CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION, ALASKA

by

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Homer Tobuk provided valuable assistance and insight throughout the survey which was greatly appreciated. Wallace Nictune of Bettles, Art Williams of Allakaket, and Dorothy Vent of Hughes served as resource experts and guided the project at the local level. Erv MacIntosh of the U.S. Fish and Wildlife Service and Ray Bane of the National Park Service contributed to the initial identification of project objectives and the development of the research design and survey form. Sara Hannan waded through completed survey forms and tabulated survey data. Tom Bucceri of Habitat Division of Alaska Department of Fish and Game drafted the final maps used in this report. Bob Wolfe offered valuable suggestions through different stages of the project and in his review of report drafts. Finally, Vicky Leffingwell is to be thanked for her persistence and patience through the typing of numerous drafts and the final copy of the report.

CHAPTER 1

INTRODUCTION

Residents of the Upper Koyukuk region (Fig. 1) rely on local fish, wildlife, and plant resources as integral components of their communities' life and economy. This has been confirmed through recent ethnographic research conducted in Koyukuk River communities during the 1970s (Nelson 1983; Nelson, Mautner, and Bane 1982). This study is a more focused examination of contemporary resource use patterns in the Upper Koyukuk region. It is a cooperative effort involving the Alaska Department of Fish and Game, Division of Subsistence; Gates of the Arctic National Park and Preserve; and the Kanuti National Wildlife Refuge. These agencies identified similar data needs regarding resource use patterns in the Upper Koyukuk region, and agreed to work jointly as a means of pooling funds, sharing information, and reducing the impact of research activities on local communities. The research is also one stage of a broader proposed transportation corridor study being conducted by the Division of Subsistence in communities adjoining the Koyukuk and Kobuk rivers.

Purpose

The purpose of this study was to examine the nature and extent of wild resource uses in the Upper Koyukuk region during a recent two-year period by residents of Allakaket, Alatna, Bettles, Evansville, and

Hughes. This study had five objectives:

(1) documentation of the fish, wildlife, and plant species utilized in 1982, including seasonality of harvest activities; household harvest levels; means and methods of procurement; processing and preservation methods; and sharing and distribution patterns;

(2) documentation on USGS maps of areas used by community residents for hunting, fishing, and plant gathering in 1981 and 1982, and furbearer trapping during regulatory years 1981-82 and 1982-83;

(3) examination of the relationship between the cash and subsistence sectors of the local economies in Upper Koyukuk communities;

(4) identification of changes in local resource harvest patterns which may have occurred during the past ten years; and

(5) assessment of topical areas warranting further attention for providing a comprehensive portrayal of the subsistence-based socioeconomic systems in Upper Koyukuk communities.

The two-year time frame was selected to complement prior research efforts. Previous research in the study area has provided extensive detail on the historical importance and cultural significance of wild resources to local residents. Information on contemporary resource uses, especially of a quantified nature, complements these historical and cultural materials. The two-year time period provides a backdrop

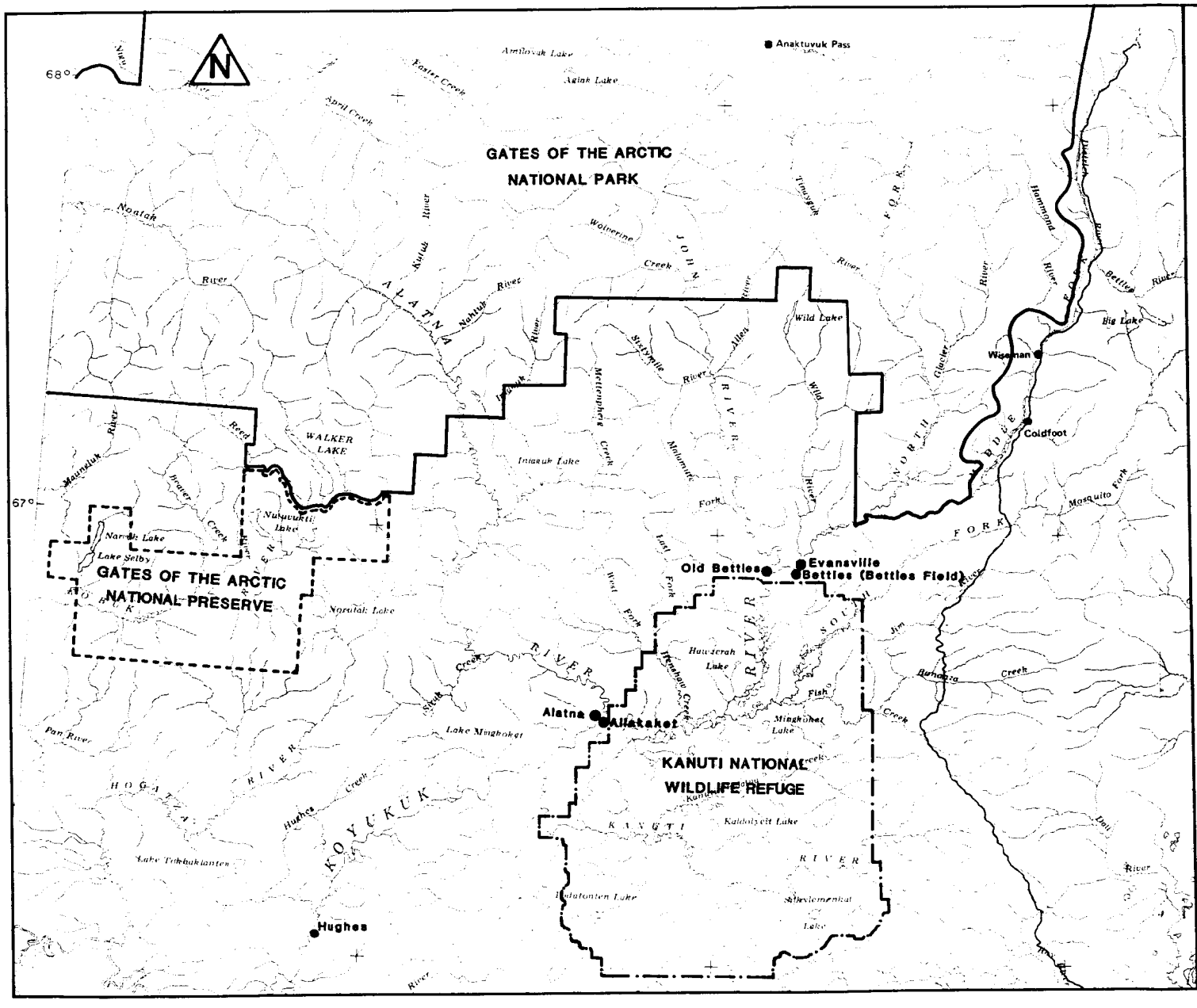


FIG. 1

COMMUNITIES OF THE UPPER KOYUKUK REGION

GATES OF THE ARCTIC NATIONAL PARK

GATES OF THE ARCTIC NATIONAL PRESERVE

KANUTI NATIONAL WILDLIFE REFUGE

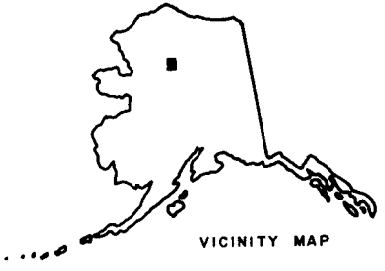
SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM ALASKA 1:1,000,000 BASE MAP SERIES ©COPYRIGHT, ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER, UNIVERSITY OF ALASKA, 1982.

SCALE 1:1000,000

0 10 20 30 40 miles

0 10 20 30 40 50 kilometers



VICINITY MAP

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF SUBSISTENCE

against which future changes in land and resource use patterns in the Upper Koyukuk region can be measured.

The study findings are designed to inform state and federal agencies engaged in land use planning in the Upper Koyukuk region. Local communities, regional Native organizations and the Koyukuk River Fish and Game Advisory Committee also have expressed interest in documenting resource uses in the area. The information may be found to be valuable for a variety of purposes. The Department of Fish and Game also will find the information applicable to resource issues in the region.

Another aim of this study was to demonstrate the viability of cooperative interagency and community research efforts and to encourage their continuation whenever possible. The study involved local residents in the data collection as community resource experts and research assistants; therefore, the quality of the information is believed to be higher than if it had been obtained by agency personnel alone. As a result of this local involvement, several residents of the study area now have subsistence data collection skills and a better understanding of how the study can contribute to local land and resource use issues.

CHAPTER 2

METHODOLOGY

General Research Design

Since the main goal of this project was to document contemporary resource use patterns in Bettles/Evansville, Alatna, Allakaket, and Hughes, a descriptive community-based research methodology was employed. Not included in this study were descriptions of the resource use patterns of households living in the region outside of a community. These households are known to be active in local resource procurement like the community-based households. Because of the exclusion of these remote households, the findings of this study should be considered only a partial representation of subsistence use patterns in the region.

The project was initiated after Upper Koyukuk residents expressed concern that state agencies planning regional highway development take into account local dependence on fish and wildlife resources. In 1982, the Alaska Department of Fish and Game, Division of Subsistence, and the National Park Service conducted a demographic study of communities in the Gates of the Arctic National Park and Preserve resident zone (Norton 1982). Interagency cooperation expanded when the U.S. Fish and Wildlife Service expressed the need for resource use data on the Kanuti National Wildlife Refuge, located between Bettles and Allakaket. In an effort to avoid duplicate research efforts in local communities, the three agencies (National Park Service, U.S. Fish & Wildlife Service, and the Alaska Department of Fish and Game) entered into a cooperative

agreement for this resource use study. The Koyukuk River Fish and Game Advisory Committee endorsed the project in April 1983. In May, representatives from the three cooperating agencies attended village council meetings in Evansville, Hughes, and Allakaket, and received approval for conducting field research in each community.

The Alaska Department of Fish and Game, Division of Subsistence, coordinated project activities. James Marcotte, a subsistence resource specialist with the Division served as the principal investigator for the study. Homer Tobuk was employed by the U. S. Fish and Wildlife Service as a local research assistant and worked with the principal investigator throughout the data collection period. Also, in each community a local resource expert employed by the National Park Service worked with the researchers while in that community. Wallace Nictune worked in Bettles/Evansville; Art Williams worked in Allakaket and Alatna; and Dorothy Vent worked in Hughes. Fieldwork was conducted at Bettles/Evansville in June and September 1983, Alatna and Allakaket in July, and Hughes in August.

Sample

Systematic interviews involving both a survey questionnaire and a mapping procedure were conducted with community households. Households were used as the survey unit, as opposed to individuals or harvest groups, since households were stable and easily identifiable sampling units during the time period studied. Attempts were made to survey all occupied households in each study community. Of the 86 households identified,

74 (86 percent) participated in this project (Table 1). This constitutes a very high participation rate for survey studies, and reflects the significant cooperation given the project by local residents. Twelve households did not participate for various reasons. In some cases, adults were working out of town or receiving medical care outside the region. A few young or middle-aged female household heads deferred to members of a related household if they considered themselves only indirectly active in fishing and hunting. Still others sought more privacy in their affairs, although some were willing to discuss issues informally or on a more general level. Within these limits, the survey data may be skewed slightly in favor of community households more active in local resource use.

TABLE 1. HOUSEHOLD SAMPLE SIZE IN UPPER KOYUKUK STUDY COMMUNITIES.

Community	Number of Occupied Households	Number of Households Surveyed	Percentage of Households Surveyed
Bettles/Evansville	25	20	80
Alatna	8	8	100
Allakaket	31	27	87
Hughes	22	19	86
Total:	86	74	86

Instrumentation

Survey

Data collection relied heavily on formal interview sessions utilizing a survey questionnaire. The survey form (Appendix 1), modeled after survey forms used by the Division of Subsistence elsewhere in the state, included subjects of interest to all cooperating agencies. If a household was active through the entire year there were 800 potential questions to be answered. A typical interview took about 1 1/2 hours.

Mapping

The mapping procedure used was consistent with the Division of Subsistence mapping methodology (Wolfe 1982) derived from Freeman (1976). The time period mapped included resource harvest areas utilized in calendar years 1981 and 1982, and the 1981-82 and 1982-83 furbearer trapping seasons. Mapping of resources use areas was done in conjunction with the survey interview. Survey questions were interspersed with drawing use areas on maps for particular species or resource categories. Individual household maps were collected during this procedure and represent activities of household members. Resource use area maps were prepared for each community by aggregating the household maps. Thus, the final maps presented in this report are a composite of all individual household maps.

Since the collection of map data represents a "survey," it is important to note that the map survey sample coincided directly with that of the survey questionnaire. Maps were compiled for nearly all households. The households not included here were comprised either of elderly residents no longer active in harvesting or individuals not active in harvesting. The community resource maps in this report specify the total number of observations under consideration for any given resource use category. For example, Hughes trapping areas are based on the 17 households (of the 18 total households interviewed) which indicated a trapping area on their household map. No member of the 18th household trapped during the 1981-82 and 1982-83 seasons.

Systematic distortion from sample bias in the use area maps is improbable in Hughes, Allakaket, and Alatna due to the large sample size. A return visit was made to each village for local review of draft maps by advisory committee members. This review also strengthens the reliability of the mapped data. The Bettles/Evansville maps underrepresent overall use areas for several reasons. First, at least one resident known to be an active fisherman and hunter chose not to participate in the mapping session. Second, distant areas accessed by aircraft for hunting, fishing, and trapping pursuits were not placed on the Bettles/Evansville resource use area maps. These harvest areas, many well outside the Koyukuk River drainage and up to 150 miles away, were noted during the interview and are mentioned in the text, but do not appear on the maps. Third, Bettles/Evansville serves as the central base for several dispersed households in this general region. These households could be considered part of the Bettles/Evansville service area. Their

resource use areas were not mapped, and so do not appear as part of the Bettles/Evansville maps.

Resource use areas recorded for each household were entered on U.S.G.S. 1:250,000 scale topographic maps. Use areas of a single household generally fit on two adjacent map sheets, although one household required four sheets. Each map sheet was identified with a code number corresponding to the household survey form and facilitated the return of the map sheets to the households upon completion of the project. By mutual agreement, the household map information belonged to the respondent and was being "borrowed" for the purposes expressed in the research design and approved by the village councils. Individual household maps were returned to the household.

The general geographic areas mapped were those used by members of that household for a particular activity for the specified time period. Lines were drawn by the respondent, the interviewer, or both, around the area used for the specific activity, such as moose hunting. Specific kill sites of moose, black bear, and sheep were also recorded when possible. Trapping activity was depicted by drawing a line around trapping areas rather than by drawing actual traplines. Lines were reviewed by the researchers after each session and highlighted with colored pens.

A total of 36 resource categories were included in the mapping procedure. Of these, 30 resource categories were combined into ten activity categories for composite maps (Table 2). The six resources not included in the final composite map were caribou, ducks, geese, brown bear, wolverine, and porcupine. The harvest of most of these resources occurred incidental to other pursuits or too infrequently to suggest a

geographic pattern. For example, caribou hunting has been poor in recent years and no general pattern can be depicted for the study period. Hunting for ducks and geese occurred in areas depicted for moose hunting.

Composite maps for Bettles/Evansville, Alatna, Allakaket, and Hughes were derived from the individual household maps using acetate overlays. A third map showing the outer boundaries of the areas used provided a basis for community review and drafting of the final maps. Both these second and third generation maps are on file with Division of Subsistence, Alaska Department of Fish and Game.

TABLE 2. RESOURCE CATEGORIES USED IN COMMUNITY RESOURCE USE MAPS

Category on Community Map	Major Resources Included
Sheep Hunting	Sheep
Moose Hunting	Moose
Black Bear Hunting	Black Bear
Trapping	Marten, Fox, Wolf, Otter Lynx, Beaver
Fishing (Set Net)	King Salmon, Summer Chum, Fall Chum Salmon, Sheefish, Whitefish
Fishing (Seine Net)	Sheefish, Whitefish
Fishing (Hook & Line)	Grayling, Burbot, Pike
Firewood Gathering	Spruce, Birch
Berry Picking	Blueberries, Low Bush Cranberries, High Bush Cranberries, Blackberries, Rose Hips, Roots
Small Game Hunting	Grouse, Ptarmigan, Hare

Procedure

The principal investigator initially contacted the Koyukuk River Fish and Game Advisory Committee in January 1982. During the next 15 months, additional meetings served to acquaint local residents with the project and data needs. The proposed project was discussed during village council meetings in Evansville, Hughes, and Allakaket. Formal presentations were made and recommendations sought for the local community resource expert positions.

The survey instrument was developed jointly by representatives of the three cooperating agencies and finalized immediately prior to the initiation of data collection in June 1983. A list of occupied households was developed by the principal investigator and local resource experts in each study community. Appointments with households for interviews generally were made a day in advance. This commonly allowed respondents time to begin thinking about the study and to consult with neighbors or the community resource expert if they had questions about its purpose.

A single respondent within each household was identified either by the community resource expert or the household members themselves, and typically was an adult male or household head. As the survey progressed, however, respondents frequently solicited assistance from other household members for specific information. For example, a son might be called upon to provide trapping harvest data, or a wife consulted for fish or berry harvest figures. Surveys usually were conducted at the respondents' homes.

The research assistant and the three community resource experts contributed significantly to the success of this project. They facilitated community involvement in the project. They also were often better able to field questions and convey project goals than a person from outside the community not familiar with Native place-names. Knowledge of local residents' work and travel schedules enabled the resource experts to arrange most interviews. Once interviews began, the resource experts were helpful in identifying on the map places referred to by local name or by local description. Explanatory comments on local practices or patterns often were added during the interviews. Clarification about social and kin relationships within the community was also made. The male resource experts from Bettles/Evansville and Allakaket were especially knowledgeable about harvest groups and hunting and trapping locations, while the female resource expert from Hughes possessed extensive knowledge about food distribution patterns between households.

This report is organized so that the study area communities are treated together through the general description and discussion of resource use patterns. Throughout the text, findings are attributed to specific communities after the descriptions of general patterns common to all communities. In Chapter 5 differences between communities are discussed. Allakaket and Alatna are treated together for purposes of community harvests and presentation of map data due to the high level of cooperation between households there. Similarly, Bettles and Evansville are discussed together as a single entity for the purposes of this study.

Co-authorship of the report is based on the following contributions. Terry Haynes wrote Chapter 1 (Introduction) and Chapter 3 (Study Area) with the exception of those sections addressing employment. James Marcotte wrote the sections on employment and Chapters 2, 4, and 5.

CHAPTER 3

STUDY AREA

Introduction

The Upper Koyukuk region is the current home territory of Koyukon Athabaskan Indians, Kobuk Eskimos, and a small non-Native population. The region's populace currently resides in communities which adjoin the Koyukuk River in northcentral Alaska (see Fig. 1), or in dispersed households around these five communities. Hughes, the southernmost settlement in the study area, is located in a steep valley through which the Koyukuk River flows. Nearby terrain includes high and low mountains, gentle ridges, flats of varying sizes, and narrow flood plains. The communities of Allakaket and Alatna are situated to the north of Hughes where the Koyukuk River leaves a large flat. The Alatna and John rivers also provide for these communities access to the hills and mountains to the north. Bettles and Evansville occupy the northern limit of the study study area and are located on the northeast side of a flat on the Koyukuk River. The Brooks Range forms a prominent feature of the landscape north of Bettles and Evansville, as do less distinctive mountains to the east and south (Nelson, Mautner, and Bane 1982:13-14).

The five study communities are oriented to the Koyukuk River as it meanders in a southerly direction from Bettles and Evansville to its confluence with the Yukon River. Within the Koyukuk valley lie many tributaries of the Koyukuk River, ranging from major watercourses to minor streams draining major areas of muskegs, ponds, and lakes.

The Koyukuk River valley, underlain by permafrost, supports a tree cover broadly classified as boreal forest, or taiga. A range of plant communities are present, however, including the closed forest of white spruce, paper birch, and balsam poplar; open forests of black spruce with scatterings of birch or white spruce; shrub thickets; and alpine tundra vegetation (Nelson, Mautner, and Bane 1982:17-18). Such habitat in this riverine environment supports a variety of wildlife species important to residents of local communities:

> From the water itself come fish, waterfowl, and mammals dependent on aquatic habitats. The shifting of watercourses creates an endless process of plant succession, which helps to support game such as moose, black bear, and snowshoe hare. The water surfaces themselves facilitate travel during both the cold and warm seasons (Nelson, Mautner, and Bane 1982:15).

The study area lies within a continental subarctic climatic zone, characterized by temperature ranges of +90°F in the summer to -60°F or colder in the winter. In Allakaket and Alatna, for example, the mean annual temperature is 22.5°F, and the mean extremes are -20°F and 70°F (Norton 1982:11). Continual daylight occurs from mid-April through mid-August.

Community Profiles

The five study communities had an estimated combined population of 312 people in 86 households the year of the survey (see Table 3). Allakaket/Alatna had the largest concentration of people with 152 residents, followed by Hughes (94 persons) and Bettles/Evansville (66 persons). In addition to these community-based households, there were

approximately ten households in the Upper Koyukuk region which were dispersed around the five named settlements. As previously mentioned, the remote households were not included in this present study.

TABLE 3. ESTIMATED 1983 POPULATION OF BETTLES/EVANSVILLE, ALLAKAKET/ALATNA, AND HUGHES.

Community	Population[1] Size (est.)	Number of Households	Mean Household Size
Bettles/Evansville	66	25	2.6
Allakaket/Alatna	152	39	3.9
Hughes	94	22	4.3
Total:	312	86	3.6

[1]Based on this study's 1983 survey of 20 households in Bettles/Evansville, 35 households in Allakaket/Alatna, and 19 households in Hughes, expanded to total number of community households using mean household size.

Table 4 shows community population levels over a 30-year time period for the study area communities based on U.S. Census figures (Norton 1982). Allakaket/Alatna has shown a 48 percent increase in population from 1950 to 1980 while Bettles/Evansville has doubled its population. The 1983 study population estimates for Allakaket/Alatna and Bettles/Evansville are lower than the 1980 U.S. Census estimates because of possible sampling error. The population of Hughes rose steadily between 1950 and 1970, then declined nominally by 1980, according to U.S. Census figures.

Table 5 shows the composition of the study communities in 1980. The population of Bettles/Evansville is comprised of Native (29 percent) and non-Native (71 percent) residents. In contrast, the populations of Allakaket, Alatna, and Hughes are almost entirely Alaska Natives.

TABLE 4. POPULATION CENSUS IN THE KOYUKUK RIVER REGION.

Community	1950	1960	1970	1980
Bettles/Evansville	47	77	57	94
Allakaket, Alatna	110	115	174	163
Hughes	49	69	85	73
Total:	206	261	316	330

Source: Norton 1982.

TABLE 5. POPULATION AND COMPOSITION OF BETTLES/EVANSVILLE, ALATNA, ALLAKAKET, AND HUGHES IN 1980.

Community	Population Size	Number of Households	Mean Household Size	Percentage Alaska Native
Bettles/Evansville	94	31	3.0	29
Allakaket, Alatna	163	46	3.5	97
Hughes	73	22	3.3	97

Source: Tanana Chiefs Conference 1983.

A wide range of household sizes was recorded during the 1983 survey (Fig. 2). Throughout the study communities there was a total of 13 single person households. The maximum household size recorded was 11. Bettles/Evansville displayed a median household size of 2, Alatna 4, Allakaket 4, and Hughes 3. Means were somewhat different: Bettles/Evansville (2.6), Allakaket/Alatna (3.9), and Hughes (4.3). Overall the mean age of household heads was 46.1 years. In Bettles/Evansville the average was 45.3 years of age, in Alatna 46.1, in Allakaket 48.1, and in Hughes 44.2.

There is considerable intermarriage between households in Allakaket and Alatna. Traditionally, Alatna was a Kobuk Eskimo settlement and Allakaket was a Koyukon Athabaskan settlement, but many individuals have moved across the river after marriage. Several of the Native residents now living in Bettles/Evansville were raised in Alatna or Allakaket.

Bettles and Evansville

Bettles and Evansville are adjoining communities located 40 miles east of Allakaket and 180 air miles northwest of Fairbanks. Bettles, also referred to as Bettles Field, is not to be confused with "Old Bettles," a former settlement five miles downstream that originated as a trading post in 1899. Bettles is the site of a large airfield built in 1945 by the U. S. Navy to support Naval Petroleum Reserve #4 exploration activities. Employment opportunities in Bettles attracted Alaska Natives and non-Natives from "Old Bettles," who settled in Evansville near the north end of the airfield. Most of the 27 Alaska Native residents live

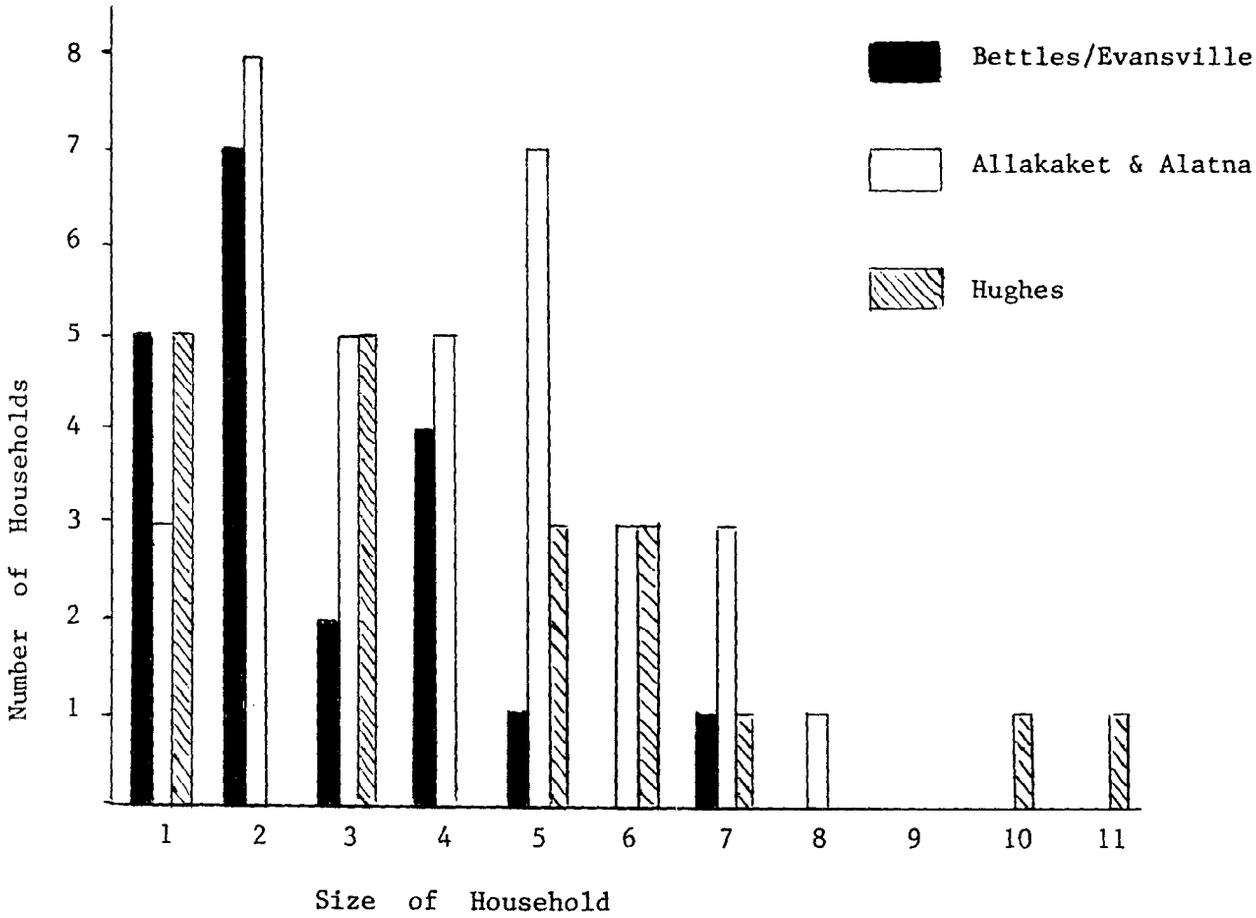


Fig.2 Household Size in Bettles/ Evansville, Allakaket, Alatna, and Hughes. (from 1983 survey, Bettles/Evansville n=20, Allakaket and Alatna n=35, Hughes n=19)

in Evansville, while Bettles is predominantly inhabited by non-Natives. The community is unincorporated.

The 5,200-foot airfield in Bettles originally was a Federal Aviation Administration installation, but now is a state facility. With the exception of the health clinic, post office, and community hall, all community facilities are located in Bettles. These include a restaurant and lodge, public school (grades K-12), store, and a utilities company. The National Park Service has one full-time employee in Bettles and, along with the Bureau of Land Management, maintains seasonal staff there during the summer. State of Alaska personnel include a Fish and Wildlife Protection Officer and employees of the Division of Aviation and Department of Transportation and Public Facilities. Air taxi operations serve a largely seasonal population of miners and recreational users of the Brooks Range.

In 18 of the 20 Bettles/Evansville households (90 percent), the head of the household held at least temporary employment in 1982. Head of household employment averaged 8.6 months in duration and was mostly full time. The two other heads of household were retired. Of 27 individuals who held jobs in 1982, overall employment averaged 9.2 months in duration. Employment sources in Bettles/Evansville were either found in the private sector (e.g., air taxi and guiding operations) or associated with state and federal government (Table 6). Clearly, the Bettles/Evansville economy and the airport facility are closely linked.

TABLE 6. EMPLOYMENT SOURCES IN BETTLES/EVANSVILLE IN 1982.

Type of Position	Number Employed	Average Duration of Employment (in months)
In-Village Employment:		
Power Plant (Maintenance, Management)	2	12
Community Health Aide	2	12
Aircraft Maintenance	1	12
Pastor	1	12
Postal Clerk	1	12
National Park Service	1	12
NOAA Monitor	1	12
Air Taxi, Guiding	5	10.4
Federal Aviation Administration	3	9.3
Teacher	3	9
School Maintenance	1	7
Mining	1	5
Laborer	2	4.5
Outside Village Employment:		
Firefighter (BLM)	2	1

Note: Based on actual employment held by 25 household members in 1982 from survey of 20 households. Many of these positions were part-time and some people held more than one position. In addition, in-village employment also occurred in the form of hired services among residents, such as firewood cutting, welding, and the like.

Allakaket and Alatna

Located approximately 57 miles upriver from Hughes and 190 air miles northwest of Fairbanks, Allakaket and Alatna are situated on opposite banks of the Koyukuk River, immediately southwest of its confluence with the Alatna River in the Kanuti Flats. Long before the communities were established, Koyukon Athabaskans and Kobuk Eskimos met in the area to exchange trade goods. Allakaket owes its beginning to Archdeacon Hudson Stuck, who established a mission there in 1906. Alatna reportedly was settled in 1914 on the site of an abandoned trading post that served prospectors in the area at the turn of the century (Norton 1982:11-12). Allakaket is a second class city and Alatna is unincorporated.

Community facilities are located primarily in Allakaket and include a post office, public school (grades K-10), two general stores, an Episcopal church, community hall, teen center, laundromat, health clinic, and a 3,000-foot airfield. Drinking water is obtained either from the laundromat, the river, or a summer-only surface pipe system. Pit privies are used. Waste is burned at a community dump.

For Alatna and Allakaket combined, 25 of 35 household heads (78 percent) were employed during 1982, with the duration of employment averaging 3.7 months. Few of these positions offered full-time (40 hours per week) employment. Of 57 people who were employed, overall employment averaged 4.1 months. Most local jobs were service and construction jobs for the city (Table 7). The 1982 projects included powerline improvements and gravel surfacing of local roads. In 1983 further road work and construction of a new community hall and a cold

TABLE 7. EMPLOYMENT SOURCES IN ALLAKAKET AND ALATNA IN 1982.

Type of Position	Number Employed	Average Duration of Employment (in months)
In-Village Employment:		
Postal Clerk	1	12
Air Service Agent	1	12
Airport Maintenance	1	12
Clinic Maintenance	1	12
Power Plant Maintenance	1	12
K'oyitl'ots'ina Corporation	2	12
Clerical - for City	2	10.5
Community Health Aide	4	10.5
School Teacher	4	9
Teaching Aide	1	9
School Maintenance	2	6.5
Washeteria	2	6
Homemaker Program	1	6
Maintenance & Construction - for City	5	5
Tanana Chiefs Conference	1	3
Clerk - Co-op Store	2	2.5
C.E.T.A. Carpentry Work	3	2
Construction - Road	5	1.8
Outside Village Employment:		
School Teacher (Hughes)	1	9.0
Carpentry, Laborer (Bettles, North Slope)	3	2.7
Fire Fighting	23	0.5

Note: Based on actual employment held by 57 household members in 1982 from survey of 35 households. Most of these positions were part-time and some people held more than one position. In addition, in-village employment was also found in the form of hired services among residents, such as firewood cutting, welding, and the like.

storage building provided employment. The 23 firefighting positions lasted an average of one-half month and represented over one-third of all jobs held by Allakaket and Alatna residents.

Hughes

The community of Hughes is situated on the east bank of the Koyukuk River, approximately 210 air miles northwest of Fairbanks and 65 miles northeast of Huslia. Established in 1910 as a riverboat landing and an outpost for gold prospectors along the Indian River, Hughes later became a predominantly Koyukon Athabaskan settlement. Hughes is a second class city and had a reported population in 1980 of 73 persons, somewhat lower than the 1970 population of 85 residents.

Community facilities in Hughes include a post office, elementary school, general store, community center, and an Episcopal church. Homes in the community have individual septic tanks and water service provided by a Public Health Service water system. Commercial air service is available four days per week; the community has a 4,800-foot runway (Tanana Chiefs Conference 1983:148).

In Hughes only 13 of 19 household heads (68 percent) were employed at all during 1982. In these 13 households, the head of household worked an average of 5.8 months. Of 38 individuals employed, their overall employment averaged 4.1 months. The most commonly held local jobs were in construction or labor on community and school projects (Table 8). In 1982 Hughes residents completed a combined community hall, office, and clinic building. Eleven Hughes residents worked for the Bureau of Land Management on fire fighting crews during the summer months.

TABLE 8. EMPLOYMENT SOURCES IN HUGHES IN 1982.

Type of Position	Number Employed	Average Duration of Employment (in months)
In-Village Employment:		
Bookkeeper - for City	1	12
Power Plant Operator	1	12
Community Health Aide	1	12
Clerk - Co-op Store	1	12
State Assistance Agent (fee agent)	1	12
Postal Clerk	1	12
Air Service Agent	2	12
Special Education Aide	1	9
School Maintenance	2	9
Cook - School	1	9
Babysitting	1	9
Clerical - for City	1	5
Homemaker and C.E.T.A. Program	3	5
Teaching Aide	4	3.3
Construction/Labor (community & school projects)	8	1.9
Outside Village Employment:		
Store Clerk (Tanana)	1	12
Cook (Anchorage)	1	6
Dishwasher (Fairbanks)	1	3
Clerical (Ruby)	1	2
Laborer (North Slope)	1	2
Firefighter (BLM)	11	1

Note: Based on actual employment held by 38 household members in 1982 from survey of 19 households. Most of these positions were part-time and some people held more than one position. In addition, in-village employment was also found in the form of hired services among residents, such as firewood cutting, welding and the like.

Employment Patterns

Information on employment was collected in each community (Survey Form, page 1). Generally the jobs held were neither full-time nor year-round positions. Norton (1982) observed that even those positions listed as full-time, such as postmaster or health aide, are generally not full time. Indeed, distinctions between full-time (40 hours per week) and part-time (less than 40 hours per week) positions were not made consistently by residents and our survey question on part-time versus full-time employment elicited inconsistent responses. Particularly in Allakaket, Alatna, and Hughes, year-round, full-time positions are so rare it seems that they are not held as a standard. Jobs that do run 12 months a year, such as postal clerk, air service agent, or health aide, are mostly less than 20 hours per week while employment that is full time such as labor, construction, or fire fighting typically lasts a little over one month.

Previous Published Materials on the Koyukuk

The Koyukuk River study communities described above and depicted in this study are well-represented in the historical and ethnographic literature. This section lists the major publication dealing with subsistence.

The historical summaries by Annette McFadyen Clark (1974:74-90; 1981:584-587) are particularly useful in establishing the early-day connections between the Koyukon Athabaskan Indians, Kobuk Eskimos, and

non-Native traders and explorers (see also Clark 1970a). The late 19th century mining history of the region, which attracted the first influx of white people to the Koyukuk, is briefly summarized by Cole (1983). Lieutenant Henry T. Allen explored and mapped the Koyukuk River in 1885 and recorded his observations (Allen 1887). Another historical summary, derived from secondary resources, examines activities on and involving navigable waterbodies in the Koyukuk River hydrological region (Ertec Northwest, Inc. 1982).

Hudson Stuck (1914, 1917), who established St. Johns-in-the-Wilderness Episcopal Mission at Allakaket in 1906, provides a general description of area lifeways in the early 1900s. Extensive linguistic studies of the Koyukon dialect were published by Krauss (1979) and Jones (1978). A Koyukon Athabaskan dictionary being developed by Eliza Jones will provide a detailed examination of Koyukon culture as seen through the language (Jones, in prep.).

Clark (1974) described the annual round of harvesting activities in Allakaket, Alatna, and Evansville in 1961-62 and reconstructed the seasonal round prior to non-Native contact on the basis of key informant interviews. The seasonal cycle in 1961-62 differed from the pre-contact cycle primarily in the fact that the people now lived in villages, utilized seasonal fishing and trapping camps, and supplemented their diet with western foods. Additionally, employment opportunities during the summer months enabled some young men to augment their cash incomes that were otherwise limited primarily to the sale of furs. Table 9 summarizes the cycle of seasonal wild resource harvest activities during 1961-62 in Allakaket and Alatna, as recorded by Clark (1974).

TABLE 9. GENERALIZED DEPICTION OF SEASONAL RESOURCE HARVEST ACTIVITIES IN ALLAKAKET AND ALATNA, 1961-62 AND 1968.

Summer	Fall	
⊕ Salmon gill netting	⊕ Moose hunting	0 Caribou hunting
⊕ Berry picking	⊕ Non-salmon seining	0 Sheep hunting
⊕ Moose hunting	⊕ Bear hunting	0 Salmon gill netting
	⊕ Small game hunting	0 Waterfowl hunting
	⊕ Wood cutting	0 Wolf and small mammal trapping
	⊕ Rabbit snaring	

Winter	Spring
⊕ Wolf and small mammal trapping	⊕ Muskrat hunting/trapping
⊕ Beaver trapping	0 Net fishing (non-salmanoid)
⊕ Ice fishing (non-salmonoid)	0 Caribou hunting
0 Big game hunting	0 Waterfowl hunting
0 Small game hunting	
0 Wood cutting	

⊕ = Major Activity 0 = Secondary Activity

Source: Clark 1974:34-36 and Clark and Clark 1978:70.

In aboriginal times, three Koyukon Athabaskan bands occupied the Koyukuk River area (Clark 1974). Each band, a unit comprised of several families, exploited a well-defined territory approximately 50 miles in diameter and periodically made longer excursions to nearby mountainous areas for sheep and caribou hunting. Each band maintained semi-permanent settlements during the summer and winter months when resources were relatively abundant. In the fall and spring months when resources were in short supply, the larger band dispersed and individual family groups hunted and fished alone (Clark 1974:96-97). Clark did not draw comparisons between the aboriginal territory of exploitation and that utilized in the early 1960s. Her discussion of aboriginal and contemporary (early

1960s) settlement patterns, however, offers many insights into land use practices adhered to by the Koyukon Athabaskans.

A 1975-76 study funded by the National Park Service (NPS) examined subsistence and associated cultural patterns in the Koyukuk River villages of Allakaket, Alatna, Evansville, Hughes, Huslia, and the nearby Nunamiut Eskimo community of Anaktuvuk Pass (Nelson, Mautner, and Bane, 1982). The project was primarily a response to the need by NPS for information about land and resource use patterns among Native peoples residing in the vicinity of the then-proposed Gates of the Arctic National Park.

Nelson, Mautner, and Bane (1982) describe in detail the range of resource harvesting activities pursued by Koyukon Athabaskans and Kobuk Eskimos in the study area, as well as travel methods, the role of women in subsistence, species distribution and population dynamics, the cultural dimensions of subsistence foods, the influences of a changing society on traditional Koyukon subsistence practices, an inventory of plant and animal species known to or used by Koyukon Athabaskans in 1976, and instructions for preparing food or making clothing from locally available resources. The intimate knowledge the people have of the land they inhabit is reflected in a series of maps depicting Native-named places and site locations. Finally, a separate set of maps documents the areas used for harvesting wild resources during the two decades prior to the study.

Nelson, Mautner, and Bane (1982) portray subsistence as being much more than simply an economic activity. In a similar fashion, Nelson (1983) examines the in-depth knowledge that Koyukon Athabaskans at Huslia

and Hughes have of the boreal forest environment and its flora and fauna. In his view, the Koyukon "perceive the environment as a conscious, sensate, personified entity, suffused with spiritual powers, whose blessings are given only to the reverent" (Nelson 1983:226).

> Viewed from this perspective, Koyukon subsistence is more than just an economic pursuit -- it is manifestly bound to religious ideology and religious practice. In the traditional milieu, nature is approached as a sacred realm that provides tangible sustenance. This approach remains true for most adults in the Koyukuk River villages despite a century of change (ibid).

Nelson takes issue with those who suggest that Koyukon Athabaskans lack a conservation ethic and methods of regulating or limiting the use of wild resources. On the contrary, he views self-regulation and other conservation practices as an outgrowth of the Koyukon's detailed knowledge of ecological patterns, fluctuations in resource populations, and the consequences of overharvesting (see Nelson 1983:200-224 for a detailed examination of this topic).

Further insights into subsistence resource uses and conservation practices are offered in a series of autobiographies of Koyukuk River residents prepared for the Yukon-Koyukuk School District (e.g., Beatus 1980; Beetus 1980; Henzie 1979; Nictune 1980; Simon 1980; Tobuk 1980). These volumes, written in the words of the elderly storytellers, are designed for use by upper elementary students in rural Alaska but are equally instructive to others interested in Koyukuk River cultures. The men portrayed in these autobiographies have witnessed dramatic changes during their lives, yet retain strong ties to a way of life revolving around the subsistence use of resources.

This study was not designed to replicate any of the works cited above. Instead, it directs attention to topics not sufficiently addressed in previous field investigations and to the current information requirements of state and federal agencies and other organizations involved in land and resource use planning. As a complement to these earlier and often more detailed studies, this report provides a basis from which future trends and changes in resource use patterns in the Upper Koyukuk region can be measured.

Since this report presents resource use data for a single year and portrays on maps areas used for resource harvesting during a two-year period, it must not be construed as a comprehensive examination of resource use patterns in the Upper Koyukuk region. Many factors can affect community and household participation in resource harvesting activities, including fluctuating species populations, inclement weather, seasonal wage employment opportunities, and other situations beyond the control of local residents. Consequently, the harvest levels, areas utilized and use patterns depicted later in this report may change in subsequent years. What is clearly evident, however, is the continued importance of fish, wildlife, and plant resources in the economies of Upper Koyukuk households and communities.

CHAPTER 4

RESOURCE USE PATTERNS

Introduction

This chapter presents contemporary resource use information derived from household interviews conducted in the Upper Koyukuk study communities. For each of four major subsistence activities (fishing, hunting, trapping, and plant gathering), the discussion focuses on (1) areas utilized for resource harvesting; (2) species harvested; (3) seasonality of harvest; (4) methods and means of harvest and preservation; (5) 1982 harvest levels; and (6) work group composition. The reader is reminded that this discussion is based on information collected for a recent two-year period. For information on more historic subsistence patterns in this region, consult Nelson, Mautner, and Bane (1982) and Clark (1974).

Fishing

General Patterns

Fishing is an important subsistence activity in the Upper Koyukuk region, with fish comprising a substantial portion of the diet among residents of Allakaket, Alatna, and Hughes. Salmon, the major species harvested in these communities, are not nearly as abundant in the Bettles/Evansville area. Fish comprise a relatively smaller, but still important, component of this Bettles/Evansville diet as a consequence.

A generalized depiction of seasonal fishing activities during 1982 is presented in Figure 3. Fishermen eagerly awaited the clearing of river ice on the Koyukuk River after the spring break-up, usually about early May, so that nets could be set for sheefish, whitefish, suckers, and pike. Fishing for these species occurred during May and early June, preceding the arrival of salmon. June was also the time when fishing equipment was repaired or mended for the new season. The first king salmon were caught in late June, which signaled the beginning of a busy salmon fishing season. By September effort shifted to moose hunting; however, some nets remained active and many people caught grayling with a hook and line. Between moose season and freeze-up on the river, usually about late October, trips were made to favorite seining sites for sheefish and whitefish. There was almost no fishing for burbot through the ice after freeze-up during the winter of 1982-83. Several fish species were typically caught with a single gear type. Fishermen did not stress the importance of a single target species for most fishing activities since all fish caught were a welcome addition to the household food supply.

Historically, the fisheries resources have been one of the most stable and consistent food sources for the people of the Koyukuk River. Elders recall a time before 1930 when moose were not found in the area, when seasonal caribou migrations were unreliable, and when the major food sources were salmon, small game, and black bear.

Participation in the harvest of fish resources is shown in Figure 4. A majority of the Allakaket and Alatna households participated in the harvest of five species, and in Hughes a majority harvested seven

Fishery Resource	Months Harvested												
	J	F	M	A	M	J	J	A	S	O	N	D	
King Salmon						x	x	x	x	x			
Summer Chum							x	x	x	x	x	x	
Fall Chum									x	x	x	x	x
Sheefish						-	-	x	x	x	x	x	x
Whitefish					-	-	x	x	x	x	x	x	x
Pike					x	x	x	x	x	x	x	x	x
Grayling							x	x	x	x	x	x	x
Sucker						x	x	x	x	x	x	x	x
Burbot					x	x	x	x	x	x	x	x	x
Trout										x	x	x	x
						x	x	x	x	x	x	x	x

xxx = usual harvest period

--- = intermittent harvest period

Fig. 3. Seasonal round of fishing activities, Bettles/Evansville, Alatna, Allakaket, and Hughes, 1982.

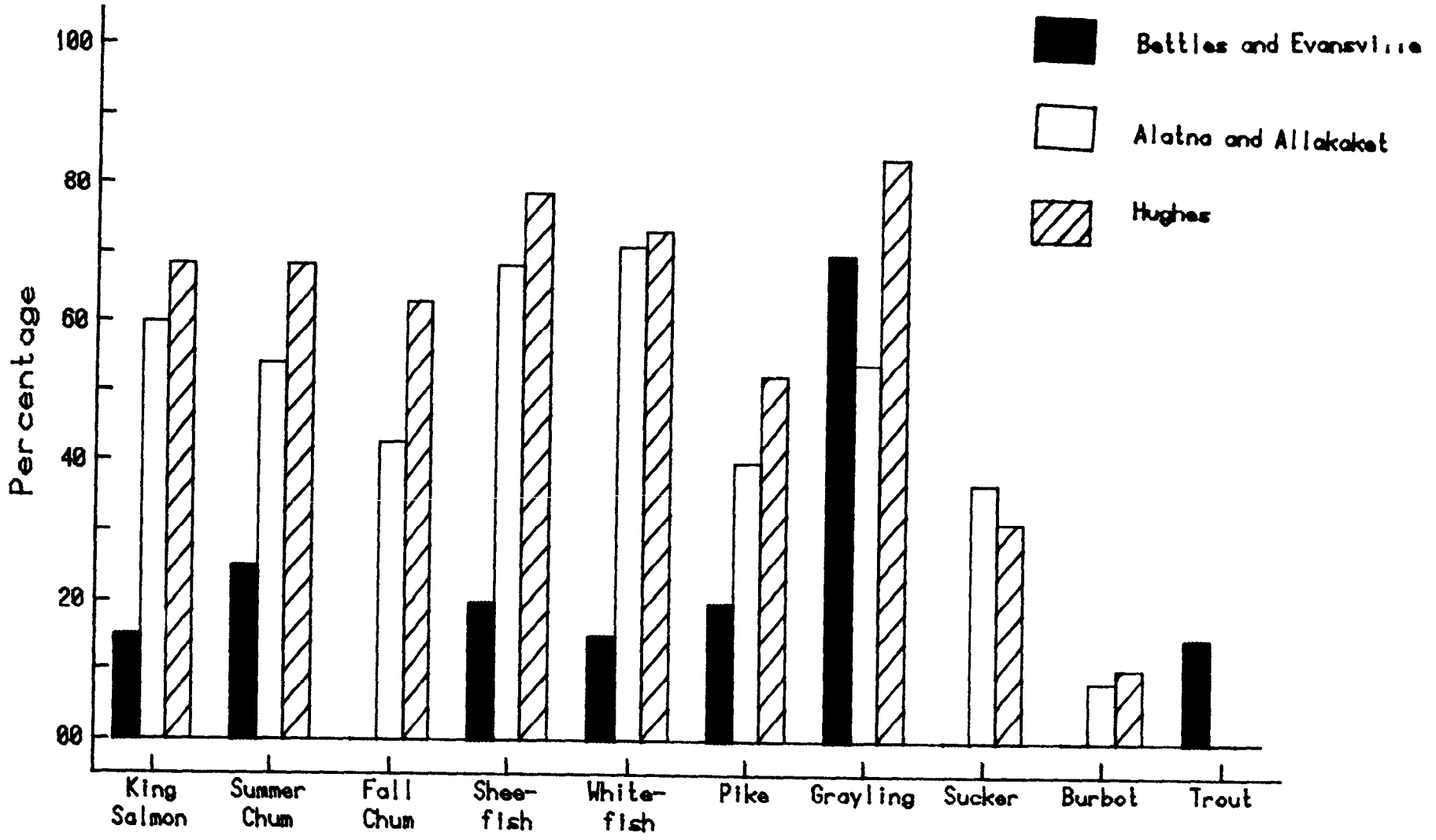


Fig. 4. Fishing Participation - Percentage of Households Harvesting Fish Resources in 1982

species. Suckers, burbot, and fall chum were caught only by Hughes, Allakaket and Alatna fishermen, while trout were caught only by Bettles/ Evansville fishermen during 1982. In general, a larger proportion of Allakaket, Alatna, and Hughes households reported fishing than Betttles/ Evansville households. Only with grayling fishing did more than half of the Bettles/Evansville households report participation in 1982.

In addition to those households participating in fish harvests, several additional households also received fish from harvesting households. An additional ten percent of Bettles/Evansville households received king salmon and sheefish and five percent received summer chum and grayling. All fish types harvested by Allakaket and Alatna households were shared with other households but most commonly shared were king salmon (23 percent of households receiving), summer chum salmon (17 percent), whitefish (14 percent), and fall chum salmon (11 percent). In Hughes king salmon, fall chum, burbot, sheefish, and whitefish were all distributed to households which did not harvest those fish.

Harvest levels for the 1982 fishing season are shown in Table 10. The table shows the number of households in each community participating in the harvest of the particular resource, the range of harvests reported for only those households, the average household harvest for all village households, and the total harvest reported for the community. During the household survey, efforts were made to document harvest levels without counting the same fish twice, a task often made difficult when two or more households were represented in the actual fish harvesting group. In most cases, the total harvest of a given species was attributed to one household and the cooperating households were noted.

TABLE 10. FISH HARVESTS, 1982.

	Bettles/Evansville N=20				Allakaket and Alatna N=35				Hughes N=19			
Resource	# of Hslds. Part.	Range Hsld. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	# of Hslds. Part.	Range Hsld. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	# of Hslds. Part.	Range Hsld. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.
Burbot	0	NA	NA	0	3	3-50	1.7	58	2	10-50	3.2	60
Grayling	14	4-150	24.6	491	19	9-500	46.8	1639	16	3-300	72.4	1,376
Pike	3	1-10	0.7	13	14	5-150	11.5	401	10	3-100	11.1	211
King Salmon	2	4-5	0.5	9	21	2-40	9.2	322	13	5-150	26.6	506
Summer Chum	5	12-300	26.6	532	19	50-2000	270.9	9480	13	200-4000	673.7	12,800
Fall Chum	0	NA	NA	0	15	3-500	57.6	2017	12	3-300	69.6	1,323
Sheefish	4	12-150	10.6	212	24	5-300	70.0	2451	15	1-100	16.8	320
Sucker	0	NA	NA	0	13	1-200	13.7	480	6	5-10	2.6	49
Trout	3	6-30	3.1	61	0	NA	NA	0	0	NA	NA	0
Whitefish	2	10-200	10.5	210	25	5-2000	138.8	4858	14	10-500	112.4	2,135

Many Upper Koyukuk households have grown accustomed over the years to quantifying their fish harvests on Department of Fish and Game catch calendars. For these households, providing estimates of harvest levels was not difficult. Other households were not used to calculating their fish harvests. One fisherman said, in reference to summer chum harvests, "we don't count fish." Consequently, some household harvest figures were not actual counts, but retrospective estimates. It is believed these are reasonably accurate estimates, because most households took great pains in considering the question. For instance, one man calculated his whitefish harvest by counting 13 fish per willow stick stringer times the number of stringers. Another counted his summer chum harvest by counting 30 fish per bundle times 40 bundles. Summer chum harvests were often counted by the nearest hundred, while king salmon harvest counts were accurate to each fish. Respondents overall attempted to present the most accurate information possible.

Overall there were more summer chum salmon taken than all other fish combined. Harvests of whitefish, grayling, fall chum, and sheefish each totaled nearly 3,000 fish or over. The total community harvest of each of the remaining species was less than 1,000 fish. A wide range of household harvests was displayed for most species and all communities, thus few households actually harvested the average number of fish. An average household harvest calculated for only those households participating in the harvest would be greater than that calculated for all households, depending on the number of households participating.

Fishing harvests can vary significantly from year to year. Fish harvest figures for a single year must be considered within the wider

range of variation found in harvest for several years. Longitudinal harvest data, however, were not collected as part of this project. Several fishermen commented that their 1982 salmon harvests were below average and attributed this to a below average salmon run. It should be recognized that strength of run, water level, fishing effort, and fish drying conditions all influence the harvest levels in any particular year.

In 1981 and 1982, fish were either consumed by people or used as dog food. Fish were eaten fresh or preserved by drying, freezing, or canning. Air-dried fish were lightly smoked over a dry balsam poplar or willow fire, then stored in a cache or smokehouse. Most households (88 percent overall) used freezers, and in 1983 the city of Allakaket started building a community freezer facility. Some king salmon, either in dried strips or pieces, were preserved by canning in quart jars.

Most of the fish harvested was used by the groups that harvested it. However, sharing of fish with others outside the work group commonly took place. For example, 23 percent of Allakaket households and 47 percent of Hughes households that harvested king salmon gave some of the harvest to other households.

Boats used were generally 16- to 20-foot aluminum riverboats powered by 25- to 40-horsepower outboard motors. The distance to salmon fishing net sites ranged from directly in front of town to 25 miles up or down river. Sheefish and whitefish were caught by beach seines at fishing sites 30 to 50 miles up the Alatna River. The Bettles/Evansville pattern differed somewhat, with residents placing less emphasis on

salmon fishing and focusing more on grayling fishing, and with some residents using air travel to reach trout fishing sites.

Patterns of fish camp use and travel to net sites may have changed in recent years. Some respondents indicated that their use of a fish camp has decreased in favor of staying in town, checking the net during short day trips, and bringing the fish home for processing. On trips taken to help fishermen check their nets, several dormant camps were observed. No fish camps were used for the entire 1982 salmon season. Some respondents commented that jobs in town prevented them from staying away from the community for extended periods. One Allakaket woman explained that her two older children were no longer willing to stay in camp for long and miss a chance of going out with the local Bureau of Land Management firefighting crew.

As with other resource harvesting activities, fishing occurred primarily among immediate family members living in the same or separate households. Family members residing in different households commonly fished cooperatively. This generally involved sons and daughters living in their own households who still fished with their parents.

Among Hughes salmon fishing groups, for example, 13 (72 percent) were composed of household members only. In the remaining five salmon fishing groups (28 percent), family members from two different households fished together: three groups were households linked by a parent-child relation, one group had two households of siblings, and one group had two households linked by "cousin" relationship. Eight Hughes households (45 percent) fished for non-salmon species as a household unit. An additional six households (30 percent) fished with parents and siblings living outside the household and five (25 percent) fished with friends.

Fishing tasks were shared among fishing group members according to the time and resources available. For instance, one 28-year-old Hughes man assisted his elderly parents by performing some of the more physical chores such as setting up the tent and camp and cutting a supply of dry balsam poplar wood for smoking fires. His parents tended the net and processed the fish on a daily basis. In one Allakaket salmon fishing group, two brothers in their early thirties and living in separate households had taken over most of the fishing from their parents. In addition, both pursued other summer activities in the village. On alternate days, one of the two brothers traveled the 20 miles to check the net and remained overnight at the family fish camp. The fish they harvested were shared among the three households.

Cooperation between households is also illustrated by one elderly Allakaket couple whose fish net site was close to town and was particularly productive. After they had processed enough king salmon and summer chum salmon for their own eating needs, they turned the site over to another local fisherman who had a large dog team to feed, and whose own net site was less productive.

Fishing Areas

Fishing areas used in 1981 and 1982 are depicted on the resource use maps by gear type and fish species (Figs. 5, 6, and 7). The general area used for fishing by Bettles/Evansville residents extended from Florence Creek Lake to sites along the Alatna River (Fig. 5). Residents fished for grayling most frequently where small tributary streams enter

the Koyukuk River and along the Koyukuk itself as it flows by the community. Several fishermen commented that they had to travel to the John River in 1983 to find water clear enough for grayling fishing. They attributed the high silt level in the Koyukuk River to placer mining operations in the area. Some Bettles/Evansville residents used seine nets and set nets to fish for sheefish and whitefish along the Alatna River with relatives from Alatna and Allakaket. Many had grown up fishing at those sites. Salmon fishing with set nets occurred along the main Koyukuk River up and down stream from the community. Salmon fishing areas along the South Fork were reportedly utilized more heavily in the past, but were still used by at least one household for chum salmon fishing. Salmon fishing also occurred at various sites along the Koyukuk River between South Fork and Mud Creek.

The general area used for fishing by Allakaket and Alatna residents extended up the Alatna River to seining areas near Chebanika Creek, up the Koyukuk River and South Fork to Fish Creek Lake, and downriver to seining areas near Niitltoktalogi Mountain (Fig. 6). Many of these fishing sites, such as the Alatna River seining areas or Fish Creek, were used at specific times of the year as they have been in the past. Other sites were used for specific species, such as pike fishing along the lower Kanuti River or grayling fishing at Henshaw Creek. Members from 14 of 24 households (58 percent) went seining up the Alatna River in 1982 for availability of species -- sheefish, whitefish, pike, grayling, and suckers. Most of the Allakaket and Alatna salmon fishing took place along the Koyukuk River between South Fork and Discovery Creek.

Hughes fishing activity focused on the Koyukuk River and its small tributaries from Discovery Creek downriver to Florence Island (Fig. 7). Salmon were mostly caught in set nets placed near town or at family fish camps. Grayling were taken with hook and line closer to town.

For all three communities, net sites used were closely associated with family fish camps that have been handed down from generation to generation. Like trapping camps, many fish camps have been selected as Native allotments. In each community, most of the salmon fishermen traveled downriver from the village to fish where salmon were more plentiful and in better condition.

Fishing areas shown here depict only a two-year time period (1981 and 1982). Resource harvest patterns may change from year to year; thus, these maps should be considered only a partial representation of areas important to local residents over time.

Hunting

General Patterns

Hunting is a major harvest activity throughout the year and provides a substantial portion of the diet in the study communities. Moose was commonly reported to be the largest single source of protein for a household, although on average more pounds of salmon were eaten by a household. In recent years few caribou have been found in the area, which is reflected in the low caribou harvests. However, they remain an important resource to people in the Koyukuk River area, and would be harvested in greater numbers with higher caribou population levels.

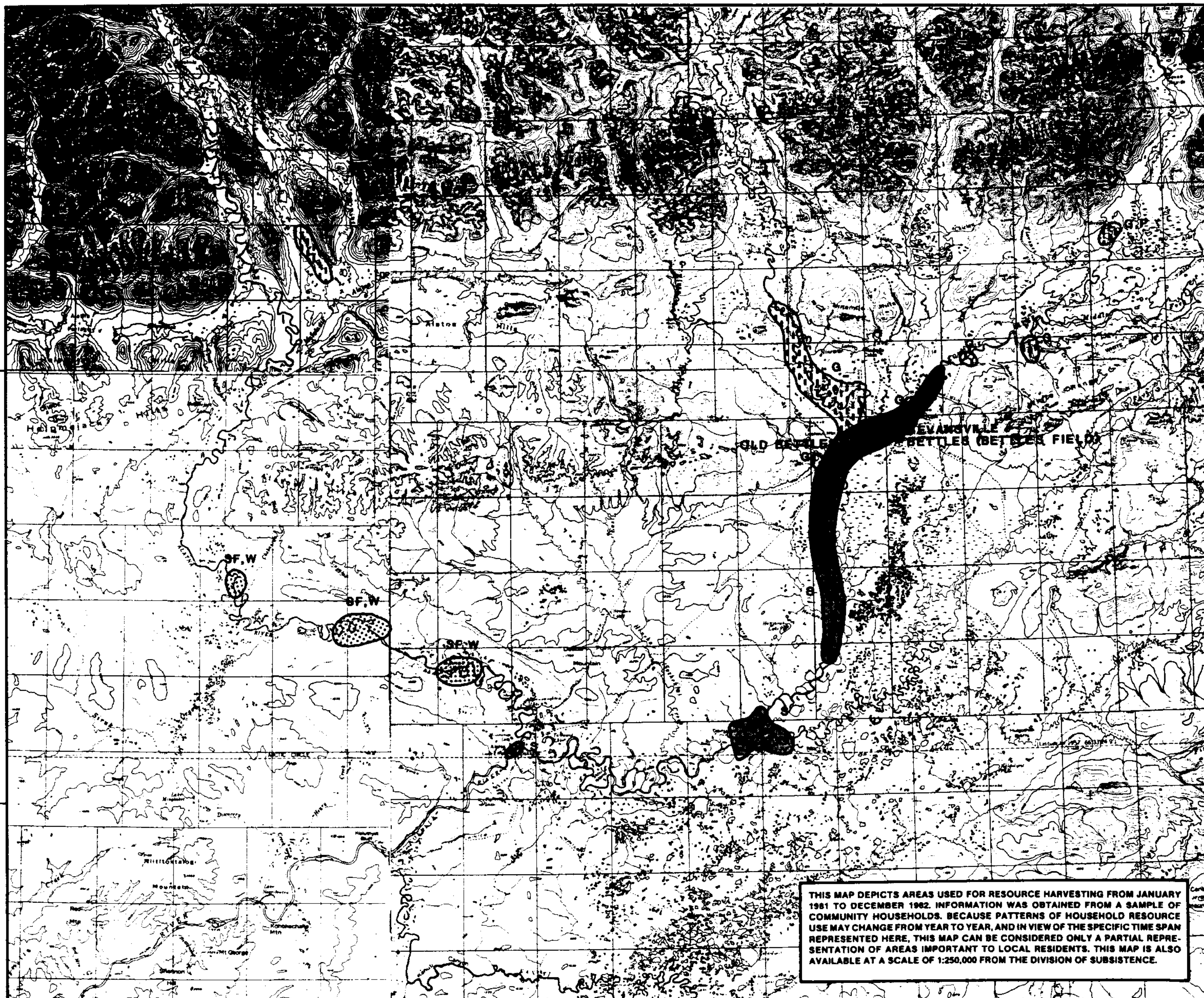


FIG.5 AREAS USED FOR FISHING BY RESIDENTS OF BETTLES AND EVANSVILLE, JANUARY 1981 - DECEMBER 1982.

SEINE NET AREA

SET NET AREA

HOOK AND LINE AREA

G-GRAYLING SU-SUCKERS
P-PIKE T-TROUT
S-SALMON W-WHITEFISH
SF-SHEEFISH

INFORMATION COLLECTED FOR 11 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND WALLACE NICTUNE, IN JUNE, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS BETTLES, HUGHES, SURVEY PASS AND WISEMAN 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

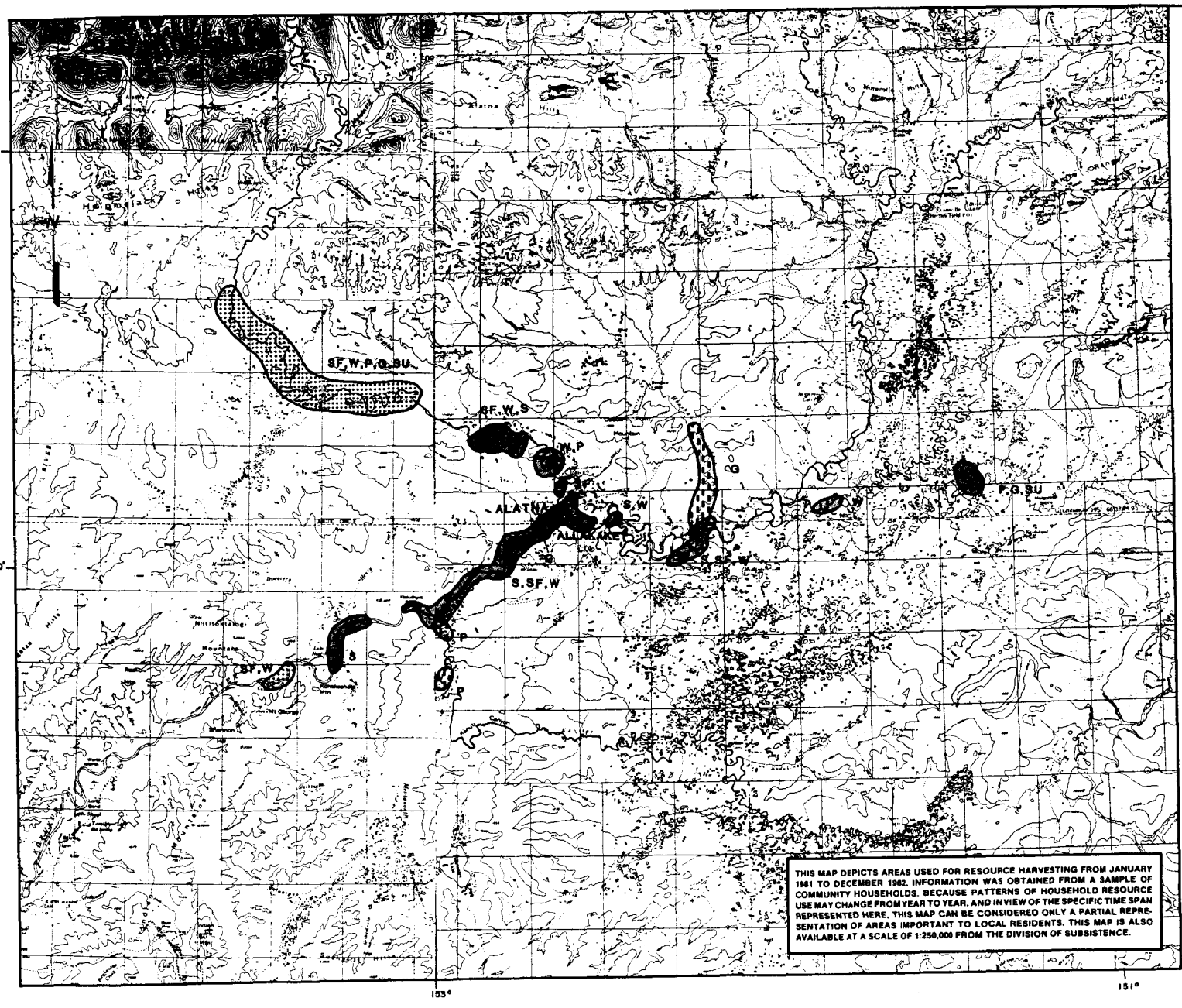
LOCATION INDEX

MELOZITNA TANANA

ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF SUBSISTENCE

1984



THIS MAP DEPICTS AREAS USED FOR RESOURCE HARVESTING FROM JANUARY 1981 TO DECEMBER 1982. INFORMATION WAS OBTAINED FROM A SAMPLE OF COMMUNITY HOUSEHOLDS. BECAUSE PATTERNS OF HOUSEHOLD RESOURCE USE MAY CHANGE FROM YEAR TO YEAR, AND IN VIEW OF THE SPECIFIC TIME SPAN REPRESENTED HERE, THIS MAP CAN BE CONSIDERED ONLY A PARTIAL REPRESENTATION OF AREAS IMPORTANT TO LOCAL RESIDENTS. THIS MAP IS ALSO AVAILABLE AT A SCALE OF 1:250,000 FROM THE DIVISION OF SUBSISTENCE.

FIG. 6 AREAS USED FOR FISHING BY RESIDENTS OF ALLAKAKET AND ALATNA, JANUARY 1981 - DECEMBER 1982.

■ FISH CAMP

SEINE NET AREA

SET NET AREA

HOOK AND LINE AREA

G-GRAYLING
SU-SUCKERS
P-PIKE
T-TROUT
SF-SHEEFISH
W-WHITEFISH
S-SALMON

INFORMATION COLLECTED FOR 24 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND ART WILLIAMS, SR., IN JULY, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION." BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS HUGHES AND BETTLES 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

LOCATION INDEX

SURVEY PASS	WISEMAN
	BETTLES
MELOZITNA	TANANA

ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF SUBSISTENCE

1984

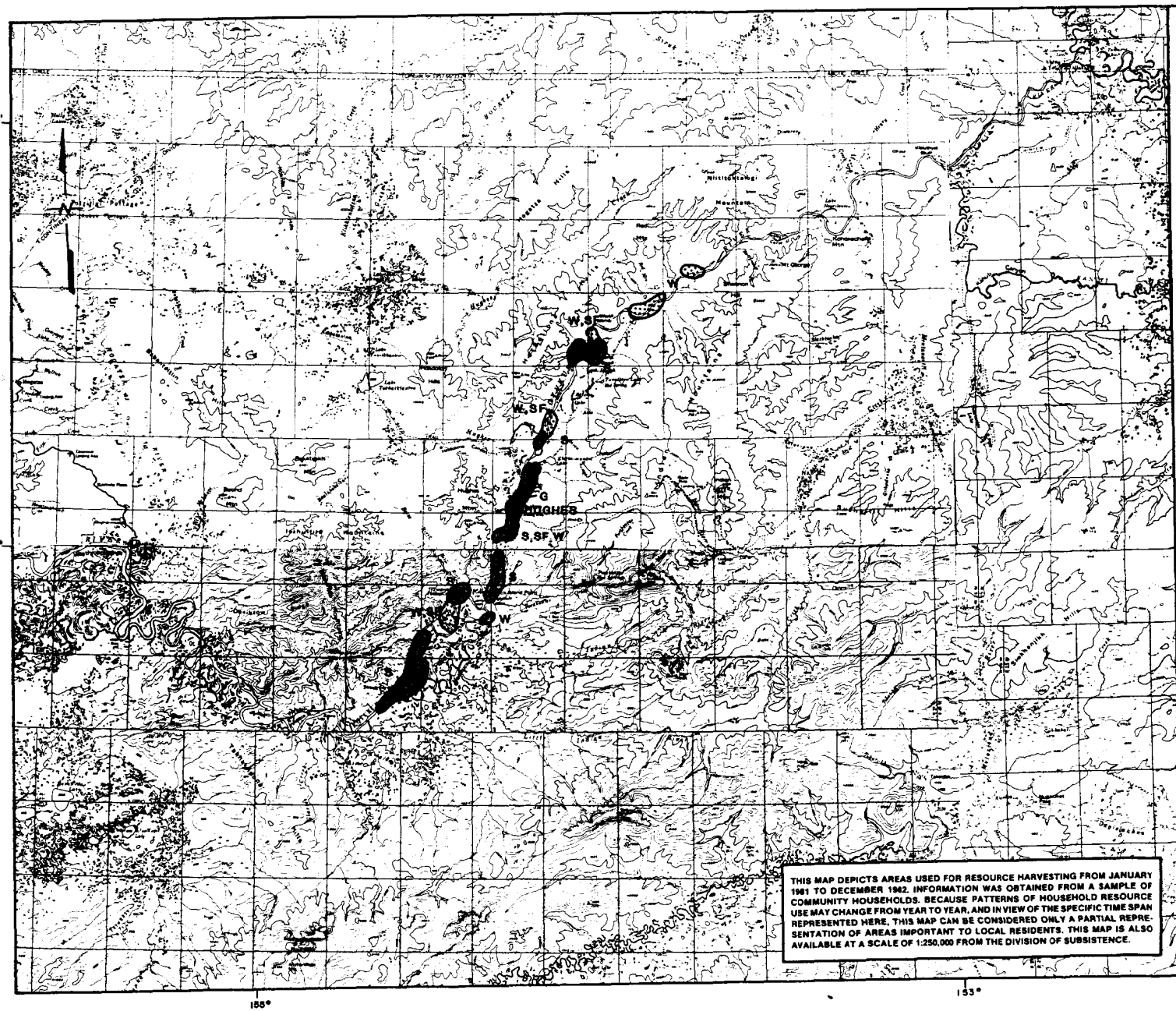


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FIG. 7 AREAS USED FOR FISHING BY RESIDENTS OF HUGHES, JANUARY 1981 - DECEMBER 1982.

- FISH CAMP
- SET NET AREA
- SEINE NET AREA
- HOOK AND LINE AREA

G-GRAYLING
P-PIKE
S-SALMON
SF-SHEEFISH
SU-SUCKERS
T-TROUT
W-WHITEFISH

INFORMATION COLLECTED FOR 17 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND DOROTHY VENT, IN AUGUST, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS HUGHES AND MELOZITNA 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

LOCATION INDEX

SURVEY PASS	WISEMAN
	BETTLES
	TANANA

ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF SUBSISTENCE

1984

A generalized depiction of seasonal hunting activities during 1982 is presented in Figure 8. Hare and ptarmigan were actively hunted throughout the winter months until the end of April. Black bear were taken at their den sites in May. Black bear also were taken throughout the summer and early fall but more commonly in August, September, and October. Sheep were taken in August and early September. September was the primary moose hunting season, although occasional harvests occurred through the fall and winter. Moose were also taken during a 10-day season in March for a portion of the study area. Beginning in September there was an increase in the hunting of hare, waterfowl, grouse, and ptarmigan. During the study period, harvests of brown bear and caribou occurred too infrequently to provide a basis for describing a general pattern. Brown bear were occasionally taken, however. As noted above, local caribou populations have been extremely low during the past 10 years.

Participation levels in the harvest of hunting resources are shown in Figure 9. In general, a high percentage of households harvested or used moose, waterfowl, hare, and black bear in 1981 and 1982. The highest proportion of community households harvesting or receiving game resources generally occurred in Hughes, while the lowest percentage was recorded in Bettles/Evansville. Waterfowl was used by all community households in Hughes as well.

The low participation in caribou harvests (about 5 to 20 percent) is a reflection of the current scarcity of caribou in the area. Many residents commented that caribou migrations have failed to pass through the area during the last decade. Residents attribute this either to the construction of the Trans-Alaska pipeline, large forest burns, or hunting pressure on caribou herd leaders. Biologists attribute the scarcity

GAME RESOURCE	MONTHS HARVESTED																							
	J		F		M		A		M		J		J		A		S		O		N		D	
Hare	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	x	x	x	x	x	x	x	x
Waterfowl								-	x	x	-				-	-	x	x						
Grouse	-	-	-	-													x	x	x	x	x	x	x	x
Ptarmigan	x	x	x	x	x	x	x	x									x	x	x	x	x	x	x	x
Black Bear									x	x	-	-	-	-	x	x	x	x	x	x	-	-		
Brown Bear*																								
Caribou*																								
Moose	-	-	-	-	x												x	x	-	-	-	-	-	-
Sheep															x	x	x							

xxx = Usual Harvest Period

--- = Intermittent Harvest Period

* = Insufficient Data for Seasonality Depiction

Fig. 8 . Seasonal round of hunting activities, Bettles/Evansville, Alatna, Allakaket, and Hughes, 1982.

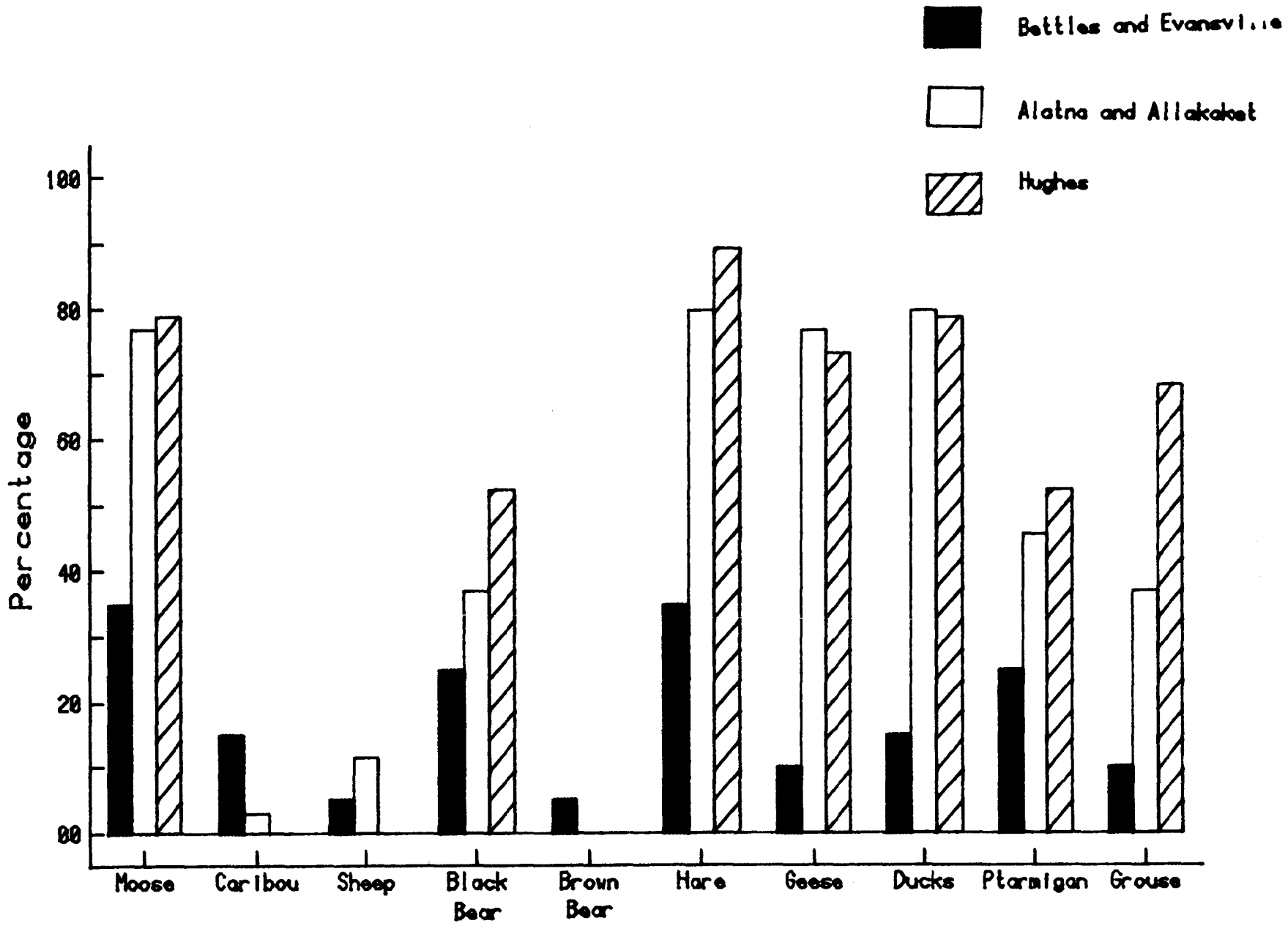


Fig. 9. Hunting Participation - Percentage of Households Harvesting Game Resources in 1982

to a dramatic decline in the Western Arctic Caribou Herd. Several persons emphasized that caribou had traditionally played an important role in the local diet.

Although certain animal species were harvested by a relatively smaller number of households, those species were still considered important to local residents. For example, in 1982 only 20 percent of the Alatna and Allakaket households harvested or received sheep; nevertheless participation in the sheep hunt was of great importance to residents. One hunter reported that a group using five boats traveled up the Alatna River in 1982. The trip was referred to as a sheep hunting trip, yet a number of black bear and four caribou were taken in addition to five sheep. Many hunters stressed the cultural values associated with participating in a sheep hunting trip and traveling to traditional use areas in the Brooks Range. Thus, participation rates and absolute harvest quantities are not synomymous with the relative importance or value placed on a cultural activity.

Harvest levels for the 1982 hunting season are shown (Table 11). The table shows the number of households in each community participating in the harvest of the particular resource, the range of harvests reported for those households, the average harvest for all households, and the total harvest reported for the community. Harvest levels vary from year to year and single year harvest figures must be considered within the context of multi-year patterns.

Overall the 1982 moose harvest averaged approximately one-half moose per household in Bettles/Evansville, one moose per household in Allakaket/Alatna, and 1.7 moose per household in Hughes. The greater moose harvests

TABLE 11. GAME HARVESTS, 1982.

	Bettles/Evansville N=20				Allakaket and Alatna N=35				Hughes N=19			
Resource	# of Hslds. Part.	Range Hsld. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	# of Hslds. Part.	Range Hsld. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	# of Hslds. Part.	Range Hsld. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.
Hare	7	6-150	11.6	231	28	2-100	23.4	818	17	2-50	16.7	318
Ducks	3	2-30	1.8	36	28	3-100	24.5	858	15	10-60	26.6	505
Geese	2	2-10	.6	12	27	1-33	11.3	395	14	8-30	12.0	228
Grouse	2	2-5	.4	7	13	1-20	2.3	81	13	2-30	6.3	120
Ptarmigan	5	2-8	1.0	20	16	2-30	4.4	154	10	4-20	4.2	79
Black Bear	5	1 ea	.3	5	13	1-3	.6	21	10	1-3	.8	15
Brown Bear	1	1	.05	1	0	NA	NA	0	0	NA	NA	0
Caribou	3	2-6	.6	11	2	1-4	.1	5	0	NA	NA	0
Moose	7	1-2	.5	10	27	1-2	.8	28	15	1-4	1.7	33
Sheep	1	2	.1	2	4	1-2	.1	5	0	NA	NA	0

in Hughes, relative to Bettles/Evansville is possibly due to higher moose populations near Hughes.

Waterfowl harvests were reported by a majority of households in Allakaket, Alatna, and Hughes. Although waterfowl hunting began as early as late April, when geese and ducks first began to arrive at local lakes and sloughs, it was during May when over half of the hunting took place. No geese or ducks were reported harvested in July and only a few in June and August. Hunting resumed during September when the geese and ducks aggregated. September hunting of geese was made difficult by their increasing wariness. The Canadian goose, mallard, oldsquaw, pintail, and widgeon were species most commonly taken through the year. In each community the young adult and teenage males were most active in waterfowl hunting, although sometimes entire household groups would participate in a hunting trip. Geese and ducks were considered a highly prized food source and were especially welcomed during the late spring when they provided a new source of wild food in the local diet.

Hunters used whatever means of travel was practical for conditions during the particular season. Snowmachine travel was possible from November through April and boat travel possible on the rivers from May through October. Airplanes were used year-round. Travel is especially difficult during break-up season in early May and freeze-up in late October.

The average one-way distance traveled for moose hunting in September was 36 miles (all communities, 46 households). Although some took moose as close as one mile and as distant as 100 miles, most traveled between 20 and 60 miles from their community. Most moose hunting was accomplished by traveling on the river while searching for moose until one was

sighted. Such searches often required considerable amounts of fuel. Several respondents estimated distance traveled by calculating from the volume of fuel they had used.

In Allakaket and Alatna most households initially looked for moose along a particular river then expanded their search to other locations if necessary. The direction of travel first pursued was often toward camps, trapping areas, Native allotments, or a family's traditional use area. A secondary area could be anywhere along navigable rivers. No areas were used exclusively by only a part of the community.

Hughes, Alatna, and Allakaket hunters did not use airplanes for moose hunting. Some Bettles/Evansville residents did. Use of airplanes for moose hunting has been prohibited by the Alaska Board of Game in the Kanuti and Koyukuk controlled use areas. The Kanuti Controlled Use Area surrounds Allakaket and includes most of the area used for moose hunting by residents of Allakaket and Alatna. The Koyukuk Controlled Use Area extends from Hughes southward to the mouth of the Koyukuk River and includes an area actively used by Hughes residents. Some Bettles/ Evansville residents used boats during moose hunting, while others accessed hunting areas by airplane. Snowmachines were used during winter moose hunting. Winter hunting access was not limited to the river corridors and travel distances were generally much shorter.

Allakaket and Alatna hunters traveled between 175 to 200 miles (one way) to traditional sheep hunting areas in the Brooks Range. Travel was by boat up the Alatna River. A second area up the John River has been used by Allakaket and Alatna sheep hunters but not during the two-year study period. Several residents recalled years between 1912 and 1930

when hunting parties would hike into sheep country fishing and hunting other game as they went, then hunt sheep and finally build rafts to drift back to Allakaket. These trips lasted over a month in duration.

In 1982, Bettles/Evansville sheep hunters traveled between 130 and 200 miles to sheep hunting locations in the Brooks Range. While some hunted in 1981 near the John River, others traveled with relatives from Alatna to hunt sheep up the Alatna River.

Moose hunting was an activity pursued primarily by related individuals in Allakaket and Alatna. All 26 parties hunting moose during the September season included adult males. Eighteen (69 percent) involved only members of one household, while eight (31 percent) counted members from two households. Of the 18 cases where only a single household was represented, 14 (78 percent) included all household members. Of the eight cases where two households were represented, the primary connecting relationships were: brother (3), brother-in-law (2), son (1), cousin (1) and nephew (1).

Several Allakaket and Hughes respondents commented that their high school age children were unable to accompany them on September moose hunting trips. In Hughes, where there is no high school, and in Allakaket, where school goes to the 10th grade only, students leave the community to finish high school and are unable to participate in harvest activities during much of the year.

Caribou hunting involved longer trips from the community and was an activity shared by members from several households. Black bear were hunted either by individuals, by groups during moose hunting, or by several men in observance of a bear party or kitlakka, a ritual sharing

of the animal (Clark 1970b). At least three bear parties occurred in 1983, two in Allakaket and one in Hughes. Small game and waterfowl were taken by household members or related individuals.

Hunting Areas

Hunting areas used in 1981 and 1982 are depicted on the resource use maps. Areas used for sheep, black bear, and moose are shown and specific harvest sites in 1982 are indicated where this information was available. The general areas shown for moose hunting were areas also used for hunting black bear and small game species. Caribou hunting areas are not shown since caribou hunting occurred too infrequently during this time period to provide a basis for a pattern. Harvest areas can vary considerably through time; thus, these maps should be considered only a partial representation of areas important to local residents.

Hunting during the study period by Bettles/Evansville residents occurred primarily along the river system using boats (Fig. 10). Other localities hunted within the Koyukuk drainage such as the Malamute Fork of the Alatna River and the Wild River valley, were reached by aircraft. As was noted with the Bettles/Evansville fishing areas, there were reported locations outside the drainage subject to limited use in conjunction with the hunting of brown bear, black bear, and caribou. In 1982, Bettles/Evansville moose hunters traveled up the John River (7 of 11 households), up the North Fork (6 of 11), up the Middle Fork to the limits of boat travel (4 of 11), and down the Koyukuk River (6 of 11). Moose hunting below the mouth of the South Fork occurred in conjunction

with travel to visit relatives in Alatna and Allakaket. Bettles/Evansville sheep hunting centered on two areas, one up the Alatna River and one up the John River (Fig. 11). A few elderly hunters indicated their traditional use centered around these contemporary use areas but was previously much greater in extent. An area near Mt. Doonerak was also indicated as being used prior to 1981.

For purposes of this study, Alatna and Allakaket use areas are mapped together. The hunting area used by Alatna and Allakaket residents is the greatest in extent for all resource use categories of the study area communities (Figs. 12 and 13). From the Alatna River sheep hunting area at the upper reaches of the Alatna River to the Kanuti River moose hunting area near Sithylemenkat Lake is 140 air miles or 300 river miles. The general hunting area also extends from a point midway between Hughes and Allakaket, northeastward to Bettles, and up the South Fork to within 10 miles of the Haul Road. Moose hunting activities are depicted both by search area and by specific kill sites. Although the 28 kill sites recorded do not represent all moose harvested in 1982, the sites are representative of the general pattern. Kill sites distributed by drainage are: Kanuti (9), South Fork (8), Alatna (4), Koyukuk downriver (4), Koyukuk upriver (2), and Henshaw (1). Hunters noted that the Kanuti River area is accessible only in years when high water level permits passage through the shallow Kanuti Canyon. Nearly all the Alatna and Allakaket moose hunting activity in 1981 and 1982 fell within the Kanuti controlled use area.

Although two specific black bear hunting areas were identified downriver from the mouth of Kanuti River, black bear were taken throughout the area used in travel by Alatna and Allakaket residents, basically

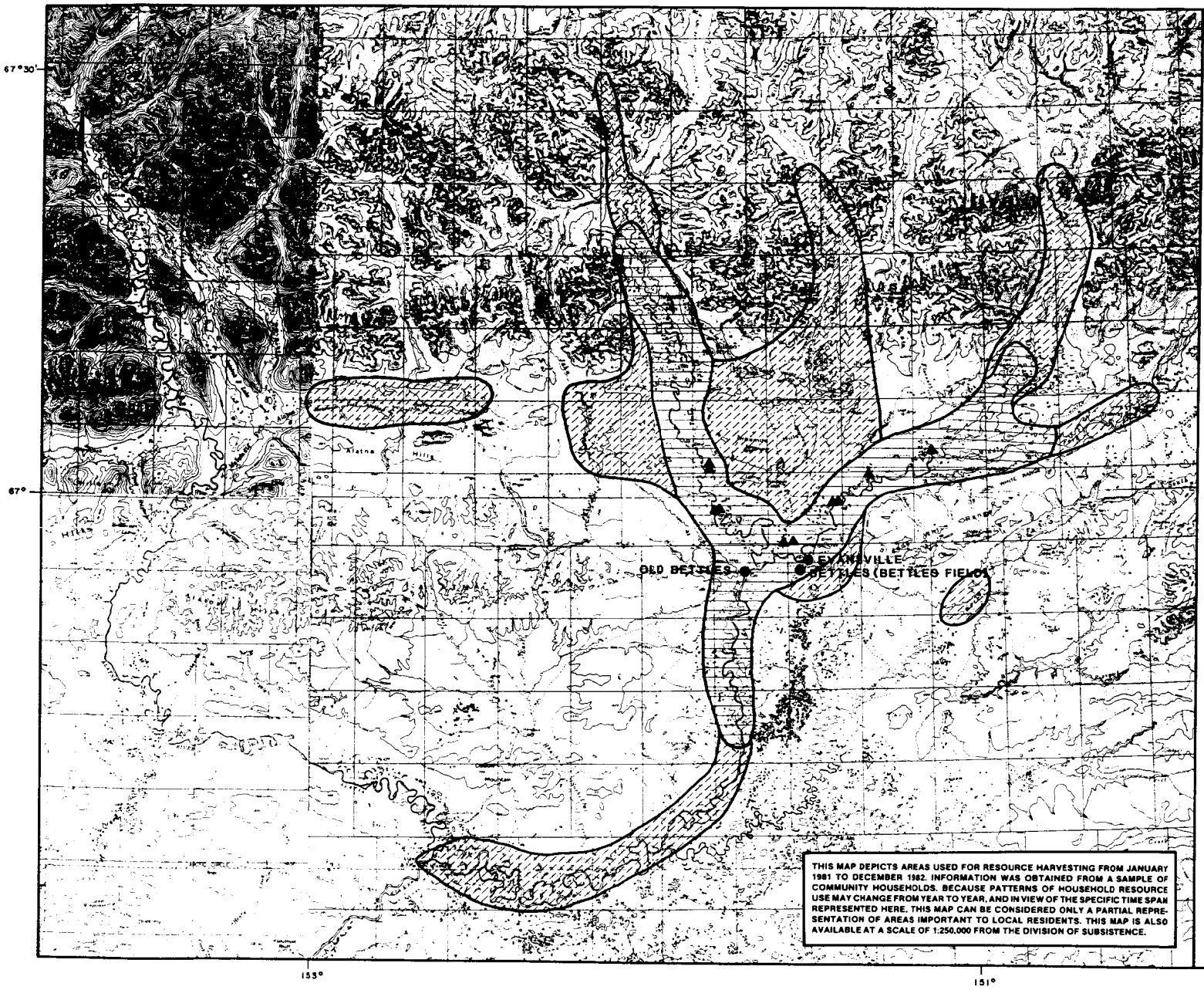


FIG.10 AREAS USED FOR MOOSE HUNTING BY RESIDENTS OF BETTLES AND EVANSVILLE, JANUARY 1981 - DECEMBER 1982.

MOOSE HUNTING AREA
THREE OR MORE HOUSEHOLDS

MOOSE HUNTING AREA
FEWER THAN THREE HOUSEHOLDS

▲ MOOSE KILL SITE

INFORMATION COLLECTED FOR 11 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND WALLACE NICTUNE, IN JUNE, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

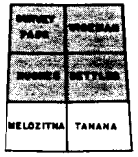
BASE MAP ADAPTED FROM USGS BETTLES, HUGHES, SURVEY PASS, AND WISEMAN 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

LOCATION INDEX



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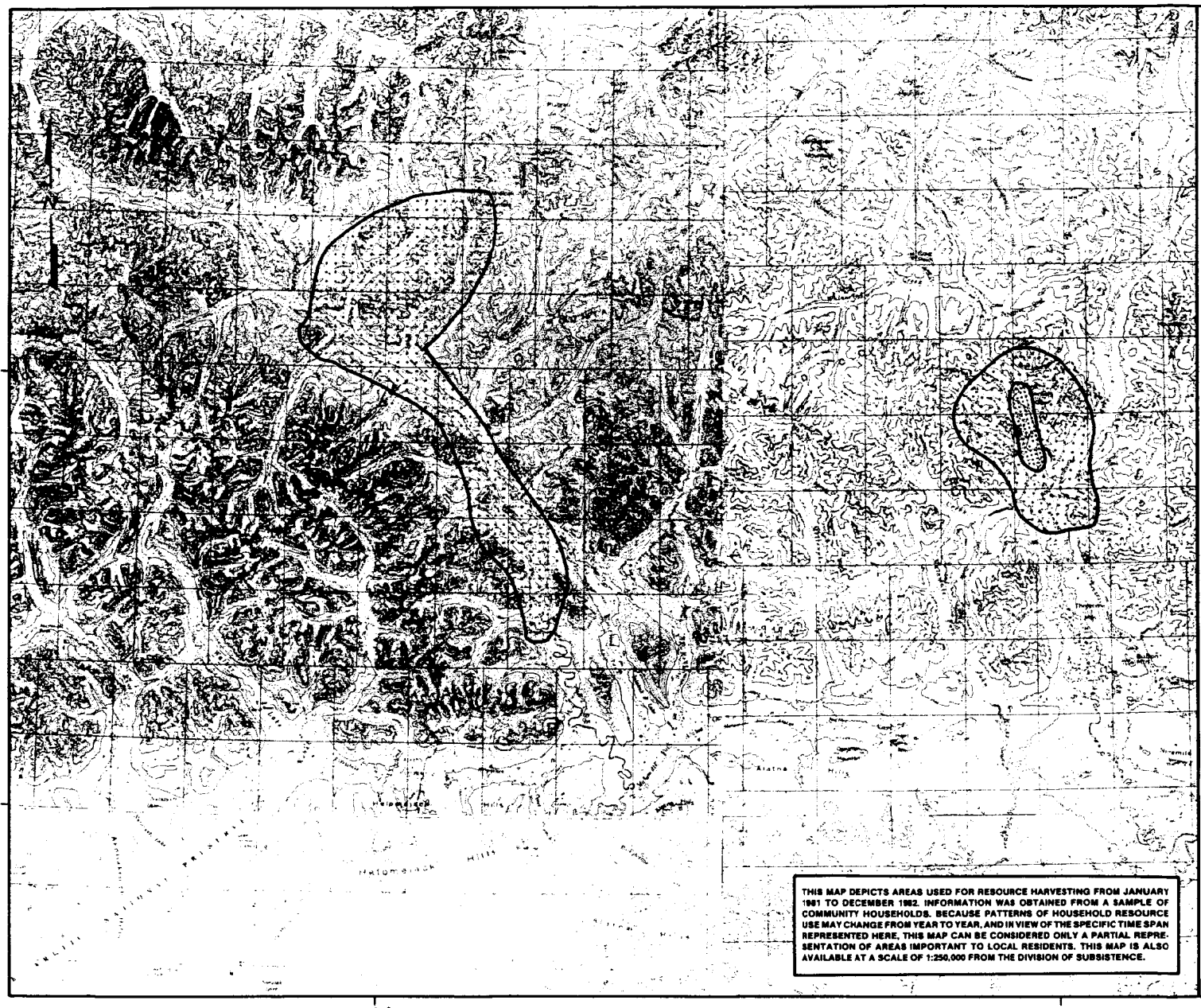

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FIG.11 AREAS USED FOR SHEEP HUNTING BY RESIDENTS OF BETTLES AND EVANSVILLE, JANUARY 1981 - DECEMBER 1982.

SHEEP HUNTING AREA
THREE OR MORE HOUSEHOLDS

SHEEP HUNTING AREA
FEWER THAN THREE HOUSEHOLDS

INFORMATION COLLECTED FOR 5 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOSUK, AND WALLACE NICTUNE, IN JUNE, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS SURVEY PASS AND WISEMAN 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

LOCATION INDEX

HUGHES	BETTLES
MELOZITNA	TANANA

ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF SUBSISTENCE
1984

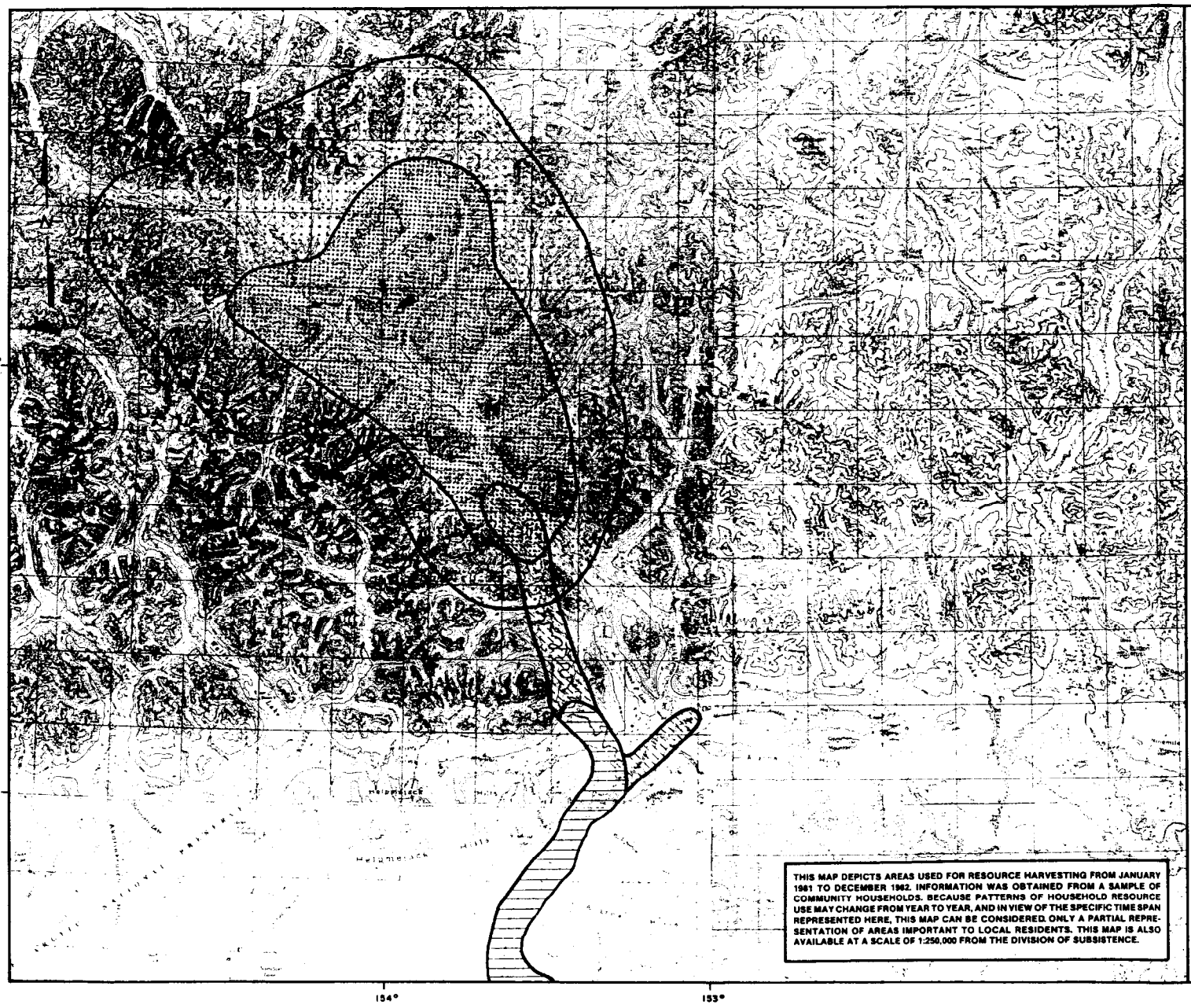

FIG.12 AREAS USED FOR MOOSE AND SHEEP HUNTING BY RESIDENTS OF ALLAKAKET AND ALATNA, JANUARY 1981 - DECEMBER 1982.

SHEEP HUNTING AREA
THREE OR MORE HOUSEHOLDS

SHEEP HUNTING AREA
FEWER THAN THREE HOUSEHOLDS

MOOSE HUNTING AREA
THREE OR MORE HOUSEHOLDS

MOOSE HUNTING AREA
FEWER THAN THREE HOUSEHOLDS

▲ SHEEP KILL SITE

INFORMATION COLLECTED FOR 29 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND ART WILLIAMS, SR., IN JULY, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS SURVEY PASS AND WISEMAN 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

LOCATION INDEX

ALASKA DEPARTMENT OF FISH AND GAME

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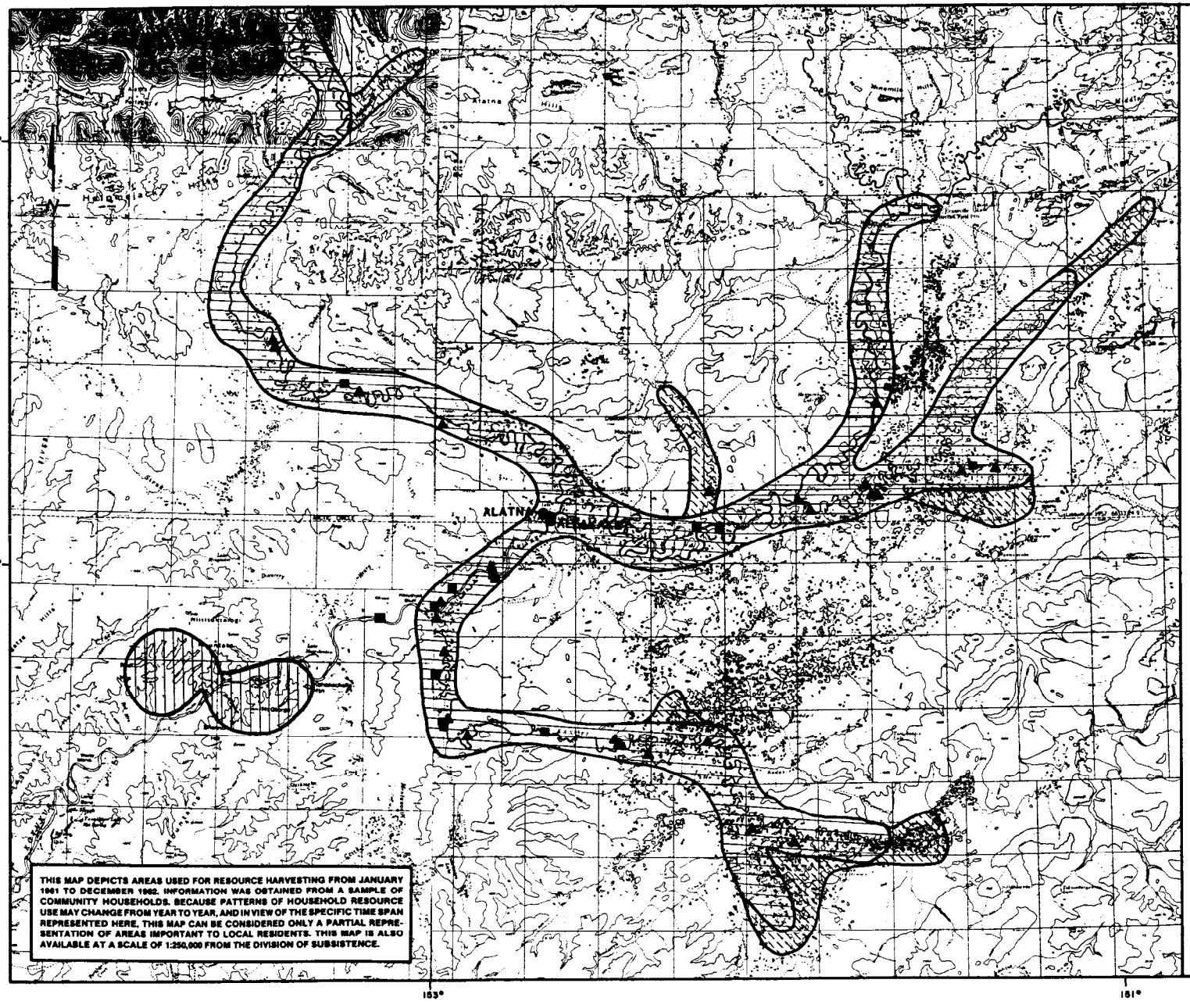

FIG.13 AREAS USED FOR MOOSE AND BLACK BEAR HUNTING BY RESIDENTS OF ALLAKAKET AND ALATNA, JANUARY 1981 - DECEMBER 1982.

MOOSE AND BEAR HUNTING AREA THREE OR MORE HOUSEHOLDS

MOOSE AND BEAR HUNTING AREA FEWER THAN THREE HOUSEHOLDS

SPECIFIC BLACK BEAR HUNTING AREA

▲ MOOSE KILL SITE

■ BEAR KILL SITE

INFORMATION COLLECTED FOR 29 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND ART WILLIAMS, SR., IN JULY, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS HUGHES AND BETTLES 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

LOCATION INDEX

SURVEY PASS | WISEMAN | HELOZITNA | TANANA

ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF SUBSISTENCE

1984

that depicted as the moose hunting area. Specific black bear kill sites are depicted throughout this area and black bear harvests frequently were reported as incidental to moose hunting. Caribou hunting areas are not shown since caribou hunting occurred too infrequently during this time to provide a basis for a pattern.

Both Alatna and Allakaket residents traveled by boat up the Alatna River to hunt sheep. Eight sheep kill sites are depicted near the Kutuk and Unakserak rivers. The primary focus of hunting activity during the two study years is shown by the area used by three or more households. However, over a much larger area there is year to year variation occurring as a function of game movements and other factors. Allakaket hunters also reported using an area up the John River for sheep hunting, although that area was not used in 1981 or 1982. An even larger area of use not shown on the maps was recalled by residents and includes the Upper Noatak, Reed, and John rivers.

Hare were generally obtained in areas independent of household trapping areas and closer to town. Geese and ducks were taken along the rivers where boat travel was possible, generally in places indicated as moose hunting areas. Locations specifically named as goose and duck hunting areas included Chalatna Creek, South Fork, and selected areas along the Alatna River.

Hughes residents' area used for hunting activities was along the Koyukuk River from the mouth of the Kanuti River to the mouth of the Hogatza River (Fig. 14). Fall season moose hunting occurred within this area. Household maps did not provide data on areas away from the river that may have been used during the March moose hunting season held only

since 1981. The majority of Hughes moose hunters used the Mathews Slough-Huggins Island area which falls within the Koyukuk Controlled Use Area. Black bear hunting took place within the same area as moose hunting as shown by the specific black bear kill sites (Fig. 14). Again, caribou hunting areas are not depicted due to too little data from the 1981-82 period. A trail east of town provided access for harvest of hare, grouse, and ptarmigan within six miles of Hughes.

Trapping

General Patterns

Trapping is a major activity during winter for many Upper Koyukuk households. In addition to having economic value as a source of cash (through fur sales), food, and local sewing materials, the trapping activity itself has numerous cultural dimensions. Local land use rights and family ties to the land are exercised while trapping, and social ties are affirmed through the sharing of furs and food. Trapping also provides younger persons an opportunity to learn important traditional skills associated with uses of the land from older and more experienced community members. As a major activity during winter, trapping is an important part of the annual harvest cycle.

A general depiction of seasonal trapping activity during 1981-82 and 1982-83 regulatory years is presented in Figure 15. Trapping begins in early November as soon as the freezing of lakes and rivers permits safe travel to trapping areas, and continues throughout the winter and into spring as long as the furs are in good condition. Beaver were caught

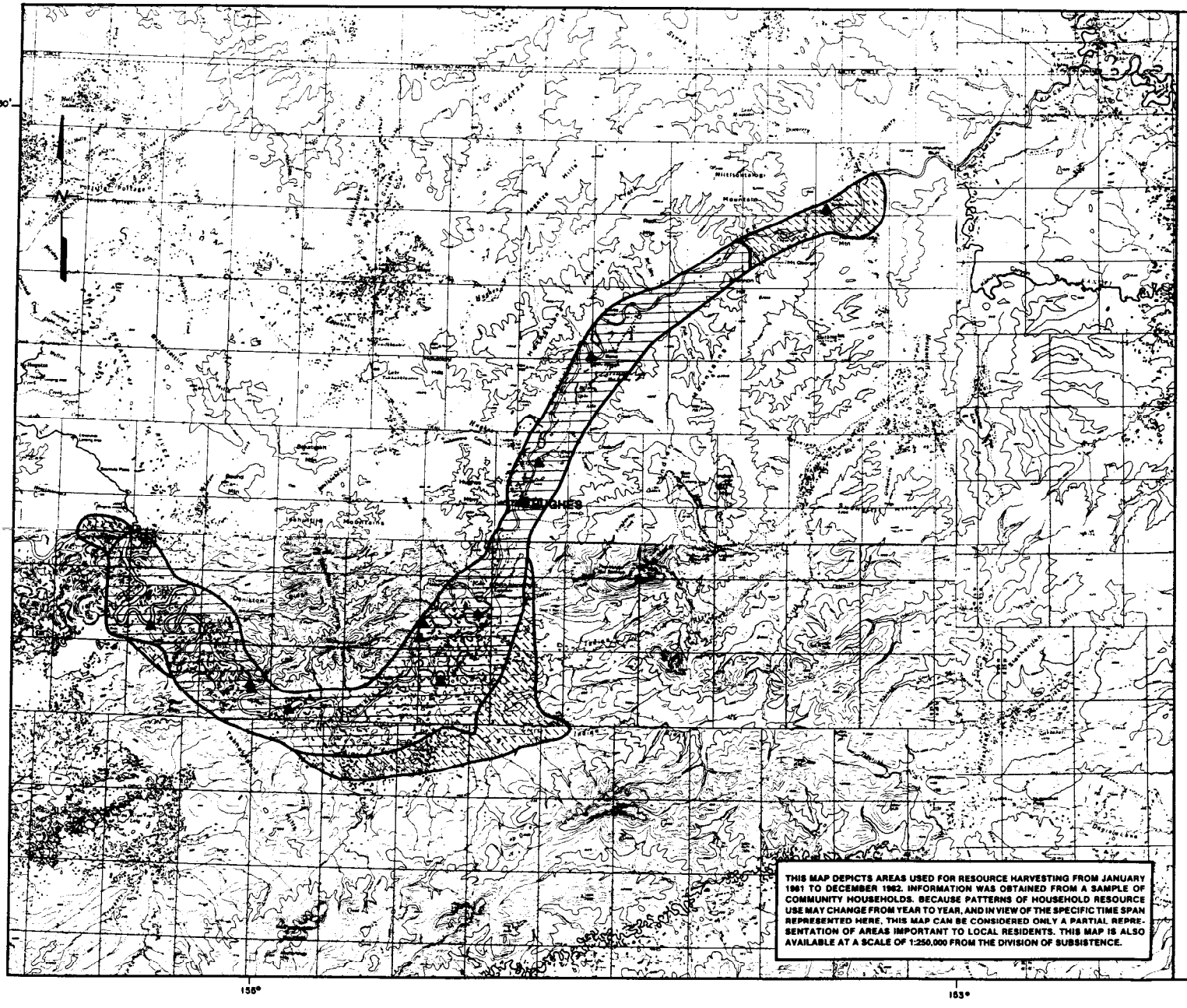

FIG.14 AREAS USED FOR MOOSE HUNTING BY RESIDENTS OF HUGHES, JANUARY 1981 - DECEMBER 1982.

MOOSE HUNTING AREA
THREE OR MORE HOUSEHOLDS

MOOSE HUNTING AREA
FEWER THAN THREE HOUSEHOLDS

▲ MOOSE KILL SITES

INFORMATION COLLECTED FOR 15 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND DOROTHY VENT, IN AUGUST, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS HUGHES AND MELOZITNA 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

LOCATION INDEX

SURVEY PAGE	WISEMAN
	BETTLES
	TANANA

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Furbearer Resource	Months Harvested															
	O		N		D		J		F		M		A		M	
Wolf			-	-	-	-	x	x	x	x	-	-				
Fox			x	x	x	x	x	x	x	x						
Wolverine			x	x	x	x	x	x	x	x	x	x				
Lynx			x	x	x	x	x	x	x	x	x	x				
Otter			-	-	x	x	x	x	x	x	-	-	-			
Beaver			x	x	x	x	x	x	x	x	x	x	x			
Marten			x	x	x	x	x	x	x	x	-					
Muskrat			-	-	-	-	-	-	-	-	-	-	x	x	x	x

xxx = Usual Harvest Period

--- = Intermittent Harvest Period

Fig. 15. Seasonal round of harvest activity for furbearer species, Bettles/Evansville, Alatna, Allakaket, and Hughes, 1982-1983 season.

primarily during February and March. Muskrats were taken in April and May, often near spring camps.

Participation levels in the harvest of furbearer resources are shown (Fig. 16). A high percentage of households trapped or received marten and beaver in Allakaket, Alatna and Hughes. Secondarily, fox and lynx were trapped. Few households harvested wolves during this time period.

Bettles/Evansville residents displayed a generally lower level of participation than the other communities for all furbearers, except wolverine, although Department of Fish and Game sealing records show that the actual harvest levels are comparable. Much of the terrain in the Bettles/Evansville area is characterized by fewer lakes and more hills than is the case near Allakaket and Hughes, which affects furbearer habitat and distribution. Allakaket, Alatna, and Hughes also displayed a slightly higher diversity of species than Bettles/Evansville.

Harvest levels from the 1982-83 trapping season (Table 12) show the number of households in each community participating in the harvest of the particular resource, the range of harvests reported for those housholds, the average harvest for all village households, and the total harvest reported for the community. Marten were taken in greatest number in all communities, followed by beaver and lynx (except in Bettles/Evansville, where fewer beaver were taken). There was a substantial range in trapping success among trappers. No trapper harvested at an average or above average level for all furbearer species. This is due to different levels of trapping effort and differences in the specific habitat of each trapper's trapping area. Trapping harvests

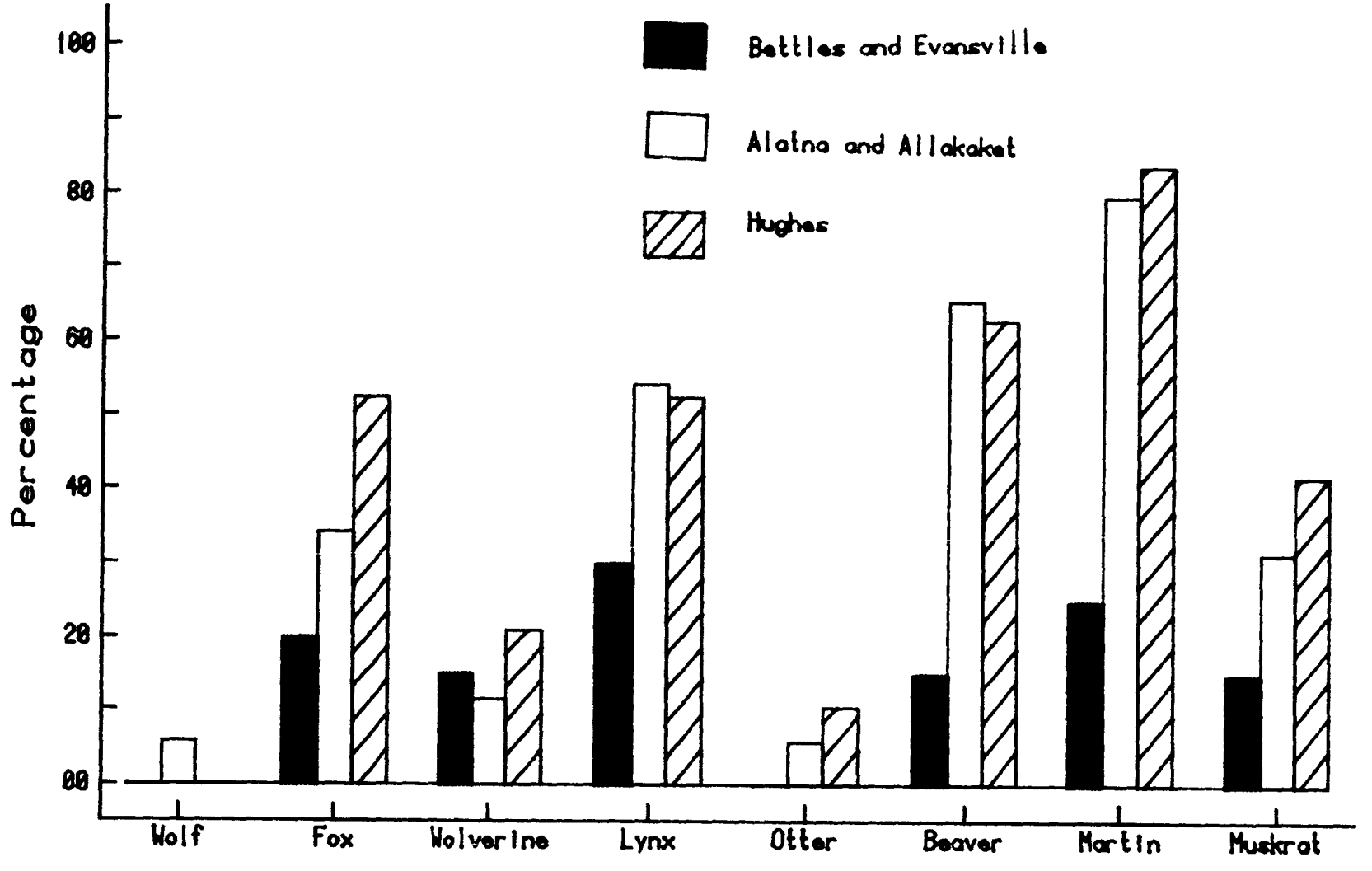

Fig. 16. Trappping Participation - Percentage of Households Trapping Furbearers in 1982

TABLE 12. TRAPPING HARVESTS, 1982-83 SEASON.

	Bettles/Evansville N=20				Allakaket and Alatna N=35				Hughes N=19			
Resource	# of Hslds. Part.	Range Hsld. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	# of Hslds. Part.	Range Hsld. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	# of Hslds. Part.	Range Hsld. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.
Wolf	0	NA	NA	0	2	1	.1	2	0	NA	NA	0
Fox	4	1-9	1.0	20	12	1-15	2.5	89	10	2-9	2.2	41
Wolverine	3	2-3	.4	7	4	1	.1	4	4	1-3	.3	6
Lynx	6	1-14	1.5	30	19	1-45	3.9	135	10	1-17	2.8	54
Otter	0	NA	NA	0	2	2	.1	4	2	2	.2	4
Beaver	3	2-6	.6	11	23	1-25	6.6	230	12	1-25	5.2	98
Marten	5	1-100	7.7	154	28	2-150	30.6	1072	16	3-60	21.4	406
Muskrat	3	3-5	.7	13	11	2-50	3.6	126	8	1-15	2.2	41

can vary significantly from year to year and single year trapping harvest figures must be considered within the wider range of multi-year patterns.

Furbearer resources are harvested primarily for their pelts except for beaver, which are harvested also for their food value. Furbearers are the only local resource which can be exchanged for cash in the Koyukuk region. Fur buyers visited Upper Koyukuk communities during the winter months. A store in Bettles also purchased furs. Fur exchanges in Seattle and Canada frequently offer higher prices for furs shipped by mail, but payments are generally delayed. Thus, selling to visiting fur buyers was the most common method of sale in 1983. In 1982-83 average prices paid by local fur buyers were as follows: wolf ($250), wolverine ($250), otter ($40), marten ($35), fox ($80), lynx ($225), beaver ($30).

Gross dollar value from trapping varied considerably from household to household. The mean gross value and range for each species are shown in Table 13. Harvests are summarized by household, and more than one trapper can live in one household. An Allakaket trapper calculated that one could gross $4,000 and net $2,000 during a winter of trapping by working very hard. He added that his family would eat well though, referring to the beaver meat. Many furs were used locally; for example, wolverine skins were commonly retained for use in sewing. Gift giving, trading, and selling of furs occurred among community residents.

Table 14 displays transportation sources used by Upper Koyukuk trappers during the trapping season. Snowmachines were used most commonly (74 percent). An additional 10 percent used dog teams in conjunction with snowmachines. Several Hughes trappers commented that they prefer to take both dogs and snowmachines when traveling with another

TABLE 13. AVERAGE AND RANGE OF GROSS DOLLAR VALUE OF HOUSEHOLD FURBEARER HARVEST IN 1982-83.

	Bettles/Evansville		Allakaket and Alatna		Hughes	
Resource	Mean Gross Value	Range	Mean Gross Value	Range	Mean Gross Value	Range
Wolf	$ NA	$ NA	$ 250	$ 250	$ NA	$ NA
Fox	400	80-720	592	80-1,200	328	160-720
Wolverine	575	500-750	250	250	375	250-750
Lynx	1,125	225-3,150	1,598	225-10,125	450	450
Otter	NA	NA	80	80	80	80
Beaver	111	60-180	200	30-750	246	30-750
Marten	1,078	35-3,500	1,340	70-5,250	889	105-2,100

Note: This table shows only gross value of furs harvested based on average prices paid locally in 1982-83 (wolf $250, fox $80, wolverine $250, lynx $225, otter $40, beaver $30, marten $35). The table does not show net furbearer harvest income which, according to local trappers, is considerably lower. Many of the furs were used locally in clothing, in making crafts, and in sharing. Mean values calculated for only those households participating in species harvest.

TABLE 14. MODES OF TRAVEL FOR TRAPPING 1982-83.
(BY HOUSEHOLD)

Modes	Bettles/ Evansville	Alatna	Allakaket	Hughes	All Communities	
Snowmachine	3	5	20	14	42	(74%)
Dog Team	1	0	0	0	1	(2%)
Snowshoes	1	1	2	0	4	(7%)
Snowmachine and Dog Team	1	0	3	2	6	(10%)
Snowmachine and Snowshoes	1	1	0	1	3	(5%)
Aircraft	1	0	0	0	1	(2%)
Totals:	8	7	25	17	57	100%

Note: Numbers indicate the number of households in each community indicating they used a particular transportation source.

trapper. In that way the advantages of both can be employed. A comparison of snowmachine and dog team travel is presented in Tracks in the Wildland (Nelson, Mautner, and Bane 1982:103). Some trappers (7 percent) snowshoed their traplines after traveling by snowmachine to a trapping camp and some elderly trappers maintained small snowshoe lines close to town. Bettles/Evansville trappers used the most types of transportation; the only use of aircraft access in trapping was reported for Bettles/Evansville.

The actual ownership of dogs and snowmachines is compared in Figure 17. In Hughes there was an average of six dogs per household, compared to an average at Alatna of two dogs. Snowmachine ownership does not appear to differ greatly between communities.

Trips away from the village for trapping generally lasted a few days. The average duration of trips by Hughes trappers was 2.6 days, and 11 of the 16 trappers (69 percent) reported they generally remained overnight at a trapping camp. One Hughes trapper stayed out for 23 days on one trip but said four-day trips were more typical. Average duration of trips for trappers from Allakaket was 1.3 days, Alatna 1.7 days, and Bettles/Evansville 1.2 days. Information on distances traveled during trapping can be obtained from the trapping area maps.

Cooperation between trappers varied in purpose and duration. There were instances of short-term cooperation, when a person accompanied another trapper on a several-day trip. There also were cases of long-term cooperation when two trappers shared a trapping area for several years. The term "partnership" was used when the cooperation occurred regularly. Many partnerships lasted two or three seasons. Those between relatives

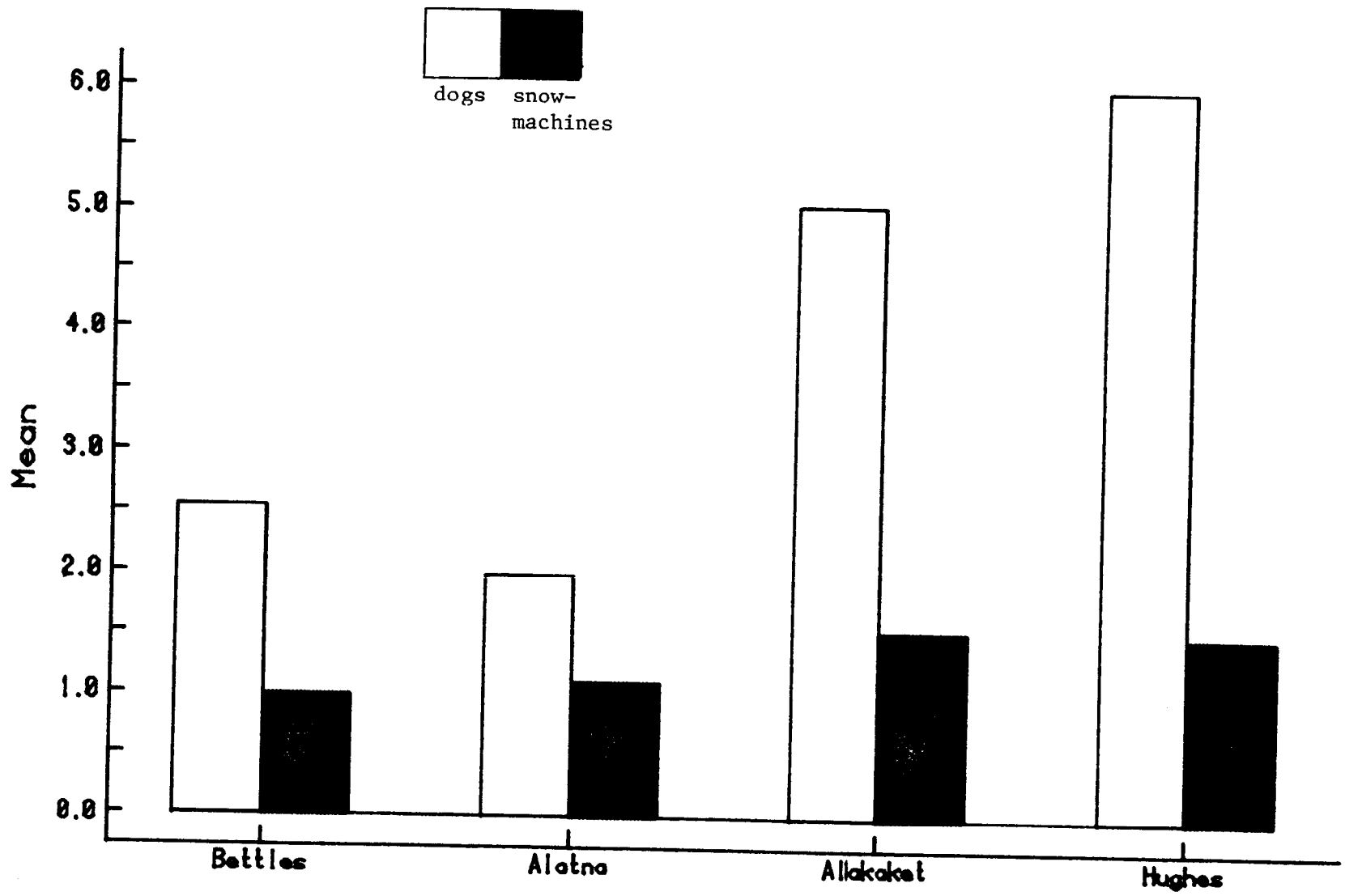

Fig. 17. Mean Number of Dogs and Snowmachines Owned Per Household, by Community, in 1982

tended to be more enduring than partnerships between non-related individuals. Some trappers worked together for only part of the season, such as for spring beaver trapping.

Relationships between trappers at Hughes are presented in Table 15. The information was given in response to the question, "Who did you trap with?" Half the responses included brothers, brother-in-law, or both (collateral relationships). Twenty-one percent of the respondents trapped with lineal relatives (father-son-grandson relationships). These "father-son" groups provided an important opportunity for teaching and eventual transfer of locally recognized use rights. Finally, 29 percent said they trapped alone. Two or more people linked through kinship to a common ancestor's trapping area frequently shared a common trapping camp or cabin, but in some cases, trapped separate traplines.

TABLE 15. HUGHES TRAPPING RELATIONSHIPS (N = 18 HOUSEHOLDS)

Relationship to Respondent	Number of Occurrences	
Brother	1	(7.1%)
Brother-in-law	2	(14.3%)
Brother and brother-in-law	4	(28.6%)
Father	1	(7.1%)
Son	1	(7.1%)
Grandson	1	(7.1%)
Traps alone	4	(28.6%)
Total	14	(100.0%)

Trapping Areas

Trapping areas for the four communities are shown in Figures 18, 19, and 20. The Bettles/Evansville trapping area map (Fig. 18) depicts the

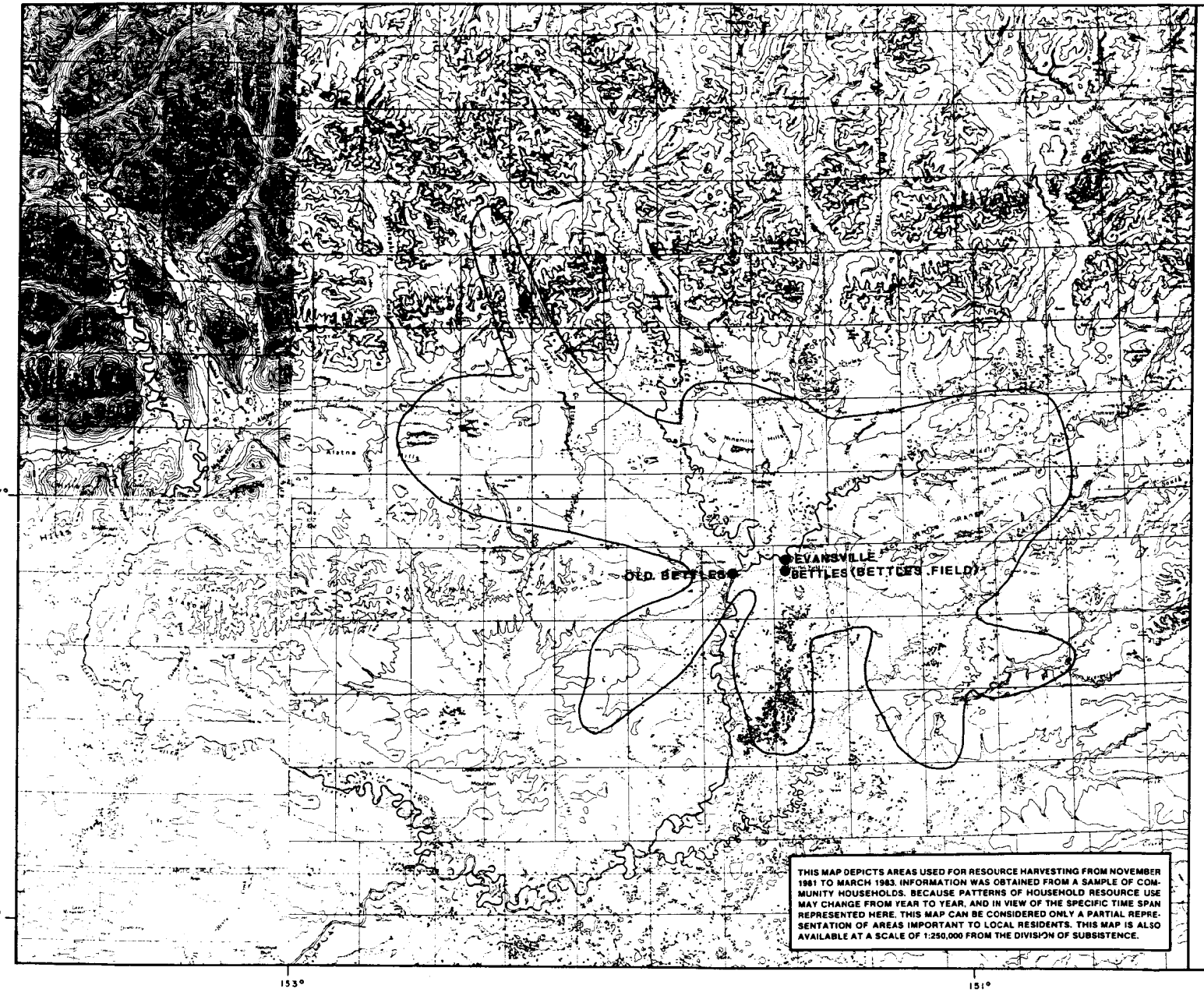

FIG.18 AREAS USED FOR FURBEARER TRAPPING BY RESIDENTS OF BETTLES AND EVANSVILLE, NOVEMBER 1981 - MARCH 1983.

TRAPPING AREAS USED BY COMMUNITY HOUSEHOLDS. (TRAPLINES ARE LOCATED WITHIN THESE AREAS.)

INFORMATION COLLECTED FOR 9 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND WALLACE NICTUNE, IN JUNE, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS BETTLES, HUGHES, SURVEY PASS AND WISEMAN 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

LOCATION INDEX

SURVEY PASS	WISEMAN
HUGHES	BETTLES
MELOZITNA	TANANA

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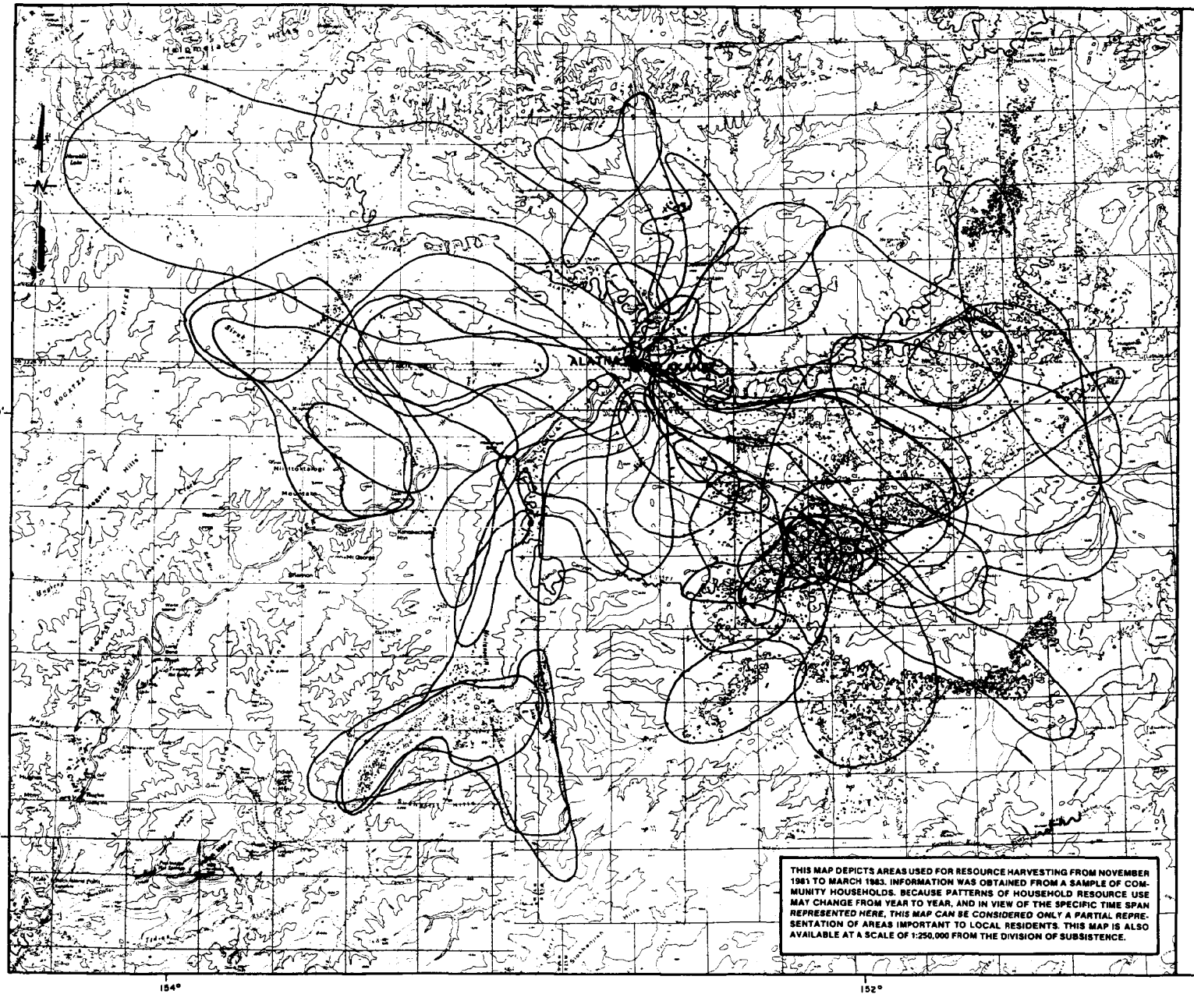

FIG.19 AREAS USED FOR FURBEARER TRAPPING BY RESIDENTS OF ALLAKAKET AND ALATNA, NOVEMBER 1981 - MARCH 1983.

TRAPPING AREAS USED BY COMMUNITY HOUSEHOLDS. (TRAPLINES ARE LOCATED WITHIN THESE AREAS.)

INFORMATION COLLECTED FOR 30 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND ART WILLIAMS, SR., IN JULY, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS HUGHES AND BETTLES 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

LOCATION INDEX

SURVEY PASS	WISEMAN
MELOZITNA	TANANA

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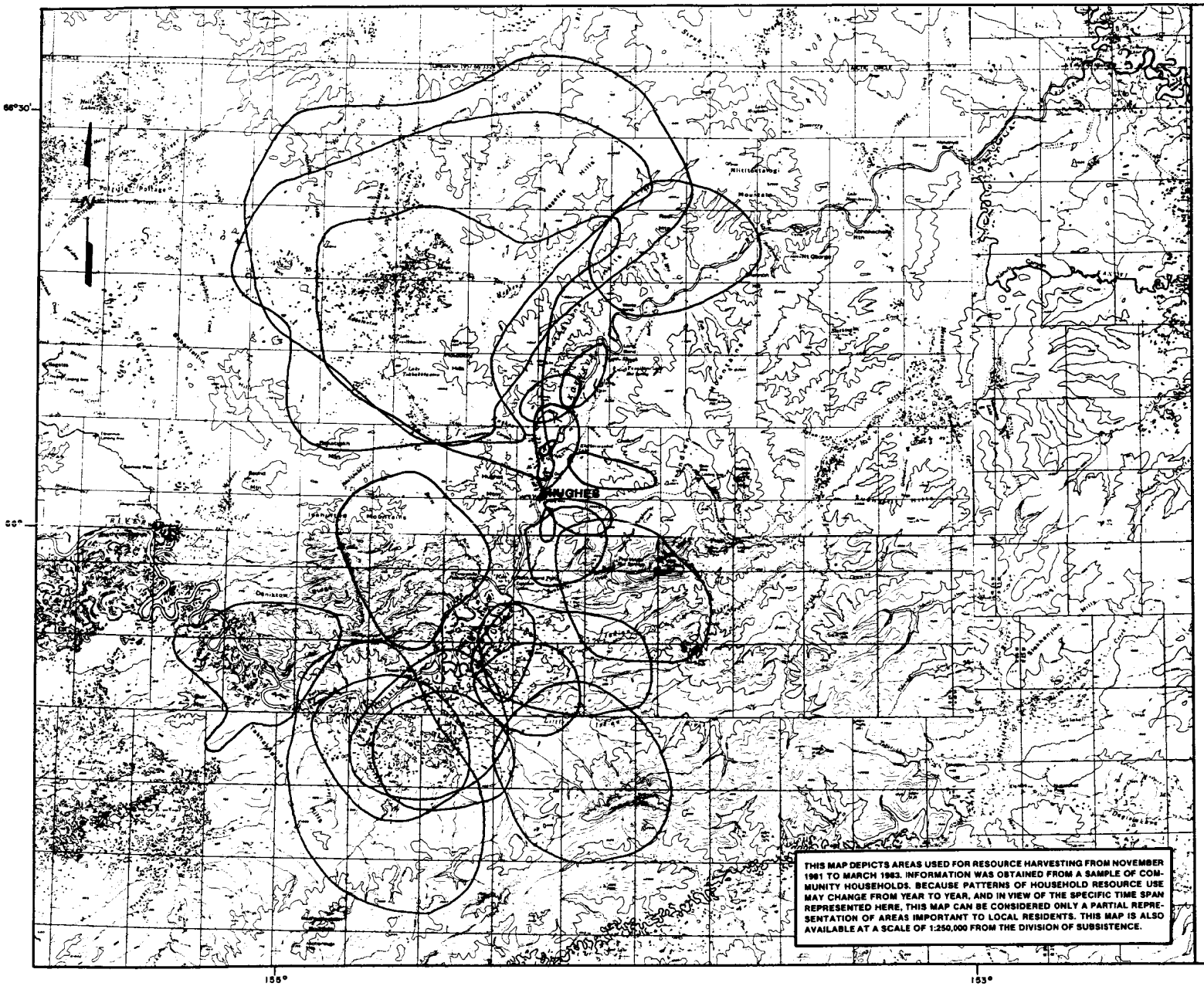

FIG.20 AREAS USED FOR FURBEARER TRAPPING BY RESIDENTS OF HUGHES, NOVEMBER 1981 - MARCH 1983.

TRAPPING AREAS USED BY COMMUNITY HOUSEHOLDS. (TRAPLINES ARE LOCATED WITHIN THESE AREAS.)

INFORMATION COLLECTED FOR 17 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND DOROTHY VENT, IN AUGUST, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS HUGHES AND MELOZITNA 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

LOCATION INDEX

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outer boundaries of all individual trapping areas combined, while the trapping area maps of the other communities (Fig. 19 and 20) show each individual trapping area superimposed together.

Behind the apparent myriad of lines shown on the community trapping area maps lies an organized system of locally recognized land use rights. These rights apply specifically to trapping and not fishing or hunting purposes. Trapping areas are identified with specific individuals and the area is often referred to as "their" trapline. Such individuals are generally middle aged or older males. They control access to the use of the trapping area, and not infrequently allow others in the community to use their trapline area for trapping. In many cases, a substantial furbearer harvest was recorded for 20- to 30-year-old trappers whose fathers no longer trapped intensively, although the particular trapline used was identified with the father. For example, the area northwest of Hughes was actively trapped by two brothers and their brother-in-law, but was recognized as the brothers' father's trapline, although he had not trapped there for two years. Aside from the obvious generation-to-generation permission, examples were also found where permission was extended to non-relatives, both within and external to a trapping partner relationship. Recognition of a person's use rights was not forfeited when another trapper was allowed to trap the area. If a man had no sons and extended permission to use the line to his brother's sons for a period of years, for example, the use rights of the trapping area may be retained by the man and acquired by a son-in-law or grandson later on.

The "trapline" as a concept used by trappers themselves and "areas" as have been mapped here are not necessarily lines and areas in a strict

sense. Areas, and not trails were mapped, since use of different trails within a general area commonly varied from year to year. The trapping areas identified by different trappers were not always mutually exclusive. This is particularly evident with beaver trapping in the Kanuti Flats area, where trapping areas overlapped considerably and trappers decided among themselves who could trap specific beaver houses at particular points in time.

For all communities, a high correlation was found between the location of trapping areas and a family's Native allotment. Native allotments often are places people have traditionally used and continue to use as seasonal camps (spring camps, fish camps, or trapping camps). Trapping cabins or tent camps are commonly found on or in the vicinity of Native allotments belonging to family members.

In the land immediately surrounding the study communities in a few miles radius there appeared to be unclaimed areas not governed by long-term use rights. These areas were being used by people learning to trap, newcomers to the community, and the elderly no longer able to safely travel great distances from the community.

At times, trapping areas are not trapped for a period of several seasons. Trappers frequently let portions of their trapping areas lie fallow in order to allow animal populations to build up, because of the short-term effect of burns, or for other reasons specific to individual situations. The locally recognized use rights extended over these periods of temporary non-use. However, if areas were left unused for a long period, other trappers might attempt to use them and establish their own claim for use rights. Most of the trapline disputes reported during this study seemed to result from differences between individuals in

acknowledging the existence of continuing use rights for areas during a period of non-use.

Trappers commented that a number of years must be spent working in an area before it can be trapped efficiently. Dormant trails must first be cleared or new ones cut. Patterns of game behavior must be studied before placement of traps most likely will yield high furbearer harvests. Thus, an intimate knowledge of a specific trapping area is essential if it is to be trapped efficiently and productively.

The outer boundary of the general areas used by Bettles/Evansville residents for trapping during the two-year study period is shown in Figure 18. The area extended east to the Dalton Highway (Haul Road), south to near Fish Creek, west to Deadman Mountain, and north to Sixty-mile Creek. This included the Jack White Range, the lower Jim River, the flats south of Bettles/Evansville, the Malamute Fork of the John River, and the lower John River. The actual area used probably extends farther north than is depicted on the Bettles/Evansville trapping area map, since not all local trappers participated in this study. This map shows only the general community trapping area, a line drawn around the outer limits of the individual household trapping areas. The individual household trapping areas for Bettles/Evansville appear more dynamic than those of the other study area communities. There was less consensus among trappers about the location of other trappers' use areas, and about the existence of use rights to particular areas. This is perhaps attributable to a demographic pattern distinguished by a greater population turnover. Moreover, in Bettles/Evansville respondents volunteered information on trapline disputes among local trappers, and a few trappers

commented that they were experiencing increased use of their trapping areas from trappers operating out of Prospect on the Dalton Highway.

The general area used by Alatna and Allakaket trappers extended north into the Alatna Hills, east to Kaldolyeit Lake and Sithylemenkak Lake, south to the Sushgitit Hills and past Lake Todatonten, and west to Norutak Lake (Fig. 19). This includes the Henshaw Creek area, all the Kanuti Flats, the Lake Todatonten-Mentanontli River area, Siruk Creek, the upper Hogatza River, and the lower Alatna drainage. Here it is important to re-emphasize that the Alatna and Allakaket trapping map depicts "trapping use areas," those areas actually used by household members, and not "traplines." A "trapline" oriented mapping procedure documenting locally recognized use rights of families and individuals would have produced a very different map. Instead, this study examined where people actually went trapping during the two-year period whether or not it was on their own trapline.

Because many trappers trapped with partners from different households, the household use areas often overlapped. Portions of the map with more lines show areas used by more than one household and are not necessarily areas subject to greater harvests or dependency. Similarly, portions with fewer lines were trapped directly by fewer households but were not necessarily trapped less intensively nor were they less important. Trappers from several households used the Kanuti Flats area, especially in late winter, for beaver trapping. In former times a settlement here, known as South Fork Camp in 1938, was used by South Fork band members for trapping and caribou hunting.

The general area used by Hughes trappers during the 1981-82 and 1982-83 trapping seasons extends north along the Hogatza River to near Siruk Creek, east to Niitlotoktalogi Mountain, south into the Melozitna drainage, and west to Bear Mountain (Fig. 20). This included the middle Hogatza River-Klikhtentotzna Creek area, the Hogatza Hills, the Hatdolitna Hills, the flats near Mathews Slough, and the Isahultila Mountains. An area between the Hughes and Allakaket community trapping areas was being trapped in 1982 by individuals at the Indian Mountain/ Utopia radar installation. Likewise, the lower Hogatza River and Pah River area to the west was trapped very actively by two area trappers, one living on the Hogatza River and the other now living in Galena. Their use areas are not depicted on the map.

It should be re-emphasized that the trapping patterns shown here depict only a two-year time period (November 1981 to March 1983). Harvest areas can vary considerably through time. Readers are encouraged to refer to the use area maps in Tracks in the Wildland (Nelson, Mautner, and Bane 1982) for additional time depth. However, neither source depicts the full extent of customary and traditional uses by area residents.

Plant Gathering

Plant resources fill a variety of food and material needs of people in the Koyukuk River area. Nearly all homes in the study area communities were constructed of and heated with locally cut spruce wood. Community buildings, smokehouses, and food caches were also built of local logs. Smaller diameter spruce poles were used for wall tents, fish drying racks,

and for general purposes. Birch wood was used for firewood and in constructing basket sleds, toboggan sleds, and snowshoes. Dry balsam poplar was the primary wood used for smoking fish and for campfires, although willow is used by some. Firewood was cut primarily during the fall and throughout the winter months.

Households in the survey sample harvested substantial quantities of wild berries during the summer of 1982. Adult females and children were the most active in berry picking. Harvesting normally occurred in July, August, and early September, generally during day trips from the community. Lowbush cranberries, highbush cranberries, blueberries, raspberries, blackberries, cloudberries, and rosehips were all harvested. The berries, eaten fresh or stored in freezers, were used in cooking, in making Indian ice cream, and served at potlatches.

Table 16 summarizes berry and firewood harvests from 1982. The table shows the number of households in each community participating in the harvest of berries or firewood, the range of harvests reported by those participating households, the average harvest for all community households, and the total harvest reported for the community. In general, high levels of participation were displayed for both activities. In addition to the wood depicted in Table 15, Allakaket and Alatna residents also cut 23.5 cords of balsam poplar and Hughes residents 20 cords of balsam poplar for smoking salmon. Several respondents commented that 1982 was not a particularly bountiful year for berries and that the amount of firewood cut was below average due to above average winter temperatures. Although 60 of the 74 sample households (81.1 percent) reported cutting firewood, nearly all households burned wood for heat.

TABLE 16. BERRIES AND FIREWOOD HARVESTS, 1982.

Resource	Number of Households Participating	Range of Household Harvests	Mean Household Harvest	Total Community Harvest
Bettles/Evansville (N=20)				
Berries	16	.25-16 gal.	4.7 gal.	94.2 gal.
Firewood	11	1-15 cords	4.5 cords	89 cords
Allakaket and Alatna (N=35)				
Berries	27	1-30 gal.	7.2 gal.	251.5 gal.
Firewood	34	3-15 cords	7.8 cords	274 cords
Hughes (N=19)				
Berries	16	.25-27.5 gal.	6.1 gal.	115 gal.
Firewood	15	2-12 cords	5.7 cords	107.5 cords

Some wood was purchased by the cord or sled load, some traded or bartered, and some was cut for elders by relatives living in other households. An individual typically worked a specific stand of trees by blazing around the trunk and allowing the tree to dry before cutting it, up to four years later. Wood was also cooperatively cut from nearby forest burn areas or areas along the river upstream from the communities.

Bettles/Evansville residents used firewood gathering areas near town, across the river, and up the Koyukuk River (Fig. 21). Berry picking activity occurred in areas near town and along the Koyukuk River to Hackett Creek and to Old Bettles. Much of the resource use near Old Bettles was by former residents of Old Bettles before they moved to Bettles Field (Bettles/Evansville).

Alatna and Allakaket residents gathered firewood generally within 15 miles of town and along the river and winter trails, especially southward into the 1972 burn area (Fig. 22). Berry picking areas for Alatna and Allakaket residents were recorded as far away as Chebanika Creek, Fish Creek, and Chalatna Creek. In some of these locales, several berries were sought while others were known for a specific berry type.

Hughes residents gathered firewood close to town, along the Koyukuk River through the canyon area between Hughes and Allakaket, and in the Kanuti Canyon burn area (Fig. 23). Berry picking sites were associated with summer fish camp locations and were within six miles of town along the trail to the east.

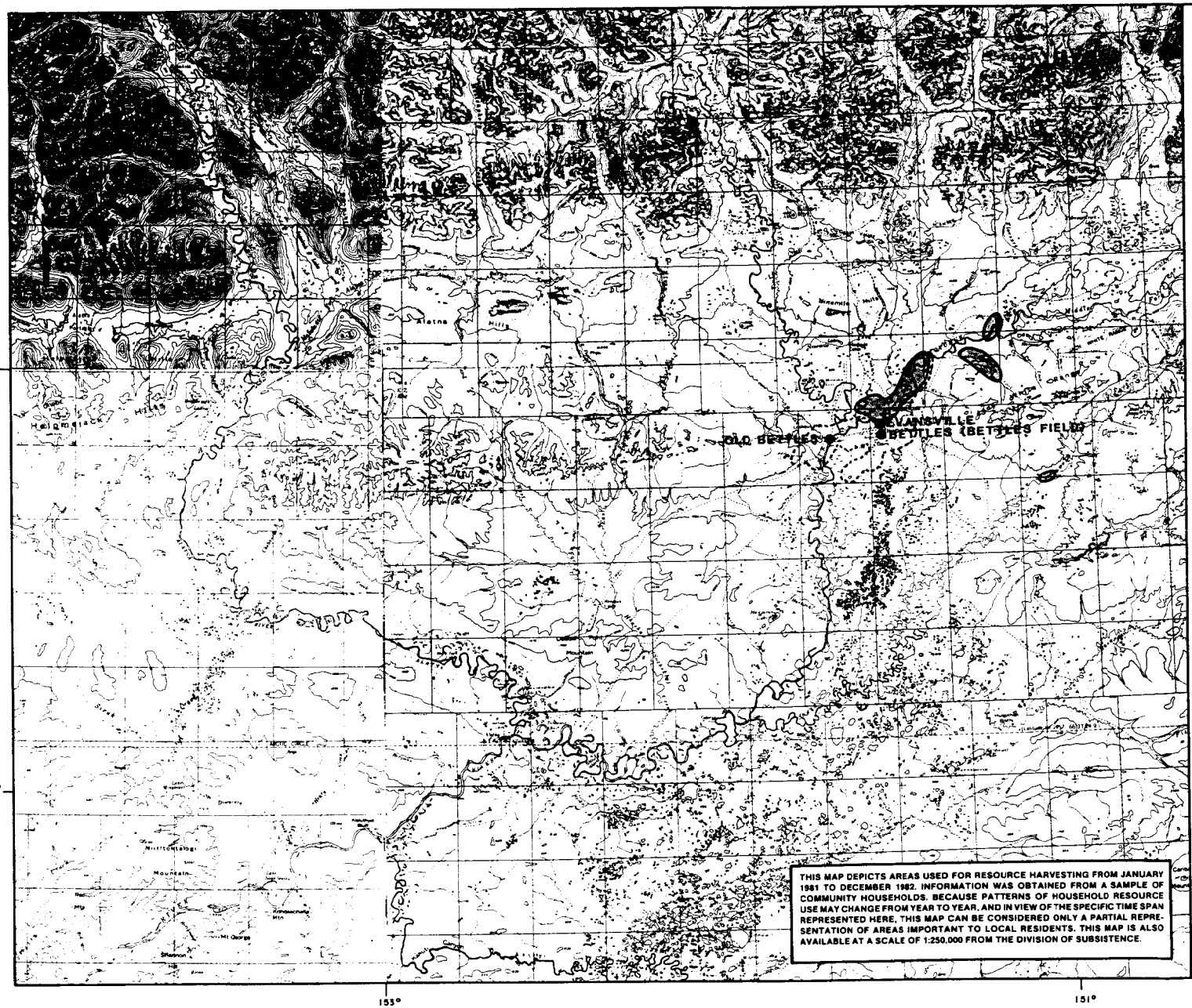

FIG.21 AREAS USED FOR PLANT GATHERING BY RESIDENTS OF BETTLES AND EVANSVILLE, JANUARY 1981 - DECEMBER 1982.

FIREWOOD GATHERING AREA

BERRY PICKING AREA

INFORMATION COLLECTED FOR 8 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND WALLACE NICTUNE, IN JUNE, 1983.

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0 5 10 15 20 25 30 kilometers

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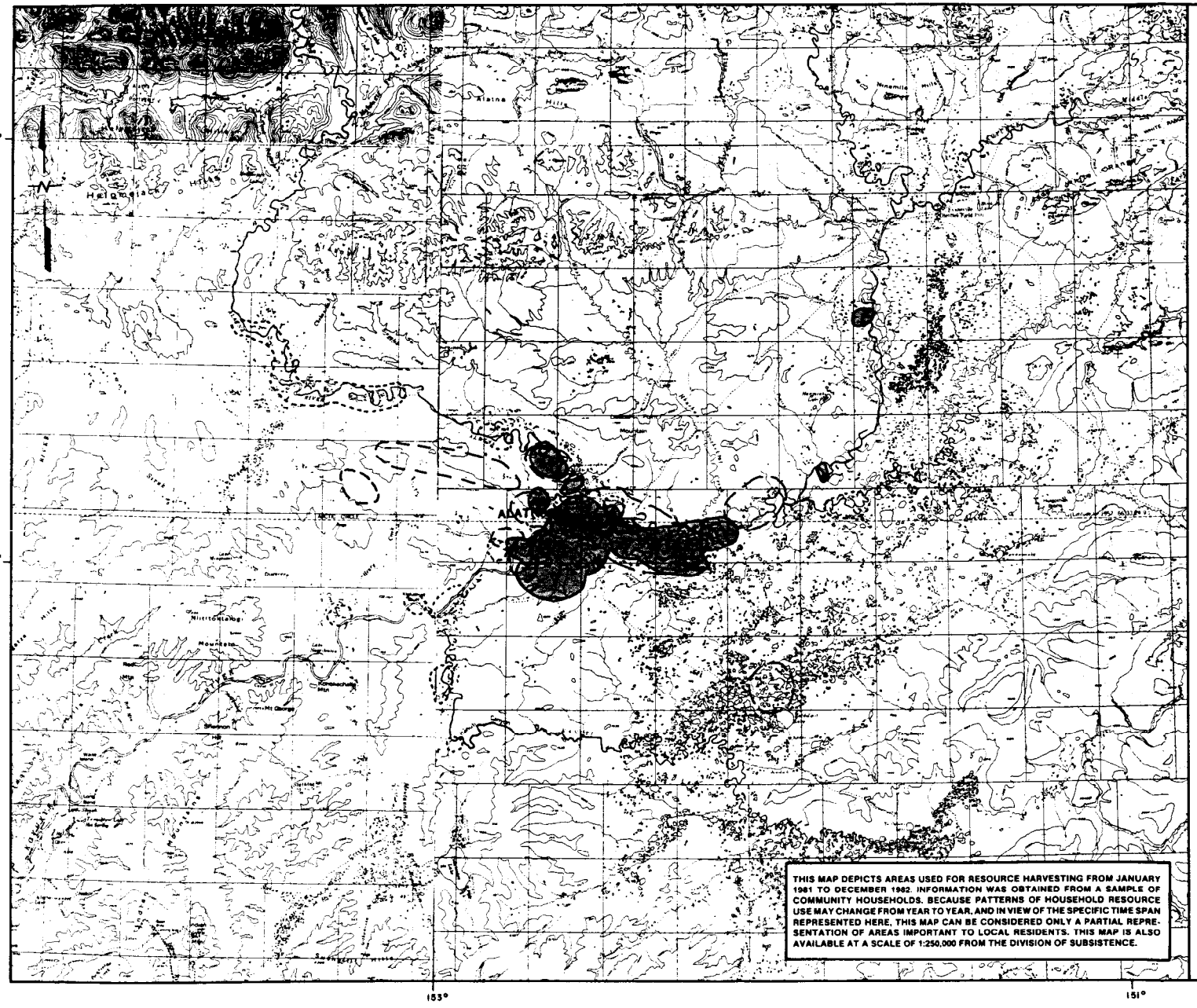

FIG.22 AREAS USED FOR PLANT GATHERING AND SMALL GAME HUNTING BY RESIDENTS OF ALLAKAKET AND ALATNA, JANUARY 1981 - DECEMBER 1982.

FIREWOOD GATHERING AREA

BERRY PICKING AREA

SMALL GAME HUNTING AREA

INFORMATION COLLECTED FOR 26 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND ART WILLIAMS, SR., IN JULY, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS HUGHES AND BETTLES 1:250,000 QUADS.

SCALE 1:500,000

0 5 10 15 20 miles

0 5 10 15 20 25 30 kilometers

LOCATION INDEX

SURVEY PASS	WISEMAN
HUGHES	BETTLES
MELOZITNA	TANANA

ALASKA DEPARTMENT OF FISH AND GAME

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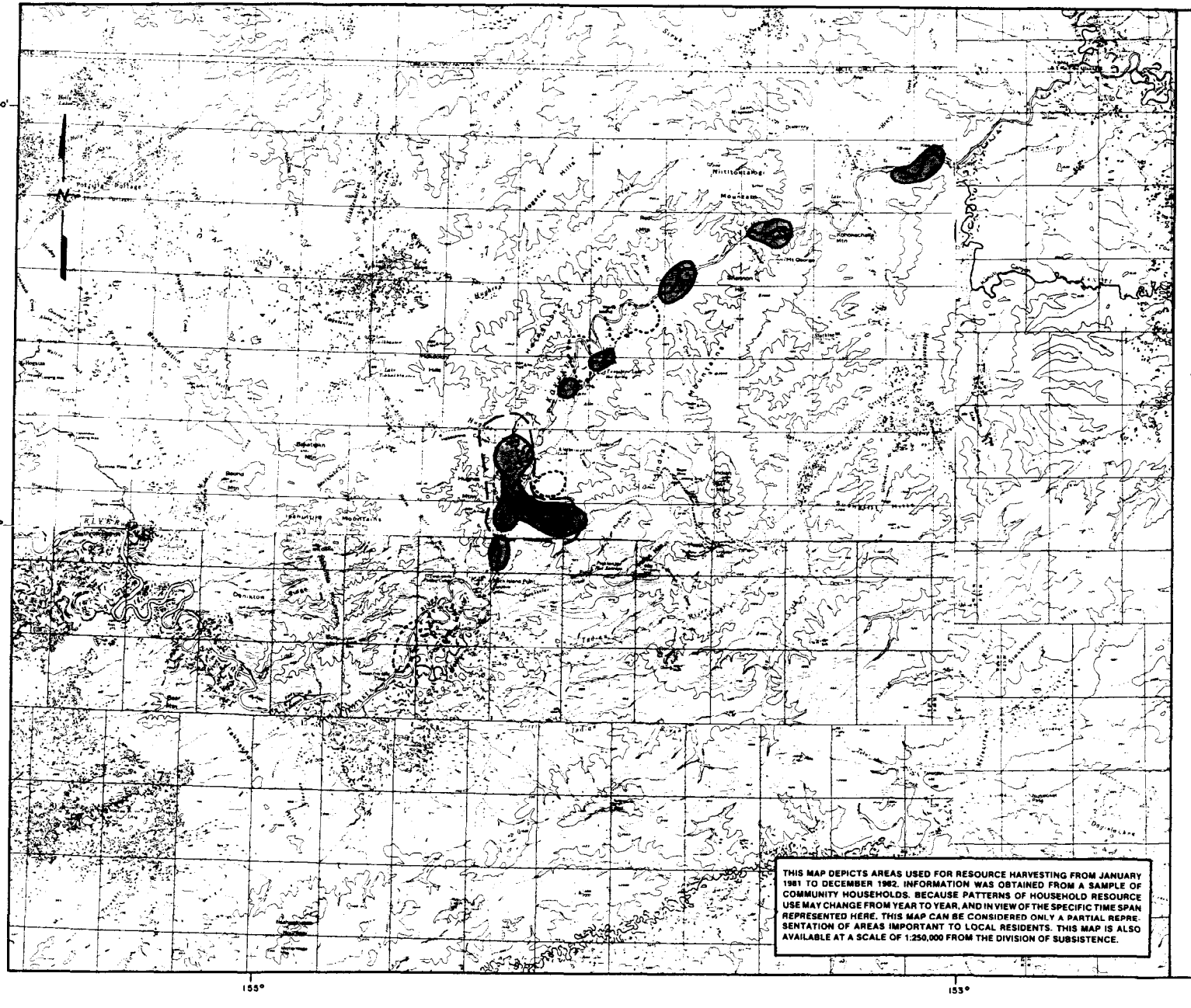

FIG.23 AREAS USED FOR PLANT GATHERING AND SMALL GAME HUNTING BY RESIDENTS OF HUGHES, JANUARY 1981 - DECEMBER 1982.

FIREWOOD GATHERING AREA

BERRY PICKING AREA

SMALL GAME HUNTING AREA (INCLUDES RABBITS (HARES), PTARMIGAN, GROUSE)

INFORMATION COLLECTED FOR 16 HOUSEHOLDS BY JIM MARCOTTE, HOMER TOBUK, AND DOROTHY VENT, IN AUGUST, 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM USGS HUGHES AND MELOZITNA 1:250,000 QUADS.

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CHAPTER 5

DISCUSSION AND SUMMARY

Communities in the study area today depend on a wide variety of local resources for meeting their cultural and economic needs. The role these resources and harvest activities play in the study communities is discussed in this chapter. General comments on the mixed subsistence-cash economy and harvest diversity are followed by an overview of the social dimension of resource use activities, a discussion of continuity and change in resource use patterns, and a comparison of patterns displayed in the study communities. An assessment of future research needs is also included.

Mixed Economy

Recent research on local resource use patterns in Alaska has examined the relationship between participation in wage employment and harvest activities (e.g., Wolfe 1981; Wolfe et al. 1984). As in other rural Alaskan communities, residents of Bettles/Evansville, Allakaket, Alatna, and Hughes are involved in both cash-producing and subsistence sectors of the local economies. Nearly all households surveyed participated in both activities.

As shown in Chapter 3, some variation was observed in employment levels in each community. By and large, job opportunities throughout the area were seasonal or part-time in nature. About 90 percent of Bettles/Evansville household heads held at least temporary wage employment in

1982, while 78 percent of Allakaket and Alatna household heads, and 68 percent of Hughes household heads held some wage employment in 1982. Several households also had other sources of income, such as fur trapping, transfer payments, or retirement earnings. The number of jobs per capita varied from a low of .48 in Allakaket and Alatna and .51 in Bettles/Evansville to .56 in Hughes (all jobs included). Allakaket and Alatna households averaged 8.6 total months of employment in 1982, compared to 11.6 months in Hughes and 12.0 months in Bettles/Evansville. Household heads were employed an average of 8.6 months in Bettles/Evansville, 3.7 months in Allakaket and Alatna, and 5.8 months in Hughes. As can be seen by comparing figures, households commonly had multiple workers so that the households average months of employment is considerably greater than that of the household head alone. The average duration of jobs per year ranged from 8.9 months in Bettles/Evansville, 5 months in Hughes, and 4.5 months in Allakaket and Alatna. A larger portion of jobs in Bettles/Evansville came from the private sector (44.4 percent) than in Hughes (15.6 percent) and Allakaket and Alatna (12.1 percent). As stated earlier, there were more private sector jobs in air transportation and guiding in Bettles/Evansville than in the other three communities.

Resource Diversity

A wide variety of resources were harvested in the area and were subject to a consistent pattern of use. Table 17 shows the number of resources harvested in each community among the 74 sample households out of a total of 29 resource categories (see survey in the Appendix).

Included in Table 17 are only those resources harvested and not those received. As stated previously, nearly all households obtained additional wild resources through sharing or cooperative harvest efforts.

As shown in Table 17, Allakaket, Alatna, and Hughes harvested a substantially larger number of resource types in comparison with Bettles/Evansville. In Bettles/Evansville, 45 percent of the study households harvested fewer than five different resources, compared to only 14 percent of Allakaket and Alatna households, and 10 percent of Hughes households. Sixty percent (21 of 35) of the Allakaket and Alatna households and 74 percent (14 of 19) of the Hughes households harvested 15 or more different resources. Harvest of fall chum, suckers, burbot, wolf, and otter in 1982 was not reported by any Bettles/Evansville households.

TABLE 17. NUMBER OF TYPES OF RESOURCES HARVESTED IN 1982 BY HOUSEHOLDS (OUT OF A TOTAL OF 29 RESOURCE CATEGORIES).

Community	Number of Households	Number of Resources Harvested per Household Range	Mean
Bettles/ Evansville	20	0 - 14	5.8
Allakaket and Alatna	35	0 - 26	14.4
Hughes	19	2 - 23	15.7
Totals:	74	0 - 26	12.4

Community Comparison

The communities of Bettles/Evansville, Allakaket, Alatna, and Hughes display somewhat different resource use patterns. Per capita outputs in pounds of edible animal and plant resources varied considerably between communities. Table 18 lists average household and average per capita subsistence outputs for each species and each community. Edible weights used in these calculations are those used by Stratton and Georgette (1984).

The per capita subsistence outputs for 1982 are depicted for the study communities in Figure 24. Per capita output of summer chum salmon differs significantly between communities. The greater abundance of the fish resource downriver is believed to account for much of the different production rates. Per capita moose production in Hughes was twice that found in Allakaket and Bettles/Evansville.

Figure 25 shows total community output, mean household output, per capita output, and proportion of output for resource category in 1982. The Bettles/Evansville 1982 per capita subsistence output (255 lbs.) was well below that of Allakaket and Alatna (908 lbs.) and Hughes (1,511 lbs.).

The salmon resource comprises the major portion by weight of the total output in Hughes (78 percent of total output) and Allakaket and Alatna (62 percent of total output). Summer chum salmon alone accounts for 63.8 percent of the total Hughes output, 46.8 percent in Allakaket and Alatna. In contrast, salmon comprised 25 percent of the subsistence harvest at Bettles/Evansville, mostly summer chums. In part, the reduced

TABLE 18. MEAN HOUSEHOLD AND PER CAPITA SUBSISTENCE OUTPUT, BY COMMUNITY AND RESOURCE.

Resource	(Edible Weight) In Pounds	Bettles/ Evansville HH (n=20)	Bettles/ Evansville per capita (n=52)	Alatna/ Allakaket HH (n=35)	Alatna/ Allakaket per capita (n=137)	Hughes HH (n=19)	Hughes per capita (n=31)
King	(18.1)	8.1	3.1	166.5	42.7	482.0	112.1
Summer Chum	(6.1)	162.3	62.4	1,652.2	423.6	4,109.4	955.7
Fall Chum	(6.1)	0	0	351.5	90.1	424.8	98.8
Sheefish	(7.0)	72.4	28.5	490.2	125.7	117.9	27.4
Whitefish	(.9)	9.5	3.6	124.9	32.0	101.1	23.5
Pike	(2.8)	1.8	0.7	32.1	8.2	31.1	7.2
Grayling	(.7)	17.2	6.6	32.8	8.4	50.7	11.8
Sucker	(.7)	0	0	9.6	2.5	1.8	0.4
Burbot	(2.4)	0	0	4.0	1.0	7.6	1.8
Trout	(2.0)	6.1	2.4	0	0	0	0
Total Salmon		170.4	65.5	2,170.2	556.4	5,016.2	1,166.6
Total Other Fish		108.8	41.8	693.6	177.8	310.2	72.1
Hare	(1.5)	17.3	6.7	35.1	9.0	25.1	5.8
Ducks	(1.5)	2.7	1.0	36.8	9.4	39.9	9.3
Geese	(5.0)	3.0	1.2	56.4	14.4	60.0	14.0
Grouse	(.5)	0.2	0.1	1.2	0.3	3.2	0.7
Ptarmigan	(.5)	0.5	0.2	2.2	0.6	2.1	0.5
Black Bear	(58)	14.5	5.6	34.8	8.9	45.8	10.6
Caribou	(130)	71.5	27.5	18.6	4.8	0	0
Moose	(500)	250.0	96.2	400.0	102.6	868.4	202.0
Sheep	(65)	6.5	2.5	9.3	2.4	0	0
Brown Bear	(141)	7.1	2.7	0	0	0	0
Beaver	(8.8)	4.8	1.9	57.8	14.8	45.4	10.6
Total Birds		6.4	2.5	96.6	24.7	105.2	24.5
Total Mammals		371.7	143.1	555.6	142.5	984.7	229.0
Berries		18.9	7.3	28.7	7.4	24.2	5.6
Grand Total		676.2	260.2	3,544.7	908.8	6,440.5	1,497.8

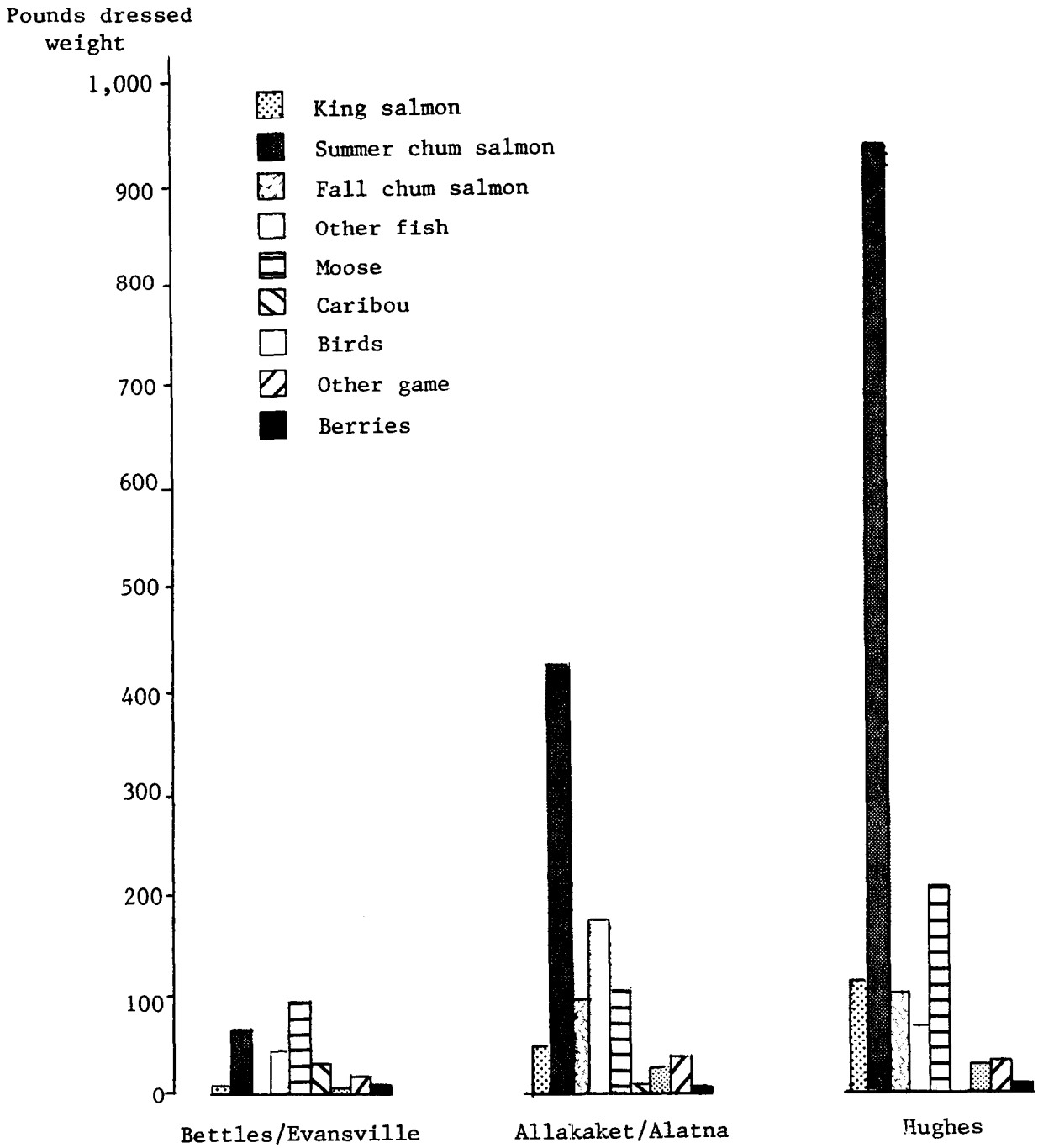
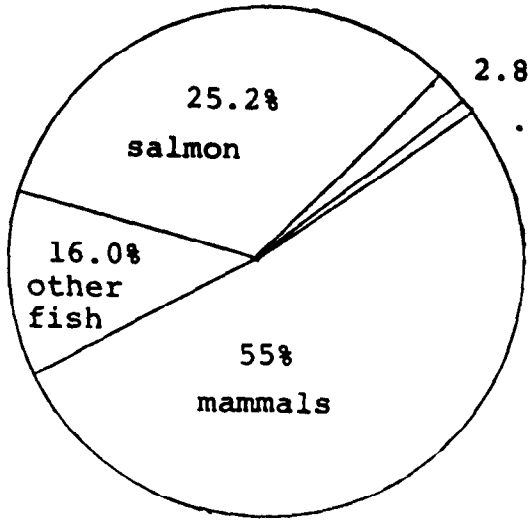
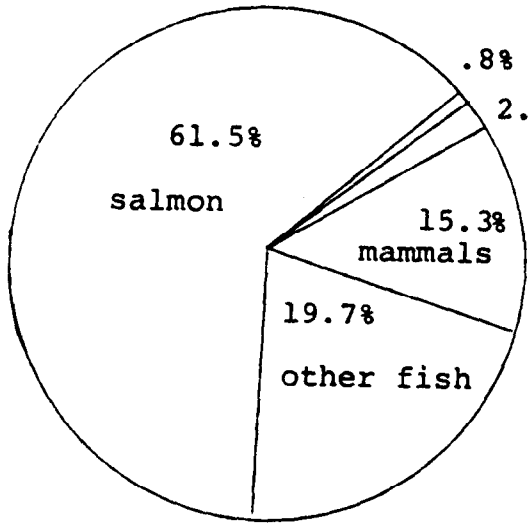


Fig. 24. Per Capita Subsistence Harvests, 1982



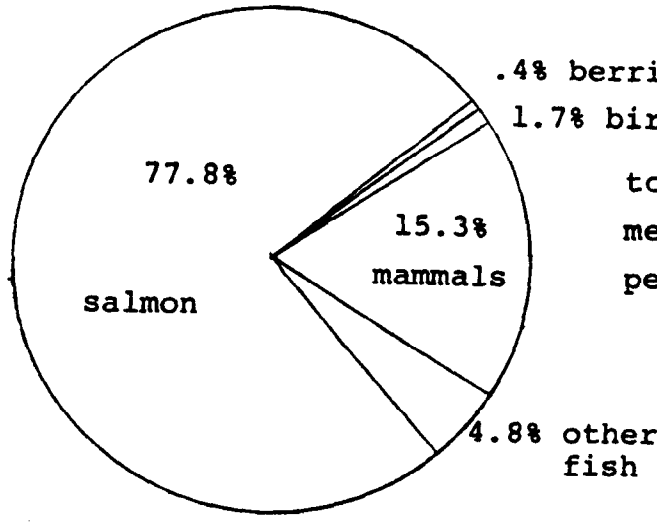
Bettles/Evansville

total community output:	13,513 lbs.
mean household output:	675 lbs.
per capita output:	255 lbs.



Allakaket & Alatna

total community output:	123,469 lbs.
mean household output:	3,528 lbs.
per capita output:	908 lbs.



Hughes

total community output:	122,414 lbs.
mean household output:	6,443 lbs.
per capita output:	1,511 lbs.

Fig. 25. Pounds of subsistence output in 1982, by community and resource category.

catch of salmon at Bettles/Evansville is because the quantity and quality of salmon diminishes considerably the greater the distance up the Koyukuk River. Non-salmon fish species account for a sizeable portion of the Allakaket and Alatna output (19.7 percent) and Bettles/Evansville output (16.0 percent). Land mammals represent the highest percentage of the output in Bettles/Evansville (55.0 percent), where moose accounted for 37 percent of the total production. Although relative contributions of land mammals to the total village catch is smaller at Hughes (15 percent) and Allakaket and Alatna (15 percent), the communities display a greater absolute amount of moose meat produced.

It should be recalled that Bettles/Evansville was founded for its suitability for aviation and not for the harvest of local resources. Old Bettles similarly had a history closely associated with transportation, commerce, and river navigation. One Bettles resident explained that the downriver communities were much more favorably located for hunting, fishing, and trapping. Although the Bettles/Evansville harvests are lower than those in Hughes, Alatna, Allakaket, still they are substantial -- 255 lbs. per capita. They are as high as any predominantly non-Native bush community in the state, comparable to Upper Yentna region and Gakona in the Copper River Basin (Fall, Foster, and Stanek 1983; Stratton and Georgette 1984). Subsistence uses are important for Bettles/Evansville. The village shows how immigrants can establish a mixed subsistence-based economy in a rural region.

In addition to environment, cultural and historical factors account for the lower harvest outputs and participation rates in Bettles/Evansville. As previously stated, in Bettles/Evansville, a lower percentage

of total households participated in the harvest of all resource categories except grayling, trout, brown bear, caribou, sheep, and wolverine. Bettles/Evansville has a larger proportion of non-Native residents (71 percent in 1980) than the other study communities. It is more recently established as well, and was settled by an influx of people from outside the Koyukuk River area. Only one household head was raised in Bettles/Evansville, one in Old Bettles, and four others elsewhere in the Koyukuk River valley. Twelve of 20 household heads were raised outside of Alaska. This added cultural differences in food tastes, social roles, activity preferences, and economic behaviors.

In addition to lower harvests of some species, participation rates and species diversity, the extent of family ties within Bettles/Evansville was lower than in the other study communities. There was an increased focus on the nuclear family and less dependence on the extended family network in resource harvesting, processing, and distribution. However, a higher level of cooperation in harvest activities was not uncommon among unrelated individuals. Certain households frequently received meat and fish from harvesting households.

Social Dimensions

Family relationships underlie the organization of most resource harvesting activities and of the distribution and consumption of those resources. Particularly in Hughes, Alatna, and Allakaket, most if not all members of the community belonged to a sharing network. Indeed, the extensive pattern of sharing was so much a part of everyday life that many respondents had difficulty with survey questions which sought

to quantify amounts of harvest shared between households. For example, salmon typically were harvested through the cooperation of related individuals residing in more than one household. Processed fish from the summer's effort was stored in a smokehouse identified with one household and available for use by other households included in the production unit.

There are two general patterns of resource sharing. The first results in an equal distribution or equal use. This occurs when individuals from different households either share equipment or effort as part of a hunting activity. In this case, the product of the subsistence activity is shared more or less equally. For example, if two brothers now residing in separate households go moose hunting together and return with one moose, the moose meat normally is shared evenly between the two households. The second type of sharing occurs in cases where equipment or effort are not shared in the subsistence activity. In these cases, the sharing tends to be more variable and based on need or availability. Examples of this are when food is given to the elderly or to relatives living outside the community.

The survey form used in this study focused on the household, which, in most cases, represented only a portion of the larger family network that served as the significant arena for subsistence activities. The communities were not simply a sum of household units, but rather a complex network of households integrated through kinship. Each individual's participation in resource harvest and use is continually influenced by his or her responsibilities and social obligations within this larger kinship network. This emphasis on the kinship network exists to a lesser

extent in Bettles/Evansville, largely due to a preponderence of individuals and families that have moved there from other places in recent years.

Young children commonly accompany adults during harvesting trips away from the community. With age, they acquire responsibility commensurate with their abilities. September moose hunting trips often are family events. During school vacations boys are taught trapping skills from fathers or grandfathers during several day trips. Respondents frequently emphasized the importance of these skills being taught at home and in the camp. Males in their late teens and twenties often accounted for substantial game harvests. Once an animal was brought home, other family members, typically females, took charge of processing.

During the course of conducting household surveys, it became apparent that the overall harvest and resource use patterns were related to the workforce of the household. Looking at Hughes households, for example, the 11 households headed by a husband and wife averaged a subsistence output of 9,236 lbs. in 1982, while the eight households headed by unmarried persons, single parents, or widowers averaged an output of 2,459 lbs. The average for all Hughes households (N = 19) was 6,443 lbs. The two households headed by widowed females which contained more than four sons or daughters averaged an output of 5,081 lbs. Each of the two households with the greatest total output (over 25,000 lbs. each) was very active in salmon fishing and had ten or more household members. The four single person households in the sample averaged outputs of 1,900 lbs. Three of these households were comprised of single males less than 35 years of age. The below average household outputs

were largely due to their less than average salmon harvests. However, one showed above average output of mammals, two recorded above average outputs of birds and non-salmon fish species, and all three displayed an above average harvest diversity as measured by the number of resource types they harvested. Further, although their mean household harvest was below the communities' average, their mean per capita harvest was about that of the community.

Harvest Continuity

One objective of this study was to identify changes in local harvest patterns which may have occurred in the past ten years. Although some change has taken place, the overall pattern of employment, land use, and harvest levels of the early 1970s was found in 1983. These patterns have continued despite game fluctuations, changes in land status, more restrictive state and federal hunting regulations, and growth in community populations.

Land ownership patterns in the Koyukuk area have become increasingly complex since passage of the Alaskan Native Claims Settlement Act in 1971, subsequent state land selections, and passage of the Alaska National Interest Lands Conservation Act in 1980. Major classifications now include Native village corporation lands, Native regional corporation lands, state land, Bureau of Land Management lands, National Parks and Preserves, and National Wildlife Refuges. For each of these land units there are different managing agencies, legislative requirements, planning processes, and implications for continued customary and traditional hunting, fishing, and trapping. Regulations developed for the

different land units in some instances conflict with actual or desired local use patterns.

A comparison of actual employment patterns in Allakaket and Alatna in 1968 (Clark and Clark 1978) and 1982 reveals many similarities in the types of positions available. Continued reliance on service positions in the community, and firefighting and construction outside the community was observed. In this 14-year period, the only new category of positions held were with the local village corporation. Again, most positions were part-time and of short duration.

A summary of land use areas for 1981 and 1982 is shown in Figure 26. For each community a line was drawn to include the maximum extent of all resource use areas used in 1981 and 1982, based upon the information depicted on the resource use maps in Chapter 4. Resource use areas covering only a two-year time period do not necessarily include all areas important to local residents, but they do, if considered as a part of an ongoing pattern, provide a basis for temporal comparison of similarities and differences.

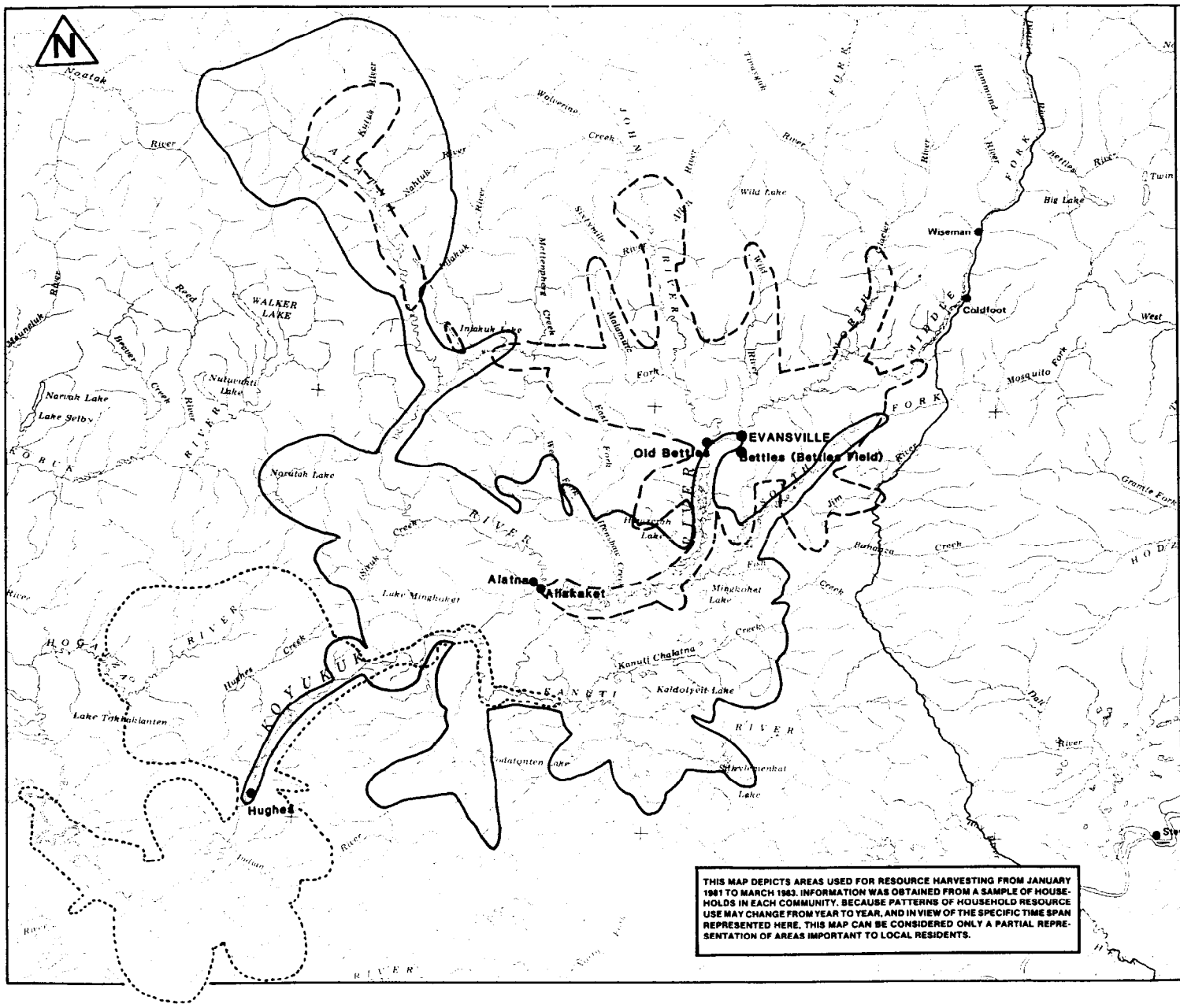
When comparing this map or the individual resource use maps in Chapter 4 with the subsistence use area maps presented in Nelson, Mautner, and Bane (1982), which depict a 1975 pattern, many similarities are observed in extent of land used. The overall land area used for resource procurement activities and the nature of use remained very consistent. Many of the specific locations used for fishing and hunting were the same as those used in 1975.

Several differences were noted between the areas used in 1975 and 1982. The 1981-82 map for Bettles/Evansville does not show use near Wild Lake up the Wild River north of Bettles, perhaps because the John

River and Wild Lake residents were not included in the present community-based study. At the eastern portion of the study area, the 1975 maps show slightly more extensive travel and trapping use up the South Fork, Jim River, Bonanza Creek, and Fish Creek than was reported for 1981-82. These areas are near the Dalton Highway and Trans-Alaska Oil Pipeline (TAPS) Corridor. Three Bettles/Evansville residents indicated that they were experiencing problems with residents of one of the pipeline camps over use of traplines in this area and, consequently, had not used them in 1981 and 1982. Similarly, an area near Indian Mountain east of Hughes is now being trapped by individuals from the Indian Mountain/Utopia Air Force radar installation. Traplines north of the Alatna Hills and near Iniakuk Lake were not reported as being used during the 1981-82 period. Future researchers should be reminded that maps depicting extent of total community land use can vary significantly with the inclusion or exclusion of a single individual's use area if that use occurred at the outer limit of the community use area.

Differences were also found with the use of seasonal camps. For example, few fish camps along the Koyukuk River were occupied during the 1983 season and several respondents indicated a reduction in their use of spring camps. Seasonal camp use is thought to be influenced by improved transportation, local employment opportunities, and participation in other community activities.

Resource harvests from 1973 and 1982 are compared in Tables 19 and 20. The 1973 figures from Nelson, Mautner, and Bane (1982:278-279) were based on subsistence harvest figures obtained by village representatives for the Joint Federal State Land Use Planning Commission. Subsistence outputs for each community were calculated on a per capita basis from these



THIS MAP DEPICTS AREAS USED FOR RESOURCE HARVESTING FROM JANUARY 1981 TO MARCH 1983. INFORMATION WAS OBTAINED FROM A SAMPLE OF HOUSEHOLDS IN EACH COMMUNITY. BECAUSE PATTERNS OF HOUSEHOLD RESOURCE USE MAY CHANGE FROM YEAR TO YEAR, AND IN VIEW OF THE SPECIFIC TIME SPAN REPRESENTED HERE, THIS MAP CAN BE CONSIDERED ONLY A PARTIAL REPRESENTATION OF AREAS IMPORTANT TO LOCAL RESIDENTS.

FIG. 26
AREAS USED FOR FISHING, HUNTING, TRAPPING, AND GATHERING BY RESIDENTS OF BETTLES, EVANSVILLE, ALLAKAKET, ALATNA, AND HUGHES, JANUARY 1981 THROUGH DECEMBER 1982*.

— — — BETTLES AND EVANSVILLE RESOURCE USE AREA

——— ALLAKAKET AND ALATNA RESOURCE USE AREA

- - - - - - - HUGHES RESOURCE USE AREA

*EXCEPT FOR TRAPPING, NOVEMBER 1981 THROUGH MARCH 1983.

SEE "CONTEMPORARY RESOURCE USE PATTERNS IN THE UPPER KOYUKUK REGION," BY JAMES R. MARCOTTE AND TERRY L. HAYNES, DIVISION OF SUBSISTENCE TECHNICAL PAPER NO. 93, FOR FURTHER EXPLANATION.

BASE MAP ADAPTED FROM ALASKA 1:1,000,000 BASE MAP SERIES ©COPYRIGHT, ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER, UNIVERSITY OF ALASKA, 1982.

SCALE 1:1000,000

0 10 20 30 40 miles

0 10 20 30 40 50 kilometers

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TABLE 19. WATERFOWL AND FISH HARVEST IN 1973 AND 1982.

	Number Harvested					
	Bettles/ Evansville		Alatna & Allakaket		Hughes	
Resource	1973	1982	1973	1982	1973	1982
Ducks	20	36	4,000	858	360	505
Geese	20	12	300	395	200	228
Grouse	10	7	150	81	60	120
Ptarmigan	100	20	500	154	260	179
Burbot	--	0	---	58	---	60
Grayling	200	491	1,000	1,639	1,880	1,376
Pike	50	10	500	401	315	211
Salmon (king)	0	9	300	322	101	506
Salmon (summer chum)	0	532	12,000	9,480	6,800	12,800
Salmon (fall chum)	0	0	600	2,017	0	1,323
Sheefish	0	212	1,600	2,451	820	320
Sucker	100	0	400	480	0	49
Trout	0	61	0	0	0	0
Whitefish	50	210	24,000	4,858	6,500	2,135

Note: 1973 Harvest data from Nelson, Mautner, and Bane (1982:379). They consider the waterfowl and fish harvest figures lower than actual harvests. Burbot harvests were not reported for 1973. Actual Bettles/ Evansville 1982 harvests expected to be greater (see Methodology).

TABLE 20. MAMMAL HARVEST IN 1973 AND 1982

	Number Harvested					
	Bettles/ Evansville		Alatna & Allakaket		Hughes	
Resource	1973	1982	1973	1982	1973	1982
Black bear	5	5	20	21	17	15
Brown bear	0	1	10	0	2	0
Beaver	43	11	300	230	82	98
Caribou	50	11	300	5	218	0
Fox	5	20	20	89	14	41
Hare	100	231	200	818	157	318
Lynx	12	30	20	135	2	54
Marten	100	154	150	1,072	123	406
Mink	6	0	100	0	32	0
Moose	25	10	48	28	22	33
Muskrat	20	13	400	126	59	41
Otter	0	0	10	4	16	4
Porcupine	10	0	15	0	15	2
Sheep	5	2	10	5	0	0
Wolverine	2	7	6	4	2	6
Wolf	10	0	5	2	10	0

Note: 1973 Harvest data from Nelson, Mautner, and Bane (1982:278). Actual Bettles/Evansville 1982 harvests expected to be greater (see methodology). 1982 furbearer harvests are counted for the 1982-83 trapping season.

harvest figures (Table 21). Salmon output increased most significantly at Hughes and Bettles/Evansville but also increased in Allakaket and Alatna. Moose production decreased in Bettles/Evansville, Allakaket, and Alatna, yet increased in Hughes. Per capita production of combined game species appeared to decline in each of the communities. However, no single year harvest figures can fully display the dynamic range of harvests occurring over time, since species populations and availability are known to vary considerably from year to year. Methodological differences could also account for some of the differences noted.

The most dramatic change is associated with the decline in caribou harvests and inavailability of this traditionally important food source. No Hughes residents harvested caribou in 1982, and only two hunters from Allakaket and Alatna were successful (during a sheep hunting trip up the Alatna River). Hughes residents did receive caribou from friends and relatives in the Kobuk River area. The comparative success by Bettles/Evansville residents was largely a function of improved access using aircraft. The three most frequently cited local explanations for the recent absence of caribou in the area were adverse biological impacts on the herds from the pipeline, from hunting of herd leaders by Anaktuvuk Pass residents, and from a 470-square mile local forest burn in 1972. Biologists cite as a factor the crash of the Western Arctic Caribou Herd in 1976.

Future Research

A final objective of this study has been to assess future research needs in providing a comprehensive picture of resources use patterns in

TABLE 21. PER CAPITA PRODUCTION IN 1973 AND 1982.

Resource	Bettles/ Evansville 1973	1982	% Change	Alatna/ Allakaket 1973	1982	% Change	Hughes 1973	1982	% Change
King Salmon	0	3.1		31.2	42.7		21.5	112.1	
Summer Chum	0	62.4		420.7	423.6		488.0	955.7	
Fall Chum	0	0		21.0	90.1		0	98.8	
Total Salmon	0	65.5	(+66%)	472.9	556.4	(+18%)	509.5	1,166.6	(+129%)
Other Fish	6.9	41.8	(+505%)	202.2	177.8	(-12%)	162.2	72.1	(-56%)
Moose	219.3	96.2	(-56%)	137.9	102.6	(-26%)	129.4	202.0	(+56%)
Caribou	114.0	27.5	(-76%)	224.1	4.8	(-98%)	333.4	0	(-100%)
Birds	3.2	2.5	(-22%)	45.1	24.7	(-45%)	20.0	24.5	(+23%)
Other Game	20.1	19.4	(-3%)	35.5	35.1	(-1%)	26.2	27.0	(+3%)
Total Game*	353.4	143.1	(-60%)	397.5	142.5	(-64%)	489.0	229.0	(-53%)
Berries	13.2	7.3		4.9	7.4		7.2	5.6	
GRAND TOTAL	377.0	255.0	(-32%)	1,123.0	907.8	(-19%)	1,088.0	1,511.3	(+39%)

* excluding birds

the Upper Koyukuk region. Like this project, any future studies of local resource use should build on Tracks in the Wildland (Nelson, Mautner, and Bane 1982) and Make Prayers to the Raven (Nelson 1983). This project sought to provide additional data on harvest and land use from 1981 and 1982. Since several major resource use issues will be addressed in the near future, accurate data as well as active public participation will be required.

This and other studies have not examined the small family groups residing outside established communities in the Upper Koyukuk region. Several individual families live on homesteads, at trapping camps, and on mining claims. It is probable that these families also maintain a very close relationship with the land. Not only have these groups tended to be overlooked by researchers, their remoteness has precluded their active involvement in the regulatory process through such mechanisms as local fish and game advisory committees. Although these individuals, families, or groups harvest substantial quantities of wild resources and rely on them throughout the year, their patterns of resource sharing and distribution are expected to differ from those found in established communities.

The present study relied predominantly on a quantitative survey methodology to examine community resource use patterns. In certain topical areas such as total use areas, community harvest levels, and diversity among households, this methodology has yielded reasonably complete and reliable data. These data are useful as part of a baseline documentation on overall resource use patterns. However, this approach often overlooked data more qualitative in nature than can best be

obtained through individual case studies. Within the structured interview format employed in this study, it was difficult to trace the distribution of harvested resources and the associated reinforcement of social ties, the composition of production units for all harvesting activities, and the cultural values associated with participation in hunting, fishing, and trapping activities.

Additional land use research and mapping is required if the full extent of contemporary and historic resource use areas is to be documented. Resource maps currently available do not provide adequate time depth for identifying traditional use areas, nor do they take into account movement of residents between communities. Map biographies showing Native place names and land use of local individuals throughout their lifetimes would greatly aid in the understanding of traditional land use patterns. Other related mapping topics could include traditional land use rights to traplines, cabins, and net sites.

Future research could also examine the impacts on local harvest activities from the Dalton Highway, from pipeline activities, from the influx of outsiders to the area, and from local placer mining activities. An examination of strategies for developing long-term local participation in National Wildlife Refuge and National Park management and planning would also be of great value.

The final but perhaps most critical research priority is to work with the oldest residents in these communities. The experience and knowledge of these elderly persons extends back to the 1920s and earlier, a period when many historic camp and village locations were occupied. The elders have seen the abandonment of settlements, growth in contemporary communities, and a wide range of economic and cultural influences

introduced from outside the area. Additionally, their lives have been closely linked with their natural surroundings and local fish and game resources. For example, elders have observed fluctuations over time in the fish and wildlife populations and made adjustments necessary for survival. The perspective of the elderly can add considerable understanding about the relationship between the resources and the resource users in the Upper Koyukuk region.

REFERENCES

Allen, Henry T.
1887 Report of an Expedition to the Copper, Tanana, and Koyukuk Rivers, in the Territory of Alaska, in the Year 1885. Washington, D.C.: U.S. Government Printing Office.

Beatus, Henry Sr.
1980 Henry Beatus, Sr., A Biography: Hughes. Yukon-Koyukuk School District of Alaska. Vancouver: Hancock House Publishers Ltd.

Beetus, Joe
1980 Joe Beetus, A Biography: Hughes. Yukon-Koyukuk School District of Alaska. Vancouver: Hancock House Publishers Ltd.

Clark, Annette McFadyen
1970a The Athabaskan-Eskimo Interface. Canadian Archeological Association Bulletin, No. 2. Pp. 13-23. Ottawa.

1970b Koyukon Athabascan Ceremonialism. In Athabascan Studies, Regna Darnell, ed. Pp. 80-88. Western Canadian Journal of Anthropology 2(1).

1974 Koyukuk River Culture. National Museum of Man, Mercury Series, Canadian Ethnology Service Paper No. 18. Ottawa.

1981 Koyukon. In Handbook of North American Indians, Volume 6: Subarctic. June Helm, ed. Pp. 582-601. Washington, D.C.: Smithsonian Institution.

Clark, Annette McFadyen, and Donald W. Clark
1978 On the Edge of Today: Culture Chance in a Northern Athapaskan Village During the 1960's. Anthropological papers of the University of Alaska 1a(1):65-80.

Cole, Terrence
1983 Early Explorers and Prospectors on the Koyukuk. In Up the Koyukuk. Alaska Georgraphic 10(4):26-39.

Ertec Northwest, Inc.
1982 Koyukuk Hydrological Region: Historical Navigability Study. Prepared for Alaska Department of Natural Resources, Division of Research and Development. Anchorage: Ertec Northwest, Inc.

Fall, James A., Daniel J. Foster, and Ronald T. Stanek
1983 The Use of Moose and Other Wild Resources in the Tyonek and Upper Yentna Areas: A Background Report. Division of Subsistence Technical Paper No. 74. Anchorage: Alaska Department of Fish and Game.

Freeman, M. M. R.
1976 Inuit Land Use and Occupancy Study. 3 Volumes. Department of Indian Affairs and Northern Development, Ottawa.

Henzie, Moses
1979 Moses Henzie, A Biography: Allakaket. Yukon-Koyukuk School District of Alaska. Vancouver: Hancock House Publishers Ltd.

Jones, Eliza
1978 Dinaakkanaga Ts'inh Huyoza: Junior Dictionary for Central Koyukon Athabaskan. Anchorage: University of Alaska, National Bilingual Materials Development Center.

(in prep.) Koyukuk Athabaskan Dictionary. University of Alaska, Native Language Center, Fairbanks.

Krauss, Michael E.
1979 Na-dene and Eskimo. In The Languages of Native North America: An Historical and Comparative Assessment. Lyle Campbell and Marianne Mithun, eds. Pp. 803-901. Austin: University of Texas Press.

Nelson, Richard K.
1983 Make Prayers to the Raven. Chicago: University of Chicago Press.

Nelson, Richard K., Kathleen H. Mautner, and G. Ray Bane
1982 (orig. 1978) Tracks in the Wildland: A Portrayal of Koyukon and Nunamiut Subsistence. Anthropology and Historic Preservation, Cooperative Park Studies Unit. University of Alaska, Fairbanks. Marceline, Missouri: Walsworth Publishing Co.

Nictune, Oscar, Sr.
1980 Oscar Nictune Sr., A Biography: Alatna. Yukon-Koyukuk School District of Alaska. Vancouver: Hancock House Publishers Ltd.

Norton, Helen H.
1982 A Review of Some Data for Six Rural Communities Surrounding the Gates of the Arctic National Park: Wiseman, Bettles/Evansville, Allakaket/Alatna, Ambler, Kobuk and Shungnak. Unpublished draft manuscript prepared for Gates of the Arctic National Park and Preserve, Fairbanks, AK.

Simon, Edwin
1980 Edwin Simon, A Biography: Huslia. Yukon-Koyukuk School District of Alaska. Vancouver: Hancock House Publishers Ltd.

Stratton, Lee, and Susan Georgette
1982 Use of Fish and Game by Communities in the Copper River Basin, Alaska: A Report on a 1983 Household Survey. Division of Subsistence Technical Paper No. 107. Anchorage: Alaska Department of Fish and Game.

Stratton, Lee, and Susan Georgette (continued)
1984 Use of Fish and Game by Communities in the Copper River Basin, Alaska: A Report on a 1983 Household Survey. Division of Subsistence Technical Paper No. 107. Anchorage: Alaska Department of Fish and Game.

Stuck, Hudson
1914 Ten Thousand Miles with a Dog Sled. New York: Charles Scribner's Sons.

1917 Voyages on the Yukon and its Tributaries. New York: Charles Scribner's Sons.

Tanana Chiefs Conference
1983 Dena' Nena' Henash. Tanana Chiefs Conference Inc.: Interior Communities. Fairbanks: Tanana Chiefs Conference Planning and Information Office.

Tobuk, Frank
1980 Frank Tobuk, A Biography: Evansville. Yukon-Koyukuk School District of Alaska. Vancouver: Hancock House Publishers, Ltd.

Wolfe, Robert J.
1981 Norton Sound/Yukon Delta Sociocultural Systems Baseline Analysis. Division of Subsistence Technical Paper No. 59. Juneau: Alaska Department of Fish and Game.

1982 Mapping Subsistence Use Areas: Methodologies and Issues. Division of Subsistence, Research Notebook Series No. 1. Juneau: Alaska Department of Fish and Game.

1983 Subsistence-Based Socioeconomic Systems in Alaska: An Introduction. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

Wolfe, Robert J., Joseph J. Gross, Steven J. Langdon, John M. Wright, George K. Sherrod, Linda J. Ellanna, Valerie Sumida, and Peter J. Usher
1984 Subsistence-Based Economics in Coastal Communities of Southwest Alaska. Division of Subsistence Technical Paper No. 89. Juneau: Alaska Department of Fish and Game.

APPENDIX 1.

SURVEY FORM

Dear Koyukuk River Resident:

We would like to ask for your help in answering some questions about your family's use of fish, game and plants in the Koyukuk region, and to help us locate areas where you harvest these resources on a map. We are trying to learn more about the importance of hunting and fishing to families in your community.

We have already talked to families in Bettles, Evansville, Alatna, Allakaket and Hughes. The study is a cooperative effort between the Division of Subistence, Alaska Department of Fish and Game, the Kanuti National Wildlife Refuge, and the Gates of the Arctic National Park and Preserve. We want to learn more about the types of resources your family uses and how important they are to your family.

The questions we ask are an important part of this study. The information we record will help State and Federal agencies understand better the importance of these resources in your community. It is hoped that this will lead to more (better) informed decisions about land and resources in your area.

We are asking for your cooperation in answering these questions and helping us prepare a map of areas important to you. This should take about an hour of your time.

Your assistance will be most valuable if you answer all questions as completely as possible. Your participation is voluntary, you are free to answer as many questions as you wish, and your name will not be recorded on this form. If you have any questions, be sure to ask them.

Thank you for your interest in this study.

Sincerely,

Jim Marcotte
Principal Investigator

Homer Tobuk
Research Assistant

Summer 1983 Household No. _____ _____ maps

First I would like to ask about the number of people who live in this household and about jobs they have held in the past year. This information is often used to help show the importance of fishing and hunting in rural Alaska.

How many people live in this household? _____ (identify person interviewed with an asterick *)

Relationship to Household Head	Birthdate	Place of Birth	Length of Residence Here	Was Employed in 1982 (Job Title)	PT/FT	Months worked	Location of job
*1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							

Household No. _____ Page One

Household No. _____ Page Two

FISH	Quantity Harvested in 1982	Amount Rec'd From Other Households	Method Of Harvest	Method Of Preservation	USE (CHECK)				Distance Traveled From Village To Harvest Fish	No. of Trips Taken	Method of Transportation	SEASON OF HARVEST 1982 (CHECK)											
					Eaten	Given Away	Traded or Sold	Other (Dogs)				J	F	M	A	M	J	J	A	S	O	N	D
King Salmon																							
Summer Chum																							
Fall Chum																							
Shee																							
White																							
Pike																							
Grayling																							
Sucker																							
Burbot																							
Black Fish																							

GAME	Quantity Harvested in 1982	Amount Rec'd From Other Households	Method Of Preservation	USE (CHECK)				Distance Traveled From Village To Harvest Fish	No. of Trips Taken	Method of Transportation	SEASON OF HARVEST 1982 (CHECK)											
				Eaten	Given Away	Traded or Sold	Other (Specify)				J	F	M	A	M	J	J	A	S	O	N	D
Moose																						
Caribou																						
Sheep																						
Black Bear																						
Brown Bear																						
Hare																						
Porcupine																						
Squirrel																						
Other																						
Geese																						
Ducks																						
Ptarmigan, Grouse																						
Others, (Eggs)																						

Household No. _____ Page Three

FUR	Quantity Harvested in 1982-83 Season	Amount Received From Other Households	Method of Harvest	AMOUNT				Use of Carcass	Distance Traveled	Method of Transportation	No. of Traps Set	SEASON OF HARVEST 1982-1983 (Check)											
				Sold	Traded	Given Away	Used in Household					O	N	D	J	F	M	A	M	J	J	A	S
Wolf																							
Fox																							
Wolverine																							
Lynx																							
Otter																							
Beaver																							
Marten																							
Muskrat																							

( ) How often did you check your traps last winter? _____

( ) How long did it take you to check your trapline (how long were you gone from home for each trip?)? _____

_____

Household No. _____ Page Four

Did your household use berries or other edible plants in 1982? YES NO

If so, what kinds did you use?

SPECIES	AMT HARVESTED	AMT RECEIVED FROM OTHERS	HOW USED
Blueberries			
Low Bush Cranberries			
High Bush Cranberries			
Blackberries			
Rose Hips			
Roots			

How much wood did you gather in 1982?

KIND	AMOUNT	HOW USED (heating, construction, smoking fish/meat, crafts, etc.)

Household No. _____ Page Five

( ) Does your household have a garden this year? YES NO

( ) What are you raising in your garden?

( ) Did you trap more in the past than you did during the last two years?

( ) If more/less active now, please explain why.

( ) How many trapping cabins were used by members of the household last year?

( ) Who did you hunt moose with? (specific relationship, residence, not name)

( ) Who do you hunt caribou with?

( ) Who did you salmon fish with?

( ) Who did you fish for other fish with?

( ) Who did you trap with?

( ) Who did you duck and goose hunt with?

( ) How many of the following are used by your household?

Boats	Fish camp
Snowmachines	Freezer
3-Wheelers	Smokehouse
ATVs	Airplanes
Dogs	

Household No. ____ Page Six

( ) What did you do with any moose hides obtained?

( ) What did you do with any caribou hides obtained?

( ) What products have been made from local resources during this past year? (sleds, toboggans, snowshoes, baskets, hats, parkas, mittens, houses, other)

( ) What was done with these items?

Compared with five years ago, has hunting and fishing in your household

_____ increased a lot

_____ increased

_____ stayed the same

_____ decreased

_____ decreased a lot

In your own words, can you tell us what is the importance of hunting, fishing, trapping, and gathering to you and your household? _____

_____

_____

_____

_____

_____

_____

_____

_____

Household No. _____ Page Seven

APPENDIX 2.

CONVERSION FACTORS*

Resource	Pounds Edible Weight
King salmon	18.1
Chum salmon	
Summer	6.1
Fall	6.1
Sheefish	7.0
Whitefish	.9
Pike	2.8
Grayling	.7
Sucker	.7
Burbot	2.4
Moose	500.0
Black bear	58.0
Hare	1.5
Geese	5.0
Ducks	1.5
Ptarmigan	.5
Grouse	.5
Beaver	8.8
Berries	4 lbs./gallon

*From Stratton and Georgette (1984).