

LAND AND RESOURCE USE PATTERNS
IN STEVENS VILLAGE, ALASKA

by

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ABSTRACT

This report describes contemporary patterns of the harvest and use of fish and wildlife resources by the residents of Stevens Village, based on research conducted in 1984-85. The information presented is based on surveys conducted with all community households, resource use area mapping, key respondent interviews, and a literature review.

Stevens Village is a small, non-road connected community situated on the north bank of the Yukon River at the western end of the Yukon Flats. The community is located approximately 27 river miles above the Yukon River bridge of the Dalton Highway. In 1984 Stevens Village had a population of 90 people in 30 households. The community is predominantly Native (94 percent), primarily of Koyukon Athabaskan descent.

Residents of Stevens Village maintained involvement in both the cash and subsistence spheres of the economy. Most households combined the harvest of fish and wildlife with wage employment or other cash-producing activities. Wage employment in the community was limited and most jobs were funded through government programs. Most employment opportunities were seasonal or part-time and many were short-term construction jobs of limited duration. Average household incomes in Stevens Village were among the lowest in the state. During the survey year the reported household income averaged \$5,374.

Households harvested a diverse range of over 50 species of fish, mammals, birds, and plants. Ninety-seven percent of all households harvested some fish and wildlife during the survey period. Stevens

Village residents produced substantial quantities of food through their fishing, hunting, and trapping activities. The per capita harvest of 1,139 pounds during the survey year was among the highest documented in the state. Salmon comprised 81 percent and freshwater fish was 9 percent of the overall harvest by weight. Approximately half of the fish harvest was used to feed dogs. Mammals accounted for 8 percent of the total harvest. The relatively low percentage which mammals contributed to the overall harvest may be related to the low moose population in the area.

Households worked cooperatively in the harvest and preparation of subsistence foods. Individual household harvests varied widely, ranging from 0 pounds to 22,000 pounds. Fish and wildlife were shared with households in the community and other areas.

Stevens Village households have maintained a significant involvement in the subsistence harvest activities. Community residents remain concerned with land and resource-related issues which may affect their continued harvest and use of local fish and wildlife resources.

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CHAPTER 1
INTRODUCTION

PURPOSE OF THE STUDY

This report describes contemporary patterns of fish and wildlife harvest and use by residents of Stevens Village, an Athabaskan Indian community located approximately 95 air miles northwest of Fairbanks at the western end of the Yukon Flats.

The study was initiated to provide information on fish and wildlife harvests and land use including species used, seasons of harvest, harvest quantities, and areas used for harvest activities. The composition of harvesting groups, the processing and distribution of resources, and the relationship between harvest and socioeconomic characteristics of households were also examined.

The Division of Subsistence, Alaska Department of Fish and Game (ADF&G), has been involved in research in the Yukon Flats and upper Yukon area since 1980. Caulfield (1983) described land and resource use patterns for the communities of Arctic Village, Birch Creek, Chalkyitsik, Fort Yukon, and Venetie. Gwich'in Athabaskan place names for these communities were documented in a separate report (Caulfield et al. 1983). A report on moose hunting activities in the Game Management Unit 25(D) permit hunt area (Sumida and Alexander 1985) described historic and contemporary patterns of moose hunting for the communities of Beaver, Birch Creek, Fort Yukon, and Stevens Village and provided background information on regulatory changes in the area.

The research in Stevens Village was aimed at addressing a number of resource management and land use issues in the area. A brief summary of these issues is presented below.

Concern about game populations had been expressed by local residents. The dramatic decline of the moose population during the 1960s and 1970s when liberal seasons and bag limits attracted hunters from other areas to the flats was of particular concern locally. By 1977 the legal hunting season had been dramatically reduced by over 80 percent from 122 days to 21 days (see Appendix A). In 1983 a restricted registration permit hunt was instituted to control and monitor moose harvests. The Yukon Flats Fish and Game Advisory Committee and other local residents have worked with ADF&G staff to implement the permit hunt system, supporting research on the moose population and developing a five year moose management plan. The Division of Subsistence contributed information on local harvest and use patterns to address these issues.

In 1987 the U.S. Fish and Wildlife Service (USFWS) was in the process of developing waterfowl regulations for spring subsistence hunting for rural areas in Alaska. For an area like the Yukon Flats, which contains some of the most productive waterfowl breeding habitat in North America, the creation of regulations that accommodate local harvest patterns and traditional seasons of use is critical for maintaining subsistence opportunities. It is expected that detailed information on spring waterfowl hunting activities by Stevens Village residents can contribute to this process.

Salmon is of major importance along the Yukon River, providing for human consumption, dog food, and cash from commercial sales.

Allocation of this valuable and limited resource is of great concern to local residents. The decline of Yukon River fall chum stocks has triggered examination of the effects of commercial fishing operations along the Alaska Peninsula and on commercial and subsistence fishing operations along the Yukon River. It is also of major concern in the Yukon River salmon treaty negotiations between the U.S. and Canada. King and fall chum salmon stocks taken by Stevens Village residents and other upriver communities are primarily from spawning streams in Canada and accurate harvest figures are essential in the discussions of allocation of these fish in the negotiations. The use of Yukon River salmon for feeding dogs in communities like Stevens Village may be examined in future sessions of the Board of Fisheries.

Management plans for federal lands surrounding Stevens Village are in progress and will affect the future activities of local residents. The USFWS has developed a comprehensive conservation plan (CCP) for the Yukon Flats National Wildlife Refuge (USFWS 1987b), which encompasses much of the area around Stevens Village. The CCP provides a framework for the development of more specific refuge policy on land and resource uses in the area.

The federal Bureau of Land Management (BLM) has developed a land management plan for lands under their jurisdiction within the Utility Corridor of the Trans-Alaska Pipeline System (TAPS) north of the Yukon River (BLM 1987). The possible transfer of corridor lands to the State may result in increased access, settlement, and development in the corridor and both direct and indirect effects on the subsistence activities of Stevens Village residents.

Preliminary project descriptions and a draft Environmental Impact Statement for the development of the Trans-Alaska Gas System (TAGS), have recently been released (BLM and USACE 1987). This project would parallel the existing oil pipeline and would entail construction and other development activities in areas traditionally used by Stevens Village residents.

Initial oil exploration has taken place on private lands in the Yukon Flats. Further oil exploration, now allowed on federal wildlife refuges in Alaska, has been undertaken by oil companies in conjunction with local and regional corporations.

These and other issues affecting subsistence demonstrate a need for baseline information on community harvest patterns. This information is expected to be useful to residents of Stevens Village, the village council, village corporation, government agencies, and other interested groups and individuals in addressing fish and game regulatory issues and informing resource and land use management decision-making. The report documents the continuity of subsistence patterns in Stevens Village and may also contribute to our understanding of subsistence systems in Alaskan communities as well as serving as a baseline by which to assess potential changes in these systems.

This report provides background information on the area, the ethnographic and historical context of community development, and a description of socioeconomic characteristics of the community in Chapter 2. An overview of contemporary harvest patterns, including a description of the seasonal round, summaries of survey data on participation and harvest quantities, the use of wild resources to

feed dogs, and information on household harvest variability is presented in Chapter 3. Chapters 4 through 7 present descriptions of fishing, hunting, trapping, and gathering activities. Chapter 8 concludes the report with a summary of key findings, a discussion of the policy implications of this information, and further description of land and resource use issues and concerns of Stevens Village residents.

STUDY OBJECTIVES

The primary objectives of this study are:

1. to describe the seasonal round of harvest of fish, wildlife, and plant species used by Stevens Village residents;
2. to describe harvest and processing methods including the composition of work groups and resource distribution;
3. to document community harvest levels for a recent 12-month period and household participation in harvest activities;
4. to describe demographic characteristics of the population and socioeconomic characteristics of the community and provide an analysis of the relationships of these to harvest activities;
5. to provide maps of areas used for resource harvesting activities by community residents for a 10-year period;
6. to identify local concerns relating to land use and resource management issues.

METHODOLOGY

The Stevens Village Council granted approval for conducting this study in January 1984, following a presentation on the proposed project by Division of Subsistence staff Terry Haynes and Clarence Alexander. Field research was carried out by Valerie Sumida, Subsistence Resource Specialist II, and Clarence Alexander, Fish and Game Technician III. Preliminary field work began in February 1984 with informal interviews on local place names by Clarence Alexander. Most field research was conducted between July 1984 and May 1985.

A variety of standard anthropological research techniques were used to collect information. Structured interviews examining harvest activities over a 12-month period were conducted with all year-round households in the community with the use of a survey instrument (Appendix B). Supplemental methods included informal interviews on selected topics, participant-observation of harvest and processing activities, and a review of historical and ethnographic literature and other relevant documents.

A community census was undertaken and at the time of the study 33 households were identified. For the purposes of the survey, three of these households were combined with other households with which they were closely affiliated in terms of kinship, household interaction (e.g., shared meals, joint responsibilities for daily household maintenance), and harvesting and processing activities. Each of the three households consisted of adult males under the age of 30 living in small dwellings adjacent to their parents' homes. One of the three included the wife and two children of the adult son. This resulted in

30 households for the study period. Calculation of frequencies, averages, and statistical analysis was based on this 30 household figure. A family of four, consisting of the two school teachers and their children, were not considered permanent, year-round residents of the community and were consequently not interviewed.

The resource harvest and use survey focused on the types of resources the household harvested and estimates of harvest quantities. Other inquiries related to harvest methods, sharing and receiving of fish and wildlife, moose hunting activities during fall 1984, trapping activities, equipment ownership, and employment.

The participation by a household in a harvest activity is identified through the successful harvest of a resource. Information on unsuccessful attempts at harvest was not collected except for moose hunting during the 1984-85 season (the year following the survey period).

Salmon fishing activities were undertaken by multiple household groups and harvest quantities were generally attributed to the "parent" or "core" household in the work group, reflecting the pattern of storage of the fish in the community (see Chapter 3).

If a harvest range was provided (e.g., 20-30 whitefish), a mid-range figure was used when coding surveys. In one instance a household reported the harvest of chum salmon but did not identify the proportion of summer and fall chum in the overall catch. Because the household was known to fish during both seasons, the harvest was split between the two stocks of chum salmon. In determining the quantity of fish used for feeding dogs, in the few cases where respondents did not provide specific numbers but generalized proportional amounts such as

most or some, these terms were assigned percentages of 75 and 25, respectively.

Data collected through the survey instrument were coded for computer entry and analyzed with the Statistical Package for the Social Sciences (SPSS) and Lotus 1-2-3 programs. Harvest quantities for edible species were converted into pounds of useable weight. Conversion figures were compiled from a variety of sources and are documented in Appendix C. Descriptive statistics were provided by the Division's data management staff.

Mapping of areas used for resource harvesting during the period 1974 to 1984 was completed with 24 individuals, representing 22 households (67 percent of all community households). The time period selected was intended to reflect areas used since the construction of the Haul Road and the Trans-Alaska oil pipeline, approximately 20 miles west of the village, and is considered to represent contemporary use patterns.

U.S. Geological Survey topographic maps at a scale of 1:250,000 were used as base maps. Active hunters and trappers were asked to mark areas used for different harvest activities (salmon fishing, moose hunting, bear hunting, waterfowl hunting, furbearer trapping, berry picking, and wood harvest) using colored pencils on mylar. Individual maps differed in the level of detail and the number and kinds of activities depicted depending on the household's involvement in each activity. Composites of individual overlays were made on mylar sheets, and maps were drafted by a professional cartographer. Community review of preliminary blue-line copies of maps took place in February 1986. All revisions made at this community meeting were

incorporated in the final version of these maps. Blue-line copies of these maps at a scale of 1:250,000 are available for review from the Division of Subsistence office in Fairbanks. The community will also retain blue-line copies of use area maps.

LIMITATIONS

Data collection for the study took place during 1984 and 1985 and harvest and use surveys covered the period September 1983 through August 1984. The limited time depth of the survey data, focusing on a single 12-month harvest cycle is a major limitation of the study. Although it may accurately reflect conditions for that year it has been shown in other studies (Burch 1985; Coffing and Pedersen 1985) that there can be a wide range of harvest variability over time. The harvest of resources at any point in time is affected by such factors as migration patterns, cyclical abundance and decline of species, effects of harvest activities on a particular animal population or fish stock, weather and other environmental conditions, the personal circumstances of the harvester including health, condition of equipment, cash availability, opportunities for cash employment, or technical or academic training outside the community. The fluidity of community residence patterns over time is another factor in subsistence production. It cannot be determined with the present level of information whether reported harvests are within an "average" range of annual subsistence production or even how large an average range might be.

Estimates of useable weights of resources reflect an "average" weight of an "average-sized" fish or animal, and in most cases are thought to be a conservative estimate. These conversions may not adequately reflect the wide range of variability in size and weight of animals of a single species, based in part on the sex of the animal, its age, and the season in which it was harvested. The processing of resources may also vary considerably, affecting the useable weight of an individual fish, bird, or mammal. The parts of each species which are utilized may vary from one animal to the next, or from household to household.

The ten-year period used for mapping reflects current use of areas. Stevens Village residents have indicated that their use of certain areas has been restricted as a consequence of the development of the Trans-Alaska oil pipeline and Dalton Highway. Contemporary use areas depicted by the 10-year time period are a subset of a larger area that had been in use during the lifetimes of some of the residents. Areas depicted do not take into account the future establishment of new use areas or the eventual inheritance of currently unused areas for trapping by young adult males, families returning after a period of absence, or newcomers to the community.

CHAPTER 2

AN OVERVIEW OF THE STUDY AREA

THE REGIONAL ENVIRONMENT

The Yukon Flats are a large outwash plain of the Yukon River, located in central and eastern Alaska approximately 80 air miles north of Fairbanks, between the communities of Circle and Stevens Village (Fig. 1). From Circle in the east, the Yukon River flows northwesterly for about 80 miles to Fort Yukon, then heads southwesterly for approximately 175 miles through the remainder of the flats. Along this stretch, the river winds sinuously through miles of shallow, braided channels, reaching two miles across in places (Ducker 1982:8).

Alaska's largest interior valley, surrounded by upland areas and mountains, the flats consist of river-sorted gravels and windborne silt encompassing approximately 6.5 million acres of land, and 10,000 square miles (U.S. Dept. of the Interior 1974:27; Institute of Social and Economic Research 1978:10-1; U.S. Fish and Wildlife Service 1985:31). Elevations range from 300 feet in the west to 600 to 900 feet in the north and east. Much of the area is marshy flats containing numerous thaw lakes, braided streams, oxbows, and sloughs (Selkregg 1976:7; Institute of Social and Economic Research 1978:10-1).

Between the flats and the eastern Brooks range lie the uplands of the Porcupine Plateau, which surrounds the northern and eastern portions of the flats and consists of gentle slopes and rounded summits from 1,500 to 2,500 feet, with some areas rising to 3,500 feet

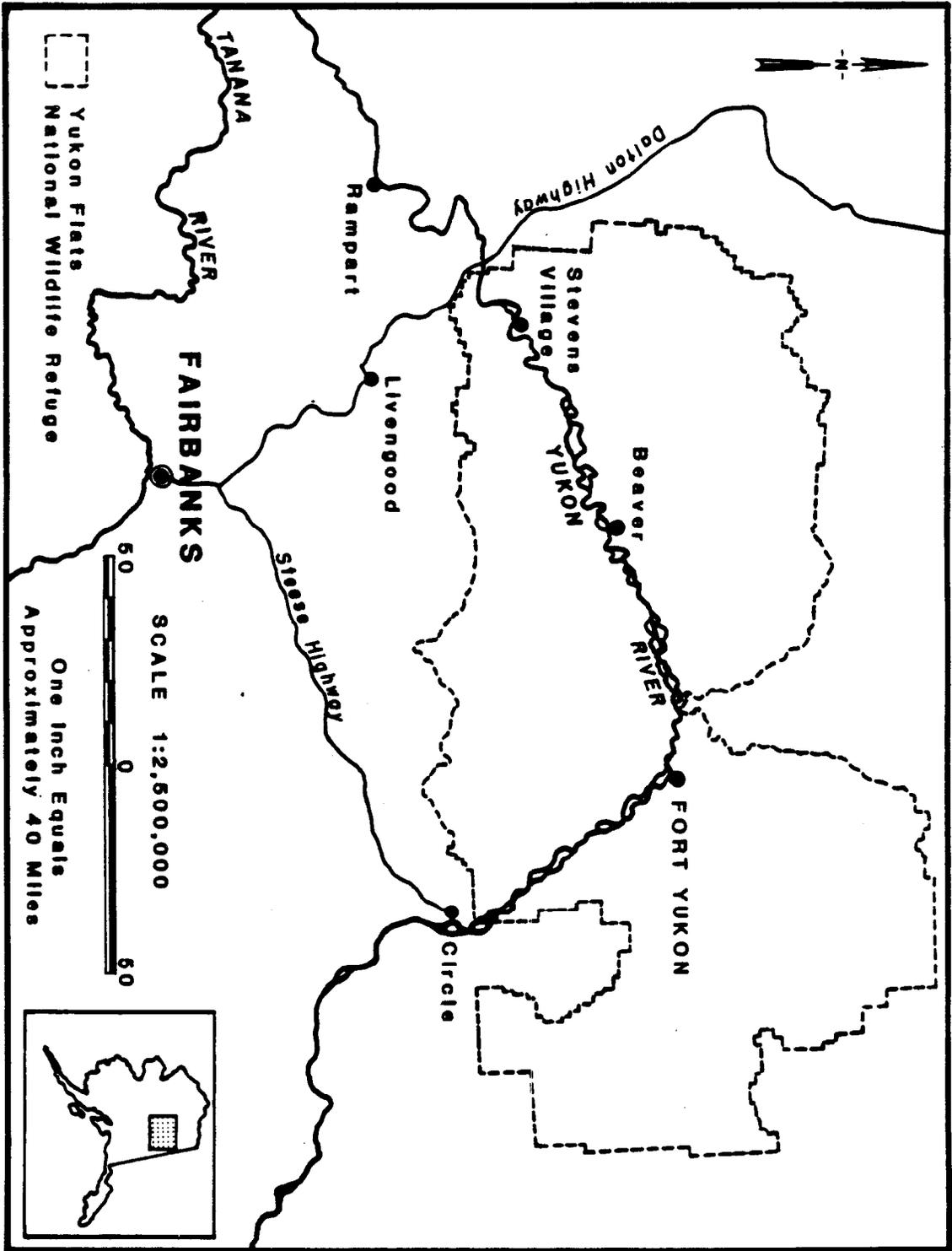


Fig. 1. Map of the Yukon Flats and Surrounding Areas.

(Selkregg 1976:7). The Chandalar, Christian, Sheenjek, and Coleen rivers drain the northern portion of the plateau, the Porcupine River bisects the eastern segment, and the Black and Little Black rivers, originating in the Ogilvie Mountains to the southeast, drain the southern end (Institute of Social and Economic Research 1978:10-1).

The Yukon-Tanana Uplands, which include the White and Crazy mountains, is found to the south, rising to elevations of 1,500 to 3,000 feet. Two major drainages in this area are Birch and Beaver creeks (Institute of Social and Economic Research 1978:10-1; Selkregg 1976:7).

The Kokrine-Hodzana Highlands, rising to 4,000 feet, borders the flats to the west and is drained by the Hadweenzic, Hodzana, Dall, and Ray rivers. At the western end of the flats, the Yukon River forms a single channel approximately one-half mile wide, and flows in a southwesterly direction through a mountainous region referred to as the "Lower Ramparts" or "Rampart Trough." Locally, this area is called "the canyon," and its upper end is approximately ten river miles below Stevens Village (Ducker 1982:10).

Information on mineral potential in the region is limited, although metallic mineral deposits occur in upland areas surrounding the flats. Placer gold has been mined in the area, particularly along the Birch Creek drainage, and at Circle, Chandalar, and Rampart. Other minerals found in the area or that are thought to potentially occur include tin, silver, lead, zinc, tungsten, copper, iron, magnesium, asbestos, chronite, nickel, coal, and uranium. An oil and gas basin in the southern and eastern portions of the area has been delineated (U.S. Fish and Wildlife Service 1985:38-39).

The continental subarctic climate of the region is characterized by seasonal extremes of both temperature and daylight (U.S. Department of the Interior 1974:27). The broad, low floodplain characteristic of the Yukon Flats is often referred to as a "solar basin" in the summer and a "cold sink" in the winter (King and Lensink 1971). Recorded temperatures in Fort Yukon have ranged from a high of 100 degrees Fahrenheit to a low of minus 75 degrees Fahrenheit. Mean summer temperatures range from 47 to 72 degrees Fahrenheit and winter averages are minus 29 to minus 40 degrees Fahrenheit (Selkregg 1976:16, 20). Near continuous daylight is present during three summer months and, although the sun rises above the horizon for only a few hours during mid-winter, a corresponding amount of twilight can be found at this time. Freeze-up on the Yukon River generally occurs during the latter part of October and break-up in mid-May, leaving about five months of open water in the area.

Average precipitation in the region ranges from seven to ten inches annually, including 45 inches of snow (Selkregg 1976:21). Most of the precipitation occurs as showers during late summer and early fall (Institute of Social and Economic Research 1978:11-3; U.S. Department of the Interior 1974:27). The low precipitation rates combined with low evaporation and areas of underlying permafrost create the numerous lakes and wetlands present in the area (U.S. Department of the Interior 1974:11-3).

The northern boreal forest environment found in the region is typified by closed forests of white spruce, balsam poplar, aspen, and birch in the lowlands, which is interspersed with open muskeg areas of black spruce with a ground cover of mosses, grasses, and shrubs.

Willow and alder thickets and other shrubs are found along rivers and creeks, and on river bars. Aquatic vegetation proliferates in lakes during summer months (Nelson 1978:209; Caulfield 1983:19). The diverse mix of vegetation types on the Yukon Flats is a striking characteristic caused by differences in soil types, drainage, erosion, permafrost, and forest fires (U. S. Department of the Interior 1974:46; Caulfield 1983:19).

Fauna in the area are those typically found in boreal forest environments and include large mammal populations of moose, black bear, and brown bear; furbearer species such as marten, lynx, fox, mink, weasel, wolverine, wolf, river otter, beaver, and muskrat; several species of ducks and geese which are present seasonally; and small mammals and game birds including porcupine, snowshoe hare, ptarmigan, and grouse. King, chum, and coho salmon migrate through the area between late-June and October. Freshwater species of whitefish, northern pike, burbot, sheefish, suckers, and grayling are also present in the area.

LAND STATUS AND SOCIOPOLITICAL BACKGROUND

Federal lands, administered by the U.S. Fish and Wildlife Service, the Bureau of Land Management, and the National Park Service (NPS), comprise a large portion of the Yukon Flats and surrounding areas. The 8.6 million acre Yukon Flats National Wildlife Refuge, established by the Alaska National Interest Lands Conservation Act (ANILCA; P.L. 96-487) in 1980, dominates the area. The refuge lies between the White and Crazy mountains to the south, and Brooks Range

to the north. Its eastern boundary is within 30 miles of the United States-Canada border, while the western boundary adjoins the pipeline corridor. Of the 11,176,000 acres within the refuge boundary, 76 percent is under the jurisdiction of the U. S. Fish and Wildlife Service. The remainder of the land is in private ownership or has been selected for individual Native allotments or by Native regional and village corporations (U.S. Fish and Wildlife Service 1985:27).

The purposes of the refuge, as outlined in the Alaska National Interest Lands Conservation Act, Section 302(9)(B) are:

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, canvasbacks and other migratory birds, Dall sheep, bears, moose, wolves, wolverines and other furbearers, caribou (including participation in coordinated ecological studies and management of the Porcupine and Fortymile caribou herds) and salmon;
- (ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;
- (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.

The Arctic National Wildlife Refuge lies to the north of the Yukon Flats Refuge, along with the Venetie Indian Reservation, and BLM lands referred to as the Venetie Block. To the west is the pipeline corridor, managed by the BLM, with the State of Alaska holding the right-of-way for the Dalton Highway. The BLM's White Mountains National Recreation Area and the Steese National Conservation Area border the Yukon Flats to the south, along with state selected lands. Southeast of the refuge is the Yukon-Charley Rivers National Preserve. Portions of the upper Sheenjek River and Birch and Beaver creeks are included in the National Wild and Scenic Rivers System.

Yukon Flats communities include Stevens Village at the western end of the flats, Beaver, Birch Creek, and Fort Yukon, Venetie to the north, Chalkyitsik on the eastern edge of the flats, and Circle to the southeast (Fig. 2). Circle is accessible via the Steese Highway, while the other communities are not road connected and can be reached by air, boat, snowmachine, or dog team.

The seven communities are within the Alaska Department of Fish and Game's Game Management Unit 25(D). The fisheries management Subdistrict 5-D includes that portion of the Yukon River from the U.S. and Canadian border through the Yukon Flats to about two miles below Waldron Creek (approximately 18 river miles below Stevens Village). The Yukon Flats Fish and Game Advisory Committee represents these communities as well as Arctic Village.

Fort Yukon, the regional center, is incorporated as a second-class city and has an Indian Reorganization Act (IRA) traditional council. All other communities in the region are unincorporated and are governed by IRA traditional councils. The Yukon Flats School District, based in Fort Yukon, administers schools in the area. Social services for the smaller communities are administered through the Tanana Chiefs Conference offices in Fort Yukon and Fairbanks. The Native Village of Fort Yukon administers a number of social service programs for that community.

Both Fort Yukon and Circle have a greater proportion of non-Native residents than the other villages. According to the 1980 census, Natives comprised 71 percent of Fort Yukon's population and 74 percent of Circle's. Native residents of Birch Creek, Chalkyitsik, Circle, Fort Yukon, and Venetie are largely Gwich'in Athabaskan,

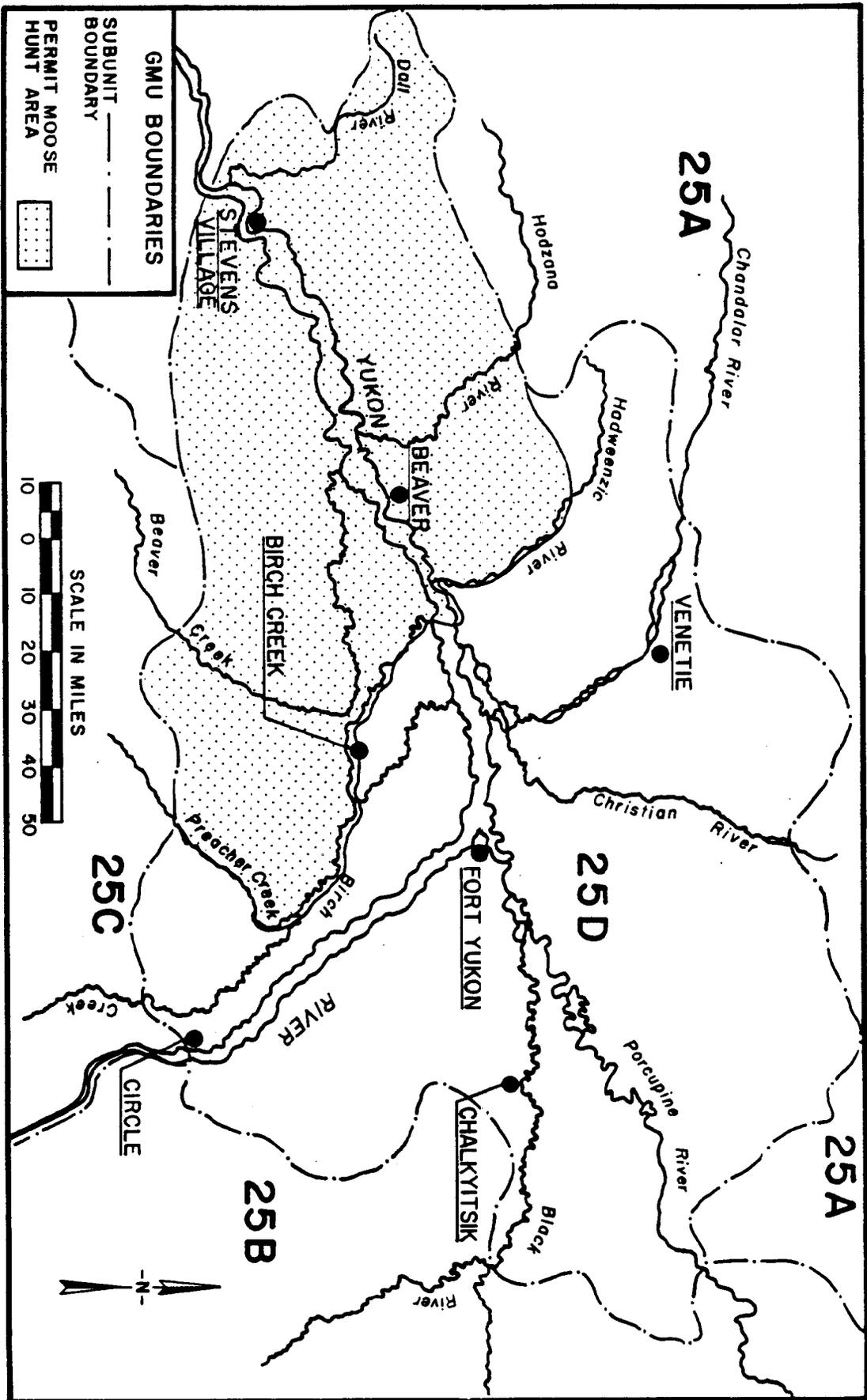


Fig. 2. Communities and Game Management Unit Boundaries in the Yukon Flats.

primarily from one of five aboriginal Gwich'in bands in the area. The English names of these bands are: Yukon Flats Gwich'in, Birch Creek Gwich'in, Chandalar Gwich'in, Black River Gwich'in, and Crow Flats Gwich'in (Slobodin 1981:515).

The community of Beaver has greater ethnic diversity. Residents include Gwich'in Athabaskans from upriver, Koyukon Athabaskans from downriver and the Koyukuk River area, interior Eskimos from the Kobuk River region, coastal Eskimos from the arctic slope, and individuals of Euro-American and Japanese descent (Schneider 1976).

Stevens Village is located on the north bank of the Yukon River, approximately 155 river miles southwest of Fort Yukon, 85 miles below Beaver, and about 27 miles upriver from the Yukon crossing of the Dalton Highway. The community represents the eastern boundary of Koyukon Athabaskans. It is the furthest east predominantly Koyukon settlement along the Yukon River.

ETHNOGRAPHIC AND HISTORICAL BACKGROUND

The Koyukon Athabaskans occupy areas along the lower and middle Yukon River, Koyukuk River drainage, lower Tanana River, and portions of the Kantishna River. Various names have been used for the Koyukon in ethnographic and historical sources, either for the group as a whole or for a specific subdivision, including: Co-Yukon, Koyokokhotana, Yunnaka-Khotana, Kaiyuh-Khotana, Unakhotana, Ten'a, and Tena (Dall 1970; Osgood 1936; de Laguna 1947; Sullivan 1942; Loyens 1966; Clark 1981:599). The name Co-Yukon was initially used by Whympers (1966:182) and was later modified to Koyukon, a name which

conveniently connotes both the Koyukuk and Yukon rivers. The Koyukon are the farthest northwest Athabaskan group in Alaska.

Although two or three major divisions of the Koyukon have been recognized by various sources (Zagoskin 1967; Dall 1877; Osgood 1936; de Laguna 1947; Clark 1981), the names used and criteria for classifications of each division have varied. The three geographically and culturally defined groups described by Clark (1981:582) are: (1) the upper Yukon division, from Stevens Village down the Yukon River to just below the mouth of the Koyukuk River; (2) the lower Yukon division, along the Yukon River from Nulato downriver to Blackburn Creek and the Kaiyuh Slough-Khotol River region; and (3) the Koyukuk River division, which includes the Koyukuk River and its tributaries. Further subdivisions of these three groups are based on dialectal and sociopolitical distinctions. Extensive movements of peoples during the 19th and 20th centuries make exact distribution of subdivisions at historic contact impossible to ascertain (Clark 1981:582).

The three major Koyukon dialects, all of which are mutually intelligible, are: Lower Koyukon, spoken at Kaltag and Nulato; Central Koyukon at Koyukuk, Huslia, Hughes, Allakaket, Ruby, and Galena; and Upper Koyukon at Stevens Village. Mixed Central and Upper Koyukon is spoken at Tanana and Rampart. Upper Koyukon is largely intelligible to Lower Tanana speakers at Minto and Nenana but the linguistic boundary between the Koyukon and the neighboring Gwich'in is the most abrupt in the Athabaskan language (Krauss and Golla 1981:74).

Social Organization

At the time of contact with Euro-Americans, the Koyukuk River and Upper Yukon divisions of Koyukon Athabaskans reckoned descent through one of three matrilineal clans. Marriage was both clan and band exogamous and preferentially division endogamous. Marriage between matrilineal cross-cousins and initial matrilineal residence were also preferred (Clark 1981:589-90). Several matrilineal extended families formed the core of a band, a group of 50 or more people who used a common, well-defined territory (Clark 1981:585).

Members of bands within each division recognized affiliation with others through marriage and the use of similar dialects. However, bands were not united into tribal entities headed by a single tribal or divisional chief (Clark 1981:585). At the time of initial contact at the mouth of the Koyukuk River in 1838, five bands are thought to have existed in the Koyukuk River drainage: four Koyukon-speaking groups and the fifth, the Dihai Gwich'in band (Clark 1975:152).

Band territories were often 50-75 miles across and there were several semi-permanent winter villages within each band territory. These villages were comprised of matrilineal families living in two to three households. Households usually consisted of two families who shared a dwelling (Clark 1981:585, 1975:166-167). Several types of households existed, a common one being a married couple and their unmarried offspring, with married daughters and their families. Other combinations included: a married couple, their unmarried offspring, and a married son and his family; two unrelated partners and their families; two or more brothers and their families; or two or more

sisters and their families. Composition of households was not static or permanent (Clark 1975:162-169). Depending on the season, households used different types of dwellings such as the semi-subterranean winter house, the moss and bark-covered summer house, and the skin tepee (Clark 1975:163).

Cooperative work was undertaken within the band territory by families, households, or village members during different seasons. At certain times of year, such as during caribou migrations, people from several villages or different bands joined in cooperative resource harvest activities (Clark 1981:585).

Certain areas of band territories were used by all members while other areas such as beaver houses and ponds, muskrat swamps, fishing sites, bear dens, big game fences, berrying areas adjacent to fish camps, and some bird hunting areas were considered family-held property (Clark 1981:585).

Traditional Settlement Patterns and Seasonal Activities

The harvest activities undertaken in the traditional Koyukon annual cycle were defined by several factors including the season, geographic location, type of activity, and type of social units participating. The social units involved ranged from a few individuals, families, or households, to groups consisting of an entire band or members of two bands (Clark 1981:588).

Several semi-permanent winter settlements formed within the band territory during both winter and summer months. During these times, groups were relatively sedentary, and excursions were made from this

village base (Clark 1974:96, 1975:166). In fall and spring, groups were dispersed and single families or small groups of families hunted and fished (Clark 1974:97).

The following description of the annual cycle during the late 19th and early 20th century is based on Cantwell (1904:221-224); Clark (1974:91-92, 1975:157-161, 1981:588-589) and de Laguna (1947:33-35).

In early June, families left spring camps to congregate at the mouths of major rivers and streams in relatively large groups for a communal potlatch. Following this, in anticipation of the coming salmon migration, several groups of families formed around "bosses" for the construction or repair and installation of fish weirs and the large, conical basket traps used to catch salmon. Later, along the Koyukuk River, the use of fish nets made from commercial twine resulted in smaller, individual fish camps consisting of one or two families. In contrast, the advent of fishwheels along the Yukon River during the early 1900s led to establishment of large camps. If salmon runs were small, traps were set in tributaries for other fish species. Men participated in hunting of large and small game and waterfowl in the vicinity of fish camps, while women and children picked berries for winter use. Families resided in dome-shaped summer lodges of birch bark or moss and turf, or in conical skin tents. Women, children, and the elderly continued fishing and gathering through late summer, while several groups of men from a single band hunted for big game, caching the meat as it was procured.

After the men returned from these hunting trips, families then moved to a fall camp. Camps were often set up along tributary streams or sloughs where fishing for various species of freshwater fish took

place. Drying of fish and snaring of small game was undertaken by women and children at the camp. Men took short hunting trips in search of bear and moose. Families then moved to their winter settlements, often a short distance from fall camps and near a caribou fence. There were usually two or three semi-subterranean dwellings at each settlement, each housing two families.

By late October, several families went in search of migrating caribou. Families of the upper Yukon division and Koyukuk River divisions sometimes joined forces for hunting when caribou came through mountain passes. After this major migration, many family groups or band segments went to their caribou fences and, under the direction of the fence boss, set snares and harvested caribou cooperatively. Between hunting excursions, basket traps or nets were set through the ice for catching fish. Men started trapping furbearers in November, while women worked on tanning hides and sewing along with their other activities. By mid-winter, most activities ceased for a period while visiting and celebrating with neighboring groups took place, including travel to the Brooks Range and Kobuk River for gatherings with Eskimo trading partners.

By late January, families left winter villages for extended hunting-foraging-trapping trips. They lived in conical skin tents and moved camp continually until a large game animal was successfully harvested, at which time they remained at the site for a few days. These trips sometimes were undertaken by several families from a band who traveled and camped together. Occasionally, groups from different bands met during these winter trips and spent a few days together.

By early spring, families returned to winter villages and later moved to nearby spring camps. Two families usually occupied a spring camp. Returning caribou were sometimes sought and muskrats and other small game were hunted. Fishing activity began again and returning waterfowl were taken. Later, as families began to move towards the main river in preparation for summer salmon fishing, they occasionally set up spring fishing camps along the way between lakes and rivers, harvesting fish with small traps or nets.

Historical Overview

Direct contact with Europeans came relatively late to many northern Athabaskan groups in the interior of Alaska. Initial contact for the Koyukon came through European trade goods from Siberia and the Russian-American and British-Canadian trading posts. These items were obtained from Eskimo trading partners or other intermediary Athabaskan groups. This occurred well in advance of the direct contact made during the 19th century (Clark 1974:79-81, 1981:586; Hosley 1981:546-548; Loyens 1966:9).

By 1839, a Russian-American trading post had been established by Petr Malakhov in Koyukon territory at Nulato. The same year a smallpox epidemic decimated the local population (Zagoskin 1967:146-147). Lieutenant L.A. Zagoskin, a Russian explorer, traveled up the Yukon River in 1843 as far as the Nowitna River and up the Koyukuk River to Kateel. The following year, John Bell, an officer for the Hudson's Bay Company, traveled through Gwich'in territory from Fort McPherson on the Peel River to the confluence of the Porcupine

and Yukon rivers (Webb 1985:31). By 1847, a Hudson's Bay trading post, known as Fort Yukon, had been established at this location by Alexander Hunter Murray (Murray 1910). By this time, the Koyukon were able to obtain trade goods at both Nulato and Fort Yukon as well as at annual trade fairs held at Nuklukayet at the mouth of the Tanana River.

During 1866 and 1867, members of the Western Union Telegraph Expedition ascended the Yukon River to the Hudson's Bay Company post at Fort Yukon (Dall 1970; Whympers 1966). Whympers (1966:247) and Dall (1870:431) reported that the few bands of the Tennuth-Gwich'in or Birch Indians (which Slobodin (1981:532) believes may be the Birch Creek Gwich'in) between the mouth of the Porcupine and the Tanana rivers had been swept away by scarlet fever. Dall (1970:100) recorded an abandoned Gwich'in settlement near the present location of Stevens Village, above the mouth of the Dall River, which had been deserted five years earlier after the epidemic. Whympers (1966:247) described the first Gwich'in village above the "Ramparts" as Chief Senitee's (referred to in other sources as Senati, or Shanyaati), a legendary Gwich'in trading chief and shaman. Petroff, in 1880, reported Senati's village near the mouth of the Tanana (de Laguna 1947:39) and, in 1883, Schwatka described the location as being at the rapids on the north bank of the Yukon River (Schwatka 1983:79). During the 19th century the Koyukon-Gwich'in boundary was probably downriver from its present location, and in the vicinity of the "Ramparts" (VanStone and Goddard 1981:560; de Laguna 1947:39).

In one version of the establishment of Stevens Village, written by an elder of the community, a group that "spoke a different language

from our language now" was living in the area when four brothers from Kokrines spent a winter there. The early inhabitants, presumably Gwich'in speakers, later relocated because of hostilities with neighboring Koyukon people. The brothers later returned accompanied by others from Kokrines and the Koyukuk River area and settled there with their families (John 1959:32).

Koyukon populations experienced extensive movement during the historic period (Clark 1981:582). Jette reported that between 1860 and 1910 large numbers of Koyukon from the Koyukuk River area including the upper Koyukuk, migrated to areas along the Yukon River, including eastern, upriver areas (VanStone and Goddard 1981:560). It was probably during this period that groups of Koyukon moved to the Rampart and Stevens Village areas.

By 1896, a trading post of the Alaska Commercial Company was established at Fort Hamlin, at the upper end of the Rampart canyon. A few Indian families resided there along with a few white traders (Ducker 1982:202-203; Woodman 1984:62). In 1898, the village of Shamansville was recorded near the present-day site of Stevens Village by the U.S. Coast and Geodetic Survey (Orth 1967:918).

The U.S. Revenue cutter Nunivak, assigned by the Treasury Department to enforce customs and navigation laws, remained at Dall River during the winters of 1899-1900 and 1900-1901 (Cantwell 1904; Webb 1985:213). J. T. White, the physician on the Nunivak, wrote detailed descriptions about the Natives in the winter settlement at the mouth of the river. According to White's unpublished manuscripts (1901), families had been scattered along the north bank of the Yukon River and in areas up the Dall River, living in "small huts or yorts,

half underground." During the summer of 1900, the Indians had built over a dozen log houses at the mouth of the Dall River and referred to the settlement as Tchttau-chaket. Some families residing there had come from other areas, including a village on the Koyukuk River near the mouth of Old Man Creek (the Kanuti River), Fort Yukon, the mouth of the Tanana, and the Chandalar. The remainder, he stated, belong to this part of the Yukon River. The group was thought to be a mixture of several bands and spoke a mixture of dialects. White collected "a partial list of words and phrases used by the Ten'a Indians living in the vicinity of Fort Shoemaker, Dall River, Alaska." In this unpublished document, he distinguishes between words provided by a Koyukuk Indian and a Yukon Indian.

A smaller village was located along the Yukon River six miles upstream from the Dall River, and White notes the various names by which it had been referred: Six-mile, Stephens' House, Rampart House, and Shamansville. The people from the two places reportedly were closely related by blood and marriage. Two or three families occupied each house, although the dwelling was considered to belong to a single individual. Individual families were small, though one family had eight children and several had four children, the majority had only one or two. White also noted that men outnumbered women by a significant number.

Young people from the area had been attracted to the burgeoning mining camps and had gone to Dawson, Circle, Rampart, and Tanana. Locals were employed as guides or as pilots on riverboats. Income was also acquired through trapping and the sale of meat and homemade crafts. White reported that, by the first of April, virtually all the

Natives abandoned their winter cabins and did not return until the following September.

The Koyukon group, from which many of the present-day residents of Stevens Village are descended, lived in a number of settlements from the Ray River up to King Slough. One such temporary settlement was the "Woodyard," located in the canyon near the present site of the Yukon River bridge. Other sites were at the mouth of Waldron Creek, Fort Hamlin, and Dall River. The village was originally called "Dinyeet," or canyon, perhaps in reference to one of these earlier sites. By 1900, the settlement at or near the present site of the village was documented by White. In John's historical account (1959:32), the village was renamed Stevens Village in 1902, after the first elected chief, the youngest of the four brothers from Kokrines.

By 1905, a trading post was recorded at King Slough (Orth 1967:523). One of the oldest residents of Stevens Village, who grew up at this settlement, recalled that seven houses were there during the mid-1920s. During the 1920s and 1930s, tuberculosis and influenza epidemics caused a number of deaths, leaving only three or four families at Stevens Village. At this time, the families living at King Slough returned (Kilbourn George, personal comm. 1984). By 1936, a post office was established in the village.

In 1939, a tribal government with its own constitution and by-laws was formed under the Indian Reorganization Act (IRA) of 1936. During this same year, the Stevens Village Council passed a resolution requesting a reservation be established for the sole and exclusive use of the area by residents of Stevens Village, as provided in the IRA. Concerns were expressed about drastically declining beaver and muskrat

populations which had been heavily harvested by people from other villages and towns. Other furbearing and food animal populations were also declining, and the timber supply had been severely depleted during the years of steamboat traffic on the Yukon River. The Department of the Interior did not convey reservation status in response to this request.

In 1950, another resolution by Stevens Village to the Department of the Interior again asserted their claim over lands and waters traditionally used and occupied by Stevens Village residents (Fig. 3). Again, no action was taken in regards to this claim.

In the early 1960s, the Rampart Dam project was proposed. The dam was to be built on the Yukon River in the Rampart Canyon of the Ray Mountains. Impounding water to an elevation of 660 feet, the reservoir would extend over 280 miles upriver to near the Canadian border and would be up to 80 miles wide. Approximately 10,600 square miles, or 6,800,000 acres, would have been inundated (U.S. Dept. of the Interior 1965:3). In describing the scope of this project, a consultant made the following statement: "To get a mental picture of this body of water, consider a dam in Washington, D.C., backing water almost to Boston; a dam in Los Angeles with water backed up to about San Francisco; or picture a body of water twice as long as South Korea" (U.S. Dept. of the Interior 1965:6).

In response to the threat of the Rampart Dam to the Yukon Flats and the villages in the region, the Stevens Village Council submitted a protest to the BLM briefly describing subsistence activities of Stevens Village residents and claiming use of at least 1,648 square

miles, or 1,054,720 acres, of land for hunting, trapping, fishwheels, and wood cutting.

In 1969, Stevens Village was among five plaintiffs in a suit seeking a prohibitory injunction restricting the Secretary of the Interior from issuing a right-of-way permit for the Trans-Alaska Pipeline System and the Haul Road. The village had granted a waiver to TAPS to cross their traditional lands under certain conditions, which had not been met. Considered a major roadblock to pipeline development, the lawsuit led to increased efforts in Congress to settle Native claims in Alaska. The pipeline, Dalton Highway (Haul Road), Yukon River bridge, and the Utility Corridor have remained a focus of concern of Stevens Village residents to the present day.

THE CONTEMPORARY COMMUNITY: SOCIOECONOMIC CHARACTERISTICS

Population

Population figures for Stevens Village first appeared in the thirteenth census of the United States in 1910, when the reported total was 100 people (Table 1). The 1940 census reported 54 people in Stevens Village and 13 in Little Dahl, which may have been a small, seasonal settlement at the Little Dall River, below Stevens Village (Rollins 1978). No reference is made to Little Dahl in any subsequent census. The 1980 census reported 96 persons with Natives comprising 64 percent of the population (U.S. Bureau of the Census 1980). The ethnicity determination reported by the census is suspected of being inaccurate based on the findings of the present study.

TABLE 1. STEVENS VILLAGE POPULATION TRENDS, 1910-84.

Year	Population	Percentage Increase or Decrease
1910	100	
1920	103	+ 3.0
1930	48	-53.4
1939	54	+12.5
1950	84	+55.5
1960	102	+21.4
1970	74	-27.5
1980	96	+29.7
1984	90	+ 6.7

Based on Rollins (1978), U.S. Bureau of the Census (1980) and the present study.

A community census was conducted in August 1984 as part of this study. At this time there were 90 people in 33 households. As mentioned previously in the Methodology section of Chapter 1, three of these households were considered part of parent households, resulting in a total of 30 households. The household of the two married school teachers and their two children and one family that resided in the community only during summer months were not included in the census. Some individuals traveled frequently between Stevens Village and another community such as Fairbanks, residing part-time in both places. These individuals also were not included in the census. Population numbers in the community fluctuated in response to such factors as school attendance and the availability of employment outside the community. Overall, the population remained relatively stable throughout the study period.

Household size ranged from 1 to 9 members with a mean of 3.0 persons per household. Fig. 4 presents the frequency of household

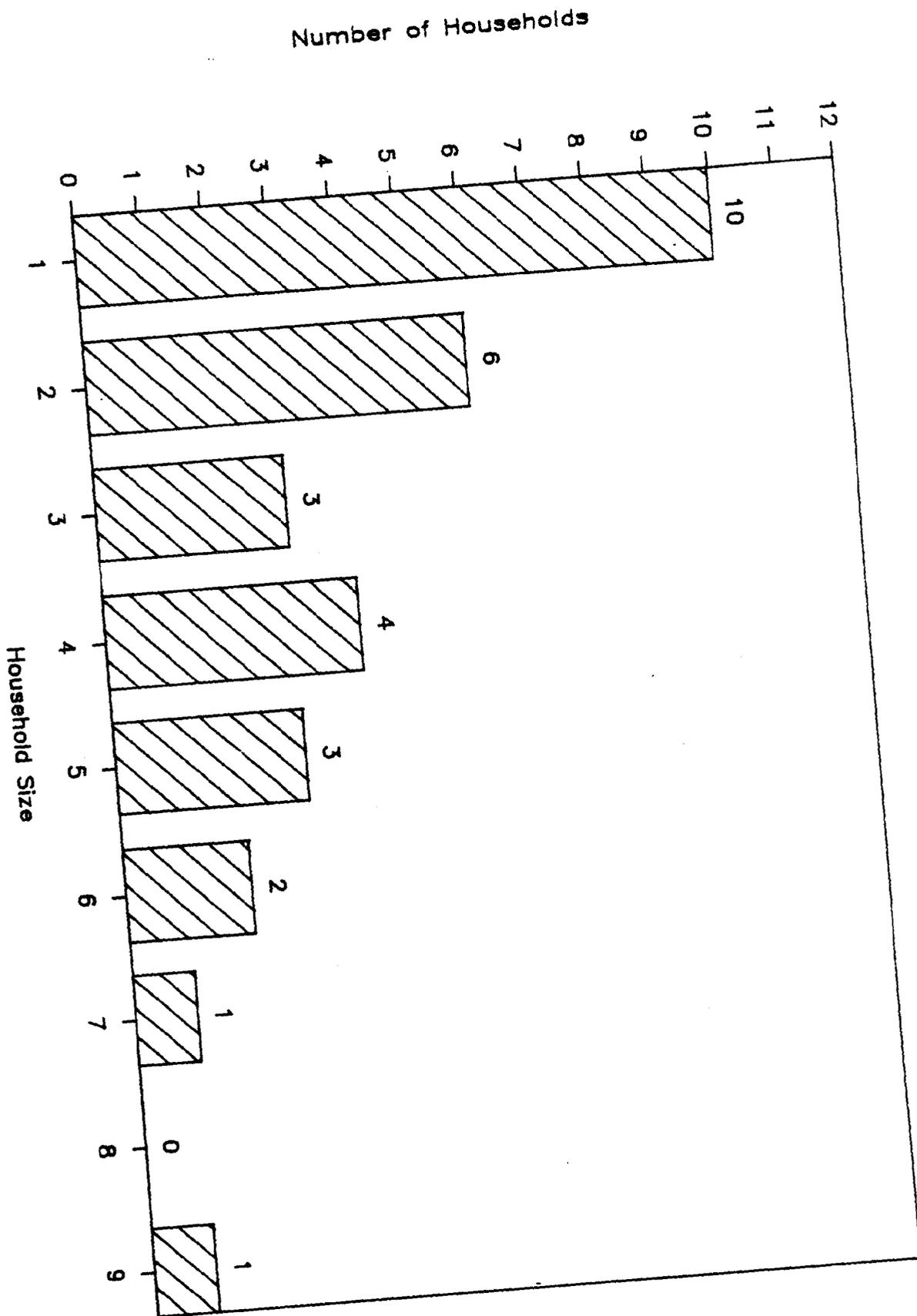


Fig. 4. Frequency of Household Sizes.

sizes. Most households consisted of nuclear family groups of a co-resident male and female and children. Five households included three generations, three of these were households raising an adopted grandchild whose parent did not live in the household. Single person households comprised 33.3 percent of the total. All were households of males ranging in age from 39 to 73 years old.

The composition of the 1984 population by age and sex is presented in Fig. 5. There were 57 males and 33 females. Males comprised 63 percent of the total population and females 37 percent. In the age range 30 to 60 years, 77.4 percent were males and only 22.6 percent were females. Out-migration of females in this age range, or in-migration of males may be two possible explanations for this unbalanced sex ratio. Additional inquiry in this area is needed. Over one-half of the population (53.3 percent) was under 30 years of age; 26.7 percent of the total population was under 10 years old. About one-third (34.4 percent) ranged from 30 to 60 years of age.

The population was primarily Alaska Native (85 people, 94.4 percent). Most residents were of Koyukon Athabaskan descent; Gwich'in Athabaskan, Eskimo, Aleut, Asian, and Euro-American groups were also represented in the population. There were five non-Native residents in the village in 1984. Three were married or co-resident with a Native resident and the remaining two were children of one of these individuals. Every household had kinship ties with other households in the community.

English and Koyukon Athabaskan were the predominant languages spoken. Koyukon was spoken primarily among elders and some middle-

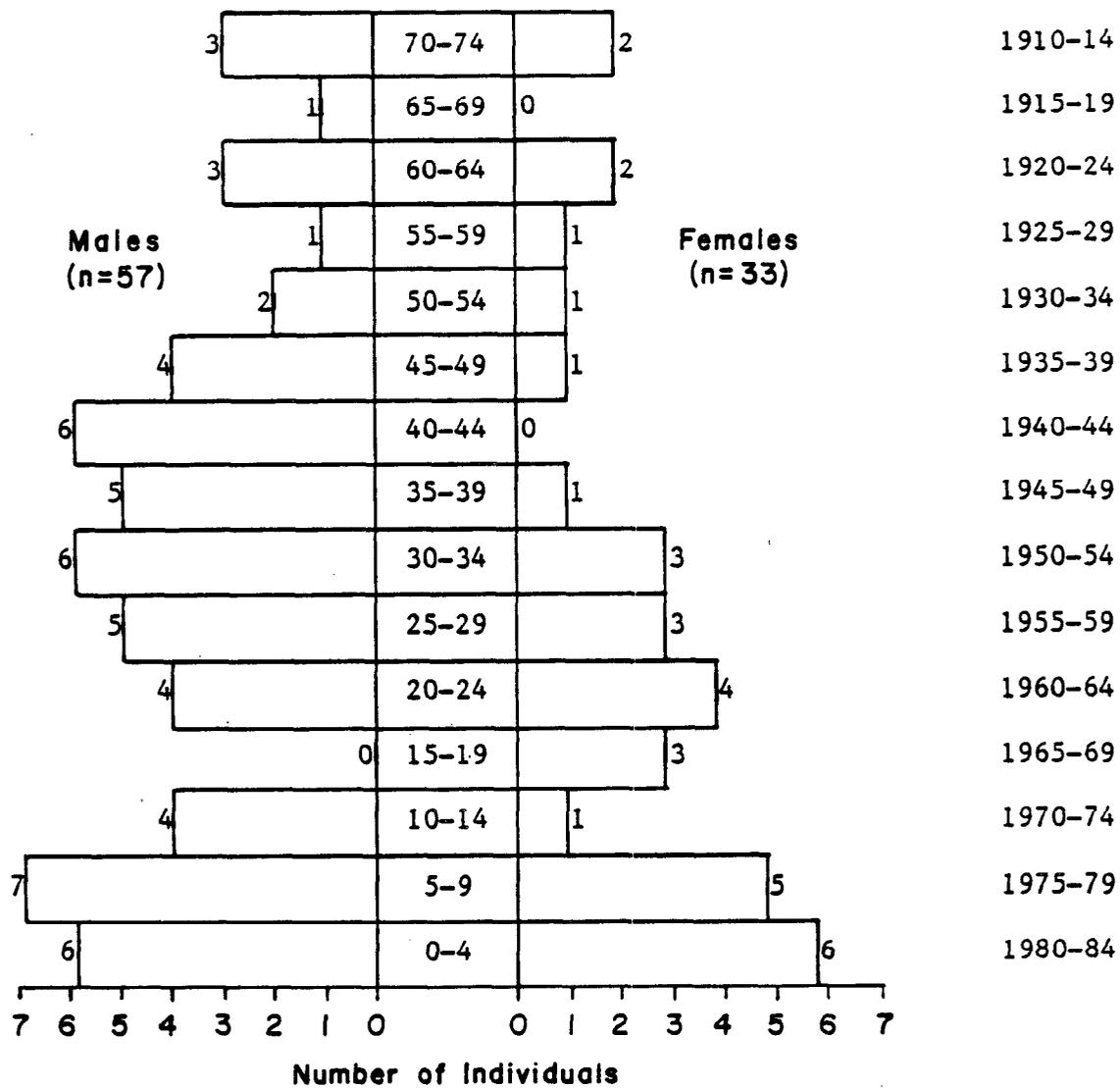


Fig. 5. Age and Sex Composition of Stevens Village Population, 1984.

aged residents. There were two Gwich'in speakers in the community, one of whom spoke both Gwich'in and Koyukon.

Community Facilities and Services

There were 33 occupied houses in Stevens Village during 1984-85, the majority of which were of log construction, including a few older, sod-roofed cabins. Three unoccupied log homes belonged to people who did not reside year-round in the community. In addition, during 1984-85, one house was under construction and had not been occupied. By summer 1985, at least three other households had obtained logs for building new homes. A number of homes, typically the older homes or those belonging to larger families, had additional outbuildings and structures such as caches, sheds, smokehouses, and fishracks. All homes had nearby outhouses. Many garden plots were evident throughout the village. All homes but one were heated by wood stoves and only a few additional buildings in the community had oil stoves. A number of households also possessed propane cookstoves.

Other community structures included the school which contained living quarters for teachers, a pre-school which occupied the former one-room log school building, a Public Health Service (PHS) clinic, a PHS safe water facility, a community hall, a council office building, a small post office, an electrical generator plant, two churches, a mission house, a bulk fuel storage tank and village equipment shed, and an airstrip hangar containing maintenance equipment.

Under the Alaska Native Claims Settlement Act (ANCSA), village corporations received surface rights to the township in which the

village is located as well as two to six additional townships. The specific number is determined by the number of stockholders. The entitlement for Stevens Village was 92,160 acres with an enrollment of 169 persons. Subsurface rights to this land belong to Doyon Limited, the regional corporation created under ANCSA. Alternate townships within the village lands withdrawn will also go to Doyon Limited.

The school building present at the time of the study was built in 1960 by the Bureau of Indian Affairs and is a part of the Rural Education Attendance Area (REAA) 13, currently administered by the Yukon Flats School District. The school served grades 1 through 12 but during the 1984-85 school year only 17 elementary school students were enrolled and three high school students chose to attend a boarding school that year. Construction of a new, larger school building began in 1987.

The original power plant in the community generated electricity for the school and a few other buildings. A village electrification project during fall 1983 provided electricity to all homes in the community. The cost of electricity was 55 cents per kilowatt hour, although this amount was partially subsidized through the state's power cost equalization program. Electrification upgrades took place during fall 1984.

Radios were present in almost all homes though reception is generally limited to broadcasts from two Fairbanks-area stations. A number of households had television sets and received cable satellite broadcasts. A single village telephone, provided by United Utilities, was located in the village council office, often referred to as the "phone house." The school and health clinic also had phones.

The safe water facility, installed by the Public Health Service in 1981 provided a central watering system for the community. A separate shower facility was also built although these were frequently inoperable. A number of residents collected rainwater during warm weather months for household use. During periods when the water system was not functional, residents used rainwater, water from nearby creeks or from the Yukon River. There was no community-wide sewage system, although the school has its own water and sewage treatment facilities. Solid wastes were disposed of and burned at an open dump site about one-half mile from the community.

Limited health care services were provided by a village health aide in the PHS clinic built in 1982. The health aide discussed cases with medical staff in Fairbanks and received instruction on treatments from PHS doctors when necessary. Itinerant public health nurses visited the community periodically.

A 2,200 foot state-owned airstrip is located just north of the main village, but is without lighting or navigational aids. The air taxi operators which provided scheduled service to the community varied during the course of the study, resulting in scheduling fluctuations throughout the year. In 1985, scheduled air service was provided by two Fairbanks carriers, Larry's Flying Service and Frontier Flying Service. Weather permitting, flights took place six days a week. Mail was delivered three times a week by one of the carriers. Air fares ranged from \$52 to \$62 for a one-way ticket from Stevens Village to Fairbanks. Air freight charges were approximately \$27 for the first 100 pounds and 21 cents per pound for the remainder. Charter service was also available from Fairbanks or Fort Yukon and

was used periodically by village residents when shipping large quantities of freight.

Since construction of the Yukon River bridge in the mid-1970s, residents also traveled to and from Fairbanks "by road" by going downriver to the landing at the bridge, by boat during open water or by snowmachine in winter. From here, residents traveled by road on the Dalton Highway for the remainder of the trip. Freight and supplies also entered the village this way. One resident kept a vehicle at the bridge that was used for this purpose.

During summer months, barge service was provided by Yutana Barge Lines from Nenana. Operating from after break-up until late August, the number and scheduling of runs depended on the amount of freight being shipped, but averaged four to five runs per season. Freight charges varied with the category and weight of the items shipped. Bulky and heavy items, such as building materials and fuel, were commonly shipped by barge.

Although Fort Yukon serves as a regional center for much of the Yukon Flats and Upper Yukon-Porcupine area, Stevens Village is closer to and more directly reliant on Fairbanks as a commercial and social center. Travel to Fairbanks for groceries, supplies, business transactions, medical appointments, social visits, and entertainment commonly occurred throughout the year.

Two small stores were operated by two households from their residence. In both cases, the "store" consisted of a counter and a few shelves of items. Both households maintained freezers and a number of sheds and caches where commercial as well as personal goods were stored. These two "mom and pop" stores carried limited supplies

TABLE 2. PRICES OF SELECTED GOODS IN STEVENS VILLAGE, 1984.

Item	Price
3 lbs. can of coffee	\$10.95
1 lb. box of salt	2.25
10 lbs. bag of sugar	12.25
4 lbs. box of lard	6.95
1 lb. can of shortening	2.50
42 oz. rolled oats	4.00
28 oz. cream of wheat	4.00
20 oz. pancake mix	2.50
1 lb. hamburger	4.00
1 lb. onions	1.00
12 oz. canned corn beef	3.75
12 oz. canned Spam	4.00
26.4 oz. jar of Tang	6.00
17 oz. can of fruit	2.00
32 oz. box of pilot bread	4.00
1 gallon of gasoline	2.90

of canned and dry goods, frozen meats, and occasionally fresh produce such as potatoes or onions. One store also sold propane. The available stock fluctuated considerably and at times shelves were empty of all but a few products. Table 2 lists prices of selected items carried in the stores.

The Dinyee Corporation, the village corporation created under ANCSA, sold gasoline in 1984 at \$2.90 per gallon, or \$135 for a 55-gallon barrel. Motor oil was \$2.75 per quart. Gasoline and propane were also available from the commercial establishment at the Yukon River bridge. As mentioned previously some residents shipped fuel in by barge.

Income and Wage Employment

Household gross earned income for the 12-month survey period was estimated by 21 Stevens Village households and ranged from zero to \$18,500 with a median of \$4,000 and a mean of \$5,374. Figure 6 shows the percentage of households reporting earned income by range. Eighteen households or 85 percent of the reporting households had incomes under \$10,000.

The survey data on income was comparable to figures reported by the Alaska Department of Revenue (1985) on the average taxable income per income tax return. For Stevens Village the average taxable income in 1978 was \$4,938, \$5,736 for 1981, and \$6,555 for 1982. This compares with the 1982 average taxable incomes for Fairbanks and Anchorage which were \$24,178 and \$23,590, respectively. The 1982 figure for Stevens Village was approximately 27 percent of the average income for these urban areas and were among the lowest in the state.

Government transfer payments, such as Aid to Families with Dependent Children (AFDC), Old Age Assistance (OAA), Aid to Permanently Disabled (APD), and Food Stamps, provided some Stevens Village households with supplemental incomes. For the six-month period of June through November 1984 there was a monthly average of 9.3 cases in the AFDC, OAA, and APD programs. Monthly payments to the community for these programs averaged \$4,240. During the same period, food stamps were issued to an average of 13.7 individuals each month. The average monthly allocation of food stamps to the community was \$3,082, or approximately \$225 per recipient (Alaska Department of Health and Social Services 1984a and b).

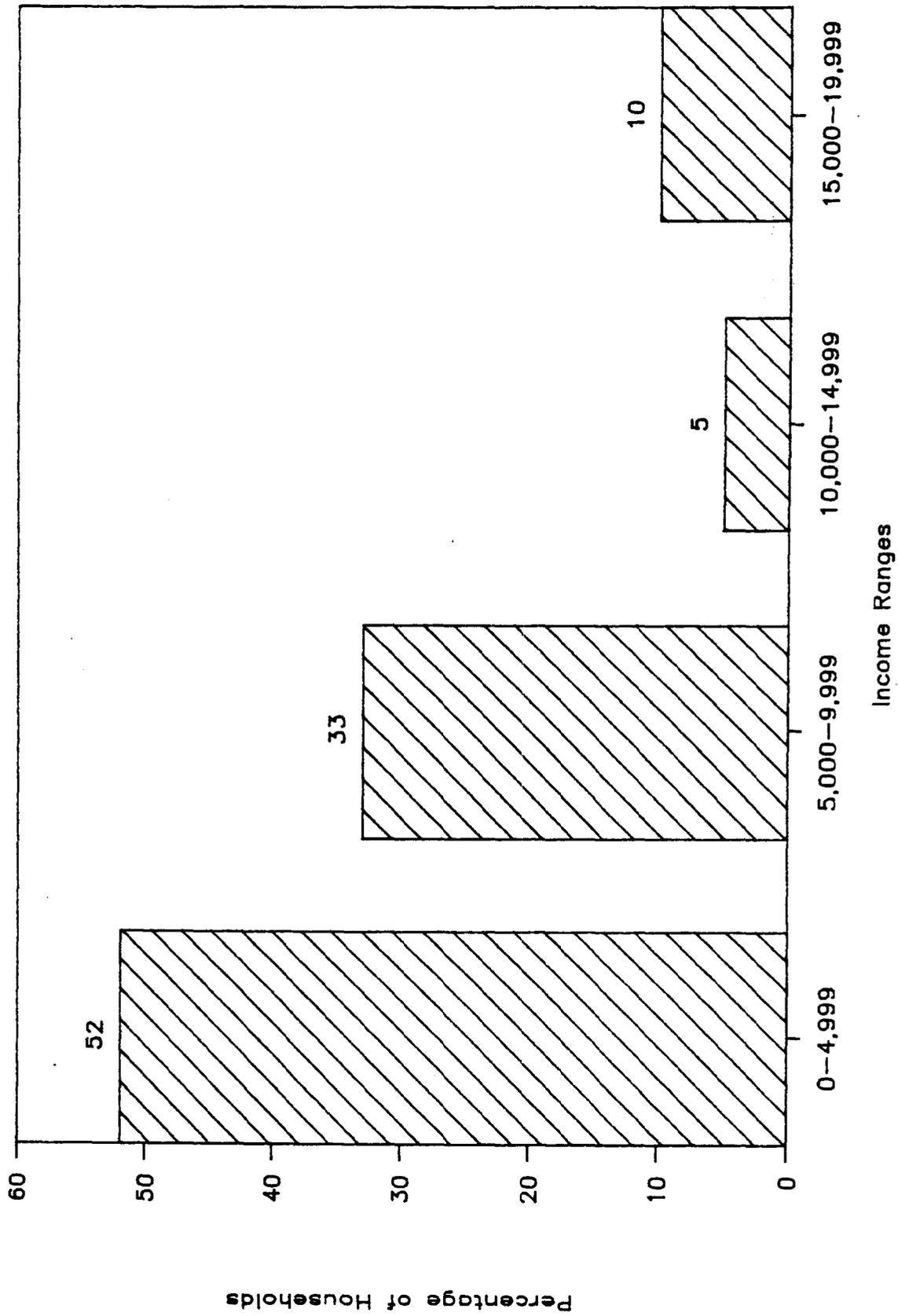


Fig. 6. Household Earned Income by Range.

Wage employment opportunities in Stevens Village were primarily positions funded directly or indirectly through state and federal government programs (Table 3). This included, among others, six positions associated with the school (not including the two certified teacher positions which were held by non-locals), the community health aide, and postal service workers. Food stamp fee agent and a fish and game license vendor positions were paid a set amount for each person enrolled or license vended. A private contractor with the state provided one seasonal airstrip maintenance position which was filled by a local resident. The village council employed part-time bookkeepers and power plant operators. Private sector employment included one part-time fuel plant manager for the Dinyee Corporation, a village agent with each of the two air service companies operating in the area, and occasional work at one of the village stores. As shown in Table 3, only a few positions provided full-time year-round employment and most were part-time or seasonal. In 1984, of the 18 permanent positions, 10 were held by women and eight by men. Of the five positions that could be considered "full-time" (at least 30 hours per week) three were nine-month positions.

Government grants for capital construction projects provided some temporary employment in the community. During the study period projects such as the electrification upgrade, school sewer system work, and the cutting and milling of logs for a new community hall provided opportunities for limited wage employment. These projects generally did not last more than a few weeks and some entailed only a few days labor. Many households relied on these temporary positions for their cash income.

TABLE 3. EMPLOYMENT SOURCES IN STEVENS VILLAGE IN 1984

Position	Number Employed	Duration (in Months)	Average Hours per Week
Teacher's Aide	2	9	37.5
Pre-School Aide	1	9	17.5
School Maintenance	1	9	36.0
School Cook	1	9	15.0
Daycare for Teachers' Children	1	9	27.5
Community Health Aide Clinic	1	12	30.0
Maintenance	1	12	2.0
Postal Clerk	1	12	20.0
Village Public Safety Officer	1	12	37.5
Fuel Plant Manager	1	12	6-8
Village Council Bookkeeper	1	12	5.0
Assistant	1	12	5.0
Generator Maintenance	2	12	14.0
Airport Maintenance	1	(Winter)	Variable
Air Service Agent	2	12	Variable

Residents sometimes obtained temporary employment outside the community in Fairbanks, Prudhoe Bay, or other locales. The timing and duration of this work was variable. These non-local jobs included positions for skilled mechanics, electricians, heavy equipment operators, and carpenters, as well as general laborers and food service workers. Firefighting provided employment during summer months of most years though there were no firefighting jobs during the survey year.

Two residents had limited entry permits for commercial salmon fishing on the Yukon River. Trapping, during winter months, was a source of income for many village households (see Chapter 6). Cutting

and hauling wood was a source of cash for a few households.

For the 12-month survey period, 43 individuals in 27 households reported participating in some form of wage employment. This did not include trapping and commercial fishing activities. Thirteen households had more than one member participating in the wage sector and at least 30 percent (13 people) of the working population held more than one job during the course of the year.

The amount of time an individual was employed ranged from less than 1 week to 52 weeks. Households often relied on combinations of seasonal, year-round, temporary, full-time, and part-time work. For example, one member of a household with two working adults had full-time (30 or more hours per week), seasonal employment (nine months); the other held year-round, part-time work and took temporary work when available. Another single-person household held two temporary jobs during a 12-month period, totaling four weeks of wage employment. Two employed adults in a third household both held part-time, seasonal positions; one of the two also obtained temporary work when available. Household employment ranged from one-half month to 27 months. Fifty-seven percent of all households had from zero to three months of work. The average number of months employed per household was 6.8 months.

CHAPTER 3

AN OVERVIEW OF CONTEMPORARY RESOURCE HARVEST PATTERNS

This chapter provides an overview of resource harvest patterns in Stevens Village. Included are a description of the seasonal round of harvest activity that currently takes place, summaries of household participation in harvest and harvest quantities based on survey data for the period September 1983 through August 1984, and information on the use of salmon and other freshwater fish to feed dogs. The striking differences in levels of household harvest are described and are illustrated with case examples. Comparisons of household characteristics are made between three groups with different harvest levels. The function of household specialization and resource sharing in explaining variations in household harvest is discussed.

Stevens Village residents harvest over 50 distinct species of fish, wildlife, and plant resources. Harvest information for certain types of resources was collected under a more generalized category such as whitefish or ducks and is therefore reported this way. Harvest information for individual berry species was combined for presentation. This has resulted in 29 resource categories. These categories are sometimes further combined into the following five broader categories of edible resources: salmon (king, chum, and coho), freshwater fish (all non-salmon species), mammals (moose, black bear, snowshoe hare, porcupine, beaver, and muskrat), birds (ducks, geese, cranes, ptarmigan, and grouse), and berries (all species).

However, when reporting the percentage of households harvesting each of the broader categories, the mammals category includes brown bear and the remaining furbearer species.

THE CONTEMPORARY SEASONAL CYCLE OF HARVEST ACTIVITIES

The harvesting of fish and wildlife undertaken by Stevens Village residents follows a seasonal pattern repeated year after year. Fig. 7 depicts the contemporary seasonal round of harvest activities. Following is a descriptive summary of this annual cycle determined by the changing seasons.

The increasing daylight and warmer temperatures of spring signifies the beginning of a new seasonal round. A marked shift from winter trapping to a variety of other activities takes place at this time. The return of migratory species such as geese, ducks, whitefish, and salmon sparks an increase in harvest activity.

During March and April muskrats are hunted and trapped and the highly-valued white-fronted and Canada geese are eagerly sought along with other species of waterfowl. Spring black bear hunting is sometimes pursued at this time. Travel by snowmachine continues as long as snow and ice conditions permit. Seeds are germinated indoors for later transplanting to outdoor gardens.

After break-up in mid-May harvest activities are concentrated along the Yukon River and other navigable tributaries and sloughs. Nets are set for whitefish and other species prior to the arrival of the king salmon by the latter half of June. By late spring the

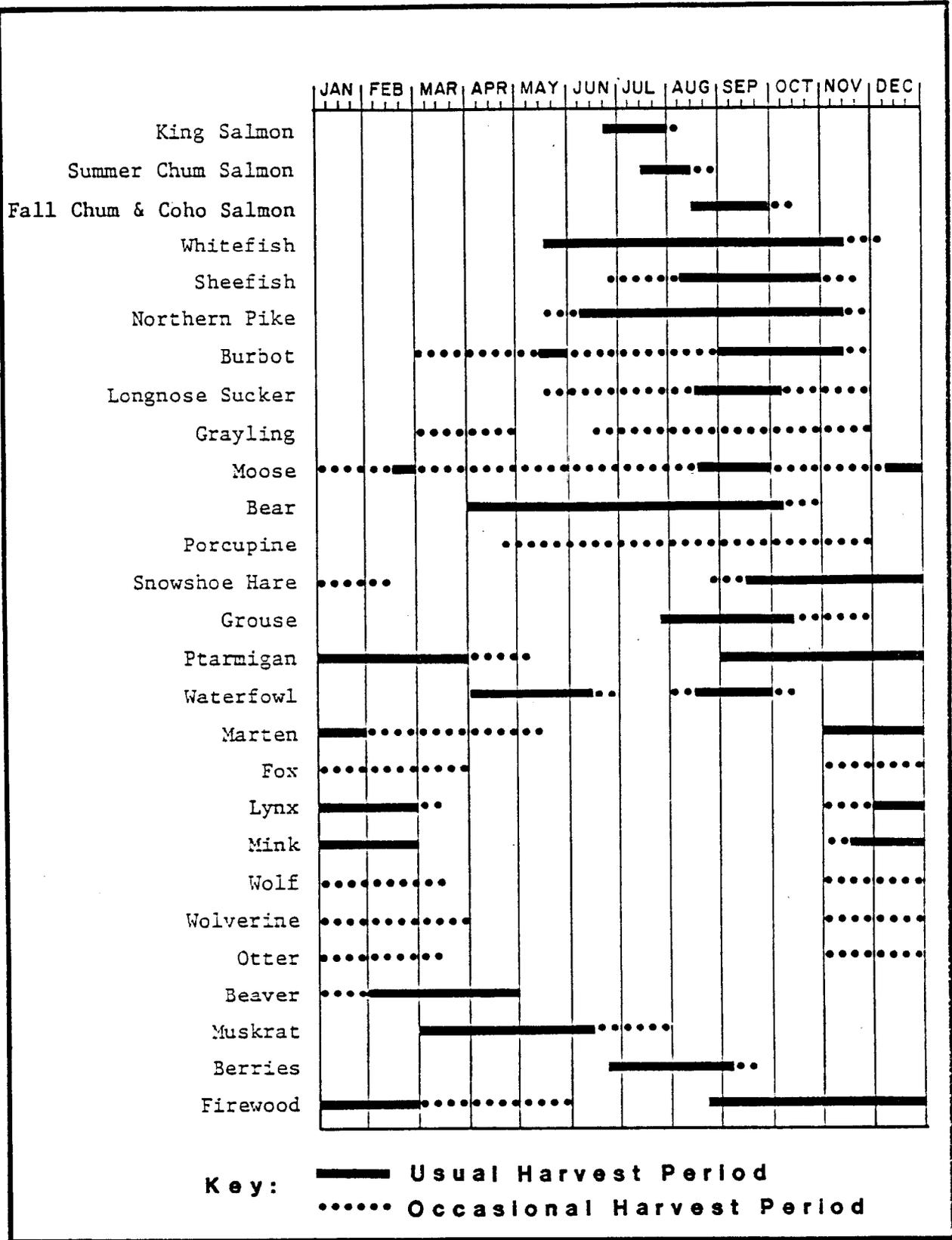


Fig. 7. Seasonal Round of Resource Harvest Activities.

cutting and rafting of house logs may be benefitted by the high water conditions which often develop at this time of year.

The advent of summer is characterized by preparations for salmon fishing, the primary harvest activity of this season and one of the most significant in the yearly cycle. Materials for fishwheels are gathered and new wheels are constructed or old ones are repaired. Nets are hung, mended, and readied for use. Fish camps or fish processing areas in the village are set up. Wood for smokehouse smudge fires is cut and gardens are planted. Fishing for king salmon often begins by the last week of June, continuing through July. Whitefish, suckers, sheefish, burbot, pike, and grayling are caught during this time, usually while fishing for salmon with fishwheels and nets, although some species are caught by hooking in nearby tributaries.

Scoters or "black ducks" are enthusiastically hunted and other game such as black bear, porcupine, or muskrat are harvested near fish camps or during the course of the extensive river travel undertaken throughout the summer. By late-July, the summer run of chum salmon appears with the last of the king salmon. By mid-summer, berry picking takes place. Later, from August until freeze-up fall chum and coho salmon are harvested by some households.

Summer is also an important time for wage employment and both local and non-local job opportunities are pursued. Local construction of log houses or community facilities also occurs during this time of year. Waterfowl which have nested in the flats or are passing through the area from distant nesting sites begin to reappear along the rivers by late summer and are hunted.

By September the focus on hunting activities increases. Moose hunting is an important undertaking at this time although waterfowl, bear, grouse, and ptarmigan are also sought. Nets are set in tributary streams, sloughs, and lakes for whitefish and other non-salmon species. Riverboats are the main mode of transportation although small, lightweight hunting canoes are used by some.

Early fall, before freeze-up, is also an important time for cutting firewood for the coming winter. Trees are downed, lashed together, and rafted downriver to the village. Wood cutting often takes place in conjunction with moose hunting.

Like break-up in the spring, the freezing of the Yukon River marks a transition and for a few weeks most river and overland travel comes to a halt. After the first snowfall, snarelines are set up for snowshoe hares and preparations for trapping activity are started.

After freeze-up in late-October, the focus shifts to furbearer trapping which occurs throughout the flats, along rivers and streams, and into the surrounding hills. Snowmachines and dog teams are the primary modes of transportation used. Furbearer species such as marten, lynx, and fox are trapped or snared. Snaring of snowshoe hares and bird hunting continues near the community and around trapping areas. Winter moose hunting takes place when meat supplies from the fall hunt are depleted or if hunters were unsuccessful during the earlier season. Hunting for moose occurs on islands or around trapping areas in the flats and hills.

Nets are set underneath the ice in sloughs and lakes near the village for whitefish, sheefish, burbot, and pike. This activity continues periodically until temperatures reach the more extreme lows

and the ice becomes too thick. Firewood is cut and transported by snowmachine to the community from nearby woodlots throughout the winter. By late winter, trapping focuses on beaver and muskrat. By this time the lengthening days once again signifies the start of another cycle.

A number of factors influence the yearly pattern of harvesting activity Stevens Village residents engage in. Some of these are: the availability of resources, food preferences, environmental conditions, and regulations.

Resource productivity varies from season to season and many species exhibit migratory behavior or some form of seasonal movement patterns within a more localized area. These factors partially determine when a certain species is likely to occur in a given geographic location.

The health and abundance of a particular game population or fish stock also fluctuates from year to year. The cyclical growth and decline of lynx and snowshoe hare populations is an example of this. Availability is also affected by increased competition for a limited resource base. Environmental conditions and access to the appropriate transportation and harvest technologies for successful operation in these conditions also affect seasonal activity.

In contemporary times, fish and game regulations have modified the timing of certain activities. For example, cow moose are preferred during certain times of the year because of their fat content and the condition of their flesh. The legal bag limit of one bull moose precludes exercising this preference.

HOUSEHOLD PARTICIPATION IN HARVEST ACTIVITIES

Of the 30 households in Stevens Village that existed at the time of the study, 29 or 97 percent of all households harvested some type of fish, wildlife, or plant resource during the survey period. The percentage of households successful in their harvest pursuits was relatively high for all resource categories as shown in Fig. 8. Participation in four of the five resource categories was greater than 70 percent. Sixty-three percent of the households harvested resources in four or five of the categories. Table 4 presents the percentages of households harvesting each specific resource category.

Participation in a harvest activity is defined as the successful harvest of a specific resource and does not take into account unsuccessful attempts at harvest. This is particularly relevant when discussing activities such as large mammal hunting. During the 1984-85 moose hunting season, 33 percent of all households successfully harvested moose whereas another 34 percent were unsuccessful though they participated in hunting. Information on attempted harvest was only solicited for moose hunting during the above-mentioned season and was not systematically collected for other harvest activities in the survey.

HARVEST QUANTITIES

Community harvests by species are presented in Table 5. Harvest quantities are based on household survey data for the period September 1983 through August 1984. Harvest numbers were converted to the

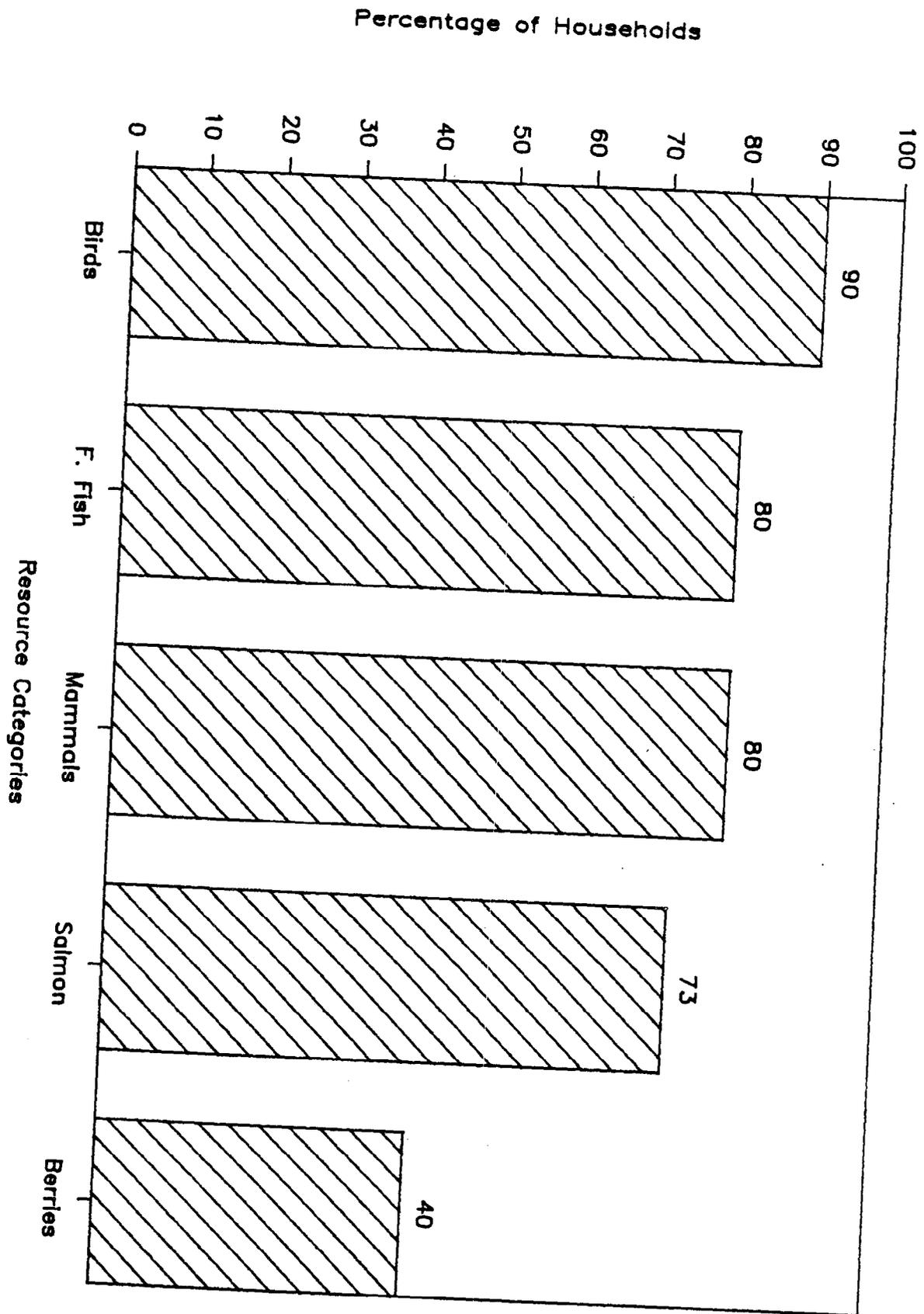


Fig. 8. Percentage of Households Harvesting by Resource Category.

TABLE 4. PERCENTAGE OF HOUSEHOLDS HARVESTING
BY SPECIES

Resource	Number of Households Harvesting	Percentage of Households
Grouse	23	77
Whitefish	22	73
Geese	22	73
King Salmon	21	70
Ducks	21	70
Northern Pike	20	67
Snowshoe Hare	17	57
Muskrat	16	53
Fall Chum Salmon	14	47
Marten	14	47
Sheefish	14	47
Summer Chum Salmon	13	43
Black Bear	12	40
Burbot	12	40
Berries	12	40
Fox	9	30
Coho Salmon	8	27
Lynx	8	27
Longnose Sucker	7	23
Ptarmigan	6	20
Moose	6	20
Cranes	4	13
Beaver	4	13
Mink	3	10
Porcupine	3	10
Brown Bear	2	7
Wolverine	1	3
Grayling	1	3
Otter	1	3

TABLE 5. SUMMARY OF STEVENS VILLAGE HARVEST
OF EDIBLE RESOURCES

Resource	Quantity Harvested (in pounds)	Average Household Harvest (in pounds)	Per Capita Harvest (in pounds)	Percent of Total Harvest
King Salmon	30,167	1,006	335	29.4
Summer Chum	26,784	893	298	26.1
Fall Chum	25,413	847	282	24.8
Moose	4,900	163	54	4.8
Whitefish	4,771	159	53	4.7
Northern Pike	2,555	85	28	2.5
Black Bear	1,700	57	19	1.7
Sheefish	1,434	48	16	1.4
Muskrat	950	32	11	.9
Geese	790	26	9	.8
Ducks	663	22	7	.6
Coho Salmon	585	19	6	.6
Snowshoe Hare	412	14	5	.4
Burbot	280	9	3	.3
Lynx	260	9	3	.3
Beaver	210	7	2	.2
Grouse	183	6	2	.2
Berries	164	5	2	.2
Longnose Sucker	111	4	1	.1
Crane	90	3	1	.1
Ptarmigan	34	1	.4	.03
Porcupine	24	1	.3	.02
Grayling	4	.1	.04	.003
Total	102,485	3,416	1,139	100

useable weight equivalent for edible species only (Appendix C). Figures for the average household harvest and per capita harvest by species are also provided. The mean household harvest of wild resources was 3,416 pounds and the per capita harvest was 1,139 pounds.

The composition of the total harvest of selected resource categories, by weight, is shown in Fig. 9. Salmon, specifically king and chum salmon comprised the greatest percentage (81 percent) of the total harvest by weight. All fish species combined accounted for approximately 90 percent of the total community harvest. Mammals, including edible furbearer species made up 8 percent of the total harvest. Birds and berries comprised the remainder of the harvest.

Fig. 10 shows the weight ranges of household harvests. Slightly over half (53 percent) of Stevens Village households harvested from 0 to 999 pounds of resources. A third (33 percent) harvested between 1,000 and 6,999 pounds, and 13 percent harvested between 7,000 and 23,000 pounds.

THE ROLE OF DOGS IN THE SUBSISTENCE ECONOMY

During the survey period, Stevens Village households reported a total of 149 dogs or 1.7 dogs for every individual in the community. Ownership of between 1 to 23 dogs was reported by 23 households, with a mean of 6.5 dogs. Of households that owned dogs, eleven had less than five dogs, six households had between five and nine dogs, and six had ten or more dogs.

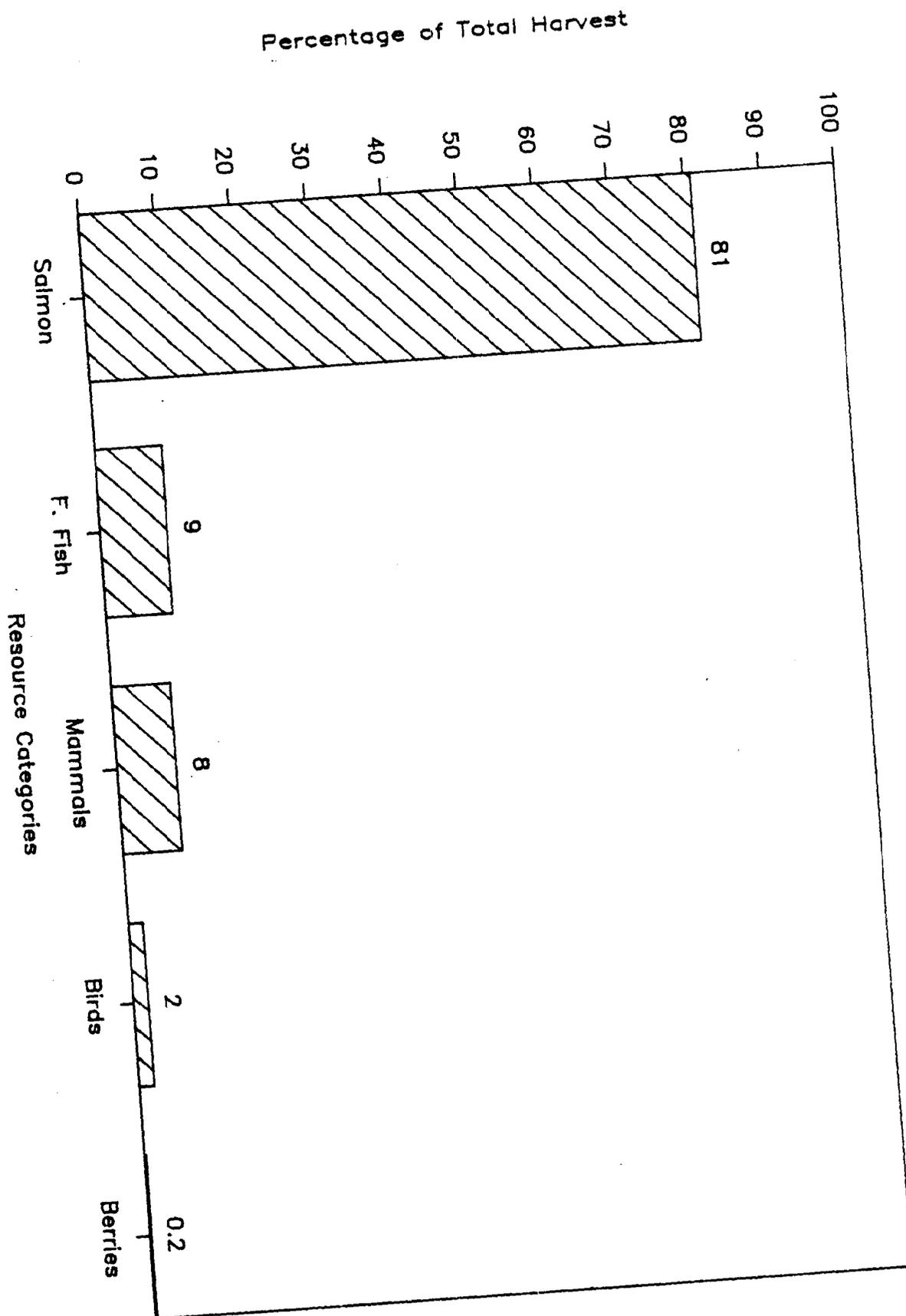


Fig. 9. Percentage of Total Pounds Harvested by Resource Category.

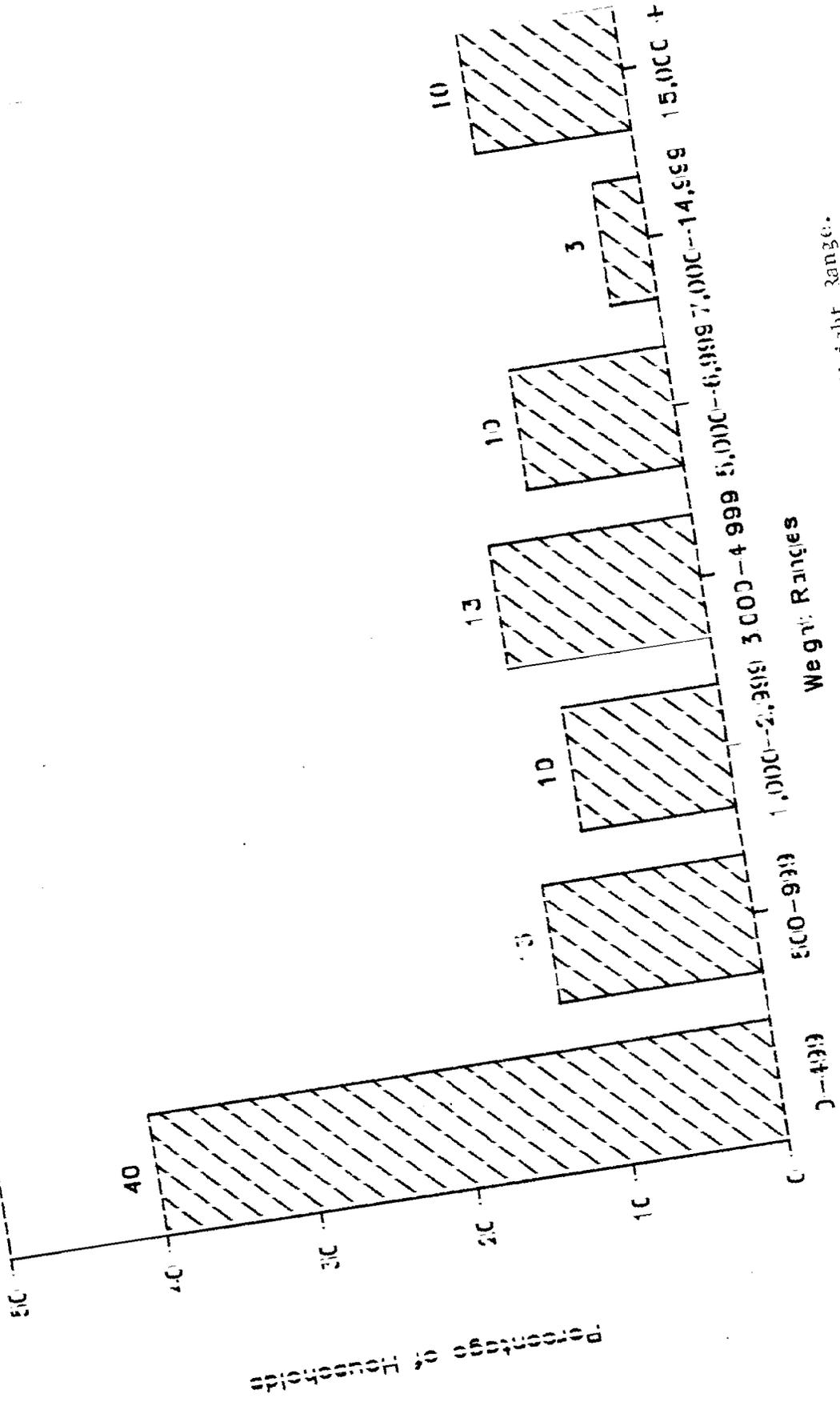


Fig. 10. Percentage of households harvesting by weight range.

Dogs were kept for several different reasons and served a variety of purposes, ranging from pets for young children which were fed table scraps to working teams used in trapping and other harvest activities which required a substantial amount of food for their maintenance. During the study, none of the households were involved in competitive dogsled racing beyond participation in recreational events such as local spring carnival races.

Sled dogs are an effective transportation mode for travel on the established trails in the area. Although slower and usually incapable of hauling as heavy a load as a snowmachine, dog team owners have commented on the likelihood of breakdowns of their mechanical counterparts and the reliability of a well-trained team. Working teams were sometimes used in trapping and winter hunting activities, often with a partner on a snowmachine.

Dogs were frequently brought along to fish camp where they provided a measure of security from intruders such as black bears. Dogs were fed the internal organs of salmon, backbones, heads, or roe, items which were sometimes by-products of fish processing activities.

Certain types of salmon were processed specifically for later use as dog food and a significant portion of the community's overall fish harvest was used to feed dogs. Fish species used for dog food included: summer and fall chum salmon, coho salmon, various types of whitefish, sheefish, northern pike, longnose suckers, and burbot. Other resources used to feed dogs include carcasses of furbearers used by some trapping households during winter months, and parts of large game species not used for human consumption.

Fig. 11 depicts the proportion of fish harvests used for dog food, by weight. King salmon is the only fish species which is used solely for human consumption. A substantial portion of the other fish harvests are given to dogs. Of the total fish harvest (92,104 lbs) about 55 percent (50,436 lbs) was used for dog food, including 53 percent of the salmon harvest and 71 percent of other species of freshwater fish (Table 6). This comes to 338 pounds per dog each year, or .93 pounds per dog per day. Fig. 12 presents individual household harvests showing the proportions of human and dog food. Fig. 13 depicts the relationship between the number of dogs owned by the household and the average amount of fish (in pounds) reported as being used to feed dogs. Some households without dogs harvested fish which were used to feed dogs in other households. Conversely, households with a number of dogs may have been reliant on harvests from others or in some cases, commercial dog food. Generally, Fig. 13 shows that as the number of dogs owned by the household increases, the amount of fish harvested for dogs increases. Households with 10 or more dogs harvested greater quantities of fish resources for dog food than households with fewer dogs.

Fish used for dog food constituted 49 percent of the total harvest of all resources. Table 7 presents the adjusted percentages of harvest composition by resource category showing the per capita harvest of wild resources for human use was 578 pounds.

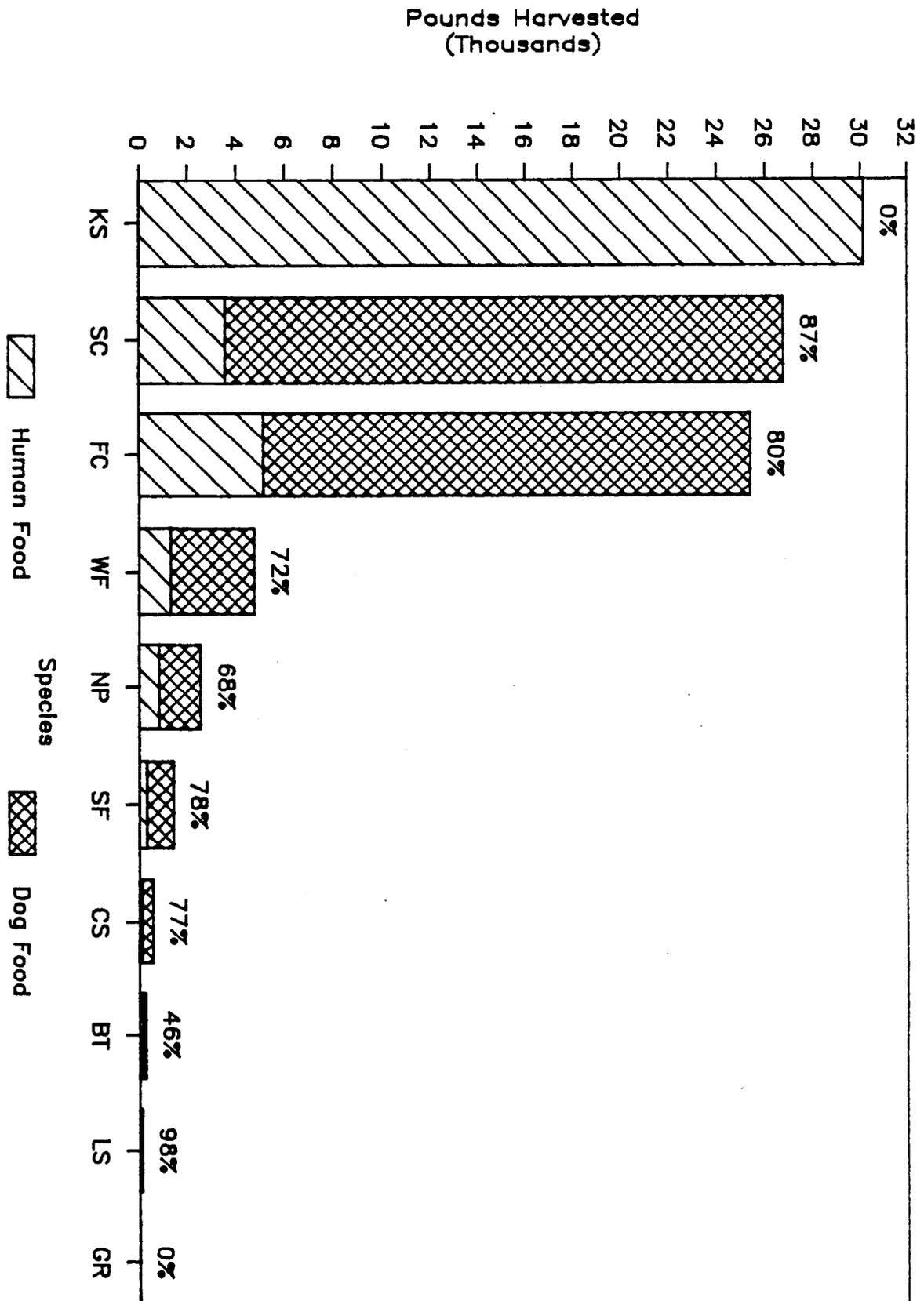


Fig. 11. Proportion of Fish Harvests Used for Dog Food.

TABLE 6. PERCENTAGES OF FISH HARVEST USED FOR DOG FOOD

Resource	Total Harvest (in pounds)	Amount Used For Dog food (in pounds)	Percent of Resource Total
King Salmon	30,167	0	0
Summer Chum	26,784	23,189	87
Fall Chum	25,413	20,262	80
Whitefish	4,771	3,446	72
Northern Pike	2,555	1,736	68
Sheefish	1,434	1,112	78
Coho Salmon	585	452	77
Burbot	280	130	46
Longnose Sucker	111	109	98
Grayling	4	0	0
Total	92,104 lbs.	50,436 lbs.	55%

TABLE 7. HARVEST OF SELECTED RESOURCE CATEGORIES WITHOUT DOG FOOD HARVESTS

Resource Category	Harvest Without Dog food (in pounds)	Percent of Total
Salmon	39,047	75
Freshwater Fish	2,621	5
Mammals	8,456	16
Birds	1,761	3
Berries	164	.3
Total	52,049	100
Per Capita Harvest for Human Use	578	

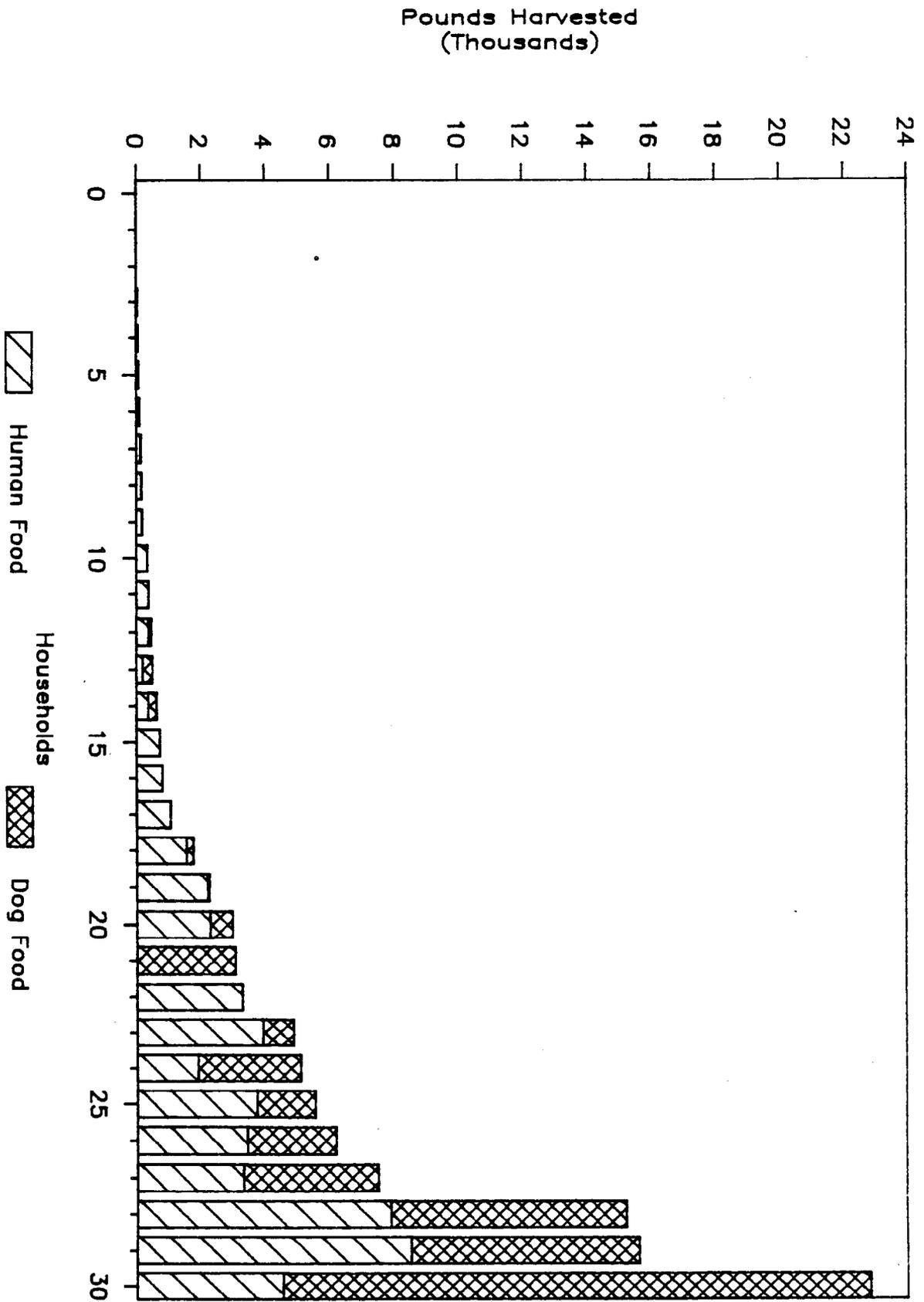


Fig. 12. Proportion of Household Harvests for Human Food and Dog Food.

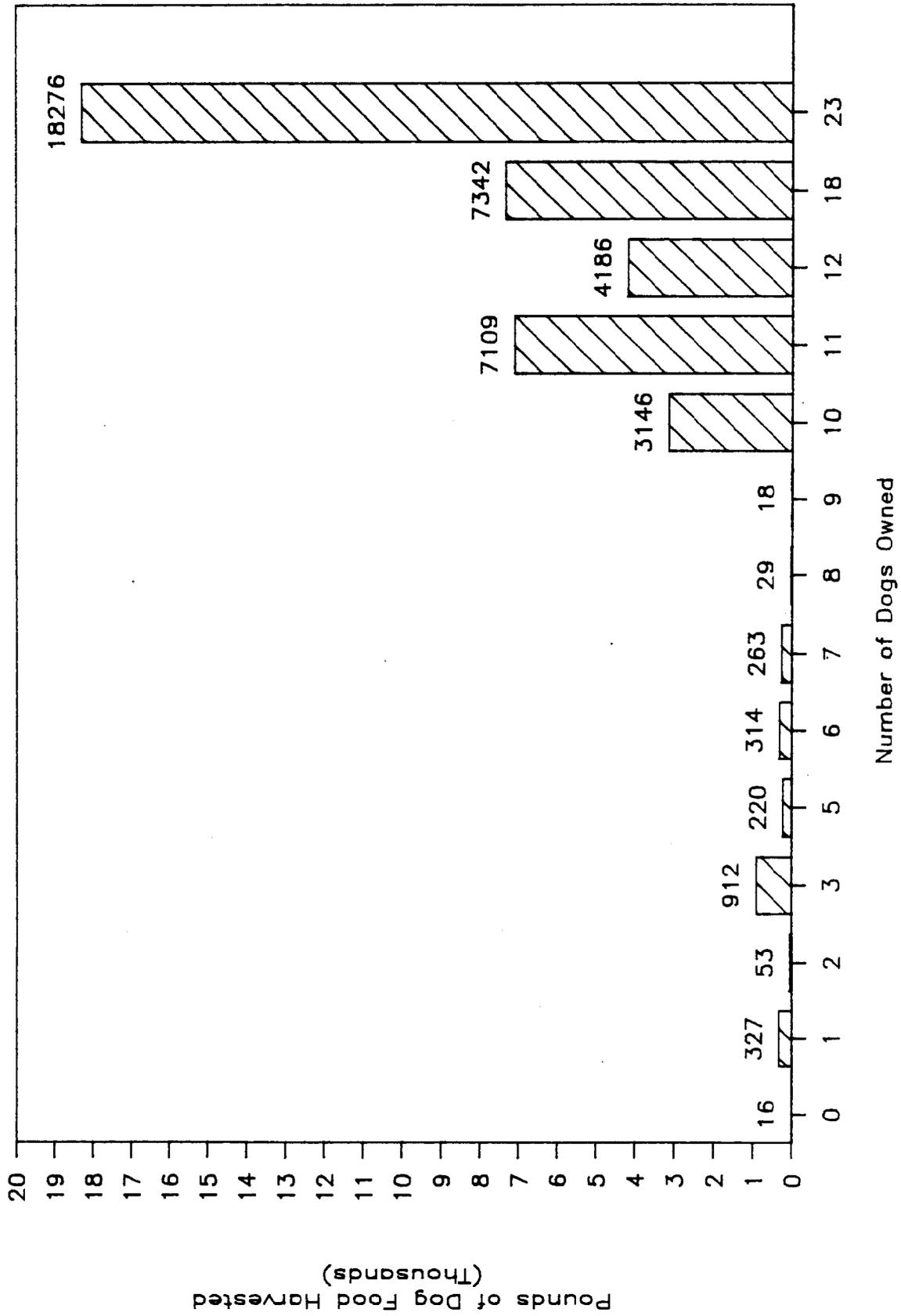


Fig. 13. Mean Household Dog Food Harvest by Number of Dogs Owned.

VARIATIONS IN HOUSEHOLD HARVEST

Households in Stevens Village had a wide range of harvest levels, from 0 pounds to 22,849 pounds (Fig. 14). Approximately 53 percent of the community households harvested less than 1,000 pounds, 37 percent harvested between 1,000 and 10,000 pounds, and 10 percent harvested over 15,000 pounds each.

Fig. 15 illustrates the relative productivity of households by comparing the cumulative harvest by weight for all households to the cumulative percent of all households. This figure shows that the highest-producing 10 percent of the households produced over 50 percent of the harvest and the highest-producing 30 percent of households produced 84 percent of the total community output.

Households were rank ordered by overall harvest productivity and divided into three groups of 10 households each: low producers (the lowest third), medium producers (the middle third), and high producers (the highest third). Table 8 presents average harvests of selected categories of resources for each group. The average household harvest for the high group was 8,951 pounds, the medium third produced 1,178 pounds per household, and the low producers averaged 120 pounds per household. The high-producing group harvested substantially more fish, but their average harvest of mammals was lower than the medium producers.

Selected socioeconomic characteristics of households in each group were examined and are presented in Tables 9 and 10. The average household size of the high third in productivity was 4.4 members compared to 2.2 persons in the middle third and 2.4 persons in the low

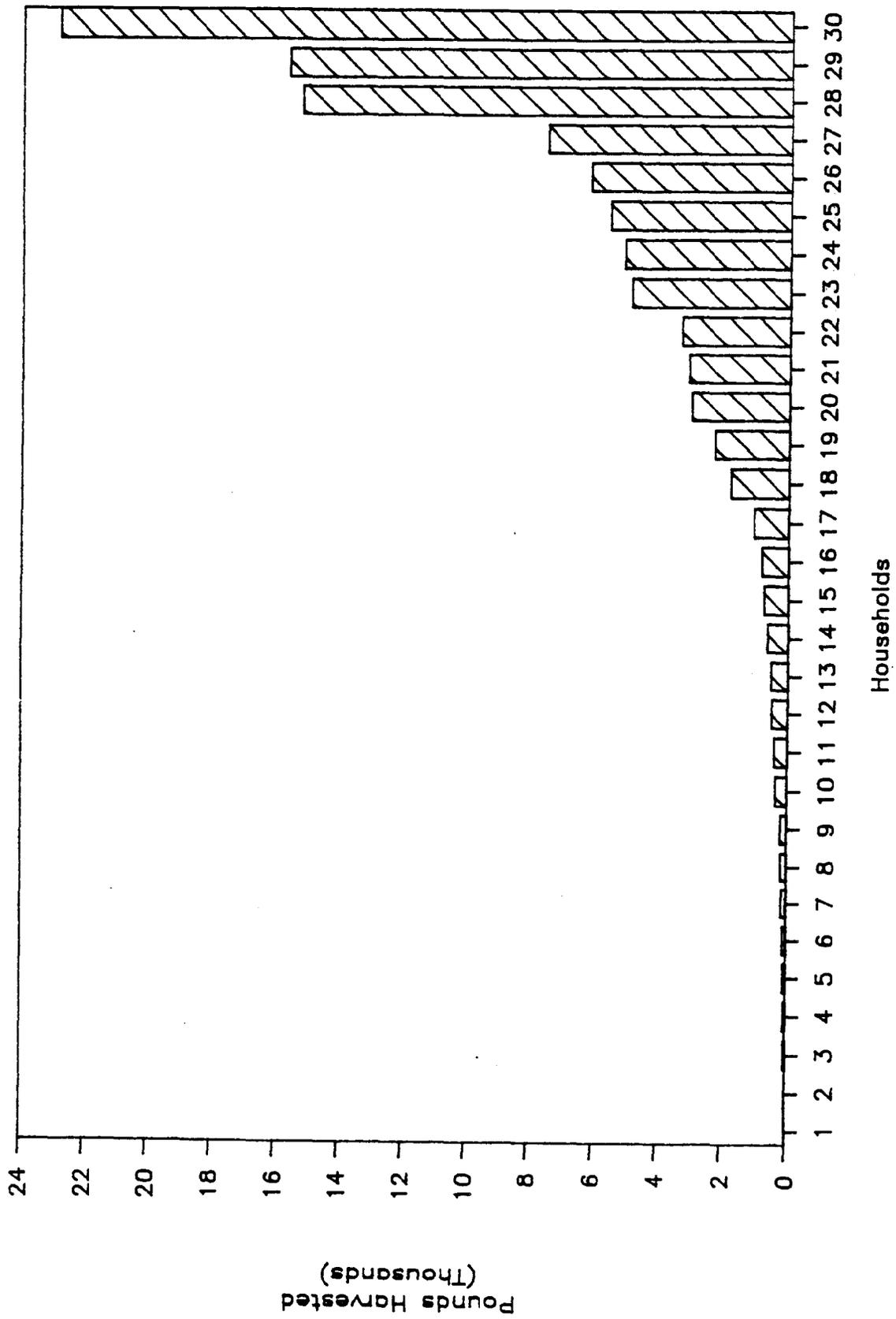


Fig. 14. Variations in Household Harvests.

Cumulative Percent of Total Harvest

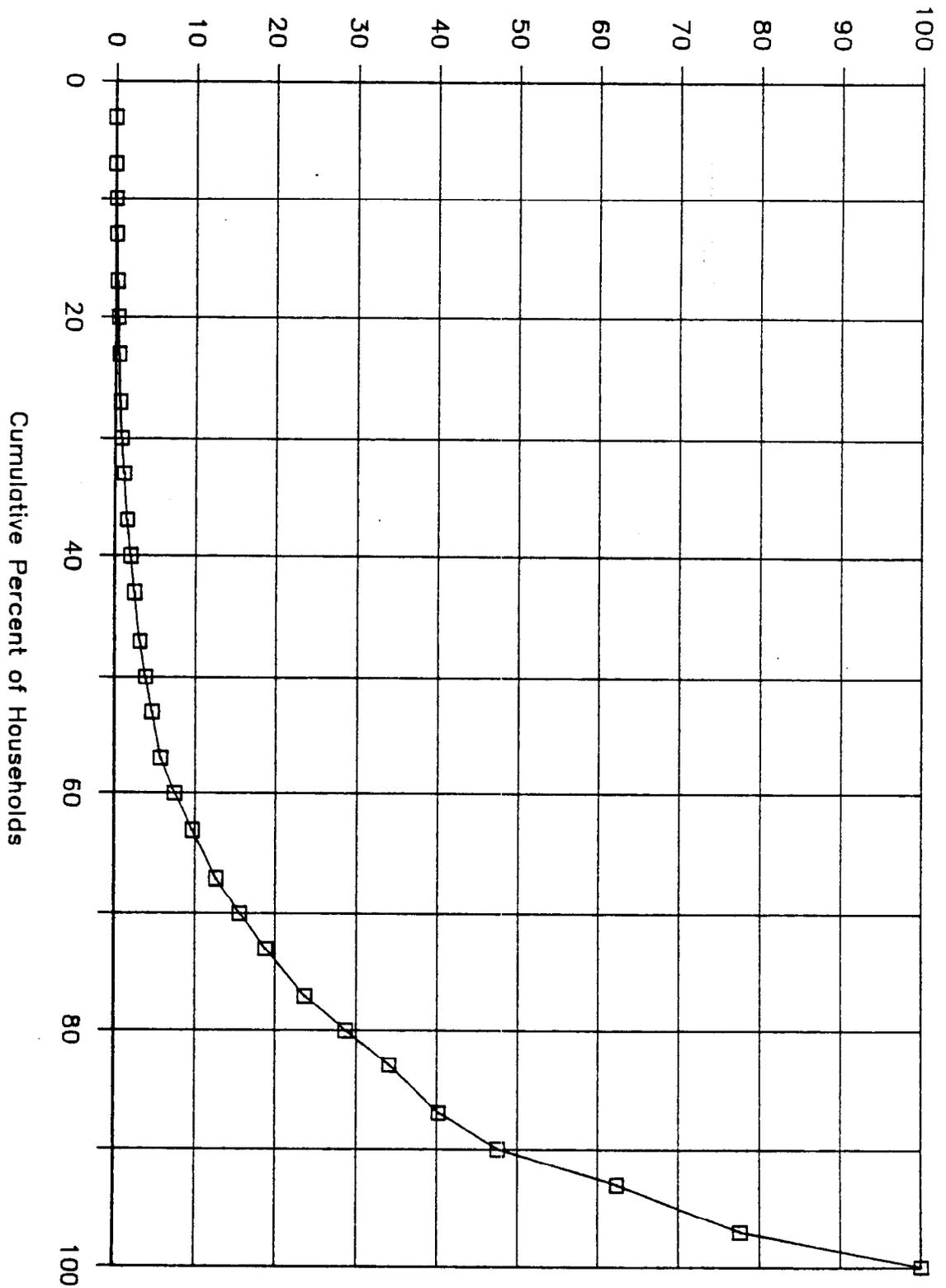


Fig. 15. Cumulative Percent of Total Harvest.

TABLE 8. AVERAGE HARVESTS OF LOW, MEDIUM, AND HIGH PRODUCING HOUSEHOLDS BY WEIGHT

Resource Category	Low Third	Medium Third	High Third
Salmon	21 lbs	547 lbs	7,727 lbs
Freshwater Fish	32	144	739
Mammals	35	431	379
Birds	27	53	96
Berries	4	3	9
Total Harvest	120	1,178	8,951
Percent of Community Harvest	1	12	87

TABLE 9. AVERAGE AGE OF HOUSEHOLD MEMBERS OF LOW, MEDIUM, AND HIGH PRODUCING HOUSEHOLDS

Household Productivity	Average Age of Household Members in Descending Order (in Years)					
	1	2	3	4	5	6
Low Third	50.2	34.4	14.3	7.3	6.0	0
Medium Third	50.3	32.8	14.3	2.5	1.0	0
High Third	52.3	40.9	20.7	16.5	9.3	5.5

TABLE 10. SOCIOECONOMIC CHARACTERISTICS OF
LOW, MEDIUM, AND HIGH PRODUCING HOUSEHOLDS

	Low Third	Medium Third	High Third
Average Household Size	2.4	2.2	4.4
Average Number of Members Over 16 Years Old	1.5	1.7	2.9
Average Number of Weeks Employed by Households	15.3	28.7	35.3
Average Number of Jobs Held by Households	1.3	1.9	2.6
Average Number of Boats	.4	.6	1.0
Average Number of Outboards	.3	.6	1.2
Average Number of Snowmachines	.4	.4	1.8
Average Number of ATVs	.1	.1	.1
Average Number of Fishnets	.3	.8	2.7
Average Number of Freezers	.2	.6	.7
Average Number of Dogs	3.0	2.8	9.1

third. There was no difference in average age of household heads. However, the high producers had more members who were 16 years of age or older. This group also had greater equipment holdings and more employment than the low and middle thirds.

HOUSEHOLD AFFILIATION AND COOPERATION IN SUBSISTENCE ACTIVITIES

The marked variation in harvest levels between households described in the previous section may be attributed, in part, to the harvest and use patterns of kin-related, multi-household harvest and processing work groups.

Although a significant proportion of fish harvested by Stevens Village residents are used to feed dogs this does not fully account for the breadth of harvest ranges. Fig. 12 showed that the elimination of dog food harvests resulted in the overall lowering of households harvests, especially of high harvesters, reducing the magnitude of difference between households. However, the high producers of food used for dogs still remained the high producers of human food. Fig. 16 compares the cumulative harvest of all resources with the cumulative harvest excluding fish used to feed dogs. This graph shows that 10 percent of the households produced 53 percent of the community's overall harvest, compared to 40 percent when dogfood is excluded. Thirty percent of the households produced 84 percent of the total harvest, which drops to 79 percent when dog food harvests are removed. This demonstrates that even when dog food harvests are excluded, a relatively small percentage of the community's households are producing most of the fish and wildlife harvest.

Cumulative Percent of Harvest

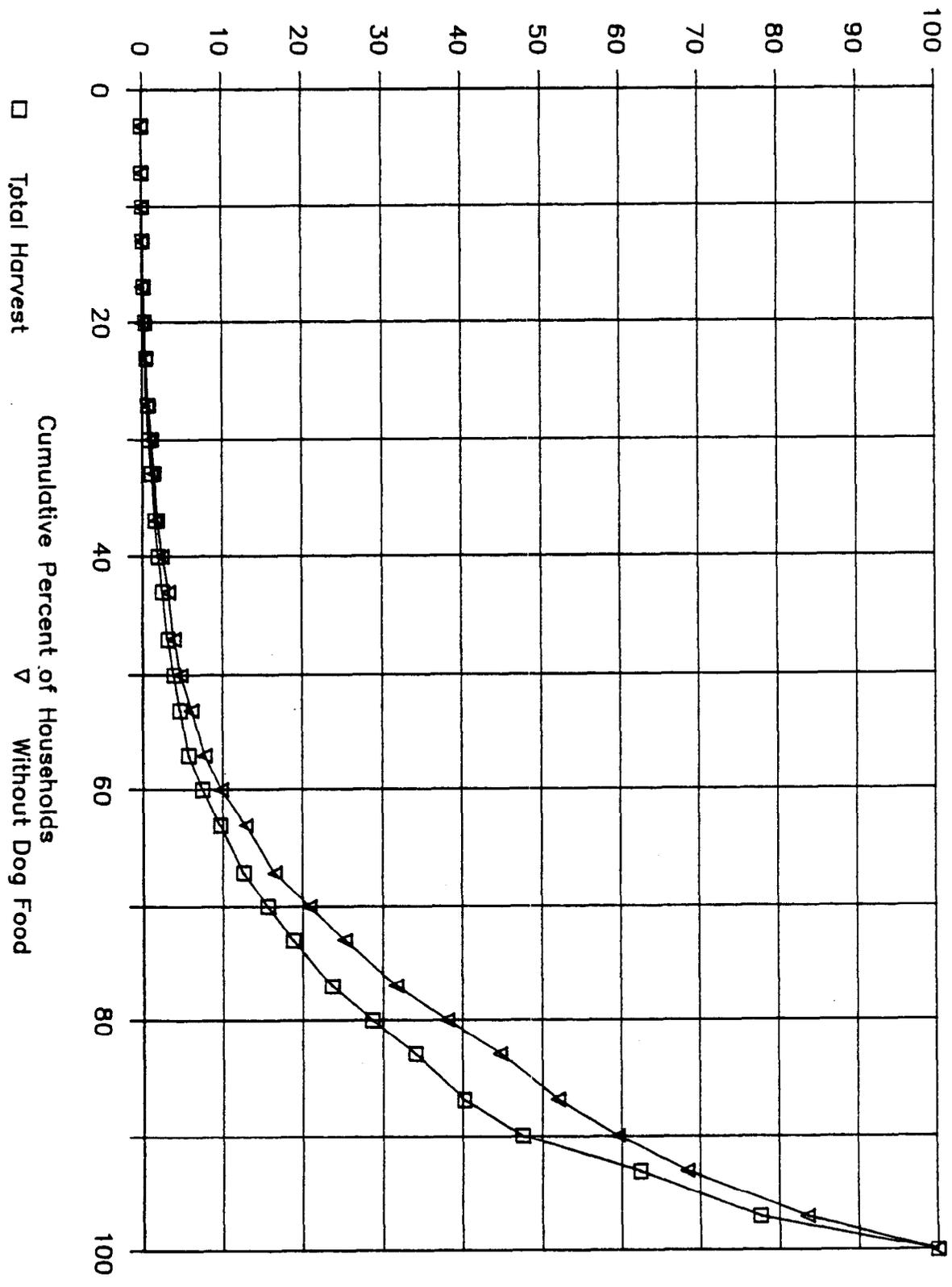


Fig. 16. Cumulative Harvest With and Without Dog Food.

One partial explanation for this phenomena involves the contemporary residential pattern that has developed in many rural Alaskan communities like Stevens Village. Whereas at contact one or more extended matrilineal families resided within a single house, the contemporary residential pattern at Stevens Village is for relatives to reside in several discrete houses, each commonly containing a single nuclear family unit.

Although living in separate dwellings, family members commonly were not economically independent units. Households with high harvests were generally working cooperatively with other households in the community in their subsistence pursuits. As described in the following chapter, households linked by kinship pool resources such as labor, equipment, cash, and expertise, in order to effectively harvest salmon for subsistence use. This pattern of multi-household affiliation and cooperation is also reflected in other types of harvest activities such as moose hunting and furbearer trapping. In terms of subsistence production and consumption, a household generally does not function independently (cf. Wolfe et al. 1984:481-485).

Wolfe (1987:9-10) describes the household developmental cycle in multi-household kinship groups from young, newly established households to mature households, to elderly households. At the core of the multi-household subsistence production groups are the mature households. These established households tend to be larger with more teenage and young adult members (Table 10). They also have the equipment and facilities needed for subsistence activities, and a correspondingly larger set of social obligations to fulfill. The younger, newly-established households commonly assist their parents in

the mature households in subsistence pursuits and subsequently share in the harvest.

In Stevens Village, these core households also maintained caches and freezers where harvested fish and wildlife were stored. This household then controlled allocation of these food resources which were shared with or made available as needed, to the younger, peripheral households that had participated in harvest or processing activities.

Thus, for resources like salmon, although more than one household participated in the harvest and processing of the resource, harvests were attributed to these core, parent households when survey information was collected as these households were storing the resource and individual allocations to other households had not been made.

The following case examples describe some of the socioeconomic characteristics of the households and the subsistence activities undertaken. The cases illustrate some of the different patterns of household affiliation and cooperation operating in Stevens Village.

Case Example A

This example describes two closely related households and their activities during the survey period. Household A is composed of a husband and wife, both of whom are over 50 years of age. Household B, with whom they are closely affiliated in terms of subsistence pursuits, consists of one of their sons who is in his late-20s, his wife, and two children.

Both members of the parent Household A were employed during the survey period, the wife had a part-time job for nine months and the husband was involved in seasonal work as a heavy equipment operator for approximately six months. The husband was also employed for two weeks in a village council project. The household owned a large riverboat and outboard motor, a fishwheel, five fish nets, two snowmachines, and two freezers. The household also maintained the requisite gear for trapping. The husband had a team of 11 dogs.

The son in Household B had approximately one month of wage employment on a village council project. His wife was employed in a full-time, year-round position in the village. This household also maintained a boat and outboard as well as a snowmachine and three-wheeler and various-sized traps and snares. Household B did not have separate caches or freezers for storing fish and wildlife.

Households A and B jointly maintained a fish camp downriver from the village and the two adult males fished for salmon during summer and early fall months with both fishwheel and fish net, providing salmon for both households' needs, including food for dogs. Several species of freshwater fish were also harvested. Fish were cached in facilities of Household A.

Members of both households participated in hunting activities, individually and in concert. The two households harvested moose, black bears, porcupine, snowshoe hares, ptarmigan, grouse, and waterfowl. They were also involved in trapping during the winter of 1983. Although in previous years the father and son had trapped together, during the survey year they conducted their trapping activities separately, the son in Household B trapped with a related

young adult male residing in another household. Both trappers in Households A and B harvested a variety of furbearers.

The total harvest of all resources by weight for the two households was 16,739 pounds. Fish comprised 87 percent of this total (14,546 lbs), mammals 12 percent (2,008 lbs), and birds and berries (185 lbs) made up the remaining one percent.

Fish and wildlife resources were shared between the two households as well as with the household of an adult daughter and her family. Fish and wildlife were also given to other village households and were shared at potlatches throughout the year.

Case Example B

This is an example of a young household establishing more autonomy while still assisting parents in subsistence activities. Although the focus is on one two-person household, many of the subsistence activities were conducted cooperatively with members of other community households with whom they were related by close kinship ties. This household participated in a wide range of both subsistence and wage activities during the study period.

This household was comprised of a couple, both in their 30s. The male head of household had been employed part-time for most of the survey year and the female head of household held a full-time, but seasonal position. The household owned a riverboat and outboard motor, a snowmachine, a "silver" salmon net, traps, snares, and a large freezer. They also had access to the smokehouse, fish racks, and caches located at the home of the man's parents.

During the survey period the household operated both independently as well as with a number of other related households in salmon fishing activities. The household worked at their recently established fish camp on the man's Native allotment where they fished for king salmon. The couple also worked at the fish camp of the man's parents along with other siblings resident in the community.

The household maintained a small garden during the summer, gathered berries in late summer, and successfully harvested both moose and black bear in the fall. At least one hunting trip was made with a brother living in another household. The meat was shared with the man's parents, who in turn distributed portions to other family members and households. The meat was also shared with the community through holiday potlatches. "Dry meat" was prepared and given to elder residents in the community. Snowshoe hares snared during October and November were also shared with elders in the community. Ice fishing with a net was undertaken in October and whitefish, pike, and burbot were harvested. These harvests were shared with parents and other elders.

The household trapped for furbearers from the village during winter months, harvesting marten and lynx. Because both members of the household had work commitments during the week, traplines were tended during evenings and weekends. Most of the furs were sold though a few marten pelts were kept for sewing. During early spring beaver and muskrat were harvested. A few pelts were kept for household use, the rest were sold, and the meat was utilized by the household. Ducks and geese were harvested in spring and early summer.

The total harvest for this household was 3,001 pounds. Forty-two percent of this total was made up of salmon and freshwater fish (1,250 lbs) while mammals comprised 56 percent (1,691 lbs). The remaining two percent consisted of birds and berries.

Case Example C

The household described in this example is composed of an elder in his late 60s and his two adult sons in their 30s. This household participated in a limited range of harvest activities, focusing primarily on fishing for non-salmon species of fish and hunting small game. Other subsistence activities such as salmon fishing, moose hunting, and harvesting firewood were pursued cooperatively with other households that possessed the necessary equipment (i.e. boat and motor or snowmachine) for the undertaking. The household also obtained resources through exchanges of labor or cash.

Only one member of the household was employed during the survey period, obtaining approximately three months of work through various village council projects. The household did not, at the time, have a boat, motor, snowmachine, or an all-terrain vehicle. They did however, own a whitefish net, traps and snares, and a freezer.

During king salmon season, the older son in the household assisted a distantly-related household and received some fresh fish in exchange for the labor. They also received some fish from other fishing groups and in addition, the household purchased some dried salmon. The household maintained a vegetable garden during summer months.

Fishing with a net beneath the ice was undertaken in the fall yielding a harvest of whitefish, sheefish, pike, and suckers. These fish were shared with two related households in the community and the remainder was used by the household for human consumption and to feed the dogs the household possessed at the time.

Snowshoe hares, ptarmigan, grouse, ducks, and geese were successfully harvested by the older son. The household received moose meat, bear meat, and ducks from other households in the community.

The household cut some fuel wood but had to arrange for someone with a snowmachine to haul the wood to the village. They also purchased some wood for \$100 per cord.

The total household harvest was 489 pounds, of which 375 pounds (77 percent) consisted of freshwater fish, while mammals made up 14 percent (70 lbs), and birds the remaining 9 percent (44 lbs).

Case Example D

This household consisted of a family of nine members. The heads of household were a couple in their 40s and their children, ranging in age from 6 to the late-20s. Both husband and wife were employed in part-time, year-round positions and the eldest son worked on village council projects for approximately three weeks during the survey year. The family owned a riverboat, two outboard motors, a fishwheel, four fish nets, two snowmachines, and a large freezer. The household's fish processing and storage facilities such as fish racks, smokehouse, and caches were located in the village.

Members of the household harvested king and chum salmon during the summer and early-fall months. Fishing was based from the village and they began preparations by the last week of June and completed salmon fishing activities by mid-September. Approximately 200 king salmon were harvested with a net and about 800 chum salmon were caught with the fishwheel. Most of the kings were dried for eating while the majority of chums were dried for dog food although about 15 chums were frozen for human consumption. The fishwheel also yielded some whitefish, sheefish, and suckers in the fall, many of which were fed to dogs. The household supplied its own labor. The husband and older sons were active participants in harvesting and processing although two of the younger sons occasionally assisted with cleaning fish.

Net fishing under the ice in the fall, as well as prior to the salmon runs yielded additional whitefish, pike, suckers, and burbot. The family also went on berrying outings, harvesting a large quantity of lowbush cranberries and some blueberries. Additional berries were obtained in exchange for dried salmon.

The household did not harvest a moose during the survey period although the husband and older son went hunting. They did receive moose meat from other village households and were successful at obtaining porcupine, snowshoe hare, grouse, ducks, and geese. The husband also trapped during the winter, at times accompanied by one of the older sons. The trapping harvest included marten, fox, beaver, and muskrat. The family maintained a large garden yielding a variety of vegetables.

This household harvested 7,532 pounds of resources. Salmon and

freshwater fish (6,477 lbs and 744 lbs respectively) comprised 96 percent of this total, mammals, birds, and berries making up the remaining 4 percent (311 lbs).

CHAPTER 4

SALMON AND FRESHWATER FISHING ACTIVITIES

The harvest of a variety of fish species is an important characteristic of the seasonal round of Stevens Village residents. Fishing is the primary activity undertaken during summer months and most of the fish harvest is taken at this time although certain freshwater species are available throughout the year and are harvested during all but the coldest mid-winter months. Salmon and other freshwater species comprised a significant portion of the wild resource harvest of Stevens Village residents for the twelve-month period surveyed, accounting for about 90 percent of the total harvest by weight (Fig. 9).

Fish weirs and basket traps, along with willow fiber set nets and dip nets were traditional harvest methods used in the area. Contemporary methods include fishwheels, set gill nets, and hooking. Nets were used for harvesting a variety of species and Stevens Village households reported owning a total of 38 fish nets of various mesh size. Net fishing and hooking were undertaken in open water conditions as well as through the ice on rivers and lakes. Fish camps were used as a base of operations during salmon fishing, when two or more households related through kinship worked cooperatively to fish for king and chum salmon. Salmon and freshwater fish are also shared with other households in the community as well as with people in other areas.

SALMON

Salmon fishing is the focus of summer harvest activities undertaken by Stevens Village residents. Preparations for salmon fishing begin in June when gear is readied and fish camps are set up. Species of salmon harvested and used are king salmon (Oncorhynchus tshawytscha), chum salmon (Oncorhynchus keta), and coho salmon (Oncorhynchus kisutch). King salmon appear first, usually arriving between the last week of June and the first week in July. The run generally diminishes by the end of July when the summer chum stocks reach the area. Mixed runs of summer and fall chum stocks occur during August, and usually by the end of the month the run consists of fall chum and coho salmon, which continue to run until freeze-up in mid-October.

Stevens Village residents conduct their salmon fishing activities in the ADF&G Fisheries Management Subdistricts 5-C and 5-D. Subdistrict 5-C extends along the Yukon River from the westernmost tip of Garnet Island (below the community of Rampart), to the ADF&G subdistrict boundary markers approximately two miles downstream from Waldron Creek. Subdistrict 5-D continues from this point upstream to the international border (Alaska Board of Fisheries 1984).

During 1984 and 1985, subsistence fishing regulations for subdistrict 5-C required that salmon not be taken from 6:00 p.m. Sunday until 6:00 p.m. Tuesday during the entire season, to correspond with the commercial fishing closure in the area. In subdistrict 5-D, salmon fishing was allowed seven days a week (Alaska Board of Fisheries 1984).

Participation and Harvest

In 1918, an investigation took place to assess the impacts to upriver salmon fisheries caused by the operation of the Carlisle Packing Company's cannery at the mouth of the Yukon River. In his report, Christian Larson reported that 30 Stevens Village residents conducted salmon fishing with 10 fishwheels and 10 fish nets. He also estimated that communities along the upper Yukon: Eagle, Circle, Fort Yukon, Beaver, Stevens Village, and Rampart each produced from 5 to more than 10 tons of dried fish annually (Ducker 1982:88-89). The use of dog teams for winter travel increased between 1867 and the mid-1920s as missionaries, miners, and the military entered the area in greater numbers. The establishment of winter mail service by dog team added to the demand for dried salmon for feeding dogs. Increased production of dried salmon for sale as dog food occurred all along the Yukon River during this period. Much of the harvest reported by Larson was for this intraregional trade. Harvests declined again after 1928 when airplanes began to transport mail and light freight (Wolfe 1979:137-139, 1984:164).

In 1957, the USFWS's Progress Report No. 2 reported that the community harvested 2,759 fish for the 85 residents and harvested an equal number for feeding the 106 dogs in the village (Pennoyer et al. 1965:32). The following year another USFWS report stated Stevens Village harvested 1,385 king salmon. The 213 chum salmon recorded was reported as an incomplete count of fish. In 1959, the harvest of king salmon dropped to 675 fish and the chum salmon harvest was 3,465 fish (Pennoyer et al. 1965:33). Declines in harvest along the Yukon River

TABLE 11. PARTICIPATION AND HARVEST FOR SALMON FISHING

Resource	Number of Households	Percent of Households	Range of Harvests	Total Number Harvested	Average Harvest of Successful Households
King Salmon	21	70	15 - 350	2,202	105
Summer Chum	13	43	22 - 2,500	5,952	458
Fall Chum	14	47	1 - 1,500	4,983	356
Coho Salmon	8	27	2 - 100	136	17

occurred again between 1961 and 1975, primarily resulting from the replacement of dog teams with snowmachines for winter travel (Wolfe 1979:144).

Salmon harvests comprised a significant percentage of the annual harvest of all resources during the survey period. A total of 22 Stevens Village households (73 percent) participated in salmon fishing and processing activities. Of these, 21 were involved in king salmon fishing, 13 reported harvesting summer chum salmon, 14 households harvested fall chum salmon, and 8 households harvested coho salmon. Participation and harvest figures for 1984 are presented in Table 11. In 1984 Stevens Village residents harvested about 40.0 tons of salmon, dressed weight. Fig. 17 presents the species composition of the salmon harvest by weight. Estimates of salmon harvests from 1961 through 1985 based on Division of Commercial Fisheries data (ADF&G 1977-84) and the study findings for the survey year are presented in Table 12. Salmon harvest trends based on a three year running average for the period 1977 to 1985 for king, summer chum, and fall chum salmon are depicted in Fig. 18. The harvest estimates presented in

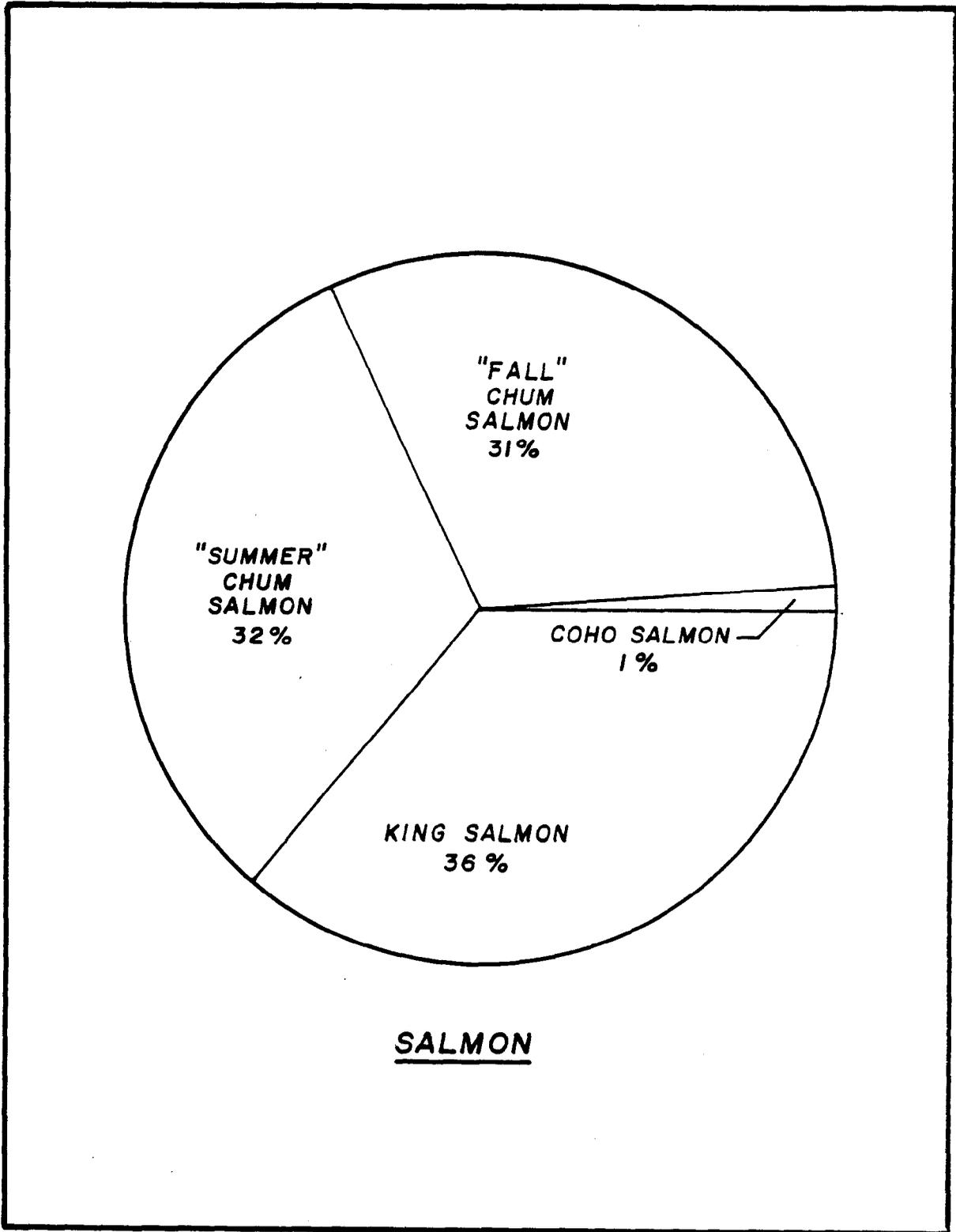


Fig. 17. Composition of Salmon Harvest by Weight.

TABLE 12. HISTORICAL SALMON HARVESTS, 1958-85

Year	King Salmon	Chum and Coho	Summer Chum	Fall Chum	Coho Salmon
1958	1,385	213			
1959	675	3465			
1960	no	data			
1961	650	3,490			
1962	831	4,355			
1963	1,073	8,247			
1964	325	6,979			
1965	910	7,346			
1966	620	1,900			
1967	534	3,145			
1968	787	2,022			
1969	350	2,725			
1970	851	8,292			
1971	750	7,957			
1972	802	1,118			
1973	967	3,618			
1974	241	4,428			
1975	391	2,297			
1976	615	1,080			
1977	775	2,359	1,257	1,080	22
1978	1,875	6,725	1,766	4,947	12
1979	1,295	4,141	16	4,125	0
1980	2,612	3,934	520	3,233	181
1981	1,292	11,027	2,576	8,356	95
1982	1,810	8,081	666	7,392	23
1983	2,531	8,553	5,051	3,502	0
1984	2,202	11,071	5,952	4,983	136
1985	2,763	14,907	3,046	11,679	182

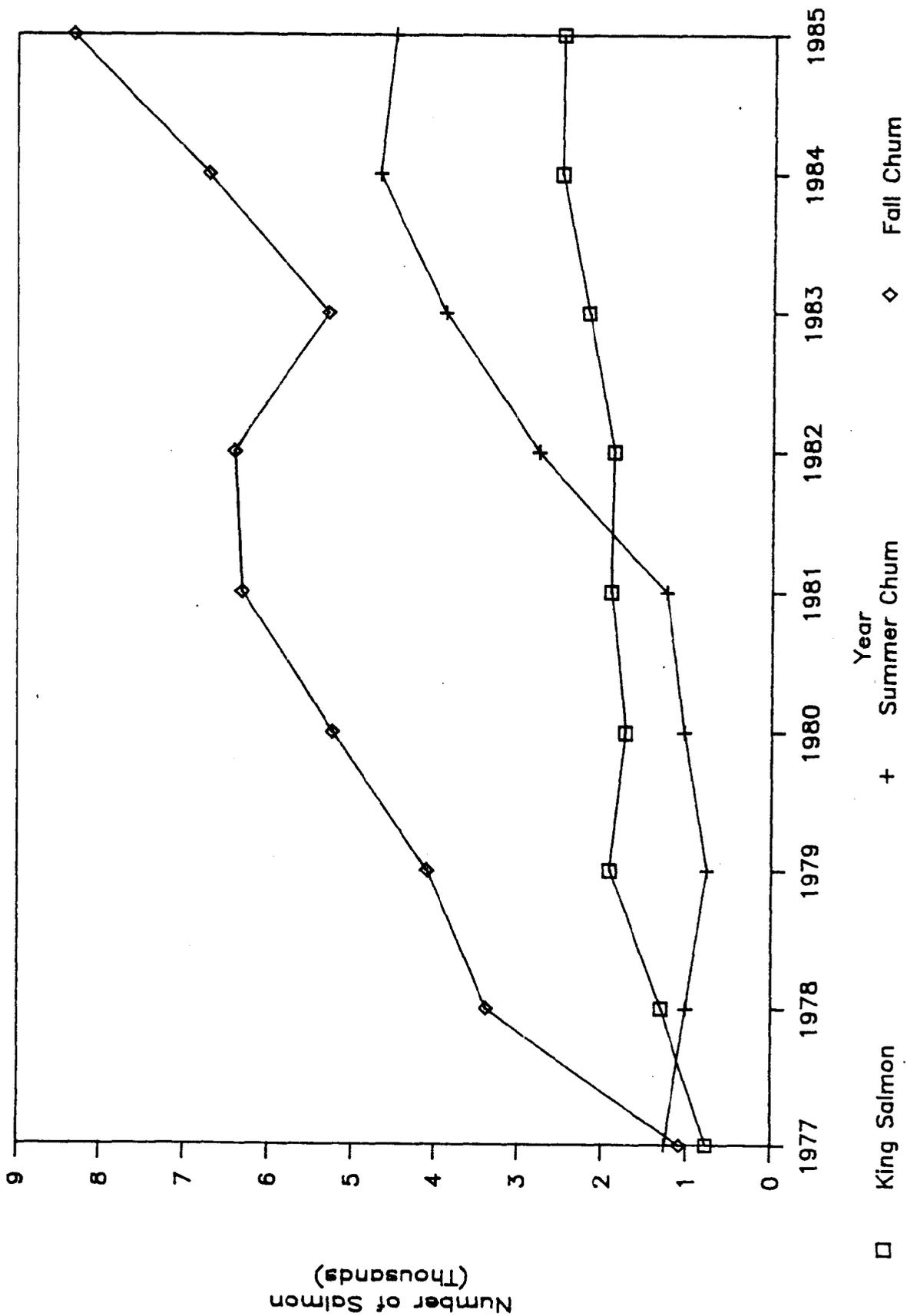


Fig. 18. Three Year Running Average of King and Chum Salmon Harvests, 1977-85.

Table 12 show the fluctuation in harvest levels from year-to-year. Fig. 18 illustrates the apparent trend of increasing harvests over time. Fall chum harvests show the greatest increase followed by summer chum harvests, while king salmon harvests appear to be more stable, increasing slightly.

Between 1978 and 1985, the total salmon harvest increased 90 percent by weight from 58,917 pounds in 1978 to 111,906 pounds in 1985. Fall chum harvests increased by 136 percent, summer chums by 72 percent, and king salmon by 47 percent.

The reasons for these apparent increases in harvest are not clear at this time. Improvements in harvest reporting and estimating may be a factor. Another possible explanation is an increase in the number of families participating in salmon fishing. Between 1978 and 1985 Commercial Fisheries data indicates the number of fishing families increased by 32 percent. An increase in fishing to feed dogs may in part account for the trends in fall and summer chum salmon harvests. Increasing salmon harvests during the early 1980s may also be a function of a shift in emphasis to a more readily available and relatively reliable resource in response to the low moose population in the area and the consequent low success rate of local hunters during these years.

Species Run Timing

The arrival of king salmon in the Yukon Flats marks the beginning of summer harvest activities in the region. The progress of the upstream migration is closely followed and local reports of the

appearance of kings at downstream communities such as Tanana and Rampart are met with anticipation and generates speculation about when the fish will finally appear in local waters. King salmon are generally available in the area from late June or early July and continue to run through July and during some years, into August. The kings traveling along the Yukon River through the Yukon Flats are headed for spawning streams in Canada near the Yukon headwaters.

Although biologists often refer to Oncorhynchus tshawytscha as "chinook" salmon, local residents refer to this species as king salmon when using English, and often when using the generic term "salmon," they are referring to this species (Fig. 19).

Biologists have distinguished two runs of Oncorhynchus keta along the Yukon. The first, referred to as the "summer" chum run begins as the king salmon runs diminish in late July or early August. At this time there is usually a mixed run of king and summer chum salmon. Most of the summer chum stocks spawn in tributaries such as the Koyukuk and Tanana river drainages although the upper Hodzana River and at least two Canadian streams are recognized by biologists as summer chum spawning areas (Morgan 1985:17, 20, 21; Fred Andersen, pers. comm., 1986). The summer chum run continues through August and by the end of the month the "fall" chum run appears, overlapping with the summer chum run. These fall chum are spawning primarily in the Tanana and Porcupine drainages in Alaska and in upper Yukon River drainages in Canada (Morgan 1985:18). Coho salmon appear in the area by September, running with the fall chum stocks. The fall chum and coho salmon continue to run during October as ice begins to form on the river.

SALMON

(Scientific names)

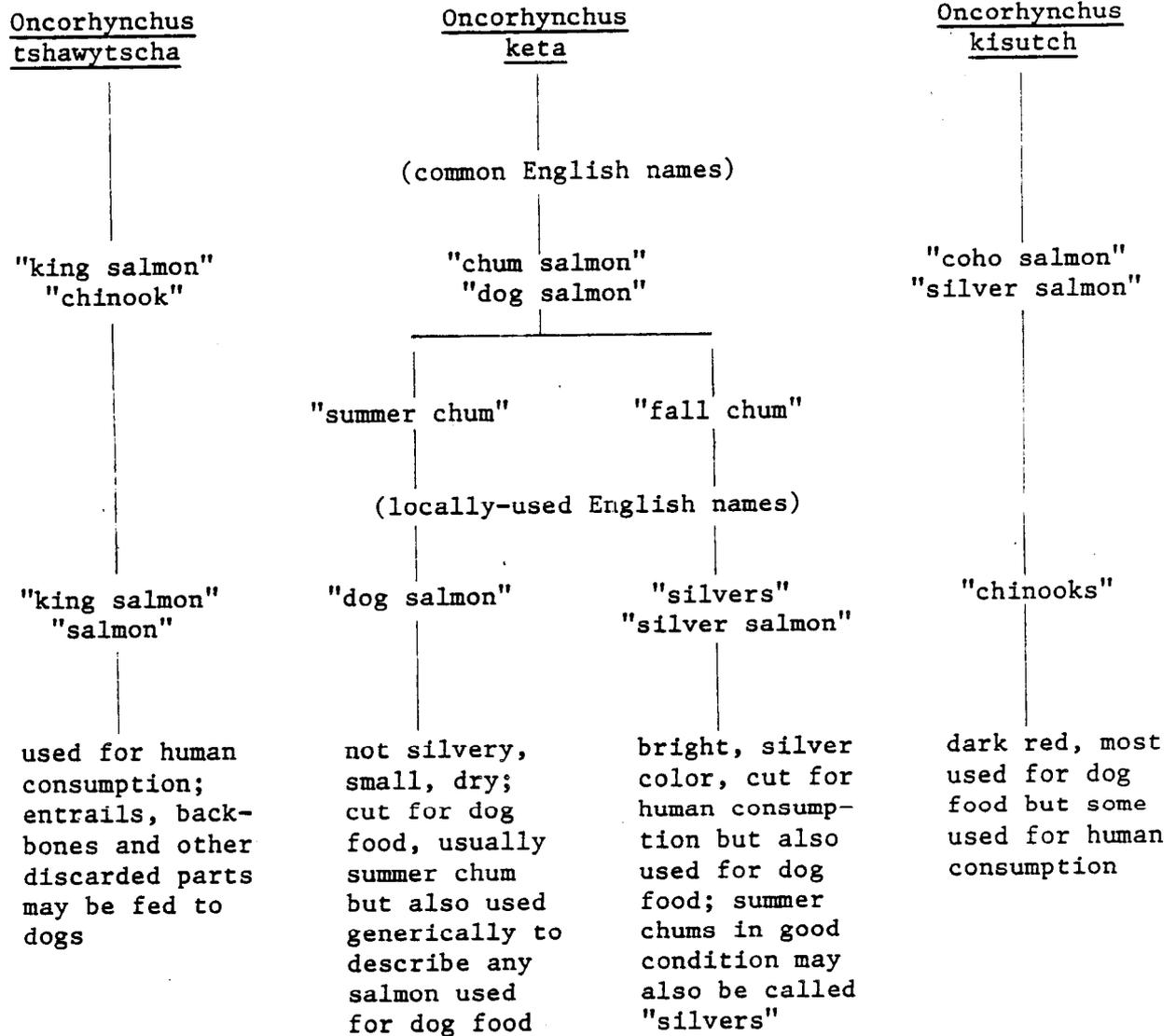


Fig. 19. Classification of Salmon.

The two runs of chum salmon are distinguished by differences in size, coloration, and flesh characteristics. Summer chums are smaller in size and less robust, appear mottled in coloration, and have light-colored flesh. Fall chums are generally larger fish with a bright, silvery appearance and firmer, pink to reddish-colored flesh with a higher oil content.

Chum salmon are known locally as "dog salmon" and "silvers" or "silver salmon," descriptors referring in the first case to the use of the fish and in the latter cases to its appearance, both reflective of the characteristic qualities of the fish. "Dog salmon" are described as smaller, poorer quality fish, which are more commonly used for dog food rather than for human consumption. The term "dog salmon" generally corresponds to the summer run of chums but may also be used to describe fall chums or coho salmon which are used for dog food. "Silvers" are, for the most part, a higher quality fish with red flesh similar to king salmon. These fall chum are considered to be good "eating fish" and some individuals prefer them over the richer king salmon. They are also fed to dogs. Coho salmon, referred to in some areas of the state as "silver salmon," are known locally as "chinooks."

Traditional Harvest Methods

Clark (1974:148) reports that fishing in the Koyukuk River area during pre-contact times was undertaken by both men and women, utilizing several harvest methods. Zagoskin mentions the use of gill

nets, fish traps, dip nets, and spearing in the harvest of fish (Zagoskin 1967:219-220).

Fish fences and traps, methods of harvest undertaken by men, were the principal means of harvesting fish and were constructed at the entrances to small streams (Clark 1974:91, 151; Loyens 1966:39). Fences with several traps attached extended across the smaller tributaries of the Yukon to harvest salmon. Several families cooperated in this endeavor (Loyens 1966:39). Weirs were constructed across stream channels by driving poles into the stream beds approximately five to six inches apart. Strips of spruce were interwoven between poles or portable fence sections were attached to stakes. Traps made from strips of spruce formed into a cone shape were placed in the center section and secured to each side of the weir. Larger traps were used in the harvest of salmon, while smaller versions were made for whitefish and grayling fishing (Clark 1974:151, 152). A description of the construction of a fishing weir and basket trap is provided in Sullivan (1942:63-64). The Gwich'in employed similar methods as described by Osgood (1970:33, 35).

Gill nets were made from willow bast twine, rabbit sinew, or babiche with stone or antler weights and carved wooden floats. Nets were constructed and used by women. Nets were set during the summer at the mouths of sloughs and in eddies along rivers. Women continued to construct and use gill nets for the harvest of salmon even after the advent and predominance of another form of fish trap, the fishwheel, circa 1910 (Clark 1981:587). Commercially-manufactured materials such as ready-made twine or twine twisted from linen thread were used in the local construction of the nets. Fibers from burlap

and canvas sacks were sometimes unraveled to make twine for fish nets. Fish nets made from commercial yarns were longer lasting, required less maintenance, and may have been more effective than nets made from traditional materials. Fish nets eventually replaced fish traps and resulted in smaller fish camps and more individualized effort (Nelson 1973:57-58; Clark 1975:157).

Willow bast twine or rawhide strips woven into conical sacks were attached to spruce frames and poles for dip nets used by men in the harvest of salmon and by women for whitefish fishing (Sullivan 1942:7; Loyens 1966:39). Though used more extensively in former times, Sullivan (1942:5) reported their continued use in the 1930s. A local source recalled the use of dip nets during his boyhood for harvesting salmon in the canyon from canoes. Spearing salmon with a toggle harpoon was another technique employed by the Koyukon (Loyens 1966:40).

Fishwheels were introduced to the area by Euro-American miners during the early 1900s. Both weirs and fishwheels are well-suited for the silt-laden waters of the Yukon, where they are not visible to the targeted fish (VanStone 1974:28-29). Loyens (1966:149) postulates that the introduction of fishwheels triggered a number of changes in traditional fishing activities. The use of this technology made possible a substantially larger harvest and may have allowed increased winter mobility through the maintenance of larger dog teams. Processing methods were altered to accommodate the increased harvest of fish and the use of the efficient "white man's cut" was reported by both Sullivan (1942:24) and Loyens (1966:149-150). A surplus of dried fish available for sale to winter travelers who needed large

quantities for dog food and the need for motor-driven boats to effectively move and position the heavy and cumbersome fishwheel also promoted increased involvement in the cash economy (Loyens 1966:149-150).

Contemporary Harvest Methods

Currently, salmon are harvested almost exclusively by locally-made fishwheels and commercially manufactured gill nets. During the summer of 1984, five fishwheels and thirteen gill nets were used by Stevens Village households to harvest salmon (Fig. 20-24). Both fishwheels and nets were used in the harvest of king and chum salmon, although fishwheels were often relied upon for the large quantities of chum salmon used for feeding dog teams.

Fish nets were an important gear type utilized by Stevens Village fishing households. Commercially-made nylon nets, between 50 to 150 feet in length, with 8-1/4 and 8-1/2 inch mesh for king salmon and 5-7/8 inch mesh for chum salmon were commonly used.

Nets were anchored to a stake driven into the shore, and a motor-driven boat was commonly used to set the net, often in a large eddy. Nets were checked using a motor-driven boat, rowboat, or canoe which is pulled alongside the net. Beginning at the end opposite from shore, sections of the net were lifted to check for fish, debris, or drift that may have become entangled. Once nets were set, they were left in position and checked regularly. The frequency of tending nets was dependent upon the quantity of fish being caught and the distance to the net from the fish camp or village. During the peak of the run

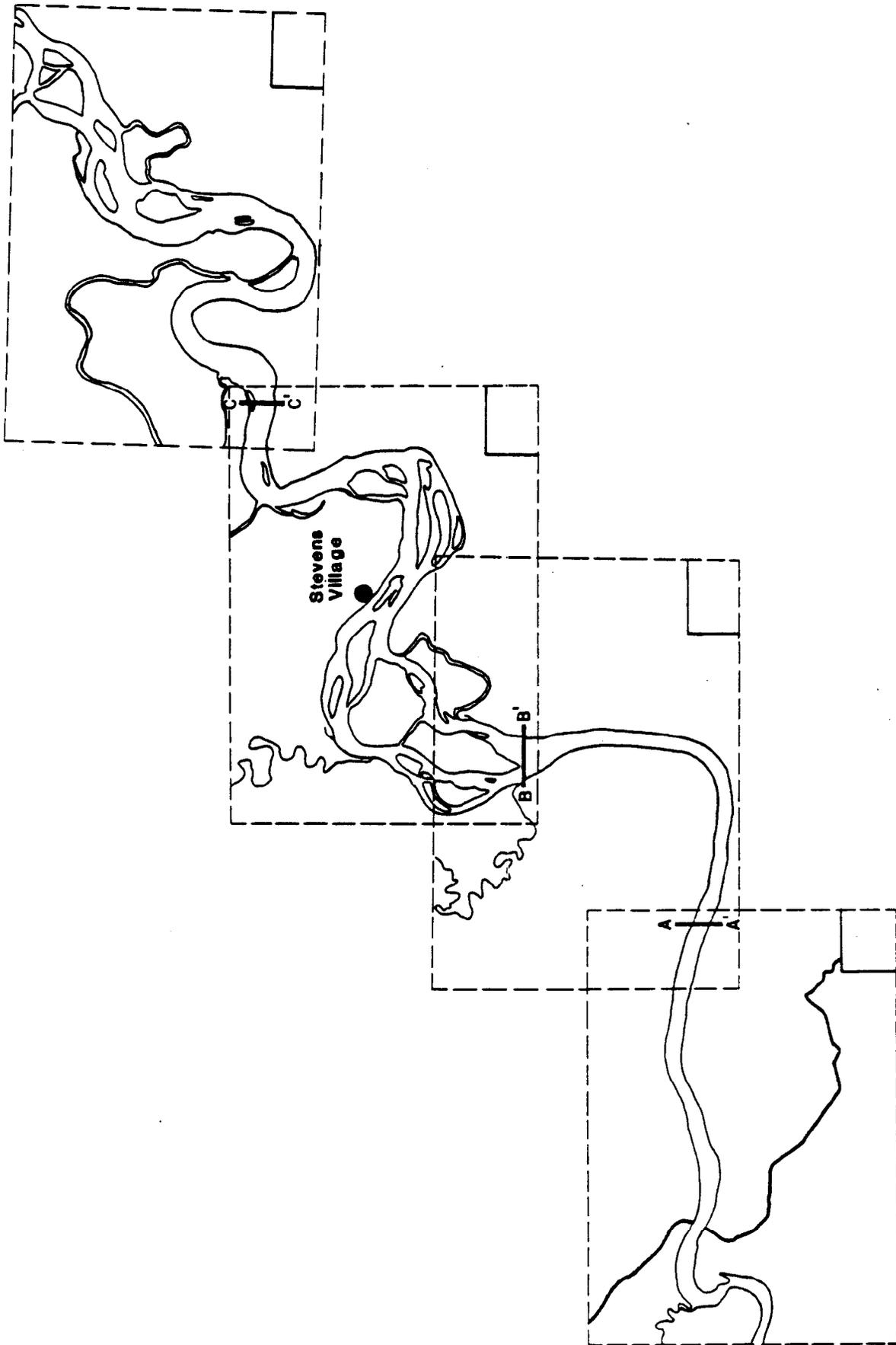


Fig. 20. Composite Map of Figures 21 through 24: Salmon Fishing Sites.

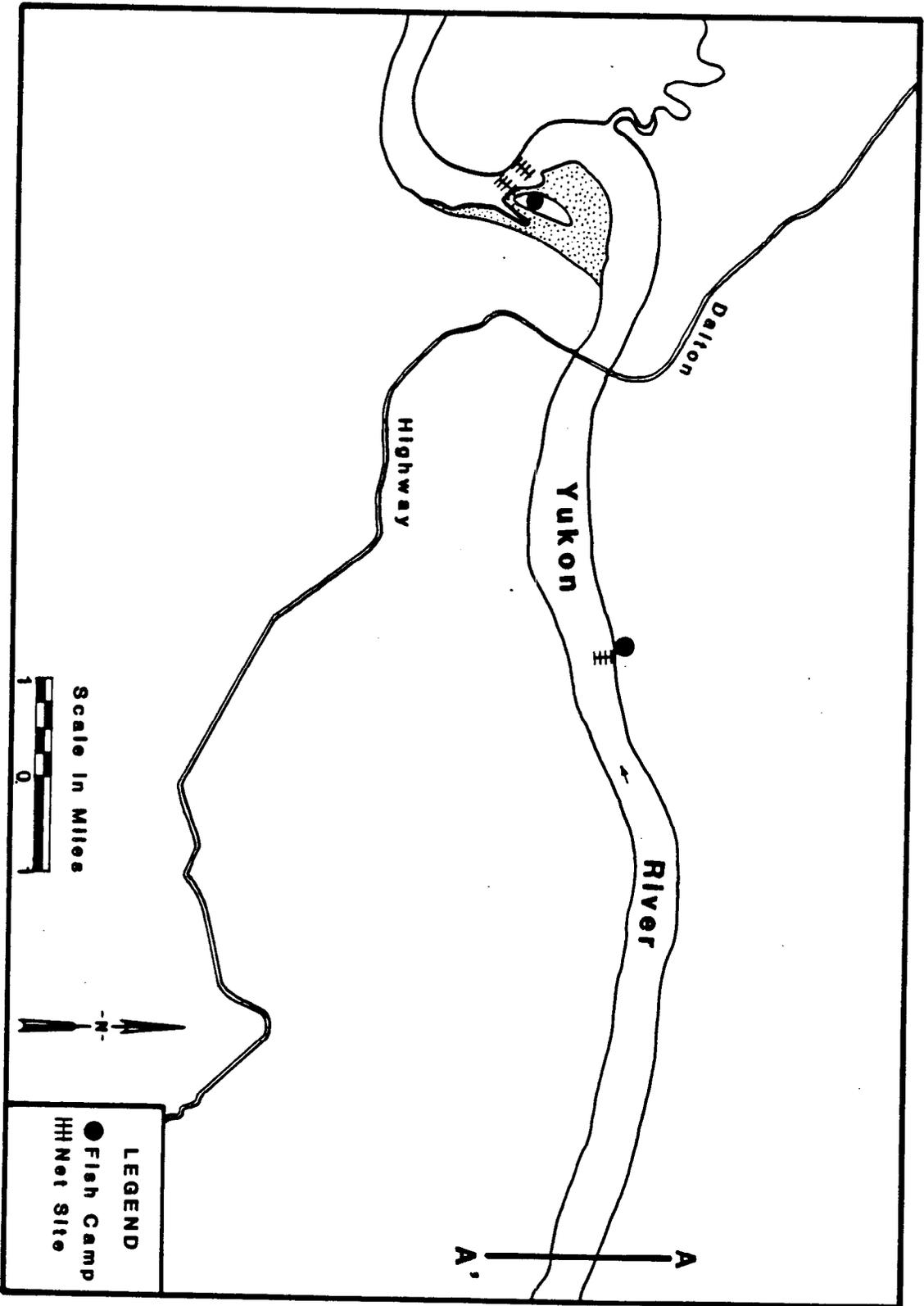


Fig. 21. Salmon Fish Camps, Net and Wheel Sites, 1984.

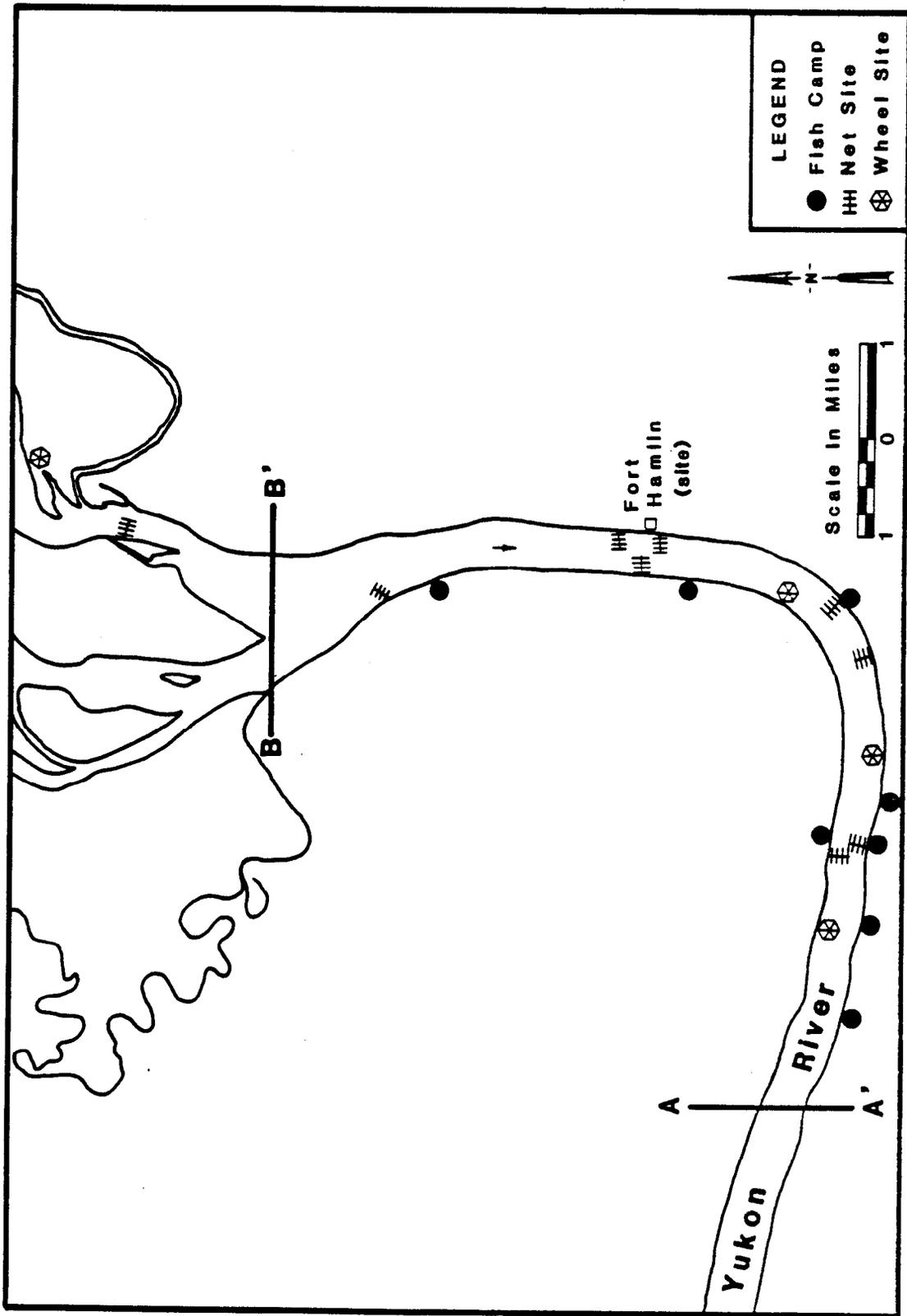


Fig. 22. Salmon Fish Camps, Net and Wheel Sites, 1984.

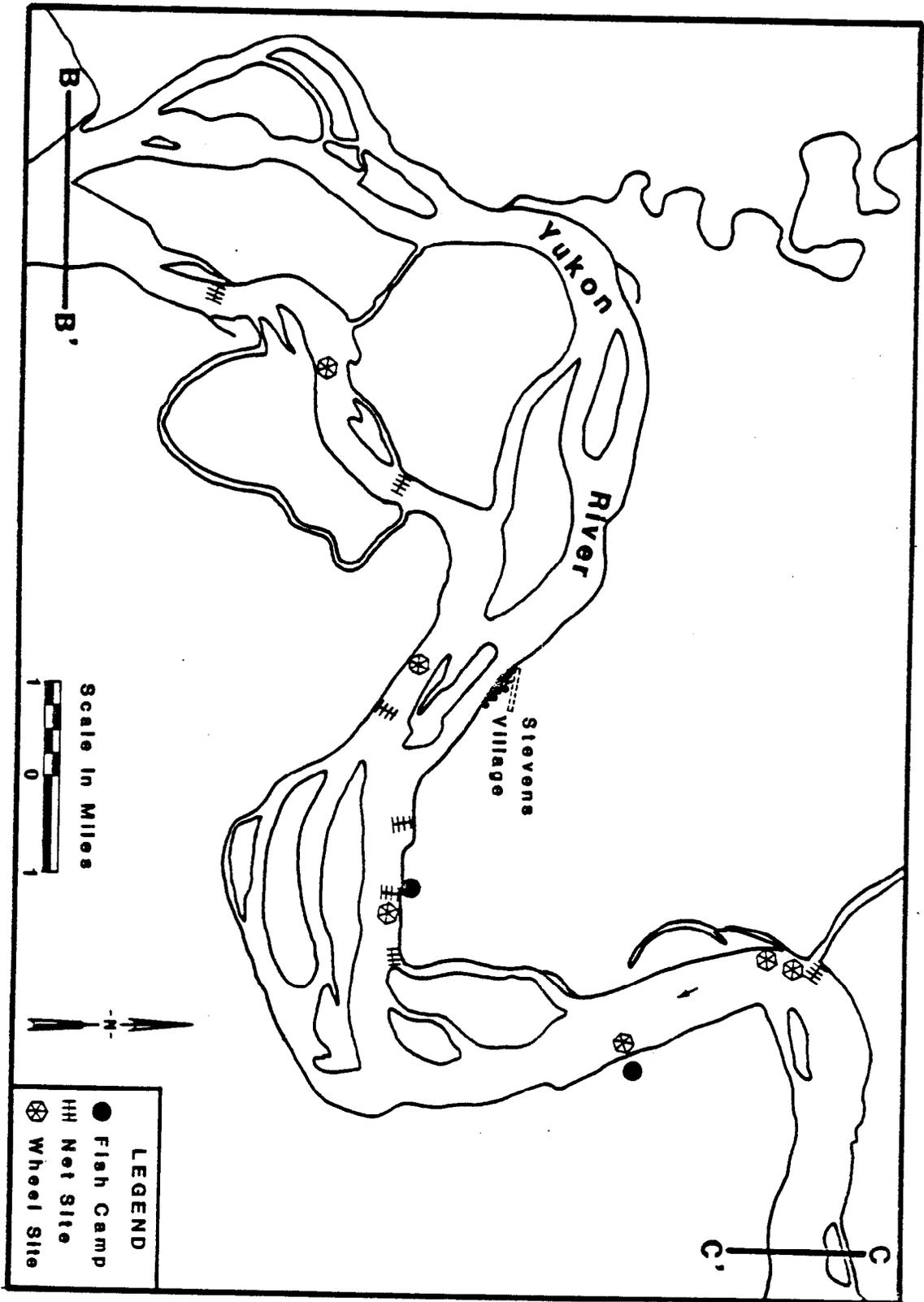


Fig. 23. Salmon fish camps, Net and Wheel sites, 1984.

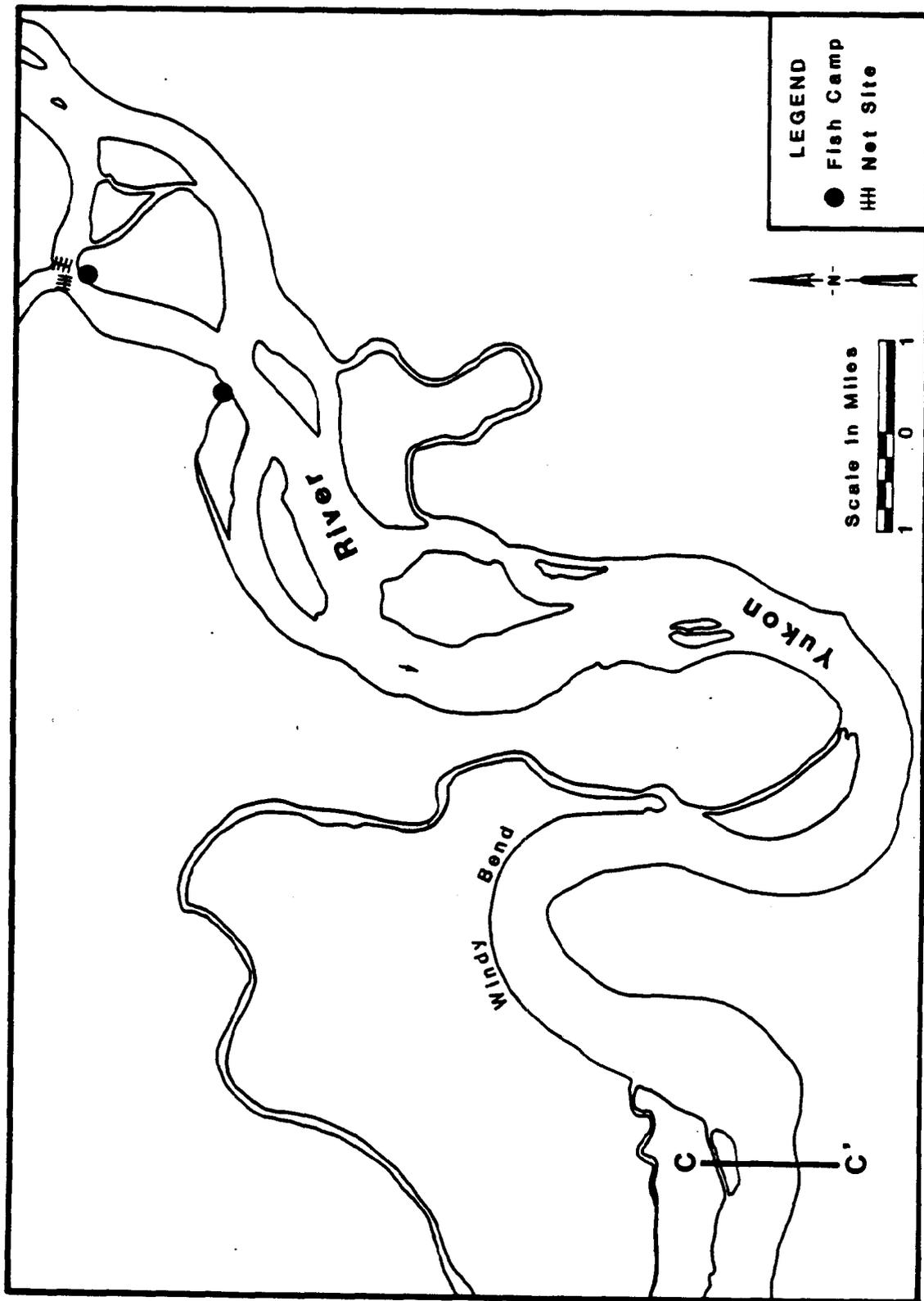


Fig. 24. Salmon Fish Camps, Net and Wheel Sites, 1984.

nets were often checked twice each day, once in the morning and again in the evening. Nets left unchecked can sink from the weight of the catch. Similarly, fish remaining in the net too long begin to deteriorate. As run strength diminishes, nets are checked less frequently.

Sets that were not producing were changed, either by altering the angle or position of the net in the eddy or by locating a different site. Eddies were often characterized as being good for catching certain species of fish. A specific eddy may be good for king salmon, while another was better for chums or yielded mostly pike or whitefish. The species of fish found at a particular eddy is partially determined by the time of year, water level, proximity to tributary streams, and characteristics of the migratory run. For example, fish entering spawning streams on the north side of the Yukon often will be found running along this side of the river prior to their entry into the stream channel.

The steady current and silty waters of the Yukon are ideal conditions for the effective use of fishwheels. The "wheel" is rotated by the current, and the large baskets scoop the upriver-bound salmon, which slide down a trough into a containment box next to the wheel. The baskets of the fishwheels constructed by Stevens Village residents were approximately eight to nine feet in length. The fishwheels were mounted on rafts, which were anchored along banks in areas where the current was strong enough to turn the wheel and where the migrating fish were likely to pass. Finding a good site may involve repeated hauling and placement of the wheels. Large booms that were sometimes fixed to the upriver end of the raft deflect the

drift carried downriver by the current which would otherwise become entangled in baskets and damage the fishwheel.

Construction or repair of fishwheels was often undertaken during the early summer. Knowledgeable individuals familiar with fishwheel construction can assemble one in a few days once all the materials are obtained. Fishwheels require periodic adjustment or repair but in general, should last for a few seasons unless irreparably damaged or swept downriver during spring break-up.

Once operating, fishwheels require little maintenance and can be tended less frequently than nets. Unlike nets, in which mesh size is in part a determinant of the catch, wheels are relatively indiscriminate harvesters, producing a varied catch of different species, sizes, and greater quantities of fish. They are used during both the king and chum salmon runs. During the peak chum salmon runs in late August, a fishwheel harvested up to 200 chum salmon daily. This capability is especially advantageous for owners of dog teams requiring large numbers of chum salmon for winter food. Fishwheels are sometimes stopped for part of the day or for a period of a few days as the processing capabilities of the fishing households may not be sufficient to continually handle these large quantities of fish.

The effectiveness of fishwheels is diminished during periods of high water, when fish may be traveling below the depth reached by the baskets. Fish nets can be more effective in these conditions but are also subject to the subsequent changes in the eddies and the large amounts of drift carried by the current.

Processing Methods

King salmon are an important and highly valued resource in the area. Considered an excellent "eating fish," they were sought by all households in the community. Kings were used fresh and were processed in numerous ways including cut, smoked, and dried in "strips" or as "dry fish," frozen, salted, and canned. In processing "dry fish," salmon were gutted and heads removed. Fish were cut lengthwise along both sides of the backbone. The backbone was severed at the tail where the sides of the fish remained joined. Parallel crosscuts were made along the length of each half of the fish to facilitate drying. Both "strips" and "dry fish" were dried on racks in smokehouses with slow-burning, smoldering fires to prevent flies from laying eggs in the flesh. Fish heads and roe were sometimes frozen or smoked and dried for later use, or were fed to dogs. Entrails and backbones were generally fed to dogs.

Chum salmon were used for human consumption and for feeding dogs. Chums may be selectively cut for "eating fish" or for dog food, depending on the quality of the individual fish, the number of dogs that must be fed and in some cases, the number of king salmon harvested earlier in the season. "Silvers" to be used as "eating fish" were often processed like king salmon and cut for "dry fish" or "strips." Fish which were to be used for dog food were not handled and processed with as much care and precision as fish for human consumption. By September, chums were frozen whole or processed as "split fish" for both human and dog consumption. "Split fish" were simply gutted after removing heads and cut in half leaving the

backbone intact. By October, as ice forms on fishwheels, the quality of the fish has often diminished and most commonly were used for dog food. Few coho salmon were harvested because of the relatively small run of this species. These fish were generally processed like chum salmon and most were used to feed dogs although some were processed for human consumption.

Fish Camps

During 1984, Stevens Village households based their salmon fishing activities from fish camps or from the village. People often stayed at the camps, set nets or operated fishwheels nearby, and processed fish there. Fish camps were located from approximately 1.5 to 30 miles from the village (Figs. 21-24). In this context, village-based salmon fishing means that nets or wheels were checked by individuals who brought the fish back to the village for processing. However, the nets or wheels were not necessarily in close proximity to the community. The three households whose salmon fishing activities were village-based had to travel from 10 to 40 miles round trip in order to check their nets or fishwheels. Fish were processed and hung on drying racks or in smokehouses located in the village.

Historically, preparations for summer fishing were undertaken in the weeks prior to the arrival of the king salmon. Construction and repair of equipment such as fishwheels, gill nets, and birch bark canoes, was necessary before the harvest of salmon could commence (Sullivan 1942:8). Traditionally, families gathered for a feast prior to leaving the village for their summer fish camps. These

celebrations honored the arrival of the first salmon and ensured a season of good fishing (Clark 1974:37).

Similarly, fishing households today must prepare fishwheels, nets, processing facilities, and living quarters at fish camp along with boats and outboard motors. Camps used by Stevens Village fishing groups varied considerably from rudimentary processing stations with minimal facilities of fish racks, smokehouse, and cutting table, to more elaborate sites with furnished wall tents outfitted with wood stoves and stocked with supplies for the entire summer. Often, dogs were brought along to fish camp and contributed to the impression of a seasonal settlement.

One fishing group reported spending two weeks in early June setting up their summer fish camp and maintained relatively steady residence there until early September. Another group reported setting up their camp around June 15th and breaking camp around October 4th.

Although the locations of fish camps appeared to be relatively stable, they were subject to the vagaries of changing environmental conditions such as the erosion of the river bank, changes in the course of the river, development of sand bars, and the disappearance of eddies. Often families had a history of the movement of their camps for these reasons or because of additions to or changes in family membership. Some of the fish camps used by Stevens Village households have been used by the family for a number of generations and have been "inherited." Many fish camp sites were claimed as Native allotments by village residents. New camps have been started by adult children who formerly fished at their parents' camp, but who have established their own separate households. Two new camps were

established in 1984 by young households.

Camps were frequently considered to be under the purview of the female head of household. Regardless of the presence or absence of a male head of household, women were generally the "owner" of the camp. Thus, one often hears camps referred to as "my mother's," "my sister's," or "my aunt's".

Camps also served as the base for other resource harvest activities such as berry picking and hunting of waterfowl and small game. Black bears were often attracted to the scent of fish and other game at the camps and were often shot by fish camp residents (see Chapter 5).

Dismantling fish camps occurred between late August and early October. Dried fish were bundled and brought to the village for storage in caches or sheds. Fish wheels were secured at sites where they remained until the following summer. Tents, tarps, and sometimes walls of smokehouses were taken down and furniture and supplies were moved back to the village.

Harvest and Processing Groups

Salmon fishing was often undertaken by fishing groups composed of multiple households which worked cooperatively at fish camps or in village-based fishing. During 1984, 22 Stevens Village households in 11 fishing groups participated in salmon fishing. Three of these groups were village-based while the remaining eight operated from fish camps. Fishing groups were comprised of members of from one to five

households. The following case examples illustrate the composition of some salmon fishing work groups, their activities, and harvest.

Salmon Fishing Group Case Example A

This example describes three kin-related households that participated in king salmon fishing together during the summer of 1984. Household 1 consisted of a widowed female in her 60s, a son and a daughter, both in their 20s, and a grandchild. Household 2 consisted of an older son of the female in Household 1, his female partner, and their three children. A single middle-aged male was in Household 3 and was the son of the head of Household 1's sister (Fig. 25). Household 1 owned all the necessary equipment and facilities for salmon fishing: boat, outboard motor, nets, cutting tables, and smokehouse and also had a large freezer and storage cache.

During 1984, this group conducted their salmon fishing activities from the village although the following year the group was based at the fish camp of Household 1. The adult males in Households 1 and 3 worked together to set and check the fish net which was located approximately 10 miles downriver from the village, near Household 1's fish camp. Approximately 200 king salmon were caught by this fishing group in 1984. Harvested fish were brought to the village for processing, which, for the most part was undertaken by the adult women in Households 1 and 2. Kings were cut for "strips" and "dry fish," and some king salmon heads were frozen for later use. During processing, Household 2 received backbones and fish roe for their eight dogs. Fish were processed and stored at Household 1's, but

CASE EXAMPLE A

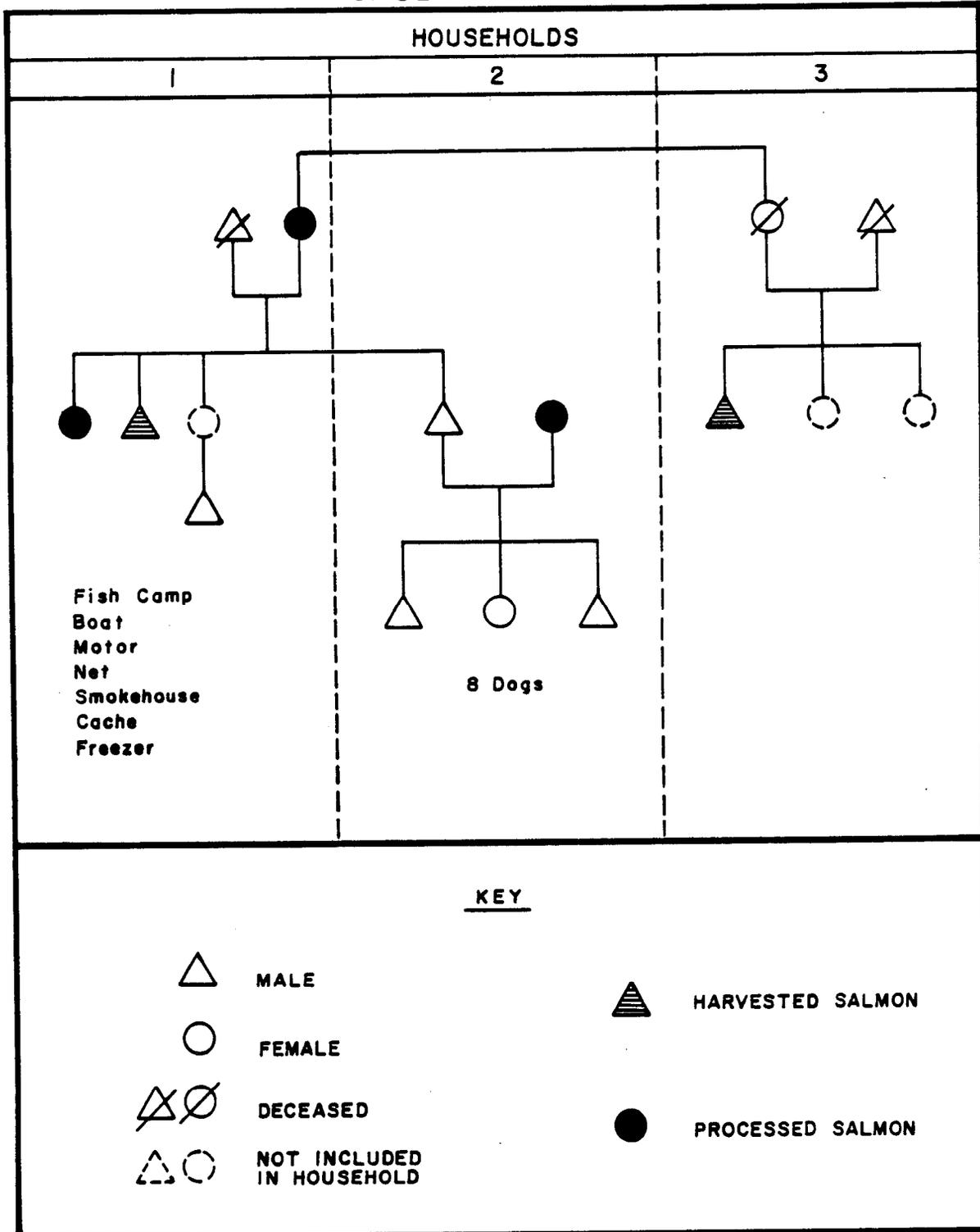


Fig. 25. Salmon Fishing Group Case Example A.

Households 2 and 3 received portions of the processed king salmon catch during the course of the winter. The head of Household 1 also distributed fish to other village households, to a funeral potlatch held in the community, and to a few Minto residents.

Salmon Fishing Group Case Example B

This fishing group consisted of members of two related households (Fig. 26). Household 1 consisted of an older couple, an adult son, his wife, and their two children. Household 2 consisted of a middle-aged man who was related to the female head of Household 1, and his adult son.

Household 1 maintained a fish camp approximately 26 miles from the village which they started setting up by the last week of June in 1984. The two older members of Household 1 maintained residence at the fish camp throughout the summer, traveling to the village on occasion for mail, supplies, and to conduct other necessary tasks. The other members of Household 1 were at camp periodically throughout the summer. Household 2 assisted at the camp on occasion during king salmon season and fished for fall chum salmon for about one week in August.

Household 1 had a boat, motor, and king and "silver" salmon nets. Their well-established fish camp had the necessary cutting tables, racks, and smokehouse and they had caches and freezers at their village residence. Household 2 had a boat, motor and a "silver" salmon net and also had a smokehouse and cache in the village. Household 2 owned a team of 10 dogs.

CASE EXAMPLE B

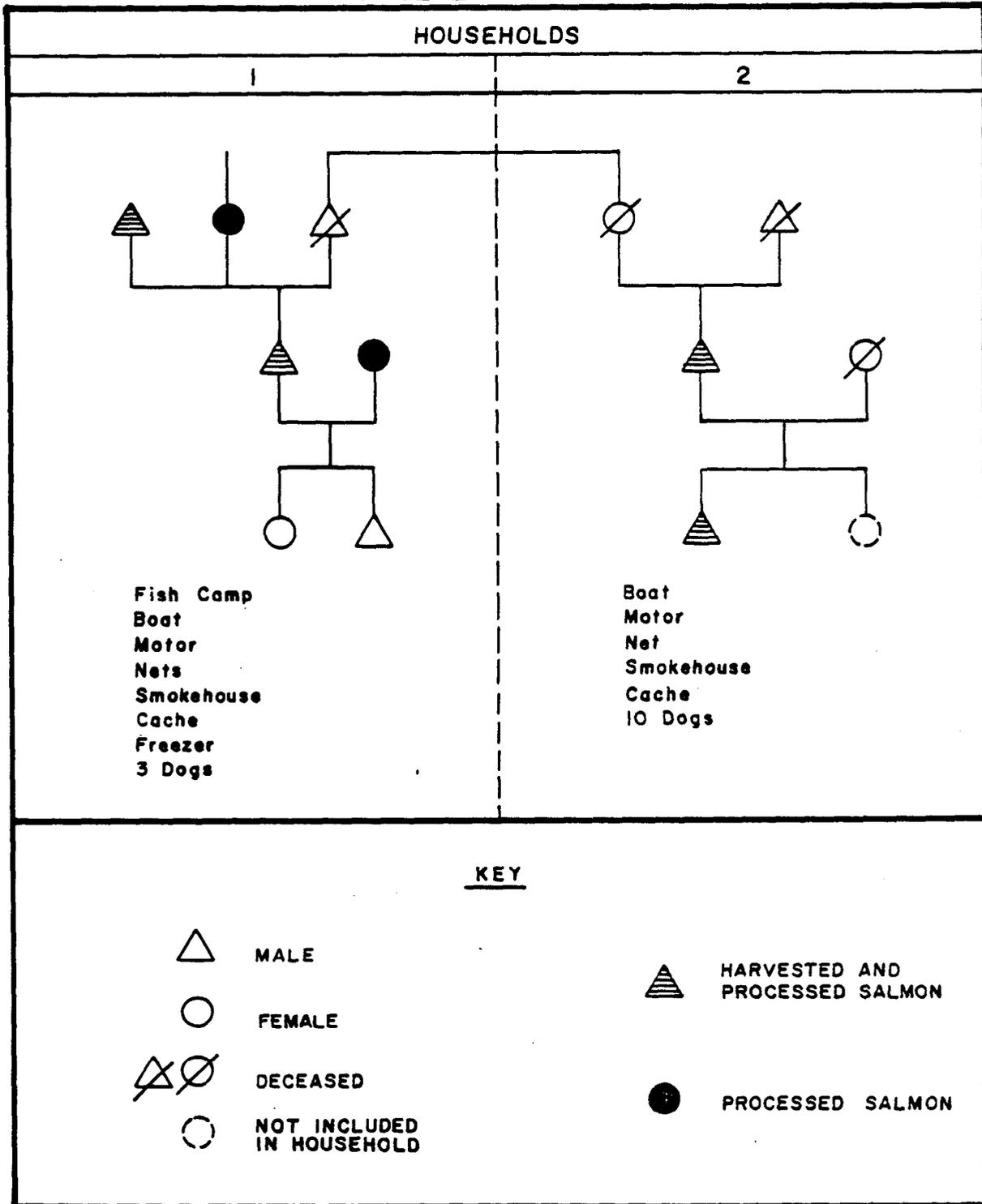


Fig. 26. Salmon Fishing Group Case Example B.

This fish camp was located in Fishery Management Subdistrict 5-C, which required that fishing not be conducted for two days to correspond with the commercial fishing closures in the area. The necessity of pulling the nets and resetting them each week, the resultant shorter fishing time, and the high water present during the early king salmon season that year created some difficulties for this group in terms of decreasing their effectiveness in fishing.

Household 1 harvested about 230 king salmon. Some of these fish were shared with Household 2 and with other households in the community. Household 1 also harvested approximately 530 chum salmon, most of which were to be used to feed the household's 3 dogs. Household 2 harvested about 600 chum salmon, primarily to feed the household's own dogs.

Salmon Fishing Group Case Example C

This example illustrates the complex interrelated salmon fishing activities of a large, extended family consisting of members of five households (Fig. 27). Household 1, the parent household, consisted of an older couple, both in their 70s, an adult son in his 20s, and an adult grandson, also in his 20s. Household 2 consisted of an adult son and his wife who had recently re-established residency in the village after living elsewhere for a number of years. Household 3 consisted of an adult daughter, her husband, and three children. Household 4 was a single, middle-aged son and Household 5 was composed of an adult son and his wife, both in their 30s. Three fish camps

CASE EXAMPLE C

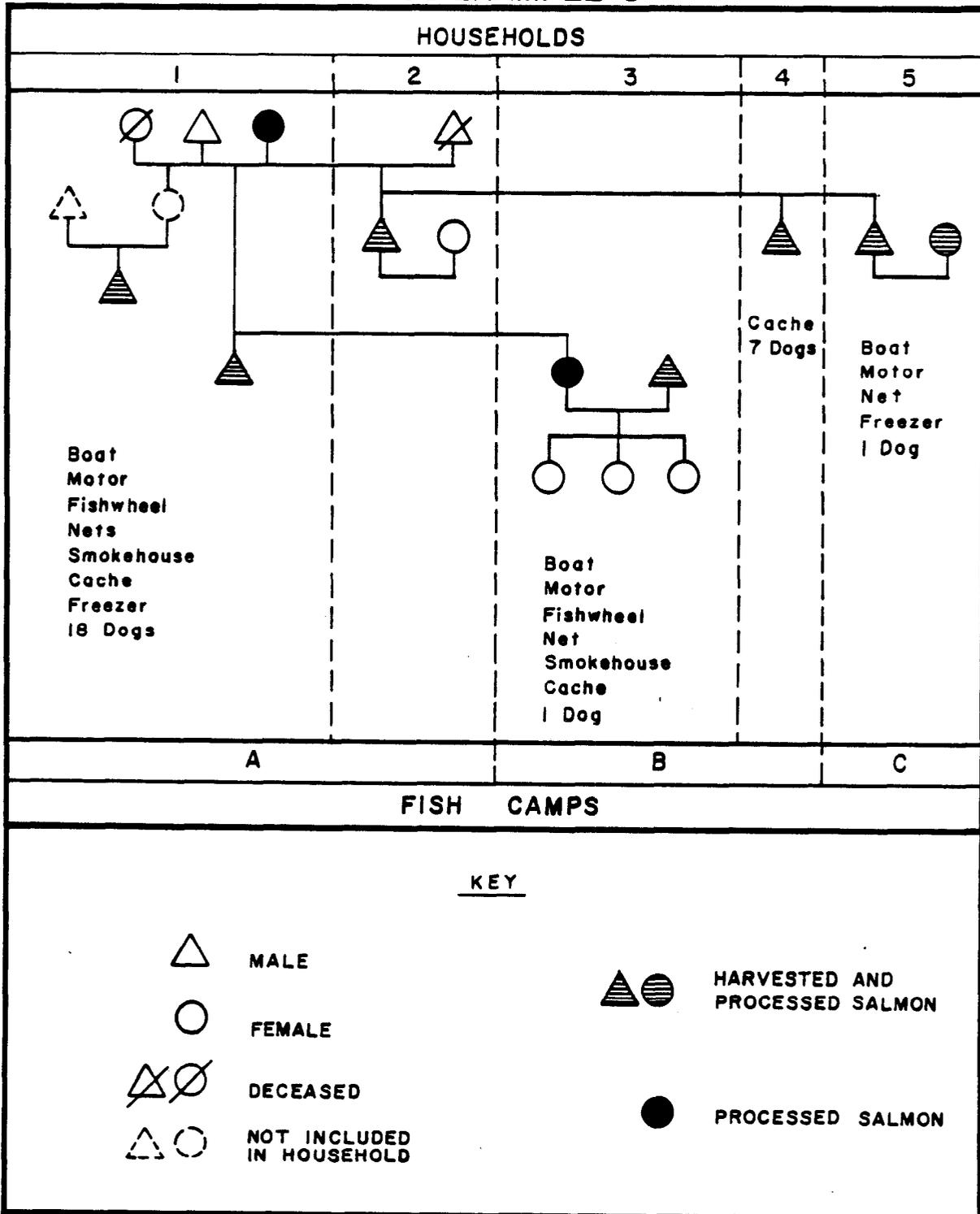


Fig. 27. Salmon Fishing Group Case Example C.

were maintained by this group of five households and members of each household assisted family members working at other camps.

The oldest and primary camp, Fish Camp A, belonged to the parent Household 1. This well-established camp consisted of a cook tent, a number of wall tents for sleeping, cutting tables, fish racks, and a smokehouse. Fish Camp A was set up during the last week of June and was maintained until mid-September. Household 1 had a boat, motor, fishwheel and nets, as well as caches and a freezer located in the village. The household had a team of 18 dogs. Assisting at this camp was Household 2. This couple helped set up camp and participated in the early part of the king salmon harvest. Households 4 and 5 periodically assisted at Camp A throughout the salmon fishing season with tasks such as moving the fishwheel or checking nets.

In 1984, Household 3 established a new fish camp (Fish Camp B) a short distance from Fish Camp A. This household had fished with the parents at Camp A in previous years. Fish Camp B was occupied for approximately one month during king salmon season. Household 3 had a boat, motor, fishwheel, net, and smokehouse. Also resident at this new fish camp was the single member of Household 4. Household 4 did not own any equipment for salmon fishing but maintained a cache in the village and had a team of 7 dogs. Members of Household 1 and 5 helped out at Fish Camp B with tasks such as moving their fishwheel.

A third fish camp, C, also was established that year by Household 5. This camp was located about 20 miles from the village and was maintained from late June to August. Household 5 had a boat, motor, and used a net to harvest king salmon.

During late-summer and early-fall chum salmon fishing, members of Households 1, 4, and 5 fished together from Fish Camp A to provide for the 26 dogs owned between the three households. The total subsistence salmon harvest between these six households was approximately 657 king salmon, 1,659 chum salmon, and 14 coho salmon.

All the salmon harvested at Fish Camps A and C were stored in caches and sheds located behind the residence of the parent Household 1. Salmon were taken as needed from these caches by Households 1, 4, and 5. Household 2 received fish periodically from this source. A portion of this harvest was distributed to other households in the community and was shared at community potlatches. The king salmon harvested at Camp B were stored in caches of Household 3 and were also shared with Household 4 and other village households.

Distribution of Salmon Harvests

The distribution of salmon takes several forms in Stevens Village, some of which were described in the case examples of fishing groups. King salmon in particular plays a significant role in the networks of distribution and exchange in the village.

Salmon harvests were shared between households that worked together in fishing and processing activities. This type of distribution operated in a few, different ways. When a fishing group consisted of an older, parent household and one or more newer households composed of adult children of the parent household, the fish were often stored or cached by this parent or core household. Usually this occurred because the established core household had the

facilities for storage such as caches or freezers. The other households that participated in fishing had access to the fish and used it as needed. This was commonly done with salmon used to feed dogs.

In other instances, usually with households that do not have as close a kinship relationship or when the peripheral households assisted minimally or for a short period of time, fresh or processed fish are "given" to the household either during fishing season or later in the year. An example of this type of exchange involved a member of one household assisting a related household in moving and setting up a fishwheel in return for some fresh salmon. In another group, a member of the household of an adult son assisted the parent household in processing king salmon and received backbones and roe to feed dogs during the fishing season and eventually received some "strips" and "dry fish" later in the year.

Both fresh and processed salmon were also given to relatives, friends, and elders who were not involved in the harvest and processing of fish. Salmon were always contributed to funeral and memorial potlatches and at community-wide holiday potlatches. Some households that do not have the equipment, time, or ability to participate in salmon fishing purchased fresh or processed fish. "Split fish" and other forms of processed chum salmon used for dog food were traded or sold to village residents and residents of neighboring communities. Salmon were also exchanged with residents of other communities for resources not readily available locally. For example, one Stevens Village household traded dried king salmon for

fresh blueberries from a Minto household. In another case caribou meat was obtained from an Arctic Village household in exchange for processed salmon.

FRESHWATER FISH

The harvest of freshwater fish species was a significant part of the traditional seasonal round of Stevens Village residents and has remained an important component of current subsistence harvest activities. The species utilized in Stevens Village include: broad whitefish (Coregonus nasus), humpback whitefish (Coregonus pidschian), least cisco (Coregonus sardinella), Bering cisco (Coregonus laurettae), sheefish or inconnu (Stenodus leucichthys), northern pike (Esox lucius), burbot (Lota lota), longnose sucker (Catostomus catostomus), Arctic grayling (Thymallus arcticus), and Dolly Varden (Salvelinus malma).

Twenty-four households or 80 percent of all households harvested some type of freshwater fish during the survey year (see Fig. 8). Various species of whitefish were the most commonly harvested followed by northern pike, sheefish, burbot, suckers, and grayling (see Fig. 28 and Table 13). Freshwater fish accounted for nine percent (by weight) of the total community harvest of all resources (Fig. 9). Many of the freshwater species were available year-round and fishing took place from about March through November. Harvest methods varied according to the season and conditions. Freshwater fish were used for human consumption although a large proportion of the harvest went to feed dogs (Fig. 11). Fish are also used as trapping bait.

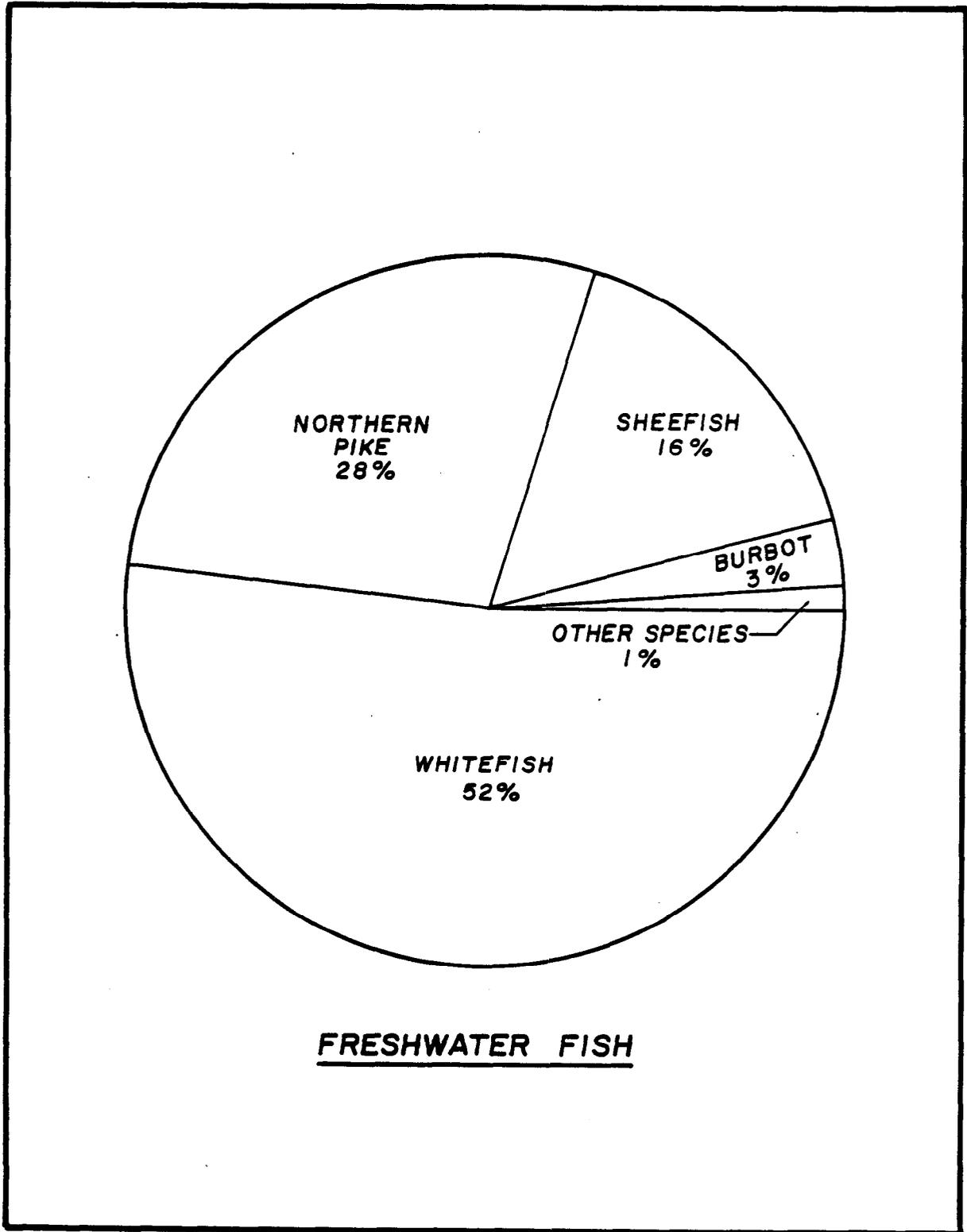


Fig. 28. Composition of Freshwater Fish Harvest by Weight.

TABLE 13. PARTICIPATION AND HARVEST FOR FRESHWATER FISHING

Resource	Number of Households	Percent of Households	Range of Harvests	Total Number Harvested	Average Harvest of Successful Households
Whitefish (var. sp.)	22	73	10 - 725	2,511	114
Northern Pike	20	67	2 - 200	730	37
Sheefish	14	47	1 - 75	239	17
Burbot	12	40	2 - 20	80	7
Longnose Sucker	7	23	1 - 40	53	8
Grayling	1	3	-	5	5

Harvest Methods

The traditional annual cycle of the Koyukon included setting traps and nets for whitefish and suckers during summer months. This activity was undertaken by extended family groups. In the fall, camps were set up near lakes and tributaries away from the main river and basket traps were set for whitefish and grayling. To avoid damage, traps were removed before freeze-up and were later reset under the ice. After freeze-up keyhole traps were set for burbot and nets were set under the ice for whitefish and pike. Fishing for whitefish also took place in January and February. Movement to spring fish camps took place prior to break-up. After the ice went out, weirs and traps were set for pike, small whitefish, and suckers. When traps were carried off by high water, harvest for these fish continued with nets (Clark 1974:91-92, 1975:157-160; Zagoskin 1967:182; Sullivan 1942:65-66).

Traditional weirs, keyhole and basket traps, gill nets, and other fishing implements used by the Koyukon are described in Clark (1974). Additional descriptions of the construction and use of basket traps by Koyukon and Gwich'in groups are provided in Sullivan (1942) and Osgood (1970).

Stevens Village elders can recall the use of funnel-shaped basket traps for harvesting whitefish and other species around freeze-up. One elder described the construction of a fish trap at Dall River in the fall. Willow poles were cut and driven into the streambed to form a fence across the creek. Additional poles of about one inch in diameter, were used to construct the funnel-shaped trap. The trap was placed with the opening upstream, facing the current. The funnel led to a holding pen approximately 2-1/2 to 3 feet wide and 6 feet long. As freeze-up progressed the water level of the stream lowered and fish would run downstream to the deeper water of the main river. At this time, pike and humpback whitefish were caught. Another elder described a similar technique but with a trap made from a net fashioned into a funnel.

Currently, most of the harvest of freshwater fish still took place from May through November. The contemporary seasons of harvest echo traditional activities as spawning migrations or localized movement of many of the freshwater species occurred in response to the seasonal changes in environmental conditions. Although a particular species of freshwater fish may be desired, many harvest methods result in a catch of a variety of species. This frequently occurred with the use of fish nets with 4 to 4-1/2 inch mesh, fish traps, and fish-wheels. The use of smaller mesh nets or hooking was often more

selective. After break-up during late May and early June, nets with 3 inch mesh were set for the smaller species of whitefish. A number of species were later harvested incidentally in nets and wheels during salmon fishing. Although an exact assessment cannot be made from the available data, it appeared that much of the reported harvest of freshwater fish was caught at this time. Pike were taken during open water months with hook and line or rod and reel although they were not harvested in large numbers by these methods. Nets were set in tributary streams for pike, whitefish, burbot, sheefish, and other species in early fall, prior to freeze-up. Fish traps were occasionally constructed to harvest freshwater species from tributary streams.

Once freeze-up has progressed to the point where the ice is thick enough to walk on nets were set under the ice in tributaries and sloughs of the Yukon River until extreme cold temperatures and the resultant thickened ice precluded the use of this method. A thorough description of the procedure of setting nets under the ice can be found in Nelson (1973:64-66). Burbot and grayling were harvested by hooking through the ice during early winter months and again in late spring.

The harvest of freshwater fish during summer and early fall months took place along the Yukon River in areas where salmon fishing is conducted (see Figs. 21-24). Fishing also occurred during open water season at Dall River, Little Dall River, and Lost Creek. Winter fishing activities also took place in these tributaries as well as in areas of the Yukon River such as Jackson Slough and the river channel on which the village is located.

Whitefish

Whitefish comprised 52 percent of the freshwater fish harvest (by weight) of Stevens Village households. Twenty-two households (73 percent) reported harvesting whitefish during the survey period and household harvests ranged from 10 to 725 fish. The total community harvest of all whitefish was 2,511 fish or 4,771 pounds useable weight. This comprised 5 percent of the total harvest of all resources.

Several species of whitefish occur in the Yukon Flats and are available throughout the year. Whitefish were generally the first fresh fish caught along the Yukon River in late May after the ice goes out. Humpback whitefish and the smaller ciscos were available at this time. Ciscos were caught with a net with 3 inch mesh size. In the past they were dried for later use and this processing method was still used by some households. Whitefish caught at this time were frequently shared with other households since they were the first catch of the spring. By the end of June the focus of fishing shifts to king salmon, although whitefish were caught in fishwheels and nets throughout the summer.

Prior to freeze-up in the fall as the water level lowers, nets were set in tributary streams to harvest whitefish running downstream after spawning. Fish traps were occasionally used for harvest at this time. As freeze-up progresses nets, usually with 4 to 4-1/2 inch mesh were set for humpback whitefish and other species of freshwater fish. Whitefish were used for human consumption and for feeding dogs. They

were used fresh, were processed by cutting and drying, and were frozen whole for later use. Some households used aged whitefish as trapping bait.

Northern Pike

Northern pike, often called "jackfish" locally, are found in streams and lakes throughout the flats. During the survey period, 730 pike were reported harvested by 20 Stevens Village households (67 percent). Household harvests ranged from 2 to 200 fish. Pike comprised 28 percent of the freshwater fish harvest by weight (Fig. 28). Of the 17 households reporting harvest methods, 14 used fish nets, 1 household caught pike in a fishwheel, and 2 households fished with hook and line.

Pike were traditionally harvested with fish traps set in streams. Currently, these fish were caught by hooking during summer and fall months, in fishwheels and nets during the chum salmon run, with nets in the fall both before and after freeze-up, and again with nets after break-up in spring. Pike are voracious predators and their long, sharp teeth make them difficult to remove from nets which can be damaged in the process. This fact provoked one resident to claim that a "bum" salmon eddy yielded mostly pike.

The Dall and Little Dall rivers, and Lost Creek, were areas frequently used for pike fishing. The Dall River has become a popular site for non-local sport fishing activities since the opening of the Dalton Highway (see Chapter 8).

Pike were used for both human consumption and dog food. Fish were eaten fresh and if frozen, were sometimes skinned before freezing. Fresh, dried, and frozen fish were used to feed dogs.

Sheefish

Fourteen Stevens Village households (47 percent) reported harvesting between 1 to 75 sheefish during the survey period. The 239 sheefish caught made up 16 percent of the freshwater fish harvest by weight (Fig. 28). Sheefish are resident year-round in the upper Yukon area and are found in the Yukon River as well as the larger tributaries. These fish migrate from wintering areas after break-up and proceed to upstream spawning areas throughout the summer. After spawning in late September and early October they move rapidly downstream to wintering areas (Morrow 1980:26-27). Sheefish, referred to as "connies" by some residents, were harvested throughout the summer and fall in fishwheels and nets. Sheefish were used fresh for human consumption by some households although most were used primarily for dog food. When harvested during summer months they were used fresh or were cut and dried for dog food. When caught during fall-time the fish were hung whole without additional processing, remaining frozen until needed. Some households used sheefish as trapping bait.

Burbot

Burbot, a freshwater species of the codfish family was known locally as "ling cod" or "lush." Twelve households (40 percent) reported catching burbot during the survey period. A total of 80 fish were harvested and household harvests ranged from 2 to 20 fish.

Traditionally fish fences and traps set in areas such as the Dall River were used to harvest burbot and other species after the ice formed during early winter months. During the study period they were harvested along with other species throughout the year. Harvest methods included: hooking through the ice during early winter and early spring, with whitefish nets in open water in late spring, with nets under the ice in late fall, and occasionally, in fishwheels along the main river during salmon fishing season.

Burbot were eaten fresh and the rich liver of this fish was highly prized and was considered especially desirable by elders. Burbot were also used to feed dogs and were sometimes hung whole and frozen for later use when caught during fall.

Longnose Sucker

Seven Stevens Village households (23 percent) reported harvesting suckers during the survey period and the total harvest was 53 fish. Local sources reported that suckers were used more extensively in the past when they were harvested in the spring with fish traps. Suckers were caught in fishwheels and nets incidental to salmon and whitefish harvests. Most were caught during late summer through late fall.

Occasionally, a fish was hooked during this time from local streams. Suckers were also harvested when ice fishing with whitefish nets. Though bony, these fish can be eaten but were more commonly fed to dogs.

Arctic Grayling and Dolly Varden

Local sources indicated that Arctic grayling are not common in streams in close proximity to Stevens Village but are found in the Ray River and other areas near the Dalton Highway bridge. During the survey period, only one household reported hooking five grayling through the ice. In the past, grayling were harvested in larger numbers with nets during the fall season and were dried for later use. Grayling were still harvested and used by Stevens Village residents but not to the extent of other species of freshwater fish. Grayling occasionally were caught in fishwheels and fish nets during salmon fishing season, when fishing with nets for other freshwater species, and by hooking through the ice.

Dolly Varden are present in some of the smaller, clearwater streams in the area. They were not actively harvested, although a few of these fish were also occasionally caught in fishwheels.

CHAPTER 5

HUNTING ACTIVITIES

This chapter describes the harvest and use of the large mammal species of moose, bear, and caribou, a variety of waterfowl species, and small game species of snowshoe hare, porcupine, grouse, and ptarmigan. Edible furbearing species such as beaver, lynx, and muskrat are discussed in Chapter 6.

Hunting occurred throughout the year although the availability and condition of a particular bird or mammal varied with the season. Hunting was, for the most part, a predominantly male activity although a few notable exceptions existed such as the participation of women in moose hunting. Young boys developed their hunting skills in pursuit of small game such as snowshoe hares, muskrat, and grouse. Children sometimes accompanied adult hunters on moose hunting trips.

During the survey year, 90 percent of the households in Stevens Village (27 households) participated in some type of hunting activity. Table 14 presents participation and harvest figures for various categories of birds and mammals which were hunted.

MOOSE

Moose hunting was often predominant among the many fall activities undertaken by Stevens Village households. Moose (Alces alces) were the most actively pursued large mammal species in the area and the hunting of moose was deliberate and sustained. A substantial amount of labor, time, and monetary resources were expended in the

TABLE 14. PARTICIPATION AND HARVEST FOR HUNTING
(EXCLUDING FURBEARERS)

Resource	Number of Households	Percent of Households	Range of Harvests	Total Number Harvested	Average Harvest of Successful Households
Moose	6	20	1 - 2	7	1.2
Black Bear	12	40	1 - 3	17	1.4
Brown Bear	2	7	-	2	1.0
Porcupine	3	10	-	3	1.0
Snowshoe Hare	17	57	2 - 50	206	12.1
Ptarmigan	6	20	2 - 32	49	8.2
Grouse	23	77	2 - 21	262	11.4
Ducks	21	70	3 - 150	442	21.1
Geese	22	73	1 - 30	158	7.2
Cranes	4	13	1 - 4	9	2.3

pursuit of moose. Moose hunting activities and the subsequent distribution and use of moose have considerable social and cultural significance in the community.

During the spring 1983 Board of Game meeting, a registration permit moose hunt was established for a portion of western GMU 25(D) in response to local and agency concerns about the low moose population in the area. Sixty permits were available to residents of GMU 25(D) and 25 permits each were issued in the communities of Beaver and Stevens Village and 10 in Birch Creek. The use of aircraft was restricted in the permit area and the bag limit was one bull moose. The following year, the permit area boundaries and season dates were adjusted, allowing three open hunting periods in September, December, and February (Appendix A). This system was in place during the survey year.

Participation and Harvest

During the survey period, 20 percent of all Stevens Village households successfully harvested moose. Unlike other activities where participation in an activity almost assured at least a minimal level of harvest, moose hunting was undertaken by far more households than were successful. The following year, during the 1984-85 hunting season, 20 households (67 percent) participated in hunting though only 10 households or 33 percent successfully harvested a moose. The success rate among those who hunted was 50 percent.

Hunting parties commonly consisted of two or three related individuals, such as father and son, brothers, or spouses. For example, 54 percent of the hunting parties from Stevens Village during fall 1984 consisted of father-son or sibling combinations, while 31 percent included spouses. On occasion an individual went out unaccompanied in pursuit of moose.

During the fall 1984 season, 32 individuals from 20 households formed 16 hunting groups. In a few cases, individuals hunted in more than one group during the course of the hunting season. Young, inexperienced hunters often accompanied an older, knowledgeable hunter. Four women participated in hunting, each accompanied their spouse.

During the survey period (September 1983 through August 1984), seven moose were reported harvested by Stevens Village hunters and the average household harvest of moose by weight was approximately 163 pounds, comprising about five percent of the total community harvest (Table 5). During the 1984-85 season, ten moose were harvested during

the three open hunting seasons: five during the fall season, two in December, and three in February.

Conditions Affecting Moose Hunting

The seasonal movement patterns of moose have been important factors in the harvest of moose. Local residents described the following patterns of the seasonal movements of moose in the area. After the fall rut, most moose moved from the lowland areas of the river and surrounding flats into the foothills where there was good browse and adequate cover. The animals remained in these areas during late October and November. During mid-winter months the moose began to move from the foothills, returning to the flats. This movement occurred from as early as December until February, usually in response to heavy snowfall in the uplands, which created difficult travel and poor browse conditions for the animals. Moose were then found scattered throughout the flats, along streams, and on the islands of the Yukon River. After break-up in May, they dispersed and fed around lakes and meadows, and along creeks and rivers through the summer until the onset of the fall rut in late September. As animals began to prepare for the rut, movement to the main river corridor occurred. At this time, moose were frequently seen along the river banks feeding and watering during early morning hours and again at dusk.

This pattern varied with yearly changes in environmental and climatic conditions. Recent studies on seasonal movement patterns and distribution of moose based on radio-telemetry data revealed patterns similar to those reported by local residents, although findings

indicated that there were two distinct moose populations found in the area: a resident population that remained relatively localized and a migratory population which traveled extensively from the flats into the surrounding hills (Roy Nowlin pers. comm., 1985).

Koyukon Athabaskans traditionally harvested moose throughout the year (Nelson et al. 1982:28). The condition of moose undergoes seasonal changes and is affected by the age and sex of the animal. Preferences for certain qualities and the ability to preserve the meat were factors which partially dictated when the animals were hunted. Cow moose were generally considered good year-round, and barren cows were especially favored, as they retained their fat throughout the winter. The quality of bull moose was good up to the early part of the fall rut while the animals were still fat and did not have the characteristic strong taste and odor they later developed. In the early fall, meat could be dried and the condition of cow moose hides was considered optimal for use in sewing boot bottoms (Nelson et al. 1982:28). By late fall, the meat could be preserved by freezing. By mid-winter, a fat cow was targeted as a source of fresh meat while only certain parts of bulls were considered edible. Bulls were considered good again from about February until the following fall. Although moose were not considered in optimal condition during the spring, animals harvested at this time were readily preserved by drying and hides were better for certain types of clothing (Nelson et al. 1982:28).

In the recent past, when trapping was a more profitable enterprise, fall moose hunting commonly occurred close to an individual's trapline, and the trapping cabin or camp served as the

base of fall moose hunting operations (Schneider 1976:93). Hunting and trapping continued throughout the winter and into spring, until after break-up. Spring hunting camps focused on the harvest of waterfowl and muskrat, although moose were harvested opportunistically, or if other resources were unavailable.

Fall Hunting Methods

Currently, Stevens Village hunters concentrated most of their moose hunting activities around the fall rut when moose were present in areas accessible by boat and when the animals were less sedentary. At this time moose were usually found along rivers and sloughs and on the many islands of the Yukon River. They were also found around lakes accessible on foot or by short portages. Moose were particularly active at this time and bull moose were still in good condition and could be "called." Weather conditions were not as significant a factor in moose hunting in the fall as during other times of the year but temperatures were usually cool enough to prevent meat from spoiling.

September was also an important month for securing the first of the household's winter wood supply. Wood cutting was often conducted upriver, where suitable stands of timber can be found along the banks of the main river and moose hunting was often conducted in conjunction with wood cutting activities, since it allowed efficient use of time and fuel. Wood cutting camps and trapping cabins along the river were sometimes used as the base for moose hunting activities.

Aluminum riverboats with outboard motors were used by most hunters. Boats ranged in length from 12 to 20 feet, the most common being 16 and 20-foot boats powered by outboard motors of between 18 to 75 h.p. Canoes were sometimes used when hunting moose as they enabled hunters to check areas such as large lakes in the flats or creeks and sloughs with low water levels which were not readily accessible by foot or with the larger, motorized riverboats. A canoe was essential when a moose was spotted across the marshy flats or on the other side of a lake. A few hunters without boats walked to nearby lakes and meadows in search of moose.

Stevens Village hunters traveled up to 90 miles upriver to the village of Beaver in search of moose. Fig. 29 depicts areas used for moose hunting during the ten year period from 1974-84. Hunting effort was often focused along sloughs and islands upriver from the village to Purgatory and Marten Island. Moose hunting was also conducted around Dall River and the upper reaches of "the canyon" below from Stevens Village. Residents traditionally hunted around the Ray River but since construction of the Trans-Alaska pipeline use of this area has diminished. Hunting is restricted in the utility corridor north of the Yukon River and use of firearms is prohibited by state statute (A.S. 16.05.789).

Hunting trips ranged from a single day to about two weeks in the field. Typically, hunters were out only two to three days at a time. Sometimes hunters returned to the village each evening and, if unsuccessful, hunted for several consecutive days in this manner.

Two to three hunters frequently traveled together in one boat looking for moose tracks along the river bank or other signs such as

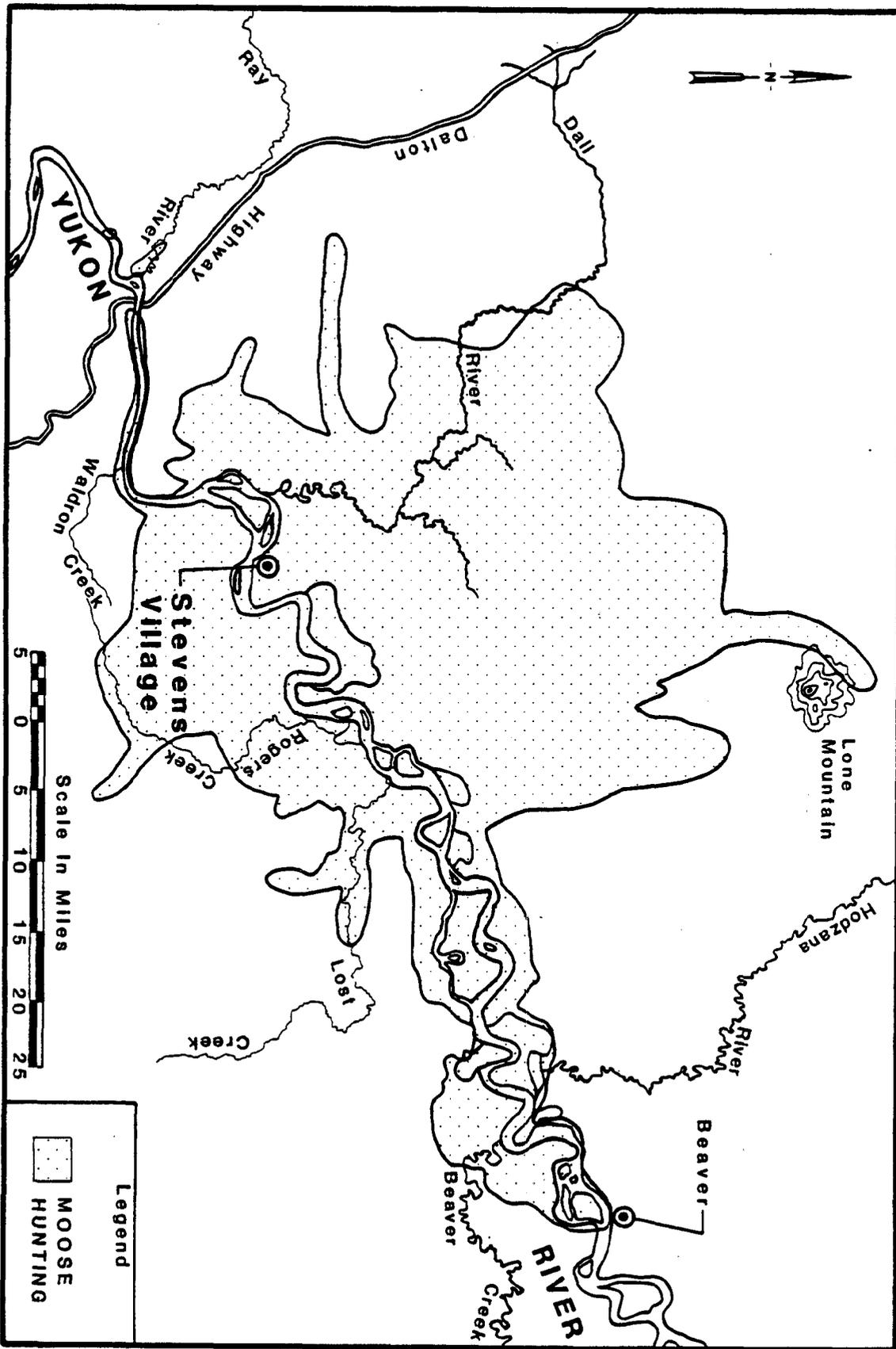


Fig. 29. Areas Used by Stevens Village Residents for Moose Hunting, 1974-84.

broken willow branches or scraped bark that indicated a nearby moose. As hunters traveled along the river, they stopped periodically to check specific islands, meadows, lakes, trails, or stands of willow where moose had been spotted in the past or were likely to be seen. If any sign of a moose was found, hunters searched the area more intensively. Occasionally, a group of hunters participated in a moose drive. During the fall rut, moose were frequently spotted along the banks of the river from boats. Generally, hunters did not search for moose more than one-half to one mile from the river to avoid the arduous task of packing a moose any greater distance (Caulfield 1983:55; Schneider 1976:93).

A moose scapula from a previous kill was sometimes dried and carved to create a "moose call." The scapula was drawn lightly against trees or brush to create a sound similar to that of a bull moose raking its antlers against willows. Bull moose hearing the "call" interpreted this as a challenge from a rival moose and appeared in the area where the sound was made. Other loud noises, such as those made at a wood cutting camp, also drew moose to the area. Some hunters made vocalizations imitative of a cow moose which attracted nearby bulls. Moose were reputed to have acute hearing and an ability to travel through brush almost soundlessly. These characteristics were important in the "calling" of moose, when a hunter must remain especially alert.

Winter Hunting Methods

Later, hunters adopted the different hunting strategies and tracking techniques that were better suited to the winter climate and conditions. Winter hunting was often conducted along with trapping activities although moose hunts were also conducted separately and both individuals and groups participated in winter hunting.

Hunting was not actively pursued during mid-winter when daylight was short and temperatures were extremely cold. After the solstice, as days lengthened and moose began to move onto the flats and river valleys, hunters were again more active. Windy or even stormy weather conditions were preferred during winter hunts as they functioned to mask the sounds hunters made while stalking moose. Snowmachines or dog teams were used for travel to winter hunting areas, while tracking and stalking moose was generally done on snowshoes or on foot.

Hunters searched for tracks in areas where moose were likely to be found, such as in willow stands where they would feed. If tracks were spotted, the age of the tracks and the direction of travel were determined. Hunters attempted to travel parallel to the tracks, careful to remain downwind of the animal, which could readily detect human scent. When a moose was ready to bed down, it would often double back downwind from its direction of travel, a maneuver that allowed it to pick up the scent of any predators that were following. This knowledge enabled the careful hunter to avoid detection during the stalking of the animal. When the hunter was within shooting range, he made a noise which alerted the moose to his presence and caused the animal to rise and look around, a move that allowed the

hunter a clearer shot. Nelson (1973:100-106) presents an excellent description of winter hunting in another Yukon Flats community.

A moose drive was another strategy used during winter hunting and a group of three or more hunters was needed to implement this technique. Hunters searched for moose sign in areas the animals were likely to frequent, such as on islands or in stands of willow. When tracks or other sign were found, hunters carefully assessed the surrounding terrain to determine directions of trail systems and possible "escape" routes. Older hunters familiar with the area often played a key role in making these determinations. Individuals were then placed at strategic points along the perimeter of the area where the moose might emerge. One or two of the hunters followed the moose tracks on foot to flush the moose out towards the companions who waited to shoot the animal (Nelson 1973:107-108).

Processing and Distribution

Stevens Village households utilized parts of the moose such as the head, stomach, intestines, liver, heart, and marrow as well as the meat, and bones. Butchered quarters of meat were usually hung in caches or smokehouses, preserved by freezing. Meat was sometimes processed as "dry meat" by cutting it into thin strips and allowing it to air dry. Traditionally, moose hides were tanned for sewing items of clothing. Presently, this was seldom done because of the time and labor involved and commercially-tanned moose hide was often used in sewing projects. Hides were still used for babiche or rawhide.

During the 1983-84 survey year, all successful moose hunters shared meat with other households. Moose meat was invariably given to elders in the community and was sent to relatives living in other areas. Moose was also considered an important food at funeral and memorial potlatches and residents expressed regret and dismay if moose meat was not available for such occasions.

BEAR

Bears are ubiquitous and abundant throughout the Yukon Flats. During summer months, when bears were frequently seen along the rivers, local residents commented on the presence of a bear on every island or around every bend. The preponderance of brown bears was considered by some locals to be a factor in the low moose numbers in that portion of the Yukon Flats. Although bear populations appeared to be healthy, local residents have noted fewer black bear around the Dall River, which they attributed to the increased use of the area by non-local recreationists who boated upriver from the Yukon River bridge.

Two species of bear occur in the area: black bear (Ursus americanus), and brown bear (Ursus arctos). A third type of bear, commonly referred to as a "cinnamon bear," is also found in the area. Taxonomically, these bears are considered by some to be a color variant of the black bear. Cinnamon bears have been described by local residents as larger in size than a black bear but smaller than a brown bear, leading some residents to consider it a cross between a black and brown bear.

Black bears are found in the forested areas of riverine lowlands and though brown bears also appear in these areas, they are more commonly found in the upland areas of alpine tundra. Both black and brown bears experience a period of winter dormancy from late fall until early spring and generally remain in sheltered dens throughout this period. On rare occasions, a bear may forage throughout the winter and a bear that does not "den up" is considered especially dangerous as it is probably lean and hungry and in search of food.

During the survey year 12 households or 40 percent of all village households reported harvesting 17 black bear (Table 14). Two households reported harvesting a total of two brown bears during this time.

Harvest and Processing Methods

The harvest of black bears took place in early spring, summer, and fall months. Black bears were frequently harvested during chance encounters or incidental to other activities such as fishing and moose or waterfowl hunting. In the past bears were hunted in the hills of the canyon below the village where they were more commonly found. Currently, bear harvests were focused along the main channels and sloughs of the Yukon River (Fig. 30). The hunting of brown bear was more prevalent in the past and they were no longer actively hunted. The reason for this change is not clear. One resident commented that only older hunters shot brown bears. A brown bear may be taken on occasion if it appeared near a fish camp, trapline cabin, or the village, where it endangered people or property.

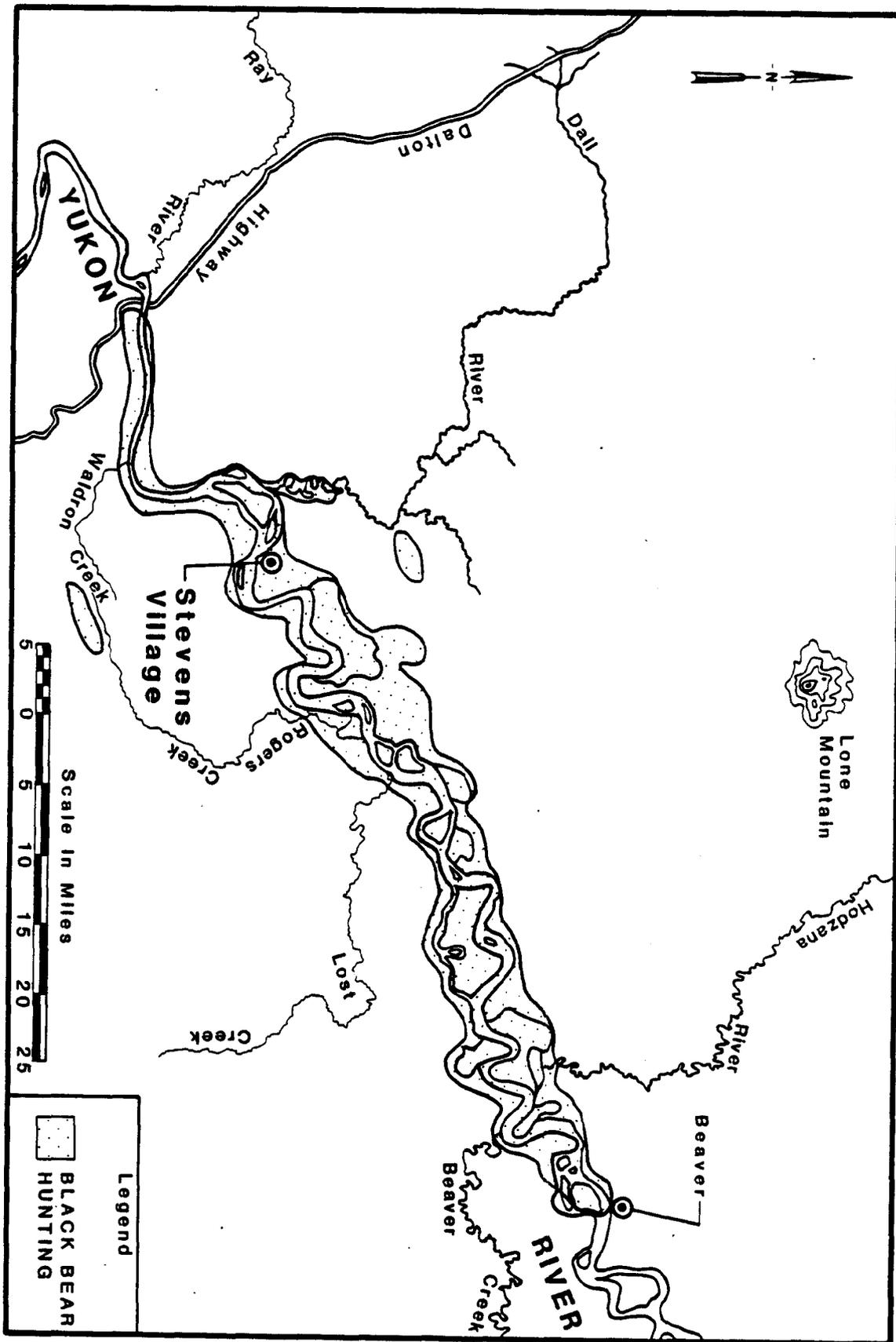


Fig. 30. Areas Used by Stevens Village Residents for Black Bear Hunting, 1974-84.

In the early spring during the first week or two after emerging from dens, bears are still tender from their remaining winter fat. Fresh bear meat is good at this time though not as desirable as in the fall. Once foraging activities begin bears lose their fat rapidly and are then considered too lean and poor for eating.

Although bears were not actively hunted in the summer, they were readily spotted along the rivers and creeks and in the hill country of the Yukon River canyon. During this season bears were harvested in the course of travel or during pursuit of other activities. "Nuisance" bears found near the village or fish camps were shot or snared as a safety measure.

Bears were considered especially good in the fall, after accumulating a thick layer of fat for their winter dormancy, the result of a diet consisting primarily of berries. At times, up to four inches of fat develops along their backs. Den hunting was sometimes undertaken during fall and early winter though not as frequently as in the past when hunters used to do more overland travel on foot both before and after freeze-up and were more likely to come across bear dens.

When bears prepare their dens during September and October, hunters can locate denning sites before the first snowfall by noting disturbed areas where the ground has been dug up and where leaves, grass, and moss have been scraped and removed. Dens are excavated from the ground or in riverbanks but can also be natural shelters created by fallen trees or the tree roots of partially downed trees. Dens are lined with grass, moss, leaves, and other materials, and once

the bear enters the den for the duration of the winter, the entrance is closed off with similar materials.

Although snow camouflages evidence of dens, often after an early snowfall, bears can be tracked to their denning sites. "Old-timers" reportedly searched for bear dens along riverbanks during fall and early winter, looking for the steam from the bear's breath which emanated from the air hole in the roof of the den.

When an occupied den was found the hunter noted the location and returned later with others. Hunters blocked the entrance to the den with poles and brush, leaving a small opening. If the bear could be seen from the entrance it was shot through the opening in the blocked entrance. Otherwise, the bear was disturbed by prodding it with a stick and was shot as its head appeared at the entrance. Another method was to securely block the entrance and chop a hole above the bear in its den, shooting it from that position. A detailed description of Koyukon bear hunting methods is presented in Nelson et al. (1982:46-47).

After a bear has been killed, the den must be thoroughly cleaned out and the grass and other materials used to line the interior of the den were removed. This was done so that the den appeared unused and assured that another bear would occupy it the following year. Marking or disturbing the area in any way resulted in future avoidance of the site by other animals.

Black bear meat was preserved by smoking, drying, and freezing. Meat was often hung in the household smokehouse, which helped to preserve it. "Dry meat" was prepared by cutting thin strips of meat and allowing it to air dry. One household reported making sausage

from bear meat. The use of brown bear meat for human consumption was relatively uncommon. Black bear meat was shared with other households, especially with village elders. Bear meat was also used at potlatches.

The fat of bears was highly prized and in the fall, it was rendered into bear grease or tallow. The grease was used in cooking and was an ingredient in "Indian ice cream," a mixture of berries, sugar, and some type of fat. Bits of fish were sometimes added to this dish. The grease was also used when eating dried meat or fish. Bear fat or grease was also shared with other households.

Bear hides were occasionally kept for household use and were still sometimes used as bedding as they were in pre-contact times (Clark 1974:19). They were considered to be the most waterproof of skins.

CARIBOU

During the survey period, Stevens Village hunters did not harvest caribou (Rangifer tarandus) although at least two households hunted for caribou in the hills northwest of the community. The only known harvest in recent years occurred during the winter of 1981-1982 when a local hunting party harvested three caribou.

In the past, caribou were more readily accessible to Stevens Village residents than they are currently. The fall migration of caribou from what is now called the Forty-mile herd brought them in the vicinity of Stevens Village during the first half of the century (Skoog 1968:271, 275, 291).

Village elders recalled that families historically followed the caribou during these migrations, traveling great distances over rugged terrain. Even in more recent times during the 1930s and 1940s, large numbers of caribou moved through the area and were harvested by Stevens Village residents. Residents reported that caribou used to cross the Yukon River downriver from the village as they headed for the White Mountains to the south of the Yukon. This crossing took place in early fall, usually in the vicinity of Waldron Creek. The animals continued their movement in a wide arc, heading north across the Yukon River further upriver. A village elder reported that during the 1930s, caribou crossings in the canyon between Stevens Village and Rampart created problems for steamboat traffic. Since the 1940s, the migration routes of the caribou have shifted and the animals have not been found in such close proximity to the village.

Hunters also used to travel to Dall Mountain and the Kanuti Flats in pursuit of caribou. A resident who trapped in the vicinity of Dall City reported that caribou were present during the late 1960s. Caribou were still found occasionally in the upper reaches of the Dall River and around Dall Mountain and to the west in the Kanuti Flats. These animals may be part of the Western Arctic caribou herd, as portions of this herd have been documented migrating through the Kanuti Flats in recent years (USFWS 1987a). A small, localized herd of caribou are also found in the Ray Mountains to the west of Stevens Village and animals from this herd are sighted occasionally by trappers (Farquhar and Schubert 1980:243; Roy Nowlin pers comm. 1986). A 1985 population estimate for this herd was 1,500 animals (Valkenburg 1985). Caribou thought to be from the Porcupine Herd

occasionally appear around Caribou Bar, the location of an old mining camp on the Upper Hodzana River.

Currently, caribou were taken infrequently by Stevens Village residents, primarily because of the absence of caribou in the community's hunting territory and the great distances to available caribou populations. In recent years, hunters have traveled to Dall City specifically looking for caribou during winter months, but animals were seldom found and harvested.

WATERFOWL

The Yukon Flats is one of the most productive waterfowl breeding areas in North America. The abundance of water not only makes it an important stopover for birds migrating farther north and west, but also provides nesting and molting grounds for those that remain. The establishment of the village at its present location has been attributed in part to the presence of the numerous lakes that provided prime habitat for waterfowl and other wildlife.

A variety of waterfowl was available to residents of the flats. Commonly used species include: Canada goose (Branta canadensis), often referred to as "honkers", greater white-fronted goose (Anser albifrons), sometimes called "speckled goose" or "speckled-fronted goose," snow goose (Chen caerulescens), mallard (Anas platyrhynchos), northern pintail (Anas acuta), American wigeon (Anas americana), greater scaup (Aythya marila), lesser scaup (Aythya affinis), green-winged teal (Anas crecca), canvasback (Aythya valisineria), oldsquaw (Clangula hyemalis), white-winged scoter (Melanitta fusca),

surf scoter (Melanitta perspicillata), and sandhill crane (Grus canadensis).

Seventy percent, or 21 Stevens Village households, reported harvesting a total of 442 ducks during the survey year (Table 14). A total harvest of 158 geese was reported by 22 households and 4 households indicated harvesting 9 cranes during the survey period. Waterfowl harvest accounted for approximately 2 percent of the total community harvest by weight.

Harvest and Processing Methods

Waterfowl begin to arrive in the flats in April and early May when longer days and warmer temperatures cause snowmelt and thawing, resulting in meadows cleared of snow and shallow ice-free lakes. Ducks and geese make their appearance when supplies of previously harvested fish and wildlife have often been depleted and they are usually the first fresh meat available in abundance after the long winter, arriving well in advance of the coming salmon run. The timing of different species varies and certain species like the white-fronted goose appear early in the spring while scoters arrive in June. Ducks and geese that nest in the flats are available throughout the summer while other species are only present for a short period of time before they continue their journeys to distant nesting sites.

In earlier times, waterfowl were harvested with bows and arrows or snares (Nelson et al. 1982:52). They were also easily captured by hand during summer molting. Duck eggs were also collected though this activity is no longer pursued. Until recently, families traveled to

productive lakes out on the flats where they set up spring camps for the harvest of muskrat and waterfowl.

Residents of the flats greet the arrival of waterfowl in the spring as enthusiastically today as they did in the past. Lakes, ponds, and sloughs throughout the flats are usually ice-free before break-up of the Yukon River and the open water in these areas attracts the migrating birds. During early spring hunting was pursued in these areas. Hunters took advantage of the colder temperatures of night to travel overland on snowmachines to lakes and meadows known to be good waterfowl habitat and the birds were often harvested during the twilight of the early dawn. As the season progressed and snow melted, hunting focused more along river corridors. Most hunting took place during April and May while the birds were still in good condition prior to nesting. This activity was frequently conducted by young adult men, individually or in groups. Scoters, known locally as "black ducks," were the last migrants to arrive and were eagerly sought because of their fatness. Some older residents lamented the scarcity of this favored bird during the past few years. Waterfowl were seldom taken during summer months when nesting took place. At this time other subsistence activities took precedence.

As fall approached, both adult and young birds began to appear in large numbers. Waterfowl harvest resumed again in August while hunters were traveling along the river or during the pursuit of other fish or wildlife. Ducks and geese were not as actively pursued as in the spring as fewer species were available, the birds were not in as good a condition, and other activities predominated. As lakes and marsh areas in the flats began to freeze, the birds that nested in the

flats moved out onto the river, remaining until freeze-up. Some migrants from further north also returned to the area in the fall. The fall hunting period lasted through September and some years into October.

Waterfowl hunting was pursued around the many lakes and sloughs in the flats north of the village and along gravel bars found on the main river. King Slough, Moose Island, and Marten Slough were considered good places to hunt waterfowl. Hunters traveled upriver to Beaver and the lower mouth of Birch Creek in pursuit of ducks and geese (Fig. 31). Non-locals hunters often hunted geese in the vicinity of Dall River during September.

In the past birds were plucked, gutted, singed, and hung to dry for later use. During the study period, ducks and geese were used fresh and were cooked in soups or roasted. Freezers were used to preserve birds during warm weather seasons. Birds were frequently shared with other households, hunters often gave them away upon returning from a productive hunt. Invariably, duck soup was prepared and served at potlatches.

Populations of ducks and geese seemed to fluctuate in availability and certain species were more abundant during some years. For example, scoters ("black ducks") had been scarce for a few years and one resident indicated the birds were now abundant around Birch Creek.

Local residents indicated that overall, waterfowl populations appeared to be declining in the area. Environmental changes were often cited as the reason for the decline. Spring floods, which occurred more frequently in the past, used to replenish water in marshes, sloughs, and lakes. Flooding has not taken place for a

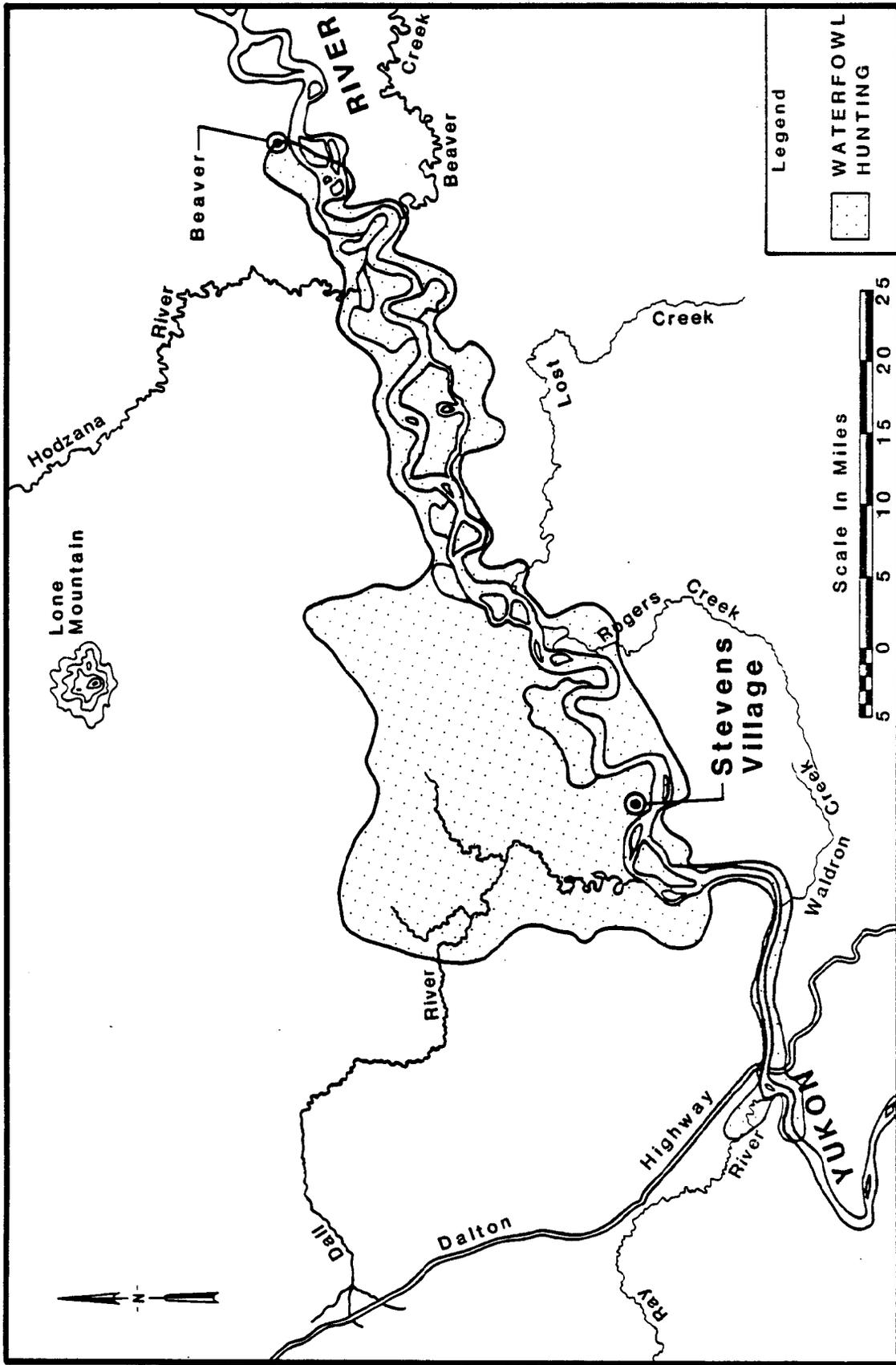


Fig. 31. Areas Used by Stevens Village Residents for Waterfowl Hunting, 1974-84.

number of years and this factor, combined with the low precipitation rates and the underlying permafrost in the area has created a drier, less favorable habitat for waterfowl, muskrat, and other wildlife. Areas that were once lakes, have developed into marsh, then meadow, then brushy stands of willow. Sandbars in the river eventually become islands of deciduous trees. Locals frequently commented on these changes and described productive "black duck" lakes or "ratting" areas that have been covered with willows. Similarly, sandbars where geese used to land have become covered with brush and were no longer used by the birds.

GROUSE AND PTARMIGAN

Three types of grouse and two species of ptarmigan were harvested by Stevens Village residents. All experience dramatic population fluctuations and at the time of the study ptarmigan were considered by locals to be scarce in the area. During the survey year, Stevens Village households reported harvesting 262 grouse and 49 ptarmigan (Table 14). Twenty-three households (77 percent) participated in grouse hunting, while only 6 households (20 percent) indicated they had harvested ptarmigan during the survey period.

Traditionally, snares were sometimes used for harvesting ptarmigan and grouse (Slobodin 1981:516). Currently, small-caliber rifles were often used to harvest these birds, which were found near the village or around trapping areas.

The harvest of grouse occurred during fall months, incidental to other activities such as moose hunting or checking "rabbit" snares.

These birds were commonly found feeding at berry patches or collecting grit along sand bars.

Spruce grouse (Dendragapus canadensis), known locally as "spruce hen," were commonly taken during early fall. They were often found feeding in the early morning during late August or September. During winter months these birds feed on spruce needles and by mid-winter their dark meat develops a strong flavor, thought by some to taste like spruce pitch and they are not as favored during this time. Spruce grouse were considered easy to harvest as they were not readily startled by human presence.

Ruffed grouse (Bonasa umbellus), referred to as "willow grouse," are also good during fall months, from September through November. These birds feed on high bush cranberries and willow leaves and buds. Unlike the spruce grouse, these birds have light-colored meat.

A third species of grouse, the sharp-tailed grouse (Tympanuchus phasianellus), is often called "pintail," (which should not be confused with the northern pintail duck). They are found in open areas such as muskegs or lakes where they eat aquatic vegetation.

Rock ptarmigan (Lagopus mutus) and willow ptarmigan (Lagopus lagopus) are more commonly found in the hilly, upland areas, although they migrate into forested areas along the river after the first snows (Nelson 1973:81). They often bury themselves in the snow and are difficult to spot. Ptarmigan were taken throughout the winter or in early spring as a source of fresh meat prior to the arrival of migrating waterfowl.

PORCUPINE

Porcupine (Erithizon dorsatum) inhabit wooded areas throughout the flats, with spruce and birch bark being a major part of their diet. Patches of gnawed bark often indicates the presence of a porcupine.

Porcupines were a highly desired but relatively scarce resource in the area. Like other animals, porcupine populations are subject to fluctuations. Local sources indicated they were now rare and appeared to be at the low end of their population cycle. Only three households reported harvesting porcupine during the survey period, with a total harvest of three animals.

Porcupines were not actively hunted but were harvested when seen, often during travel on the river or while conducting other hunting or fishing activities. They were most often killed by clubbing though they occasionally were shot with a low caliber rifle. Porcupine were frequently harvested during summer and fall months when the animals were especially fat.

Quills were generally singed off the porcupine before cooking and a common method of preparation was roasting. Older residents relished the rich meat of the porcupine, which was considered a delicacy. When available, porcupine was a cherished food for potlatches and porcupine meat was often shared with elders in the community when it was obtained.

Porcupine quills were sometimes carefully removed and kept for use in sewing craft items, such as earrings or other jewelry. Quills

traditionally were dyed with local pigments, flattened, and used in decorative sewing, in much the same way as glass beads are used today.

SNOWSHOE HARE

Snowshoe hares (Lepus americanus) are found throughout the Yukon Flats in forested and brushy areas which provide food and shelter. Locally referred to as "rabbits," these animals display dramatic cyclical fluctuations of abundance and scarcity in a cycle of approximately ten years. The population of hares affects the number of predators in the area, especially lynx. Local sources indicated that hare populations around Stevens Village had been low during recent years, but were gradually increasing. One household reported harvesting about 40 hares in the early 1980s while catching only one the following winter. During the survey period, 206 snowshoe hares were reported harvested. Fifty-seven percent of Stevens Village households (17 households) participated in this activity.

Hares may have up to three litters a year, accounting for their reputation as prolific breeders. A marked increase in population often seems to occur suddenly. One resident commented, "It's as if a big wind blows them in, or they drop from the air." The first litter, often born in May, is almost full-grown by September (Ernest 1978).

Hares were harvested primarily during fall and early winter months, October through December. They were shot with .22 caliber rifles during the fall, usually after developing their white winter pelts but before the first snowfall. Snare lines were set after the

first snowfall. Late in the winter, hares were considered too poor in quality to eat.

Older residents recalled setting elaborate spring pole snares to catch hares. Traditional sets for harvesting hares are described in Nelson (1973:140-141). Communal rabbit drives were undertaken by the Koyukon when hares were abundant (Nelson et al. 1982:139). These drives were often successfully conducted on islands or narrow points of land along rivers, but is uncommon today.

Currently, short snare lines were tended close to the village, particularly by young adult men and boys. Although many village women have had snare lines in the past, it did not seem to be common at present. Hares were often found as they feed on the tips of the freshly cut branches of willow and birch around areas where people have been cutting wood. Hares traveled over familiar trails which became visible after regular use and snares were set across or adjacent to these trails. Trappers also set snare lines at their trapping areas and occasionally caught hares in No. 1 traps set for marten. Snares constructed from commercially-manufactured picture hanging wire have replaced the traditional sinew snares. Snare lines must be tended regularly as hawks, owls, fox, marten, or other predators often eat hares caught in snares or traps before they are retrieved.

Hares were often cooked in soups and stews or were roasted. Their meat provided a change from moose meat or grouse and they were especially sought if these resources were unavailable. Hares were stored in caches or freezers for use during the winter. They were sometimes used for dog food.

The soft thick fur of the hare is reputed to be very warm, although the skin itself is paper thin and tears easily. Pelts formerly were cut into strips and woven together for clothing or blankets. Rabbit skins were readily tanned and were sometimes used as mitten or boot liners.

CHAPTER 6

TRAPPING ACTIVITIES

Furbearing animals were a part of local economies in interior Alaska long before the Euro-American fur trade era. Like other game species, furbearers were harvested with traps, deadfalls, and snares, methods that allowed the harvest of animals in the absence of the hunter (Nelson et al. 1982:55; Clark 1974:161, 164). The success of these techniques depended on a thorough knowledge of local conditions and characteristics and behavior of the animals (Nelson et al. 1982:55). Animal hides and furs were used for clothing and for trading with neighboring groups (Slobodin 1981:516; Nelson 1983:140). A few species such as beaver and muskrat were regularly consumed while others provided food when alternative resources were scarce.

Before the actual arrival of Euro-Americans in the area, both European and Native goods circulated through trade networks spanning Siberia to Canada. European goods were available through intermediary Indian and Eskimo groups prior to the development of trading posts during the first half of the 19th century (Loyens 1966:126; Helm et al. 1975:312; Webb 1985:21). The Koyukon maintained an important role in this aboriginal commerce (Clark 1981:595). By 1839 the Russian-American Company established a trading post at Nulato while the Hudson's Bay Company post at Fort Yukon was started in 1847. The competition between the two companies was instrumental in the increased emphasis on fur trapping by Native groups in these areas (Loyens 1966:128; Hosley 1981:548).

In recent times, trapping has remained the primary winter harvest activity in the Yukon Flats. The harvest of furbearers still provides an important source of cash income to village residents during a season of few wage employment opportunities, and supplies furs and meat for local use. The major furbearing species harvested by Stevens Village trappers included: marten (Martes americana), lynx (Felis canadensis), fox (Vulpes vulpes), mink (Mustela vison), wolverine (Gulo gulo), river otter (Lutra canadensis), wolf (Canis lupis), beaver (Castor canadensis), and muskrat (Ondatra zibethicus). Species such as the short-tailed weasel (Mustela erminea) and least weasel (Mustela nivalis) are caught occasionally but are rarely targeted because of their small size.

Marten, lynx, muskrat, and fox currently were the species harvested most frequently in the area. Composition of the harvest for the community as a whole may change from year to year because of variable participation of village trappers, fluctuations in animal populations, changes in their geographic distribution, or the targeting of certain species because of favorable fur prices.

PARTICIPATION AND HARVEST

Of the 30 households in Stevens Village, 70 percent reported that at least one person resident in the household was an active trapper. Five households or 17 percent reported having two or more trappers in the household. During the survey period, 21 households (70 percent) reported a harvest of at least one furbearing species by trapping or hunting. Six of these households participated exclusively in the

spring harvest of muskrats. Most trappers were adult males, the exception was one woman who reported participating in trapping activities with her co-resident partner.

Table 15 presents a summary of household participation and harvest of furbearing species. For the survey year, muskrat and marten comprised the greatest proportion of harvest by number of animals. The edible species (muskrat, beaver, and lynx), made up 1.4 percent of the total community harvest, by weight.

TRADITIONAL TRAPPING PATTERNS

During the 19th century the Yukon Flats became a principal area for trapping activities because the broad river valleys, marshes, and surrounding low-lying foothills were productive furbearer habitat and provided a relatively high return for the invested time and effort. The introduction of steel traps and rifles through trade networks enhanced the efficiency of furbearer harvest and led to an increased success rate for local trappers (Nelson et al. 1982:55-56).

During the late-19th and early-20th centuries the seasonal cycle for the Koyukon included travel to fall camps prior to freeze-up for hunting and fishing. Often, families transported their dogs and supplies by boat between mid-September and early October (Sullivan 1942:60; Clark 1974:138, 1975: 156, 158-159). This was followed by movement to semi-permanent winter settlements usually located a short distance from fall fishing sites. The semi-subterranean dwellings used during winter were later replaced by log cabins around the turn of the century. Entire families resided at winter settlements,

TABLE 15. PARTICIPATION AND HARVEST FOR
FURBEARER HUNTING AND TRAPPING

Resource	Number of Households	Percent of Households	Range of Harvests	Total Number Harvested	Average Harvest of Successful Households
Muskrat	16	53	4 - 208	950	59.4
Marten	14	47	3 - 130	432	30.9
Fox	9	30	1 - 15	40	4.4
Lynx	8	27	1 - 7	26	3.3
Beaver	4	13	1 - 6	14	3.5
Mink	3	10	1 - 5	8	2.7
Wolverine	1	3	-	4	4.0
Otter	1	3	-	1	1.0

contributing to harvest activities. Trapping of furbearers usually began in November (Sullivan 1942:60, 66-67; Clark 1974:91, 1975:158-159). Later, families left winter camps and gathered for mid-winter festivals and celebrations. During this time visits with Eskimo trading partners were made. This was followed by extended hunting-foraging-trapping trips by the families. In April, families relocated to spring "rat" camps on lakes known to be productive muskrat habitat (Clark 1981:589; Sullivan 1942:124). This general pattern remained intact during the first half of this century.

CONTEMPORARY TRAPPING PATTERNS

Currently, trapping is rarely, if ever, undertaken in the manner described above although it remains a significant part of the seasonal pattern of harvest activities in the area. Changes in the traditional pattern have resulted from the use of snowmachines rather than dog

teams, the mandatory requirement that children attend school during winter months, the increased availability of wage employment relative to the early 20th century, fluctuations in the fur market, and in general, a greater orientation to the village as a base of activities.

Participation in trapping in any given year is affected by the interaction of a number of factors. These include environmental conditions such as snowfall, temperature, and the availability and distribution of each species, as well as fur prices, wage employment opportunities, available cash, and other responsibilities in the village.

The level of involvement in trapping varied between households. One weekend trapper had only a few marten sets a short distance from the village, easily reached on foot. Another trapper traveled weekly to his trapping cabin 40 miles from the village. From there he worked several traplines with a total of over 200 traps. His lines covered a variety of terrain and different sets were made for each of the many species in the area.

An important aspect of trapping which remained intact from earlier periods, was the recognition of individual trapping areas conveyed or inherited through family lines. Specific areas were often associated with families who had used the area historically. These were areas where older residents were raised at a time when families moved to winter camps for the entire trapping season. One elder in the community trapped along trails originally cut out by his great grandfather and his sons currently trapped in various portions of the area. Most local residents were familiar with the general areas used for trapping by a specific individual if not the exact location of

their traplines. Implicit customary rights were associated with "ownership" of these areas and infringement on another's traditional trapline was generally avoided. The "ownership" of lines carried with it the responsibility to take care of an area, prevent overexploitation, and conserve resources for long-term yield. Trappers "rotated" use of lines in a manner similar to a farmer rotating crops, giving an area a rest for one or more years, which allowed the resident animal populations to build up before trapping was resumed again.

Another aspect of trapping which appeared to be unchanged was that the young adult males in the community often learned to trap from an older, experienced trapper, usually a close relative such as their father or uncle. In this way younger men learned about the specific area being trapped along with trapping techniques and animal behavior. This information was especially relevant as the younger man would someday inherit the trapping area.

In certain instances a trapper learned about another individual's trapline when a partnership was formed. When local trappers talked about the areas they had trapped, they were careful to specify ownership of the trapline. Partnerships were sometimes relatively permanent and longstanding while others were temporary in duration. Partners often maintained separate lines in the same general vicinity of one another. They may have helped one another check lines but usually kept their catches separate. During the 1983-84 trapping season, ten Stevens Village trappers reported having a trapping partner, most commonly a related individual.

Trading posts, which were still common in the first part of the century, no longer operate to subsidize trappers on credit in exchange

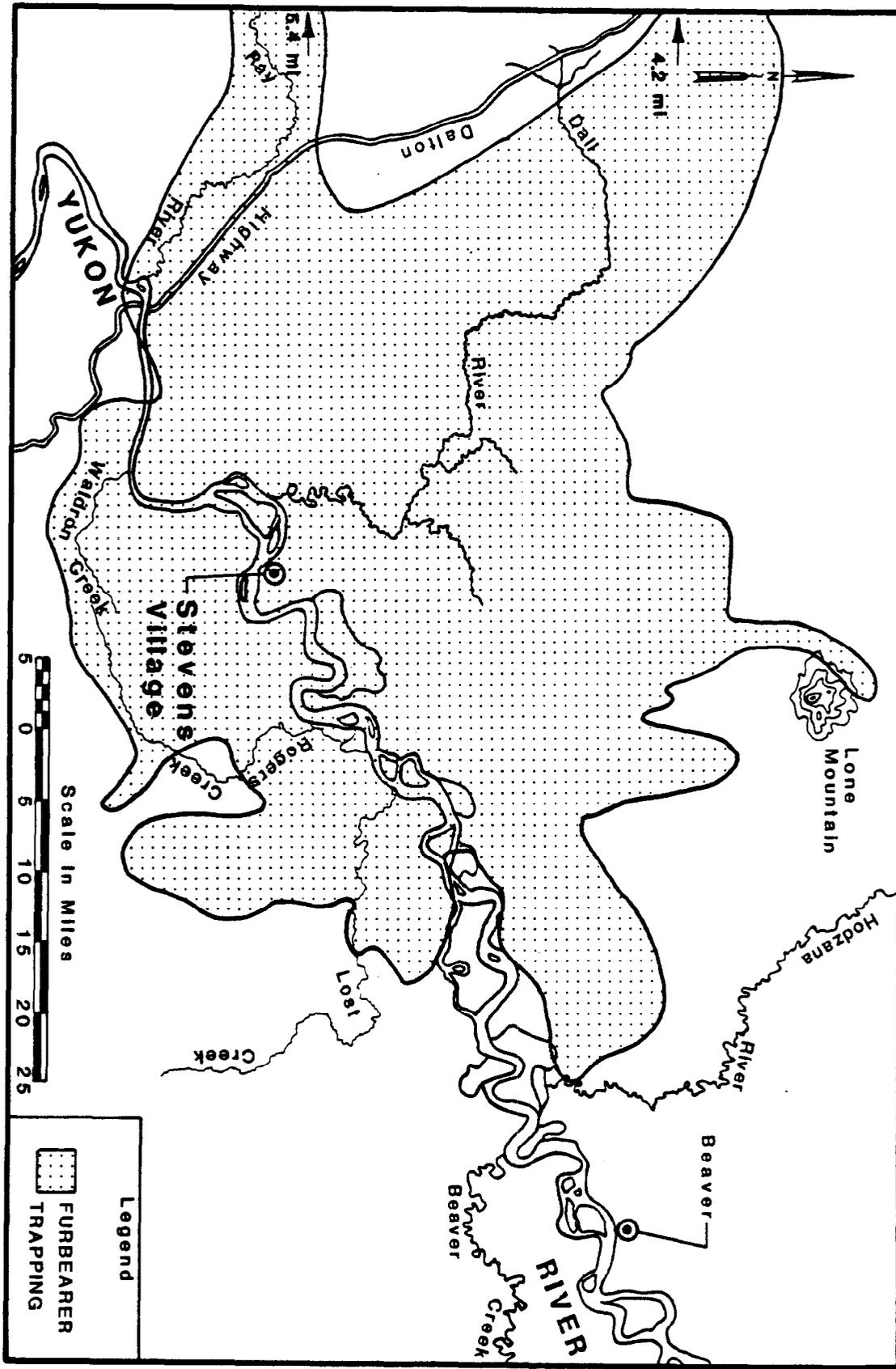
for their fur harvest. Instead, trappers sometimes shared expenses with a partner or were subsidized by another trapper with available cash in exchange for assistance in trapping activities. To undertake trapping required an initial cash outlay of up to several thousand dollars for the purchase of necessary equipment. Snowmachines were currently the main mode of transportation, and commercial traps and snares were used. Annual expenditures were made for equipment repair, fuel, and other supplies (cf. Wolfe 1979:215-218).

The Yukon Flats and the surrounding hills contain an extensive network of trails used in the winter along which are interspersed seasonally-used cabins and tent sites. Some trappers had several cabins and campsites throughout their trapping area. Often located at a distance that can be covered in a single day, they were convenient overnight stops when checking lines.

A prominent trail in the area is the controversial "Hickel Highway," locally referred to as the "winter road" or "cat trail." Originally a trapline trail of a long-time Stevens Village resident, during the 1940s a mining company encroached on the area, widening the trail and disrupting trapping activities. Later the trail was used by the FAA to haul heavy equipment. More recently it was used by oil companies prior to construction of the present-day Dalton Highway, located to the west of the village. At present, the portion north of Stevens Village was used by a number of trappers to reach their individual trapping areas.

Fig. 32 depicts areas used for furbearer harvest by Stevens Village trappers during the period 1974 to 1984. Trapping areas extended north to Lone Mountain, west up Dall River towards the

Fig. 32. Areas Used by Stevens Village Residents for Furbearer Hunting and Trapping, 1974-84.



pipeline and Dall City, south to Rogers and Lost Creeks, and east towards the mouth of the Hodzana River.

Maintaining equipment, repairing and setting up trapping cabins, clearing trails, and setting up lines occurred during late fall and early winter months, prior to or early in the official trapping season.

Once traplines were set up, most village trappers checked their lines once a week or every few days. A few trappers waited ten days to two weeks between trips. Depending on the distance to be traveled and the length of the line, tending the lines took from a single day to one week. Traplines near the village were often reached by walking, whereas snowmachines were used for travel to more distant areas. A common pattern reported by trappers during the winter of 1983-84 entailed spending one or two days each week checking lines. Fifteen trappers reported traveling an average of 40 miles round trip to their trapping areas. Round trip distances for individual trappers ranged from 3 to 80 miles.

Sets were baited with a variety of material, including "green" or slightly decomposed fish with a strong odor, often whitefish or chum salmon. Fish eggs, carcasses of other furbearers, bird wings, beaver castor, and commercial lures were also used as bait.

Beaver, lynx, and muskrat were commonly used for human consumption although these and other furbearer carcasses were sometimes fed to dogs, used as bait, or were discarded. Trappers used both homemade and commercial stretchers for drying furs. After drying, furs were stored until they could be sold to fur buyers. Most households kept

some furs which they home-tanned for use in sewing hats, mitts, mukluks, or parka trim.

Marten

Marten populations were reportedly healthy in the area around Stevens Village, and it was one of the main species harvested by local trappers. During the 1983-84 season, 14 Stevens Village household reported harvesting a total of 432 marten. Household harvest ranged from 3 to 130 animals.

Marten are found in forested areas throughout the flats and in the surrounding hill country, often in proximity to prey species such as hares and squirrels. Marten furs generally become prime during the early part of the winter as temperatures drop. They were targeted during November and December, but were trapped throughout the winter. Their furs begin to lighten in color and become less valuable as spring approaches. Various deadfall sets were used in the past to harvest this species (Sullivan 1942:91). Currently, No. 1-1/2 traps were the most commonly used for catching marten.

Marten prices during the past few years averaged \$40 ranging from \$20 to \$65 with a large, dark pelt commanding a higher price. The fur of this animal is both lightweight and warm, and was used by local skin sewers in hats and as trim on various craft items.

In the past, the meat of the marten was only eaten in the absence of other food resources (Sullivan 1942:94). One resident claimed that even dogs did not like to eat marten carcasses.

Lynx

Lynx are found in wooded and marshy areas in proximity to their favorite prey species, snowshoe hares. Populations of both hares and lynx are subject to extreme fluctuations, occurring in a cycle of approximately ten years. Lynx migrate to areas of abundant food resources. During the winter of 1984 lynx were found in close proximity to the village and one trapper indicated that the constant wood cutting around the perimeter of the village during winter months provided forage for snowshoe hares which in turn, attracted lynx. Local trappers indicated that lynx populations in the area had been low during the early 1980s but were starting to improve. Eight households reported harvesting 26 lynx during the survey period.

Deadfalls and snares made of twisted sinew or rawhide and baited with beaver castor, rabbit meat, or a piece of rabbit skin were used in the past to harvest lynx (Sullivan 1942:95). Wire snares or No. 2 traps were commonly used today. Aged whitefish or commercial lynx lure were two types of bait currently used. Some trappers believed that lynx were caught only when they wanted to be caught. These animals had a reputation for evading traps and walking through snares that were not properly set.

Lynx pelts become prime later in the season than do marten and are usually good in January and February. The high value of lynx pelts in recent years led to an average price of around \$300, making lynx one of the most sought-after species in the area. The leg skins were sometimes used locally to make mitts. Lynx meat was commonly eaten and was especially favored by older residents.

Fox

Foxes appeared to be one of the more abundant furbearer species in the area according to Stevens Village residents. Nine households reported harvesting 40 fox during the 1983-84 season. Favored prey species of fox included muskrat, hares, and squirrels. Foxes were reputed to follow trapline trails and steal bait or carcasses from traps or snares. Currently, trappers used snares and No. 1-1/2 traps along trapline trails or near muskrat houses for this species. Fox pelts were sometimes home-tanned and used in sewing. Carcasses were occasionally used for dog food. Recently fox pelts have not commanded a high price averaging \$45 with a range of \$35 to \$90.

Wolf

Wolves were present in the area around Stevens Village, but were not considered to be abundant by local residents. During the survey period no wolves were harvested although during the following winter of 1984-85, two animals were snared near the village. One explanation for the presence of wolves in the vicinity of the village was that the scarcity of available prey (i.e., the low number of moose in the area) forced the wolves to venture nearer to the community in search of food. One experienced Stevens Village trapper indicated that wolves occasionally killed a moose calf if there was nothing else for them to eat, but considered this a relatively rare occurrence.

Sullivan (1942:105) reported that wolves used to be trapped with deadfalls. Presently, No. 4 double-spring traps or commercial snares

were used. One pack of about seven animals ranged over the area of the upper Dall River and another pack was present in the Lost Creek drainage (R. Nowlin, pers. comm., 1986).

Wolverine

Four wolverine were taken by one Stevens Village trapper during the survey period. Considered by some to be "one part mink, one part weasel, and the rest, all devil," the wolverine was viewed as an extremely powerful and formidable animal. Wolverines were thought to possess spiritual powers, and the Koyukon conducted a traditional ceremony to celebrate the taking of a wolverine.

Primarily a scavenger, wolverine also reputedly followed traplines, eating the trapped animals. Traps and snares were used to harvest wolverine and they were sometimes shot. Wolverine are not readily caught, however, and have been known to completely destroy or bury traps which were set for them. The fur of a wolverine is coveted as a parka ruff, as the guard hairs do not collect frost. They commanded up to \$300 from fur buyers.

Beaver

Beaver are found throughout the Yukon Flats in areas with adequate forage and open water during the winter months. Four Stevens Village households reported harvesting a total of 14 beaver during the survey period.

Beaver formerly were hunted with bow and arrow or caught with pitfall and deadfall traps (Loyens 1966:45; Sullivan 1942:106). Later during break-up, they were shot with rifles. Beaver pelts played an important role in the early trapping economy. Trapping or snaring of these animals under the ice required specialized knowledge and skill, and is a difficult and laborious undertaking. Beaver were primarily sought in February, March, and April, when furs were prime after periods of extreme cold.

Like other animals, beavers disperse in search of new timber or better water conditions. The drying up of lakes and marshes around Stevens Village was thought by some to be related to the scarcity of beaver during the past several years. However, trappers have indicated that beaver populations seemed to be increasing and that new dens had been spotted on nearby lakes and old, unoccupied dens were again housing beaver. Local trappers recognized that the relatively low density of beaver populations made them especially vulnerable to overharvesting. Trappers waited until beaver numbers in their area were larger and more stable before attempting harvest. Often trappers did not clear out an entire den, but left younger animals to develop and reproduce.

Beaver skins were stretched on circular frames or were nailed onto boards. The average value of beaver pelts was \$24. Beaver provided a number of useful products: the pelt was used for caps, mitts, and trim on parkas, mukluks, and moccasins, beaver castor was used to scent traps, and beaver meat was a highly prized and favored source of food. Beaver carcasses were sometimes traded or sold to others for either human consumption or for feeding dogs.

Muskrat

Muskrat populations around Stevens Village were low for several years, but appeared to be increasing according to local residents. Certain lakes around Stevens Village housed large numbers of muskrats. Sixteen Stevens Village households harvested a total of 950 muskrats during the survey period. Overall, the lower muskrat population in the area was attributed to the decline of suitable habitat. Spring flooding, which normally replenished lakes, sloughs, and marshes, has not occurred in the area for nearly 20 years. Lakes that once had an abundance of muskrat have become meadows and brushy stands of willow.

Muskrats inhabit marshes, lakes and sloughs throughout the flats, building houses from piles of vegetation along the banks of waterways. During winter months, these animals pile aquatic vegetation around a hole in the surface of the ice. These "push-ups" are readily visible, and muskrats enter these hollow mounds from beneath the water in order to feed. The prevalence of muskrat "push-ups" is an indicator of the population size in the area.

The establishment of spring "rat" camps was part of the traditional pattern of activity. The bountiful muskrat populations around Stevens Village attracted people from the downriver communities of Rampart and Tanana during the first half of the century. Middle-aged and elder residents recalled the establishment of these camps during April when families traveled by dog team at night when snow conditions were better. One resident recalled that two or three families would be camped around the larger lakes. Hunters paddled around the ice-free edge of the lake in canoes and harvested up to 100 muskrats

in a single evening. Total harvests of up to 1,000 to 1,500 muskrats per household were not uncommon. These large harvests became a matter of concern to local residents during the late 1930s and 1940s (see Chapter 2).

The use of spring muskrat camps has diminished, and muskrats were trapped or hunted during single-day or overnight trips. Trapping took place in March and April, prior to the thinning and softening of the ice. Number 1 or 1-1/2 spring traps were set in houses or "push-ups." Later, in May and June, when warming weather caused houses and "push-ups" to collapse, muskrats appeared in the open to feed. This also coincided with the mating season, at which time the animals were more active and frequently moved about in the late evenings. Muskrats were commonly shot with .22 caliber rifles at this time.

During 1984, muskrat pelts yielded about \$2.50 apiece. Furs were used locally in craft items and muskrats provided good meat for both human consumption and for feeding dogs.

Other Furbearers

Mink are generally found near lakes, creeks, and marshy areas and were considered to be very scarce in the area. Only eight mink were reported harvested by three households during the survey period. The price for a mink pelt averaged \$25. Carcasses were sometimes cooked for dog food or were discarded.

River otter were considered to be scarce in the area. During the survey period, only one otter was reported harvested by a single trapping household. Although they are found in similar habitat as are

mink, the two rarely inhabit the same area simultaneously. Otter were seldom targeted for harvest, although one was occasionally caught in a trap set for another species. The market value of otter was about \$35.

Weasels were sometimes caught in traps set for marten. They tend to be quite small and have little monetary value, so were not a targeted species. Young children sometimes attempted to trap weasels.

The Contribution of Trapping to the Local Economy

Income generated through the trapping of furbearers appeared to contribute significantly to the cash earnings of Stevens Village residents. An estimate of the potential gross income generated from trapping was made based on harvest figures and the average fur prices for each species. The estimate assumed that all furs were sold and does not take into account the value of handcrafted items such as marten caps or beaver skin mitts or the value of meat from certain edible species.

The potential gross income from furbearer pelts harvested during the survey year was \$31,026 or \$1,477 per trapping household (Table 16). Marten pelts alone accounted for 56 percent of the total potential income. During the survey year the mean earned income was \$5,374. The estimated trapping income for this period was 27 percent of this amount, demonstrating the significant contribution of trapping income to the cash sector of the local economy.

TABLE 16. ESTIMATED VALUE OF HARVESTED FURBEARER PELTS

Species	Average Price	Gross Potential Value	Percent of Total
Marten	\$ 40	\$17,280	55.7
Lynx	300	7,800	25.1
Muskrat	2.50	2,375	7.7
Fox	45	1,800	5.8
Wolverine	300	1,200	3.9
Beaver	24	336	1.1
Mink	25	200	0.6
Otter	35	35	0.1
Total		\$31,026	100.0

CHAPTER 7

GATHERING ACTIVITIES

Stevens Village residents utilized several edible plant and tree species that occurred in the area. Berries were picked throughout summer months, in the vicinity of fish camps or during outings along nearby creeks. The most commonly used berries were the lowbush or bog cranberry (Vaccinium vitis-idaea), highbush cranberry (Viburnum edule), bog blueberry (Vaccinium uliginosum), and raspberry (Rubus idaeus). Berries were shared with others and were commonly served at potlatches and other special occasions in the form of "Indian ice cream." Other plant species used on occasion included rosehips (Rosa acicularis) and wild rhubarb (Polygonum alaskanum). The extent to which other plant resources were currently used in Stevens Village was not examined in this study. Readers are referred to Nelson (1973, 1983) and Caulfield (1983) for further information on plant uses in Koyukon and Gwich'in Athabaskan communities.

The harvest and use of local timber resources was essential to the existence and maintenance of the community through the provision of firewood and building materials. Wood cutting took place throughout the year, although the majority of the harvest occurred during fall and winter months. House logs were often obtained during high water months in late spring and early summer. Commonly used tree species were: white spruce (Picea glauca), paper birch (Betula papyrifera) and balsam poplar (Populus balsamifera).

BERRY PICKING

Berry picking occurred during summer and early fall as each species ripened. Lowbush cranberries were present in large quantities and were found in close proximity to the village. Blueberries were more uncommon and were found only in relatively small patches in localized areas. Berries appeared to proliferate in disturbed areas such as along the village airstrip or the Dalton Highway, and were also found along creeks and in the hilly country of the canyon. Twelve Stevens Village households (40 percent) reported picking berries during the survey year, with a total harvest of 41 gallons. Berry harvesting was most commonly undertaken by women and children, although a few men participated in the activity. Many households indicated that they gathered berries during outings or in the course of other activities, but only to eat and not in sufficient quantities to warrant reporting. One household reported trading king salmon strips for berries from a Minto resident.

Specific areas mentioned as good berry picking sites included: the areas around the village airstrip and beyond to Twin Lakes, around Fort Hamlin, along the Dall and Little Dall rivers, along the Dalton Highway and Ray River, and near fish camps along the canyon (Fig. 33). Residents repeatedly referred to a small island which had existed just upriver from the Yukon River bridge and had been a favorite blueberry picking site. The island was apparently razed during bridge construction.

Sullivan (1942:35) reported that berries traditionally were kept in watertight birch bark baskets with a bark lid sewn on with spruce

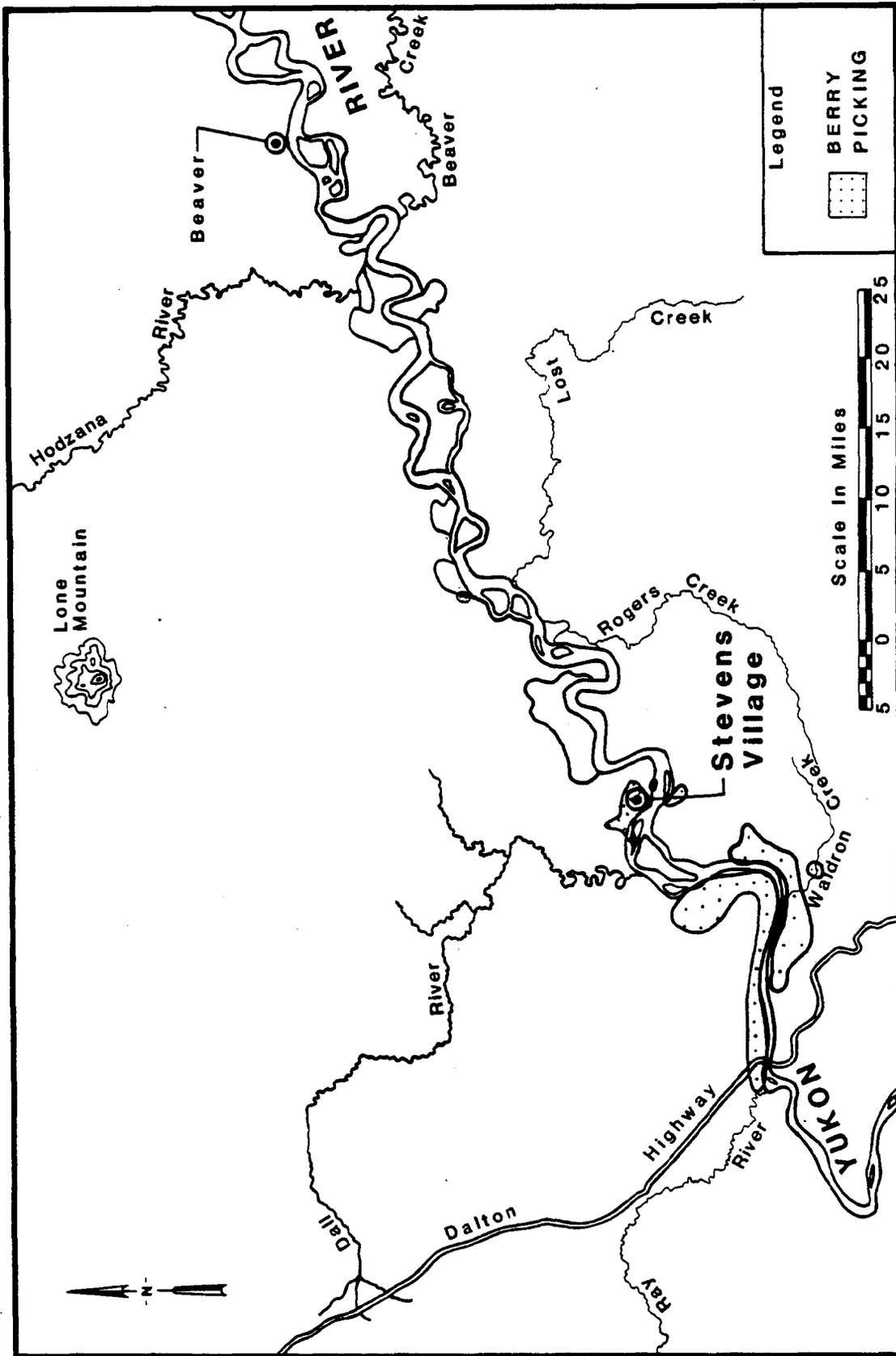


Fig. 33. Areas Used by Stevens Village Residents for Berry Picking, 1974-84.

root fibers. These baskets were stored in underground caches. Currently, berries were used fresh or were frozen for later use. They were often served at potlatches in the form of Indian ice cream, which consisted of berries and sugar whipped into bear grease, rendered moose fat, or a commercial shortening. Cranberries also were used to make a gravy or sauce, which was served with meat. Jams and jellies were also produced by some households.

TREES AND SHRUBS

A variety of trees and shrubs were used by residents of Stevens Village and wood was essential to the existence and livelihood of the village. Stevens Village households reported using between two to twenty cords of firewood a year, with an average of six to seven cords per household. White spruce, birch, and poplar or "cottonwood" were the species most commonly used.

Spruce was used for construction of homes, caches, and other structures. Almost all homes in Stevens Village, both old and new, were of log construction and only a few framed buildings were present in the village. House logs were commonly obtained during high water months of spring and early summer.

Almost all heating in the village was by wood stove. Oil heaters were present in one residence and in a few community buildings, such as the council office/phone house, clinic, school, and safewater building. Firewood was cut and hauled throughout the year. A major logging effort took place in September, when most village households cut and hauled the first of their winter fuel supply. Wood cutting

was conducted by groups, often in conjunction with fall moose hunting. Both activities took place along the river, often as far upriver from the village as Beaver (Fig. 34). A good stand of dry spruce was sought close to the riverbank to lessen the distance wood had to be transported. Wood cutting parties sometimes cut up to six cords of wood which were then hauled to the bank, lashed into a raft and floated downriver to the village.

Harvest of spruce continued throughout the winter, and was hauled to the village by snowmachine. One household cut most of their winter wood supply in the spring since high water levels at that time permitted travel into sloughs and creeks normally too shallow for riverboats. The cut and stacked wood dried during summer months. Some households also collected driftwood for their stoves after break-up in the spring when fallen logs piled up on sandbars or accumulated along certain bends in the river. Birch wood was also used in smaller quantities as a heating fuel during winter months. Birch was available nearer to the village and was often harvested during the winter by snowmachine.

Most households cut and hauled their own wood, although older or disabled residents or those without access to boats or snowmachines purchased firewood for \$100 a cord. Some households paid for gas for outboards or snowmachines in trade for their wood supply.

Birch was also used in the construction of snowshoes, sleds, and toboggans. Birch bark was traditionally used for baskets and canoes. Balsam poplar, commonly referred to as cottonwood, was used primarily in smokehouses when drying fish or meat.

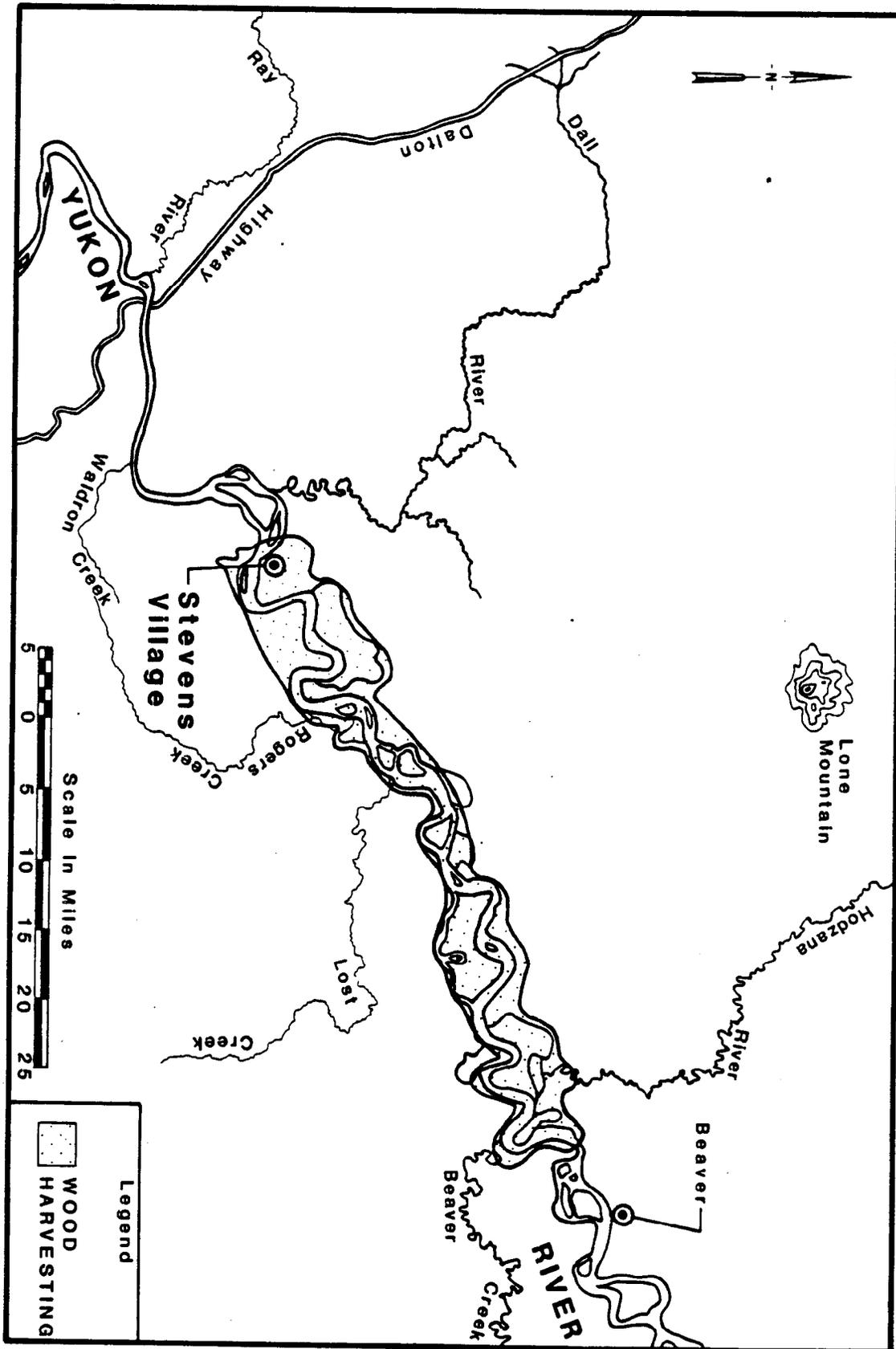


Fig. 34. Areas Used by Stevens Village Residents for Wood Harvesting, 1974-84.

CHAPTER 8
DISCUSSION

The residents of Stevens Village, as in most rural Alaskan communities, maintained involvement in both the cash and the subsistence spheres of the economy. Most households undertook a combination of wage employment and other cash-producing activities along with the harvest of fish and wildlife. An activity like trapping, pursued by a majority of households, successfully combined both cash and subsistence components. Residents were often involved in more than one cash-producing job through the course of a year as well as participating in a number of different subsistence activities.

Cash employment opportunities in Stevens Village were very limited and most wage jobs were seasonal or part-time and were funded through government programs. Government grants for capital construction projects in the community provided temporary employment for many households during the survey year. Residents also pursued temporary wage employment opportunities in other areas such as Fairbanks and Prudhoe Bay. Fifty-seven percent of Stevens Village households had zero to three months of wage employment. The average number of months employed was 6.8 months per household. The average household income in Stevens Village is among the lowest in the state. During the survey year reported household income averaged \$5,374.

Stevens Village households reported harvesting a diverse range of locally-available resources of over 50 species of fish, mammals, birds, and plants. The harvest activities undertaken each year exhibited clear seasonal patterns (Fig. 7) that often appeared to be

modified versions of traditional settlement and activity patterns. Residents also showed continued use of local areas for harvesting fish and wildlife (Fig. 35).

The findings from the household surveys on harvest and use of wild resources indicated that a large majority of households (97 percent) harvested fish and wildlife, to some degree. Household participation in harvests were high in each of the five major resource categories (Fig. 8): birds (90 percent), freshwater fish (80 percent), mammals (80 percent), salmon (73 percent), and berries (40 percent).

A substantial quantity of resources was harvested by Stevens Village households. Fish accounted for about 90 percent of the total harvest by weight, mammals comprised approximately 8 percent, and the remaining 2 percent was composed of several bird species and berry harvests (Fig. 9). The per capita harvest for all resources was 1139 pounds (Table 5). This was one of the highest harvest levels documented in the state and was in keeping with the findings of Wolfe and Walker (1985:13) of an average per capita harvest in the Yukon-Koyukuk region of 957 pounds. Although this figure was calculated with preliminary data from Stevens Village, when this is eliminated, harvest for the region remained relatively similar at 936 pounds. This regional harvest compared to 212 pounds in the Southeast region, and 725 pounds in the Western region (Yukon-Kuskokwim Delta).

Wolfe and Walker (1985:14-15) also found that subsistence productivity showed a statistical relationship with the proximity of the community to roads and the degree of settlement entry. Both factors were correlated with reduced levels of harvest. This finding

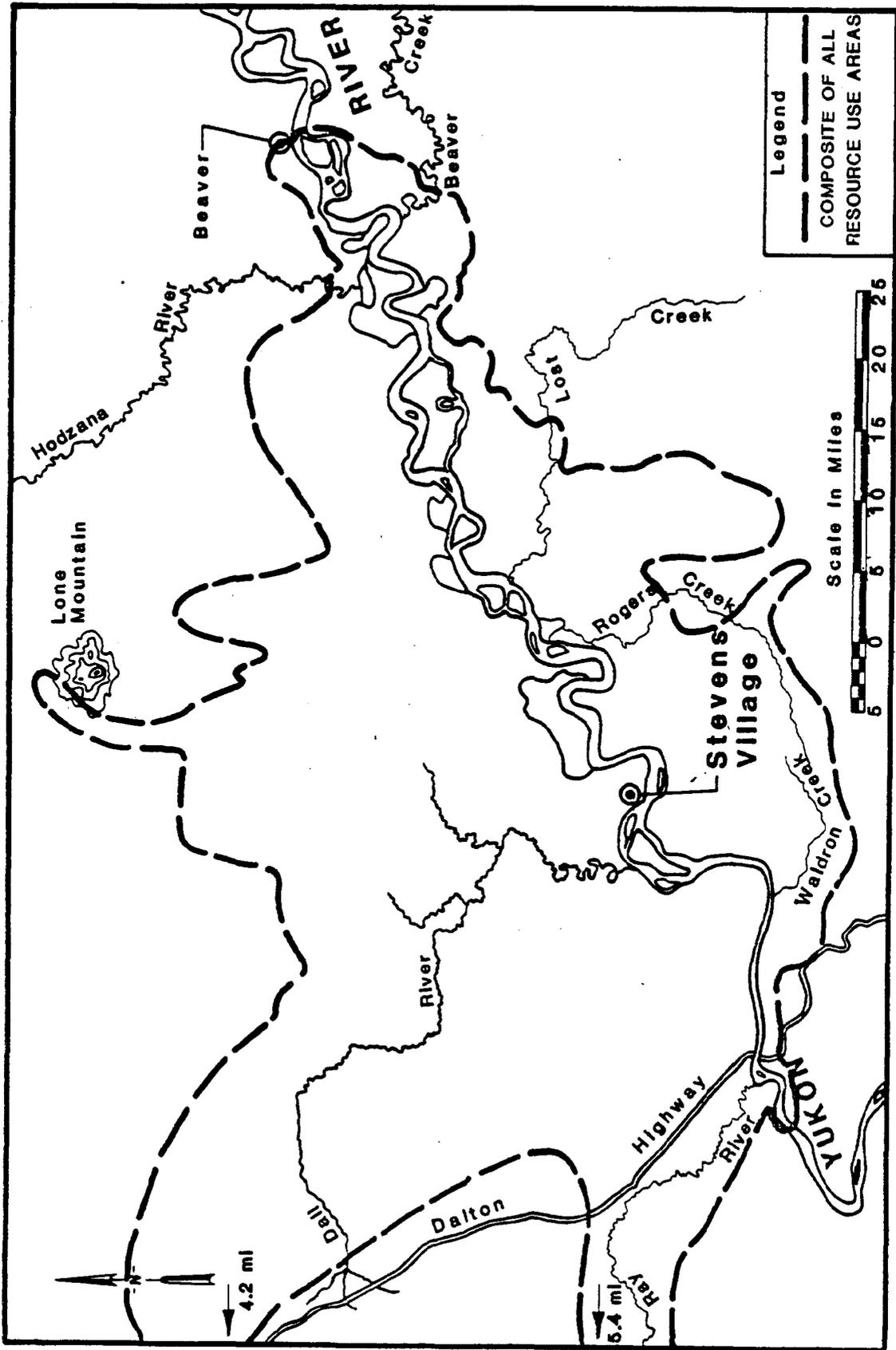


Fig. 35. Composite of Areas Used by Stevens Village Residents for All Harvest Activities, 1974-84.

is relevant to Stevens Village in that residents have continued to express concern about the effects that have already occurred because of their proximity to the newly constructed Yukon River bridge and the possible escalation of negative impacts resulting from increased development along the utility corridor.

At present, non-local use of the Dall River for recreational sport fishing and hunting has been a growing issue for Stevens Village residents. Degradation of the area, vandalism, destruction of private property, the negative effects on local fish and wildlife populations, and the increased competition for resources have been cited as concerns of the community.

Proposed development along the Utility Corridor and at the Yukon Crossing, including recreational and commercial facilities and potential settlement entry is viewed as exacerbating an already existing problem. Similarly, construction of the Trans-Alaska Gas System adjacent to the existing oil pipeline might result in a short-term increase in non-local traffic in the area, with some of the same potential impacts to local residents.

A wide range of variability in quantities of fish and wildlife typified Stevens Village household harvests (Fig. 14). Household harvests ranged from 0 to over 22,000 pounds of edible resources. A relatively small percentage of households accounted for the majority of the harvest. During the survey year, 10 percent of the households produced over half the total community harvest. Although dog food harvests accounted for some of this variation, it did not account for all of it (Fig. 16).

Households that produced large harvests exhibited certain socioeconomic characteristics that distinguished them from households producing smaller harvests. Some of these characteristics included larger household size, more members 16 years of age or older, greater equipment holdings, and more employment (Tables 9 and 10). Similar patterns were seen in other communities such as Huslia, Minto, and Kaktovik (Andrews 1988; Marcotte 1986; Pedersen 1986). Wolfe (1987:9-11) attributed these findings to the relationship of the developmental cycle of households and the resultant patterns of household affiliation and cooperation in subsistence pursuits. This relationship was clearly evident in salmon fishing by Stevens Village households, an activity that produced almost 90 percent of the total community harvest. As Wolfe (1987:15) points out, this is a significant finding in terms of management of resources through the establishment of individual bag limits or household harvest quotas, a system which may not be appropriate for the cultural norms of many rural Alaska communities. This may be particularly relevant in light of the development of hunting regulations for the subsistence harvest of waterfowl during spring and summer months.

The harvest and use of salmon along the Yukon River is currently the focus of discussions between the U.S. and Canada. The declining numbers of king and fall chum salmon are a major management concern. Stevens Village showed a high degree of dependence on salmon resources, as measured by participation and harvest. King salmon accounted for almost 30 percent of the total harvest and virtually all these fish were used for human consumption. Harvests of chum salmon to feed dogs varied from year to year as the number of dogs fluctuated

in the community. During the survey period, over 80 percent of the chum salmon harvests were used to feed dogs. The use of salmon to feed dogs may be addressed at future Board of Fisheries meetings.

Along with salmon, over 70 percent of the freshwater fish harvest was used for dog food. The per capita harvest without the fish used for dogs remained relatively high at 578 pounds. This was comparable to the estimated per capita harvest without dog food for the interior community of Huslia which was between 589 to 711 pounds (Marcotte 1986:63-64).

Although Stevens Village households harvested a diverse range of resources, the availability of many of the boreal forest resources fluctuates substantially from year to year (Nelson 1978:223-224). Mammals comprised only 8 percent of the total harvest, by weight. The harvest of moose accounted for 5 percent of this harvest, most likely a reflection of the relatively low density and abundance of moose in the area. Although moose numbers have been increasing over the past few years, it is not known how this will affect the relative composition of the community's harvest.

In summary, Stevens Village appeared to have successfully integrated subsistence and cash components of the economy. Seasonal patterns of harvest continue to be followed and the social composition of harvest and processing groups for certain activities also reflected traditional patterns. The community has maintained significant involvement in the subsistence harvest of fish and wildlife and the integrity of the land and resources used for subsistence remain an important concern of residents.

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APPENDIX A

HISTORY OF MOOSE HUNTING REGULATIONS

Table A-1 summarizes the moose hunting regulations from 1957 to 1985 in the area now designated as the GMU 25(D) permit moose hunt area. From 1963 until 1981, this area encompassed a portion of what was then GMU 20(C). As shown in Table A-1, from the mid-1960s through the mid-1970s, the open season extended from late August through December. During eight years of this period, a two moose bag limit (only one moose could be antlerless) was in effect. During this time, there were no restrictions regarding residency or transportation. Non-local hunters from outside GMU 25(D) took advantage of the long seasons and liberal bag limits, flying into the area or using riverboats transported by road to the Steese Highway bridge at Birch Creek, the community of Circle, or more recently, to the Yukon River bridge on the Dalton Highway.

By the 1976-77 season, the open season had decreased slightly, and the bag limit reduced to the taking of one bull moose. The following year, 1977-78, the season was reduced considerably with the bag limit remaining one bull moose. Season dates were modified in 1980 to allow both a mid-September and early November season opening, although the season length and bag limit remained the same. Additional changes were made in 1983 with the establishment of the registration permit hunt.

For 1984-85, the season dates in the registration permit hunt area were September 10 to 30, December 1 to 10, and February 18 to 28.

TABLE A-1
 MOOSE HUNTING SEASONS, BAG LIMITS, AND SEASON LENGTH
 FOR THE AREA NOW DESIGNATED AS GNM 25(D) PERMIT MOOSE HUNT AREA,
 1957-85*

REGULATORY YEAR	AUG	SEP	OCT	NOV	DEC	JAN	FEB	BAG LIMIT ¹	DAYS
1957-58	X	XXX		X				1 BULL	53
1958-59	X	XXX		X				1 BULL	53
1960	X	XXX	X	XXX				1 BULL	72
1961-62	X	XXX		XX	X			1 BULL	73
1962-63	X	XXX		XXX				1 BULL	72
1963-64	XXX	XXX		XXX				1 BULL	91
..	X	XXX		XXX				1 MOOSE ²	72
1964-65	X	XXX	XXX	XXX				1 MOOSE ³	103
..	X	XXX	X	XXX				1 MOOSE ⁴	79
1965-66	X	XXX	XXX	XXX				1 MOOSE ³	103
..	X	XXX	X	XXX				1 MOOSE ⁵	74
1966-67	X	XXX	XXX	XXX	XXX			2 MOOSE ⁶	134
..	X	XXX	X	XXX				1 MOOSE ⁷	75
1967-68	X	XXX	XXX	XXX	XXX			2 MOOSE ⁶	134
..	X	XXX	X	XXX				1 MOOSE ⁸	76
1968-69	X	XXX	XXX	XXX	XXX			2 MOOSE ⁶	134
..	X	XXX	X	XXX				1 MOOSE ⁸	76
1969-70	X	XXX	XXX	XXX	XXX			2 MOOSE ⁶	134
..	X	XXX	X	XXX				1 MOOSE ⁸	76
1970-71	X	XXX	XXX	XXX	XXX			2 MOOSE ⁶	134
..	X	XXX	X	XXX				1 MOOSE ⁸	76
1971-72	X	XXX	XXX	XXX	XXX			2 MOOSE ⁶	134
..	X	XXX	X	XXX				1 MOOSE ⁹	79
1972-73	X	XXX	XXX	XXX	XXX			2 MOOSE ⁶	134
..	X	XXX	X	XXX				1 MOOSE ⁹	79
1973-74	X	XXX	XXX	XXX	XXX			2 MOOSE ⁶	134
..	X	XXX	X	XXX				1 MOOSE ⁹	79
1974-75	X	XXX	XXX	XXX	XXX			1 MOOSE	134
..	X	XXX	X	XXX				1 MOOSE ⁹	79
1975-76		XXX	XXX	XXX	XXX			1 MOOSE ¹⁰	122
..		XX		X				1 BULL	30
1976-77		XXX	XXX	XXX	XXX			1 BULL	122
..		XX						1 BULL	20
1977-78		XX						1 BULL	21
..		XX						1 BULL	20
1978-79		XX						1 BULL	21
..		XX						1 BULL	11
1979-80		XX						1 BULL	21
..		XX						1 BULL	11
1980-81		X		X				1 BULL	21
..		XX						1 BULL	11
1981-82		X		X				1 BULL	21
1982-83		X		X				1 BULL	21
1983-84 ¹¹	X	XXX	X					1 BULL	42
1984-85 ¹¹		XX			X		X	1 BULL	42

* This information is derived from Alaska Game Regulation booklets for each regulatory year.

** Regulations for the portion of Subunit 20(C) that is now included in the permit area.

1 As defined by 5 AAC 90.020.

2 Antlerless moose could be taken only on September 30.

3 Antlerless moose could be taken between November 20-30.

4 Antlerless moose could be taken between October 1-7.

5 Antlerless moose could be taken between October 1-2.

One moose of either sex constituted the bag limit for Unit 20(C).

6 Only one moose could be antlerless.

7 Antlerless moose could be taken between September 29-October 3.

One moose of either sex constituted the bag limit for Unit 20(C).

8 One antlerless moose could be taken from September 28-October 4.

One moose regardless of sex shall constitute the bag limit for Unit 20(C).

9 Bull moose only could be taken between August 20-September 30 and November 1-30.

Only antlerless moose could be taken between October 1-7.

10 Antlerless moose could not be taken prior to October 1.

11 Registration permit hunt for residents of GNM 25(D); no aircraft allowed.

Sixty permits were available from local license vendors to residents of Subunit 25(D) on a registration basis in the communities of Stevens Village (25 permits), Beaver (25 permits), and Birch Creek (10 permits). The permits were valid for all three seasons although the bag limit was one bull moose per permit. No aircraft were permitted for hunting moose in the area.

During the 1985-86 hunting season, permit issuance was based on determinations of individual household need. By the 1986-87 season, in response to changes in the state's subsistence statute, there was no restriction on the number of permits issued, although a harvest quota of 35 moose was established for the permit area.

APPENDIX B

STEVENS VILLAGE RESOURCE HARVEST AND USE SURVEY, SEPTEMBER 1984

HH # _____ Date _____ Interviewer: _____

SALMON FISHING: 1984

1. Participation: YES NO If no, last time _____
2. Did you receive any dried salmon from anyone during the past year? YES • NO
3. From whom? _____
4. When did you go to fish camp this summer? _____
5. How long were you there? _____
6. How was the fishing this year? _____

1984 Subsistence harvest

-----Processing Method-----

	Harvest total	Net or Wheel	No. for Dogfood	No. dried for eating	No. cut in strips	No. Frozen	No. canned	No. Other (Specify)
King Salmon								
Summer Chum								
"Dog" Salmon								
Fall Chum or "Silver"								
Coho or "Chinook"								

7. Who did you fish with during king season? _____
8. Who did you fish with during chum season? _____
9. Who set up camp? _____ Built fishwheel? _____
10. Got wood for smoke? _____ Checked net or fishwheel? _____
11. Cut fish? _____ Other tasks? _____
12. Other activities at fish camp? _____

Did you give away any dried salmon during the past year? YES NO

Person/Potlatch _____

OTHER FISH: SEPTEMBER 1983 - AUGUST 1984

Resource	Harvest total	If none Last time	Harvest method	Which months	How did you put it up	Sharing	Receiving
Whitefish							
Sheefish							
Northern Pike							
"Sucker"							
Burbot "Lush"							
Grayling							
Trout							
Other (Specify)							

BERRIES AND PLANTS: SEPTEMBER 1983 - AUGUST 1984

1. Did you go berry picking?
 YES NO

2. Did you receive any berries? YES NO
 From whom? _____

Lowbush Cranberries	gals.
Highbush Cranberries	gals.
Blueberries	gals.
Raspberries	gals.
Salmonberries	gals.
Rosehips	gals.
Wild Rhubarb	
Other plants	
Firewood	ords

3. Did you give away any berries? YES NO
 Person/Potlatch _____

MOOSE HUNTING: 1984

1. Did you go moose hunting this September season? YES NO
2. If no, reason _____
3. How many days did you spend hunting: _____
4. Who did you go with? _____
5. Did you get a moose? YES NO
6. If no, why not? _____
7. When was the last time you got a moose? _____
8. If yes, where did you get your moose? _____
(Indicate on map)
9. How much gas did you use when hunting this season? _____
10. How are you keeping your meat? _____
11. Did you receive any moose meat? YES NO
12. Did you give away any moose meat? YES NO
13. Person/potlatch _____
14. Are you going to hunt during the December or February seasons? _____
15. What do you think of the current permit hunt (seasons, bag limit, permits, etc.)?

16. Do you think there should be any changes (bag limit, sex, seasons, etc.)?

OTHER GAME: SEPTEMBER 1983 - AUGUST 1984

Did you harvest any of the following during the past year?

Resource Harvested	Total Harvest	If none, last time	Which Months	Sharing Person/Potlatch	Receiving Person
Moose					
Black Bear					
Cinnamon Bear					
Brown Bear					
Porcupine					
"Rabbit"					
Ptarmigan					
Spruce Hen					
Ducks					
Geese					
Crane					
Other					

TRAPPING: SEPTEMBER 1983 - AUGUST 1984

1. Did you trap during the past year? YES NO

Resource harvested	Total harvest	If none, last time	Methods	Months	Sold/HH Use	Sharing Person/Potlatch	Receiving Person
Marten							
Mink							
Lynx							
Red Fox							
Otter							
Wolverine							
Wolf							
Beaver							
Muskrat							
Other (Specify)							
Other (Specify)							

2. Use: DOGS SNOWMACHINE WALK ONLY

3. How often did you check your traps? _____

4. How many miles roundtrip was your trapline? _____

5. Did anyone else trap with you? YES NO Who? _____

6. How long have you been using this area? _____

7. Who used this area before you? _____

8. What kind of changes have you noticed in trapping in this area? _____

HOUSEHOLD INFORMATION

1. During the past 12 months (Sep. 1983 - Aug. 1984), did anyone in your household have a job? YES NO

Name	Type of job	Number of Months Worked	Number of Hours/Week

2. Does anyone in the household receive any checks for Social Security, Adult Public Assistance, Longevity, Aid to Families with Dependent Children, etc? YES NO

About how much a month? \$ _____ /mo.

3. Does anyone get food stamps? YES NO About how much a month? \$ _____ /mo.

4. Estimated gross earned income for the household for the past year? _____

5. How many cords of wood did you use during the past year? _____

6. Did you buy wood or haul it yourself? _____ 7. Cost if purchased _____

8. Do you use propane? _____ How much did you use in the past year? _____

9. Cost _____

10. Did you have a garden last summer? YES NO

What did you grow? _____

11. Do you own any of the following? (Number and type)

No.	Type	
Boat _____	Size _____	Number of dogs _____
Outboard _____	HP _____	
Fishnets _____	Type _____	
Snow-go _____		
3-Wheeler _____		
Freezer _____	Size _____	
Cache _____	Size _____	

APPENDIX C

USEABLE WEIGHTS FOR SELECTED RESOURCES

<u>Resource</u>	<u>Useable Weight</u>	<u>Source</u>
King Salmon	13.7	ADF&G 1984
Summer Chum Salmon	4.5	" "
Fall Chum Salmon	5.1	" "
Coho Salmon	4.3	" "
Whitefish (var. sp.)	1.9	Ken Alt pers. comm., 1985
Sheefish	6.0	" " " " "
Northern Pike	3.5	" " " " "
Longnose Sucker	2.1	" " " " "
Burbot	3.5	" " " " "
Grayling	.7	Behnke 1982
Moose	700.0	Roy Nowlin pers. comm., 1985
Black Bear	100.0	Behnke 1982
Porcupine	8.0	" "
Snowshoe Hare	2.0	Ernest 1978
Ptarmigan	.7	Behnke 1982
Grouse	.7	" "
Ducks	1.5	Behnke 1982; Wolfe 1981
Geese	5.0	Wolfe 1981
Crane	10.0	" "
Beaver	15.0	Howard Golden pers. comm., 1985
Muskrat	1.0	" " " " "
Lynx	10.0	" " " " "
Berries (per quart)	1.0	Statton and Georgette 1984

