

**LIVING OFF THE LAND:
CONTEMPORARY SUBSISTENCE IN TETLIN, ALASKA**

**by
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PREFACE

This publication is based on field work conducted in 1983-84 through a cooperative project between the U.S. Fish and Wildlife Service, the Alaska Department of Fish and Game, and the University of Washington. With the exception of minor editorial changes, this document is a re-publication of a thesis submitted in 1985 as required for a Master of Science Degree at the University of Washington.

CHAPTER 1

INTRODUCTION

The Tetlin National Wildlife Refuge (NWR) was one of nine areas in Alaska designated as new federal refuges under the Alaska National Interest Lands Conservation Act (ANILCA). Title VIII of ANILCA provides that rural residents of Alaska who have utilized these public lands for subsistence purposes have continued opportunities to do so. The present study of land and resource uses in Tetlin responds to this mandate by providing the U.S. Fish and Wildlife Service (USFWS) with current information on subsistence uses of the Tetlin NWR by one local community.

Tetlin is one of four Upper Tanana communities known to have utilized the area now constituting the Tetlin NWR (Figure 1). These traditional land and resource uses are documented in detailed ethnographies: McKennan (1959) conducted a study there in the late 1920's, and Guedon's (1974) research was completed in the late 1960's. Other pertinent references include Vitt (1971) who described hunting practices among the Upper Tanana Indians, and Pitts (1972) who examined Athabaskan settlement patterns and housing types in the region. Contemporary resource use data for these communities are not well-developed. Buge' (1979) prepared a brief report on subsistence activities in Tetlin as part of an environmental assessment for a proposed natural gas pipeline. More detailed resource use studies have been conducted by the Alaska Department of Fish and Game, Division of Subsistence, in Dot Lake (Martin 1983), and Northway (M. Case 1986).

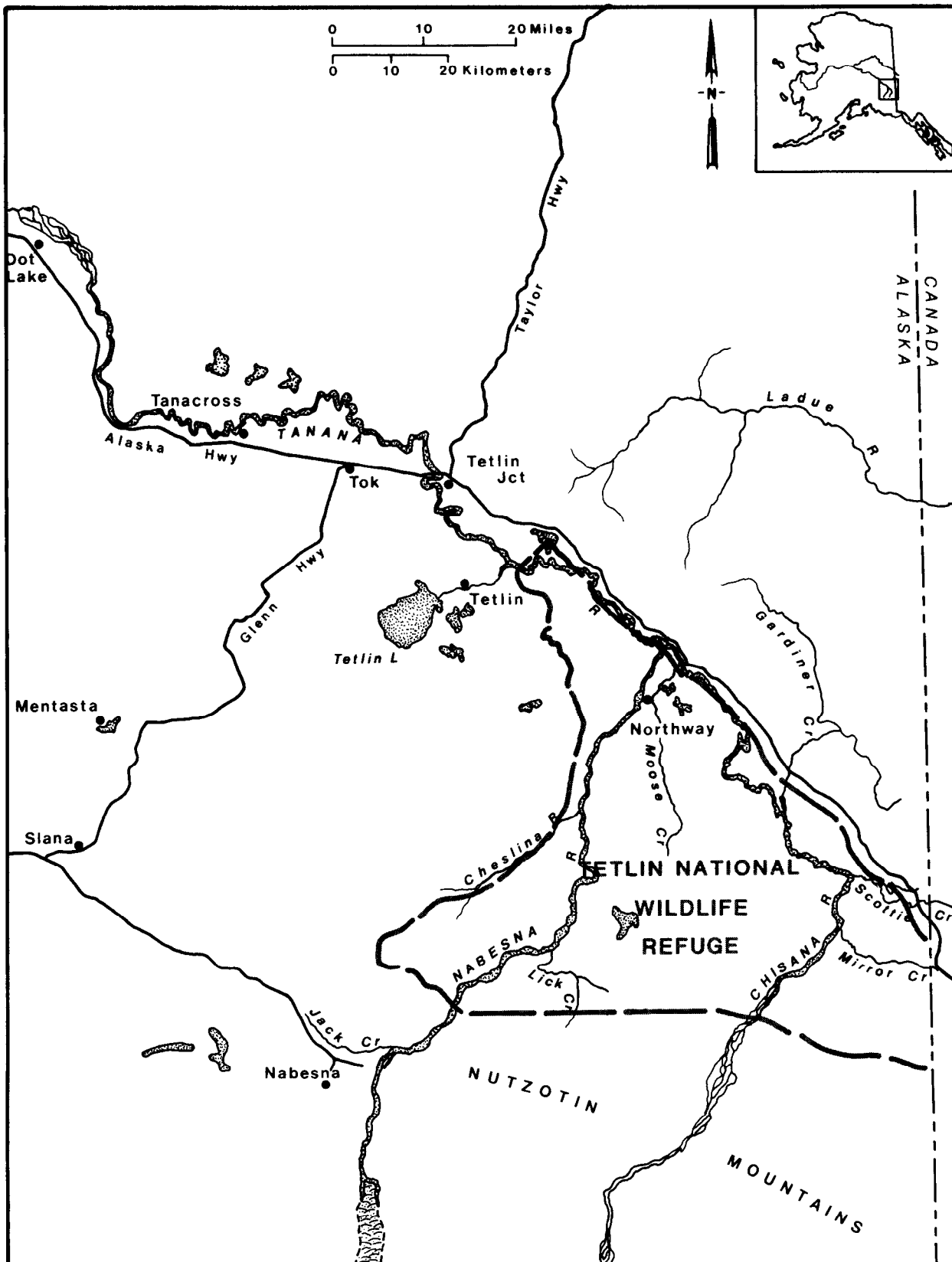


Fig.1. Location of Tetlin

Uses of Copper River salmon and other resources in four Upper Tanana communities are discussed by Haynes et al. (1984).

The purpose of this study is to document how residents of Tetlin currently use the lands surrounding them. The results will enable the USFWS and State agencies concerned with regional resource allocation to better understand patterns of local use. Documentation of these uses may also enhance the ability of Tetlin residents to play a more active and informed role in land and resource management issues involving their community.

The specific research goals were:

- 1) To identify the wild resources used by residents of Tetlin, the times during the year when they are harvested, and the methods by which they are commonly taken;
- 2) To document household and community harvest levels over a 12 month period, and discuss potential reasons for variation between households;
- 3) To identify the geographic areas currently used for resource harvest, and to document Upper Tanana place names in the Tetlin area; and
- 4) To identify resource issues of concern to residents of Tetlin.

Information was gathered during two months' residence in Tetlin during summer 1984 and during subsequent shorter visits the following fall and winter. Interviews were conducted in 20 of the 28 households occupied in 1984. Questions focused on types of resources used, methods and timing of harvest, and harvest quantities for a twelve month period in 1983-1984. Resource harvesting areas for each household were recorded on 1:63,360 U.S.G.S. topographic maps. A local resident was hired to help with the interviews, and to provide interpretative assistance and guidance. In addition to these interview sessions,

frequent discussions with several knowledgeable residents and insights gained from participating in harvest activities also provided information. The latter method, "learning by doing," seemed to be the most natural and culturally-appropriate method used in this research.

Observations of resource harvesting activities described in this report were limited to those occurring in the late spring and summer months during the data collection period, and focused on those performed by women. Discussion of traditionally male-dominated activities, such as moose and waterfowl hunting and "large fur" trapping, is based largely upon descriptions provided by participants and secondary sources.

CHAPTER 2

THE VILLAGE

ENVIRONMENT

Tetlin is a small Athabaskan Indian community located in the Upper Tanana basin of eastern interior Alaska. The village lies on the banks of the Tetlin River, midway between Tetlin Lake and the Tanana River, twenty miles southeast of Tok. Tetlin borders two distinct ecosystems (Plate 1). To the north are the Tetlin Hills, foothills of the Alaska Range. They are mostly forested, consisting of mixed and pure stands of spruce and birch, and some poplar. Beginning immediately south of the village is a long stretch of lowlands or flats surrounding the Tanana River. The flats, dotted with numerous glacial outwash lakes, are characterized by open black spruce woodlands and bogs. These two very different terrain types contain a wide variety of habitats and support a relatively diverse flora and fauna.

HISTORY SINCE CONTACT WITH WESTERN CULTURES

Archaeological findings from two sites north of Tetlin indicate that Athabaskan or proto-Athabaskan people inhabited the Upper Tanana region as early as 2000 B.C. (McKenna 1981). Tetlin's history since contact with western cultures is brief in comparison, representing little more than a single century. This relatively short period is noteworthy in the context of this study because of the profound changes that occurred to traditional patterns of land use.



Plate 1. The Physical Environment of the Tetlin Area. The village lies on the border of two distinct ecosystems; the white spruce and birch uplands of the Tetlin Hills, and the open black spruce lowlands of the Tanana Valley "Flats" (above). Tetlin Lake, the largest in the Upper Tanana region, lies just to the west of Tetlin (below).

Tetlin (Teetlaiy) originally constituted a temporary settlement for a group of semi-nomadic hunters and gatherers. They were one of several Northern Athabaskan Indian bands inhabiting the region of the upper Tanana and Nabesna rivers. These bands collectively formed a broader social and linguistic unit, through which intermarriage and exchange occurred. Associated with each band was a village site, a chief, and a nearby hill or mountain. Each controlled a territory over which the band ranged during its seasonal movements to hunting and fishing areas (Guedon 1974).

By the late 1700s, European and Russian explorers and traders had entered much of Alaska and western Canada. However, due to their relative geographic isolation, Indians of the Upper Tanana region remained insulated from the influence of the Russian traders just to the west, and the Europeans on the MacKenzie River in Canada until the late 1800s. At that time, several American traders set up trading operations along the Yukon River, near the present site of Dawson, Yukon Territory. Tetlin residents probably had their first encounter with non-Indians at one of these posts, Fort Reliance, in 1874 (McKenna 1959). The names of some of these traders -- McQuesten, Ladue, Harper, and Mayo -- are still familiar among some of the older residents.

The first known written account of Tetlin appeared in the journal of Lieutenant Henry T. Allen in 1885. While conducting a military reconnaissance that led his party into the upper portion of the Tanana basin, Allen stopped at the settlements of Tetlin and Last Tetlin, which he referred to as "Tetling" and "Nandell". Last Tetlin is located eight miles south of Tetlin. Allen observed two log houses and 17 people at Tetlin, and four log houses and considerably more people at Last Tetlin

(Allen 1887). Bonds between the people of these two villages seemed to be strong, although they appeared to form separate groups. Regarding the relationship between these two bands Guedon remarked:

It is sometimes difficult to ascertain the ties between two camps if one cannot take the feeling of the people themselves into account. . . . There is a strong relationship between Last Tetlin and Tetlin and the two settlements are not too far from one another, yet for all that they form distinct units (Guedon 1974:12).

When Allen passed through Tetlin and Last Tetlin he reported that the people were familiar with the English alphabet and had articles of clothing which presumably had been obtained through trade at Fort Reliance (Allen 1887). Residents of these camps also served as intermediaries in trade, transporting items from the Yukon River posts to Indians in the Copper River settlements of Suslota and Batzulnetas. The trade routes used at this time were recounted to the author by several elderly residents of Tetlin, and correspond to those described in Allen's journal.

In 1912, the first trading post was established near Tetlin by an American fur trader named Flannigan (Titus David, pers. comm.). His post was located at the mouth of the Kalukna River, which residents refer to as "Old Store Creek". Following the gold rush of 1913-14, known as the Chisana Stampede, another trader, John Hajdukovich, set up a business in Tetlin. John and his brother Milo remained in the area for many years. Several elderly residents recalled working for John Hajdukovich as young men. The presence of these trading posts drew people to Tetlin from the surrounding camps and from the village of Last Tetlin. When McKennan arrived in 1929, a provisional school had been established and the population had doubled in size. Most notably,

McKenna (1959) observed a change from the former semi-nomadic hunting and gathering existence to a more village-based lifestyle. This trend continued as the Bureau of Indian Affairs built a new school in 1931, and as westernized values of education and a sedentary lifestyle were reinforced by non-Native presence in the village.

World War II and the construction of the Alaska Highway greatly changed the communities of the Upper Tanana Basin by providing jobs and cash income, and by facilitating access to this region that led to in-migration by outsiders of Euro-American culture. Tok, now the largest community in the area, originated as a construction camp for the highway project. During this period, people from other nearby settlements permanently relocated to new sites on the highway (Pitts 1972). Although Tetlin residents participated in highway construction, the village remained at its original site, approximately 15 river miles to the west. Wage income combined with government support programs led to an increase in imported goods. Technological introductions, such as high-powered rifles, aluminum boats and outboard motors, created greater incentives for cash income, while apparently enhancing harvest efficiency enough to accommodate an increasingly sedentary lifestyle.

In the meantime, the status of the land surrounding Tetlin had undergone major changes. In 1930, under provisions of the Vocational and Educational Reserves Act of 1925 (Public Law No. 468, 68th Congress), President Herbert Hoover signed an executive order that established the 768,000 acre Tetlin Reserve. The stated purpose of this designation was "to promote the interests of the Natives by appropriate vocational training, to encourage and assist them in restocking the country and protecting the fur-bearing animals, and to otherwise aid in

the care and support of the said Natives. . . ." (Executive Order No. 5365, 1930). The Tetlin Reserve was one of five "public purpose" reserves designated in Alaska, and was somewhat of an anomaly, since it was many times larger than any of the others (D. Case 1984).

Less obvious is the sequence of events leading up to this designation and the establishment of reserve boundaries. Tetlin residents attribute the establishment of the Reserve largely to the efforts of Chief Peter Joe, a highly-respected village leader during this time. It appears too that the prominent local trader, John Hajdukovich, was also interested in seeing the area designated as a reserve. The following are excerpts from an article he wrote in 1930, just prior to the Reserve's designation:

If the section in which these Indians live and trap could be established as a Reservation, many advantages would accrue. . . . A Reservation would make it possible to keep out certain white men who call themselves trappers, but who really are professional gamblers. These men gamble with the Indians for their furs. . . . The Reservation would also safeguard certain trapping grounds for the use of Indians alone so that they could build up the fur and get a dependable crop for the following season. As it is now, all sections are open to the professional white trapper who goes in and cleans up all the fur and takes it out with him and never returns (Hajdukovich 1930:2).

In addition to these reasons, it was in Hajdukovich's interest as the dominant trader in the area to "safeguard" the region from potential competitors, and to sustain the trade by encouraging conservation of fur resources by his clientele. The establishment of a reserve for exclusive use by Tetlin was likely viewed as the means to this end.

The boundaries of the Reserve may represent the major harvest areas of Tetlin people in the 1920s and 1930s, or at least the trapping areas,

as this information seems to suggest. As discussed later, they offer some important insights into historical patterns of land use.

Under the Alaska Native Claims Settlement Act of 1971 (ANCSA), Tetlin was given the option of maintaining reservation status, or selecting the lands under provisions of ANCSA and forming a village corporation, with reservation status revoked. They chose the latter.

In summary, Tetlin's history in terms of contact with non-Native cultures and associated impacts can be characterized as follows: (1) Insulation: the period lasting throughout the 18th and most of the 19th centuries, when Russians and Europeans settled among Indians in surrounding areas but had no direct influence on the Indians of the Upper Tanana region; (2) Contact: the late 1800s, around the time of the Fortymile Gold Rush south of the Yukon River. Trading posts established near Dawson at this time are probably where members of the Tetlin band first came in contact with non-Indians; and (3) Localization: the first half of the 1900s, when establishment of trading posts, schools, and eventually churches, contributed to abandonment of a semi-nomadic hunting and gathering economy in favor of a village-based, mixed cash and subsistence economy.

HISTORICAL ACCOUNTS OF RESOURCE USE

Prior to contact with white traders, the Upper Tanana Indians were semi-nomadic. Small family groups dispersed widely in pursuit of game, primarily moose and caribou. According to Chief Sam, born at Last Tetlin around 1870, "In the old days people seldom stayed in the village. Always they were on the trail hunting and camping" (McKenna

1959). All but one of the six Upper Tanana bands had semi-permanent village sites, which were located near fishing weirs built to intercept the summer whitefish runs. Since the number of places where fish could be taken efficiently was limited, the fishing villages served as the nucleating centers for the local band. Members of the band congregated for the July fish run to maintain and use the fish weirs, and for the caribou migrations, to maintain and use the large game "fences" (McKenna in Heffley 1981). Relying on accounts from his older informants, McKenna summarized the seasonal harvest cycle of this early period:

Fishing at well known sites in July; moose hunting in the summer; sheep hunting in the fall; then the early winter migration of caribou; then more moose hunting and quite possibly hunger, alleviated somewhat in the late spring by ducks and muskrats; and then again the welcome appearance of caribou in late May (McKenna 1959:47).

Game killed during the summer and fall was dried and cached on site, often at considerable distance from the village. Individuals and family groups transported some of the cached meat back to the village during the winter months, or utilized it while hunting and trapping in the area and living in temporary winter camps. Family-based winter camps were located where hunting conditions were most favorable, and relocated as dictated by movement of animals (McKenna in Heffley 1981).

The hunger McKenna alludes to in late winter and spring is borne out in Lt. Allen's account of this region in the spring of 1885. He repeatedly referred to the scarcity of moose and caribou as well as the lack of food and "near starving condition" of many of the Upper Tanana and Copper River natives (Allen 1887). The "poor condition" of the Natives at this time may have been in part due to spread of infectious

diseases to these communities from trading centers. In any case, late winter and early spring seemed to be the leanest time of the year, when muskrat and waterfowl served as a critical link to survival, especially when large game was scarce. Since Allen observed a scarcity of caribou and moose when he was in the region, it is not surprising that he emphasized the importance of small game and fish in the diet of the Upper Tanana Indians.

By the time McKennan arrived in the region in 1929, the fur trade had become a dominant feature of the economy. McKennan summarized the seasonal round in 1929, contrasting it to the former nomadic life:

The annual cycle is but little changed today except that the winter season is now devoted to trapping as well as hunting. The market for muskrat skins has also interjected a new factor into their seasonal life, namely muskrat shooting in the lakes during the month of May. The location of trading posts at Chisana, the mouth of Nabesna, and Tetling has also tended to divide the group into bands trapping out from these centers. Although such divisions are still exceedingly loose, there is a growing tendency toward localization quite at variance with the earlier fluidity (McKennan 1959:47).

CONTEMPORARY SETTING

Only two to three generations have passed since Tetlin Indians first encountered white traders and explorers. A total of 107 year-round residents lived in Tetlin at the time of this study in 1984, which compares favorably with the 110 residents counted for a Department of Community and Regional Affairs census but is higher than the Alaska Department of Labor 1984 estimate of 92 persons for the community. The population has remained fairly constant since 1960, ranging between 100 and 125 persons (Table 1). According to a U.S. Bureau of Census 1980 report, 88 percent of Tetlin residents were Native American, nearly all

TABLE 1. TETLIN POPULATION, 1950-1984.

Year	Population
1950	73 ^a
1960	122 ^a
1970	114 ^a
1980	107 ^a
1983	110 ^b
1984	110 ^b (92 ^c)

^aU.S. Bureau of Census, 1980.

^bAlaska Department of Community and Regional Affairs 1984.

^cAlaska Department of Labor 1987 (estimate).

of Athabaskan Indian descent. Within the sample, the majority of household heads were born in Tetlin, although Last Tetlin and several Copper River communities also are represented (Table 2). Heads of households (average age = 56 years) had spent an average of 49 years in Tetlin. The mean age was approximately 31, with one-third of the population under 20, and one-fifth over 50. The average size of households sampled is 3.9 members (Table 3).

TABLE 2. BIRTHPLACE OF TETLIN HOUSEHOLD HEADS

Birthplace	Number	Percent
Tetlin	11	55
Last Tetlin	1	5
Northway	3	15
Copper River Community	4	20
Other Rural Alaska Community	1	5

TABLE 3. SIZE OF HOUSEHOLDS SAMPLED

Household Size	Number of Households	Members of Households
1	3	3
2	2	4
3	6	18
4	3	12
5	2	10
6	1	6
7	1	7
9	2	18
Total	20	78
(Mean Household Size: 3.9 members)		

Of the 35 houses standing in 1984, 28 were occupied during most of the year. Most of the houses are located on the north side of Tetlin River, forming a narrow row that extends along the river. A few are situated on the south side of the river. Approximately half the houses are made of logs, while others are of pre-fabricated frame construction. None of the houses have running water, although all houses on the north side have electricity provided by a community-operated generator. Homes are heated by wood-burning stoves. Community facilities include an elementary school, health clinic, laundry, community hall, and post office. Mail is delivered twice a week by airplane from Tok. A single communal telephone is located in the laundry facility. There is no store in Tetlin, and at present, Tok is the nearest center for commercial exchange.

Tok and other neighboring communities are accessed primarily by boat, snowmobile, or airplane. Though an unimproved road exists between

Tetlin and the Alaska Highway, it is only passable during a few months of the year (Plate 2). This distinguishes Tetlin from most other Upper Tanana communities which are connected to the highway by public road. Plans are underway, however, for construction of an all-season road. In 1984, less than half the households owned automobiles or trucks, and only one household owned an off-road-vehicle (ORV). ORVs appear to be of little utility in this terrain dominated by lakes and rivers. Sixty percent of the households owned riverboats which serve as the primary form of transportation during the summer and fall. A network of snowmobile and foot trails radiates out from the village to traplines, hunting and fishing camps, and other communities.

Income levels in Tetlin are very low, and reflect the limited opportunities for local wage employment (Table 4). The average taxable income in Tetlin for the years 1978, 1981, and 1982 was \$4,368, compared with \$21,629 for Anchorage and from \$5,917 to \$11,926 for other Upper Tanana communities. Table 5 presents comparative figures for Tetlin and other Upper Tanana communities for 1980, based on information collected for the 1980 Census of Population. (Caution should be exercised in comparing the figures in Tables 4 and 5, since they are derived from different sources.) The mean household income for Tetlin was well below that of the other area communities. Only 25 percent of the households reported incomes above \$5,000 for 1983-84, of which federal and state subsidies accounted for a large portion (see Table 6).



Plate 2. Modes of Access. An unimproved road built in 1981 now connects Tetlin to the Alaska Highway, but because of the swampy terrain through which it meanders, it is only passable during a few winter months (above). Motorized river boats provide access during the summer and fall (below).

TABLE 4. AVERAGE TAXABLE INCOME FOR SELECTED UPPER TANANA COMMUNITIES AND ANCHORAGE, 1978, 1981, 1982.

Year	Tetlin	Northway	Tanacross	Tok	Anchorage
1978	\$4,806	\$10,791	\$4,335	\$13,482	\$18,255
1981	3,856	10,549	6,519	16,095	23,043
1982	4,443	13,304	6,898	18,334	23,590
Three-year Average	4,368	11,548	5,917	11,926	21,629

Source: Alaska Department of Revenue, 1985.

TABLE 5. COMPARATIVE INCOME AND EMPLOYMENT DATA FOR FOUR UPPER TANANA COMMUNITIES.

	Tetlin	Tok	Tanacross	Northway
Mean Household Income - 1980 ^a	\$5,492	\$22,930	\$21,927	NA
Percent Households Below Poverty Level	72	12	10	NA
Mean Number Months Household Head Employed (1984) ^b	1.9	7.1	4.6	5.0

^aSource: U.S. Bureau of Census 1980.

^bData for Tok, Tanacross, and Northway from Haynes et al. (1984).

TABLE 6. EXAMPLES OF TYPES AND AMOUNTS OF PUBLIC ASSISTANCE TO
TETLIN HOUSEHOLDS OVER A SIX MONTH PERIOD,
JUNE THROUGH NOVEMBER, 1984.

Program Type	Total Payment Made to Tetlin During Six Months	Mean Number of Cases	Mean Monthly Payment per Case
Aid to Families with Dependent Children (AFDC)	\$7,500	3.5	\$357
Food Stamps (FS)	12,332	7.0	294
Combined AFDC and FS	27,627	5.0	921
Old Age Assistance (OAA)	12,126	9.0	225

Source: Alaska Department of Health and Social Services, 1984.
Division of Public Assistance, Computer Data Files. Juneau.

In the year preceding this study, 45 percent of the household heads were employed, working an average of 1.9 months a year. This average increases to 2.8 months when those over 65 years are excluded. Since all but three of the twenty household heads sampled were male, employment of women in the community is not well-represented in the household head statistics. Fifty percent of the female spouses to household heads were employed, working a mean of 1.7 months a year for the sample as a whole. This combined average of 3.6 months for male heads and their spouses still falls short of household head employment levels elsewhere in the region (Table 5). As is evident in these figures, the majority of jobs are intermittent, short-term opportunities (Table 7). Examples of short term jobs reported by Tetlin residents in 1983-84 included firefighting, construction, and housekeeping for the elderly.

TABLE 7. HOUSEHOLD HEAD EMPLOYMENT FOR 12-MONTH PERIOD
IN TETLIN, 1983-84.

Employment Status	Number	Percent
Not employed	11	55
Employed	9	45
Local full-time	(2)	
Local part-time	(2)	
Non-local part-time	(1)	
Sporadic or intermittent	(4)	

When compared with other Upper Tanana communities, income and employment levels in Tetlin are low. Tetlin's relative isolation has probably been a major factor in diminishing access to job opportunities. However, as will become apparent in the following chapters, this isolation appears to enhance opportunities for harvest of local resources.

CHAPTER 2

THE SEASONAL ROUND

The annual harvest cycle in Tetlin resembles a fine hunting tool that has been shaped and modified through generations. In response to the particular options and constraints of their surroundings, residents have refined a yearly schedule of activities that enables them to efficiently exploit local resources for their livelihood. The schedule, however, is no more rigid than is the environment from which it is derived. The yearly round must be sufficiently flexible to accommodate both short and long term changes, such as daily changes in the number of fish running, yearly changes in caribou range and abundance, or longer term influences such as the introduction of fur traders, snowmobiles, and supermarkets. Tetlin's seasonal round represents a continuum of responses to a dynamic environment.

In addition to setting a routine, the harvest cycle plays an important role in establishing and reinforcing values and institutions. For instance, July is considered an important time of the year for harvesting fish. At this time, there is noticeable peer pressure to catch large quantities and store them for winter use, and recognition is awarded to those who do so. Knowledge of the seasonal round reveals more than the schedule of resource harvests; it gives insights into the cultural environment of the people who adhere to it.

The current seasonal round focuses on moose, furbearers, waterfowl, several species of freshwater fish, small game animals, and a variety of plants (Tables 8 and 9). Fall, winter, spring, and summer are recognized by seasonal landmarks such as freeze-up, ice ready to move,

TABLE 8. FISH AND WILDLIFE SPECIES HARVESTED
BY TETLIN RESIDENTS

SPECIES	UPPER TANANA ATHABASKAN NAME ^a
<u>Fish</u>	
Arctic Grayling (<u>Thymallus arcticus</u>)	Seejiil
Burbot (<u>Lota lota</u>)	Ts'aan
Longnose Sucker (<u>Catostomus Catostomus</u>)	Taats'adn
Northern Pike (<u>Esox lucius</u>)	Ch'uljuudn
Salmon (Species Unspecified)	Yuugn delt'al
Whitefish (<u>Coregonus</u> spp.)	Yuugn, Yuuk
<u>Large Game</u>	
Black Bear (<u>Ursus americanus</u>)	Shoh
Caribou (<u>Rangifer tarandus</u>)	Udzih
Dall Sheep (<u>Ovis dalli</u>) ^b	Dibee
Grizzly Bear (<u>Ursus arctos</u>)	Ch'iliithoo'
Moose (<u>Alces alces</u>)	Diniign
<u>Small Game</u>	
Porcupine (<u>Erethizon dorsatum</u>)	Ts'iit
Rock Ptarmigan (<u>Lagopus mutus</u>)	?
Ruffed Grouse (<u>Bonasa umbellus</u>)	Ch'ahtagn
Sharp-tailed Grouse (<u>Tympanuchus phasianellus</u>)	Tsaa'ts'uu
Snowshoe Hare (<u>Lepus americanus</u>)	Gah
Spruce Grouse (<u>Dendragapus canadensis</u>)	Daih
Willow Ptarmigan (<u>Lagopus lagopus</u>)	K'atbah

Furbearers

Beaver (<u>Castor canadensis</u>)	Tsa'
Coyote (<u>Canis latrans</u>)	- - -
Ermine (<u>Mustela erminea</u>)	Nihbaaiy
Gray Wolf (<u>Canis lupus</u>)	Thiikaan, Shyoo
Least Weasel (<u>Mustela nivalis</u>)	Chuiy, tsuiy
Lynx (<u>Lynx canadensis</u>)	Niiduuiy
Marten (<u>Martes americana</u>)	Tsuugn
Mink (<u>Mustela vison</u>)	Tehts'oo
Muskrat (<u>Ondatra zibethicus</u>)	Dzanh
Red Fox (<u>Vulpes vulpes</u>)	Noogaaiy
River Otter (<u>Lutra canadensis</u>)	Ntsia
Wolverine (<u>Gulo gulo</u>)	Nahtsia'

Waterfowl^c

American wigeon (<u>Anas americana</u>)	Shah saiy
Canada Goose (<u>Branta canadensis</u>)	Xah, T'aaxadn
Common Goldeneye (<u>Bucephala clangula</u>)	?
European wigeon (<u>Anas penelope</u>)	Shah saiy
Greater Scaup (<u>Aythya marila</u>)	?
Green-winged Teal (<u>Anas crecca</u>)	Tuhtsil
Lesser Scaup (<u>Aythya affinis</u>)	Nal thoo
Mallard (<u>Anas platyrhynchos</u>)	T'aiy choh
Northern Shoveler (<u>Anas clypeata</u>)	Dilahchuiy, da ^h ah ^h agn
Pintail (<u>Anas acuta</u>)	Dzehnia
Snow Goose (<u>Chen caerulescens</u>)	Tagadu (Guedon 1974)

Surf Scoter (<u>Melanitta perspicillata</u>)	Taatsaa'al
Swan (<u>Cygnus spp.</u>)	Taagoh
White-fronted Goose (<u>Anser albifrons</u>)	Dzanthat
White-winged Scoter (<u>Melanitta deglandi</u>)	Nal

^aMilanowski (1979)

^bTraditionally harvested, not commonly harvested at present.

^cThis is a partial listing of waterfowl species known to be harvested; based on Guedon (1974) and personal observations.

TABLE 9. PLANT SPECIES HARVESTED BY TETLIN RESIDENTS FOR FOOD, MEDICINE, AND OTHER PURPOSES.

SPECIES ^a	COMMON NAMES ^b	U.T. ATHABASKAN NAME ^c	SEASON COLLECTED	COMMENTS
<u>FOOD PLANTS</u>				
<u>Arctostaphylos uva-ursi</u>	Stoneberry, Kinnikinnik, "Indian Popcorn"	Dindaih	late summer, fall	Mixed fresh with moose or fish grease and frozen.
<u>Betula papyrifera</u>	Paper Birch	K'itl	mid-summer	Bark peeled back and sweet sap skimmed off trunk, eaten fresh.
<u>Boletus</u> sp.	King Bolete, "Birch Mushroom"	Ch'inaiy'	mid - late summer	Fried and eaten fresh. Not dried or canned. Said to occur only near birch tree (<i>Betula</i> <i>papyrifera</i>).
<u>Chenopodium album</u>	Lambsquarter	Kqo'	summer	Leaves boiled and eaten. Reported to be introduced - not traditional native food.
<u>Empetrum nigrum</u>	Crowberry, Blackberry	Naht'ia, Da' ts'ign	late summer, fall	Berries eaten fresh or boiled with sugar. Also canned.
<u>Epilobium angustifolium</u>	Firewood	GooH	late spring, early summer	Young shoots boiled with sugar and eaten. Children eat nectar from flowers.
<u>Geocaulon lividum</u>	"Ravenberry"	Taatsaa'jign	anytime	Roots are eaten, not berries - "emergency food".
<u>Hedysarum alpinum</u>	"Roots", "Indian Potato"	Tsuu	late spring, fall	Roots eaten, usually boiled then fried.
<u>Leccinum</u> sp.	Orange Bolete, "Cottonwood Mushroom"	Ch'inaiy'	mid - late summer	Fried and eaten fresh, not preserved. Said to occur near cottonwood tree (<i>Populus</i> <i>balsamifera</i>).
<u>Nyriophyllum spicatum</u>	"Muskkrat Cache", "Roots"	Niitsil, Dzanh tsaa	winter	Roots of this aquatic plant are stored by muskrat in burrows. They are removed from these burrows, fried and eaten.

SPECIES ^a	U.T. ATHABASKAN		SEASON COLLECTED	COMMENTS
	COMMON NAMES ^b	NAME ^c		
FOOD PLANTS, cont.				
<u>Oxycoccus microcarpus</u>	Swamp Cranberry, "Ground Berry"	Nan'jign	late summer, fall	Same uses as Lowbush Cranberries. One informant commented "Young kids can't eat - their teeth will fall out. In old time, nobody eats."
<u>Polygonum alaskanum</u>	Wild Rhubarb, "Bluebar"	Ts'igoo'	early summer	Roots and leaves of young plants boiled with sugar.
<u>Ribes sp.</u>	Currant	Nany nuul	late summer, fall	Berries eaten.
<u>Rosa acicularis</u>	Wild Rose, Rosehips	Nchqq	late summer, early fall	Mixed with cranberries. Boiled and eaten, or canned.
<u>Rubus idaeus</u>	Raspberry	Danch'ogn	mid-summer	Berries eaten fresh, canned, or frozen.
<u>Rubus chamaemorus</u>	Cloudberry, "Salmonberry"	Dankaał	mid-summer	Berries eaten fresh or cooked with sugar. Also canned or frozen.
<u>Rubus arcticus</u>	Nagoonberry, "Little Raspberry"	Dant'ot	mid-summer	Berries eaten fresh.
<u>Salix sp.</u>	Willow	K'at' ch'ia	early summer	Young shoots peeled and "inside" eaten fresh - "emergency food".
<u>Vaccinium uliginosum</u>	Blueberry	Jign	mid-late summer	Berries eaten fresh or cooked with sugar. Also canned.
<u>Vaccinium vitis-idaea</u>	Lowbush Cranberry, Cranberry	Nt'at	late summer and fall after first frost	Berries eaten fresh or boiled with sugar, canned and frozen - frequently combined with rosehips. Sometimes mixed with fish eggs to make "Indian Ice Cream".
<u>Viburnum edule</u>	Highbush Cranberry	Tsaa'theel	late summer, fall	Same as lowbush cranberries - often mixed with rosehips.

SPECIES ^a	COMMON NAMES ^b	U.T. ATHABASKAN NAME ^c	SEASON COLLECTED	COMMENTS
<u>MEDICINAL PLANTS</u>				
<u>Artemesia frigida</u>	Prairie Sagewort, "Medicine Flower"	Dikoh ch'onih	summer	Placed in steambath to treat congestion. "Like Vicks". One woman reported that leaves are chewed to cure cancer.
<u>Chenopodium album</u>	Lambsquarter	Koo'	summer	Leaves boiled and eaten to treat diarrhea.
<u>Gentiana</u> sp.	Gentian, "Medicine Flower"	Dikoh ch'onih	summer	Boiled for tea (leaves?, flowers?, roots?) to treat colds.
<u>Ledum groenlandicum</u>	Greenland Tea, "Canada Tea"	Ch'illaak'aiy'	summer, fall	"Cure-all" plant. Some uses: 1) Boil leaves to make tea for colds, coughs, and headaches. made from tea or crused leaves and 2) Balm applied externally to abrasions. 3) Leaves chewed raw for mouth sores and indigestion.
<u>Picea glauca</u> (maybe <u>mariana</u> too); <u>Empetrum nigrum</u> ; and <u>Ledum groenlandicum</u> ; <u>Populus balsamifera</u>	"Cold Medicine"	?	summer	These four plants (new spruce sprigs, <u>Empetrum</u> leaves, <u>Ledum</u> leaves, and young <u>Populus</u> shoots) are combined and boiled. Tea taken in small amounts for bad colds and coughs.
<u>OTHER USES</u>				
<u>Artemesia tilesii</u>	"Stink Weed"	Kqq'tsanh	summer	Placed on floor of steambath for nice aroma. Also lay fish on top of this plant before cutting them.
<u>Chenopodium capitatum</u>	Strawberry Spinach	Yii jign	summer	Red inflorescence crushed to make "paint" and dye for quills and basket roots. Not eaten.

SPECIES ^a	COMMON NAMES ^b	U.T. ATHABASKAN NAME ^c	SEASON COLLECTED	COMMENTS
<u>OTHER USES, cont.</u>				
<u>Polyporus</u> sp.	Tree Conk, "Ashes", "Monkey Bread"	?	summer, fall (other seasons)	Knocked loose from trees. Burned and ashes saved and mixed with chewing tobacco for homemade "snuff". One type of tree fungus formerly used as firestarter with mouth drill.
<u>Valeriana</u> sp.	Valerian, "Potlatch Weed"	thi'man	early to mid-summer	Small roots collected from young plants only. Burned at potlaches. "Good smell and makes everyone happy." Also reported to bring "good luck".

SOME PLANTS NOT USED

<u>Arctostaphylos</u> alpin	Bearberry, "Camp Robber Eyes"	Jq̄ nagn		Berry not eaten. "Don't eat, funny taste."
<u>Oxytropis</u> spp.	"Rabbit Roots"	Gah shii'		These plants are very similar in appearance to <i>Hedysarum alpinum</i> or "Indian Potatoes", though are reported to "taste funny" and are never eaten. Some species are reported as poisonous.
<u>Astragalus</u> spp.				
<u>Petasites</u> sagittatus	Sweet Coltsfoot	Naaxq̄iy th'aal'		This plant commonly used as medicinal herb among other N.A. Native groups. One resident commented, "Don't use it - we don't like the smell".
<u>Shepherdia</u> canadensis	Soapberry, Gooseberry	Dan ba'		Berry not eaten by Tetlin residents, claimed to be too bitter. "Canada Indians do that - mix it with sugar and make ice cream. We don't".

^a Plants identified by author at the University of Washington Herbarium, Seattle. Names after Welsh (1974).

^b Local Tetlin Names are in quotation marks.

^c Athabaskan names were transcribed from tapes with the assistance of linguist Paul Milanowski, 1984.

ice-moving or break-up, greening of trees, fish starting to run, and moose in rut (Guedon 1974:37-39). The calendar is therefore not fixed in time but is defined by real changes in the environment.

The harvest cycle, depicted in Figures 2 and 3, follows this course: fall, which most people consider the beginning of the cycle, is characterized by harvest in preparation for winter, and is dominated by moose and waterfowl hunting. Much of the meat harvested is dried or frozen for later consumption. The period just before and after freeze-up constitutes an active fishing period. "Pickle", or young pike are taken before the freezing of small sloughs and lakes, while burbot and large pike are harvested through the ice while it is still thin. The winter months are distinguished by trapping a variety of furbearers. By late winter, trapping effort shifts almost exclusively to muskrat. Following break-up, trapping ceases and muskrat are taken by hunters with rifles on foot or in boats. Waterfowl begin arriving in the spring and congregate where there is open water. Some are harvested at this time as a welcome source of fresh meat. Fishing dominates summer activity. Whitefish are taken and dried in large numbers in Tetlin, and at fish camps at Last Tetlin and other areas. Also during the summer, a large variety of plants are gathered for food and handicrafts. By late summer and early fall, moose and waterfowl are again harvested, thereby completing the cycle.

Figures 2 and 3 summarize the primary seasons of harvest for most species or species groups taken. Factors which seemed most important in determining when during the year a given resource is harvested were:

1) availability of the resource; 2) condition of the resource (e.g.,

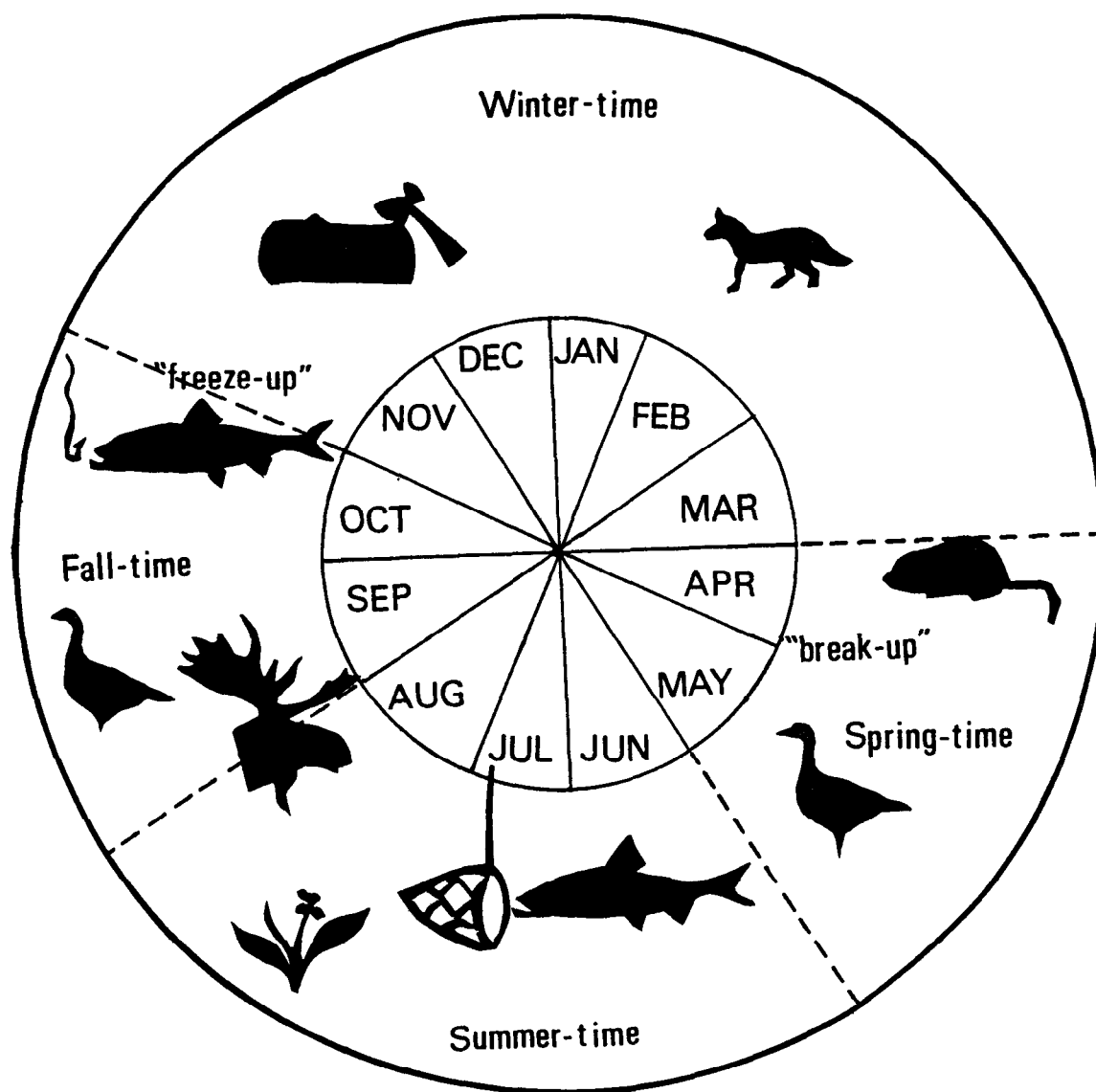
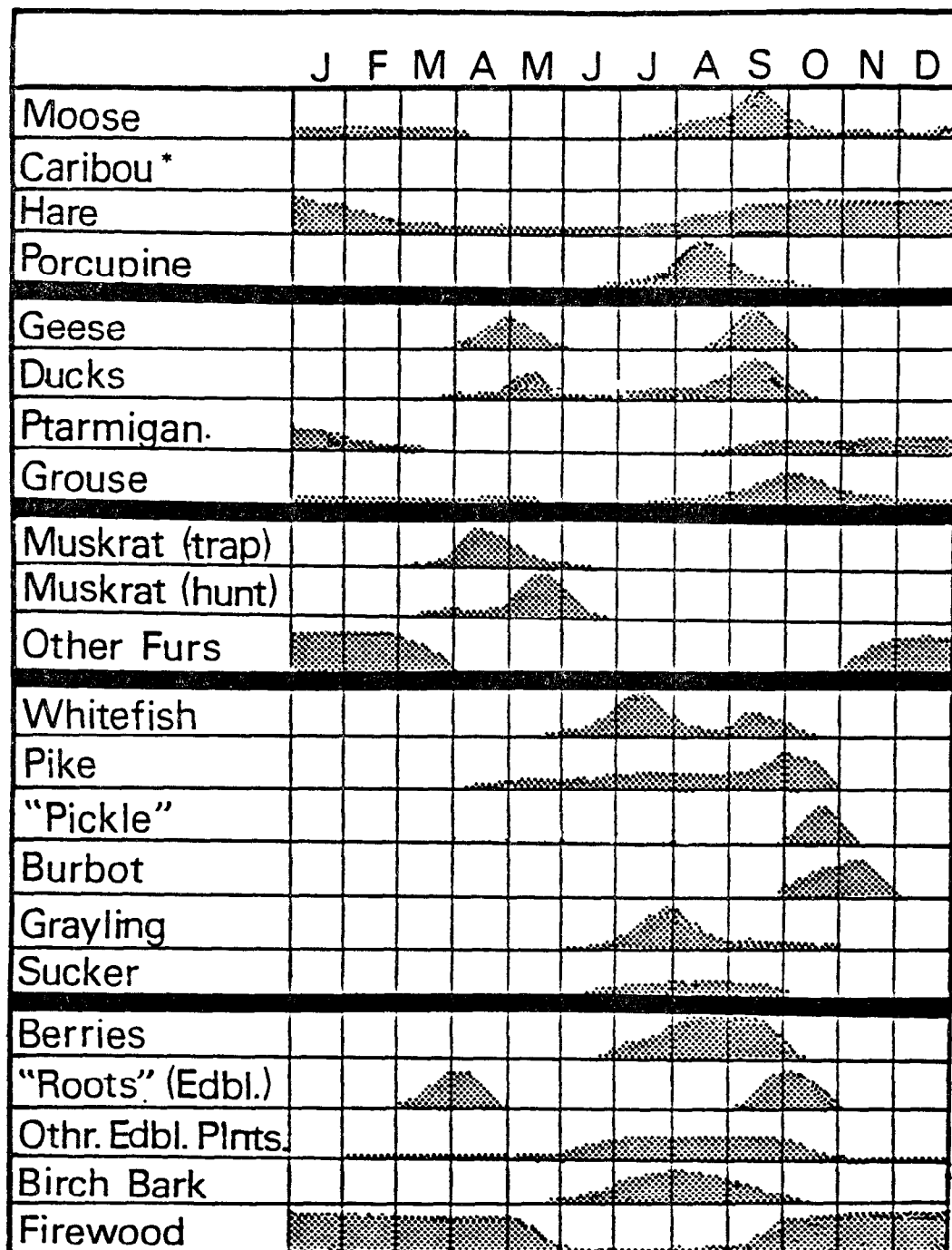


Figure 2. Tetlin's Annual Harvest Cycle for Major Harvest Seasons.



* No caribou were reported to have been harvested during the study year. Caribou have been harvested in previous years during the fall, and when available, in the winter.

Figure 3. Harvest Seasons for Selected Species or Species Groups Taken by Tetlin Residents as reported in 1983-1984.

fat, "poor" or skinny, strong taste); 3) mode of access (e.g., snowmobile, boat); 4) legal seasons as established by fish and game regulating agencies; 5) timing of other activities (e.g., harvesting other resources, wage employment, schooling); and 6) tradition.

The following section briefly describes each of the resources currently harvested, in the context of the six factors listed above. In this way, the reader can gain a better appreciation for the complexity involved in the timing of various harvest activities. Additional information on the methods and timing of harvest at Dot Lake is presented by Martin (1983) and is largely applicable to Tetlin.

BIG GAME HUNTING

Large Mammals

Moose

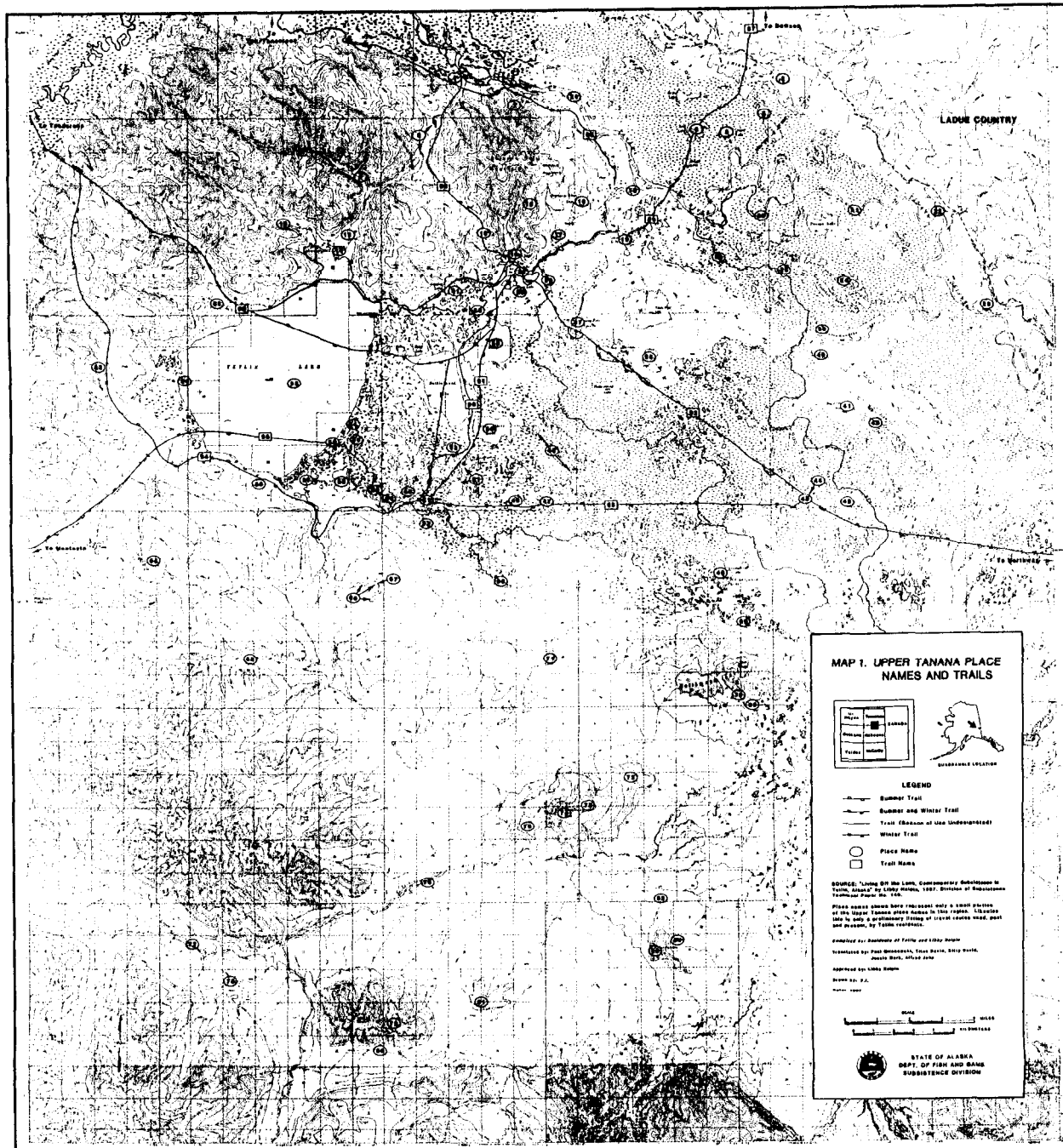
Harvest activities are concentrated in the late summer and early fall when moose remain in the more easily accessible lowlands, and are considered "fat" and good eating. Later in the fall, residents report that moose retreat from feeding areas around the lakes and rivers, and move to higher elevations when they enter the rutting season. At that time they are more difficult to pursue, and the meat is considered less palatable. Moose are occasionally taken at other times of the year, such as in late winter. Although a winter moose is not regarded as highly as one taken in the fall, its meat is valued at a time when winter food stores are running low and few alternative sources are

available. A tendency to harvest moose at these times of the year was noted by McKennan in the early 1900s:

Although an Indian is always ready to kill a moose, it's most important at two times of the year -- late summer, early fall following the disappearance of whitefish and before the fall caribou drive, and again in late winter, early spring after the winter caribou stores had been used up, and before it's possible to hunt ducks and muskrat (McKennan 1959:34).

Moose are most commonly hunted along the shores of lakes and rivers, and within a corridor extending inland from the shores approximately one mile. This limits the distance an animal must be carried to where a boat can be used to transport it back to the village. Several hills are designated as "game lookouts" (nahk'eedn, literally 'watch for animals.' (See Map 1 and Appendix A). According to older hunters, these same lookouts have been used over several generations, for caribou as well as moose. Hunters frequently climb these hills prior to the hunt, to scan the area for game. Once game is sighted, motor boats provide access to hunting areas. At closer ranges, game is sometimes pursued by canoe. Good hunters employ some of the highly-developed tracking skills used by past generations to gather clues about the direction and timing of moose movements.

Most moose hunting is done by the male household head, often accompanied by sons or male friends and relatives from outside the household. It is not uncommon, however, for a woman to accompany her husband, and several instances of women having harvested moose were recorded. On plant gathering trips in the late summer and fall, women usually are prepared to shoot a moose if one is seen near the village. At the very least, they take care to note any fresh sign of moose and report it to the hunters in their family.



MAP 1. UPPER TANANA PLACE NAMES AND TRAILS



- LEGEND**
- Summer Trail
 - Summer and Winter Trail
 - Trail (Season of Use Undetermined)
 - Winter Trail
 - Place Name
 - Trail Name

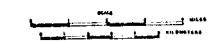
SOURCE: "Living Off the Land, Contemporary Subsistence in Yukon, Alaska" by Larry Brown, 1987. Division of Subsistence Technical Paper No. 140.

Place names shown here represent only a small portion of the Upper Tanana place names in this region. Unchecked are only a preliminary listing of place names used, past and present, by Table residents.

Compiled by: Subsistence of Tanana and Upper Tanana
Translated by: Paul Mendenhall, Tana Davis, Ship Smith,
Jason Smith, and others

Approved by: Linda Brown

June 20, 1991



STATE OF ALASKA
DEPT. OF FISH AND GAME
SUBSISTENCE DIVISION

- | | | | | | |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------------------|
| 1. 1st of 1st (Upper Tanana River) | 18. 1st of 1st (Upper Tanana River) | 35. 1st of 1st (Upper Tanana River) | 52. 1st of 1st (Upper Tanana River) | 69. 1st of 1st (Upper Tanana River) | 86. 1st of 1st (Upper Tanana River) |
| 2. 1st of 1st (Upper Tanana River) | 19. 1st of 1st (Upper Tanana River) | 36. 1st of 1st (Upper Tanana River) | 53. 1st of 1st (Upper Tanana River) | 70. 1st of 1st (Upper Tanana River) | 87. 1st of 1st (Upper Tanana River) |
| 3. 1st of 1st (Upper Tanana River) | 20. 1st of 1st (Upper Tanana River) | 37. 1st of 1st (Upper Tanana River) | 54. 1st of 1st (Upper Tanana River) | 71. 1st of 1st (Upper Tanana River) | 88. 1st of 1st (Upper Tanana River) |
| 4. 1st of 1st (Upper Tanana River) | 21. 1st of 1st (Upper Tanana River) | 38. 1st of 1st (Upper Tanana River) | 55. 1st of 1st (Upper Tanana River) | 72. 1st of 1st (Upper Tanana River) | 89. 1st of 1st (Upper Tanana River) |
| 5. 1st of 1st (Upper Tanana River) | 22. 1st of 1st (Upper Tanana River) | 39. 1st of 1st (Upper Tanana River) | 56. 1st of 1st (Upper Tanana River) | 73. 1st of 1st (Upper Tanana River) | 90. 1st of 1st (Upper Tanana River) |
| 6. 1st of 1st (Upper Tanana River) | 23. 1st of 1st (Upper Tanana River) | 40. 1st of 1st (Upper Tanana River) | 57. 1st of 1st (Upper Tanana River) | 74. 1st of 1st (Upper Tanana River) | 91. 1st of 1st (Upper Tanana River) |
| 7. 1st of 1st (Upper Tanana River) | 24. 1st of 1st (Upper Tanana River) | 41. 1st of 1st (Upper Tanana River) | 58. 1st of 1st (Upper Tanana River) | 75. 1st of 1st (Upper Tanana River) | 92. 1st of 1st (Upper Tanana River) |
| 8. 1st of 1st (Upper Tanana River) | 25. 1st of 1st (Upper Tanana River) | 42. 1st of 1st (Upper Tanana River) | 59. 1st of 1st (Upper Tanana River) | 76. 1st of 1st (Upper Tanana River) | 93. 1st of 1st (Upper Tanana River) |
| 9. 1st of 1st (Upper Tanana River) | 26. 1st of 1st (Upper Tanana River) | 43. 1st of 1st (Upper Tanana River) | 60. 1st of 1st (Upper Tanana River) | 77. 1st of 1st (Upper Tanana River) | 94. 1st of 1st (Upper Tanana River) |
| 10. 1st of 1st (Upper Tanana River) | 27. 1st of 1st (Upper Tanana River) | 44. 1st of 1st (Upper Tanana River) | 61. 1st of 1st (Upper Tanana River) | 78. 1st of 1st (Upper Tanana River) | 95. 1st of 1st (Upper Tanana River) |
| 11. 1st of 1st (Upper Tanana River) | 28. 1st of 1st (Upper Tanana River) | 45. 1st of 1st (Upper Tanana River) | 62. 1st of 1st (Upper Tanana River) | 79. 1st of 1st (Upper Tanana River) | 96. 1st of 1st (Upper Tanana River) |
| 12. 1st of 1st (Upper Tanana River) | 29. 1st of 1st (Upper Tanana River) | 46. 1st of 1st (Upper Tanana River) | 63. 1st of 1st (Upper Tanana River) | 80. 1st of 1st (Upper Tanana River) | 97. 1st of 1st (Upper Tanana River) |
| 13. 1st of 1st (Upper Tanana River) | 30. 1st of 1st (Upper Tanana River) | 47. 1st of 1st (Upper Tanana River) | 64. 1st of 1st (Upper Tanana River) | 81. 1st of 1st (Upper Tanana River) | 98. 1st of 1st (Upper Tanana River) |
| 14. 1st of 1st (Upper Tanana River) | 31. 1st of 1st (Upper Tanana River) | 48. 1st of 1st (Upper Tanana River) | 65. 1st of 1st (Upper Tanana River) | 82. 1st of 1st (Upper Tanana River) | 99. 1st of 1st (Upper Tanana River) |
| 15. 1st of 1st (Upper Tanana River) | 32. 1st of 1st (Upper Tanana River) | 49. 1st of 1st (Upper Tanana River) | 66. 1st of 1st (Upper Tanana River) | 83. 1st of 1st (Upper Tanana River) | 100. 1st of 1st (Upper Tanana River) |
| 16. 1st of 1st (Upper Tanana River) | 33. 1st of 1st (Upper Tanana River) | 50. 1st of 1st (Upper Tanana River) | 67. 1st of 1st (Upper Tanana River) | 84. 1st of 1st (Upper Tanana River) | |
| 17. 1st of 1st (Upper Tanana River) | 34. 1st of 1st (Upper Tanana River) | 51. 1st of 1st (Upper Tanana River) | 68. 1st of 1st (Upper Tanana River) | 85. 1st of 1st (Upper Tanana River) | |

Preparation of the moose, after it has been dressed and sectioned by the hunter, is usually done by the women. Nearly all parts of the moose are utilized. The meat is sliced into large thin sheets that are dried or "jerked" in the smokehouse. Strips of fat are saved to be eaten with the dried meat. If the family owns a freezer, pieces are cut as steaks and frozen. The liver, kidneys, and heart are boiled and eaten fresh. Often the stomach is boiled and made into a soup, though not as commonly as in the past. Bones are also boiled for soups. The head and hooves are cooked, the latter being roasted over a fire and the meat extracted. Moose head is used to make moosehead soup, a traditional potlatch dish. Although moose skins are in high demand for handicrafts, the home tanning process is arduous and time-consuming. Only one woman in Tetlin continues to tan hides herself. Hides are occasionally sent out to be commercially tanned, which is an expensive proposition. Although many of the Tetlin women make handicraft and clothing articles from moose skins, (e.g., moccasins, vests, mittens, and gun cases) the cost of obtaining skins seems to significantly limit production of these items.

At a time when there appears to be an increasing focus on individual family units, moose meat remains subject to a strict traditional code of communal distribution in the village. For example, a hunter's first moose is always shared with others. One hunter explained, "First moose you can't eat, your Mom has to pass it all around. They say if you don't, it's bad luck." Similarly, the first moose of each season has to be "passed around." Both of these traditions appear to be widespread among Athabaskan groups. There are similar expectations that all moose harvested be at least partially

distributed. One hunter complained, "I can't remember one time that I got to keep a whole moose to myself." During a return visit to Tetlin in the fall, the author was given moose meat by two families, and noticed that several of the elderly residents who had not hunted also were well-stocked.

Moose meat is highly valued in Tetlin. Several older men commented that a real meal is only one with wild meat -- particularly moose meat. People who attend potlatches in Tetlin expect moose meat, and complain if there is not enough. Moose have played a very important part in the life of the Upper Tanana Indians historically, and continues to be a highly sought-after and relished traditional food.

Dall Sheep

At the present time, Dall sheep are not harvested by Tetlin residents. Although one man and his wife stated that they had tried hunting sheep in 1980, thirty or more years have passed since most residents last hunted sheep. The older men in Tetlin recalled sheep hunting trips into the "high country" of the Nutzotin and Mentasta mountains in the late summer and fall. Sheep provided warm skins for clothing and meat rich in oil. However, the energy costs associated with hunting and transporting them down from the mountains prevented sheep from playing a major role in the diet even in earlier days (McKenna 1959). Several younger hunters interviewed expressed an interest in sheep hunting in the future.

Bear

Bears are no longer hunted in Tetlin, although from time to time they are killed in defense of life or property. The distinction is an important one; when respondents were asked if they had hunted bears during the past year, they were likely to say no. If asked whether they killed any, some hunters answered differently. It is considered taboo (eegi) to actively pursue a bear for harvest and consumption. Only one person reported eating bear meat. Taboos do not appear, however, to apply to the killing of nuisance bears.

Current attitudes and folklore regarding bears indicates their close association with man. This is evident in stories describing bears that "walk on two feet like a man", or "eat off a plate like man". They are said to be "smart" or "smarter than man" and as such are considered dangerous to hunt.

Traditionally, killing a grizzly bear entailed a one-to-one contest, the hunter being armed with a spear and club. The risk was undoubtedly high, but substantial prestige was accorded a successful hunter. Black bears do not appear to have been held in the same esteem and often were taken instead by a group of hunters (Vitt 1971). Although there always were taboos or restrictions surrounding the consumption of bears, especially for women, bear meat was taken and dried much like moose and the fat was used extensively for preserving other foods (McKenna 1959). Bears were generally harvested in the late summer. An older informant commented, "August-time, we go where blueberries are and shoot bear. A lot of fat then. May, June they are poor. We roast grizzly bears' feet, and use lots of fat for berries."

At some point in the past ten to twenty years bear hunting ceased, and bear meat was all but dropped from the diet. People today acknowledge that they used to eat bear meat, but cite taboos in explaining why they no longer do so. Residents even complain that bears are too numerous in the area create a problem, but do not consider hunting them as an appropriate solution.

Caribou

In marked contrast to the earlier part of this century, caribou play a very minor role in the seasonal round today. According to the village elders, caribou numbers in the Tetlin area declined in the late 1940s, coinciding with construction of the Alaska Highway and the influx of workers. A few remained scattered on the Tanana flats near Tetlin through the 1950s and 1960s, but by the 1970s they had all but disappeared. This was probably due to both increasing hunting pressure as the regional human population swelled, and natural fluctuations in the size and distribution of caribou herds in this area (Davis, Shideler, and LeResche 1978).

During the 1950s and 1960s, the Bureau of Indian Affairs assisted hunters from Tetlin by providing transportation to a hunting area located off the Taylor Highway, approximately 70 miles to the northwest. Although there is still a caribou season in that area, inadequate transportation and a limited period during which caribou are accessible has discouraged most people in Tetlin from hunting there in recent years. Most people feel that hunting caribou on the Taylor Highway is not worth the time and expense.

In very recent years, the winter range of caribou from the Nelchina and Mentasta herds has extended into the Tetlin area. The reaction to caribou presence in the vicinity has been mixed. Some residents were enthusiastic about prospects for hunting them, while others were irritated at their interference with traplines and muskrat push-ups (Haynes et al. 1984). All seemed to want the opportunity to harvest caribou if they continued to occupy the area in future years. The Alaska Board of Game responded to this situation in March 1983, by making up to 85 permits available in Tetlin and Northway if sufficient numbers of caribou ranged near these communities during the winter months. This provision was dropped in 1985 when major changes were made in the Alaska hunting regulations.

FURBEARER TRAPPING

Written accounts and conversations with some of the older residents of Tetlin suggest that fur trapping was the dominant feature of the Upper Tanana economy during the first half of this century. The onset of the fur trade in the late 1800s thrust the economy into one of greater specialization. Some of the time previously devoted to hunting moose and caribou was reallocated to fur trapping, thereby altering the seasonal round (McKenna 1959). The trade created a dependence upon imported commodities, and fueled the movement to permanent village sites where trading posts had been established. As mentioned earlier, the extensive involvement of Tetlin people in the fur trade was cited as the main reason for creating the Tetlin Reserve in 1930.

Today, although trapping remains an important economic activity for some residents, its contribution to the community economy has declined.

For a few households, trapping income constitutes a major portion of their cash earnings. More often, however, trapping supplements income derived from wages and salaries. School-aged boys trap as time permits to earn spending money. Examples of fur prices in 1984 for two of the relatively valuable fur species in the area, were \$125 for marten and \$300 for lynx in good condition (Titus David, pers. comm.). Despite variable fur prices, trapping remains one of the more reliable sources of cash income available to Tetlin residents.

Trapping closely follows the legally established seasons for furbearers. Activity begins in November when the snow cover is sufficient to operate snowmobiles. The harvest focuses on mink, marten, lynx, fox, wolverine, otter, coyote, and wolf, all of which are referred to as the "big furs". Muskrat and beaver also are important species and are taken later in the season. An extensive system of well-maintained winter trails radiating from the village provides easy snowmobile access to traplines. The degree to which the traplines themselves are maintained seems highly variable between families.

In contrast to most hunting, fishing, and plant gathering areas which are used by all villagers, trapping areas are viewed as "belonging" to a given family. Within the area, a family has exclusive rights to harvest the fur animals. The same area, however, may be considered communal for other types of harvest activities. It appears that traplines have been passed down through families for at least the past two or three generations. Table 10 summarizes recent patterns of trapline inheritance. Fifty-two percent were transferred from parents to a son, and 37 percent from parents to a daughter. Only 11 percent of the traplines were not inherited from kin.

TABLE 10. PATTERNS OF TRAPLINE INHERITANCE.

Previous User ^a	Number of Responses	Percent
Father	9	47
Wife's Father	6	32
Wife's Mother	1	5
Parents (unspecified)	1	5
Non-Kin	2	11

^aResponses by male trappers to the survey question "Who used your trapline before you?"

Steel traps and snares are used, the size and method of setting dependent on the species targeted. Trapping activities were not observed during fieldwork and are not discussed here. Robert (1984) provides detailed descriptions of trapping techniques among the Koyukon Athabaskan people of the Kaiyuh Flats area in west central Alaska.

Trapping for the "big fur" species is a male-dominated activity, though a woman sometimes accompanies her husband on the trapline. Skinning and stretching furs is done by the trapper. With the exception of beaver, muskrat, and occasionally lynx, the meat of fur animals is not eaten. Residents do not consider it appropriate to use fur animals as dog food. After skinning, the unused carcass is stored someplace safe from scavengers, and burned after the spring thaw. During winter, carcasses and skeletons of fur animals commonly are visible cached on rooftops of houses in the village. McKennan (1959:168) described some of the taboos surrounding fur animals, many of which are still recognized.

MUSKRAT TRAPPING AND HUNTING

The abundance of shallow lakes and sloughs of the Tetlin flats provide excellent habitat for muskrat. Muskrat are harvested from late winter until June. Prior to break-up, muskrats are trapped from small lodges or "push-ups" on the surface of frozen lakes. After break-up, they are hunted with small caliber rifles along the shores of open lakes and rivers.

Families are recognized as having exclusive rights to the muskrat in lakes associated with their trapline. Usually a family has a trapping cabin located on one of these lakes. Women, who do most of the muskrat trapping, sometimes move out to these camps for several weeks in the spring. Others make day trips by snowmobile and return to the village in the evening. Traps are set along the push-ups, and later in the season along the opening shorelines. Hunting with rifles also occurs at these "family" lakes, as well as in communally-used areas such as Tetlin River and Tetlin Lake. Harvest continues until the breeding season in June, at which time the male animals fight and the quality of the furs deteriorates.

Muskrat are taken for their meat as well as their furs. It is generally the woman's job to skin the muskrat, and the man's responsibility to stretch the fur onto wooden mounts for drying. The meat is eaten fresh or sliced into sheets to make 'drymeat.' Meat taken later in the season is said to be strong and is used for dog food. Prices paid for muskrat pelts in 1984 ranged between \$1.50 and \$5.00 (Dave Stearns, pers. comm.).

Residents of neighboring communities seem to envy Tetlin's proximity to good muskrat hunting and trapping areas. Parcels of muskrat meat were often sent from Tetlin to friends or relatives outside of the village.

WATERFOWL HUNTING

Tetlin village lands and the adjacent Tetlin NWR form a large wetland basin that is recognized as one of the most important waterfowl nesting areas in the state. McKennan (1959) and Guedon (1974) noted that Upper Tanana Indians relied on waterfowl in the spring as a source of fresh meat, in the summer for eggs and molting ducks, and in the fall when they were taken and dried for winter consumption. This general pattern continues today. At least ten species of ducks and two species of geese are harvested (Table 8). Of these, white-winged scoters, locally called "black ducks", appear to be the most common. Scoters may be a preferred species because of their oiliness. One person commented: "Black ducks are very greasy. Old people love the oil". Another person described scoters:

They taste best and are a lot bigger. Not much law for them -- don't know why. Have to wait a week after they come back, otherwise too fishy. July is really good for black duck roasting and stuffing.

Canada and white-fronted geese stage in the Tetlin area enroute to and from breeding areas farther north. The majority appear to be taken in the fall when they are stored for winter. Although swans were hunted traditionally, an informal village rule discourages their harvest today. The restraint shown for swans is likely in part due to the influence of

a wildlife biologist who spent several years studying swans in the Tetlin area. With regard to harvest of geese and swans, one person remarked, "Only the chosen ones can eat them, like the old people. We know who's who, and who should have them".

McKenna (1959:35) observed that duck eggs afforded variety to the Upper Tanana diet, and were collected in late May and early June. Some consumption of eggs occurs today, primarily by older residents. It is difficult to say whether this is because older people have a greater desire for them or because consumption of rarer foods (i.e., "luxuries") by custom is limited to the elderly. One woman asked about eggging replied: "Yes, we do that -- mostly older people though. Sometimes I like them. Usually we don't bother them, just if we want some". In other words, she might go out for duck eggs specifically, if she had a craving, but does not gather them incidentally to other activities. There appears to be a break in harvest in June. One person commented, "Ducks in June -- too skinny and they have eggs". Molting ducks, usually referred to in Athabaskan as chot, are taken in mid- to late summer, depending on the species. An elderly man reported that, as a young hunter, he knew when each duck species was featherless, and where to find them. Chot are often taken in conjunction with summer potlatches when there are many people to feed.

Most waterfowl are taken during the fall, when they can be eaten fresh or preserved for later use. Today, all are taken by hunting with rifles. Older residents recalled setting snares for ducks, though this no longer appears to occur. Several waterfowl species are not eaten. "Fish ducks", which probably refer to mergansers and grebes, are not sought, nor are loons.

Waterfowl hunting is done by men and boys, and as is true for nearly all game species, women prepare the ducks and geese for eating. Larger feathers are plucked and the remaining down is singed off. Those eaten fresh are cleaned and cut into pieces, usually for a soup. Most waterfowl taken in the fall are hung to dry or left outdoors to freeze, and then cached for winter consumption.

SMALL GAME HUNTING

Snowshoe hare, porcupine, ptarmigan, and grouse are utilized throughout the year. Hare either are trapped with handmade wire snares, or hunted with small caliber rifles. They are taken year-round, but harvest peaks in the late summer and fall when they are "fat" and relatively efficient to harvest because they are clustered in family groups. Snares are set in the vicinity of the village, most often by the older women. Hunting hare is a common activity among young people, and is easiest when hares undergo changes in pelage coloration and are most visible. During the winter, many of the hares harvested are caught unintentionally in traps set for larger furbearers. In the spring when women trap for muskrat, they simultaneously set snares for hare. The meat is boiled or fried, and sometimes made into a soup. Skins may be saved for clothing articles and handicrafts. One man recalled that in older times, skins were cut into strips and braided to make "rabbit rope blankets."

Grouse, commonly called "spruce hen", are taken all year, "whenever they are seen". Three different species are harvested: spruce, ruffed,

and sharp-tailed; each has a distinct Athabaskan name (Table 8). Most are taken in the fall, for the same reasons as snowshoe hare. Ptarmigan are most often taken along traplines. One man described a method of snaring ptarmigan by luring them to a willow branch placed in the snow, to which a snare was attached. Guedon (1974) observed this method of harvest when she was in Tetlin in the late 1960s.

The meat from porcupines is relished, but because of their scarcity, it is considered somewhat of a luxury. They are not specifically pursued but are taken "whenever a person comes upon it" with with rifles or clubs. Porcupines are prepared for eating by singeing off the quills, giving the meat a "barbeque" flavor, then boiled.

Older people recall harvesting marmots and ground squirrels, although they are not presently taken. Since these animals were formerly taken on trips made into the high country for sheep, they may have been dropped from the diet as sheep hunting became less common.

FISHING

Tetlin, and the former village site of Last Tetlin, originated as fish camps. McKennan (1959:47) observed a layer of fish scales several feet deep at Last Tetlin, showing evidence of long term occupation, as well as residents' long term reliance on fish. Although salmon do not reach the upper portion of the Tanana River, residents rely heavily upon several species of freshwater fish.

Whitefish

Whitefish (Subfamily Coregoninae) account for most of the fishing effort. In the Tetlin area, whitefish make annual upstream migrations to spawning areas beginning in June and continuing into October. After spawning, whitefish move back downstream, dispersing into deeper waters during the winter months (Morrow 1980). Judging by accounts of Tetlin residents, at least two whitefish species are harvested. Residents are thoroughly familiar with where and when these different species are available.

Harvest begins in June and continues until October. The greatest effort occurs during July, corresponding to the heaviest runs at Tetlin and Last Tetlin. During the summer of 1984, most whitefish were taken immediately in front of the village. In a typical year, more fishing occurs at Last Tetlin. Most families have a cabin or tent camp at Last Tetlin, and move there when fish are more plentiful than in the village. Several people were in the process of building new cabins at Last Tetlin or repairing older ones during the summer of 1984.

Whitefish are taken by two methods: traditional hoop net and weir, or gill nets. The former method was observed by both Allen (1887) and later McKennan (1959) when they visited the Tetlin and Last Tetlin camps. McKennan wrote:

Virtually all their fish are taken by means of weirs in conjunction with either fish traps or dip nets. Weirs are constructed by driving posts into the bed of the stream. Branches are intertwined between these to form a fence, impenetrable except at the center where an opening is left. In this is placed a cylindrical-shaped trap. . . .The hoop-shaped dip net, uu, is also used in place of the trap. It is from 3 to 4 feet in diameter and the netting is of twined spruce roots or babiche. The fisherman stands on a platform built upon the weir (McKennan 1959:62).

The weir and hoop net currently in use at Last Tetlin are identical to those described in the early part of the century, except that the handmade net is now woven with cotton line rather than roots or babiche (Plate 3). The fisherman stands on the platform when the run is heavy and dips the net, scooping up fish. When the platform is not occupied, fish continue to move upstream through the opening in the weir. McKennan (1959:63) observed that the Upper Tanana people made no fish nets other than the dip net. However, some of the older people recalled making and using gill nets when they were young. Commercial gill nets are used today, predominantly at Tetlin where a weir is no longer maintained.

Whitefish are seldom eaten fresh, but instead are dried and eaten, or stored for winter. People prefer them dried, even in the summer when they have the option. Many summer hours are spent checking nets, and cutting and drying fish in the smokehouse. When the season peaks, nets must be checked constantly so that fish will be fresh and firm. Whitefish seem to be particularly sensitive to temperature, and on warm days are quick to "spoil" or soften in the nets. Once out of the water the fish must be cut and hung to dry quickly, again to prevent loss from spoiling. During peak runs, it is difficult for one family to process all the fish in their nets. At such times, owners commonly share their nets with those who do not have their own.

Checking nets is work shared by all family members, while cutting and hanging fish for drying is almost exclusively women's work. Men and children occasionally speed the process along by scaling fish, or by helping to keep a smudge fire burning. During the month of July it

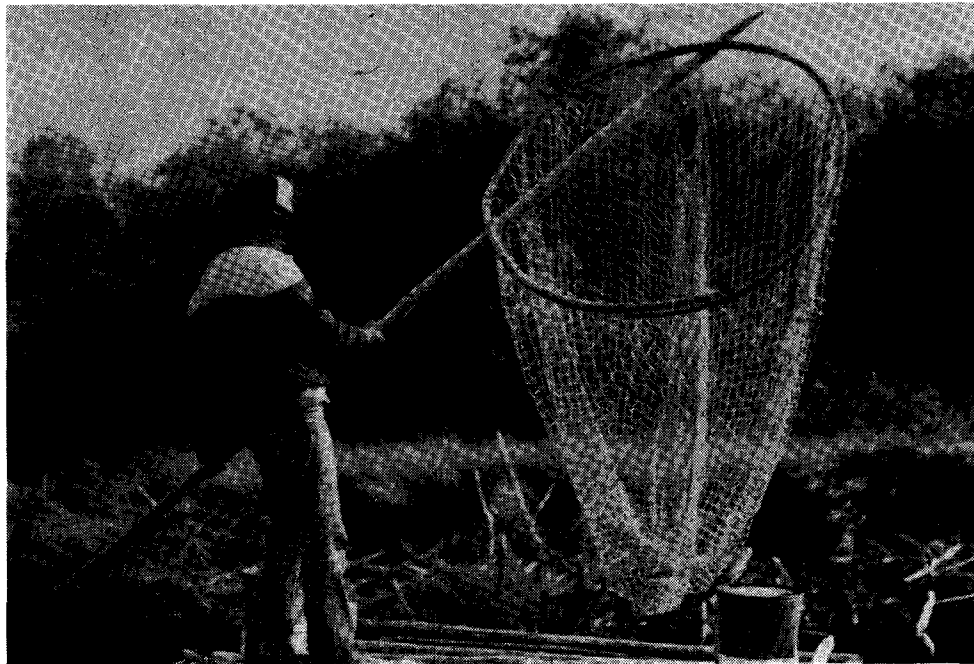


Plate 3. One Method of Whitefish Harvest in Tetlin. A weir or "fence" made of spruce and willow branches and platform (above), is used in combination with a large hand-made dip net or "uu".

is not unusual for women to work around the clock cutting and hanging fish. Many prefer late night or early morning hours when cooler temperatures minimize fish loss to spoilage. Fish are cut two ways for drying: (1) ba' is for firm fish, and are usually designated for human consumption; (2) tsilalkeiy is a method of cutting fish that have become soft, and are usually given to dogs. Most of the inner parts of the fish are used. Intestines are boiled, and the oil is rendered. Stomachs and the upper portion of the intestine are fried and eaten fresh. Eggs are hung to dry for later consumption. Martin (1983) presents a detailed description and illustrations of the fish cutting and drying process in Dot Lake. Tetlin methods appear to be very similar, if not identical.

Other Freshwater Fish

Four other species of fish are commonly harvested: northern pike, Arctic grayling, burbot, and longnose sucker. Suckers are not deliberately sought, but are taken if they get into nets set for whitefish. They are sometimes eaten, but more often given to dogs. Grayling and pike are taken with rod and reel in the summer months. This type of fishing is common among younger people and children, and is viewed more as recreational than as serious fishing. One older man commented, "Rod and reel is white man way -- too much hard work for nothing". Both grayling and pike are eaten fresh, though the latter is occasionally fed to dogs.

Just prior to freeze-up, usually near the end of October, yearling pike (5"-10") referred to as "pickle", are harvested in small sloughs,

rivers, and along lake shores. They are taken with a sal -- a handcrafted hook attached to a long wooden pole that resembles a gaff. The specific strategy involved in using the sal to catch these fast-moving fish was not observed. "Pickle" are eaten fresh by frying them whole. Since they are taken in the fall, they are also easily frozen and stored in outdoor caches. A missionary who spent eight years in Tetlin in the 1950s and 1960s commented that the fall "pickle" harvest was an important event in the seasonal round (Paul Milanowski, pers. comm., 1984).

Pike are also taken in the fall with a larger hooked version of the "pickle sal", dip nets, or traps. The majority are taken at this time when the taste is said to be best, and when temperatures are cold and the fish can be stored frozen in outdoor caches. Chicken wire fish traps, modeled after a traditional willow mesh trap, are approximately 2 feet wide, and 4-5 feet long. The trap is placed in a narrow slough in open water, or under the ice in later fall. Historically, both pike and whitefish were taken in traps, although this practice does not appear to be as prevalent today.

Fishing through the ice occurs in the late fall, just after freeze-up on the larger rivers. Since the ice thickens rapidly, the season is short-lived and fairly intensive. Effort is concentrated on burbot, also referred to as "ling cod," which are taken through the ice with a hand-held line and hook. "Pickle," taken earlier in the fall are often used as bait. While the modern version of the hook is metal, several older men described a hook fashioned from a dry branched limb, suggesting the longevity of this practice. Larger pike are also taken by this method. The fish freeze as soon as they are taken from the water and so are easily stored.

Salmon

Although salmon are not present in the Tetlin area, residents are accustomed to small amounts in their diet, most of which is acquired from communities in the Copper River basin. When Lt. Allen passed through the village of Batzulnetas in 1885, he noted that people from the Tetlin area were there to harvest salmon (Allen 1887). The villages of Last Tetlin and Batzulnetas were connected by a summer foot trail that traversed the mountains. One older resident recalled that his father had travelled over this trail to exchange muskrat for salmon. This long-standing tradition of exchange with Copper River communities has persisted to the present time. Today, people occasionally travel by car to the Copper River to harvest salmon in June and July, using the fishwheel of a friend or relative. Most salmon, however, is acquired through trade, often occurring in conjunction with potlatches. A more detailed discussion of the role of salmon in the Upper Tanana communities is presented in Haynes et al. (1984).

PLANT GATHERING

Many plants are utilized for food, medicine, crafts, construction and other purposes. Plant foods add variety and important nutritional supplements to the diet. McKennan (1959:37) noted, "In scarcity of game, vegetable foods can be the measure between life and death." Many people, especially the older women, show an acute awareness and understanding of Tetlin's surrounding flora. In addition to being familiar with common edible plants, they can identify those plants that

can be used as emergency food, plants with medicinal properties, toxic plants, and those with a wide array of technical uses. A collection of some of these plants was made. A partial list of species gathered and their uses are summarized in Table 9.

A general sequence of plant gathering activities during the year follows: in the late spring, after snow melt, women dig roots of the previous year's crop of the legume, Hedysarum. These roots are sometimes referred to locally as "Indian potatoes". Shortly thereafter, when the ground becomes softer, spruce roots are excavated for basket-making. Wild rhubarb is harvested along muddy lake banks in early summer. With the onset of warmer temperatures, bark from birch trees is easily removed. Bark is harvested all summer long in large amounts for basket-making. Judging by old scars from earlier bark removal, this process does not seem to affect survival of the trees. By mid-summer, early berry plants such as raspberries and nagoonberries are ready to be harvested. Mushrooms, though still relatively scarce at this time, are avidly sought. Spruce trees are cut and peeled for use in construction and repair of smokehouses and caches. In late July and August, blueberries are harvested. Fall is the season for cranberries, blackberries, and rosehips. Cranberries are often taken after the first frost when they sweeten. Once again, Hedysarum roots are harvested. These same roots are gathered from the burrows of microtine rodents, an activity described as "stealing from the mouse caches." By fall, firewood is in high demand, and is gathered by the boatload until freezing prevents river travel. With the onset of snow, firewood is gathered near the village, and transported on sleds pulled by snowmobiles. The only edible plant harvested during the winter is

"muskrat cache" (Myriophyllum spicatum), an aquatic plant that muskrat store in great quantities. Burrows along the banks of lakes are excavated, often through several feet of snow and frozen ground (Plate 4). These burrows are located by marking entrances in the fall or by tapping a heavy stick on the ground and listening for a hollow sound.

The following is an account of a plant gathering trip in which the author participated in 1984. It is typical of those that occurred almost daily among women in Tetlin during the summer.

June 4, 1984

One of the women stopped by today to ask me if I'd like to accompany "the ladies" on a trip for birch bark. There were seven of us in all, and we were quite a sight. All of us wore bright colored bandanas on our heads, and were armed with butcher knives (for cutting bark). In usual form, the decision as to where we would go was not made until the last minute. We decided to go west of town instead of east, to Wood Lake. We started on the winter road, and after about one-half mile, left it, walking through the brush on the east side that led to a winter wood trail used for snowmobiles. Stumps lined the trail, and suggested recent cutting for firewood. Eventually, we veered off the trail, bushwacking our way up a steep spruce slope. I tried to imagine my Mother and her friends doing the same, and I had to laugh. Many of the ladies were much older, some were overweight or diabetic, and one woman was nearly lame in one leg, yet all continued up at a good clip. We did make frequent stops for snacks (Hunt's canned puddings, Doritos, and drymeat), gossip, jokes, and moss fights. Generally a very social event for the women -- no men and no children, just dogs and big sticks. As we travelled, I had the feeling that they had a general idea of where we were going, but that was all.

Coming back, everyone had large bundles of birch bark and "ashes" (birch tree fungus used to make homemade snuff). One of the older ladies led the way to an old summer trail that she said she used for berry picking when she was young. At times, the trail was difficult to follow, "disappearing" into the brush. I was astonished at how well our leader could follow it. We returned around 7:15, after six hours and five miles. Everyone was exhausted and swore not to forget the tea pot next time.



Plate 4. Examples of Plant Foods Harvested by Tetlin Residents. Wild Rhubarb (*Polygonum alaskanum*) is collected in the early summer months (above), and roots of an aquatic plant stored by muskrats are excavated from burrows during the winter months (below).

The most active foragers were older women without small children. On rare occasions children, but never men, accompanied the women on these trips. Trips usually began in the late afternoon to accommodate one person who worked each day until 3:00 p.m. The size of the group ranged from two to ten women, often accompanied by as many or more dogs. Dogs provided some protection from bears, although several women also carried guns for this purpose. Trips were generally very social, though equally rigorous. Women rarely returned to the village before sundown, always with packs brimming over with berries, birch bark, and roots, and an armful of firewood.

Most plant gathering trips are made on foot, along one of the many trails leading out of the village. Relatively little preparation is required for these trips, and they can be integrated spontaneously into the day's activities. Boats are occasionally used for travel to specific sites along rivers or lakes, especially when plant gathering occurs in conjunction with other harvest activities.

Plants foods are prepared in as many ways as there are species harvested. Traditionally, all berries were stored in fat (moose, sheep, bear, and fish oil) and frozen or buried. Today they are generally cooked and canned or frozen, with the exception of "stoneberries" (Arctostaphylos uva-ursi) which are stored in moose grease and frozen.

Medicinal plants are collected by both men and women during the summer, many of which are dried and used later in the year. McKennan (1959:108-109) reported that herbal medicines were strictly secular, and limited to treatment of common maladies such as colds, headaches, and abrasions. More complex problems were treated by a shaman (medicine man). A list of herbal remedies is presented in Table 9. On one

occasion, the author accompanied two women on a trip which they stated was specifically to collect two plant species: one a medicinal herb, the other a ceremonial plant. Both were found in fairly uncommon habitats and nearly the full day was spent hiking to where the plants were known to occur. Having previously joined the women on many multi-purpose trips into the woods, it was surprising to learn that these women were willing to devote so much time and energy to the collection of these two plants alone.

All materials for basket-making are collected in large quantities in the summer, and used throughout the year. Basket-making is taken very seriously and women depend on their sales to augment family incomes. Birchbark items are sold to gift shops in Tok, Fairbanks, and Anchorage, and bring anywhere from \$5 for a small basket, to \$80 for a bark cradle board. Crafting pieces of diamond willow for sale to gift shops is also popular, especially among younger men.

COMPARISON OF CONTEMPORARY RESOURCE USE TO HISTORICAL ACCOUNTS

McKenna (1959) and Guedon (1974) provide the only detailed descriptions of the seasonal round of activities in the earlier part of this century (See Chapter 2). Since McKenna's visit to the Upper Tanana in the 1920s, an increasingly sedentary lifestyle and cash reliant economy, technological introductions, and changes in the availability of wild resources have led to alterations in the seasonal round. McKenna described the Upper Tanana culture as centering around a semi-nomadic, hunting existence with the major food animals being the caribou, moose, and sheep, with caribou "by far the most important"

(McKenna 1959:32). Tetlin people are no longer nomadic. Although there is some movement to fish camps in the summer and to muskrat camps in the spring (Plate 5), the village is now occupied throughout the year. At present, caribou do not migrate past Tetlin on a regular basis. As a result, few are currently taken due to the travel and expense required. No one in Tetlin reported successfully hunting sheep in the past ten years. Of the large game species, moose is the only one still taken in appreciable numbers. Given heavy reliance on large game in the past, it is not surprising that residents show a very high regard for moose meat today.

Fishing, which McKenna (1959:35) described as "decidedly secondary in importance," and "largely confined to the month of July," seems to play a more prominent role now. At present, it occurs throughout the summer and at two distinct periods in the fall. Though McKenna stated that neither fish hooks nor spears were known to the Upper Tanana people, a hand-held line and hook, and a long gaff-like pole called a sal are currently used. According to several older informants, fishing with hooks has occurred for many years.

It appears likely that McKenna's visit to the Upper Tanana coincided with a period of unusually high caribou density. Indeed, it has been suggested that migratory herds of caribou in 1929-1930 were the largest known in the history of interior Alaska (Skoog 1968). The Fortymile Caribou Herd, which formerly passed through the area twice yearly, crashed in the 1930s and 1940s, leaving a small remnant herd to the north, away from the Tetlin area (Davis, Shideler, and LeResche 1978). Given that caribou populations are known to fluctuate dramatically over time, Heffley (1981) proposed that the Upper Tanana



Plate 5. A hunting and fishing camp used by Tetlin residents -
 Located within the Tetlin National Wildlife Refuge. Built in 1930
 by an older Tetlin resident, these "high caches" are used for storage
 of foods and harvest equipment (above). Several cabins and numerous
 smokehouse frames for drying meat and fish (below) are present in this
 area which has been occupied by members of the Tetlin band since before
 the turn of the century.

Indians periodically shifted reliance from caribou to other species. At such times, dependence on the more reliable annual whitefish runs may have increased. This may have been the case when Lt. Allen passed through in 1885, and may again be the case today. The importance of fish in the Upper Tanana diet might be borne out when viewed over the long term, and not in the shadow of high caribou density. As Nelson observed in his study of Koyukon Athabaskans in west-central Alaska:

In fact, the population of almost every animal and edible plant species significant in the Koyukon economy changes markedly over time. Thus, at any given time, the resource picture for the Koyukon is determined by a composite of population levels. This causes constant fluctuations in the economy, as the subsistence quest shifts from one species to another (Nelson 1982).

Despite the differences discussed in the preceding paragraphs, the general course of harvest activities today remains remarkably similar to earlier patterns. Fall is still devoted to hunting and fishing, winter to "big fur" trapping, late winter to muskrat trapping, spring to waterfowl and muskrat hunting, and summer to fishing and plant gathering.

CHAPTER FOUR

RESOURCE HARVEST IN 1983-84

This chapter summarizes resource harvest in Tetlin over a twelve month period in 1983-84, based on responses obtained in individual household interview sessions. In reading this chapter, three points should be kept in mind. First, these data reflect resource harvest levels in 1983-84, and may not represent a "typical" year. Central to a resource extractive economy such as this one is flexibility to respond to changes in the surrounding environment, such as changes in the availability of wild fish and game. If a certain resource is unavailable one year, other resources may be taken in increased amounts to compensate. The following year, such a pattern may be reversed. Similarly, resource harvest and consumption levels can be affected by the number of potlatches held each year (Plate 6). Research conducted over several harvest seasons is required to determine "average" harvest quantities. Secondly, this information describes resource patterns in Tetlin, and is not necessarily applicable to other communities in the region. Local variation in the availability of resources, customs and traditions, and economies within the Upper Tanana area make it difficult to extrapolate to these other communities. Finally, all data presented in this chapter should not be viewed in isolation, but in the context of information presented in the other chapters. Appendix B lists the types of problems encountered while collecting quantitative data for this study.



Plate 6. Women's "Dance with the Guns" at a Potlatch ceremony given in Tetlin, June, 1984. Among other things, the Potlatch serves an important function in the distribution and exchange of wild resources among residents of different communities.

HARVEST LEVELS

Tetlin residents reported that of the fish and meat consumed, an average of 58 percent is derived from wild fish and game species. Table 11 summarizes household harvest participation levels during the 1983-1984 season and quantities reported taken. The first two columns indicate the percent of households attempting harvest of each of the resources, and the range of quantities harvested for successful participants. The next two columns give the mean harvest for all households sampled (N=20), and the standard deviation about the mean, an index of variability. In a separate table, harvest quantities have been converted to pounds of resources harvested based on average usable weights for species which are consumed (Table 12). Summaries of the relative quantities of fish, land mammals, and other resources harvested are presented in Table 13, and Figures 4 and 5.

In addition, each household was asked how many whitefish, moose, and ducks their household needed in a year. This is reported in Table 14, along with the actual harvest levels. The degree to which actual harvest satisfied the demand is given in terms of a percentage. The intent of this table is to generally portray how needs for these three species were perceived as being met by the community as a whole.

Household participation was highest for harvest of whitefish, pike, moose, ducks, muskrat, hare, and berries. With the exception of pike, which is taken in large amounts to feed dogs, these species serve as the wild food staples. Minimal participation was reported for harvest of geese, cranes, and porcupine, which seems more a function of their relative scarcity than an indifference to hunt them. No sheep hunting

TABLE 11. HOUSEHOLD HARVEST PARTICIPATION AND QUANTITIES OVER
A TWELVE-MONTH PERIOD IN 1983-84, TETLIN, ALASKA (N=20).

Species	Percent Household Participation	Harvest Range for Participants	Mean Household Harvest	Standard Deviation
FISH				
Whitefish - Any Method	80	20-1000	284	284
Whitefish - Dipnet	55	20-500	101	158
Whitefish - Gill Net	75	50-500	183	193
Grayling	65	10-100	28	35
Pike - Adult	85	10-1000	236	350
Pike - Yearling ("Pickle")	35	100-1000	135	303
Burbot	70	5-60	18	19
Sucker	40	25-100	19	29
LARGE GAME				
Moose	85	1 _a	.5 _a	.5 _a
Sheep	0	a	a	a
Bear	5	a	a	a
WATERFOWL				
All Species	90	10-100	35	26
Geese	35	1-4	.7	1.3
Ducks	85	10-100	34	25
Cranes	10	1-2	.2	.2
FURBEARERS				
Muskrat - Any Method	70	4-1000	158	252
Muskrat - Trapped	>40	5-110	19	36
Muskrat - Hunted	>45	4-500	108	170
Other Furs	35	1-60	7.6	16
SMALL GAME				
Ptarmigan	40	1-12	2.4	4.0
Grouse	60	1-12	2.7	3.8
Both Ptarmigan & Grouse	70	1-24	5.1	6.1
Snowshoe Hare	80	2-97	24	28
Porcupine	20	1-3	.3	.7
PLANTS				
Berries (in quarts)	85	5-160 _a	41 _a	40 _a
Other Edible Plants	75	a	a	a
Medicinal	75	a	a	a
Firewood (in cords)	85	5-15 _a	4.1 _a	4.4 _a
For Crafts	85			

^aInformation is not available or not applicable

TABLE 12. POUNDS OF WILD RESOURCES HARVESTED IN TETLIN, 1983-84.

	Mean Household Harvest	Conversion Factor In Pounds	Mean Household Harvest In Pounds
FISH			
Whitefish	284	2.0	568.0
Grayling	28	1.0	28.0
Pike (adult)	236	3.0	708.0
Pike (yearling)	135	.25	33.8
Burbot	18	2.5	45.0
Sucker	19	.75	14.3
Total Fish			1,397.1
LAND MAMMALS			
Moose	0.5	650.0	325.0
Hare (Snowshoe)	24.0	1.5	36.0
Porcupine	0.3	10.0	3.0
Muskrat	158.0	1.0	158.0
Total Land Mammals			522.0
OTHER			
Geese	0.7	5.0	3.5
Ducks	34.0	1.5	51.0
Cranes	0.2	10.0	2.0
Ptarmigan	2.4	1.0	2.4
Grouse	2.7	1.0	2.7
Berries	41 qts.	1.0	41.0
Total Other			102.6
Total All Resources			2,021.7

TABLE 13. MEAN HOUSEHOLD AND PER CAPITA HARVEST IN TETLIN BY MAJOR RESOURCE CATEGORY, 1983-84.

Resource Category	Mean Household Harvest In Pounds	Mean Per Capita Harvest In Pounds ^a	Percent of Total
Fish	1,397	367.7	69.1
Game	522	137.4	25.8
Other	103	27.1	5.1
Total	2,022	532.1	100.0

^a Assumes an average household size of 3.8 members.

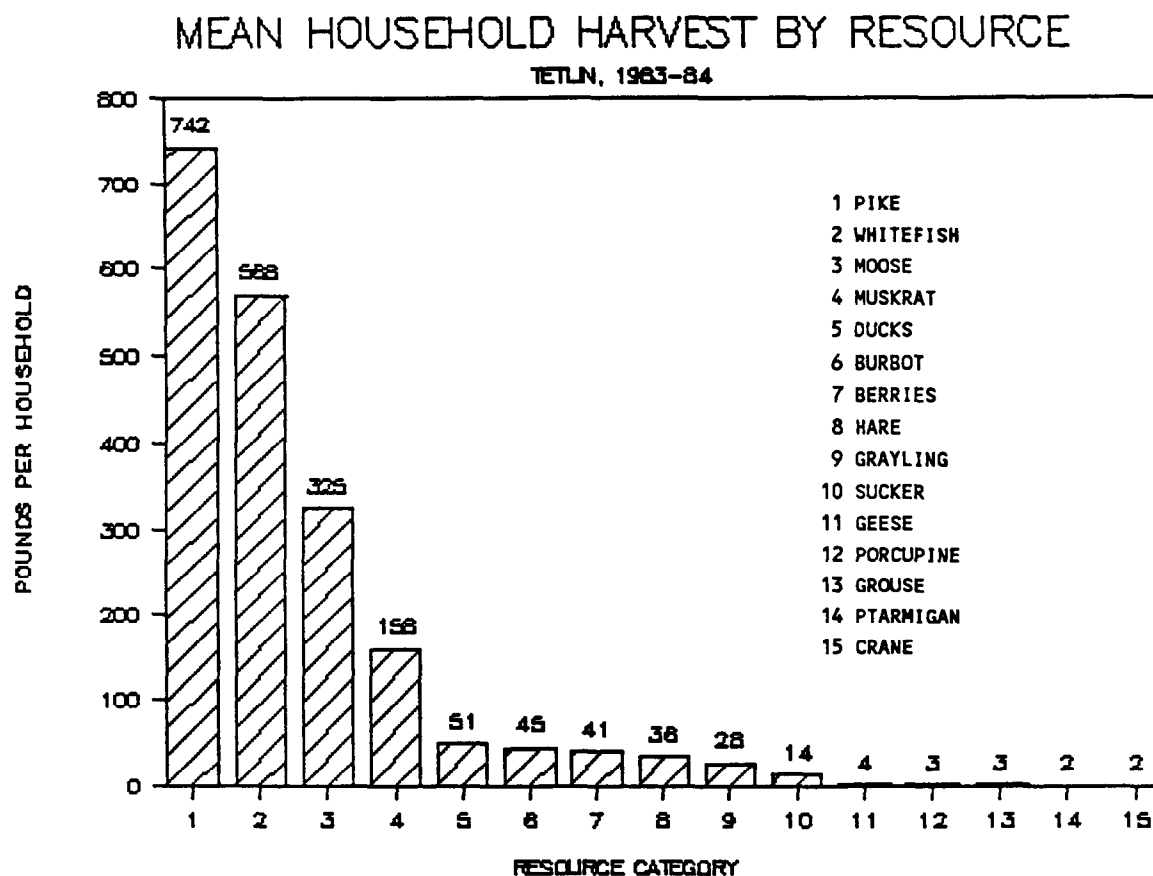


Figure 4. Mean Tetlin Household Harvest in 1983-84 of Selected Resources.

TETLIN RESOURCE HARVESTS, 1983-84
PER CAPITA HARVESTS BY MAJOR CATEGORY

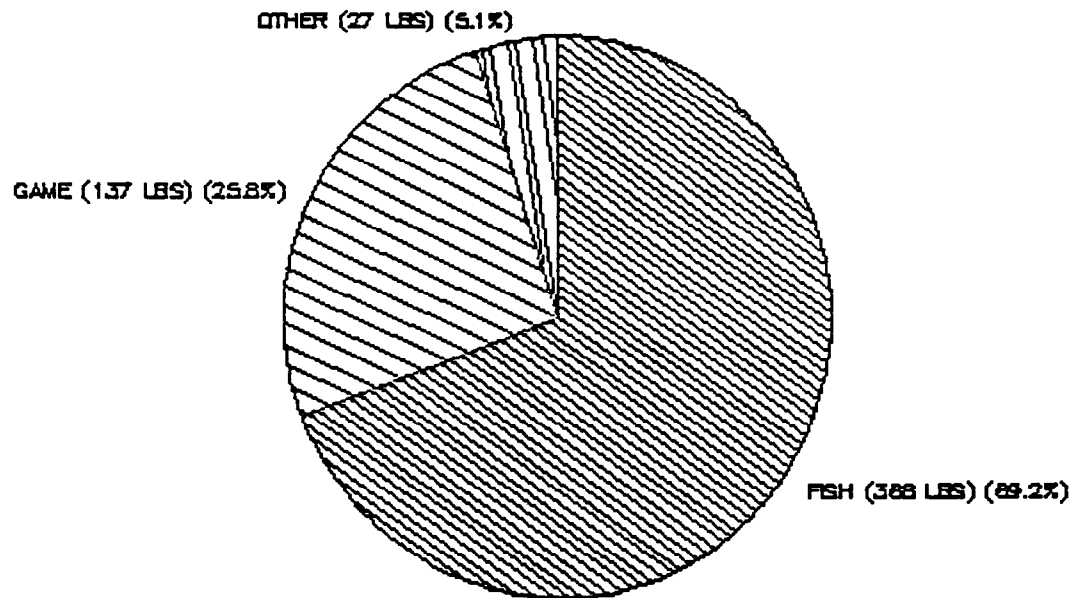


Figure 5. Per Capita Harvest by Tetlin Residents in 1983-84 for Major Resource Categories.

TABLE 14. COMPARISON BETWEEN MEAN HOUSEHOLD HARVEST NEEDS AND QUANTITIES ACTUALLY HARVESTED IN A TWELVE MONTH PERIOD FOR SELECTED SPECIES IN TETLIN, 1983-84 (N=20 Households).

	Reported Need		Actual Harvest		Percent Demand Realized (Actual Harvest Divided by Reported Need)
	Mean	S.D.	Mean	S.D.	
Whitefish	453	365	331	304	73
Ducks	51	35	34	26	67
Moose	2.3	1.6	.5	.5	22

was reported. Reluctance to harvest and consume bears is apparent in the data. Only one household (5 percent) reported harvesting a bear in the study period, though several households (45 percent) reported killing nuisance bears within the past five years. Variability in quantities harvested between households is high for all species. Some of the variability may be the result of a small sample size.

For two non-local species not represented in Table 11, salmon and caribou, harvest participation was low. Twenty percent of the households harvested salmon in 1983-84, while 26 percent had hunted caribou in the past ten years. At present, most salmon is acquired through customary exchange. The expense associated with harvest of non-local species appears to be the main deterrent to greater harvest participation.

Fish accounted for the majority (69 percent) of pounds of wild resources harvested in 1983-84. Of the fish species, whitefish and pike were taken most often and in the largest quantities. Whitefish are favored for human consumption, and also are used as dog food. Their relative abundance and the efficient method of harvest may explain why they constitute a large portion of the catch. One household dried over

1,000 fish in 1984. Harvest of whitefish in 1983-84 (mean, 331) approached that which was demanded (mean, 453), the actual harvest mean equal to 75 percent of the quantity reported to satisfy household requirements.

Demand for whitefish and pike was considerably higher for households that maintained a team of racing dogs than for the sample of all households (Table 15). The mean harvest for households with dogs was 527 for whitefish and 360 for pike, more than a 50 percent increase from the sample as a whole. Households with dog teams reported requiring a mean of 850 whitefish compared with 453 for all village households, about twice as much.

TABLE 15. COMPARISON OF FISH QUANTITIES HARVESTED IN 1983-84 BETWEEN TETLIN HOUSEHOLDS WHO OWN DOG TEAMS AND THE SAMPLE OF ALL HOUSEHOLDS.

	Household With Dogteam (n=3)		Household Without Dogteam (n=20)	
	Range	Mean	Range	Mean
Whitefish - Dip Net	0-500	167	20-500	101
Whitefish - Gill Net	80-500	360	50-500	183
Pike - Adult	100-750	360	10-1,000	236
Whitefish quantity reported needed	550-1,000	850	20-1,000	453

Participation in moose hunting was high (85 percent), although actual success rate was considerably lower (59 percent). Given that caribou are almost absent in the Tetlin diet today, the importance of moose as the only remaining source of wild red meat is high. To give an idea of the traditional importance of red meat in the diet, Vitt (1971) reported that 10-12 caribou were needed every year for a family of four.

Considering the importance of moose, it is somewhat surprising that the number taken averaged only .5 per household. Some respondents likely were hesitant to report animals harvested outside the legal season, especially to a researcher associated with a fish and wildlife agency. However, some respondents did report their household's entire take. With these qualifications in mind, the number of moose reported taken in-season still appears to be lower than what would be expected for an animal in such high demand. Tetlin residents frequently noted that they had difficulty securing a moose during the legal hunting season, explaining that the animals move away from the lake shores and into higher elevations in September. The discrepancy between actual harvest and the reported need was the greatest for moose. This suggests that current hunting regulations might not adequately accommodate local subsistence needs, or that the present moose population is not large enough to support the demand. An accurate assessment is difficult with only this data because of the understandable reluctance of some residents to report out-of-season harvest.

Participation in waterfowl hunting also was high (90 percent). Ducks constituted most of the harvest, while geese and cranes were taken in smaller numbers, proportionate to their local levels of abundance. Households reported a mean requirement of 50 ducks. This compares to the actual mean harvest in 1983-84 of 34 per household.

Of the furbearers, muskrat are taken in the largest numbers. Seventy percent of the households reported hunting or trapping muskrat. Information regarding participation in trapping versus hunting muskrat was not collected systematically, although it was evident from the data that at least 40 percent of the households trapped, and at least 45

percent hunted. Based on this smaller sample, hunting accounted for more of the harvest than did trapping.

Trapping for other furbearers ("big furs") was reported by 55 percent of the sample households for the 1983-84 season. Participation is likely to fluctuate substantially from year to year and house to house depending on fur prices, status of animal populations, and the individual circumstances of each household. Households that did not trap in 1983-84 but had in previous years cited disrepair of equipment, "poor" trapline populations and the need to let them replenish, or the absence or poor health of the active trapper.

Of small game, snowshoe hare, were taken in relatively large numbers (mean, 24) by snaring and hunting. Ptarmigan, grouse, and porcupine most often were hunted opportunistically, and quantities taken were much smaller (mean, 2.5).

Eighty-five percent of the sampled households gathered plant foods in 1983-84. Households averaged over 10 gallons of berries during the study period. Although many plants in addition to berry plants were gathered, quantitative data were recorded only for berry species. Eighty-five percent of the households gathered firewood and used plant materials to make handicrafts such as birchbark baskets or diamond willow gift items.

VARIATION IN PARTICIPATION AMONG HOUSEHOLDS

In the course of this study it became apparent that certain households were more involved in resource gathering than others. Younger families, or younger individuals comprising a household,

appeared less active. This seemed to be primarily a function of lack of equipment and labor, and in some cases, lack of interest. Such households infrequently initiated harvest activities, and instead joined in the activities of the parent household in what resembled a casual apprenticeship. In this way the young adults gained access to the equipment and the greater knowledge of their older relatives. By assisting these more established households, younger households were able to secure wild resources for their own use.

Households with middle-aged household heads (35-65 years old) appeared to be more active than the younger, newly-established households. This may be attributable in part to their being more stable and cohesive, and because they more often had the equipment and experience required for successful harvesting.

Households with a head older than 65 years of age participated less directly in harvest activities. Many of the elderly Tetlin residents are no longer physically capable of harvesting sufficient resources to meet their needs. However, they are able to contribute to younger and more active harvesting households. For example, although elderly households comprised only one-third of the sample population and were among the least active harvesters, they owned more than half of the boats and more than one-third of the snowmobiles in the community. Loaning equipment to relatives and friends in exchange for a portion of their harvest was a common way to secure wild foods. Indeed, several elders did not operate their own equipment but owned it principally for this purpose.

Although income levels were relatively low among elderly households, they generally were reliable and derived from such sources

as Supplemental Security Income, Old Age Assistance, and the Longevity Bonus program. This small but steady flow of cash often resulted in the recipients being called upon to purchase ammunition, gas, oil, and even pay for equipment repairs. This provided another vehicle for wild foods to be distributed within the community. For example, elderly persons often supplied younger boys with ammunition and guns for moose or duck hunting. One older woman who owned a gill net had someone else set it in the creek early in the summer. It was considered a "communal net" and was used by several households. By making her net available to others, the woman could count on receiving fish from those who used it -- although she was too old to harvest fish from it herself. Another form of exchange utilized by the elderly involved direct cash purchases of wild resources from other Tetlin residents. Wood, berries, and "dryfish" were among the goods most often purchased in this way.

That a household does not participate actively in harvesting at one point in time does not imply that it will not assume an active role in the future. According to the project assistant, many of today's "active" middle-aged households were yesterday's less-involved, sometimes less enthusiastic younger households. One might question whether "outside" observers are sometimes too quick to attribute differences in the attitudes and behaviors of the "younger generations" to rapid cultural change and sudden declines in interest in Native lifestyles. Similar observations were made of the "younger generation" in 1929 by McKennan (1959). Changing patterns in activity level by age may, to some extent, reflect a natural progression and not one brought about entirely by "outside" influences.

All of the households interviewed were asked if their intensity of resource gathering had changed over the past five years, and if so why. Responses are summarized in Table 16. Examples of some of the specific reasons given for a change in activity were:

"We're more involved. Better equipment and have sons who can start hunting now."

"Don't do as much -- getting older, health not so good, and my wife is gone."

"More involved. Financially we need to -- both unemployed now."

Responses from those who reported a change can be grouped under four general headings: 38 percent attributed it to a change in health and/or old age, 23 percent linked it to a change in household structure (i.e., number and age of people present), 23 percent cited financial reasons, and 15 percent related it to presence or absence of harvest equipment.

TABLE 16. TRENDS IN HOUSEHOLD PARTICIPATION IN HARVEST ACTIVITIES.

<u>Change in Harvest Activity:^a</u>	<u>Percent^b</u>
Much More Involved	22
Little More Involved	11
Same	28
Little Less Involved	33
Much Less Involved	6
(Missing Cases: 2)	
<u>Reason For Change in Activity Level^a</u>	
Equipment related	15
Health/ Old Age	39
Family Age Structure	23
Financial	23
(Missing or non-applicable cases: 7)	

^aResponses to survey question, "Has your participation in harvest activities changed in the past year? If so, why?"

^bAdjusted to exclude missing cases or those that were not applicable.

ANALYSIS OF FACTORS INFLUENCING HOUSEHOLD ACTIVITY LEVEL

Economic decisions regarding harvest activities are complex and appear to involve many variables. While subsistence activities are often perceived as "economical", this depends on the nature of the activity and on the individual circumstances of the harvester. It should not automatically be assumed, for example, that low income households represent the most "active" users of wild resources. Integration of modern technology, while increasing harvest efficiency, requires considerable cash outlays for purchase and subsequent operation and maintenance. For some resources, subsistence harvesting may not be "cheap." A household must consider the benefits and costs of resource gathering, weighing them against other options, such as a trip to the grocery store.

In his observations of the Banks Island Natives in Canada, Usher noted:

Contrary to the idea that trapping or hunting is "primitive" and wage jobs are "modern," a native hunter is likely to see the choice in opportunistic terms. Other things being equal, he will engage in whatever activity brings the greatest return for the least effort (Usher 1981:60).

Similarly, it appears that Tetlin residents view the choice between harvesting or purchasing food items largely in opportunistic terms. Such decisions, however, do not seem to be measured solely in terms of time, energy, and dollars. Included are less tangible social and cultural values and costs such as peer recognition accorded a trapper who returns with many furs, or a woman who spends the entire night cutting fish in her smokehouse.

An attempt was made to determine the specific factors important in a household's decision to harvest by looking at characteristics of "active" households. To make such a distinction, it is desirable to have information on harvest investment by individual households (i.e., time, money, and energy). However, this type of information was not collected during the short period available for fieldwork. A closely related measure of household involvement, the variety and relative amount of resources procured (i.e., harvest diversity), can be obtained with the data collected. This diversity measure may be a reasonable approximation of harvest activity levels among households.

To calculate this diversity value, the Shannon-Weiner Index was used (Ricklefs 1979). This measure is commonly used among ecologists to characterize biological communities. As it is adapted for this use:

$$N$$

$$\text{Shannon-Weiner Formula: } H = - \sum_{i=1}^N P_i \log_e P_i,$$

where P_i equals the proportion that the individual household's harvest is of the total harvest for all 20 households sampled, and N equals the total number of resource activities considered.

It is important to keep in mind that a diversity measure has two components and that the value of the index is influenced by both (a) the number of different harvest activities in which a household is involved, and (b) the relative quantities of each resource procured. In light of the large potential for error within the Tetlin quantitative harvest data, this index seems appropriate because it does not rely entirely upon volume of resources taken.

Nine categories of resources that are commonly harvested were considered:

- 1) Whitefish
- 2) Burbot and Grayling (Combined)
- 3) Moose
- 4) Waterfowl (Ducks, Geese, and Cranes)
- 5) Game Birds (Ptarmigan and Grouse)
- 6) Snowshoe Hare
- 7) Muskrat
- 8) Other Furs
- 9) Berry Picking

Examples of the derivation of this index for two households are given in Table 17. Note that in the example, Household Number 2 has a higher diversity index, even though its members participated in fewer different harvest activities than Household Number 1. The relative quantities taken by Household Number 2, however, were in most cases larger than for Household Number 1, influencing the value of the index. For purposes of this discussion, higher harvesting households are those which harvested relatively large quantities of a variety of sources. A more detailed discussion of diversity measurements and their two components is presented in Peet (1974) and Pielou (1975).

To test for relationship among variables, two household types were designated based on the diversity index: (1) active - diversity index between 1.4 and 2.2, and (2) less active - diversity index between .3 and 1.0 (Figure 6). That is, the diversity index was used to classify households into two groups, relatively higher harvesting households and relatively lower harvesting households, based on reported 1983-84 harvest levels.

Specific variables that were hypothesized to influence household harvest were derived from the broader categories listed in Table 16

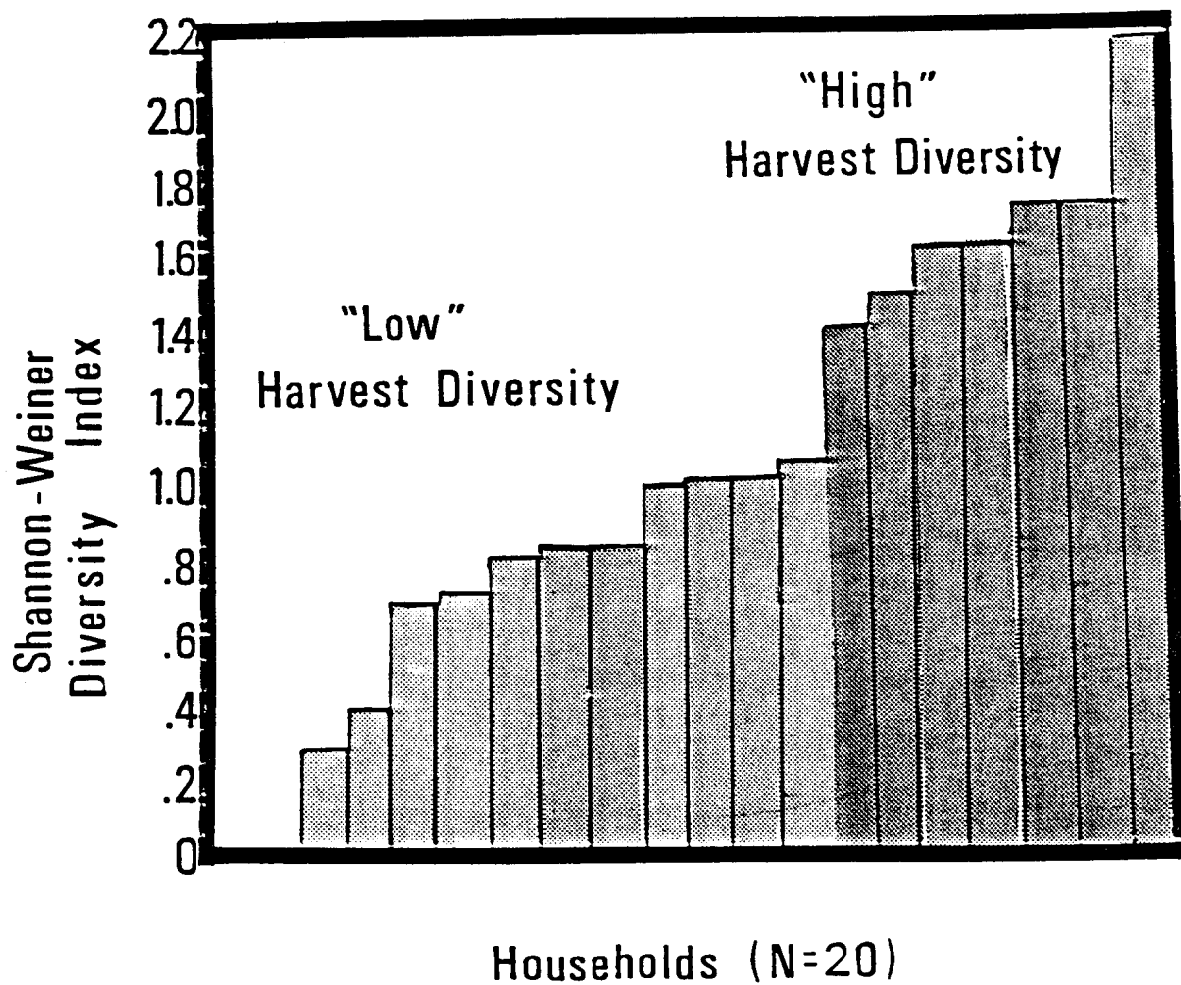


Figure 6. Values of the Shannon-Weiner Diversity Indices for each of the Twenty Tetlin Households Interviewed in 1983-84. Households with relatively high indices (dark), were labelled as having "High Harvest Diversity."

TABLE 17. ADAPTATION OF THE SHANNON-WEINER INDEX TO SHOW HARVEST DIVERSITY LEVELS AMONG HOUSEHOLDS IN TETLIN, ALASKA.^a

Species:	Quantity Harvested		Total Quantity Harvested by all Households	Pi (Number Harvested by household/Total for all sample)		Pilog	Pi
	HH#1	HH#2		HH#1	HH#2	HH#1	HH#2
Whitefish	400	50	5,680	.070	.009	-.186	-.042
Grayling/Burbot	0	23	934	0	.025	0	-.092
Moose	0	0	10	0	0	0	0
Waterfowl	10	45	696	.014	.065	-.060	-.178
Game Birds	1	6	102	.010	.059	-.045	-.167
Snowshoe Hare	3	0	492	.006	0	-.031	0
Muskrat	20	0	3,114	.006	0	-.031	0
Other Furbearers	0	0	152	0	0	0	0
Berry Plants (qts.)	5	44	830	.006	.053	-.031	-.156
						-.384	-.635

Activity level index for: Household No. 1 = .385
Household No. 2 = .635

^aExample calculation for two households.

above. They include age of household head, size of household, number of offspring fourteen years and older in the household (approximate age at which children become involved in harvest activities), presence of both household head and spouse, income, and ownership of harvest equipment. These variables were broken down into categories for analysis in frequency tables (Table 18). Association between these variables and the two household types were analyzed using Fisher's Exact Test, which is preferred over Chi-square tests when sample sizes are small (Zar 1984). At the 95 percent confidence level, no clearly significant results were obtained for any of the variables tested except household head age (Table 19).

TABLE 18. FREQUENCY TABLES USED TO TEST FOR ASSOCIATION
OF SIX VARIABLES WITH HOUSEHOLD DIVERSITY INDICES, USING
FISHER'S EXACT TEST.

1) Ho: Household harvest diversity is not associated with age categories of household head.

	Young/Old (<35 or >65 yrs.)	Middle-aged (35 to 65 yrs.)
High Diversity	0	7
Low Diversity	9	4

P value = .0047

2) Ho: Household harvest diversity is not associated with size of household. (mean household size = 3.9).

	Four or more Persons in Household	Less than four Persons in Household
High Diversity	4	3
Low Diversity	5	8

P value = .6426

3) Ho: Household harvest diversity is not associated with the number of offspring of at least 14 years of age living in the house (i.e., the approximate age at which children begin to assist in harvest).
(Average number offspring of at least 14 yrs. per household = 1.4)

	Two or more offspring at least 14 yrs. old	Less than two offspring at least 14 yrs. old
High Diversity	2	5
Low Diversity	5	8

P value = 1.00

- 4) Ho: Household harvest diversity is not associated with presence of two household heads (i.e., both head and spouse).

	Both Present	Not Both Present
High Diversity	7	0
Low Diversity	7	6

P value = .0515

- 5) Ho: Household harvest diversity is not associated with income.

	Income Above or equal to \$5,000	Income Below \$5,000
High Diversity	4	3
Low Diversity	11	2

P value = .2898

- 6) Ho: Household harvest diversity is not associated with how much harvest equipment a household owns (i.e., snowmobile, boat, freezer, cache, smokehouse).

	"Big Owner" (4 or more of the above)	"Smaller Owner" (less than 4 of the above)
High Diversity	4	3
Low Diversity	4	9

P value = .356

The null hypothesis that household participation level was not associated with the age of the household head was strongly rejected ($p = .0047$), as might be expected from observations of different age groups. This result lends support to the hypothesis that middle-aged households constitute the group which harvests the most types and

TABLE 19. SUMMARY OF RESULTS OF FISHER'S EXACT TEST
FOR ASSOCIATION BETWEEN HOUSEHOLD HARVEST DIVERSITY AND
SIX SELECTED VARIABLES.

Variable:	P-value
Household Head Age	.005 ^a
Household Size	.642
Number Offspring >14yrs.in Household	1.000
Presence of Head and Spouse	.052
Income	.290
Equipment Ownership	.356

^a Significant at 95 percent.

largest quantities of wild resources. However, it seems unlikely that age of the household head, per se, fully explains a household's level of involvement. More likely it is due to a combination of associated variables whose cumulative effect influences harvest participation. For example, in a separate test, two of the other variables listed (income level and presence of both a household head and spouse) were shown to be positively associated with middle-aged household heads.

Testing for association between "two-headed" households (i.e., presence of both household head and spouse) with household harvest diversity gave a "borderline" test result ($p=.0515$). Given that traditional division of labor in Tetlin usually requires both a male and a female to carry out different steps of the harvest process, it is suspected that these two variables, a household's harvest diversity and presence of two household heads, are correlated. Further testing with a larger sample size might bear this out.

Absence of an association between diversity and all other variables thought to influence harvest involvement levels suggests the complexity

of this relationship. Both the mixed implications of a single variable, and the interactions between variables may contribute to this complexity. For example, income level may have two effects. High income may permit purchase of harvest equipment encouraging harvest, but it may also be that time spent earning income decreases time available for harvest activities. One effect may potentially cancel the other. Another example illustrates interaction between variables. A large family may have a greater demand for resources, as well as a larger pool of harvesters to draw from, leading one to suspect that they may be major harvesters. If coupled with a low income, lack of equipment, or large quantities of food stamps, however, incentives may be greater to purchase goods rather than harvest them. To isolate the importance of any single variable would require repeated measurement and more complex statistical procedures (e.g., multiple regression).

The purpose of this discussion is simply to show that predicting the degree to which a household, or even more generally, a community is involved in resource gathering on the basis of low income or any other single criterion is an over-simplification. The results presented here suggest instead that participation hinges upon a wide variety of variables that interact in many ways.

DIVISION OF LABOR IN HARVEST ACTIVITIES

Beyond satisfying nutritional needs, harvest of wild resources serves an important function in establishing and maintaining social relationships in the community. Usher noted:

What is important about wildlife to native people is that it is the basis for the maintenance of the social relations that characterize

the traditional mode. It is the relations among people that wildlife harvesting generates, not simply the relations between man and wildlife, which are important (Usher 1981:61).

Traditions regarding the division of labor in the various harvest activities continue to guide many aspects of daily life in Tetlin. Sex roles and the social composition of work groups are summarized in Table 20. Information is based on responses to the survey questionnaire and on personal observations. Roles did not appear to be rigid, and some variation should be expected.

In general, male-oriented activities tended to center around the actual pursuit of wild resources while women were more involved in preparation of resources for consumption. This applied most notably to large game and waterfowl. Although women were prepared to and have killed moose, it was more likely to occur incidental to some other activity, and not in deliberate pursuit. The exception to this was when women accompanied their spouses on hunting trips. However, hunting groups usually consisted of several males -- father and sons, or male members of different households.

Muskrat trapping at "family camps" appeared to be largely a woman's responsibility, while hunting them in open waters involved both men and women. Preparation of muskrat pelts was a shared task, women skinning the animals, and men stretching the furs onto wooden mounts. Trapping of larger fur animals was reported to be a male-dominated activity, though several women indicated that they accompanied their spouses on the trapline. The trapper was responsible for skinning and mounting his own furs.

TABLE 20. ROLE DIVISIONS BY SEX FOR SELECTED HARVEST
ACTIVITIES IN TETLIN, 1983-84.

ACTIVITY	SEX OF PARTICIPANT	COMMENTS
Whitefish		
Set Nets	M or F	One or two individuals
Pull Fish from Nets	M or F	" " " "
Cutting, Drying	F	Often several female relatives
Pike/Grayling Fishing	M or F	Mostly young adults and children
Burbot-Ice Fishing	M or F	
"Pickle" Harvest	M or F	
Moose		
Hunting	M	Father & sons, brothers, sometimes husband/wife
Cutting and Drying	F	Individual or several females (e.g., Mother/daughter/ daughter-in-law, sisters)
Waterfowl		
Hunting	M	Group of men and boys
Plucking, Cleaning, and Drying	F	One or two individuals "Big Furs"
Trapping	M or M/F	Couple
Skinning and Mounting	M	Individual activity
Muskrat		
Trapping	F	Several female relatives
Hunting	M or F	
Skinning	F	
Mounting	M	
Small Game Hunting	M or F	One or two individuals (e.g., brother/sister, friends)
Rabbit Snaring	F	
Plant Gathering (excl. firewood)	F	Group of women, sometimes accompanied by children Occasionally large groups

Fishing for grayling and pike, or ice fishing in the fall involved both sexes. Setting nets and harvesting whitefish was done by both men and women, although the processing of fish for drying was almost exclusively women's work. Other female dominated activities included rabbit snaring, and plant gathering. Plant foraging trips were social

occasions, most often involving a small group of women, though occasionally large groups of ten or more.

Harvest activities that were common among younger people (i.e., high school age) were waterfowl hunting and some trapping among the boys, and rod and reel fishing and small game hunting among both sexes. Some parents commented that the timing of school prevented their older children from participating in activities such as trapping and helping with the processing of wild game.

MECHANISMS OF SELF-REGULATION AND CONSERVATION OF RESOURCES

Rules and regulations that constrain the quantity of resources taken are not limited to "white man law", as residents sometimes refer to the body of state and federal fish and game regulations. Many customary harvest practices have built-in mechanisms which, intentionally or not, serve to conserve the resources upon which the Upper Tanana economy has depended for many centuries. This is not to suggest that overharvest never occurs, but that mechanisms are present which make it less likely. This section discusses some deliberate measures taken to conserve wild resources, as well as some of the unintentional or naturally-functioning mechanisms which have the effect of conservation. These are:

- 1) Limits of demand
- 2) Optimal foraging behavior to maximize efficiency
- 3) Processing costs and limited storage capability
- 4) Definition of property rights
- 5) Cultural rules - "Chief's Rules", "Village Rules", taboos, and social mores

Limits of Demand

A person is unlikely to spend time and energy hunting waterfowl or fishing for pike that he or she does not need. Absence of "waste" of resources in Tetlin attests to this. Demand saturation hence sets an upper limit to resource quantities taken.

Before white contact, and in the absence of commercial export markets for resources such as furs, there appears to have been little incentive among Upper Tanana Athabaskans to take more than what was needed for consumption within the local group, and small-scale trade with neighboring groups. This continues to be the case today with most resources, where demand is still limited to the amount a harvester and extended family themselves consume. The exception is furbearing animals, where establishment of a commercial market created incentives to take more. (Limitations on furbearer harvests is discussed in subsequent sections.)

Optimal Foraging Behavior

If certain resources are in high demand and as such are subject to heavy predation, it still remains unlikely that harvest by Athabaskan hunters and gatherers would deplete them. This is suggested on the basis of "optimal foraging behavior" (Smith 1983), a theory derived from concepts in neo-classical economics (Marginal Value Theorem). In simple terms, the theory predicts that as local resource populations get smaller (i.e., as they are removed by harvest), it often becomes increasingly more difficult to harvest the next animal or plant

belonging to that population. For example, as local numbers of waterfowl decrease as a result of harvest, the hunter must expend more effort to seek out and shoot the next duck. It is also likely that as the hunting season progresses, behavioral changes that make the ducks more evasive will add to the search time. If a hunter's goal is to retrieve resources with the least amount of effort, he or she would be encouraged to shift effort to another locale where resources are more plentiful, or to a different prey type altogether. With the exception of resource populations in the immediate vicinity of a permanent camp or settlement, it is unlikely for reasons of efficiency, that Athabaskan harvesters would seriously deplete or exterminate local wildlife populations.

Results of such a practice might be different for species that congregate in large numbers, where it is possible to harvest many of them without great increases in the effort expended to harvest each additional individual. In such a case, other factors seem to prevent their over-harvest. This is discussed in the next section.

Processing Costs and Storage Limitations

As has been mentioned, demand or harvest effort required for some species may not be the limiting factor in quantities taken. Rather, burdensome processing requirements or storage capabilities often appear to be more of a controlling factor. For whitefish, for example, behavioral characteristics (e.g., a tendency for fish to congregate in large numbers at predictable times and places) combined with a very efficient harvest technique (net combined with weir) suggest the potential for

depletion of the stock. However, cutting and drying fish is time consuming, and it is commonly this processing time that limits the number of fish taken. When a woman can not "keep up" with the number of fish passing through the nets, the nets are taken out of the water or loaned to other households. Circumventing the time-consuming process of cutting and drying fish and meat is not currently an option for most households in Tetlin. Only two of the twenty households sampled owned freezers in 1984.

Property Rights

With the introduction of a commercial market for furs following white-contact in the late 1800s, the potential for over-exploitation of fur resources was greatly increased. It appears that competition for furs among members of the band was sufficient to warrant the establishment of formally recognized family traplines. Though family trapping areas might have existed in some form before the establishment of a commercial fur market, recognition of a narrowly-defined area within which a family has exclusive rights to furbearers was only traced back two or three generations. Traplines defined property rights, and helped to prevent conflict between trappers. More relevant to this discussion, however, traplines created stronger incentives for conservation. A trapper likely assumed greater responsibility for conserving fur animals, as he alone incurred the most harm if they were depleted. In a letter from an administrator for the Bureau of Education who visited Tetlin in the late 1920s:

The natives have their own rules and regulations with reference to conservation of the furbearing animals. The chief of the village assigns them to various grounds, and in this way, the fur is not depleted (Beck 1930:31).

Families usually maintain more than one trapline from which they alternate use, so as not to exert too much pressure on any one area.

A conservation incentive resulting from the definition of property rights may have existed to some extent before family traplines. Allen (1887) and McKennan (1959) both noted that the Upper Tanana Athabaskans recognized broader band territorial boundaries. Depending on the degree to which these territories ensured exclusive harvesting rights, incentives to conserve the resources within the territory for the security of the whole band may have existed. This type of "stewardship," whether or not it occurred in early times, was likely developed by 1930 when their general territory was designated as a federal reserve. The establishment of property rights as a tool to encourage conservation of Tetlin's resources was specifically cited in the 1930 Executive Order (See Chapter 2).

Cultural Rules

The discussion to this point has centered on some of the general, long-term harvest practices that have the effect of sustaining resources over time. More specific day-to-day measures take the form of social mores, taboos, and informal laws.

Historically, the "Chief" appears to have been an influential figure in the regulation and conservation of resources for the benefit of his band. Beck (1930:31) noted, ". . .when rats have been trapped heavily in one lake in the spring, the following spring that area is closed by the Chief's orders, and another area is used." Another comment by an older resident in Tetlin evinces the chief's persuasive

role in regulating the harvest, "Dad passed away in 1919. No beaver. Chief Peter saw first one in flats area -- told everyone. In 1946 beaver come back. Said nobody kill first ones, let them go by. Now lots of beaver."

Today, instead of the "Chief's rules", residents refer to some of the customary laws and traditions as "village rules." For example, a "rule" against the killing of non-edible species, or taking in excess of what one needs, helps to guard against waste. An attitude of reverence exists toward the young, whether it be a wild animal, a puppy, or human baby. All "babies" are accorded special treatment (i.e., young children are "spoiled", and puppies are sometimes given a lot to eat and allowed to stay inside the house) until a certain age when they are no longer viewed as babies and are expected to fend on their own. With regards to wild animal populations, this attitude appears to be manifested in informal rules that discourage the taking of animals with young and the young themselves under most circumstances. Several people commented, "we take care of our babies" in reference to the wild animals on Tetlin lands. Refraining from the taking of animals during the breeding season is a basic strategy in biological management, and appears to have been recognized to a large degree as a worthwhile sacrifice to the Upper Tanana Athabaskans to sustain animal resources. Activities that might disrupt important harvest animals or their habitat are also discouraged. For example, people are discouraged from building or overnight camping on the west shores of Tetlin Lake which is considered important moose habitat.

CHAPTER FIVE

SPATIAL DIMENSIONS OF RESOURCE USE

Tetlin residents often characterize the lands surrounding them in terms of the resources they contain and harvest activities that have occurred there over time. This is evident from the partial list of Upper Tanana Place Names documented during the study period (Map 1 and Appendix A). Most of the place names identified describe physiographic features of the site, such as details of terrain, water bodies, and resources present. The names reflect a depth of familiarity with the environment that one might expect from a people whose survival has depended on such knowledge. Although the list of names is far from complete, the compilation of place names identified serves as a good orientation to the geographic area with which Tetlin residents are so familiar, as well as a good introduction to the areas used, both past and present, for the harvest of wild resources.

Upper Tanana place names were collected from many residents throughout the field season during the course of interview sessions and informal discussions. Place names were subsequently compiled and recorded on tape by four individuals from Tetlin, who also gave English translations for the names. The tapes were then transcribed by linguist, Paul Milanowski, for correct Upper Tanana spellings.

To document current use areas for the harvest of wild resources, four small-scale maps (1:63,360) were combined to form a detailed base map of the Tetlin area. One of these base maps was taken to each of the 20 households sampled, and members were asked to point out the areas they currently used (defined as during the past ten years) for different

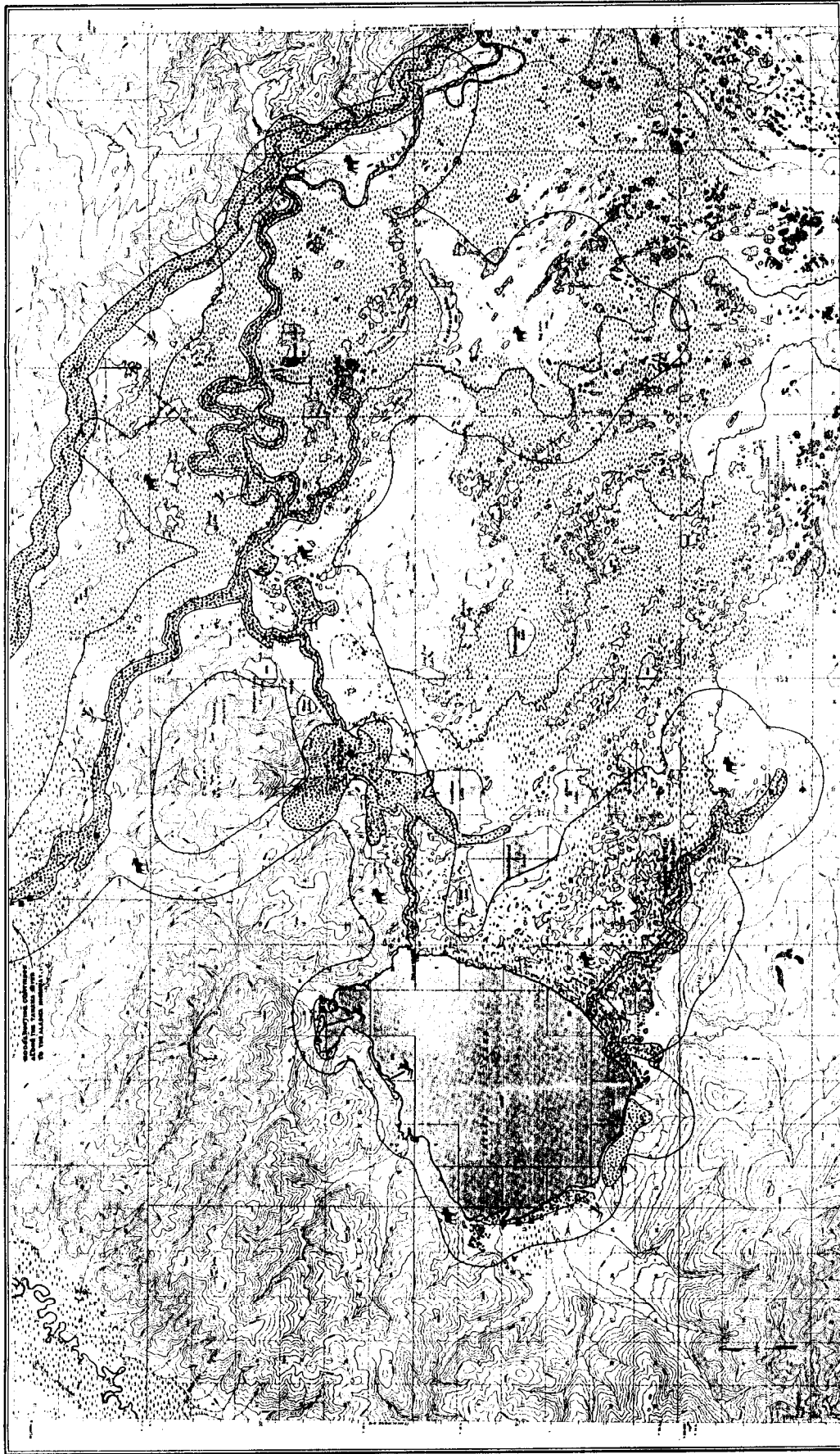
harvest activities. Colored pencils were used to draw lines around the areas used. Mapping proved to be an effective research method, due mainly to the enthusiasm of the participants. Residents were eager to discuss their harvest activities through the medium of topographic maps, and had little difficulty orienting themselves to various localities.

This chapter summarizes community use areas, compiled from individual household base maps. Use areas are expected to change over time in response to changes in the distribution of animal and plant populations, harvest methods, access, and other variables. Maps depicting current land use patterns may not accurately portray areas that Tetlin people will rely on in the future.

MOOSE HUNTING

Navigable rivers and lakes form the basis of the current pattern of moose hunting during the late summer and fall (Map 2). Moose harvest sites for the past two years are also indicated. As noted in Chapter 3, most hunting occurs within a narrow corridor extending approximately one mile inland from the shores of lakes and rivers.

Harvest effort is concentrated along the shoreline of Tetlin Lake, and the Tanana River north to its intersection with the Alaska Highway, and south approximately eight miles beyond Riverside landing. The area farther south along the Tanana River is recognized as Northway's hunting grounds. Hunting is also common along both Tetlin and Last Tetlin rivers, and the Kalutna River, referred to locally as "Old Store Creek". Interconnected systems of lakes provide good hunting grounds near Last



MAP 2. AREAS USED FOR MOOSE HUNTING AND PLANT GATHERING BY RESIDENTS OF TETLIN, 1974-1984

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
SUBSISTENCE DIVISION

LOCATION MAP

CONTINENTAL LOCATION

SOURCE

"Living Off the Land: Contemporary Subsistence in Tetlin, Alaska" by Lily Mishin, 1987. Division of Subsistence, Technical Paper No. 146.

LEGEND

- MOOSE HARVEST SITES (IN TETLIN, 1974-1984)
- PLANT HARVEST AREAS
- MOOSE HUNTING AREAS

SCALE

1:100,000

UNIVERSAL TRANSVERSE MERCATOR PROJECTION

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MOOSE HARVEST SITES (IN TETLIN, 1974-1984)

These areas are used for moose harvesting by residents of Tetlin, Alaska, in 1974-1984. The map shows the areas used for moose harvesting by residents of Tetlin, Alaska, in 1974-1984. The map shows the areas used for moose harvesting by residents of Tetlin, Alaska, in 1974-1984.

PLANT HARVEST AREAS

These areas are used for plant gathering by residents of Tetlin, Alaska, in 1974-1984. The map shows the areas used for plant gathering by residents of Tetlin, Alaska, in 1974-1984. The map shows the areas used for plant gathering by residents of Tetlin, Alaska, in 1974-1984.

MOOSE HUNTING AREAS

These areas are used for moose hunting by residents of Tetlin, Alaska, in 1974-1984. The map shows the areas used for moose hunting by residents of Tetlin, Alaska, in 1974-1984. The map shows the areas used for moose hunting by residents of Tetlin, Alaska, in 1974-1984.

SCALE

1:100,000

UNIVERSAL TRANSVERSE MERCATOR PROJECTION

Tetlin and leecheegn camps, the latter located near Fish Camp Lakes on the northern portion of Tetlin NWR (See Map 1 and Appendix A).

Of all hunting areas, Tetlin Lake seems to be the most highly regarded. Its value for moose hunting seems to be well-known, as residents from other local villages, such as Northway, are known to hunt this area with permission from Tetlin residents (M. Case 1986). Historical reliance on this area was noted by many elderly residents who claimed they had hunted moose there as young men, as did their fathers. One man explained that moose come down from the hills to the water to escape mosquitoes. As previously mentioned, village rules discourage building or overnight camping along the shore, even at the expense of good fishing, to maintain the value of the habitat for moose.

Elderly residents identified several areas that they used in earlier years, but which are not currently used and do not appear on the map. These consist of areas in the high hills southwest of Tetlin, and a group of rolling hills east of the Tanana River and the Alaska Highway.

This latter area is referred to as the "Ladue Country", named after a Yukon trader at the turn of the century. One older man remarked, "When I was a boy, not many moose. Go down Ladue and get dry meat". Summer and fall hunting in these areas meant that the meat had to be dried and cached on location, not to be retrieved until winter when it could be more easily transported back by dog team. Game taken in the "Ladue Country" was occasionally packed down to the Tanana River, and transported by skin boats driven by the current toward Tetlin. Though it is common today, several persons noted that before the introduction

of motorized crafts, people rarely hunted north on the Tanana River because successful hunters then faced the problem of transporting game upstream.

The introduction of motorized boats appears to have significantly influenced harvest patterns. Motor boats allowed residents to take much fuller advantage of the extensive system of interconnected waterways surrounding their village. With motorized crafts, the relative efficiency of tracking moose on foot significantly declined. Coupled with rising incentives to stay in the village (school, church, stores, and occasional wage labor), summer and fall moose hunting seems to have become increasingly limited to shorter trips, in contrast to the extended hunting trips of earlier days.

The first engine was introduced in Tetlin by traders in the 1920s. One elderly man recalled that the first motor, which was mounted on a canvas or skin scow, was in 1927. "A four horsepower engine, and very slow -- five days to Last Tetlin!" The first aluminum skiff was purchased by a Tetlin resident in 1958.

It is difficult to assess the impact of the motor boat and other 20th century technology on the number of moose harvested. These "advances" undoubtedly increased harvest potential, although one can not automatically assume that such a change led to increased harvests. This is one possibility. Alternatively, motorized boats may have made exploitation of marginal habitats more worthwhile, or increased efficiency may have simply resulted in more leisure time, or time to pursue other activities. The effects of new technology depend on factors such as the size and distribution of the moose population, the demand for moose, cost of new equipment, and alternatives to moose meat.

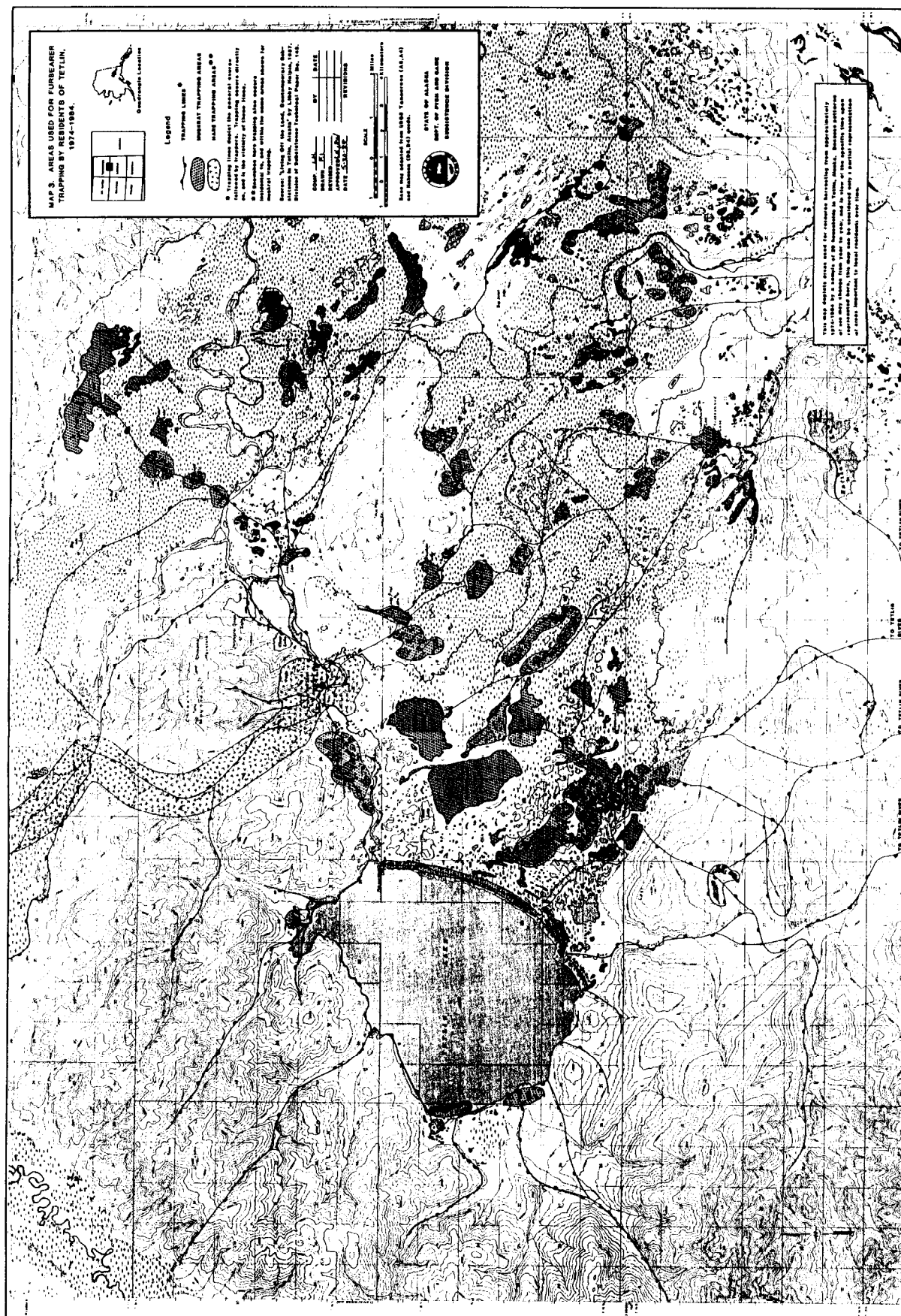
Because Tetlin was undergoing many changes at that time, it is exceedingly difficult to isolate the influence of technology alone on the harvest.

PLANT GATHERING

Most plant foods are harvested within walking distance of Tetlin (i.e., the area within approximately a five mile radius). Occasionally people travel longer distances by boat to obtain plant foods, but such trips are usually in conjunction with other activities such as fishing, hunting, or travel to Tok. The fact that most plant gathering occurs on short distance foot trips or incidental to other activities is reflected in the distribution of plant use areas (Map 2). Harvest areas are concentrated in the immediate vicinity of the village, at popular fishing sites, and along access routes to Tok. The few localities that fall outside of these areas, such as those along the shore of Tetlin Lake, represent known habitats for some of the rarer plants in the area including raspberries and wild rhubarb.

FURBEARER TRAPPING

Map 3 is a compilation of "family" traplines, used for all the "big fur" species -- beaver, otter, marten, mink, lynx, wolverine, red fox, coyote, and wolf. The lines on the map show the general course a trapline follows, although actual trapping may occur anywhere in the vicinity. As indicated on the map, muskrat are taken in lakes adjacent to and associated with a family's trapping area.



This map depicts areas used for resource harvesting from approximately 1937/1940 by a sample of 30 households in Taithe, Maaka. Business patterns of our key change (from year to year, and in view of the specific time span represented here, this map can be considered only a partial representation of area importance to local residents) over time.

Active traplines form a tight network within a 15 mile radius of Tetlin. Several extend into the northern portion of the Tetlin NWR. Not all of these lines are in use at a given time. Families often have more than one line and alternate use of them in different years. Most traplines shown here have been passed down from parents to offspring for several generations. All traplines extend only as far as the distance a trapper can cover on snowmobile in a day. Tetlin residents refer to this as "making a round trip", or returning to the village each night rather than spending a night on the trapline.

Several elderly trappers reported that historically many of the traplines depicted on the map extended farther away from the village than currently, and that trappers commonly would spend several nights or more camping along their trapline. The elders also noted that formerly they relied heavily on the hilly area east of where the Alaska Highway is now located in what is referred to locally as the "Ladue Country" (See Map 1 and Appendix A). No recent use of this area was reported. With an increasingly sedentary lifestyle, and with the introduction of snowmobiles in the late 1950s, it appears that trappers maintained only the closer portions of their family's trapline, developing offshoots and new lines within a day's travel by snowmobile. Hence, instead of expanding the range of trapping activity, snowmobiles may have contributed to a more tightly woven and compact network of traplines encircling the community.

SMALL GAME HUNTING AND TRAPPING

Hare, ptarmigan, and grouse are most commonly taken near Tetlin, along wooded trails surrounding the village. Small game, especially hare, are also taken in significant numbers on the "big fur" traplines (Map 3) by snares, rifles, or incidentally in steel traps.

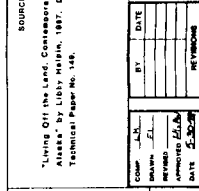
WATERFOWL HUNTING

Waterfowl hunting occurs along all rivers and lakes in the vicinity of Tetlin, with motor boats serving as the primary mode of access (Map 4). Tetlin Lake is a highly favored area, and several people commented that "you can get all the ducks you want on Big Lake (Tetlin Lake)." The interconnected lake system near Last Tetlin is another popular area for duck hunting. During periods of high water, motor boats are able to penetrate most of this lake chain. Foot travel is common and some hunters occasionally pack a canoe to one of the several lakes near Tetlin. During the summer of 1984, a canoe was cached at one of these nearby lakes and used communally by waterfowl hunters. Spring waterfowl hunting is confined to ice-free areas along lakes and rivers.

Locations sited by some of the elders as "old time" duck hunting areas are still in use. These include Tetlin Lake, Last Tetlin lake system, and Gasoline, Butterfly, and Old Albert lakes. The use of the Tanana River for duck hunting may be a relatively new practice, made more efficient by motorized crafts.



STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
SUBSISTENCE DIVISION

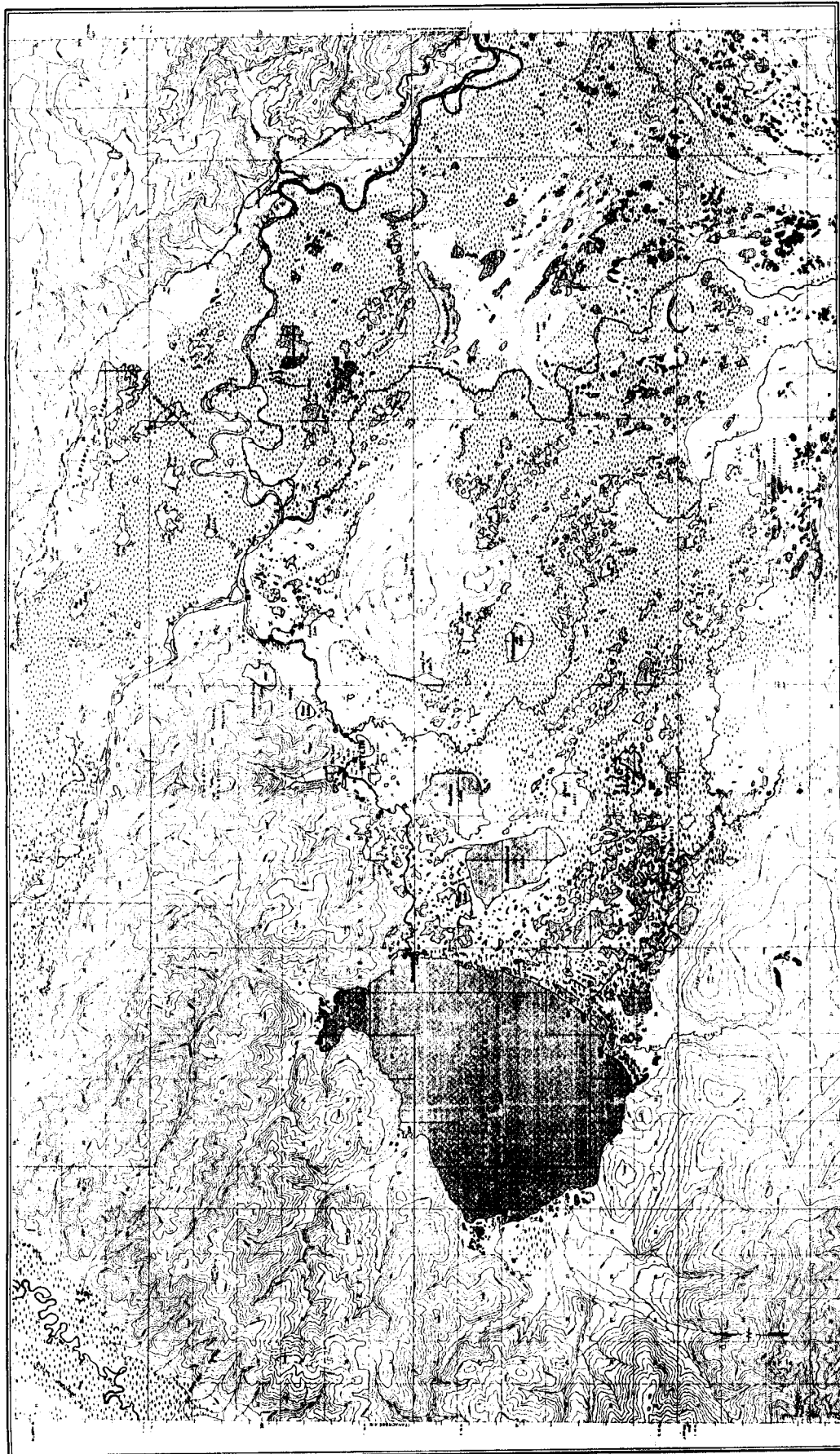


This mass depletion refers to the commonest breeding from approximately 1974-1984. By a sample of 20 *Andropogon* in Tullahoma, Alaska. Because patterns of use may change from year to year, and is not at the specific time upon representing here, but may be considered only a partial representation of areas important to local residents over time.

FISHING

In contrast to hunting and trapping, fishing activity is more localized, the majority occurring at a few traditional sites (Map 5). Use of these sites rotates, depending on the time of year and relative abundance of fish. Both Tetlin and Last Tetlin originated as fish camps for the spring, summer, and fall whitefish runs. The presence of a deep layer of fish scales at Last Tetlin indicates that this area has been used for a long time (McKenna 1959). Allen (1887) observed the use of a weir and hoop net when he visited Last Tetlin. McKenna (1959) noted the presence of weirs at both Tetlin and Last Tetlin villages in 1929. The harvest of whitefish continues to center around these two village sites, although the weir at Tetlin is no longer maintained, and has been replaced by the use of gill nets. Harvest also occurs at smaller 'family' camps such as leecheegn (within Tetlin NWR), Louie Lake, and others on the river near Last Tetlin. At leecheegn, a hoop net is placed in the small clearwater slough next to camp. In these small sloughs, the hoop net fits snugly into the stream bed, eliminating the need for construction of a weir.

Grayling are taken locally during the summer with rod and reel in clear rivers and streams. Clearwater Creek, east of Last Tetlin, is a highly favored area. Pike are taken in many of the same areas as grayling, as well as in Tetlin Lake and other smaller lakes in the vicinity.



LEGEND

- ▲ DIP NET
- HANDLINE THROUGH ICE
- FISH TRAP
- GIFT THROUGH ICE
- GILL NET
- ROD AND REEL

This map depicts areas used for resource harvesting (see Appendix A) by residents of TETLIN, Alaska. The map is based on aerial photography and ground surveys. It is not a political boundary map. The map is not to be used for any purpose other than that for which it was prepared. The map is not to be used for any purpose other than that for which it was prepared.

SOURCE

"Living Off the Land: Contemporary Subsistence in Tetlin, Alaska" by LARRY HARRIS, 1987, Division of Subsistence, Technical Paper No. 148.

LOCATION MAP

UNIVERSAL TRANSVERSE MERCATOR PROJECTION

DATE

1987

SCALE

1:50,000

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

SUBSISTENCE DIVISION

MAP 5. AREAS USED FOR FISHING BY RESIDENTS OF TETLIN, 1974-1984

Yearling pike ("pickle") are taken in the fall just prior to freeze-up, in lakes and small sloughs near the village. Ice fishing for pike and burbot, like the whitefish harvest, occurs at a few traditional sites, the most common of which is the mouth of the Kalutna River. Motorboats provide access to all fishing areas outside of Tetlin, with the exception of fall ice fishing sites.

Conversations with elderly residents indicate that fishing areas have undergone negligible change in their lifetimes. Despite the trend toward localization of harvest activities, fishing sites at considerable distance from the community (i.e., 10 river miles) have been maintained.

SUMMARY

Tetlin residents tend to view their land as that which they use currently or have used traditionally to harvest wild resources, and less in terms of the legal boundaries. Trapping or building by a non-Tetlin resident on such areas would probably be viewed as an intrusion or trespass.

For all harvest activities except trapping, use areas are considered communal and shared among all members of the village. In contrast, trapping rights for furbearer species are defined through a system of family-inherited traplines, each family having exclusive rights to the furbearers along their trapline and in lakes associated with it. There is some recognition of territorial harvest boundaries between Tetlin and the closest community of Northway. These do not always correspond to the legal boundaries of Tetlin's landholdings. These areas seem to be loosely defined, and do not preclude use by

non-village members. As described in this chapter, Northway residents hunt moose in the Tetlin area, and Tetlin residents may have the same privilege in Northway.

Most harvest activities occur within a 10-15 mile radius of Tetlin. Areas used previously by elderly residents, but no longer used suggest shifting geographic patterns of resource harvest in recent history. A transition to a more sedentary village-based lifestyle beginning in the early 1900s and continuing into the present was cited as a probable reason for the discontinued use of areas lying on the fringe of Tetlin's traditional harvest areas.

Technological change, most notably revolutionized modes of access, appears to have accommodated the growing preference for a more localized, village-based lifestyle. Motorboats, for example, seem to have encouraged more extensive use of the of water corridors surrounding Tetlin, while discouraging use of the upland areas historically utilized. Most moose hunting now takes place on or near navigable water bodies. Motorboats also provide the major mode of transport to Tok, increasing potential for incidental harvest along these access corridors. Snowmobiles, introduced in the 1960s, appear to have accommodated contemporary desires to conduct trapping activities closer to the village, eliminating the need for overnight trips on the trapline. Traplines now extend only as far as a person can reach by snowmobile and return to the village in the same day. The network of traplines now appears more 'compact' than it is believed to have been in the earlier part of this century, suggesting that snowmobiles may have contributed to a decrease rather than increase in the range of trapping activity.

Finally, despite an increasing tendency toward localization of harvest activities, areas such as Last Tetlin, Leecheegn, and other camps at considerable distances from Tetlin, are still commonly used harvest areas. More efficient travel made possible by motorized transport may promote the continued use of such areas.

CHAPTER SIX

CURRENT RESOURCE ISSUES

This chapter summarizes Tetlin residents' concerns regarding resource issues in the area. These issues were identified in the household interview sessions, public land-use planning meetings, and through informal discussion with residents. The first section addresses issues specifically related to land use on the Tetlin National Wildlife Refuge (NWR), while the latter section is a discussion of more general concerns.

ISSUES RELATING TO REFUGE LANDS

The concerns expressed by Tetlin residents generally focused on specific, immediate problems that residents were experiencing on refuge lands. All of the issues voiced concerned the northern portion of the refuge where resource use by Tetlin residents is most intensive.

Trapline Interference

Two major trapping areas are utilized by Tetlin residents on the refuge, both for muskrat and the larger fur species. These traplines represent areas which have been passed down within families for at least several generations. Families currently using these areas claim that other trappers have been encroaching on their lines. One trapper stated that he had to relocate because of depletion of furs in his area by

other trappers. Tetlin trappers feel that managers of the Tetlin NWR should address these trapline conflicts.

Disturbance of Cabins and Campsites

Those residents who have fishing and hunting camps on refuge lands or private inholdings complained of intrusions and vandalism. One resident claimed that a person had built a cabin adjacent to his camp, near the site of a family cemetery.

Refuge Planning

Residents were less articulate in response to issues regarding future management philosophies and goals for the ten-year refuge general management plan. This did not reflect apathy toward refuge policies. Rather, Tetlin residents seemed to be unaccustomed to the abstract planning scenarios and the format of public meetings, both of which are standard for the development of environmental impact statements. One resident voiced what seemed to be the consensus: "We don't want them to do anything that will hurt our subsistence hunting and fishing". Specifically, residents were concerned about potential plans to enhance access to the refuge, or to build recreational sites if they resulted in increased human presence near their camps or harvest areas.

GENERAL CONCERNS

Other concerns, not specifically related to Tetlin NWR, involved the timing of harvest seasons as established by the Alaska Board of Game.

Moose

The 1983-84 legal hunting season in Game Management Unit 12 was September 1-20, one bull per licensed hunter. Most residents felt that the season was not adequate to meet community needs, claiming that only a few people were able to get a moose at that time. Residents explained that in September, moose retreated from the more accessible lowlands into the hills, requiring that hunters make long treks on foot. They viewed this kind of hunting as time-consuming and a waste of energy, with a much diminished chance of hunting success. Residents expressed a desire to see the season accommodate, to the extent possible, traditional periods of moose harvest in the late summer and winter.

Waterfowl

Residents expressed concern about their ability to continue the traditional practice of hunting waterfowl in the spring and summer, and stated the need for legal recognition of this practice.

Caribou

Residents expressed their desire to hunt caribou when and if the Mentasta or Nelchina herds extended into the Tetlin flats area. Currently, most people feel that it is not economical to hunt caribou outside of the local area (i.e., Fortymile Herd on the Taylor Highway) because of the necessity of transportation to the area and off-road

vehicles if the caribou are large distances from the road. Since few people in Tetlin own cars, and only one household owns an ORV, current utilization of the Fortymile Caribou Herd is minimal.

CHAPTER SEVEN

SUMMARY AND CONCLUSIONS

Tetlin's population today consists largely of the children and grandchildren of the semi-nomadic hunters and gatherers whose first direct encounters with western culture probably occurred only about one hundred years ago. The fur market, introduced by European and American traders, was the major catalyst in Tetlin's transition to the current sedentary, mixed subsistence and cash economy.

Tetlin remains one of the only Upper Tanana communities inaccessible by public road. With no community store, Tok is the nearest center for commercial exchange, and is reached by boat or airplane during most of the year. Tetlin's relative isolation contributes to the low employment and income levels reported. Isolation and large land holdings, however, work in favor of supporting and sustaining a relatively rich natural resource base. Lack of employment and income coupled with a relative abundance of fish and game helps to explain the community's dependence on harvest of local wild resources.

In the early part of this century, Upper Tanana Athabaskans were heavily dependent on caribou that migrated through the region twice a year. Though reliance on caribou has decreased dramatically with the decline of the herd, the current seasonal round of harvest in Tetlin remains very similar to that described by McKennan in the late 1920s.

Current harvest effort focuses on moose, furbearers, waterfowl, freshwater fish, small game, and a wide variety of plants. Of these, moose and whitefish constitute the staples. Fall is characterized by moose and waterfowl hunting. Fur trapping dominates winter months, and

trapping shifts almost exclusively to muskrats by late winter. Following breakup, muskrats are taken in open waters by shooting, and newly-arriving ducks and geese are hunted. Fishing, in Tetlin and at family fish camps, and plant gathering occurs throughout the summer months.

Similarity to the seasonal round described by McKennan suggests the strong influence of historical patterns of resource use on the timing of present-day harvests. State fish and game regulatory seasons are accepted when they coincide with traditional harvest periods, and resisted when they do not. The legal trapping seasons during the study period, for example, were quite similar to traditional timing of trapping activities. In contrast, the waterfowl season was limited to fall, and did not accommodate the traditional spring and summer harvest periods. Out-of-season harvest was expected to be more common in the latter case, and it was.

Efforts to document household participation and quantities of resource types harvested during the 1983-84 year revealed the following:

- 1) Households reported that an average of 58 percent of their fish and meat was derived from wild fish and game populations.
- 2) Of the 20 categories of species or species groups harvested, harvest participation was highest (greater than 80 percent) for moose, ducks, whitefish, pike, and berry plants. Minimal participation in the harvest of geese, cranes and porcupines was reported, all of which are relatively scarce in the area. No current sheep hunting was reported.
- 3) Participation in the harvest of wild resources was noticeably higher among some households than others. This could not be explained in terms of any single variable or attribute. However, households that were highly involved in the harvest of wild resources were not limited to low income categories as is sometimes assumed. Harvesting resources can be costly, and each household faces a complex economic decision in choosing between harvest and other options, such as purchasing groceries.

Although there is a need for a better understanding of the quantitative nature of subsistence requirements, caution must be exercised in collecting and analyzing such information. As discovered in this study, misinterpretation of information and potential margin for error is magnified when working in cross-cultural settings over short periods and can lead to misleading results. Some of the specific problems encountered have been discussed in this report (Appendix B). Prior awareness and consideration of such problems in research design would lead to more meaningful results. The assistance of a local person in this study was extremely valuable and critical to the success of the project.

Mapping subsistence use areas was one of the more effective means to document resource use. Residents generally were enthusiastic about mapping, and had little difficulty orienting themselves to the topographic maps provided. Information compiled from maps of household use areas indicated that most harvest activity occurs locally, within a 10 to 15 mile radius of the village. Use of the Tetlin NWR is concentrated in the northern portion where camps and traplines are located. Tetlin residents seem to recognize a loose boundary between their harvest areas and those used by Northway, the closest neighboring community. With the exception of fur trapping where families have exclusive rights to the furbearers on their trapline, use areas are considered communal and are shared among all Tetlin residents.

Comparison of current use areas with what is known about historical use indicated a greater concentration of resource use at closer range to the village. A shift from a semi-nomadic to a sedentary lifestyle, and introduction of new modes of access appeared to have a major impact on

the geographic pattern of harvest. For example, motorized boats are said to have promoted more intensive hunting along water corridors, and snowmobiles may have contributed to a decrease in trapping range over time.

Regarding future resource policies, residents expressed their first priority as protecting their subsistence uses of the land, including those on Tetlin NWR. They were particularly concerned about potential plans to enhance access to the refuge, which they felt might increase both visitor use and disturbance of their camps and harvest areas. This concern is well-founded as the population of surrounding areas continues to swell. The population in Tok, for example, has doubled every ten years since 1950 (U.S. Census Bureau 1980). State land disposal programs have fueled the rapid growth in the Tok area, resulting in a steady increase in competition for local fish and game resources.

In contrast to most of the other Upper Tanana Athabaskan settlements, Tetlin has remained in its original location, unconnected to the Alaska Highway by public road. The community has maintained a viable mixed subsistence-cash economy despite very limited local employment opportunities and cash flow. Tetlin's relatively large landholdings and access to a diversity of wild resources seem to be largely responsible. However, concerns about the land are derived from ties that go far beyond economic dependence. The land is the basis from which residents derive their culture and sense of identity. Values of this kind are difficult to express in an analytical report, yet might be many times more important than anything presented here. One elderly man remarked to me on several occasions, "My Dad always tell me, you got to hold on to the land, and take care. It's the most important thing."

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APPENDIX A
UPPER TANANA PLACE NAMES AS DEPICTED ON MAP 1.

1. tsaiy na' niign	Grandpa Creek
2. taa'ah niign	Flowing Creek with many feeder sloughs and ponds
3. toochin mann'	Midway Lake ("alot of sticks in water")
4. manh ts'eegn	Long Lake
5. taagoh mann'	Swan Lake
6. dilahth'aal' mann'	Lily Pad Leaf Lake
7. nahk'eedn gaaiy	Small Hill Moose Lookout
8. daa manh deedlaiy	Lakes on top of hill
9. yul niign	
10. dzanh tsaa' niign	Muskrat Cache Creek
11. dzanh tsaa'	Muskrat Hollows on Ground Area
12. shyok niign	
13. jogn daak'eedn	Blueberry Picking Hill
14. saanah mann'	Sun Lake
15. tsaih	Ochre (red rock) Hill
16. ts'iit tɬ'oo mann' (or) dishinh mann'	Porcupine Grass Lake Medicine Man Lake
17. t'ia tsat mann'	Burned Wood Lake
18. taacheegn	Mouth of Tetlin Creek
19. tɬ'ookaagn	Grass on top of Water Lake
20. koht'aa niign	Short Cut Slough
21. th'iitu' niign	Tanana River
22. thaaiah nedee	Riverside Area ("high banks")
23. nahk'eedn choh	Large Hill Moose Lookout

24. ch'inaagn'mann'	Moose Food Lake
25. Ieecheegn	Titus David's Camp
26. Ieecheek niign	Old Store Creek
27. teetla _{ij} y	Tetlin (water going down from Tetlin Lake)
28. teet _{ij} y niign	Tetlin Creek
29. taak'at niign	Clearwater Creek
30. ts'een _{ij} in ushiit tetniithadn mann'	Girl Carrying Baby Sister Drowned Lake
31. ts'oo mann'	Logging Lake
32. tuut niign	Wave Creek
33. ch'ishyaan t'oh niign	Goldin Eagle Nest Creek
34. Idaats'eegn	Long Point (Island Lake)
35. manh choh	Big Lake (Tetlin Lake)
36. gq _q choh mann'	Big Black Bug Lake (Gasoline Lake)
37. manh ts'eegn	Long Lake
38. shyuu	Small Hill (landmark)
39. nuudhii'aa	Chief Luke's Camp Area (Nuziamundcho Lake area)
40. naathaaih mann'	Sand Lake
41. Itataa'uudeh'aiy dhal'	Big John Hill
42. Itaataauud _{ij} ht'aiy	Lake with many points (Big John Lake)
43. tatxodn	Almost a Circle Lake (Crooked Lake)
44. Iii mann'	Dog Lake
45. ts'i ts'aal t _{ij} y	Place where two trails meet
46. ch'inaagn'mann'	Moose Food Lake
47. dinaih t'a _q mann'	Stoneberry Leaf Lake

48. ʔtaataa'uudɨht'aiy	Lake with many points, can go a long way on it
49. manh chuuiy	Feather Lake
50. tiniɨ'ah	Old Albert Lake ("Can't see all of it")
51. dziiɭ mann'	Last Tetlin Fish Lake
52. naathaaih mann'	Sand Lake
53. nihts'iil mann'	Sand Lake
54. gooh mann'	Weed Lake
55. nahk'adn cheegn	Mouth of last Tetlin Creek
56. kaaɭ keiy	Salmon Berry Village
57. xaal niign	Large Whitefish Creek
58. tooniitɭeek mann'	Banks Caving In Lake
59. taaniitsoo mann'	Red-Orange Water Lake
60. tsa' kii' mann'	Beaver Lodge Lake
61. nahk'adn	Last Tetlin Village
62. nahk'adn niign	Last Tetlin Creek ("clear, cold water")
63. taanuu huuk'et ee'aan mann' (or) taiht'aa mann'	Island-on-top-of-it Lake Bottom-of-the-hill Lake
64. ch'idzaa'	Ear Hill (Tetlin's Hill)
65. shehtsadn t'oh niign	Mouse Nest Creek
66. daa manh deedlaiy	Last Tetlin Hilltop Lakes (4)
67. ch'inaagn' mann'	Moose Food Lake
68. taak'at niign	Clearwater Creek
69. xaalmann' niign	White Fish Lake Creek
70. xaal keiy	Old Whitefish Village
71. nahk'eedn gaaiy	Small Hill Mosse Lookout
72. k'ɨɭ shuh dhal	Birch Mountain

73. shahtsall dhal'	
74. teek'ut dhal'	
75. ch'iil thoo dhal'	Grizzly Bear Mountain
76. shaa'aat niign	Wife Creek
77. tsa' tu'niign	Beaver Water Creek
78. taih tah	Among the Hills Area
79. uudladn	Sharp Pointed Hill
80. ch'ihqql ^{li} niign	Muzzel Loader Metal Creek
81. ch'iithoo	Skin Scraper Hill
82. shyaatsal niign	Little Hill Creek
83. shyaatsal	Little Hill
84. shyaatsal mann'	Little Hill Lake
85.	Trail to Tanacross
86.	Trail to Midway Lake
87.	Trail to Dawson
88.	Winter Road to Tok
89. dihtaadn ts'a' xaiy t ^{ai} y	Winter Trail to Mansfield (Tanacross)
90. nahk'adn ts'a' shiin t ^{ai} y	Summer Trail to Last Tetlin
91. nahk'adn ts'a' xaiy t ^{ai} y	Winter Trail to Last Tetlin
92. naabiahts'a' ts'a' t ^{ai} y	Trail to Nabesna (Northway)
93. nahk'adn ts'anh maaniah ts'a' xaiy t ^{ai} y	Winter Trail from Last Tetlin to Mentasta (also Suslota)
94. nahk'adn ts'anh dihtaadn (maaniah) ts'a' shiin t ^{ai} y	Summer Trail from Last Tetlin to Mansfield or Mentasta
95. nahk'adn ts'anh na ^{ai} biahts'a' ts'a' t ^{ai} y	Trail from Last Tetlin to Northway

APPENDIX B. Discussion of quantitative harvest data, and examples of problems encountered in gathering quantitative data.

There has been considerable discussion among those involved in subsistence research over the usefulness and limitations of quantitative harvest data. Numerical data, in contrast to descriptive or qualitative information, are succinct and unambiguous, and have obvious value to resource managers. However, such data may present only a partial or even inaccurate picture of resource use when interpreted without an understanding of the context from which they are derived. Certainly this is a concern of any researcher, but is of particular concern in research conducted in a cross-cultural setting. Assumptions that one often makes sub-consciously when interpreting information are less likely to hold across cultural boundaries. Although the assistant from Tetlin was invaluable in this regard, there remained some difficulties. Specific examples of problems encountered while gathering data, especially of a quantitative nature are summarized below.

- 1) As in any such study, the accuracy and precision of responses varied from individual to individual.
- 2) Respondents were particularly unaccustomed to thinking of harvest activities in quantitative terms. For example, in requesting how many whitefish a household harvested, answers such as "a lot" or "a few" were common, and relative to a typical year for that household, or perhaps relative to what other households take. When I pressed for a more precise figure, I encountered comments such as "I don't know, we don't count it as we catch it", or "I take as much as I can get". Even with the help of my assistant, translating these terms to numbers involved a large margin of error.
- 3) Sensitive issues surrounding certain types of harvest activities probably decreased candidness with regard to some questions, even though anonymity was assured.

- 4) There was difficulty in obtaining an account of household harvest. In Upper Tanana culture, there is a definite tendency to answer for one's self only, and not for others. Hence respondents frequently stated only what they themselves had harvested, and not the activities of the entire household. Unless all household members were present, cumulative household harvest was hard to document. By the same token, a respondent often reported harvest taken with another person outside the household, introducing overlap, and again making it hard to focus on the individual household unit.
- 5) Respondents found it difficult to think of their harvest activities over a twelve month period, and often responded with information about a specific trip (i.e., the last trip taken), and not their cumulative harvest over a year. This may cause underestimation of a full year's harvest.
- 6) The tendency to share resources among members of the extended family, and with friends, or for communal gatherings such as potlatches, resulted in some confusion over harvest quantities. It may be the case, for example, that a family harvested 100 ducks in a season, but 50 were given for a potlatch, or to an aging relative. Subsequently, some respondents might report a harvest of 100, while others 50. Similarly, responses to questions about household need varied greatly depending on whether it was interpreted as that amount needed for the consumption by household members exclusively, or the amount necessary to maintain customary sharing and exchange networks in addition to household consumptive needs.