting goods.

LOCAL TRAVEL

In the late 1960s and early 1970s snowmachines became commonly used by Stony River people. Today people depend heavily on snowmachines for local winter travel, with most households owning one operating machine during the 1983-84 season and some possessing two or more. During the same period, several households used dogs regularly for travel, although they also owned snowmachines.

In spite of the increased use of snowmachines by Stony River people, dogs are still an important part of the local economy. Even households that do not use dogs for travel have at least one dog, because they value them for protection at home and while out traveling. Also, dogs potentially provide an alternate means of transportation.

During the fall of 1983 the community had an estimated dog population of approximately 80 adult dogs, or an average of 4 adult dogs per household. Families that use dogs for transportation prefer to keep at least seven dogs, since five to seven dogs are commonly used for pulling at one time. In recent years, Stony River dogs have been used in local races and in the prestigious Iditarod Race from Anchorage to Nome. In 1973, Stony River dogs won first place in the Iditarod. Dogs have been used traditionally by Stony River residents for hunting both large and small game animals.

Within their land use area, Stony River people regularly use snowmachines for hauling wood, checking traplines, and for

transportation to hunting grounds and fishing locations. A person traveling by snowmachine for a distance normally prefers to travel with at least one other person and snowmachine in case of breakdown. Both men and women know how to operate them and children usually learn to use them by pre- or early adolescence. Dogs also frequently accompany snowmachines both for exercise and to provide transportation if the snowmachine becomes inoperable. One elderly man traveling alone by snowmachine tells how he hitched up his dogs to the sled when his machine broke down and was able to return safely home. It is customary to look for travelers who do not return home when expected.

At least several Stony River households use dogs regularly for hauling wood, since dogs are said to travel better than snowmachines on rough trails made for wood cutting. One man uses dogs for most of his winter transportation, including trapping and hunting activities. His pattern is to break trail with his snowmachine and afterwards use dogs for most of his travel. He commonly travels alone to hunt, trap, and haul wood. His children, both male and female, learned by pre-adolescence to drive dogs.

Most Stony River dogs are fed primarily on fish supplemented with meat scraps. Salmon, whitefish, and burbot supply the greatest quantity of dog food. People cook for their dogs in drums over outdoor fires, although fish is also fed to them frozen or dried without cooking. Families provide bedding for their dogs, usually in the form of dried grass or spruce boughs, and often some form of shelter as well.

Stony River people make their own dog and snowmachine sleds, the latter locally being called a "toboggan." Snowmachine sleds, which are commonly made out of plywood, are box-shaped and relatively easy and

inexpensive to make. Dog sleds are crafted out of green birch and, although materials are not extremely costly, are very time-consuming to make. Stony River residents use both types of sleds to haul passengers, equipment, and harvested and commercial resources.

Most winter travel within the Stony River land use area takes place on frozen waterways, on trails between waterways locally called "portages," and in open country, the moist tundra, low-growing spruce forests, and treeless bog environments. Winter trails along waterways and in open country are normally made with snowmachines. Trails are cut in heavily vegetated areas by clearing trees and brush with chainsaws, axes, and other cutting tools. For example, a new trail was made by residents during the late fall of 1983 for improved access to an important fish spearing locality.

A good snow pack, which may not form until mid-winter, improves traveling conditions significantly, as both snowmachine and dog sled travel are affected adversely by the lack of it. Residents note that most snowfall occurs after Christmas from January to March. On the other hand, deep powdery snow covers trails, creating poor traveling conditions that are extremely difficult to drive in. When this occurs, people often make a trail on snowshoes ahead of their dogs or machine.

Rain and temperatures above 30°F are reportedly possible any month. These conditions, especially when combined with a heavy snow load, produce a soft packed trail and slow, potentially hazardous travel. Portions of streams may open up and soft spots and overflow occur. People use ice picks and poles to test for holes and potentially dangerous ice spots, and to look for signs such as discoloring of ice that warn of hazardous conditions. A light snowfall may cover dangerous

ice and cause a traveler to be less wary than he should be. Kuskokwim ice tends to freeze rough and sharp in places during some years, as was the case in 1983.

Clear, calm weather with temperatures between +10°F and -10°F and a well-packed trail are considered by Stony River residents to be the most ideal for winter travel. Freezing rain, blowing snow, and temperatures below and above -30°F are the least desirable. Most people will not start out to travel more than a short distance in the latter conditions unless they have urgent reasons to do so. If stranded while traveling, they may attempt to reach the village or the nearest shelter, which may be a trapping cabin or tent; or they may decide to set up camp, preferably at a site which affords protection from wind and precipitation. Dense stands of large spruce trees help to provide these needs. Temporary shelters are also made of small spruce trees placed in a circular position with an opening near which a fire is built outside.

Observing the texture of snowdrifts, the direction of the wind, and the position of the moon, stars, and planets are some traditional methods still used by people today for finding their way under difficult and uncertain conditions. Trees are also marked to provide guidance. Matches, a gun, knife, lightweight food such as dry fish or dry meat, and a pot in which to boil water are considered essential items for long distance travel.

During the first part of break-up, above freezing temperatures during the day and below freezing ones at night produce a hard crust on the snow which creates optimal travel conditions during the morning hours. During the latter stage of break-up, travel conditions deteriorate significantly due to melting snow and ice. After the

Kuskokwim River opens, usually in early May, a period of approximately one week occurs when running ice makes boat travel unsafe.

As soon as the waterways become sufficiently clear of ice, small boats powered by outboard motors become the primary means by which Stony River people travel significant distances within their land use area. Foot travel is commonly combined with boat travel in the harvesting of resources. While the Kuskokwim River and other larger streams are navigable from May until October or November, many of the smaller streams are accessible only by boat during times of high water. High water occurs normally in the late spring due primarily to melting snow. Extended periods of heavy rain during the summer and fall create high water conditions. During warm summers, glacier runoff also raises water levels significantly.

The Kuskokwim River is relatively deep and wide compared with other streams in the central Kuskokwim area. Travel by small boat, especially during high water, is not restricted to the main channel. This is primarily true for tributaries of the Kuskokwim including the Stony and Swift rivers throughout the open-water season. Navigators and passengers have to be constantly on the watch for drifting logs and other debris, especially during times of high water. Besides oars, people often carry poles in their boat for testing the water depth and to aid in directing the boat when drifting. People drift on the Kuskokwim and its tributaries especially when hunting in order to lessen noise, to watch for game more carefully, and to reduce fuel consumption.

Today, Stony River people primarily use handmade wooden boats and commercially purchased aluminum and fiberglass boats for transportation on waterways within their land use area during the open-water season.

At least one new wooden boat was made by a Stony River resident during the 1983 summer season. Commercially made canoes which have replaced locally built canvas canoes within the last ten years are now used almost exclusively for lake travel. Few households owned canoes during the period of this study.

Boats are powered by 18 to 48 horsepower outboard motors, with 20 to 35 horsepower motors being the most commonly used. Canoes are paddled or run by very small outboard motors. The majority of households in Stony River owned at least one boat during the 1983 open-water season, while less than half owned canoes.

People prefer dry, clear weather for boat travel, although they will go out in most kinds of weather if necessary. High winds, fog, and heavy rains, which are potentially dangerous as well as uncomfortable to navigate in, may cause the postponement of boat travel plans. Running ice, which also significantly curtails boat travel, normally occurs in October and November. Hard running ice is especially difficult to maneuver in and can seriously damage a boat. Since the Kuskokwim River freezes particularly late in the vicinity of Stony River, usually by late November or early December, people there have an especially long period of time to contend with this potentially dangerous condition. The type of ice running fluctuates with local temperatures and with ice conditions in the Kuskokwim and its tributaries.

Occasionally people get stranded on the mainland east of the community because of heavily running ice. Sometimes people are forced to camp on the mainland for a period of time before conditions improve enough to drive across the Kuskokwim River by boat. Such a situation occurred for a party traveling from Lime Village during late October

1983. People also tell of walking across the Kuskokwim River on large floating ice cakes, holding on to their boats in order to reach Stony River village.

For a short period of time in late October and November, depending on snow and ice conditions, Stony River villagers may be able to travel by boat as well as by snowmachine and dogteam. People with larger boats occasionally transport their snowmachines by boat to the east bank of the river. By early December the main channel of the Kuskokwim is usually adequately frozen for winter modes of travel.

CHAPTER 5

PATTERNS OF LAND USE

INTRODUCTION

The Stony River economy functions around the integration of a number of primary components: fishing, hunting, trapping, gathering, earning cash income, and trade. The first four components mentioned above are activities by which people harvest resources from their land use area. Of these, hunting and fishing are especially significant in the non-commercial economy. While fishing provides a predictably high protein food most of the year, hunting furnishes a more preferred high protein and high fat food but with less reliability. Trapping supplies residents with marketable furs and quality meat. Wood, which residents spend many hours procuring year-round, provides essential heat to most households. People also spend considerable time picking berries and other wild plants for food during the growing season. Although they are not significantly high in protein, sugar, or starch, local plants provide important nutrients as well as variety to a family's diet. This chapter portrays these four major land use activities in which Stony River residents are highly involved and which are vital to their economy and lifestyle: fishing, hunting, trapping, and gathering. Figures in this chapter present wild resource areas used within the lifetime of present-day Stony River people.

HUNTING

Introduction

Both large game animals (moose, caribou, and black bear) and a variety of small game animals, which includes beaver, porcupine, snowshoe hare, and muskrat, occur within the land use area of Stony River people. Residents harvest all of them for food but prefer moose as a staple over any other animal. Although people regularly hunt black bear and caribou, more households participate consistently in the regulatory seasons for moose than for any other animal. Black bear and caribou are very important as supplementary foods especially when moose and other edible resources are scarce. They also add variety and give stability to an unreliable economy. Stony River residents hunt small game including grouse and waterfowl to supplement and add variety to a diet which consists primarily of fish and large game.

The majority of Stony River households own at least three types of firearms--namely, a small and large rifle and a shotgun. Adult males hunt most frequently, although the majority of women and older male children are also active hunters. People hunt alone, with a partner, or in groups. Individuals of the same sex and age, often kin-related, commonly hunt together as partners. Spouses frequently accompany one another. Especially in the summer when travel is by boat and children are out of school, larger hunting parties are more often composed of people of different ages and both sexes.

People frequently share both large and small game animals with members of other households. The sharing of meat occurs normally but

not exclusively along kinship lines. Residents that are not related as kin also share meat. Elders were traditionally given high quality meat and special parts of an animal that were considered delicacies, a practice to which Stony River people still adhere.

A single person or a hunting party who kills an animal is accountable for the butchering and distribution of the animal. Especially if it is a large game animal or a number of small animals, household members or sometimes other close relatives or friends assist the hunter with these tasks. People who help with the work are given meat if they desire it. Another strategy employed when a large animal is killed is for the hunters to take what they need and then tell other people to take a share. The hunters may leave the remaining meat in the field, informing would-be recipients where the kill site is so that they may retrieve their own meat.

Stony River residents cook their meat most frequently by boiling, although they also fry and bake it. They especially enjoy it roasted over an open fire, which usually occurs when they are out hunting or camping. People still preserve meat by the traditional method of drying. In warm weather this is usually done over a fire in the smokehouse and in the winter occasionally over the stove in their home. They also commonly freeze meat both in their smokehouses during cold weather and in commercial freezers year round. Besides the meat, Stony River residents use most other parts, especially of large animals, for food. They also tan the skins of many animals and make articles of clothing from them. Preventing waste by using most of an animal is a traditional practice that residents attempt to adhere to. They contrast their behavior with hunters from outside their land use area and the

remaining central Kuskokwim area whom, they observe, commonly violate this custom.

Large Game

Moose

Moose is the most important animal resource available to people in terms of the quantity of meat it provides. People prefer its flavor and the nutritional value they feel it provides over caribou and bear, the other large game animals available to them. They also obtain more food from one moose than any other single animal. Although central Kuskokwim people traditionally hunted moose year-round, fall and late winter are their primary season for harvesting moose today. In 1983 and 1984, in Game Management Units (GMUs) 19A and 19D used by Stony River residents, established seasons occurred in September, November, December, and February. During September 1983 and February 1984, the majority of Stony River households harvested moose, the greatest numbers being taken in the fall season. Few moose were reported to have been procured during November 1983. Moose harvest areas are depicted in Figure 3.

Today most moose hunting occurs along the Kuskokwim and Stony Rivers. Hunters occasionally travel as far as the Black River on the Kuskokwim and to above Lime Village on the Stony River, a distance of about 75 miles overland. Hunting also takes place along the Swift River and its tributaries and along the Tatlawiksuk River. The Big River and Holitna River have also been used for moose hunting.

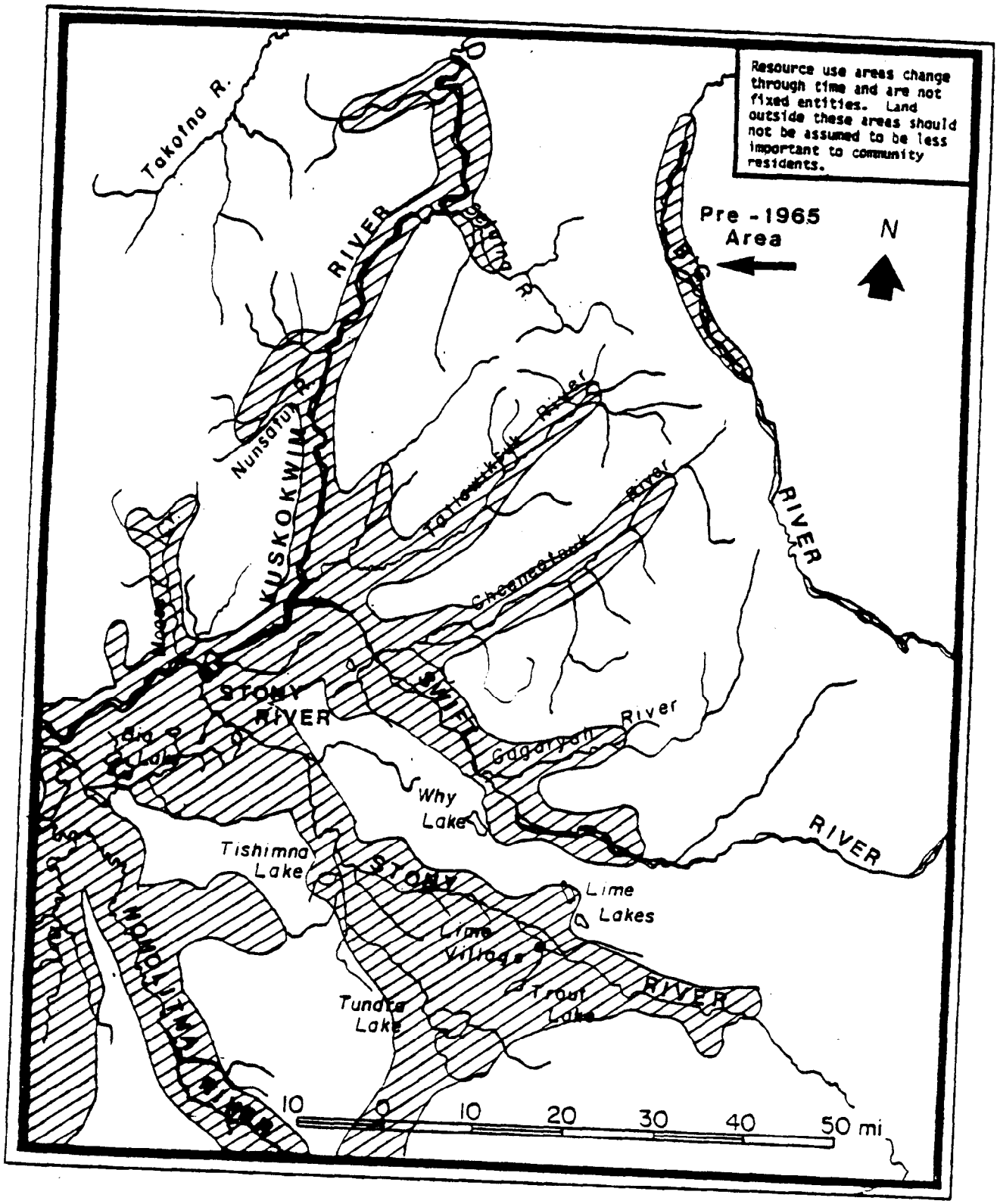


Fig. 3. Areas used for moose hunting during the lifetimes of Stony River residents as reported in 1983-84.

Throughout the hunting seasons, people frequently but not necessarily hunt with relatives. Fall moose hunting parties tend to be more varied in composition and larger than winter hunting parties. In the fall, both women and children are more likely to join men then in the winter when traveling conditions are more difficult. Berry picking, an activity for which women and children are most responsible, is frequently combined in the fall with moose hunting. People also often combine moose hunting with wood hauling and trapping. It is common for spouses, a single male, or several males to hunt together. Women occasionally hunt alone or form all-female hunting parties.

Although moose roam widely and are found in a variety of environments, they tend to occur near bodies of water and in brushy areas where they feed on aquatic vegetation and shrubs during the open-water season. Hunting during the fall takes place primarily by boat along the Kuskokwim, Stony, and Swift rivers (Fig. 3). During September 1983, most animals were reportedly taken within one half-mile of the stream shore. People prefer not to hunt far inland because of the difficulty of packing the meat out on foot. When hunting downstream people frequently drift and pole in order to lessen the noise and watch carefully for moose signs. During the rutting season when male moose are aggressive, hunters attempt to call them to within shooting range.

In the winter moose feed primarily on brush and occur where it is available. Their movement patterns are influenced by snow cover, as moose have difficulty walking in deep snow and try to avoid it. Although dog teams are occasionally used, most winter moose hunting by Stony River residents is by snowmachine combined with foot travel.

Snowshoes are often used. Travel by boat is sometimes possible in November.

Typically, as was the case in 1983, travel conditions during the November moose season were especially difficult due to heavily running ice and poor snow conditions. Since Stony River village is located on an island, people are often confined to it, the nearby islands, and the mainland west of the village, which is accessible by sloughs when the main channel of the Kuskokwim River is not frozen. When boat travel is still possible, hunters with large boats sometimes transport their snowmachines by boat to hunting grounds on the mainland east of the village. Sometimes moose hunting and whitefish spearing are combined, particularly in the vicinity of the Swift River. Normally by late November or early December, the main river channel is frozen sufficiently for travel.

In February, the Kuskokwim River and other streams are well frozen and overland travel is normally improved by a better snow pack. During the 1984 February season, however, travel was hampered by especially deep powder snow. Fortunately for hunters, the moose moved in significant numbers to the stream valleys because of the deep snow and were fairly accessible.

During both the fall and winter seasons, hunting is generally most frequent at dawn and dusk because moose are most active during these times. People stop at localities where moose are known to frequent, sometimes walking inland a distance to look for fresh signs. Hills and ridges may be used as lookout points to survey the surrounding country. If an animal must be stalked, a hunter attempts to stay downwind of the animal because of its keen sense of smell. Moose also have an acute

sense of hearing and some hunters prefer to hunt on windy days when their noise is diminished by the wind.

When a hunting party finds fresh moose signs, one or several members may follow the animal and try to chase it back to other hunters stationed a distance apart. Snowshoes are commonly used in the winter. Two persons hunting together also use this strategy. This is usually possible only in an open or brushy environment or on an island. In dense woods, the animal has to be tracked and stalked. Islands are favored year-round for moose hunting because an animal cannot easily escape once it has been spotted, especially if several people are hunting together.

Depending on the time of day the kill takes place and how far from the village it occurs, the hunting party may butcher and transport the animal back the same day or return for it the following day. A third option is to camp if it is late and the kill site distant from the community. If the meat is left in the field, it is carefully concealed with brush or spruce branches for protection from animal scavengers.

Following are some examples of fall and winter moose hunting involving Stony River residents:

> Example 1: Early in the September 1983 moose season, a man and his son traveled up the Kuskokwim River by boat in the early evening looking for moose. This was the party's first moose hunting trip of the season. The man's wife went hunting separately with an unrelated woman. The man and his son sighted and shot a moose in the vicinity of Devil's Elbow, approximately 30 air miles from Stony River, the same evening. As it was late in the evening and they were a considerable distance from Stony River, they camped for the night. The next day they butchered the animal and returned home. The women were unsuccessful and came back to the village the same day they left.

Example 2: The first evening of the September 1983 moose season, a man traveled alone by boat up the Stony River hunting moose. Approximately ten miles from the community, he sighted a moose on an island and shot it. As it was late in the evening, he decided to return the next day to butcher it, taking only some of the organs, intestines, and a small piece of meat with him. He covered the animal well with brush and went home. The following day he returned with his wife, daughter, and daughter's husband who assisted him with butchering and packing the meat. Since the daughter and her husband had already secured their own moose, the man kept the moose, sharing half of it with his brother's household which did not obtain one until late in the season.

Example 3: Several years ago during the September moose season, members of one household went on numerous hunting outings without success. Four days before the season closed, a man and his wife made a trip by boat up the Nunsatuk River, the mouth of which is located about 40 air miles from Stony River. Having left in the morning, they reached the stream's fork by midday. In the afternoon, they drifted, listening, watching, and calling for moose but without success. Towards the end of the day as they neared the Kuskokwim River, a north wind began to blow. They entered a slough soon after they left the Nunsatuk River heading down the Kuskokwim River. It was beginning to get dark and the wind was blowing hard but they decided to attempt calling one more time. Soon after they called, a moose walked out on a sandbar on the opposite side of the slough from where they were beached. They attempted to pole across to the other side in order to get a better shot but the wind was blowing too hard. They reached the other shore by motor just in time to shoot the moose before it disappeared over the bank. It rolled down the bank landing close to their boat. Because it was late, they stayed the night there keeping a fire going continuously as they had not come prepared to camp and were without bedding and shelter. The next morning they butchered the moose and hauled what they could in their small boat, returning later for the remainder. Since most Stony River households had already obtained a moose, the animal was used primarily within their own household.

Example 4: In the beginning of the 1983 February moose season, a man and an adolescent male cousin traveled up the Stony River about five miles by snowmachine looking for moose. At this point on the river, they turned inland and traveled several miles to a place where moose had often been found in the past. The man shot the moose and was assisted by the younger person in butchering it. As they had two snowmachines and sleds, they were able to haul the entire animal home the same day. The meat was stored in a single cache that both households shared.

Example 5: During the 1984 February moose season, two adolescent brothers, each with a snowmachine, went up the Stony River to hunt moose. Travel was difficult due to overflow on the ice. About ten miles from the village they sighted and shot a moose which they transported back home the same day. They shared a portion of the animal with their grandfather who belonged to a different household.

Example 6: Two male cousins traveled by snowmachine up the Stony River during the beginning of the February 1984 moose season. Approximately ten miles from the village, they spotted a moose feeding on an island. They left their snowmachines and circled towards the animal on snowshoes. When they were sufficiently in range of it, they both fired, killing the animal. After the animal was transported home that day, it was divided between their two households and portions shared with other households which had little meat.

Almost all parts of a moose are used for food by Stony River residents. Besides the meat of the main body of the animal, they cook and eat the head, feet, intestines, and organs. The meat and organs are usually boiled or fried while the intestines and stomach lining are cleaned well and then boiled. The nose, tongue, and cheek meat, all considered delicacies, are also normally boiled. The hooves, too, are boiled, often with onions and salt, producing a gelatinous dish. The legs are split and cooked for their grease, which is very clear and of high quality. The body fat of the animal is rendered and used for cooking in a variety of ways. It is also used in the making of "native ice cream" called akutaq in Yup'ik Eskimo. A large fat moose may produce five or more gallons of lard. The quality of a moose is judged both on its fat content and on the quality of its meat.

Stony River households preserve moose meat both by smoking and freezing. In the fall, families often hang it in large pieces in their smokehouse over a small fire for several days in order to cure it. Families without freezers store the meat permanently in the smokehouse,

keeping a small fire going daily during warm weather. The smoke produces a hardened crust on the outer surface of the meat which keeps the inner meat fresh and soft. People also smoke strips of fat which they cook with the meat for flavor. In the fall, people make dried meat by cutting it into small strips and smoking it. In the winter they occasionally dry meat over their stoves in their homes. Dried meat is a lightweight nutritious food, ideal for camping and traveling. Charnley (1983 and 1984) provides a detailed description of contemporary and historic moose hunting in the central Kuskokwim communities of Sleetmute and Chuathbaluk.

Caribou

Stony River people hunt caribou in the fall and winter months, both to supplement their supply of moose meat and for a change of diet from that staple. Winter is the main season for harvesting caribou, although fall hunting also takes place. While most households hunt caribou each year, the tendency is to expend greater effort during years when sufficient moose meat is not obtained during the fall and early winter seasons. In GMU 19 used by Stony River residents for hunting caribou, open seasons occur in August and September and November through February. Within their land use area, caribou tend to occur in small scattered groups and not in large herds as in some areas. Residents report that the number of animals seen together at one time varies greatly, from a few animals to rarely as many as 100 or more.

Caribou occur in the alpine, moist tundra, treeless bogs, and open low-growing spruce forest environments. They seek shelter and

protection among the trees of the latter environment. Stony River residents note that, within their hunting area, caribou tend to stay at higher elevations during the spring and summer months, moving to lower country in the late fall and winter. Localities commonly used by Stony River people for fall and winter caribou hunting are the flats between the Cheneetnuk and Tatlawiksuk rivers, between the Swift and Stony rivers, and between the Stony and Holitna rivers (Fig. 4). Residents say they can cover each one of these areas on snowmachine in a day looking for caribou. Areas used for the harvest of caribou in the lifetime of Stony River residents are depicted in Figure 4.

Fall caribou hunting is by boat and on foot and in winter by snowmachine, dogsled, and on foot. Most caribou are harvested by Stony River people after freeze-up of the main river which normally occurs in November or December. Within the lifetimes of present-day residents, they have been taken between the Stony and Holitna rivers and along the Stony River, a direct distance of approximately 85 miles from Stony River village. They have also been hunted along the Kuskokwim River and in the Kuskokwim Mountains about 70 miles upriver from Stony River village and downriver approximately 15 miles. They have been harvested along the middle and lower Swift and Tatlawiksuk rivers, and in a land area adjacent to them and along a portion of the Big River. In contemporary times, the focus of caribou harvest has been between the lower Holitna and Tatlawiksuk rivers.

Some of the strategies for hunting caribou differ from those employed for moose hunting, because caribou tend to inhabit open country more frequently than do moose which frequent brushy environments particularly during winter. While frozen, open environments make it

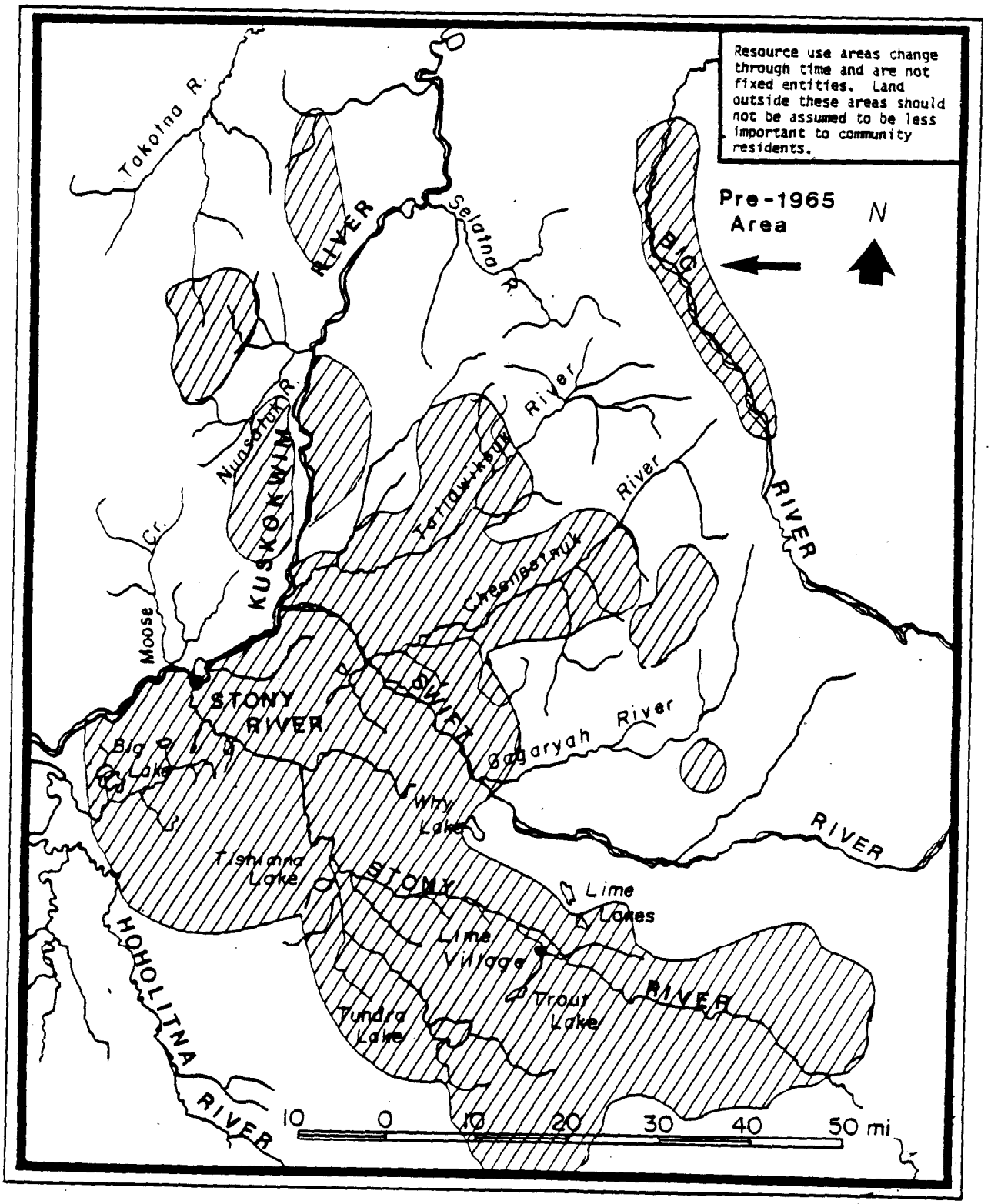


Fig. 4. Areas used for caribou hunting during the lifetimes of Stony River residents as reported in 1983-84.

fairly easy for hunters to sight and pursue caribou. The hunters are also potentially more conspicuous. Once the animals are spotted, hunters attempt to approach quietly into shooting range. As with moose, it is important to stay downwind from caribou in order to prevent detection by scent or sound. Residents note that if the leader of a group of caribou can be shot first, the remaining animals may become disoriented, often running in a variety of directions which make them easier to harvest.

Sometimes hunters sight caribou up on a hill or on the side of a mountain. A strategy commonly used in this situation is to attempt to surprise the animals and frighten them down to a hunter below. The same method is employed when caribou are detected among trees.

Although caribou are more often harvested in larger numbers at a time than are moose, they are not necessarily distributed more widely within the village. A caribou does not produce as much meat as a moose nor are caribou harvested as frequently as moose. The construction of long fences in which snares were set was a traditional means of efficiently harvesting large numbers of animals. This method was used by the ancestors of present-day Stony River people. Caribou were also taken by bow and arrow.

The following examples illustrate methods and patterns of caribou hunting.

> Example 1: Several years ago in November, two brother-in-laws of separate households went hunting by snowmachine in the vicinity of Basket Creek. One of these men was the head of a large household which had harvested only one small moose that year, although household members had hunted in both the September and November moose seasons. The two men camped overnight in the area and the next day sighted a small group of caribou. Each man procured an animal and returned home the same day. The hunter whose household had not

obtained a moose that fall kept the meat he harvested for his family. His partner, head of a household that had sufficient meat, gave his catch to his brother-in-law.

Example 2: In February 1984 two adult males went caribou hunting by snowmachine between the Stony and Holitna rivers. The first day they traveled a distance of about 35 miles, making a random check without sighting any animals. The weather was cold and windy. Near the end of the day they spotted signs where caribou had been feeding among the trees. As it was late and they had no snowshoes to follow them in the deep snow, they returned home.

The next day they went back to the area where they had observed the signs. Although a small group of animals were spotted in the open, they ran into a wooded area before they could be shot. The hunters followed them on snowshoes but were unsuccessful in retrieving any. While hunting together, the men also looked for evidence of bear dens.

Example 3: Several years ago in February, a man went alone up the Stony River by dog team to hunt and trap. He hunted for several days, going out in different directions from his trapping base without success. On the third day he sighted caribou about five miles from the river in the direction of the Swift River. After making a kill, he hauled the meat in two trips back to his site. The man made dried meat out of some of the animal and shared the rest between his household and that of his sister-in-law.

Example 4: During the early winter of 1983 a couple went caribou hunting between the Stony and Holitna rivers without success. The couple again tried unsuccessfully later in the winter between the Tatlawiksuk and Stony rivers. At another time they finally harvested three animals between the Stony and Holitna rivers. They noted that their household, which consists of three members who hunt, normally harvests six caribou in a year. During the 1983-84 winter season they said they obtained only three animals.

As with moose, almost the entire caribou is utilized for food and other purposes. Edible parts are similar to those of a moose and are prepared and preserved in much the same way. Caribou meat is said to dry out more quickly than moose, which is one reason it is not preferred for food as much as is moose. Besides using the meat of the animal, people tan the leg skins and make boots from them. They use the hide with hair on it as a mat, especially for camping.

Stony River residents report that the 1983-84 caribou season was not as productive for them as is usually the case. They observed that caribou were absent in some of their most important hunting grounds, namely those in the Tatlawiksuk and Swift river areas. They attribute this absence to the seismic testing that occurred in the vicinity from the spring to the fall of 1983 in advance of the proposed oil and gas lease sale of the Holitna Basin. The seismic testing involved loud blasts which could be heard in the community. Residents believe that this activity frightened the caribou and possibly other animals away from these important traditional hunting grounds. Besides the seismic testing, numerous helicopters were also brought into the same area as part of the Bureau of Land Management's settlement and mineral entry programs. Poor traveling conditions may also have been partially responsible for a lower than normal harvest.

Black Bear

Black bear is a third large game animal hunted by Stony River residents for its meat and hide. People enjoy the meat, as it is a diversion from moose and caribou. In the spring when other meat is often scarce, it may become an important staple for a short period of time. Stony River people hunt black bear primarily in the spring although some fall and winter hunting also takes place. Areas in which Stony River residents have hunted bear during their lifetimes are depicted in Figure 5. Bear hunting has occurred along the Kuskokwim River upriver from Stony River village a direct distance of approximately 70 miles and downriver over 20 miles. Hunting has also

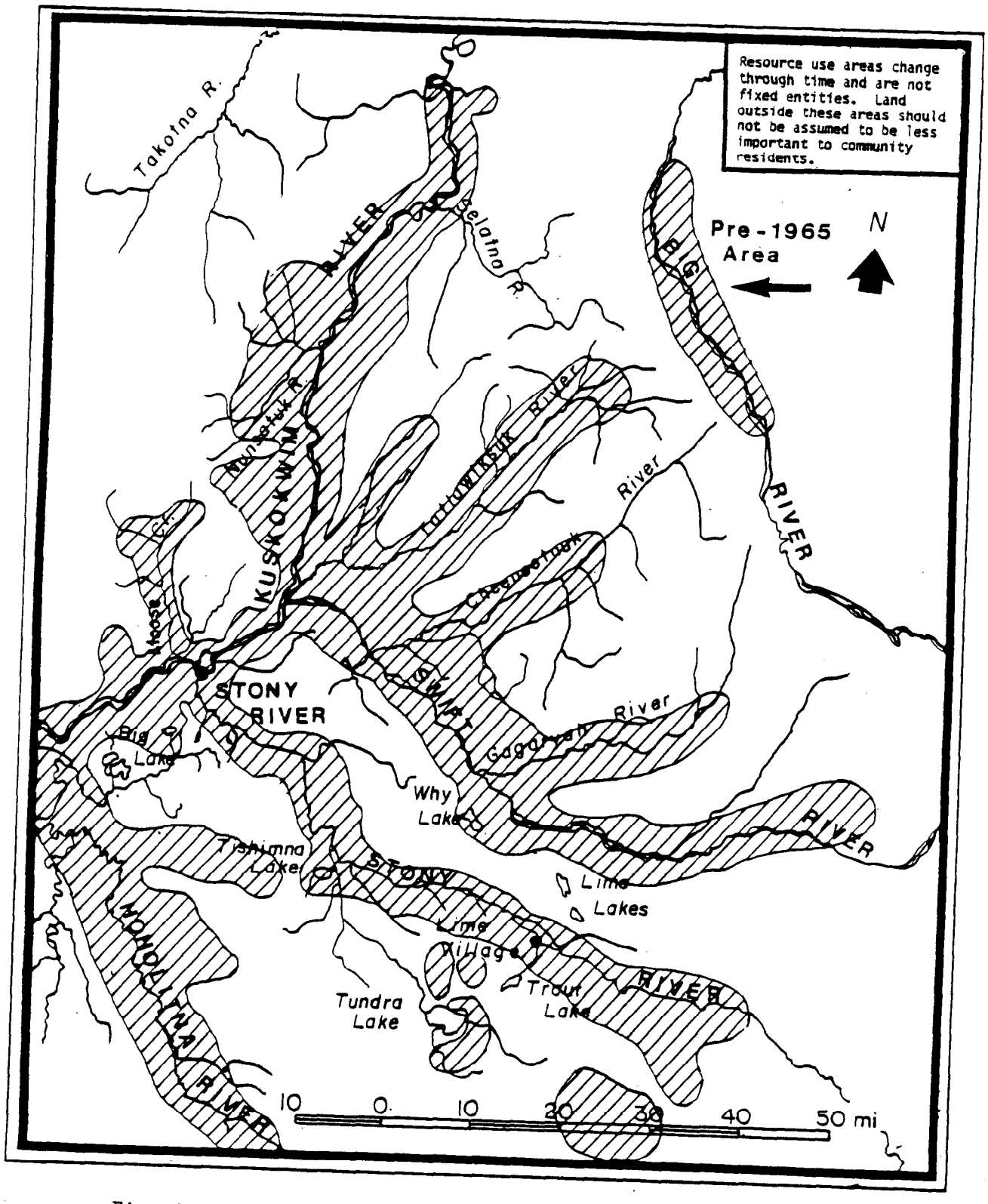


Fig. 5. Areas used for black bear hunting during the lifetimes of Stony River residents as reported in 1983-84.

taken place along the Stony and Swift rivers, and their tributaries, extending approximately 75 air miles upriver and along the Tatlawiksuk River. It has also occurred along the Holitna and Big Rivers. The focus in contemporary times has been along the lower and middle Stony, Swift, and Tatlawiksuk rivers, and along the Kuskokwim River upriver from Stony River village to the mouth of the Nunsatuk River, about 120 miles and downriver to the mouth of Inowak Creek, a direct distance of approximately 25 miles from Stony River.

Two strategies are employed in hunting bears in the spring. One is to hunt them by snowmachine or dogteam and by walking on the snow crust. Dens are easier to find at this time than in the winter when the entrances are concealed by the snow. In the spring, the sun melts the snow, often revealing the entrance.

Several methods are used for harvesting denning bears. Hunters look for scratch marks or bits of fur on a tree which may be signs that a den is in the immediate area. Once a den is found, the hunter may sight the animal through the entrance and shoot directly in. If he cannot see the bear in its den, the hunter may plug the doorway, usually with wood, and then make a separate opening in the top of the den. He may then shoot down through the hole at the bear or he may poke the bear with a stick until it charges out of the den. The obstruction in the entrance way slows the bear down as it comes out and makes it easier to shoot effectively.

A second spring strategy for hunting bear is looking for them by boat along the river shore right after the ice breaks up in late May or early June. By early summer they are lean and are not considered good to eat. Bears are normally only killed in the summer if they become a

nuisance, which usually occurs at a fish camp. Sometimes a snare is set in the smokehouse to catch a troublesome bear.

In the fall black bears are found primarily in the flats and hill country, where they feed largely on berries and prepare for denning. Although they are highly preferred as food during that season, they are not as commonly harvested then because of the necessity of traveling on foot through rough terrain. Sometimes they are sighted along the river during this season and shot. In the fall, other game hunting and berry picking may be combined with bear hunting.

A prime time for hunting black bear is in the late fall and early winter right after freeze-up. The frozen ground is easy to walk on and the dens are not as hard to find as later in the winter when they are more completely covered by snow. Several black bears were reported taken during the 1983-84 winter season.

Traditionally, bears were taken by spearing and with deadfalls. They were also smoked out of their dens in winter. Dogs were commonly used to locate dens. One elderly Stony River resident remembers killing a black bear with an ice pick when he was surprised by it in the spring before break-up. Dogs have customarily been used to hunt black bear. The following examples illustrate black bear harvesting.

> Example 1: Early June of 1983, a man, his wife, and another man unrelated to the couple made a trip by boat about 20 miles down the Kuskokwim River to the vicinity of Inowak Creek where they sighted a black bear along the river and shot it. This was the second trip the couple had made that spring looking for black bear. The couple usually secures a black bear by this strategy in the spring.
>
> Example 2: During the 1982 fall season, a man hunting by boat along the lower Stony River sighted a black bear and shot it. He said that, although black bear are not as common as

they were in the past, he has often caught one in that locality in the fall.

Stony River residents eat the meat of the black bear and render the fat which they use in "native ice cream," called akutaq in Yup'ik Eskimo, and for cooking. People also eat the heart and kidneys. The meat is eaten fresh, and also preserved by freezing or smoking. Boiling is the most common method of cooking bear meat. Women tan the hide and use it for sewing articles of clothing such as mittens, caps, and boot soles. The tough back hide is used for boot soles after it has been soaked in water until the hair rots off.

Brown Bear

Traditionally brown bear were hunted for food, but they are no longer utilized today. People say that they are rare in the vicinity and that no one has had to shoot one in defense in recent years. Elders remember that in their youth and middle age, brown bear were occasionally harvested, being especially valued for their high fat content. Residents report that the practice was discontinued in the 1940s.

Dall Sheep

Dall Sheep were traditionally hunted by the ancestors of Stony River people in the Alaska Range. Sheep hunting areas are depicted in Figure 6. Several present day elders hunted sheep during their youth in the mountains in the vicinity of Big River and Swift River, and in the upper Stony River. No sheep are reported harvested by Stony River

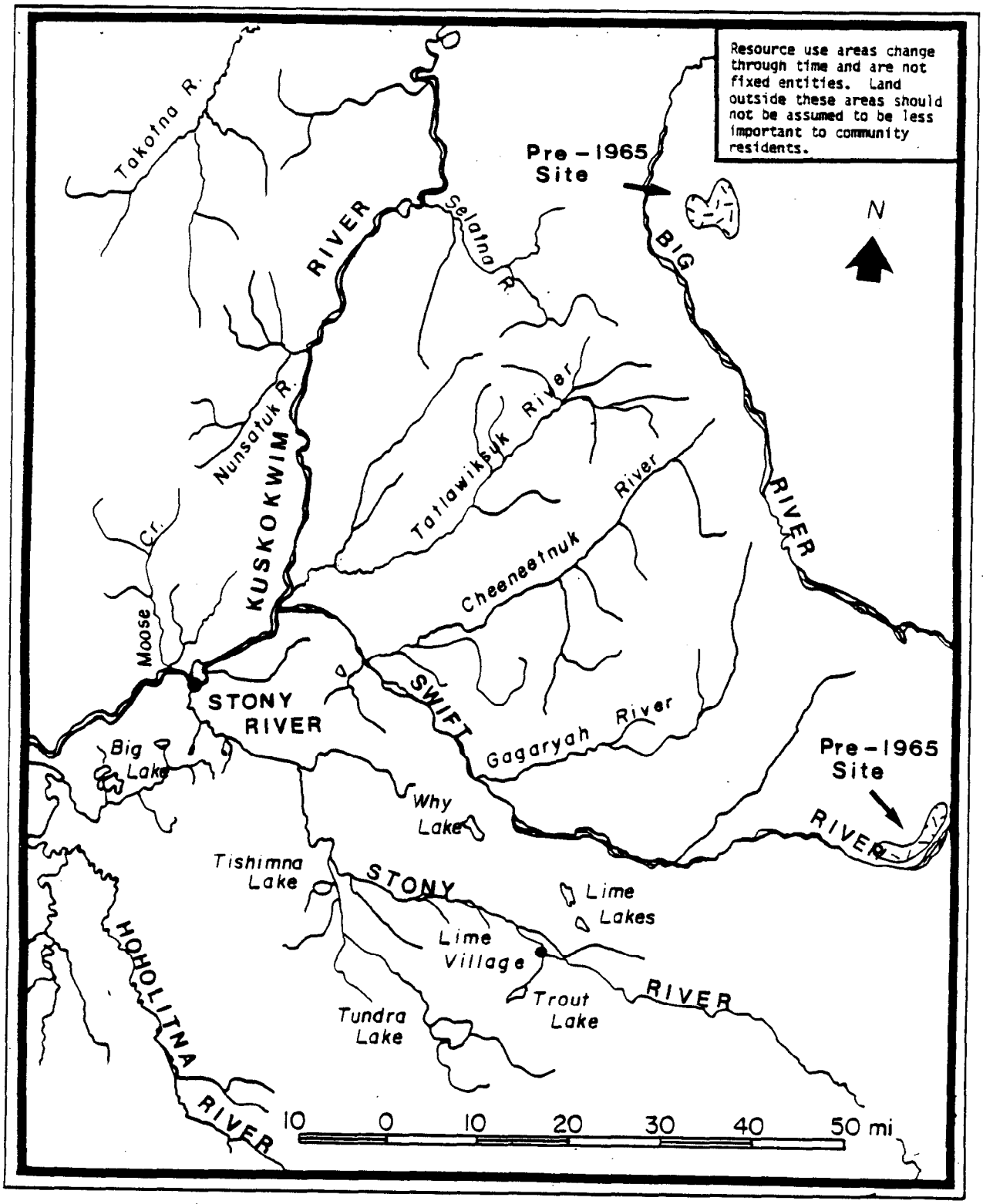


Fig. 6. Areas used for sheep hunting during the lifetimes of Stony River residents as reported in 1983-84.

people today. Difficult and time-consuming access overland are reasons given for the decline in the hunting of these animals.

Small Game

Snowshoe Hare

The snowshoe hare, also called "rabbit" locally, is periodically abundant in the forests and shrub thickets of the central Kuskokwim area. A number of factors are thought to be responsible for fluctuations in their numbers. These include predation, disease, spring flooding of habitat, and possible insect kill, especially of young animals. Stony River residents noted that there were few hares in the area during 1983 and early 1984. A reason given for this situation was a spring flood caused by an ice jam several years ago that caused many of the animals, especially young ones born during that season, to drown.

Residents noted that the 1983-84 winter season was generally poor for harvesting hares. They said the animals were more abundant in November and December before the heavy snows began in January. Members of one household, which may take as many as 40 hares a month during a good year, estimated it harvested only about 10 during November 1983.

The snowshoe hare is important as a supplementary food for Stony River residents, especially in years when its numbers are high. They are shot or snared primarily from October to March. Also, in the fall as well as the above mentioned seasons, people concentrate on major resources.

A common method employed by Stony River people today for harvesting hares is to set wire snares in their trails and check them periodically. Residents say that they set the snares when their supply of meat is low, to supplement other resources and to add variety to their diet. Normally the snares are left out for a week or two at a time and may be set as often as once a month during the winter depending on a household's needs. One family noted that during an average year using seven snares, they tend to catch that many hares in a week.

Stony River people employ other strategies for harvesting hares. One is to flush them out of the brush and shoot them. In contemporary times, Stony River residents have conducted hare drives, a traditional practice which involves group participation. These occur most efficiently on islands in the fall before the ice freezes when the animals are unable to escape to the mainland. This method is most effective in October after the hares' coats turn white and before a snowfall when they are easily visible. Hunters spread themselves out in a line across one end of the island and walk towards the other end flushing the animals out and shooting them as they appear.

Another customary method used in recent times to secure large numbers of hares was to make a fence by piling up brush and setting snares along it. Snares traditionally were made of rawhide, but today they are constructed from wire.

Today hares are eaten fresh or frozen for future consumption. The meat, including the head and certain organs, is usually cooked by boiling and frying. In the past, the fragile skins were saved and made into blankets.

Porcupine

Porcupine is a small game animal highly enjoyed as a delicacy by many Stony River residents. People consider it prime food, especially in late summer and fall when it is fat. As is true of the hare, the porcupine is not normally eaten during the spring when it bears young nor during the early summer, because its meat is lean and of poor quality. Residents note that porcupine populations fluctuate over time and that they were not numerous during the period of this study. It is harvested primarily for the same reason as is the hare. As one elder commented, "If you have lots to eat, you'll let it pass."

Although porcupine are animals mainly of forest environments, residents say they also are frequently encountered on stream beaches. They are slow-moving animals and most people harvest them by the traditional method of clubbing. They are occasionally shot. Hunters find them by watching for tracks and signs of feeding or encountering them by chance. A treed porcupine is usually dislodged by a long pole or sometimes shot and then clubbed when it falls to the ground.

The most common method of preparing a porcupine for cooking is to singe off the hair and quills and then remove them by scraping. An easier way is to simply skin the animal, although most people consider an animal prepared in this way to be less flavorful because the fat is removed from the carcass. The meat of the entire animal is eaten, usually boiled, including the head if it is not badly damaged. The liver, heart, and kidneys may also be eaten. The quills are sometimes saved and made into jewelry.

Waterfowl

Stony River residents hunt several species of geese and at least ten species of ducks that migrate through or nest in their land use area. Geese are common on the sandbars of the Kuskokwim River and its side streams, while ducks frequent the streams, sloughs, lakes, and ponds of the area. Mallards, American widgeons, common goldeneyes, pintails, and scoters, locally known as "black ducks," are said to be among the most common ducks utilized. The latter are especially favored for food bcause of their high fat content. The sandhill crane, which utilizes the wetlands, is occasionally hunted. Two species of swans also occur in the marshes, tundra, lakes, and rivers of the central Kuskokwim area and were hunted in the past for food. None have been reported taken in recent years. Areas used for waterfowl hunting during residents' lifetimes are depicted in Figure 7.

Within the lifetimes of present-day Stony River residents, waterfowl have been hunted along the Kuskokwim River upriver approximately 75 miles direct and downriver at least 15 miles. They have been harvested along the Stony River to above Lime Village, a direct distance of about 60 miles and also up the Holitna River. Waterfowl have also been taken along the Swift and Tatlawiksuk rivers, a direct distance of about 45 miles. The focus of hunting in contemporary times has been the lower and middle Stony, Swift, and Tatlawiksuk rivers and up the Kuskokwim River from Stony River as far as the Nunsatuk River, and downriver from Stony River as far as Inowak Creek.

Waterfowl migrate through the central Kuskokwim area in greater numbers in the spring from late April to mid-May and during the fall in

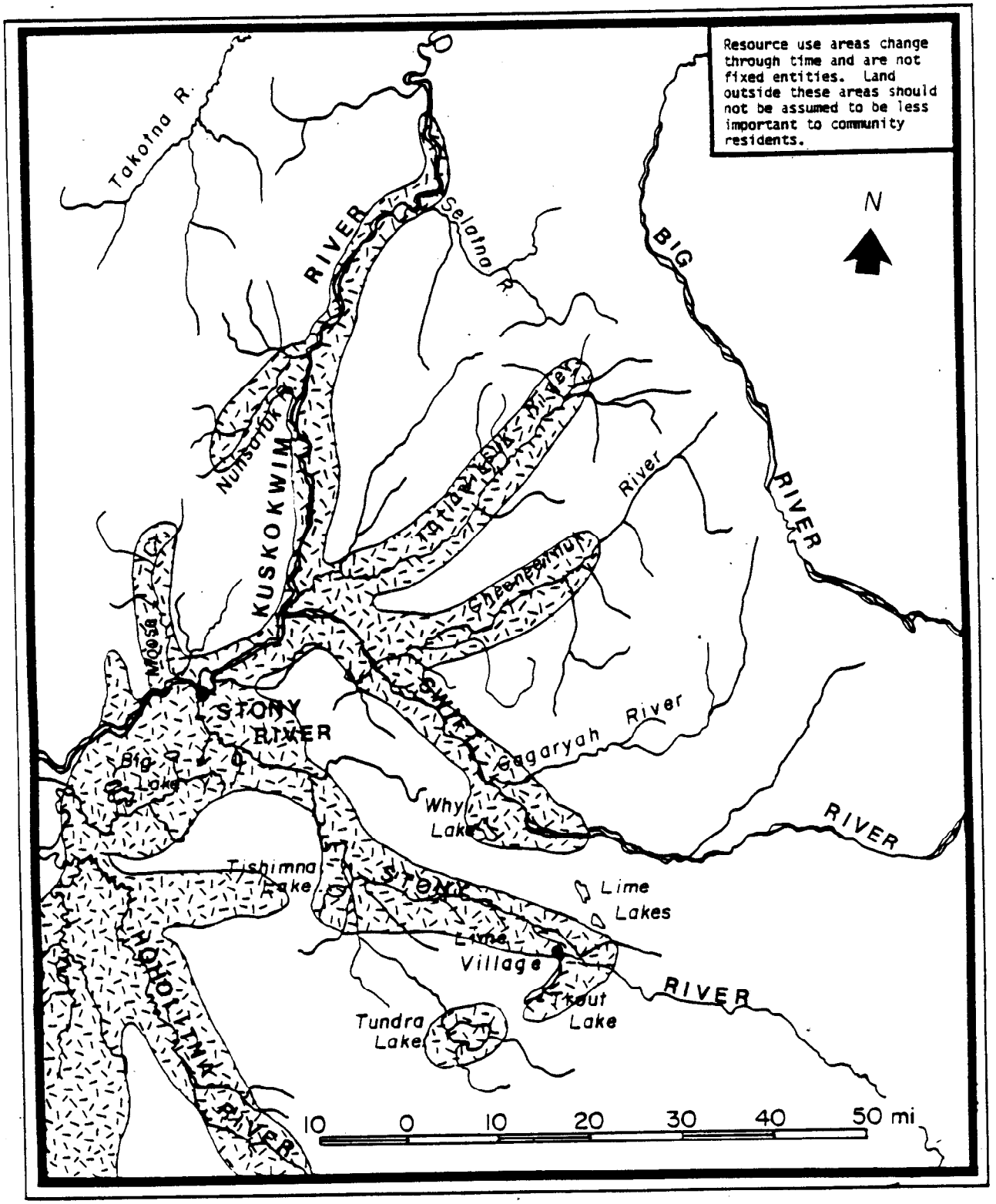


Fig. 7. Areas used for waterfowl hunting during Stony River residents' lifetimes as reported in 1983-84.

lesser numbers from late August to mid-September. As was the case traditionally, they are harvested today in significant numbers by Stony River people when they first arrive in the spring. This is a time when local food supplies often are low. Most large and small land animals are not easily obtained because of poor traveling conditions. The hunting of waterfowl is often combined in the spring with the harvesting of whitefish and other non-salmonid fish species. Muskrats are also occasionally hunted. In the fall, waterfowl harvesting is frequently combined with moose hunting.

Stony River people employ a number of strategies for procuring waterfowl. One method is to wait in underbrush close to bodies of water that waterfowl are known to frequent. At times hunters construct shelters out of brush or grass to better conceal themselves. People hunting together may space themselves apart along a shoreline waiting for an opportunity to shoot. Hunters sometimes use imitating calls to attract waterfowl. No. 1 traps have customarily been set on sandbars to catch geese.

Another strategy used to obtain waterfowl is to shoot them overhead as they fly by. Hunters attempt to calculate where the birds will fall so as not to shoot what they cannot retrieve. Today Stony River people use handmade wooden or commercial boats and aluminum canoes for transportation once the waterways are sufficiently open. In the past, moose skin, birchbark, and canvas canoes served this purpose.

Stony River people usually boil waterfowl. Sometimes they split them open, gut, and smoke them for several days for additional flavor. After smoking, they may be boiled and eaten or frozen for future use. People use waterfowl feathers, especially the soft down feathers, for

filler material in pillows, mattresses, and clothing. They also use the wings of the larger birds as sweeping tools.

Earlier and within contemporary times, Stony River residents have harvested waterfowl eggs for food. They are enjoyed as a delicacy and are not gathered in quantity to help insure an adequate number of surviving waterfowl for the future. Traditionally, swans were harvested for their meat, down, and wings, the latter which were used as sweeping tools.

Grouse, Ptarmigan, and Other Game Birds

The spruce grouse, locally known as "spruce chicken," and the ruffed grouse, locally called "willow grouse," are common lowland birds within the Stony River people's land use area. The former occurs mainly in spruce and mixed hardwood-spruce forests and the latter in hardwood forests and shrub thickets. Stony River residents harvest them primarily during the fall, winter, and early spring (September to March). They do not generally take them later than early spring in order to allow the young to hatch and grow.

Stony River people prefer to hunt grouse at daybreak or dusk, because the birds are most easily encountered at these times. Residents note that especially during the morning they may be found on the ground eating grit, which they use for processing their food. Hunters watch carefully for the birds roosting in the trees or eating on the ground, moving quietly so as not to frighten them. Another strategy is to flush them out.

Grouse hunting is often combined with moose hunting and wood harvesting in the fall and winter months. During the 1983-84 fall and winter seasons, people hunted grouse both alone and in groups. The composition of grouse hunting parties varied greatly, including spouses, parents with children, pre-adolescent and adolescent children, and adults of varying ages who were not necessarily related. One teenage male is reported to have hunted willow grouse after school almost every day during November 1983, and to have harvested approximately 40 birds.

Three species of ptarmigan, all upland birds, occur in the land use area of Stony River residents. Only the willow ptarmigan moves to valley bottoms in the winter, especially when there is blowing snow in the high country. It also tends to move to lower elevations in March when the melting and freezing snow higher up forms a hard crust which makes feeding difficult. The other species, the rock and white-tailed ptarmigan, are exclusively high country birds inhabiting tundra, rocky mountain ridges and shrub thickets.

Significantly fewer ptarmigan than grouse are taken by Stony River residents, as ptarmigan are uncommon in the lowland environments where most land use and resource activities take place. One family who regularly hunts grouse throughout the winter noted that, on an average, they harvested four or five a week. On the other hand, they said they rarely obtained ptarmigan. No ptarmigan were reported taken during the 1983-84 winter season.

Grouse and ptarmigan are most frequently harvested today with shotguns and small rifles. Within contemporary times, fish nets have been hung on brush to catch ptarmigan. The birds fly into the nets and

become entangled in them. Traditionally, snares made out of rawhide were used to catch both grouse and ptarmigan.

Stony River residents usually boil or fry the meat of grouse and ptarmigan. Other edible parts include the heart and liver. Some families have continued into contemporary times to use the feathers for making blankets and pillows.

The larger owls and sandpipers used to be harvested for food and were considered a delicacy. Elders and middle-age people have eaten them in earlier times. Almost any bird including the chickadees, redpolls, and small songbirds were considered edible in times of extreme food shortage.

TRAPPING

Introduction

As it was in the past, trapping continues to be a very important land use activity for Stony River people today. Most of the same animals that present day elders harvested in their youth are still taken by people today. These include beaver, marten, fox, land otter, wolverine, wolf, lynx, mink, ermine, and muskrat. Ground squirrel and marmot, two furbearers found in select mountainous environments, have reportedly been taken only by the present-day older generation.

The areas used in contemporary times for trapping have had prolonged use by the majority of Stony River village residents and their ancestors. These trapping areas are depicted in Figure 8. Major trapping localities exist both along and inland from the Swift,

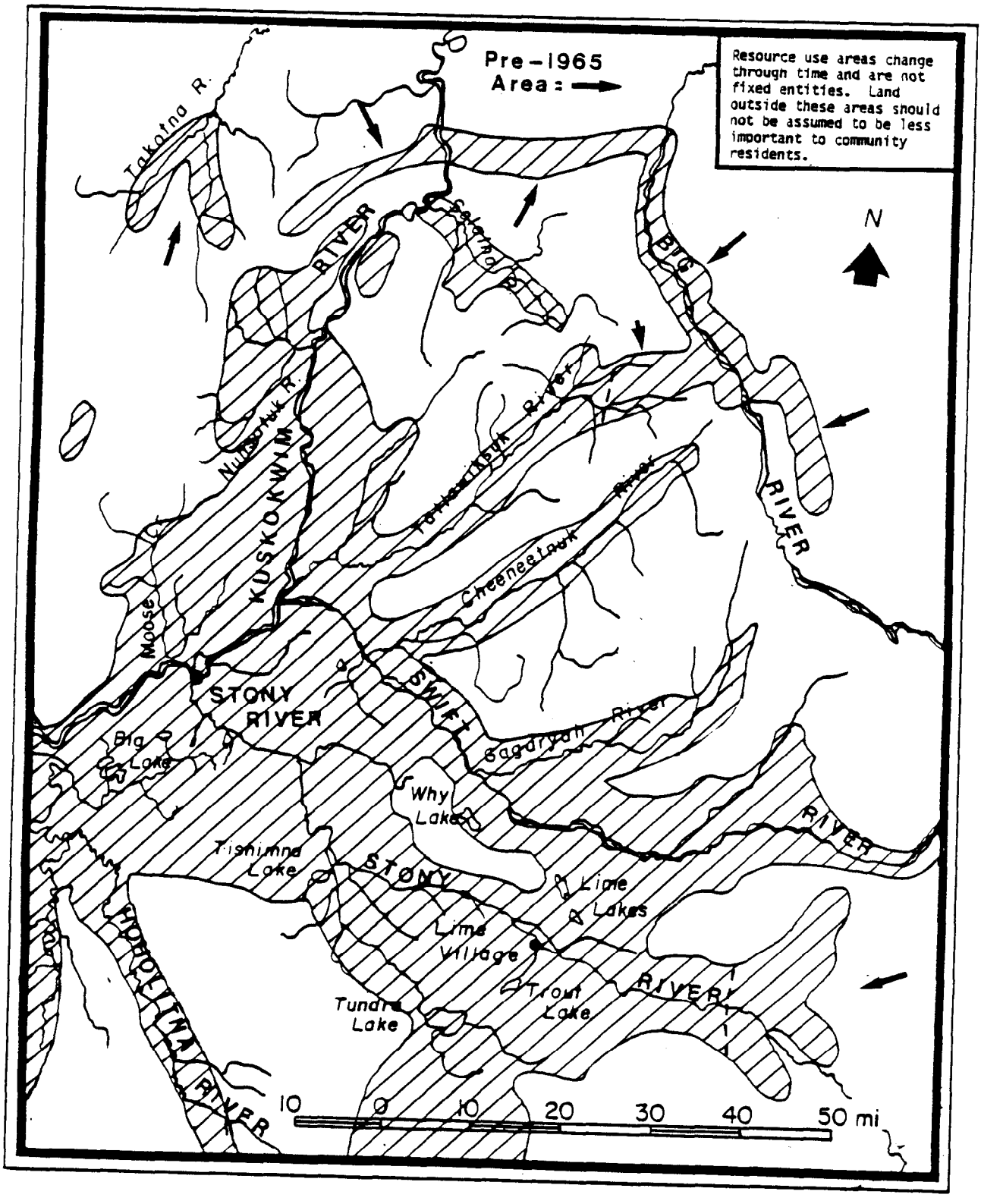


Fig. 8. Areas used for trapping during Stony River residents' lifetimes as reported in 1983-84.

Gagaryah, Cheeneetnuk, Tatlawiksuk, Nunsatuk, and lower Stony rivers. Today the Kuskokwim River from Inowak Creek to the Nunsatuk River, is heavily used for trapping by Stony River people. Most residents who lived outside this area of the Kuskokwim River during their lifetime have trapped other areas as well.

In the past, during the youth of today's elders and middle-aged, people trapped away from home for extended periods of time, often as long as a month or two. They returned occasionally to their winter home or to the store at the present-day site of Stony River village to obtain supplies and to sell or trade their furs. Often they trapped away from home during the late fall and early winter, returning home for the mid-winter Christmas festivities before going out again to trap until March or just before break-up.

Stony River residents still trap long distances from their community and stay for extended periods of time. The latter does not occur as frequently as before due to restricted legal trapping seasons, wage employment, lack of necessary equipment, and mandatory school attendance for children. However, people trap as much as possible, especially when animals are abundant and fur prices are average to good, both because they need the income and because they have a strong desire to continue using the land for this activity. For example, a Stony River man in his eighties trapped alone for the month of November 1983 in the Swift River drainage. He again trapped for an extended period of time with a partner in March 1984.

Almost all households did some trapping during the 1983-84 season in spite of Stony River residents reporting low marten population and

low prices for beaver, the two most-actively trapped furbearers. For these reasons the number of both animals taken was reported to have been well below the average. Other furbearers, including fox and otter, were harvested during the 1983-84 trapping season but in numbers significantly lower than the harvest of marten and beaver. In general, people did not trap as far from home or stay for as long as usual, for the reasons cited above and because of very poor traveling conditions, especially during the early and late winter. Trapping provided a few Stony River households with their primary source of income during the study period.

The length of traplines maintained by Stony River people in recent years varies from less than a mile to 30 or more miles. One trapper noted that he could check a straight 30-mile trapline by snowmachine in a day, taking five hours to cover it one way. When he traveled by dogteam that same distance, it took two days round trip. Another trapper said that the length of his line decreased since he stopped using dogs, because dogs are able to travel in rougher terrain than are snowmachines.

Trappers not able to get away for long periods of time set traps closer to the village so that they could be checked easily within a day, a distance of about ten miles or less. Those who can afford to be gone for a longer time place sets more distantly, alternating between home and their traplines every several days to a week or more.

A full-time trapper spends considerable time and energy in maintaining and operating a trapline. If he sets traps inland from a main travel route, which is usually a large stream, he may have to make a trail both to and within his trapping locality. Some trappers make

only one long or circular line, while others make side trails out from the main line in order to expand their trapping area. Trappers use waterways whenever possible to reduce the time spent making trails.

Once a trapper has set his traps and snares, he has to check and maintain them as regularly as possible. They have to be reset and rebaited when an animal has been harvested or the bait stolen. Traps must be cleared of snow after a storm and snapped and reset if freezing rain occurs. Sets that do not harvest animals may be moved to another place. The upkeep of a snare is greater than that of a trap because it has to be removed from the ice with a pick for resetting. Besides this work, trappers must maintain their own transportation and provide shelter, food, and firewood for themselves if they trap a distance from home. Some trappers combine moose and caribou hunting during legal seasons with their trapping activities.

Unless a line is within five or ten miles of the village, a trapper who does not have a cabin normally sets up a 10 x 12 foot canvas tent at the start of the line as a base camp. He may also set up tents both along the trail to the trapping area and at a point or two along the line, depending on its length. One man who in recent times has maintained a 30-mile line said he placed a tent at both the beginning and end of the line. Both tents could be slept in or be used merely to warm up in. Another Stony River man who normally maintains a 9 to 12-mile marten line by snowmachine located along a riverbank sets only one tent along it.

The tents are normally equipped with a small wood burning stove, while a base camp will usually include cooking utensils, a supply of food, Coleman lantern and candles, and some type of bedding perhaps in

the form of spruce boughs, a caribou mat, or sleeping bags. Matches, a knife, gun, and an axe and/or a chainsaw are also considered essential trapping equipment. An icepick and shovel are used for checking beaver snares. A Swede saw and a Coleman stove are often included. At least one trapper said he always keeps a Coleman stove in his sled while traveling in order to easily warm his hands or to make a hot drink wherever he is. Commercially-made traps and snares appear to be exclusively used today for harvesting furbearers, although present-day residents have made and used traditional deadfalls, snares, and traps.

Besides the upkeep of the line and equipment, there is also the work of fleshing the harvested animals, stretching the pelts, and mending tears in the skins to give them a higher market value. Trappers often make their own stretching equipment, while female members of a household frequently assist with preparing the skins. The majority of Stony River families keep some of their harvest each year for home use. Women tan their own furs and sew mittens, hats, vests, and other clothing, both for home use and for trade or sale. Girls learn these skills often before adolescence, usually from their mothers or other female relatives. Female members of households with female occupants in Stony River sewed with locally harvested furs during 1983 and 1984. Women from at least one third of these households trapped, tanned, and sewed with fur they had harvested.

Most Stony River trappers have several or more locations that they trap in a winter. Commonly a trapper uses one during the first part of the winter, moving to another site later in the season usually after the Kuskokwim River freezes. He most always focuses on marten and/or beaver, which form the core of the Stony River village trapping economy.

While a variety of other furbearers may be taken in a season, their numbers are incidental compared to marten and beaver.

Some trappers follow a pattern of returning to the same locations year after year, expanding their use area outward if necessary, both to prevent depletion of game and to harvest greater numbers. Other trappers prefer to trap a location for a year or two and then leave it unused for a season or more so as not to exhaust the game population. Both patterns are difficult to practice during the late fall-early winter period, as trappers are largely confined to the north bank of the Kuskokwim near the village until the river freezes sufficiently for travel.

For example, one trapper normally sets beaver snares and marten traps at a site near the village that he has used over time during the early winter season. After the Kuskokwim River freezes, he harvests marten and beaver each year in a trapping area further from the village. He has three lines there which he alternates using from season to season. Occasionally in years when he has been able to leave the village for an extended period during the early winter season, he has chartered a plane with a partner to a distant trapping ground.

Another method is to maintain a number of areas, but to alternate the species of animal taken in an area from year to year. For example, one man noted that three years ago he primarily trapped marten from Devil's Elbow to the Nunsatuk River, and beaver mainly along the Cheenetnuk River (Fig. 8). Two years ago he harvested mostly marten in the vicinity of the Tatlawiksuk River and beaver primarily in the Swift River area. Last year he reportedly followed his trapping patterns of three years ago as described above.

Alternate trapping areas are necessary for Stony River trappers because of variability in the game population, traveling, and weather conditions, and a person's social and economic situation, both within a season and from year to year. This traditional practice of alternating trapping areas also appears significant in helping to maintain furbearer populations in an area.

Stony River people most frequently trap alone or with a relative, although it is not unusual for unrelated persons to trap together. Adolescents and adults trapping within five miles of the winter village are more apt to trap alone than those trapping farther from it. Pre-school age children begin learning trapping skills by accompanying their parents when they check their traps and snares. By pre-adolescence they may run their own short lines in close proximity to the village. One ten-year old boy had his first trapline about five miles from home during the 1983-84 season. As it was a distance from the community, family members assisted him in checking it.

Although the male members of a household tend to be more highly involved in trapping and take the dominant role, many Stony River women are also expert trappers. They frequently travel with their spouses and children to traplines and occasionally go by themselves. It is common for members of a household to share the work of the family's traplines regardless of whose trapline it is. The same is true of close relatives who live in separate households. The following examples illustrate trapping practices:

> Example 1: A daughter and her spouse trapped an area distant from home, Devil's Elbow to the Nunsatuk River, with her father who lived in another household a year ago. During the 1983-84 season, they all trapped near home, the older man

trapping separately from his daughter and son-in-law. The father's adolescent son, who lived in the same household as his father, had his own trapline close to the village. His trapping efforts were restrained by school attendance. In seasons prior to 1984, the daughter's mother had often accompanied her husband trapping. Besides trapping with close family members, the older man has trapped within the last ten years for extended periods of time with relatives and with at least one unrelated man.

Example 2: A young middle-aged man runs his own trapline by himself each year. He also assists the members of an aunt's household with their traplines. The two households share other work throughout much of the year, such as the maintenance of a fish trap and harvesting wood. Occasionally, the younger middle-aged man accompanies his uncle who belongs to a third household on his trapline.

Following is a discussion of the most actively trapped furbearers by Stony River people.

Marten

Stony River people normally combine the trapping of marten and beaver, the two furbearers they seek most actively. Marten live primarily in spruce or mixed spruce-deciduous forests through which beaver habitat, lakes, ponds, and streams, are dispersed. Especially in recent years, when beaver pelts have brought a low price on the commercial market, marten have generated more income than beaver for most trappers. However, trappers continue to take beaver, since they are valued for their meat quality. Their pelts are made into articles for local use and sale.

Marten are trapped by Stony River residents from November through February, most actively after the Kuskokwim River freezes over in late November or early December. Marten are caught with pole, cubby, and

ground sets using No. 1 traps. A variety of bait is used, including dried salmon, meat scraps, and pieces of moose hide. Beaver castor is sometimes mixed with other ingredients and put on the traps as a scent to lure the animals. Marten are inquisitive animals, and trappers sometimes use red cloth, yarn, or other bright materials to attract them.

Stony River residents do not consider marten meat to be food for human consumption except in emergency situations, although trappers sometimes feed the meat to their dogs. Some local persons have eaten marten meat while trapping when other food supplies ran low.

The 1983-84 marten season, November 1 through February 28, was especially poor for Stony River residents. Reportedly very few animals were harvested in their land use area as compared with the previous year, most trappers taking half or fewer marten than what they had procured the year before. One part-time trapper who normally harvests about 20 animals said he only took 10 during the 1983-84 season. A household which traps very actively most years noted taking only about 20 marten this season, while normally it harvests about 100. On the other hand, an elder who traps alone said he took 30 animals, which was somewhat below his normal harvest level. A local fur buyer estimated that the majority of Stony River trappers averaged about ten animals in the 1983-84 season.

Beaver

Beaver is one of the most important furbearers harvested by Stony River people because it provides both high quality meat and commercially

valuable pelts. After moose meat, people eat more beaver and caribou meat than any other wild meat. In some households the intake of beaver meat appears to exceed that of caribou.

Stony River residents harvest beaver from November to mid-April, the main seasons being from mid-winter to early spring. Some trappers put considerable effort into harvesting both marten and beaver through mid-winter, while others place their greatest energy into marten trapping during early and mid-winter, and beaver snaring in late winter and early spring. Both time periods have advantages and disadvantages. During the colder months, travel is normally easier, but the ice is thick and more difficult to remove. Warmer weather makes work outdoors more pleasant, but creates overflow and generally more difficult traveling conditions.

Stony River residents today primarily use No. 2 or No. 3 snares for harvesting beaver. Other equipment consists of ice picks for making the holes in which snares are set, an axe to cut beaver bait, sticks to hold the snares in place, and a shovel to clear chipped ice and scoop slush out of the snare hole. Trappers shovel snow back into the water after the sets have been checked and set so that the area opened in the ice will not look unusual to the beaver and arouse its suspicion. The slush also helps to hold the snares in place and prevents the ice from freezing as solidly. Cottonwood and willow are normally used for bait.

Snares are set a distance from the beaver lodge, sometimes in the area of the dam. The further a snare is from the lodge, the more likely it is to catch large beaver, which travel further from home than young beaver. Setting snares in beaver dams attract older beaver who go there to repair the damage. The number of holes a trapper makes in a locality

and the number of snares he sets depends on a number of factors, including the ice thickness and the productivity of the area. The number of sets placed near a lodge or dam commonly varies from 6 to 15. Residents say that beaver have remained plentiful within their area of harvest over time and that even a stream trapped out of beaver is soon replenished with them.

Traditionally, people hunted beaver during both the open- and closed-water seasons because the meat is considered edible year-round. Today a beaver is sometimes accidentally caught in a fish net and utilized. People customarily have hunted beaver with firearms, especially during the open-water season.

Besides the meat and fat of the beaver, Stony River people eat the liver, kidneys, heart, feet, tail, and head. Sometimes the meat is smoked for several days to help preserve and flavor it.

The majority of skins are sold commercially or traded, although most households keep some for home tanning and sewing. Women use beaver skins to make hats, mittens, boots, and other articles of clothing which they sell, trade, or keep for local use. In the past, the castor was used as a medicine and the teeth made into awls and other tools.

Red Fox

Fox travel extensively and are found in both open and forested environments. Stony River people note that, although they have been fairly common in their land use area in recent times, they do not trap them as actively as they do marten and beaver. One reason given for this is that fox are harder to catch than marten. Some of the fox they

harvest are caught in traps set for marten, although trappers also make sets specifically for fox. Most Stony River households that trap actively report that they normally harvest one or two fox in a trapping season. During the winter of 1983-84, the legal season for fox occurred between November 1 and March 31.

Land Otter

Stony River residents trap and snare land otters which occur in the lakes and streams of their land use area. However, they do not hunt them nearly as actively as they do the beaver which share the same environments. Otters are not as numerous as beaver and they are also harder to catch. Equally important, only the pelt of the otter is valuable, since its meat is not a desired food. Land otters, which are traditionally considered emergency food, have been eaten by older present-day residents of Stony River during times of food scarcity. Otter carcasses are occasionally fed to dogs.

Most otters harvested by Stony River residents are apparently caught in snares set for beaver. Otters are known to inhabit old beaver lodges, and some trappers deliberately set snares or traps for them under the ice near old lodges or in areas of shallow, open water. Traps are also set along otter trails both on the ice and on land. Especially where an otter crosses back and forth on the ice of a small stream, a trapper may make a brush fence which funnels the animal towards the snare or trap.

Earlier in this century, central Kuskokwim people harvested otters after break-up with bow and arrow and with fish traps, and in more

recent times with firearms. According to Stony River residents, the pelts are of good quality in all seasons except the summer. Harvesting was legal in Unit 19 from November 1 to April 15 during the 1983-84 season.

Stony River residents trade or sell otter pelts and tan them for home use. They use the skins especially for making mittens as well as for trim on boots and other articles of clothing. Active trappers note that they harvest one to three a year, occasionally taking four or five. The 1983-84 harvest levels were reportedly normal.

Muskrat

Muskrats are hunted and trapped by Stony River residents both for their edible meat and for their fur. Spring is the main season for harvesting these aquatic animals, which spend most of their lives in and around marshes, streams, lakes, and ponds. The 1983-84 open season in Unit 19 for muskrats was between November 1 and June 10.

Some muskrat harvesting occurs in April when traps or snares are set on the ice or bank near feeding areas. People also shoot them on the ice at this time. Most muskrats are taken later in the spring, in May or June after the ice goes out, by boat or canoe. At this time they are most frequently shot, although sometimes they are reportedly clubbed while swimming. Evening is the best time for hunting muskrats, as they are said to be the most active then. In earlier days, floating rafts were made of dry wood on which traps were set to catch muskrats.

People note that there used to be many muskrats within their land use area but that their numbers have decreased over the last five years.

One reason residents give for this is that some of the habitats they occupy have dried up. One Stony River person who no longer hunts muskrats because their numbers have diminished said he used to easily get 30 or 40 animals in a season.

Muskrats are said to be prime food when they are fat, before the ice breaks up and immediately after. Once they are actively swimming, the food quality diminishes. The meat may be boiled fresh, although some people prefer to smoke or dry it before boiling. The skins are sold commercially or made into mittens, caps, and other clothing at home. In earlier times, many muskrat pelts were sewn together into blankets or coats. Also, the teeth were used as awls, especially for making snowshoes.

FISHING

Introduction

Fish are available to Stony River people year-round and obtained by them during every season. Salmon, burbot, and whitefish are the three primary species harvested annually. Salmon during the summer months and burbot in the winter and spring are the most reliable and provide the greatest numbers of fish. Although whitefish are obtained year-round, they are normally procured in the greatest numbers during the spring and fall.

Besides salmon, burbot, and whitefish, a variety of secondary species are harvested throughout the year. These include the arctic grayling, northern pike, longnose sucker, and arctic lamprey. They

serve both to add variety to and supplement the diet, especially when salmon, burbot, and whitefish are not available. The main harvest season for grayling is the fall, for pike the late winter and spring, and for suckers the spring. The major run of lampreys is in the early winter but they are not harvested every year primarily because they move quickly and may pass through the area unobserved. The Alaska blackfish, a fish of secondary importance, was taken in significant numbers in the past. Unsuccessful attempts to harvest these small fish were made by Stony River residents during the 1983-84 winter season.

Stony River people harvest fish by six basic methods; set nets, drift nets, fishwheels, fish traps, leisters, and hooks. Of these techniques, all but fish traps are used in open water, while set nets and hooks are also used under the ice. Fish are preserved fresh by freezing year-round in commercial freezers and caches and on outdoor platforms during the winter. In warm weather, large quantities of fish, particularly salmon, are preserved by smoke drying. Besides smoking fish, another customary method used by a few families today is fermenting fish by placing them in the ground or in water. Some households also preserve a small percentage of their salmon harvest in brine.

Fish are most commonly prepared for eating by boiling, frying, and baking. "Native ice cream," a favorite dish made of fish, berries, sugar, and lard, is described more completely below. Whitefish and their eggs are consumed frozen without cooking. Besides the meat and eggs, the head and certain organs of some fish are also used for food.

The harvesting and processing of large quantities of fish are normally accomplished by work parties composed of members of single or

multiple households who are often related. This occurs especially in the summer when the large runs of salmon are harvested with fishwheels and nets and in the winter and early spring when burbot and other non-salmonid species are obtained by means of fish traps.

Nets are also set in open water and under the ice in the fall and spring to harvest whitefish and a variety of non-salmonid species, including suckers, pike, and grayling. Several households may maintain these nets, especially those placed under the ice, as they involve considerable work. One such net involving at least three households was placed in the fall of 1983.

Whitefish is the main species obtained by leisters in the early winter from the shore fast ice when the run is strong. Hooking, which occurs primarily in the late winter and early spring, procures the minor fish species such as grayling and pike. Harvesting fish with hooks and leisters is normally accomplished by small groups of people.

Within contemporary times, whitefish and other non-salmonid fish species have been taken with a fence and trap in the spring after break-up and in the fall before freeze-up. The fence and trap were set in streams running from lakes. Today this method has been replaced by nets. It is unclear what effect the fishing regulations regarding gear types had on the discontinuation of this practice.

Both fishwheels and fences and traps are said to be a more productive mode of harvesting fish than nets. On the other hand, fishwheels and fences and traps require significantly more work to construct and maintain. One resident estimated that fishwheels were ten times more efficient than nets. Residents note that over 100 fish

can be taken by a fishwheel and trap at a time, while a net can harvest less than half that amount.

Work groups, particularly for harvesting large quantities of fish, are commonly composed of members of households that have close kin ties. People who work together distribute the fish they harvest primarily according to need. A fish camp, fishwheel, net, or trap normally belongs to one household but may be shared with other households who do not have access to them. Those persons who help with the work are entitled to a share of the harvest. Although one household may own a camp, cache, or smokehouse, several households who work together commonly share the use of the camp's facilities. Households owning freezers also frequently share space with those who do not possess them.

Salmon

Stony River people harvest the four species of salmon available in the central Kuskokwim area during the summer with set nets, drift nets, and fishwheels. King, red, and chum salmon appear in the area by late June, with the peak of their runs occurring in July. A run of coho salmon ("silver") takes place in September. Coho salmon arrive in August and run into September or early October, with the heaviest concentration found in August. Residents say they harvest king, red, and chum salmon in the greatest numbers, followed by coho and finally pink salmon.

Today, the fishing base of most Stony River households is located on the island on which the community is situated. Some households maintain separate fish camps from which they harvest and process their

salmon catch, while other families prefer to use their village residence as a fishing base. As families moved from outlying areas into Stony River, fish camps were established in the community and nearby. Fish camp locations are depicted on Figure 9. During the summer of 1983, three separate fish camps were used by Stony River people and at least five winter residences were used as a fishing base. Members of one household regularly stayed overnight at their fish camp. Approximately eight households shared fishing bases. Long-term residents of at least four households did not fish in the area due to having jobs away from home or other circumstances.

Within their traditional area of use, salmon is solely a non-commercial resource for Stony River people. Over the years, however, residents have obtained jobs in the commercial salmon industry at other localities, including Bristol Bay, Bethel, and St. Mary's. Several Stony River people worked at cannery jobs, or for fish buyers at Bethel and St. Mary's during the 1983 summer season.

In the spring, people prepare for the summer fishing season by mending nets, overhauling motors and boats, repairing camp structures and fishwheels or building new ones if necessary. The raft of the fishwheel usually needs replacing every year or two, although the rest of the fishwheel may last indefinitely if it does not become unanchored in the spring by high water or ice and drift away. Residents made their own fishwheels out of spruce wood, chicken wire, and nails. Until 10 or 15 years ago, people used handmade wooden pegs instead of nails. Residents estimate that materials alone for fishwheels cost at least $100 today. About six fishwheels were in operation during the 1983 season. These were primarily located within several miles of the

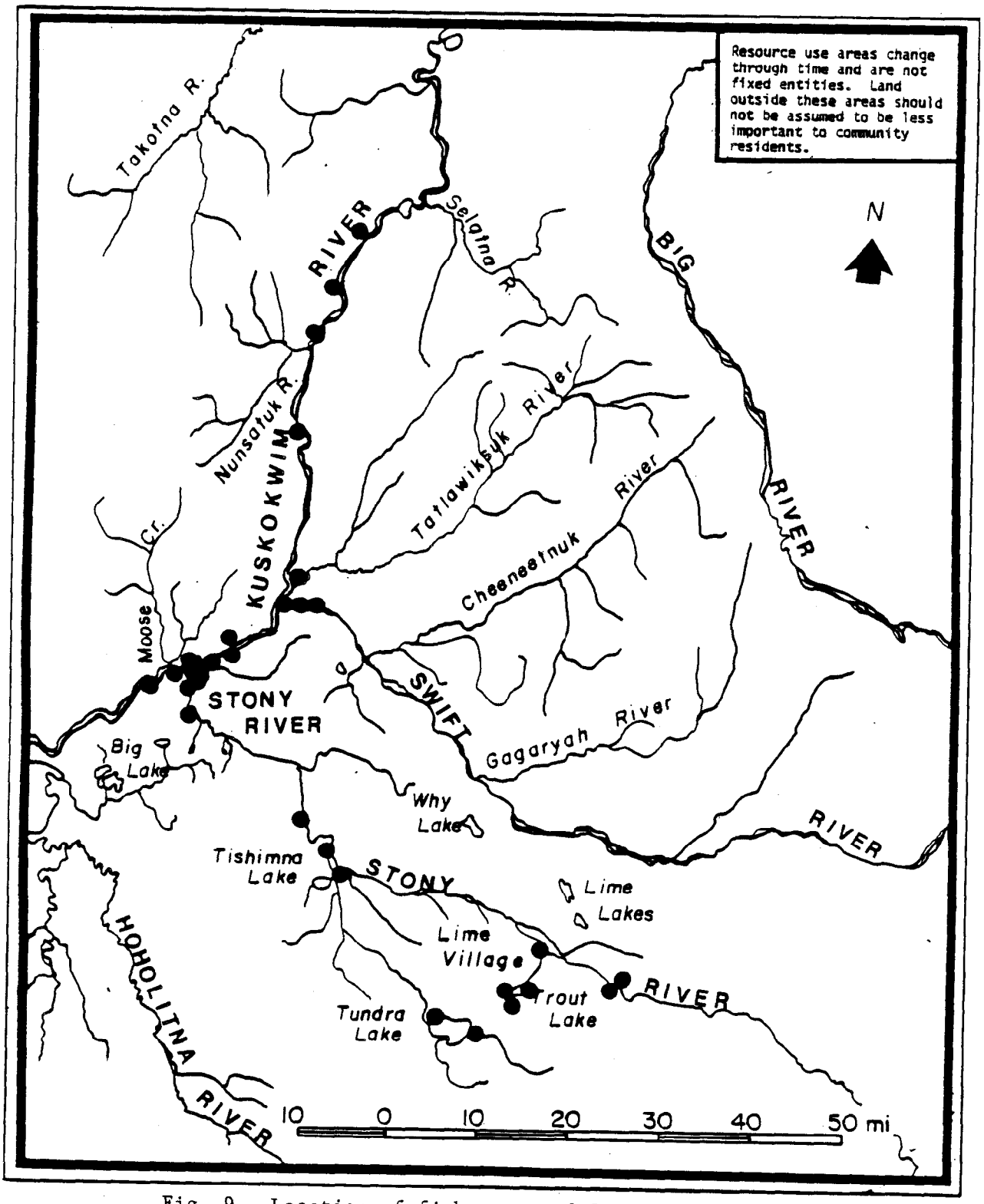


Fig. 9. Location of fish camps of Stony River residents, used during their lifetimes as reported in 1983-84.

community. Fishwheel sites have extended in the past, approximately 75 miles up the Kuskokwim River from the community. Nets are purchased commercially, dog salmon nets being the most commonly used. Most Stony River families use both fishwheels and nets to harvest salmon, this equipment commonly being shared by several households.

At a minimum, buildings and facilities at a fish camp normally consist of a smokehouse, cache, racks for hanging fish on, fish cutting table, a holding pen for fish before they are cut, and one or two tent frames, if the camp is used overnight. A well-established camp usually includes a cabin and bath house as well. Logs, poles, rough cut boards, sheet metal, and polethylene sheeting ("visqueen") are the most commonly used building materials.

People start their fishwheels at least by the time the heavy runs of fish begin. Nets are generally employed before and after the peak of the runs, since they are reportedly less efficient than fishwheels for harvesting large quantities of fish. Fishwheels provide the bulk of the harvest preserved for future use. They can hold more fish than a net and do not have to be checked as often. They are also easier to maintain because they do not get tangled with driftwood as nets do.

Fishwheels can also be stopped and started easily. Residents note that they make an effort to stop their wheels before they procure more fish than can be processed at one time. Good fishwheel sites are areas of deep, swift water located near the river bank. Eddies provide excellent set net sites because the fish are slowed down as they attempt to pass through. Fishwheels and nets are occasionally moved during the summer because of changes in water depth or to harvest the red salmon that ascend the Stony River and bypass the village.

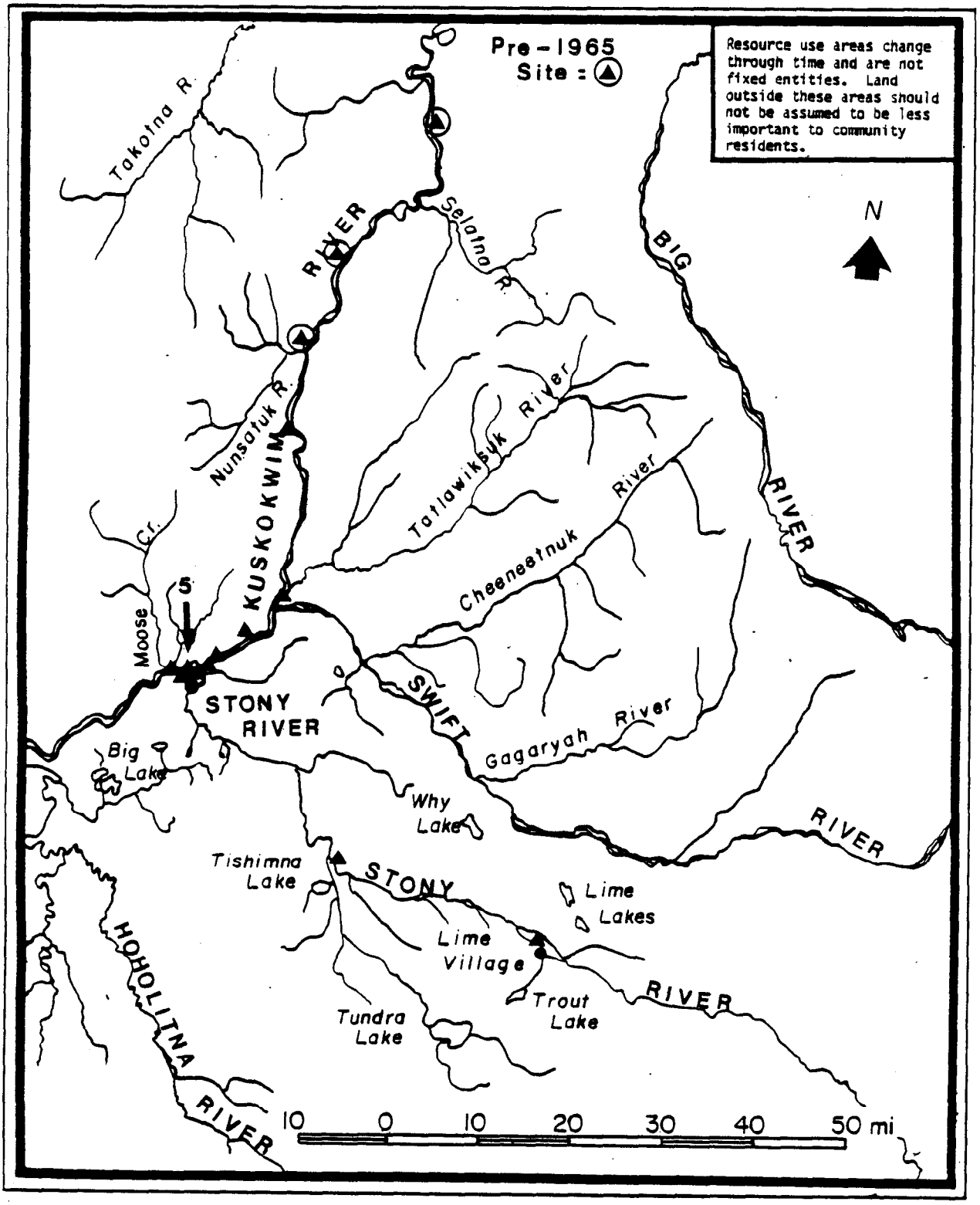


Fig. 10. The location of fishwheels of Stony River residents used during their lifetimes, as reported in 1983-84.

A significant decline in the use of fishwheels does not appear to have occurred in Stony River consequent to a decrease in the number of dogs in the community and greater use of snowmachines. Households which do not process large quantities of salmon keep a fishwheel going for less time than those families harvesting large numbers.

An individual or household gains tenure to a camp, fishwheel, or set net site through continued use of the site. The establishment of permanent structures at a camp also indicates this right. Because fishwheels or set nets are occasionally moved during a fishing season, an individual or household may hold priority to a number of wheel or net sites. Use of a site may be loaned to a party that has need of a site for a period of time, but the lender ideally retains rights of tenure to the site. An individual or household may also be given permission to take fish from another party's net or fishwheel. While most households prefer to use both nets and fishwheels in harvesting fish during the summer, this is not always possible. For example, a household may lose its fishwheel and not have the time or money to buy materials to make another one, or it may not have the cash to replace a net that has worn out. Therefore, instead of employing both a fishwheel and net during the season, they may have to resort to using one or the other until they have the means to replace what has been lost. This was the situation for several Stony River village households during the 1983 season.

On the other hand, a household may have the necessary equipment to fish productively but lack access to a convenient net or fishwheel site. Stony River residents prefer to use sites that are within a mile of their fishing base in order to save time and energy. A household may find itself without convenient net and fishwheel sites if, for example,

they are not able to use the place they normally fish from. A case in point was one household which had to remain near the village during a recent summer season and was not able to use its net and wheel sites conveniently because of personal circumstances. Fortunately, another household loaned it a net site close to the village.

Groups composed largely of nuclear and extended family members are primarily responsible for harvesting and processing the salmon. Work may be shared by multiple household units, which was true at no less than eight fishing bases during the 1983 summer season. Camps are overseen by older generation persons who are usually assisted by their children and other close relatives.

Once the salmon are running, work consists of checking the harvest site at least once a day and hauling, cutting, and hanging the catch. Men normally do most of the hauling, while women and children are primarily responsible for processing the fish. Girls learn in their pre-teens to cut fish for smoking, practicing first on fish for dogs, primarily chum, before progressing to the more complicated "eating" fish used for human consumption. On days when the runs are at their peak, residents estimate that an expert salmon cutter may cut up to 100 fish a day. After the fish is cut, it is usually hung directly in the smokehouse. A smokey fire locally called a "smudge" is kept burning most of the time to assist drying the fish and to keep insects away. Besides being consumed fresh, fish eggs are also dried on racks and used for food. Cottonwood and willow are the woods most commonly used for smoking fish. Depending on the weather and the length of time the fire is maintained, the fish takes three to four weeks to dry sufficiently,

after which it is usually stored in a cache in bundles of approximately 40 fish.

The amount of dried fish a household puts up in a season varies according to how many people and dogs they feed regularly, whether they have access to a freezer, their annual income, and weather conditions that season. Two Stony River households, comprised of five to eight persons and seven or more dogs, estimated that between 70 percent and 75 percent of their salmon harvest in 1983 was preserved by drying, and the rest by salting or freezing. A household composed of six persons and seven dogs having no freezer reported drying 90 percent of their salmon and salting the rest of what was not eaten fresh or given away. Half or more of the salmon that the three households harvested was estimated to be used as dog feed. One of the three households calculated that of their total salmon harvest for 1983, approximately 1,500 fish were used for dog food and 500 for human consumption. The amount of energy families spend on harvesting fish for their dogs is evidence of the importance of dogs to Stony River residents. Although snowmachines have replaced dogs as the primary method of transportation, they are important to people for protection from wild animals. Also of significance, they provide an alternate mode of travel if necessary.

Stony River residents also preserve significant amounts of salmon by two introduced methods, freezing and salting. "Salt fish" is made by placing slices of fish in a brine and storing it in a cool place. Before the fish is cooked, it is soaked in two or three changes of water for at least several hours each time.

Freezers came into relatively common use in Stony River in the early 1980s, when the Middle Kuskokwim Electric Cooperative provided the

community with power. Before then, a few households operated small privately-owned generators. During the summer of 1983, about half the households in Stony River owned freezers which were used for preserving in most cases only a small percentage of a family's salmon harvest. Besides drying, salting, and freezing salmon, a few households still preserve small amounts of salmon by a traditional method of fermentation. Fish head and eggs are either buried in a five- or six-foot deep hole lined with birchbark in the ground or hung in a bag in water for a number of days before being boiled for a short time and eaten.

The following examples describe fish camps and illustrate work groups which harvest and process fish.

Example 1: An elder is the head of his household's summer fish camp which consists of a smokehouse and cache. The family uses drift nets to harvest sheefish and both a fishwheel and set net to obtain salmon and other fish available in the summer. The man and several daughters who belong to one household were assisted during the 1983 season by a son who lives in his own home. The son does not have his own smokehouse or cache and stored his share of the fish in his father's cache.

Example 2: An older couple maintains a summer fish camp on the Kuskokwim upriver from the community. The camp is comprised of a cabin, smokehouse, cache, and tent frames. Normally the fish are harvested by both fishwheel and nets. The couple is assisted by three children from their own household and a daughter and her spouse who have their own home. Both households share the same cache and smokehouse and use the fish as they need it.

Example 3: A third fish camp is situated on an island near the village and is run by a middle-aged couple who are assisted primarily by their two school age children. The camp building includes a cabin, smokehouse, and bath house. Both fishwheel and nets are used to harvest the summer's catch but are not used simultaneously during the peak of the salmon runs. As the couple explained it, they could not process all of the fish that both would procure when used at once.

Example 4: An elderly man, the sole occupant of his household, uses his home as his fishing base. A cache and

smokehouse are situated nearby. His children and grandchildren assist in harvesting and processing of the fish. The fish are shared widely within the village.

Whitefish

At least five species of whitefish are harvested by Stony River people today. Areas used for the harvest of whitefish are depicted in Figure 11. In the past, they have occurred up the Kuskokwim River from Stony River village approximately 75 miles and up the Stony River about 75 miles. The focus of harvest in contemporary times has been the Kuskokwim River from Stony River village to the mouth of the Swift River. The three largest species, sheefish, broad whitefish, and humpback whitefish, are the most economically significant, being very important both as human and dog food. Some people prefer them for flavor over salmon and other species of fish they harvest. Two smaller species of whitefish are available to Stony River people. The round whitefish and least cisco are harvested in fewer numbers and are used mainly but not exclusively for dog food. Nets are the primary means of obtaining whitefish, although fishwheels and burbot traps are also used. The broad and humpback whitefish are also taken with leisters in the fall. Following is a discussion of the major species of whitefish utilized by Stony River people.

Broad Whitefish, Humpback Whitefish

Other than the sheefish, the broad and humpback species are the largest whitefish available to Stony River people and the most

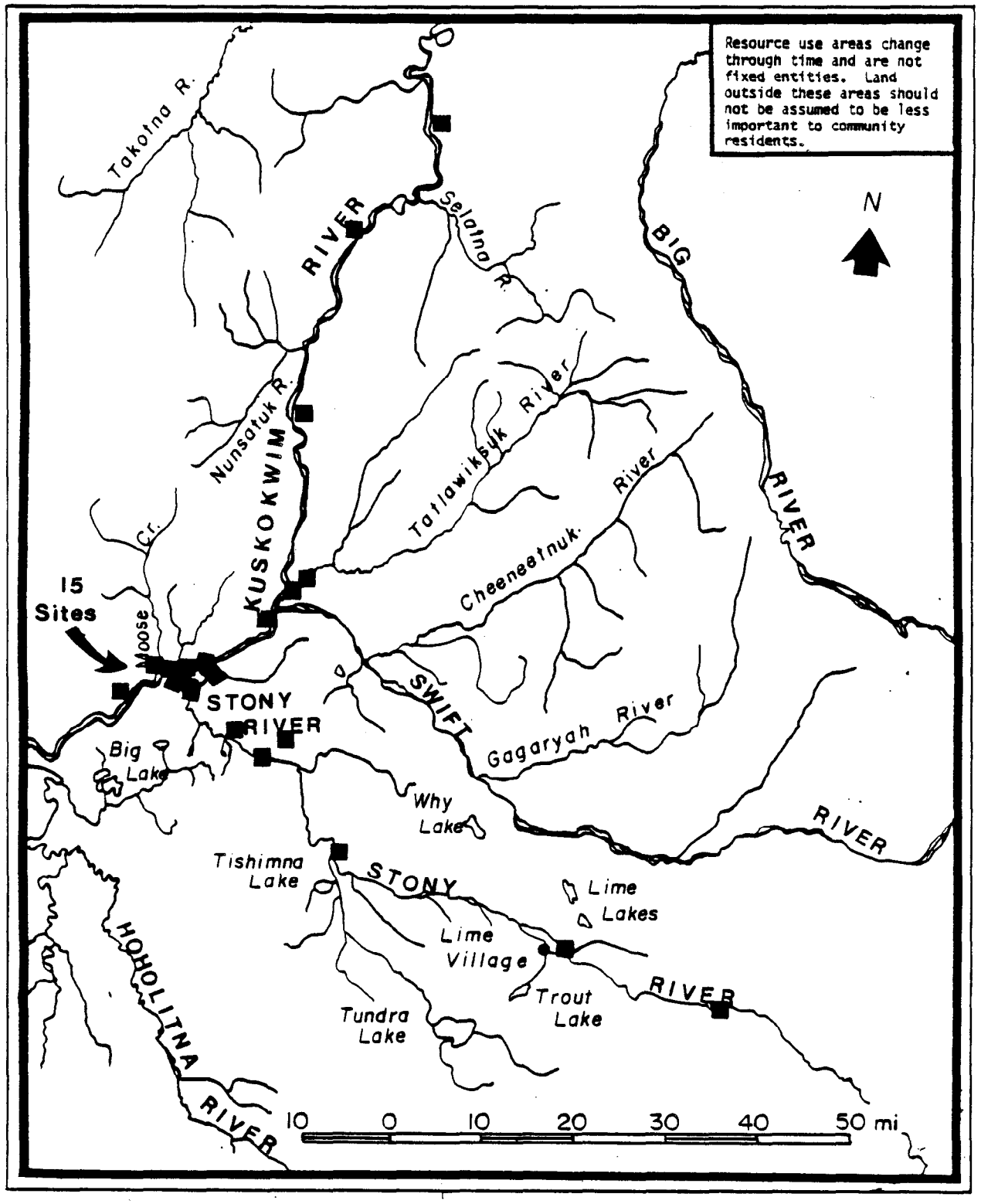


Fig. 11. Areas used for the procurement of whitefish during the lifetimes of Stony River residents as reported in 1983-84.

economically important to them. They migrate through the central Kuskokwim River mainly in the spring and fall and are harvested by Stony River people primarily in nets, fishwheels, and by spearing. As early as August, people begin to harvest whitefish and other non-salmonid species and silver salmon in nets and fishwheels. They continue to catch them by these methods at least until the ice runs. Once the shore ice is firm enough to walk on, people set nets under the ice for whitefish and other non-salmonid species. They do this again in the spring before break-up. One net was set under the shore ice as soon as it froze in October and removed the second week of November. Again in the spring after the river opens, nets are set to harvest whitefish. The areas used for harvesting whitefish are depicted in Fig. 11.

Another method used for harvesting whitefish in the early winter is by standing on the shore ice and taking them in open water with leisters, locally called "spears." Leisters are bought commercially or are handmade with nails placed in a piece of wood or iron pipe. The approximately eight- to ten-foot poles are usually made of dried spruce, although other types of wood are sometimes used. People spear both during the day and at night using kerosene lamps. Night spearing is preferred because the fish are sighted more easily with a lantern than by daylight as they swim by. The light may be set on the ice near the spearer or another person may hold it for him. The spearer stands at or walks carefully along the edge of the ice, holding the leister and being careful not to make any sudden motions that might frighten the fish. Once he spots a fish that is moving towards him, he waits for it to position itself in front of him before thrusting the spear downward at the fish. If he misses the fish, he may carefully follow behind it,

trying to get in position for another thrust. When the fish are running heavily, it is sometimes possible to get two fish with one thrust. People greatly enjoy this method of harvesting whitefish. Other non-salmonid fish species are occasionally taken with leisters.

Besides spearing whitefish from the ice, Stony River people also spear them from boats. At least two people normally work together spearing and directing the drifting boat. At night, the lantern is tied to the boat. During the 1983 fall season, over one-half of the Stony River households harvested whitefish using nets, and members from almost all households speared whitefish.

The work of setting, checking, and picking a net, especially one set under the ice, is commonly done by members of multiple related households. The more fish caught at a time, whether by spearing or by net, the more likely they are to be shared with people outside one's household. A person who spears a fish is considered the "owner" of the fish, although when several people work together closely, as when spearing from a boat, they may decide to pool their fish. When a run is good, members of a party who traveled to a spearing place together may decide to pile their fish together and then divide it up equally or according to need.

Some residents noted that the number of whitefish taken with leisters during 1983 was not as great as in 1982. A reason given for this was that the main run of whitefish came before there was sufficient shorefast ice from which to fish. The following examples portray methods of parties spearing whitefish and the composition of harvest groups.

Example 1: Several years ago in November, a man and his brother-in-law drifted from the Swift River to Stony River village spearing whitefish. They obtained over 100 fish which they reportedly divided equally between each other. When they returned home, they distributed part of their catch to each household in the community.

Example 2: Two adolescent boys went whitefish spearing together several times in November 1983 at night on an island adjacent to the one on which the village is situated. Fishing for several hours each period, the first time they went they reportedly caught 13 whitefish and the second time 22 fish. One boy provided the snowmachine and the other the spear. They divided the catch evenly between themselves.

Early in the fall season before temperatures are below freezing for most of the day, whitefish is gutted, cut like fish for dogs, and hung in the smokehouse to dry. Households with freezers may also freeze some at this time. After temperatures are reaching below freezing for most of the day, whitefish is frozen ungutted in a cache or on a platform constructed especially for storing late fall and winter fish. Families that have freezer space may also use it for preserving whitefish.

Stony River people consider both the broad whitefish and humpback whitefish to be high quality food both for themselves and their dogs. Whitefish is boiled, baked, and fried for eating and is especially relished in "native ice cream." The head, eggs, and stomach of the whitefish are also eaten, the latter two especially being considered a delicacy. Both whitefish meat and eggs are consumed frozen without being cooked. Whitefish eggs are also eaten fermented.

Sheefish

Stony River village residents harvest sheefish primarily in May and June when the run is at its peak in the central Kuskokwim area. The

sweet, somewhat oily, white meat of this large whitefish is especially enjoyed by people, as it arrives in numbers after the winter fish and before the much-awaited king salmon. Sheefish are harvested with both set and drift nets in the spring as soon as the river is sufficiently free of ice for boat travel. People say that they occasionally find them in their nets and fishwheels in the summer and fall. Sheefish are also taken by hooking through the ice and in open water in the spring.

Sheefish are eaten fresh or preserved by smoking and freezing. One resident estimated that her household's sheefish harvest is approximately 10 percent of their total salmon harvest.

Burbot ("Lush")

Burbot, locally known as "lush," appear in the central Kuskokwim area by the time the ice runs in the late fall. Burbot migratory habits are not well-known (Morrow 1980). Stony River residents observe that they can only harvest burbot as they move upstream and that the colder the weather, the greater the numbers harvested. Areas used for burbot and blackfish trapping and hooking are presented in Figure 12.

In contemporary times, most burbot traps, blackfish traps, and "hooking" sites have occurred within about 15 miles of the community of Stony River. Present-day residents have also used hooking sites in the vicinity of Lime Village, a direct distance of approximately 50 miles from Stony River village, and a blackfish trap site up the Kuskokwim River about 70 miles from the community.

Stony River villagers take burbot by four methods: set nets, spearing, "hooking," and winter fish traps, the latter being the primary

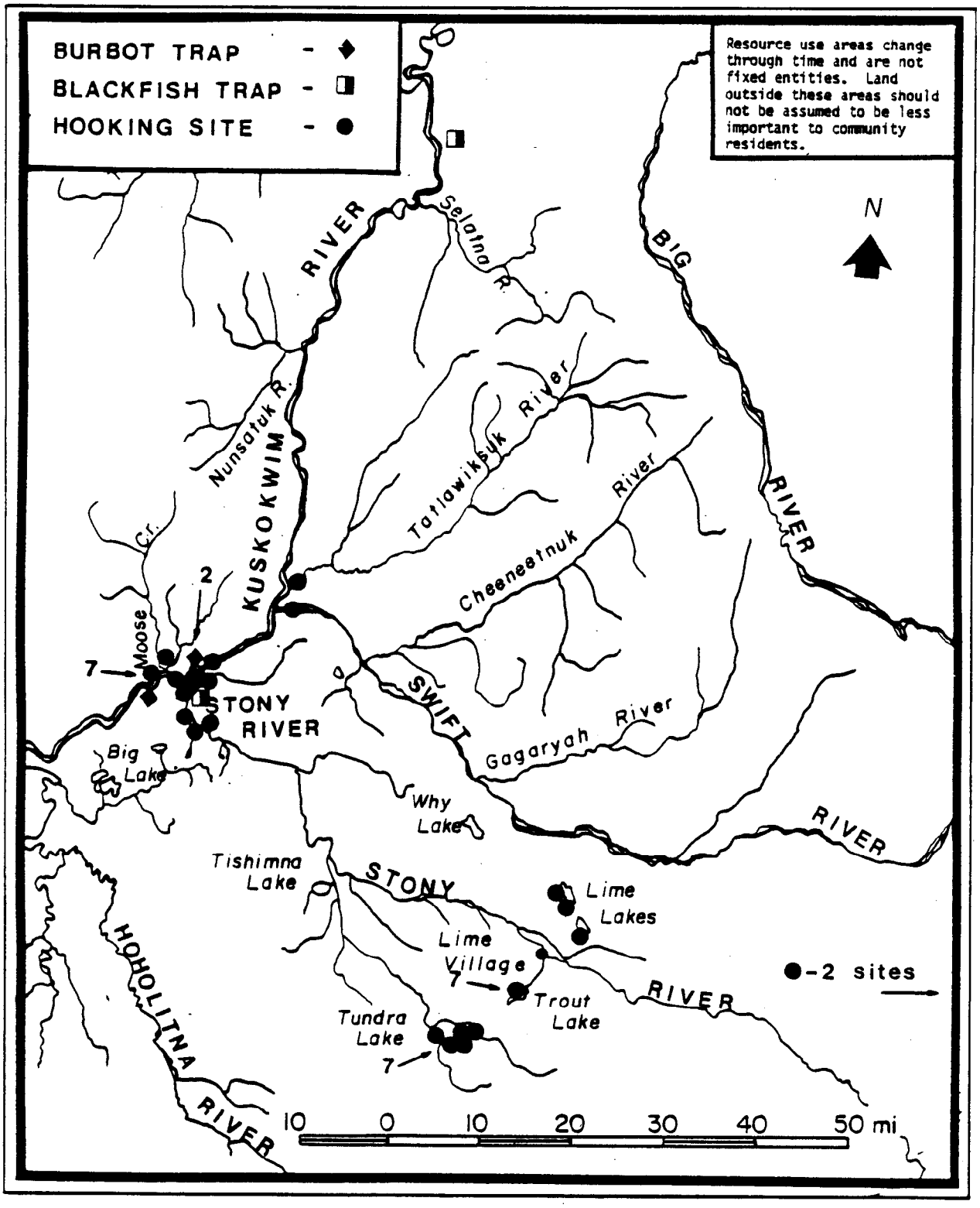


Fig. 12. Areas used for burbot and blackfish trapping and hooking during the lifetimes of Stony River residents as reported in 1983-84.

means. Set nets that are left out in open water after the ice begins to run usually catch a few burbot, as was the case in October 1983. Burbot are also harvested in nets set under the ice in late fall and early winter. They are occasionally hooked through ice near the shore in early winter and late spring, and taken with leisters from the shore ice in November.

Fish traps and fences set under the ice are the most productive methods of harvesting burbot. People begin using traps in late November and December and remove them at least by March or April. The greatest numbers of fish are taken in mid-winter.

The fence and trap are situated close to the river bank at a place where the current is swift. The fence extends out from the bank at an angle approximately 50 to 75 feet. Today the fence is made primarily out of local or commercial wood and chicken wire. The basket-style trap also almost always is made out of chicken wire, as is the funnel which directs the fish into the trap. However, at least one man within the last few years has constructed a trap using sticks split out of spruce wood tied with commercial twine. In the past, the fence also was made of split spruce wood and both trap and fence tied with spruce roots. Charnley (1984) provides a more complete discussion of the type of burbot trap used in the central Kuskokwim area.

In order to place the fence and trap, a trench is made in the ice with chainsaws and ice picks. Besides constructing and placing the fence and trap, the trap must be checked for fish regularly at least once a day when the run is strong. In order to obtain the fish, the basket is chipped out of the ice using an ice pick, is emptied of its

contents, and reset. The harvested fish are then used fresh or stored in a cache or on an outdoor platform.

In very cold weather, a large trap can harvest 100 or more fish at a time. With warmer temperatures, the numbers decrease. In mid-winter the majority of the fish are burbot. As spring approaches, the percentage of other non-salmonid species, such as whitefish species, increases greatly. The "lush" harvest was reported to be good in December 1983 and January 1984. As normal, it slackened in February and March. In April, according to residents, the fish are especially fat but not plentiful.

Stony River residents prepare burbot for eating by boiling, frying, or baking. Besides the meat, they also consume the intestines, organs, eggs, and the liver which is large and considered a delicacy. Not only is burbot a source of fresh fish throughout the winter for Stony River people, but it is also very important as a winter dog food.

The greatest cost of constructing a fish trap is the chicken wire. A 50-foot roll, 4 feet wide, was reported to cost $50 in Aniak and $69 in McGrath in 1983. Two rolls of this size are said to be necessary for building a good-sized trap and fence, approximately 50 by 50 feet. Normally new wire has to be bought every year because the ice tears it.

In recent years, three or four fish traps have been in operation each winter in Stony River, with several or more households sharing in the construction and maintenance of the fences and traps and in the harvesting of the fish. People who help with the work are entitled to a share of the fish, although ownership of a fish trap is vested in the person or household that organizes the initial construction of the trap and fence.

During the mid-winter of 1983, three fish traps and fences were constructed by Stony River residents, all by multiple household units. One trap was overseen by an elder of the village and his wife who each year maintains a fish trap. During 1983, members of at least two other households, one of whom was related, helped in the construction of the trap and used fish from it.

A second fence and trap were built by members of three separate households, all of whom were related. Other relatives helped to maintain and harvest fish once it was constructed. Relatives who did not help with construction and maintenance of the trap were also given fish from it to use. Non-relatives who did not assist generally paid for the fish they used from the trap.

A third fence and trap were constructed by a man, his wife, her brother, and a man unrelated as kin, all of whom belonged to separate households.

Arctic Grayling

Grayling occur in the streams of the land use area of Stony River people. They overwinter for the most part in the larger tributaries, congregating at the mouth of clear water streams before moving upstream to spawn. In the fall, they move back downstream to the deeper water again.

Grayling is a fish species of secondary importance to Stony River village residents when compared with salmon, whitefish, and burbot. It is taken in the greatest numbers in the fall by hooking through holes in the frozen sloughs, the shorefast river ice, or in the open water at the

edge of the ice. Commercial lures or pieces of red yarn are used to attract the fish. Morning after daybreak, late afternoon, or early evening before dusk are said to be the best times to get bites. Also in the fall, grayling are occasionally speared with leisters when people are catching whitefish. In the winter, they are harvested in burbot traps and during the spring in nets set both under the ice and in open water. Occasionally they are hooked during the summer at the mouths of small streams.

Children and adults participate actively in hooking grayling. During the 1983 fall season, as soon as the shore ice became safe, individuals or small groups spent an hour or two daily in favorite hooking locations such as in front of the village. One adult male said he "jigged" for grayling about three times during the 1983 fall season. He fished in one-hour intervals and caught up to nine fish each time. During the same season, a pre-adolescent boy started hooking grayling with his brother on November 1. Going every few days, he reportedly caught about 20 fish by November 10.

One adult male observed that he usually begins hooking grayling in late October after the ice freezes. He usually fishes by himself, going two to four times a week for several weeks. He fishes for an hour or two at a time and may catch up to ten at a time if he is very lucky. As his household is small, he considers 30 grayling an adequate winter supply.

Northern Pike

Northern pike are found in lakes and streams of the central Kuskokwim area. They are available to Stony River residents year-round who harvest the largest number of pike annually with nets. In the late fall and winter, they are occasionally taken with set nets under the ice, in the river with leisters, and in burbot traps.

Late winter and spring are the primary times for obtaining pike. Before the ice breaks, they are taken with nets set under the ice and by hooking through the ice. Burbot traps are also used to procure a few at this time. After break-up, nets and fishwheels harvest pike.

Pike are used for dog food as well as for human consumption. People boil and fry the meat and make "native ice cream" from it. Besides the meat, the eggs and liver are also eaten. The harvesting of pike in lakes during the spring is sometimes combined with muskrat and duck hunting.

Longnose Sucker

Suckers occur in the stream drainages and lakes of the central Kuskokwim area. In the spring, they move from deep stream pools or lakes into shallow parts of streams to spawn (Morrow 1980). They spend the summer moving more or less randomly up and down the stream but with a general downstream trend, so that no fish remains in the upper portion of the stream by fall. Suckers have traditionally been taken in the spring in large quantities for dog food, and families still harvest them for this purpose with nets placed under the ice and in open water.

Infrequently, they are taken in nets, fishwheels, and by hook and line during the summer. Occasionally they are procured in winter fish traps. They are used as dog food cooked fresh or dried.

Arctic Lamprey

Arctic lampreys, or "eels" as they are known locally, migrate up into the central Kuskokwim area in November to spawn. According to Stony River residents, they only make one large run a year past the village. At this time, the "eels" must be watched for carefully, as it is possible to miss the run altogether. Residents harvest them with "eel" sticks, poles eight to ten feet long, planed on one end at an angle, with approximately eight nails embedded in them. They are caught in open water from the shore ice or through a large hole in the ice. The person "eeling" thrusts the stick into the water and then pulls it up hopefully entangling a lamprey on it. Occasionally lampreys are caught in fishwheels as occurred during the 1983 season. The large three-foot "eel" was cooked and enjoyed thoroughly by the family in charge of the wheel. According to local residents, lampreys have not been harvested in quantity by Stony River residents since 1980, because they reportedly have not observed a large run in the area since that time.

Lampreys are baked for human consumption with the head, intestines, and organs removed. Lampreys are rich in oil and are also considered good dog feed. When caught in large numbers, they are frozen.

GATHERING

Introduction

Stony River villagers utilize many of the trees, shrubs, and herbaceous plants found in their land use area for a variety of purposes. The larger woody plants are harvested in greater amounts than other types, because most households depend on them as a source of heat. They also provide materials for large construction projects as well as a variety of other needs. Berries, which are used for food, are the most important resource provided by the smaller plants. The leaves, stems, and roots of a number of herbs and small woody plants also supply Stony River people with food, medicine, and raw materials for technology. Produce from vegetable gardens that families grow supplements the wild edible plant foods which they harvest.

Trees and Large Shrubs

Stony River residents procure wood primarily for fuel, although it is used also for a variety of other purposes including the construction of buildings, sleds, boats, oars, fish traps and fishwheels. Residents also carve bowls, spoons, tool handles, and other implements such as skin stretchers, furniture, snow shovels, fish poles, and racks. Spruce and birch are the most economically important species, although cottonwood, alder, and willow are also used. Areas used for harvesting wood of all species recorded in this study are depicted in Figure 13. Most

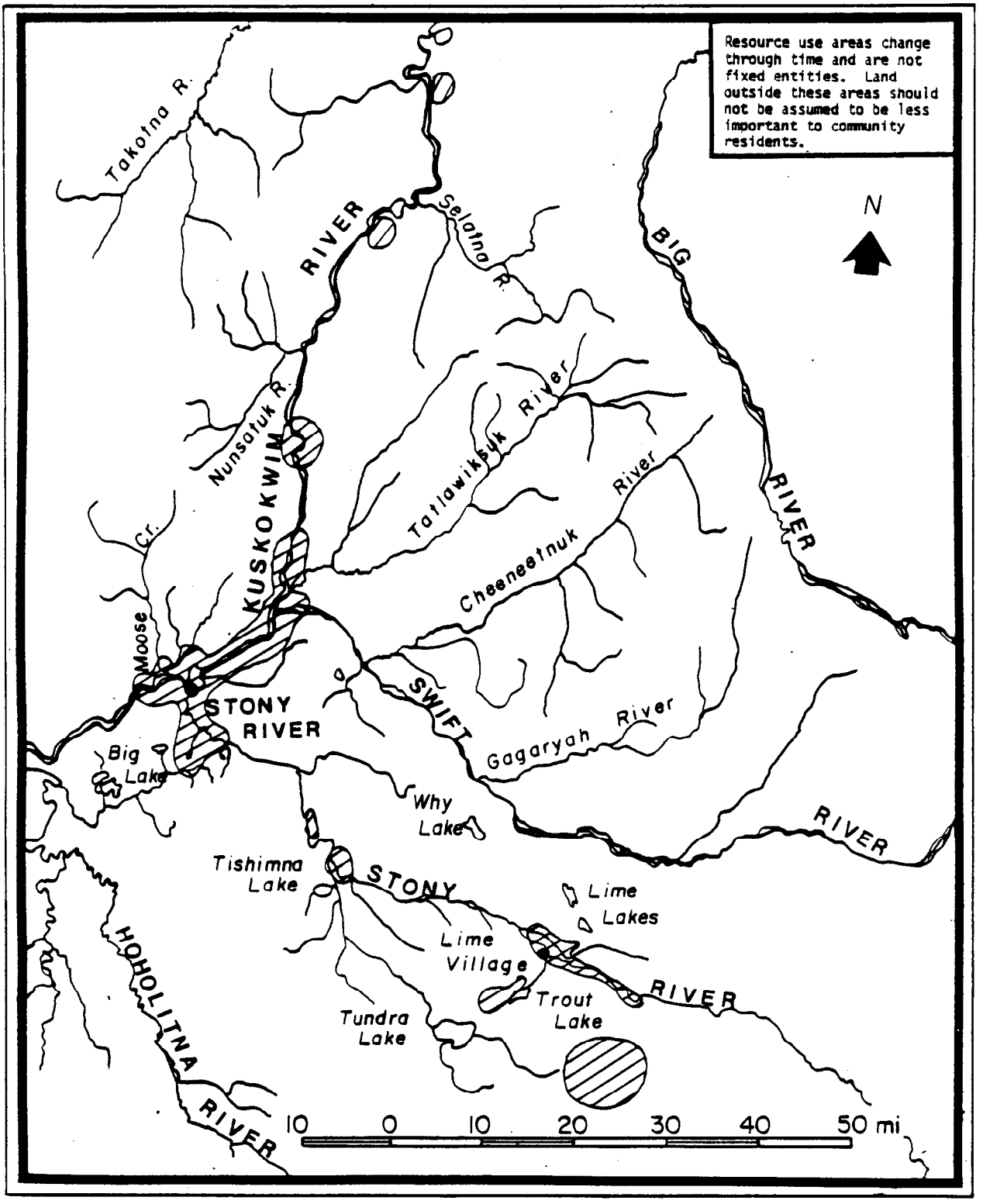


Fig. 13. Areas used for collecting wood during the lifetimes of Stony River residents as reported in 1983-84.

woodcutting today occurs within ten miles of the community along the Kuskokwim and Stony rivers.

Stony River residents harvest wood year-round for fuel but spend their greatest effort during the fall, winter, and spring before break-up. Including the school teacher's quarters, all but four residences were heated with wood during the 1983-84 winter season. The families which did not burn wood used oil for heat. Most families which heated with wood also cooked at least partially with wood. White gas, bottled gas, oil, and electricity were other fuels also used for cooking. During the period of this study, approximately a third of the households had steambaths heated by wood. In the summer, significant amounts of wood are used at fish camps to smoke salmon.

Members of one household estimated that they used between 5 and 7 cords of wood a year to heat their 16 x 16 foot log home, while the owner of an 18 x 20 foot log house said he used about 10 cords. The head of a 20 x 24 foot log home estimated his family harvested at least 15 cords of wood for cooking and heating. In very cold winters, more wood is reportedly used.

In the summer and especially in the fall before the ice begins to run, villagers make trips by boat upriver to wood cutting locations on the Kuskokwim and Stony rivers (Fig. 13). To obtain dry spruce wood near the riverbank, residents estimate they commonly must travel at least three to seven miles. Dry spruce wood is highly valued for making quick-starting, fast-burning fires. People have made standing dry spruce wood by peeling sections of bark from a living tree. Green wood, on the other hand, is easily obtained within a mile or two of the village. People prefer not to cut too far from the banks during summer

and fall because of the necessity of hauling the wood out on foot. On the return trip, it is common to fill the boat with dry wood and tie logs of green wood to the back or front of it.

In October, running ice stops most wood hauling by boat. Cutting standing trees is not allowed on the island where the village is situated. Therefore, wood harvesting in quantity cannot be resumed until the sloughs which provide access to the nearby islands and mainland to the east of the village freeze over sufficiently to allow travel by snowmachine and dogs. Members of most households haul their wood by snowmachine, although a few households used dogs regularly during the 1983-84 season.

By early November 1983, people were crossing the sloughs to harvest wood and to set and check marten traps and beaver snares, activities often combined in the early winter. The week before Thanksgiving, families were hauling extra quantities of wood and pulling snares and traps in expectation of the high water that the ice jam downriver was expected to bring as it moved upriver. The high water normally floods the sloughs preventing travel across them for several days to a week.

After the Kuskokwim is well frozen, people travel up and down along its west and east banks in both directions harvesting wood (Fig. 13). Some families also regularly travel up the Stony River for wood. Driftwood is plentiful both in the sloughs and along the river shore and quantities of it are procured. While green wood is easily obtained in close proximity to the riverbank, trails are made inland to obtain quantities of the less accessible, highly desired dry spruce.

Wood harvesters made their trails into an area where there is a high concentration of dry spruce. They may choose an area also for its

trapping potential in order to combine both activities. Members from several households may share in the work of making the trail and thus in the use of the area. Woodcutting areas are not owned, although persons making a trail to an area ideally have priority to use it because of the work involved. Trails are made on foot with chainsaws and axes.

A person owns the wood once it has been harvested unless arrangements were made to cut it for someone else. Persons of separate households who cut wood together commonly divide it. Wood is not sold and rarely is it traded. If members of a household do not have the means or skills to obtain their own wood, relatives or friends from other households assist in procuring it. The assistance may be in the form of lending members of the needy household the necessary equipment to obtain their own wood or cutting and hauling the wood for them. The following cases provide examples of production units and the sharing and lending of skills and equipment:

> Example 1: During the winter months, a man and his wife make several trips a week, usually on weekends, to harvest wood for their immediate family, which consists of themselves and five dependents. Sometimes their older children make separate wood hauling trips on their own during the week. A related adult male who is the sole member of his household also cuts and hauls wood for the family. The two households frequently participate in other land use activities together. A snowmachine is the main mode of transportation used for wood harvesting, although occasionally dogs are used.

> Example 2: During the 1983 early winter season, a woman and her daughters, who formed a single household, were without a snowmachine or dogteam. They made a trail for cutting wood across the slough from their home on an adjacent island. They went out about once a week to cut and stack their own wood, a niece of the woman sometimes accompanying them. Some of the wood they hauled back home on a sled the older woman made herself. However, a cousin and other relatives hauled most of the family's weekly wood by snowmachine. At times the women reportedly furnished the gasoline for the vehicle in return for the service.

Example 3: Using only dogs for transportation, one adult male regularly harvests and hauls wood for his household and that of two other households. Two cousins work with him, at separate times, for approximately half the time he spends at this activity. The work is normally shared by one person cutting it and the other hauling it. They usually divide the wood equally between them.

Stony River people today follow woodcutting practices which they used in the past as well. They do not clearcut, but select trees for specific qualities and purposes. For example, straight trees are preferred to crooked ones, which are harder to split. Broken, bent, and windfallen trees are regularly harvested. Where a group of trees are located too close together for prime growth, some are harvested while others are left to grow. The limbs of trees that have been knocked down are commonly piled in one place and burned at the woodcutting site or occasionally transported home where they are used for fuel for cooking dog food.

The different species of trees are used both separately and in combination for firewood, depending on a variety of factors including the season, outdoor temperature, and the purpose for which the wood is to be used. Dry spruce is used as kindling for starting fires and when a fast, hot-burning fire is needed such as for cooking. Some families reportedly use mostly dry wood throughout the year. Green spruce is used for maintaining a fire, especially during the day and at night when temperatures are not cold. Birch, which produces a hot, slow-burning fire, is used especially at night but also during the day when temperatures are cold outdoors. People say "cottonwood," which is plentiful, can be used, but is slow-burning and does not produce a hot fire. It also makes a lot of ashes. It is commonly used along with

alder and willow for smoking fish and meat and for keeping mosquitoes away.

Stony River village residents use trees and large shrubs for a variety of purposes besides firewood. Following is a discussion of some of these uses according to species.

Spruce

Not only do Stony River people construct many of their buildings from spruce, but they also use the wood for building boats, fishwheels, and fish traps. Bowls, spoons, furniture and marten stretchers are fashioned out of spruce wood also. In contemporary times, spruce pitch has been used as caulking material, medicine, chewing gum, and spruce roots as string and rope. Spruce needles are boiled and the tea used as a medicine for stomach ailments. Residents also at times use spruce boughs as bedding material for themselves when camping.

Birch

Stony River people still use birch wood to make sleds and carve bowls, spoons, and tool handles. Within the past ten years, snowshoes have been constructed from birch by Stony River residents. At least one resident continues to made baskets from the bark. The loose bark is also still commonly used as a firestarter. A large birch fungus is burned during the summer months to keep mosquitoes away.

Cottonwood

"Cottonwood" (Populus balsamifera), is occasionally used in the construction of small buildings. For example, one household built a cabin out of cottonwood which serves as their living quarters at their summer fish camp. Cottonwood is readily available on the island where the camp is situated. Bowls are also carved out of the wood.

Small Plants

Stony River residents harvest a variety of small plants, both herbaceous and woody, to use for food, medicine, and other miscellaneous purposes. They are procured most commonly today for food. In the past, they were more frequently used for purposes other than those for which they are today. Central and upper Kuskokwim people, of which Stony River villagers are no exception, continue to be primarily fish and meat eaters as they were traditionally. Plant foods, however, add variety to the diet as well as important minerals and vitamins. A few of them possess a relatively high sugar or starch content that is readily available for human use.

Today, Stony River villagers harvest the fruit (berries) of small plants in larger amounts than any other plant parts. They also obtain them from more species than they do edible leaves, stems, and underground parts. Leaves and stems are normally ready for harvest from late May through June, berries from mid-July through September, and underground parts in late summer and fall. Areas used for berrypicking are depicted in Figure 14.

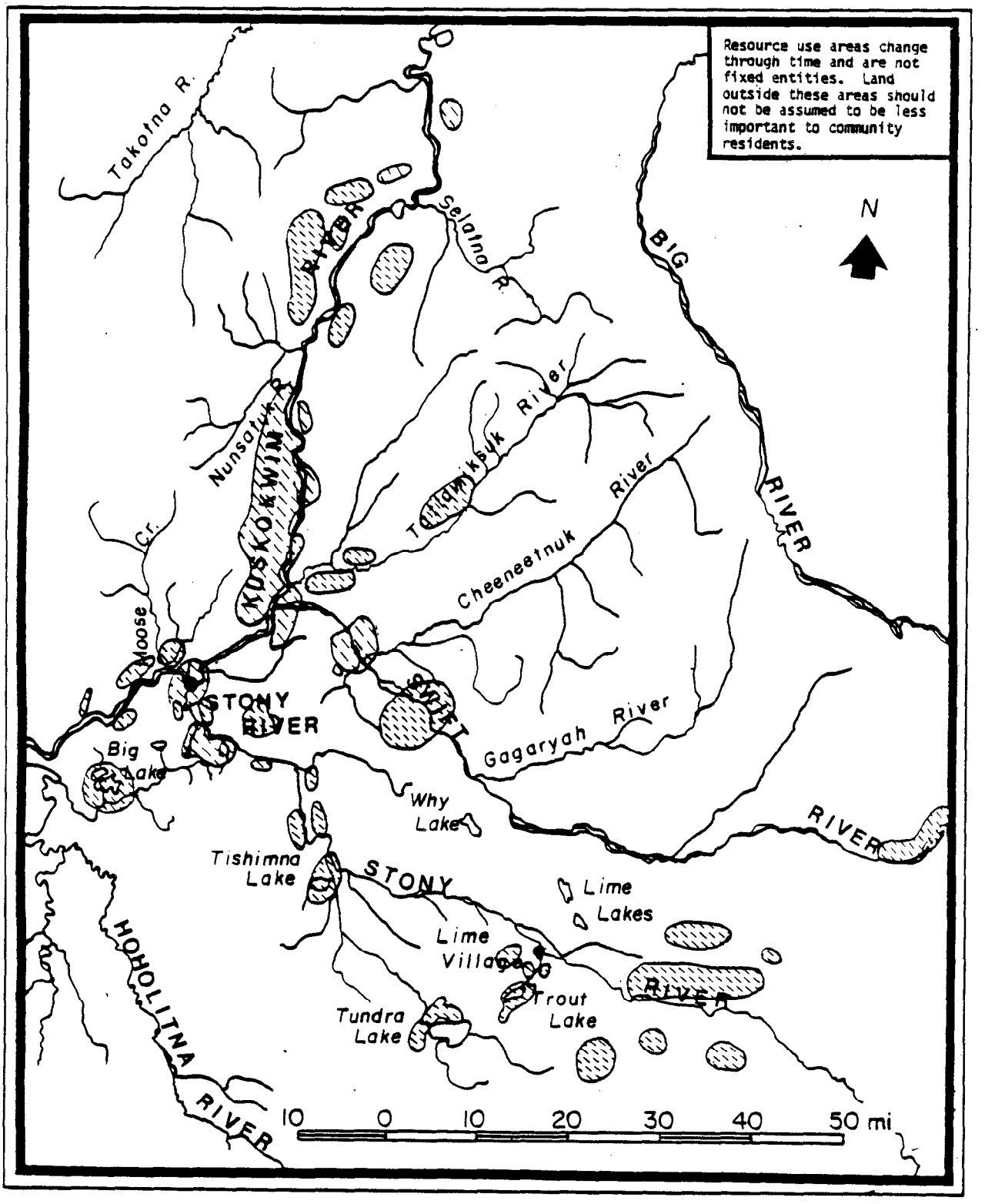


Fig. 14. Areas used for harvesting berries during the lifetimes of Stony River residents as reported in 1983-84.

Women and children are primarily responsible for the harvesting of small plants, although a spouse or other closely related adult male may assist them. Parties gathering small plants frequently consist of family members of other close relatives. Women and children without close kinship ties also accompany one another. Berry harvesting often occurs in association with other land use activities that primarily males are involved in, such as moose and bear hunting.

"Native ice cream," or akutaq (in Yup'ik) is a favored way of preparing and eating berries. To make akutaq, fish, usually whitefish, is boiled until soft, picked of its bones, and squeezed of its liquid into a pulpy texture. Liquified lard, preferably made from moose or bear fat, or commercial vegetable shortenings is stirred alternately with sugar into the fish. When the mixture is light and fluffy which may take up to one-half hour of hard mixing, the berries are carefully stirred in. Akutaq may be eaten fresh, although it is preferred frozen. It is prepared particularly for special occasions such as holidays, birthdays, and the arrival of guests from other communities. Dried caribou or moose meat is sometimes used in place of fish.

Other methods of preparing berries are to boil them with sugar and flour, make them into jams, jellies, and pies, or simply to eat them with canned milk and sugar. Besides preserving berries by making jams and jellies from them, people commonly freeze them. If no freezer space is available, they may layer them, especially blueberries, with sugar and store them in a cool place. In the past, berries were also preserved in oil or lard.

Stony River residents observed that 1983 was a good year for berries which they attributed to several reasons. These included a

heavy snowfall the previous winter which provided sufficient moisture for the plants in the spring. During the summer, there was the right combination of sunshine and rain, the weather being neither too moist nor too dry. Long cool rainy spells and lengthy periods of hot, dry weather both negatively affect the growth and ripening of the fruit. Households which pick berries the most actively estimated that in an average year they normally gather between five and ten gallons each of the family's favorite berries, which are usually blueberries (Vaccinium uliginosum), lowbush cranberries (Vaccinium vitis-idaea), "lowbush salmonberries" (Rubus chamaemorus), and "blackberries" (Empetrum nigrum). A head of one household said that her family picked 15 gallons of blueberries, 10 gallons of lowbush cranberries, and 5 gallons of blackberries during 1983.

Berries are both shared and traded within the village and with other communities. For example, in the fall of 1983, a Stony River woman was given lowbush cranberries by a cousin, also a resident of the village, who had picked them with Lime Village relatives at a whitefish camp near Stink River. The woman made jam with the berries which she shared with visitors who ate with her.

People commonly share both their skills and their resources. In the fall of 1983, a Stony River woman showed her niece how to make Native ice cream and gave her whitefish, lowbush salmonberries, and lard to make her own.

A place located above Stony River village, locally called Lisky's Crossing, has for many years been a favorite berry picking site for Stony River residents. Recently a non-local person reportedly moved

into the general site area. Residents say this occurrence has prevented their use of this important site.

Blueberries, lowbush cranberries, lowbush salmonberries, and blackberries are favored berries that are picked in quantity by Stony River people. Less desirable wild fruits normally gathered in smaller amounts include rosehips, highbush cranberries, and northern red currants. A more detailed discussion of some of the small plants harvested by Stony River people follows.

Salmonberries

"Lowbush salmonberries" (Rubus chamaemorus), the first berries to ripen of the season, are usually prime for gathering by mid- to early July. They occur in swampy flats (treeless bogs), which are not always easily accessible by boat and on foot. Parties who can afford to charter small aircraft to areas where the berries are known to be abundant and camp usually for a few days. Members of at least one Stony River family, a woman and several of her children, did this during the 1983 season. She noted that she and her children can normally pick between five and ten gallons of berries during such a trip as was the case in 1983. Blackberries (Empetrum nigrum) occur in the same environment as salmonberries and are sometimes harvested with them. They are not as sweet then as they are in the late summer, however, after the first frost occurs.

Blueberries

Blueberries (Vaccinium uliginosum), are normally ripe for picking by late July or early August. They are found most abundantly in flats, the slopes of open woodland, and mountain tundra. Favored places for picking them are on the hillsides along the Kuskokwim River above the village. A site near Lisky's Crossing is a favored locality. Members of several households related to Lime Villagers harvested blueberries and lowbush cranberries during 1983 in the vicinity of Stink Creek near the site of a fall whitefish camp. At least one Stony River family with relatives in Lime Village travels there each summer to pick blueberries. Black bear hunting is commonly combined with gathering blueberries.

Lowbush Cranberries

Lowbush cranberries (Vaccinium vitis-idaea), also called lingonberries, are generally gathered after the first frosts in late August or September because they sweeten with below freezing temperatures. They are especially common on the slopes of open woodlands and in alpine tundra where blueberries also abound. Favored places for picking lowbush cranberries are described earlier under blueberries.

Blackberries

Empetrum nigrum, locally called blackberries, are gathered after they first ripen in July until after the first frosts when they are

sweeter. They occur primarily in flats and mountain tundra. People frequently combine the harvesting of lowbush cranberries and blackberries with moose hunting, since the season is when these berries are ripe.

Rosehips

Rosehips (Rosa acicularis) grow in clearings and open woodlands and occur on the island the village is situated on. Some households normally pick two or three gallons, usually in early August, when they are slightly sweet. Because the fruit contains many seeds, people often eat them raw without any special preparation. Some families occasionally fry them in grease.

Wild Rhubarb

Stony River villagers utilize both the leaves and stock of wild rhubarb (Polygonum alaskanum), which occurs primarily in open woodland within their land use area. The plant is harvested in June before it becomes tough and unpalatable. Both the leaves and the stems are consumed either raw or cooked. The leaves are also boiled and eaten with grease while the stems are cooked with sugar or used raw in Native ice cream. The leaves and stems are occasionally canned for winter use. The large leaves are also used as a lining for holes where fish are fermented.

Wild Potato, Wild Carrot

Hedysarum alpinum, locally known as "wild potato" or "wild carrot," grows abundantly on the islands and sandbars in the vicinity of Stony River village. Residents dig the long roots of this plant in the spring as soon as the ground thaws sufficiently and after the first frosts of the season. They are sweeter and more tender at these times than during the summer months. They are eaten raw and are occasionally mixed into Native ice cream. They are also fried and boiled, sometimes with fish eggs.

Hudson Bay Tea

The leaves and stems of Hudson Bay tea (Ledum palustre), a small evergreen plant, also commonly called Labrador tea, are used by Stony River residents both in making a beverage and a medicine. The plant is steeped or boiled in water after which the liquid is drunk. The plant is used as a tonic for a variety of ailments including colds and "weak blood." Since the plant is an evergreen, it can be harvested year round, providing it can be located under the snow during the winter.

Grass

Stony River people use grass commonly today for cutting fish on and as bedding for their dogs. It has been used as insoles in foot gear and as stuffing material inside clothing. For additional warmth, it was also placed between a person's wet clothing and skin in emergency

situations. Within contemporary times it has been gathered for these purposes. One person explained that the advantage of grass over commercial insoles is that if it becomes wet, it can be thrown away and replaced by dry grass without expense.

Gardens

Most Stony River households which remain in the village during the summer cultivate gardens. Potatoes, lettuce, cauliflower, broccoli, turnips, cabbage, strawberries, and onions are some of the plants most commonly grown. During several summers in the early 1980s, CETA sponsored a community garden project in the village. The project was directed by a Stony River person who employed a number of village residents to assist with the work. Following the CETA project, the Kuskokwim Native Association (KNA) sponsored a garden project for school children of the village in 1983.

Produce is shared with the few families that do not have gardens. Sometimes several households share both in the work and in the harvesting of a garden. For example, a single male who did not plant a garden in 1983 assisted a family in harvesting their potatoes. In return for his work, he received a share of the vegetables.

CHAPTER 6

RESOURCE ISSUES RELATED TO LAND USE

Stony River people have strong attachments to areas which they use for harvesting wild resources, in part because of prolonged use and intimate knowledge of the area. Not only is their livelihood dependent on the wildlife harvested from these lands, but they share a common ethical system regarding how the land and its resources should be used. One of their most important ethics is to conserve resources by attempting to harvest only what can be used and to use all that is possible of a single resource. Their system of sharing and bartering strongly supports these values. This value system also attempts to preserve the natural landscape and to prevent radical disruption of the environment and its resources.

Stony River people continue the practice of alternating resource areas in to order use their land base most productively. They maintain that alternate use areas are necessary, due to variability in the amount of a resource available, traveling and weather conditions, and a person's social and economic situation both within a season and from year to year. According to one long-term Stony River resident:

> "When we hunt the Kuskokwim, we hunt up to Deacon's Landing. When we can't catch [anything], we go up the river [a] long ways, sometimes around Vinasale area. We hunt [around] Selatna too... When we hunt ducks we go anyplace, sometimes [up] Tatlawiksuk where we can go--[along the] Kuskokwim [a] long ways too. [For] trapping we go up Swift River clear to the mountains. [And] Gagaryah [Creek] way up. [We go up the] Cheeteetnuk all the way to White Mountain... [and to] Nunsatuk [River] all over around the hills and mountains. Sometimes we go almost to Deacon's following the hills.

> [There are] berry picking areas around Lisky's, Stony River, inside Tatlawiksuk, on the tundra around Gregory's, Swift River..."

Stony River people have voiced concern over the potential impacts of the State of Alaska's Holitna Basin Oil and Gas Lease Sale, planned land disposals, and other development-related changes in their resource use areas (Alaska Department of Natural Resources 1983a; Bureau of Land Management 1983). Following is a discussion of major development proposals for the area.

The proposed Oil and Gas Lease Sale 46, Holitna Basin, by the Alaska Department of Natural Resources, Division of Minerals and Energy Management is of concern to Stony River residents. The proposed area is bordered on the west by the Holitna River and on the north by the Kuskokwim River, extending to the communities of Sleetmute and Stony River. The Stony River runs near a portion of its eastern border, although Lime Village lies immediately outside of it. Its southern boundary lies near the upper reaches of the Holitna River. Not only is the community of Stony River situated on the border of the proposed area, but a significant portion of the land used by its residents for wild resource activities lies within it (Figs. 3-14). The area between the Swift and Holitna rivers is used extensively by Stony River residents for hunting and trapping, and is also utilized for fishing and gathering.

Stony River people have voiced concern over the potential impact of the sale. For example, the seismic testing that took place in the Swift River area between the spring and fall of 1983 in advance of the proposed sale produced loud blasts. Residents of Stony River believe that

this testing may have frightened caribou and other animals away from the hunting and trapping grounds in that area.

Second, the U.S. Department of the Interior, Bureau of Land Management, is proposing to open up lands known as the Upper Kuskokwim/NYAC planning blocks for mineral entry, mineral leasing, and settlement (Bureau of Land Management 1983). Some of the area included within the Upper Kuskokwim block is used by Stony River people for subsistence purposes. This land block extends from near McGrath and Nikolai on the north to include Sparrevohn Air Force Station and Lime Village near its southern boundary. The Kuskokwim River runs near its western border, with the community of Stony River located close by. Land used by residents of the community for subsistence purposes within the block occurs along the Tatlawiksuk, Swift, and Stony River drainages. Some of their most highly valued hunting and trapping land occurs within the block. Important fishing and gathering sites are also situated close to the western border along the Kuskokwim River and at the mouth of the Swift River.

Stony River residents have expressed concern over the impact this program may have on the wild resources of the area and their use of them. They have voiced the opinion that the large number of helicopters in the area associated with the above described programs likely contributed to wildlife disruption and thus harvest disruption. Low trapping and hunting harvests for Stony River people during the 1983-84 winter season may be evidence of this.

Third, the State of Alaska through the Alaska Department of Natural Resources (1983b) is currently proposing to open 40 non-agricultural homesteads of 40 acres maximum size known as the "Wasky Homestead Disposal"

site (Alaska Department of Natural Resources 1983b). This is part of the State's FY86 land disposition. The site is located on the Kuskokwim River between Stony River and McGrath approximately 50 miles downriver from the latter community. This and the surrounding area delimited between the vicinity of Devil's Elbow, which includes Lisky's Crossing several miles below it, and the mouth of the Nunsatuk River, appeared to have been used at least throughout this century by Stony River people and their ancestors for resource harvesting (Figs. 3-14). Besides providing a livelihood, the area has strong cultural and historical significance for Stony River residents. This is also the case for at least one long-term resident family of the area presently residing outside of the village and within 15 miles of it. In this report, that family has been included when reference was made to Stony River people or households.

Following is a very brief history of the Wasky and Stony River areas. As reported earlier, the native people, primarily of Yup'ik and Athabaskan descent, commonly lived along the central and upper Kuskokwim River in one or several household units. One such unit was located at the Wasky site to which "Black Wasky," a native of the central Kuskokwim area (Inowak Creek) reportedly moved with his family in the early 1900s. The family built one or more cabins across the Kuskokwim River from the Wasky disposal site and used the area for big and small game hunting, furbearer trapping, fishing, and gathering. They are also said to have built at least one trapping cabin within the disposal site. A cemetery is located on a ridge adjacent to the homesite.

Several of "Black Wasky's" children and their families had moved to the vicinity of Devil's Elbow by the 1940s, where at least some of them remained until the early 1960s, and then dispersed to Stony River and its

vicinity, Lime Village, and other central Kuskokwim communities. Nevertheless, these families retain strong ties to the area. Another cemetery is said to be located in the vicinity of Devil's Elbow. Members of at least four contemporary Stony River households were raised or spent a significant period of their lifetime at locations within the area.

Native place names also provide evidence of customary and historical use of the area. They also reveal information about the local geography. The site where "Black Wasky's" is located is called Gitthe' chux "head big" in Deg Hitan (Ingalik) Athabaskan and Ugsurpak "big head" in Yup'ik Eskimo. The Wasky nomination site across from Black Wasky's homesite is named Ts'inaghilivindi "overflow place" in Deg Hitan and Seng'utuli "overflow" in Yup'ik.

Currently large game hunting, furbearer trapping, and berry picking are the resource activities Stony River people pursue most actively within the area (Figs. 3, 4, 5, 8, 14). It is estimated that at least 75 percent of Stony River households have used the area for resource harvesting within the past three years. The Kuskokwim River is a primary transportation route for Stony River people both in the open and closed water seasons when people traverse the area. Especially during the late summer and fall, they travel to the area by boat to hunt moose, black bear, and small game, and to pick berries. In the winter months, local residents normally reach the area by snowmachine and consider it to be important for trapping and hunting.

People mentioned specific locations within the area as being especially productive for certain resources. Both the Wasky site and Lisky's Crossing are commonly referred to as being important for furbearer trapping, hunting, and berry picking. The Nunsatuk River drainage is a

favored moose hunting and furbearer trapping grounds. Disruption of resource activities at Lisky's Crossing has reportedly occurred due to the settlement of a non-local resident on a mining claim.

The large majority of Stony River people are opposed to the development of lands within the area they use for wild resource harvesting, noting their dependence on these lands for their livelihood. Concerns have been expressed that the proposed development will not only restrict their use of these lands, but also use of adjacent lands. It is believed that the stability of resource populations in the area will be negatively affected by more people harvesting resources there. Already they cite the encroachment of non-local people into areas they regularly use, especially during the fall moose hunting season. Not only has this reportedly made their own hunting efforts more difficult, but conflict due to differing values as to how the land and its resources should be used have arisen. Stony River people think that these problems will increase with new settlement in the area. Moreover, it appears likely that development may have a detrimental effect on the community's economic base because its relatively unstable cash income is largely compensated for by the harvest of local resources.

Another issue related to land use is the opposition of the majority of Stony River residents to persons who live outside the central Kuskokwim area hunting in the areas they rely on. During the fall moose hunting season, large numbers of people from outside their land use area and the remaining central Kuskokwim area hunt within it. Residents cite frequent incidences of meat being wasted by these "outside" hunting parties. For example, one Stony River elder observed a cow moose that was left rotting in the field during the 1983 fall season. Stony River people

have repeatedly stated that they would like to have the area they use closed to all hunters except those that reside within it and the remaining central Kuskokwim area. They feel that if it is not closed, the area will become so over-harvested that they will not be able to obtain sufficient meat for themselves.

In conclusion, Stony River people are dependent on the wild resources they harvest from their land use area for their livelihood. A cultural value system influences how these resources are harvested, distributed, and used. Stony River residents are generally opposed to the development of these lands because they view it as potentially detrimental to their use of them.

CHAPTER 7

CONCLUSION AND SUMMARY

Stony River is a rural Alaskan community of southwestern interior Alaska located at the confluence of the Stony and Kuskokwim rivers. Residents of the community number about 70 persons and comprise approximately 20 households. They are primarily of Yup'ik Eskimo, Ingalik Athabaskan, and Dena'ina Athabaskan descent.

The economy of the community is largely based on the harvesting and processing of local resources procured through the activities of hunting, fishing, trapping, and gathering. The community has a land base which present-day residents and their ancestors have used for these purposes for many years. It is bordered on the north by the Kuskokwim Mountains; on the west by Inowak Creek, Big Lake, and Muskrat Creek; on the south by Tishimna Lake and Why Lake; and on the east by the Lyman Hills and the Big River. A variety of environments within this land area are utilized including forest, bog, shrub, tundra, riverine, and lake environments. The climate is continental.

Residents of Stony River travel out of the local area by means of small aircraft, boat, snowmachine, and occasionally dog team. They use the latter three types of transportation primarily for the harvest of local resources.

A traditional system of exchange distributes local resources and to a lesser extent commercial items primarily along kinship lines. This occurs through the processes of sharing, trading, borrowing, and lending. The system distributes goods both within the community and beyond it.

Members of a large majority of Stony River households are highly involved in the activities of hunting, fishing, trapping, and gathering in order to obtain their livelihood. Cash obtained through wage employment and government transfer payments supplements the income received from wild resources. The trading of goods is an important component of the economy.

Hunting is a major economic activity with moose, caribou, and black bear being the primary large game taken; and porcupine, snowhsoe hare, and waterfowl being important small game. Moose is the most desired meat and is a primary food staple. Meat is most commonly preserved by drying and freezing. Besides using wild animals for food, Stony River people also tan skins and make them into articles of clothing for home use, trade, and sale.

Although fishing furnishes a less highly preferred high protein food than hunting, it is a more reliable food resource during most of the year. Salmon is the primary fish harvested in the summer, whitefish in the fall and spring, and burbot during the winter months. Arctic grayling, northern pike, longnose sucker, and Arctic lamprey are species of secondary importance. Salmon are procured with nets and fishwheels, whitefish with leisters and nets, and burbot with fence and trap arrangements. Fish is most commonly preserved by drying and freezing, both out-of-doors and in commercial freezers.

Marten and beaver are the two furbearers harvested in the greatest numbers by Stony River trappers. Fox, land otter, wolverine, mink, muskrat, wolf, and lynx are also taken. People trap both from their home base and from trapping cabins and camps located a distance away from home. The majority of Stony River families do some trapping each

year and receive a supplementary income from this activity. Primary trapping areas occur both along and inland from the Kuskokwim, Stony, Swift, Gagaryah, Cheeneetnuk, and lower Stony rivers. A common practice is for a trapper to alternate his trapping areas over time due to variability in the furbearer population, traveling and weather conditions, and a person's social and economic situation. Furs are sold for cash, traded, and made into articles of clothing. Beaver also is an important meat source.

Stony River people make use of a variety of plants found within their land use area. Trees, especially birch and spruce, are important as fuel since most families depend on them as their primary source of heat. Stony River people also use local wood for constructing buildings and to handcraft sheds, containers, and other items.

A variety of berry plants are utilized, including lowbush blueberries, lowbush cranberries, "lowbush salmonberries," and blackberries. A number of other plants also are used for food, medicine, and technological needs. Families supplement the wild edible plant foods they harvest with produce from vegetable gardens.

When people hunt, fish, trap, and gather, work parties are frequently formed which include members of different households. Doing this often improves work production, while strengthening friendships and kinship ties. Stony River people commonly, but not always form work parties along kinship lines. A system of sharing which also frequently occurs along kinship lines helps to prevent waste of resources.

Local residents are concerned about the potential impacts of land disposals, oil and gas lease sales, and other proposed development activities in the area on their uses of renewable wild resources. This

report has described the importance of the animal, fish, and plant resources found in the area to the Stony River economy. Their use of the land and its wild resources is necessary in order for Stony River residents to maintain into the future their present vital way of life which has roots in a deep, rich past.

REFERENCES CITED

Alaska Department of Natural Resources
1983a Call for Nominations and Comments, Proposed Oil and Gas Lease Sale 46, Holitna Basin, Anchorage.

1983b FY86 Southcentral District Office Land Disposal Nominations. Anchorage: Department of Natural Resources, Division of Land and Water Management.

Armstrong, Robert
1981 A Guide to the Birds of Alaska. Anchorage: Alaska Northwest Publishing Co.

Bureau of Land Management
1983 Final Environmental Assessment of the Upper Kuskokwim/NYAC Planning Blocks for Mineral Leasing Mineral Entry and Settlement, Anchorage.

Charnley, Susan
1983 Moose Hunting in Two Central Kuskokwim Communities: Chuathbaluk and Sleetmute. Technical Paper No. 76. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

1984 Human Ecology of Two Central Kuskokwim Communities: Chuathbaluk and Sleetmute. Technical Paper No. 81. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

Hrdlicka, Ales
1943 Alaska Diary. Lancaster, Pensylvania: Jaques Cattell.

Hultén, Eric
1968 Flora of Alaska and Neighboring Territories. Stanford: Stanford University Press.

Jacobsen, Steven A., Compiler
1984 Yup'ik Eskimo Dictionary. Fairbanks: Alaska Native Language Center.

Kari, James, Compiler
1978 Deg Xinag (Ingalik Noun Dictionary). Fairbanks: Alaska Native Language Center.

1979 Kuskokwim Ingalik Place Names: MS. On file at the Alaska Native Language Center, Fairbanks.

1980 Kuskokwim River Place Names by Gusty Mikhael: MS. On file at the Alaska Native Language Center, Fairbanks.

Kari, James and Priscilla R. Kari
1982: Den'aina Elnena, (Tanaina Country). Fairbanks: Alaska Native Language Center.

Kari, Priscilla R.
1983 Land Use and Economy of Lime Village. Technical Paper No. 80, Juneau: Alaska Department of Fish and Game, Division of Subsistence.

Morrow, James
1980 The Freshwater Fishes of Alaska. Anchorage: Northwest Publishing Company.

Orth, Donald J.
1967 Dictionary of Alaska Place Names, Geological Survey Professional Paper No. 567. Washington, D.C.: U.S. Government Printing Office.

Oswalt, Wendell
1962 Historical Populations in Western Alaska and Migration Theory. Anthropological Papers of the University of Alaska 2(1): 1-11.

1980 Historic Settlements Along the Kuskokwim River, Alaska. Alaska State Library Historical Monograph No. 7. Juneau: Alaska Department of Education.

Rearden, Jim
1981 Alaska Mammals. Alaska Geographic Society 8(2). Anchorage.

Ricks, Melvin B.
1965 Directory of Alaska Post Offices and Postmasters. Ketchikan: Tongass Publications.

Selkregg, Lidia
1974 Alaska Regional Profiles, Southwest Region, Alaska Enviromental Information Data Center, Anchorage: University of Alaska.

Snow, Jeanne H.
1981 Ingalik. In Handbook of North American Indians. Volume 6: The Subarctic. June Helm, ed. pp. 602-617. Washington D.C., Smithsonian Institution.

Stickney, Alice
1980 Middle Kuskokwim Food Resources Survey: Status Report. Technical Paper No. 52. Bethel: Alaska Dept. of Fish and Game, Division of Subsistence.

1981 Middle Kuskokwim Food Survey - II. Technical Paper No. 53. Bethel: Alaska Dept. of Fish and Game, Division of Subsistence.

U.S. Dept. of Commerce, Bureau of the Census
1981 Census of Population, Vol. 1, Part III. Washington D.C.: U.S. Government Printing Office.

VanStone, James W. and Ives Goddard
1981 Territorial Groups of West-Central Alaska before 1898. In Handbook of North American Indians. Volume 6: The Subarctic. June Helm, ed. pp. 602-617. Washington D.C., Smithsonian Institution.

Viereck, Leslie and Elbert Little
1972 Alaska Trees and Shrubs. Washington: U.S. Department of Agriculture.

Zagoskin, Lavrentii Alekseevich
1967 Lieutenant Zagoskin's Travels in Russian America, 1842-1844. Henry N. Michael, ed. (Anthropology of the North: Translations from Russian Sources, No. 7). Toronto: Published for the Arctic Institute of North America by University of Toronto Press.

APPENDIX 1

NATIVE PLACE NAMES IN THE CENTRAL KUSKOKWIM AND STONY RIVER VILLAGE LAND USE AREA

INTRODUCTION

The Native place names corpus of the Central Kuskokwim River and the Stony River village land use area is a partial inventory which has not been rigorously researched due to time restraints. Several residents of the area were interviewed by James Kari of Alaska Native Language Center between 1975 and 1980 and again by Raymond Peterson and Priscilla Kari during the period of this study. The Kuskokwim Ingalik names have been researched more thoroughly than were the Yup'ik names.

The most significant fact about the place names data from this area is that there is a zone of Eskimo-Athabaskan place names between Kolmakov and the Tatlawiksuk River (Figs. 15-19), where many of the places are known by Stony River residents in two Native languages. This is the largest zone of overlapping Eskimo-Athabaskan place naming in Alaska. Note that many of the names of Eskimo and Athabaskan origin given in Zagoskin (1967) have never been reelicited since 1842 to 1844.

Some of the Native place names known by the late Deacon Deaphon, the last Kuskokwim Ingalik speaker, originally from the upper Takotna River have been included on Figure 19. For many years, he lived on the upper Kuskokwim River between the Nunsatuk and Selatna rivers. Today, some of his descendants reside both at Stony River and at Deacon's Landing (number 74 on Figure 19).

It appears that the record of Native place names in this area will not become as detailed and as comprehensive as in the adjacent territory of the Dena'ina of Lime Village (Kari 1983). In Lime Village, 283 place names mark a well-defined ancestral land use area. On the central Kuskokwim there has been population loss, expansion and contraction of former language areas, and recent relocation of families. Because of the high degree of multilingualism in this area, however, the place names should be more thoroughly researched.

The Native place names listed below were recorded by Stony River residents, of whom Custy Mikhael was the primary contributor, and compiled by James Kari (1979, 1980) and Steven Jacobson (1984) of Alaska Native Language Center, Raymond Peterson of the Alaska Department of Fish and Game, Subsistence Division, and Priscilla Kari.

The English names are those which appear on U.S. Geological Survey quadrangle maps (scale 1:250,000) and are spelled as they are cited in Donald Orth's Dictionary of Alaska Place Names (1967). Other English names commonly used by area residents for places which do not appear in Orth (1967) are indicated in quotation marks, for example, "Lisky's Crossing" (number 61). Finally, some names were reported to Wendell Oswalt (1980) during his archeological surveys in the area. Oswalt's work is referenced following such names.

This is a preliminary version of Stony River village place names and must not be viewed as necessarily complete. The Yup'ik, Deg Hit'an, and English place names or descriptions of places are listed with a number keyed to the map (Figs. 15-19). When possible, a translation of the Yup'ik and Deg Hit'an name is given below the name. Figure 15 depicts the area within which the recorded names (numbers 1-92) occur.

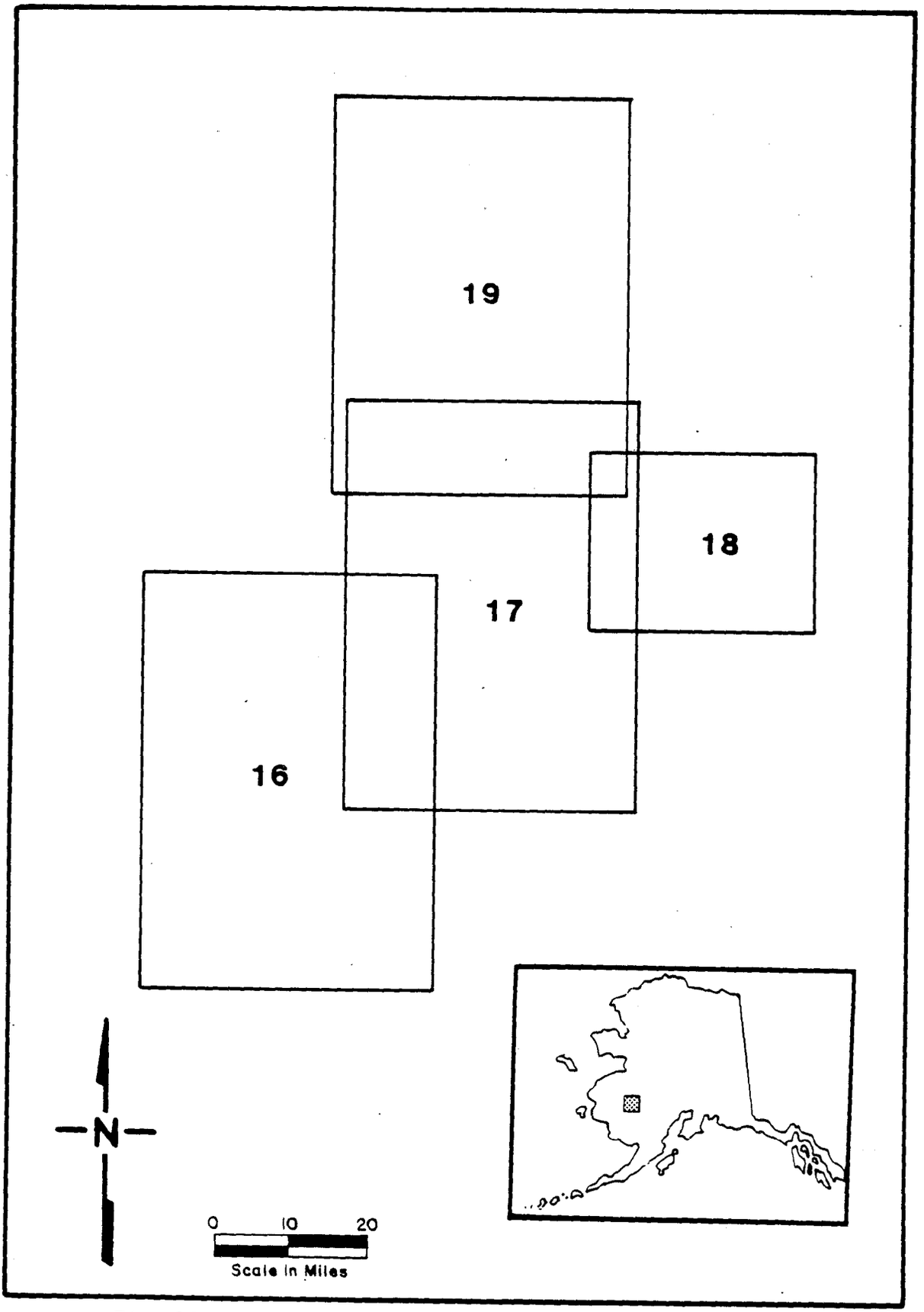


Fig. 15. Orientation of figures showing locations of places with native names in the area.

PLACE NAMES - Figure 16

	Native Name	English Name or Description
1.	Tovishq'uɬ Ghunh (DH) whetstone place	Sleetmute
	Cellitmiut (Y) the settlement of the people of the whetstone	
2.	Xaletno', Xoletno' (DH) grease flows stream	Holitna River
	Rruulitnaq (Y) ?	
3.	Nanvarpak (Y) big lake	Big Lake
4.	Noɬchidlno', Niɬchidlno' (DH) sack stream	Basket Creek
	Kellarvik or Kellarviim Kuiga (Y) container, sack (creek)	
5.	Iligviim Kuiga (Y) muskrat creek	Muskrat Creek
6.	Toltetno', Tetno' (DH) pike stream	Titnuk Creek
7.	Qeneq Ts'andadlinh (DH) flows out from a depression	Elutuli Creek
8.	Nat'os No' (DH) behind us stream	stream into the Holitna River from the southeast
9.	Nginiqechun Shehno (DH) ? (personal name) sidestream	stream into Nat'os No' from the east
10.	Digenegh (DH) ?	Kuskokwim River
	Kusquqvak (Y) ?	
11.	Tthaq'iz (DH) rock-red	near elevation 537' "Tower"
12.	Iinruq (Y) medicine	Inowak Village

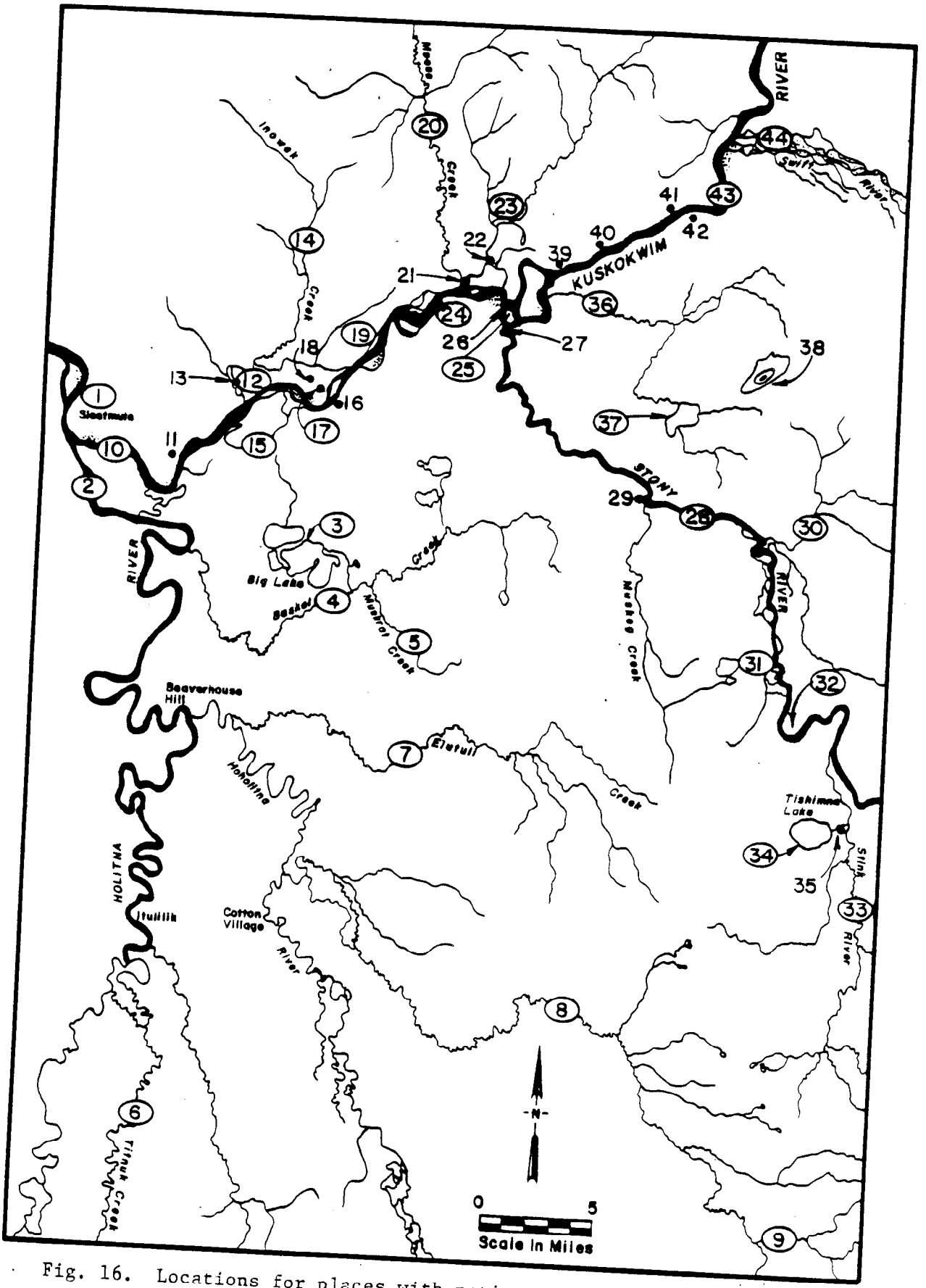


Fig. 16. Locations for places with native names, numbers 1 through 43.

13. Q'eqetno' Viniq'it (DH)
medicine stream lake
Inowak Lake

14. Q'eqetno' (DH)
medicine
Inowak Creek

15. Novistluggi Neniq (DH)
blanket slough
across from Inowak Creek

16. ?
"Sergies" (Oswalt 1980)

17. Gag Helanhdi (DH)
berry place

Atsartalek (Y)
place with lots of berries
across from "Sergies"

18. Viniq'i Xidochagg (DH)
lake mouth
slough near Inowak Creek

19. Tthat'ogh (DH)
bluff beneath
bluff on the north side of the Kuskokwim River

20. Gitthin' Chuxno' (DH)
moose stream

Tuntuviim Kuiga (Y)
moose's creek
Moose Creek

21. ?
"Moose Village" (Oswalt 1980)

22. Dinaq'i Xon-gidighe'odi (DH)
grave place?
slough from near Stony River village to Moose Creek on the north side of the Kuskokwim River

23. Dinaq'i Xon-gidighe'odi Gisixno' (DH)
grave place? stream
"Little Moose Creek"

24. Nat'osno' (DH)
our back creek

Tunumteḥi (Y)
our back
slough from the lower Stony River to the Kuskokwim River, on the south side of the Kuskokwim River

25. Nat'osno' Ne (DH)
our back stream island
Stony River village island

26. Gidighuyghatno' Xidochagg Qay (DH)
stony river mouth village
Stony River village

27. Gidighuyghatno' Xidochagg (DH)
distant river mouth

Teggalqum Kuigan Painga (Y)
mouth of stream of stone

Stony River mouth

28. Gidighuyghatno' Giqedhatno' (DH)
distant stream

Teggalqum Kuiga, Teggalquq (Y)
stone river, stone

Stony River

29. Sixchagg (DH)
sidestream mouth

Muskeg Creek mouth

30. Ts'etedanditl'itsdi (DH)
black water comes out

Mer'a Tungulriam (Y)
black creek

"Black Creek" (stream into Stony River from the north - not officially recognized as Black Creek which runs into Stony River from the south

31. Tsa Danisiq'is (DH)
rock red

bluff on the west side of the Stony River

32. Vith Q'iɣ (DH)
white bank

bank on the north side of the Stony River

33. Vin Dashtno' (DH)
lake bar stream

Stink River

34. Hutthedi Viniq'it (DH)
by the stream lake

Tishimna Lake

35. Hutthedi (DH)
by the stream

Tishimna Lake village

36. Taq'agits'oyhdi, Toq'agets'o (DH)
moose come down stream

Pavaken Ngelgaanek Atralran Kuiga (Y)
from up there something? comes down its creek

"Gusty's Creek"

37. Taq'agits'oyh Vin (DH)
moose come down lake

"Gusty's Lake"

38. Taq'agits'oyh (DH)
moose come down

hill near "Gusty's Lake"

39. Adnashga (R)
(Russian personal name)?

upper end of north slough

40. Gag Helanhdi (DH) — "Ignatty Macar's location"
berries are there place

41. Tthaghoy (DH) — mountain at "Sinka's"
bluff end

Epnam Nuuga (Y)
tip of bluff

42. ? — Towhai (Oswalt 1980)

43. Q'iyt'ogh (DH) — rapids above "Sinka's"
birch beneath

PLACE NAMES - Figure 17

	Native Name	English Name or Description
28.	Gidighuyghatno', Giqedhatno' (DH) distant stream	Stony River
	Teggalqum Kuiga, Teggalquq (Y) stone river, stone	
30.	Ts'etedanditl'itsdi (DH) black water comes out	"Black Creek" (stream into Stony River from the north - not officially recognized as Black Creek which runs into Stony River from the south
	Mer'a Tungulriam (Y) black creek	
31.	Tsa Danisiq'is (DH) rock red	bluff on the west side of the Stony River
32.	Vith Q'iɮ (DH) white bank	bank on the north side of the Stony River
37.	Taq'agits'oyh Vin (DH) moose come down lake	"Gusty's Lake"
38.	Taq'agits'oyh (DH) moose come down	hill near "Gusty's Lake"
42.	?	Towhai (Oswalt 1980)
43.	Q'iyt'ogh (DH) birch beneath	rapids above "Sinka's"
44.	Xelinhdi (DH or Y?) it flows place	Swift River
45.	Jonetno' (DH) bright water	Cheeneetnuk River
46.	Tleq (?) (Y?) ?	a creek flowing into the Cheeneetnuk River
47.	Jonetno' Xidochagg Deloy Chux (DH) bright stream mouth mountain big	mountain between the Cheeneetnuk River and the Swift River (near elevation 2073' "Steep")
	Kiturcii(ga)lnguq (Y) place one can't pass	
48.	Gighighayhno', Gighighayiq (DH) kill fish stream	Gargaryah River
	Neqsuryaraq (Y) place or way to catch fish	

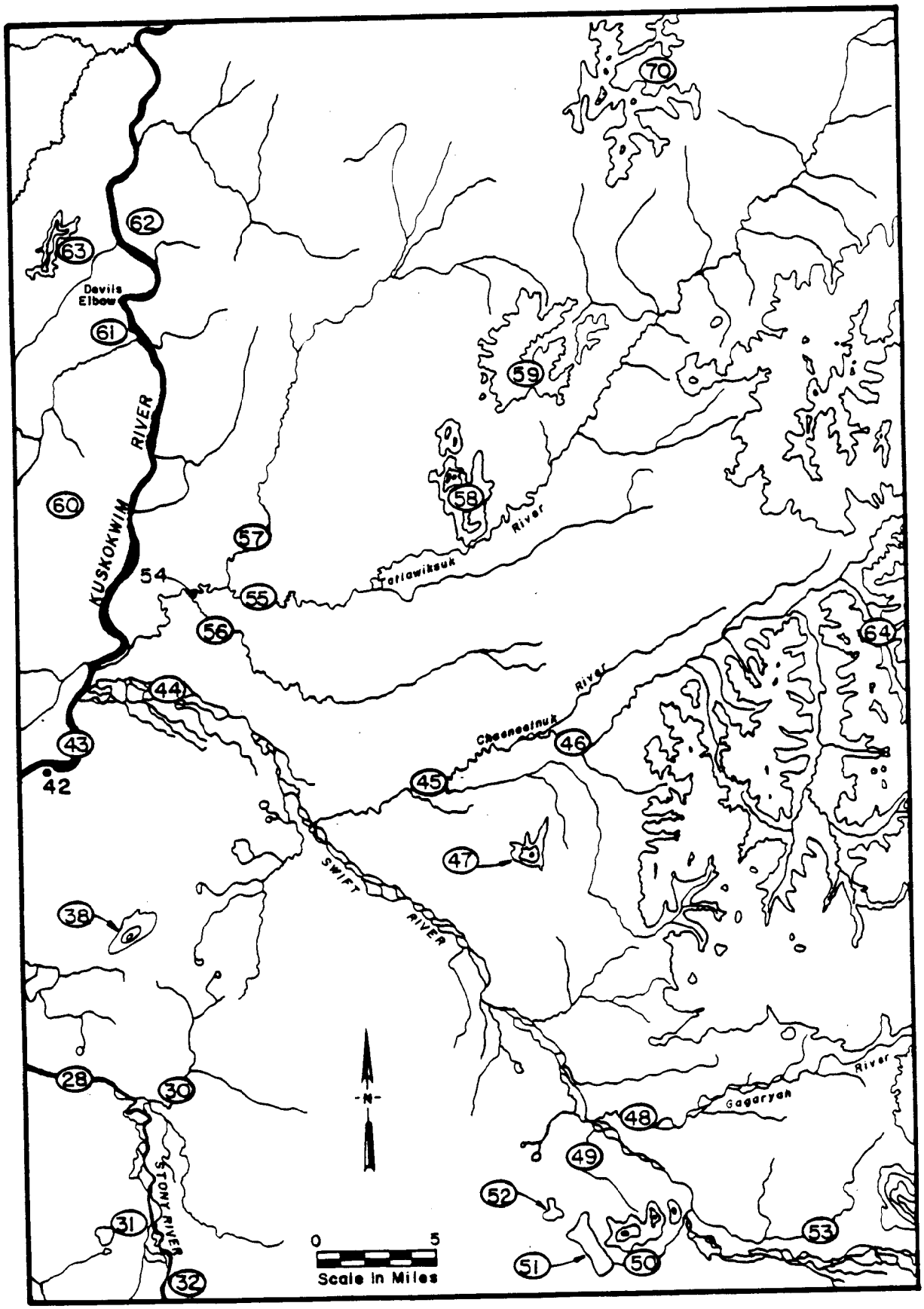


Fig. 17. Locations for places with native names, numbers 28 through 64.

49. Tl'atiyh Dighelo'
rear hill mountain
mountain near the mouth of the Gagaryah River

50. Iłdiye Min Xidochagg (DH)
brush lake mouth
creek from Why Lake into the Swift River

51. Iłdiye Min (DH)
brush lake
Why Lake

52. Iłdiye Digheloy (DH)
brush mountain
mountain near Why Lake

53. Gidhighayhno' Xuk'idz (DH)
kill fish stream little
Little Gagaryah River

54. Tilighuchagg (DH)
?
mouth of the Tatlawiksuk River

55. Tilighutno' (DH)
?
Tatlawiksuk River

Talgurrsaq (Y)
?

56. Te Ts'ot'ixdi (DH)
bad water place
creek into the Tatlawiksuk River from south

Merrlirtellria (Y)
dirty water stream

57. Xidiqughełtsenhdi Gisixno' (DH)
blocked by log creek
"Log Jam Creek;" creek into the Tatlawiksuk River from the north

Caputelek (Y)
one with weirs or blocks

58. Viq'entidl K'idz (DH)
small pestle
mountain north of the Tatlawiksuk River

Passiksuar (Y)
small pestle

59. Viq'entidl Chux (DH)
big pestle
mountain north of the Tatlawiksuk River

Passillugpak (Y)
big pestle

60. Gitthettho' (DH)
head + ?
near mountain "Tatla"

61. ?

"Lisky's Crossing"
"Big Rapids Village"
(Oswalt 1980)

62. Ts'inaghilivindi (DH)
overflow place

Seng'utuli (Y)
overflow

area across the Kuskokwim River from "Black Wasky's"

63. Gitthe'chux
big head

mountain near "Black Wasky's" and name for "Black Wasky's"

64. Xidochagg Ts'ixet'ixdi (DH)
?

Cetuyilkiik (Y)
?

Shoeleather Creek

PLACE NAMES - Figure 18

	Native Name	English Name or Description
64.	Xidochagg Ts'ixet'ixdi (DH) ?	Shoeleather Creek
	Cetuyilkiik (?) (Y) ?	
65.	Digidithqaggidi (DH) we can't come down that way	mountain up the Cheeneetnuk River
66.	Digidithqaggidi Xudiggi Xusixno' (DH) we can't come down that way upper creek	"Gold Creek" (stream from the Cheeneetnuk River)
67.	Thoyh Dhivo Gisixno' (DH) white sand creek	stream from the northwest into the Cheeneetnuk River
68.	Thoyh Dhivo (DH) white sand	mountain (3435') between the Tatlawiksuk River and the Cheeneetnuk River
69.	Nithdlagh Dhighayhno' (DH) silver salmon are killed river	Big River
	Dhdlaghiyno' (DH) sheefish stream	

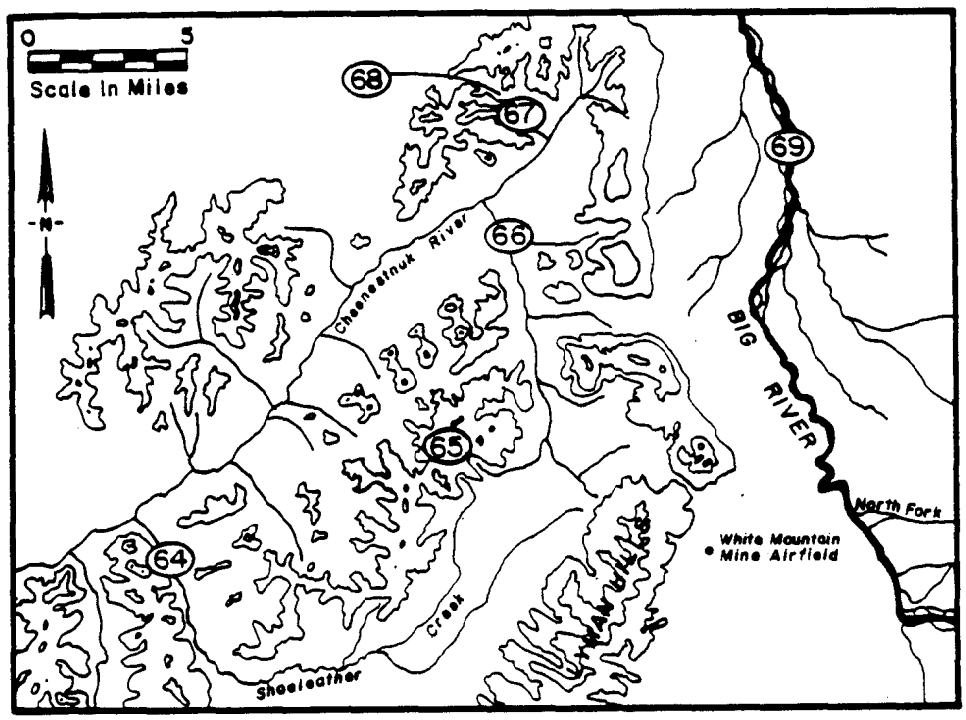


Fig. 18. Locations for places with native names, numbers 64 through 69.

PLACE NAMES - Figure 19

	Native Name	English Name or Description
70.	Tthata Dighelo' (DH) rock water mountain?	mountain at the head of the Tatlawiksuk River
71.	Nonts'ididixdi (DH) where we spend time?	Nunsatuk River
72.	Jiles Xinedi̇ghe'odi (DH) where a cross is standing	"Deacon's" old homesite on the east side of the Kuskokwim River
73.	Tth'etodh'o Qogg (DH) straight water bar	straight stretch on the Kuskokwim River below "Deacon's Landing"
74.	?	"Deacon's Landing;" Deacon's #2 (Oswalt 1980)
75.	Tth'etodh'o Dighelo' (DH) straight water mountain	mountains behind "Deacon's Landing"
76.	Ne Chux (Y) or (DH?) big island	Nunivak Bar; "Heart Island"
77.	Tsalatno' (DH) ?	Selatna River
78.	Tsalatno' Xuk'idz (DH) ?	Little Selatna River
79.	Tsaltsa D'ghelo' (DH) ? mountain	mountain at the head of the Little Selatna River
80.	Tat'asno' (DH) charcoal water creek	Black River
81.	Sith Lizin (DH) black ridge	Black Mountain
82.	Minetthel T'ogh, Minelghodz T'ox (DH) ? beneath	Vinasale village site, below Vinasale Mountain
83.	Vunitthali, Vinitthal (DH) ?	Vinasale Mountain
84.	Medoy Tin (DH) canoe trail	Beaver Creek

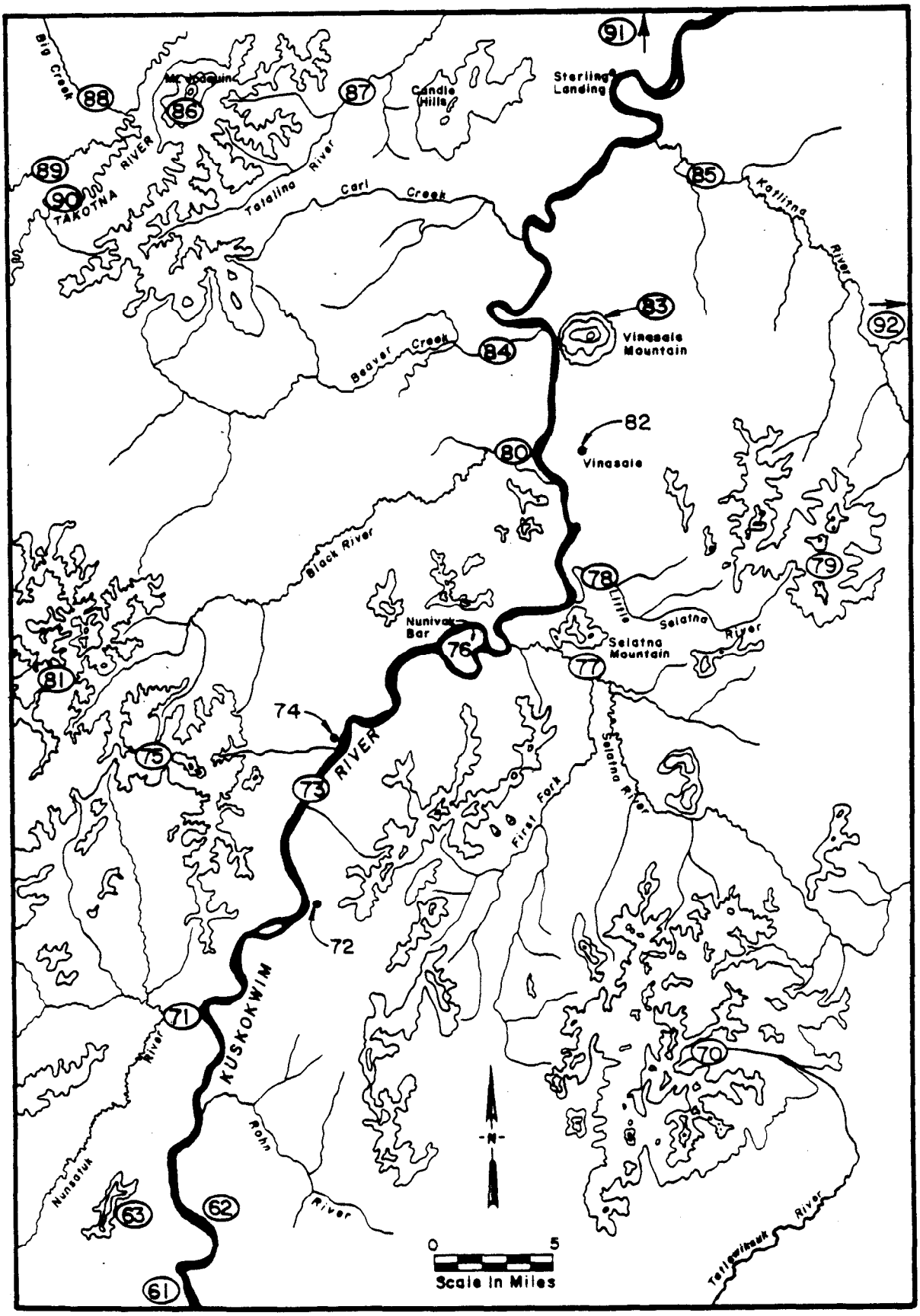


Fig. 19. Locations for places with native names, numbers 70 through 92.

85.	Q'iyhtsatno' (DH) birch stream	Katlitna River "Birch Creek"
86.	Nts'idh (DH) ?	Mt. Joaquin
87.	Nts'idheno' (DH) ?	Tatalina River
88.	Noxits'idiłno' (DH) we go back stream	Big Creek
89.	Taxoltsitno' (DH) ? stream	Fourth of July Creek
90.	Tokotno', Tochotno' (DH) water mouth stream	Takotna River
91.	Tochagg (DH) water mouth	McGrath; mouth of Takotna River
92.	Tl'odoleno' rear stream	Blackwater Creek

Additional Place Names recorded Yup'ik and Deg Hit'an names for places not located on a map in this report.

	Native Name	English Name
93.	Sanh Qun (DH) summer fire	Bethel
94.	Kuiggluk (Y) poor river	Kwethluk
95.	Akiacuar (Y) little place across	Akiachak
96.	Akiaq (Y) place across	Akiak
97.	Tuullkessaaq (Y) yellow-billed loon	Tuluksak
98.	Qalqaq (Y) ?	Kalskag
99.	Ayemkaryaraq (Y) broken place	"Yukon Portage"
100.	Tthaghun Qay (DH) raven village	Crow Village
	Tulukarnarmiut (Y) the settlement of the people of the ravens	
101.	Anyaraq (Y) place to go out	Aniak River
102.	Te ts'aghit'ixdi (DH) bad water	Kolmakov
	Perrlurliq (Y) ?	
103.	Ch'inihay Dinechoxdi (DH) that which we pick is big	Chuathbaluk
	Curarpalek (Y) one with big blueberries	
104.	Mith Ghoy (DH) bank end of	Napaimiut
	Napamiut (Y) people of the trees	

105. Uskuralek? (Y) — Oskawalik village
one with a cord

106. Totith Engtthegh (DH) — Crooked Creek village
portage by the river

Tevyaraq (Y)
portage

107. Totith Engtthegh Sixno' (DH) — stream by Crooked Creek
portage by river creek

Kic'arpak ? (Y)
big sinker

108. Gilighotsitno' -DH — George River
?

Yugnilnguq (Y)
unfriendly

109. Jujeqay (DH) — Georgetown village
George's village

110. Dinanhche Qay (DH) — "Eight-Mile" village
our nose village

Qengarmiut (Y)
the settlement of the
people of the nose

111. Digheq'un Deloy (DH) — Barometer Mountain
burned mountain

Ekleq (Y)
burned place

112. Goldaq Eqo Nixuxolyaxdi (DH) — Red Devil
where they dig for gold

113. Noqoy Dina Qay (DH) — hill up the Holitna River
rock man village

Teggalqungayaq (Y)
stones

114. Nunamediq (DH) — place up the Holitna River
?

(Nunamiut)
the settlement of the
people of the land

115. Kassigluq (Y)
fork in river

"Fork Village" up the Holitna River

116. Tixvel Viniq'it (DH)
net lake

cove up Inowak Creek

117. Tixvel Giniq'i
net hole

slough approximately 5 miles up the Stony River from its mouth

118. Te Nalch'uxdi (DH)
water boils place

"Hot Springs Creek," from the south into the Tatlawiksuk River

119. Te Nalch'uxdi Deloy (DH)
water boils place mountain

mountain below "Hot Springs Creek"

120. Edzetnu (DH)
?

South Fork, Kuskokwim River

121. Nets'inno' (DH)
island side stream

Nixon River

122. Denadh (DH)
the tall one

Mt. McKinley

APPENDIX 2

GLOSSARY OF TERMS FOR SELECTED SPECIES
UTILIZED BY STONY RIVER RESIDENTS

English	Scientific[1]	Yup'ik[1]	Kuskokwim Ingalik[1] (Deg Hit'an)
MAMMALS			
moose chux	Alces alces	tuntuvak	gitthing'
caribou	Rangifer tarandus	tuntu	ggagg
black bear	Ursus americanus	tan'gerliq	neli'ey
snowshoe hare	Lepus americanus	maqaruaq	ggux
porcupine	Erethizon dorsatum	issaluuq	dothdoy, nene
marten	Martes americanas	qavcicuaq	gitsighiye
beaver	Castor canadensis	paluqtaq	noya'
red fox	Vulpes vulpes	kaviaq	chighiligguy
river otter	Lutra canadensis	ciugnilnguq	tixet'an
mink	Mustela vison	imarmiutaq	tixgedr
FISH			
king salmon	Oncorhynchus tschawytscha	taryaqvak	ggath
red salmon	O. nerka	sayak	diq'oy
silver salmon	O. kisutch	qakiiyaq	lighan
sheefish	Stenodus leucicthys	ciiq	ses
whitefish	Coregonus	qaurtuq	tilay
burbot	Lota lota	manignaq	gidhiyh
northern pike	Esox lucius	qalru	giliqoy

English	Scientific	Yup'ik	Kusokwim Ingalik (Deg Hit'an)
longnose sucker	Catostomus catostomus	cungartak	tonhts'ixgi
Arctic grayling	Thymallus arcticus	culugpauk	sdat'an
Arctic lamprey	Lampetra japonica	nemeryaq	tl'ighisney
BIRDS			
goose	Anatidae	neqleq	dits'in
duck	Anatidae	yaqulek	nanhdal
spruce grouse	Canachites canadensis	egtuk	diyh
ruffed grouse	Bonasa umbellus	temtemtaaq[2]	gitthid, gidiłning
willow ptarmigan	Lagopus lagopus	aqesgiq	q'iyałdal
PLANTS			
white spruce	Picea glauca	kevraartuq	didlang
Kenai birch	Betula kenaica	elnguq	q'iy
cottonwood	Populus balsamifera	avngulek	t'ighith
blueberry	Vaccinium uliginosum	curaq	niłyagh
lowbush salmonberry	Rubus chamaemorus	atsalugpiaq	dondhi'on
lowbush cranberry	Vaccinium vitis-idaea	tumagliq	nenhtl'i
blackberry	Empetrum nigrum	tan'gerpak	niłonht'as
grass	Graminaea	canek	gidingidz
wild rhubarb	Polygonum alaskanum	angukaq	xołtthil
wild potato, wild carrot	Hedysarum alpinum	elagaq[2]	xathdloy

[1] Scientific names are derived from Armstrong (1981) for avian species; Hulten (1968) for flora; Morrow (1980) for fish species; and Rearden (1981) for mammals. Yup'ik Eskimo terms are from Jacobson (1984) and Ingalik Athabaskan (Deg Hit'an) terms from Kari (1978).

[2] This is the Yup'ik Eskimo term according to Central Kuskokwim residents interviewed during this study and Charnley's (1984) study, although it is not included in Jacobson (1984).