

RESOURCE USE AND SOCIOECONOMIC SYSTEMS:
CASE STUDIES OF FISHING AND HUNTING IN
ALASKAN COMMUNITIES

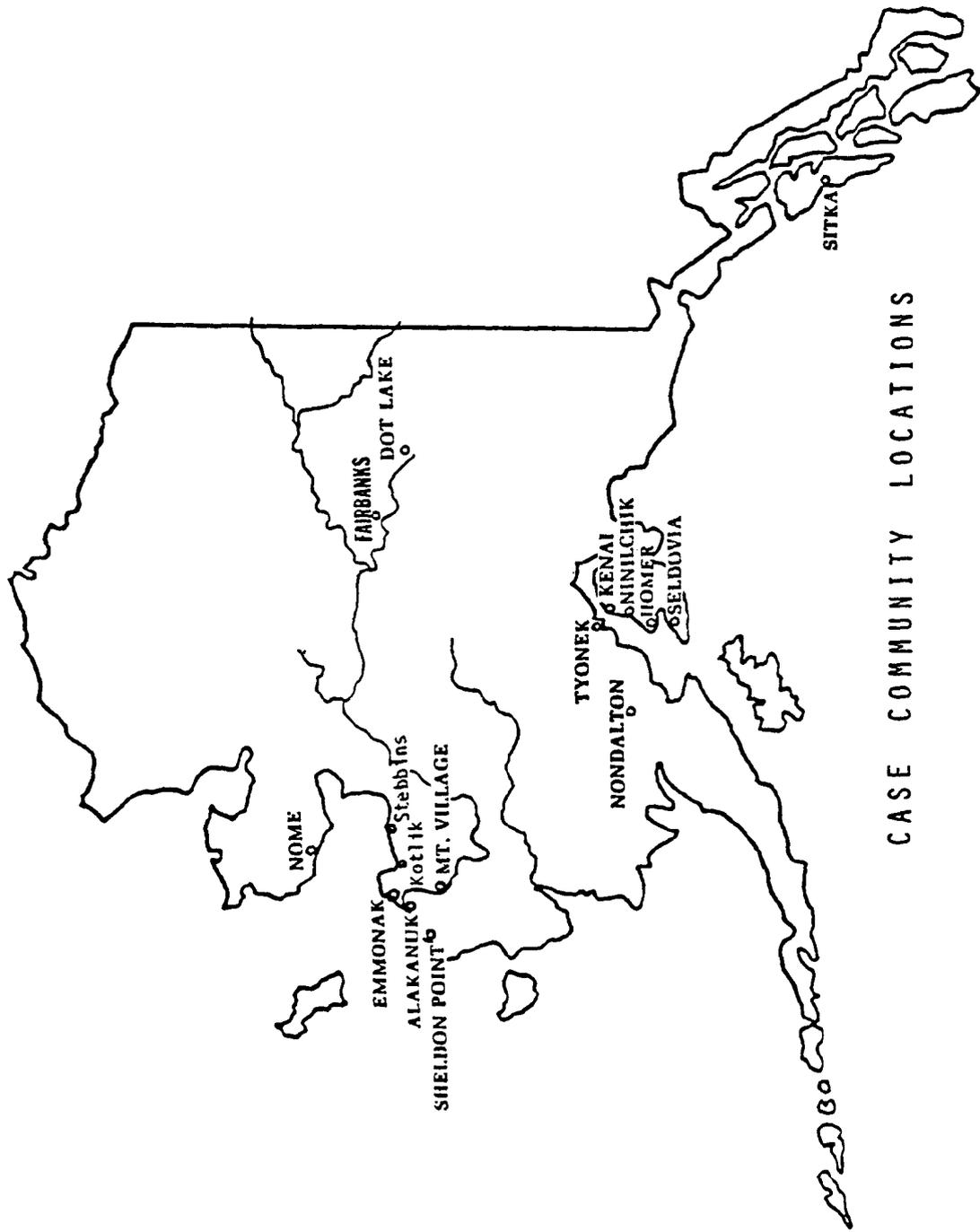
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CASE COMMUNITY LOCATIONS

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CHAPTER 1

INTRODUCTION TO THE CASE STUDIES

By Robert J. Wolfe and Linda J. Ellanna

PURPOSE

This report is intended to contribute information on the role of fishing and hunting in the socioeconomic systems of rural and urban areas of Alaska. The report describes and analyzes patterns of fishing and hunting and the use of wild, renewable resources in representative areas of Alaska, and explores the types of relationships between resource use and other area characteristics, such as demography, economy, and social structure. The report seeks to provide a compilation, synthesis, and analysis of information on resource use patterns which will further understanding of the diverse systems of fishing and hunting found throughout the State.

REPORT FORMAT

The report is organized under a format different from previous Division of Subsistence reports. The report follows a "comparative case" format. The report is a compilation of information on resource use patterns from seven representative geographic areas, including sixteen distinct communities or "community clusters." Each geographic area is treated as a "case." That is, each area is treated as an example of a socioeconomic system in which fishing and hunting occur which may represent a larger number of areas in Alaska with similar characteristics. The patterns of resource use are described for each geographic area, and the role of fishing and hunting in the socioeconomic system discussed.

Consequently, the majority of this report is actually seven separate reports placed together, which explains its length. The format facilitates comparison between cases, which is the major value of the comparative case methodology. Each case attempts to cover similar variables on resource uses and area characteristics. For instance, each case provides descriptions of resources harvested, timing of harvests, stability in harvest patterns, types of fishing and hunting groups, distribution and exchange networks, historical factors influencing harvest patterns, belief and value orientations, and other use-related variables. In addition, for each case the community's population size, population composition, economic base, household income levels, and regional transportation and communication networks are described. Each case provides examples of specific households within the community to illustrate household socioeconomic characteristics and fishing, hunting, processing, and distribution at the household level.

ASSUMPTIONS ABOUT RESOURCE USES

The information is organized in a manner to encourage the comparative exploration and analysis of tentative generalizations about fishing and hunting in Alaska. In particular, several current assumptions about the role of fishing and hunting in the social life and economy of communities can be examined in conjunction with the detailed case presentations.

For instance, the case materials can be used to examine assumptions about how patterns of resource use relate to rural and urban characteristics. There is no consensus among social scientists or administrative agencies on a single definition of "rural" or "urban" (Larsen 1968). There are multiple definitions and multiple meanings, each depending upon

the purpose served by defining the word. If a definition is to be framed for Alaskan communities, concepts of rural and urban must be validly related to the diverse systems of fishing and hunting occurring in the State. Alaska's rich cultural and socioeconomic heritage is unique relative to the rest of the United States. So are certain social characteristics of Alaskan settlement patterning and economy. Consequently, definitions of rural and urban "borrowed" from social science or government agencies have limited value in relation to Alaska's diverse socioeconomic systems which incorporate fishing and hunting for customary and traditional uses.

Second, the cases can be used to explore assumptions about subsistence-based socioeconomic systems. As it happens, some assumptions are not supported by on-the-ground, research data. One misconception has been that subsistence uses only occur in "cashless" economies. Another is that subsistence fishing and hunting do not use technologies purchased with cash. The case studies in this report show that these are misconceptions. All socioeconomic systems in Alaska utilize currency and current technologies. Subsistence-based economies are "mixed" economies with a market sector and non-market subsistence sector. It is not the presence per se of money or technology that distinguishes a subsistence-based economic system, but how the money and technology are integrated into the community's economic and social activity.

Another assumption sometimes held is that customary and traditional uses of fish and game resources are attributes of individuals, such as a personal heritage, a habit, or a lifestyle preference. According to this perception, subsistence uses can be identified by individual characteristics, such as the age, monetary income, or ethnic status of a hunter or a hunter's household. This assumption is also unsupported by data. On the

contrary, the case studies support that customary and traditional uses of fish and game are the customs and traditions of a community or region. Subsistence uses appear to be elements of a socioeconomic system that is larger than the individual participant. The cases show that in subsistence-based economic systems fishing and hunting commonly occur within cooperative and extended kinship groups linking several households. Fish and game products are distributed and exchanged along community-wide, nonmarket networks. The community is dependent socially and economically on the productive activities in the non-market fishing and hunting sector. These traditional and customary modes of production, distribution, and exchange provide the social and economic integration of entire communities.

Each of these assumptions can be examined with the data from the case studies. How well the experiences of Alaska's diverse communities conform with theoretical generalizations may be examined with empirical data derived through direct and systematic observation. The purpose of the comparative case design of this report is to draw together information to allow the examination of these assumptions from a cross-section of geographic places and communities. It is hoped that the exploration of these relationships will advance the base of empirical knowledge of and theory about contemporary Alaskan fishing and hunting systems.

CASE SELECTION

The report provides descriptions and analyses of fishing and hunting patterns in seven geographic areas of Alaska. The areas were selected to represent some of the range of resource uses in Alaska, recognizing the existence of substantial regional diversity in the State. The sources of diversity in part derived from Alaska's ecology, culture, and history.

Different ecological settings (such as tundra and forest, interior and coastal zones, arctic and temperate) offer different economic opportunities to communities. The mixed cultural heritages of Alaska's population are associated with diverse traditional and customary forms of production, exchange, and social organization. Lastly, different histories of development within regions have led to differences in community adaptations. The patterns of resource uses within communities are molded by each of these factors.

The cases were selected to examine patterns of resource use that occur in places with a range of characteristics, representing some of the regional diversity in the State. Table 1 compares certain aspects of the cases. As indicated, the cases derive from six regions, representing several different ecological settings (interior forest, coastal forest, and coastal tundra). A range of population sizes is considered, from Dot Lake (population of 50) to Fairbanks (population of 22,645). Three of the six cases areas are located within boroughs, and three of the case areas include communities which are connected by roads to larger population centers.

The cases were not randomly selected. Most cases were selected for inclusion because previous Division of Subsistence research had collected relatively detailed information on their resource uses. Research on the Yukon River Delta was conducted in 1981 by Wolfe (1981). Nondalton was studied in 1980 and 1981 by Behnke (1982). Participants in the Tanana River salmon fishery were surveyed in 1980 and 1981 by Caulfield (1981a and 1981b). Data on Nome were collected by Ellanna during the period 1969 to 1980 and updated this year. Research in Tyonek has been conducted over the past several years by Fall, Foster, and Stanek (Fall 1981; Foster 1982; Stanek 1981; Stanek, Fall, and Foster 1982). Dot Lake and the Kenai

TABLE 1
CASE STUDY CHARACTERISTICS

<u>Geographic Area</u>	<u>Region</u>	<u>Community Population</u>	<u>Borough</u>	<u>Road Connected</u>
Tanana Salmon Fishery	Interior	large	yes	yes
Yukon River Delta	Western	small	no	no
Nondalton	Southwestern	small	no	no
Dot Lake	Interior	small	no	yes
Nome	Northwestern	moderate	no	no
Kenai Peninsula Borough	Southcentral			
Kenai		moderate	yes	yes
Homer		moderate	yes	yes
Ninilchik		small	yes	yes
Seldovia		small	yes	no
Tyonek		small	yes	no
Sitka	Southeastern	large	yes	no

Peninsula area studies were planned at the time of the report's conception. Kenai Peninsula communities were selected in such a manner to provide useful information to the Boards, and they include road-connected and non-road connected and large and small communities (Table 1). Each of these research efforts will result in separate, expanded reports on resource uses. Research variables in these studies were identified to accommodate the report's comparative design. The only community selected specifically for this report was Sitka. It was considered important to examine resource uses in one of Alaska's larger communities. Sitka was chosen because information on resource uses there would contribute to the Division's overall research program in Southeast Alaska.

The cases were intended represent a wide range of settlement types in Alaska. The communities of the Yukon River Delta and Nondalton represent some of the relatively small and remote settlements of Alaska, not connected by roads to major population centers. There are communities in all six regions which share these characteristics. Dot Lake illustrates a small community which is less remote, connected by roads to a major population center. It may represent certain types of communities in the Interior and Southcentral regions. Nome is a "regional center" for a remote sector of Alaska, a relatively large community acting as a service, transportation, and trade center for a cluster of smaller settlements. Other regional centers with these characteristics include Barrow, Bethel, Kotzebue, Dillingham, Unalaska, and perhaps Ft. Yukon. The participants of the Tanana River salmon fishery may represent a subset of the population of a relatively large city, possibly paralleling groups in Anchorage and Juneau. The communities of the Kenai Peninsula Borough may illustrate settlements close to a large population center like Anchorage, affected by "urban

spill-over." Tyonek and Seldovia are not connected by roads within the borough, while Kenai, Homer, and Ninilchik are. Communities within the Matanuska, Susitna, Kodiak, and Fairbanks-North Star boroughs may share these characteristics. Finally, Sitka may represent larger, non-road connected communities in the southeast portion of the State, such as Ketchikan.

LIMITATIONS

The cases illustrate the diversity in the socioeconomic systems and resource use patterns in the State. However, because of their small number and non-random selection, the cases may not be representative of all regions or communities in Alaska. Also, in certain respects they may be dissimilar to other communities with which they share particular characteristics. In using the comparative case design generalizations from a few exemplary cases cannot be extended to the entire "universe" of communities in Alaska (see appendix). Without additional research, the level to which the cases are representative of the range of communities in the state cannot be ascertained.

The strength of a comparative case design is that it allows an in-depth examination of relationships between multiple variables. A case approach is warranted when there exists minimal information about a set of phenomena (Becker 1968; Hersen and Burlow 1976). It is an exploratory methodology for generating and refining relationships about complex variables. Because little is yet known about the relationships between patterns of resource use and rural-urban characteristics in Alaska, the comparative case design is appropriate. The caveat is that general theoretical principles derived from a comparative case approach must be taken as tentative, requiring

additional empirical support. As the Division of Subsistence continues its ongoing research of subsistence uses throughout Alaska, refinements to the general principles discussed here will be possible.

ORGANIZATION

The report has two major sections. The first section (Chapters 2-8) documents patterns of resource use in seven geographic areas, representing contemporary fishing and hunting systems in Alaska. The cases are presented similarly, with information on resource use patterns, settlement sizes, population structures, socioeconomic characteristics, and interrelationships between these variables. Each case begins with a preface summarizing major findings. The preface may be read as a synopsis of each case.

The second section (Chapter 9) discusses the role of fishing and hunting in the socioeconomic systems of rural communities, drawing upon the information of the case studies. Chapter 9 compares and contrasts cases along several criteria. The criteria were selected as potentially characteristic of customary and traditional resource uses of fish and game. The intent of the second section is to contribute to a better understanding of the form and function of fishing and hunting systems in Alaska.

CHAPTER 2

TANANA RIVER SALMON FISHERY: RESOURCE USE NEAR A LARGE, INTERIOR CITY

By Richard A. Caulfield

PREFACE

The following case describes resource uses by the subset of the Fairbanks area population which participated in the subsistence salmon permit fishery in subdistrict Y-6C of the Tanana River in 1980 and 1981. The case illustrates resource use patterns near a city with a large population (the City of Fairbanks had a population of 22,645 persons in 1980) and with a relatively diversified market economy offering a high level of opportunity for wage employment. Fairbanks' growing population and multimodal transportation system have increased the level of access to resources and competition among potential users of fish and game resources within the North Star Borough. At the same time, because of the nature of Fairbanks' economy, fishing and hunting are no longer central economic activities of most households.

Caulfield's survey documents characteristics of participants in the Tanana River subsistence salmon fishery, whom he grouped into two general types of users. The majority of users (about 80 percent) demonstrated a short history of use of the resource (2.1 years mean), a high turnover rate, short fishing times (typically on weekends), and low harvest levels. The profile of the majority of users indicated substantial involvement in Fairbanks' wage economy (66.8 percent had full-time wage occupations). Salmon fishing was frequently part of a pattern of harvest activities, which included gardening, moose and caribou hunting, and trout fishing,

scheduled around wage jobs, and engaged in for the value of "being outdoors" (88 percent) and experiencing a form of "recreation yielding food returns." There was no extensive sharing, bartering, or trading of wild products; 83 percent use "all" or "most" of the salmon within their own household, and 90 percent used none for barter or trade. The costs of equipment, gas, and oil commonly exceeded the cash value of the salmon.

The second type of user, representing a minority (about 20 percent), participated in the fishery primarily for economic reasons, and obtained food for families and dog teams. They demonstrated a longer history of use (4.9 years mean), more stability over time, and higher harvest levels, and reported higher harvest needs. Fishing times were longer (weekdays and weekends), and cost-effective methods were sought, such as fishwheels. Their profiles showed lower monetary incomes and somewhat larger household sizes. For some of this group, salmon fishing was perceived to be a part of an "interior way of life" engaged in part, for self-sufficiency and independence. Others with Alaska Native heritages reported longstanding "cultural ties" to the fishery, which had been engulfed by the growth and expansion of Fairbanks.

The study group as a whole is characterized by diversity within resource user groups and the practice of subordinating fishing and hunting activities to a wage occupation (the focus of a household's economic activities). These characteristics are similar to those found in the Kenai, Homer, Ninilchik, and Sitka cases.

INTRODUCTION

The Division of Subsistence undertook research during the period 1980 to 1982 to document characteristics of households using the subsistence

salmon permit fishery in subdistrict Y-6C of the Tanana River, located in the Fairbanks North Star Borough (Caulfield 1980, 1981). Research results are of interest because they illustrate the use characteristics of a subsistence permit fishery in an area having large population size, a multitude of wage employment opportunities, and a relatively well-developed multimodal transportation network (roads, railroad, and air). Tables 2 and 3 show household incomes and commercial fisheries incomes for residents of the City of Fairbanks.

In general, the research findings indicate that the majority of households using the fishery have moderate to high incomes, substantial involvement in the wage economy, and a relatively short history of participation in the fishery. Most households interviewed emphasized the values of being outdoors and of obtaining nutritious, locally-produced resources.

A small number of households, however -- representing less than 20 percent of the sample -- made more intensive use of the fishery. Despite their residence in or near populated areas of the Fairbanks North Star Borough, these households generally participated in the wage economy on a seasonal basis and had longer histories of participation in the fishery, lower cash incomes, and somewhat larger household sizes than the majority of users. Some of these households have long-standing cultural ties to the subsistence fishery. For these more intensive users, fishing in subdistrict Y-6C was less a recreational outing than an integral component of their way of life in interior Alaska. Their residence in an area which is currently defined by regulation as urban, coupled with escalating demands upon the resource base, however, raise questions about whether these more intensive uses can continue in the future.

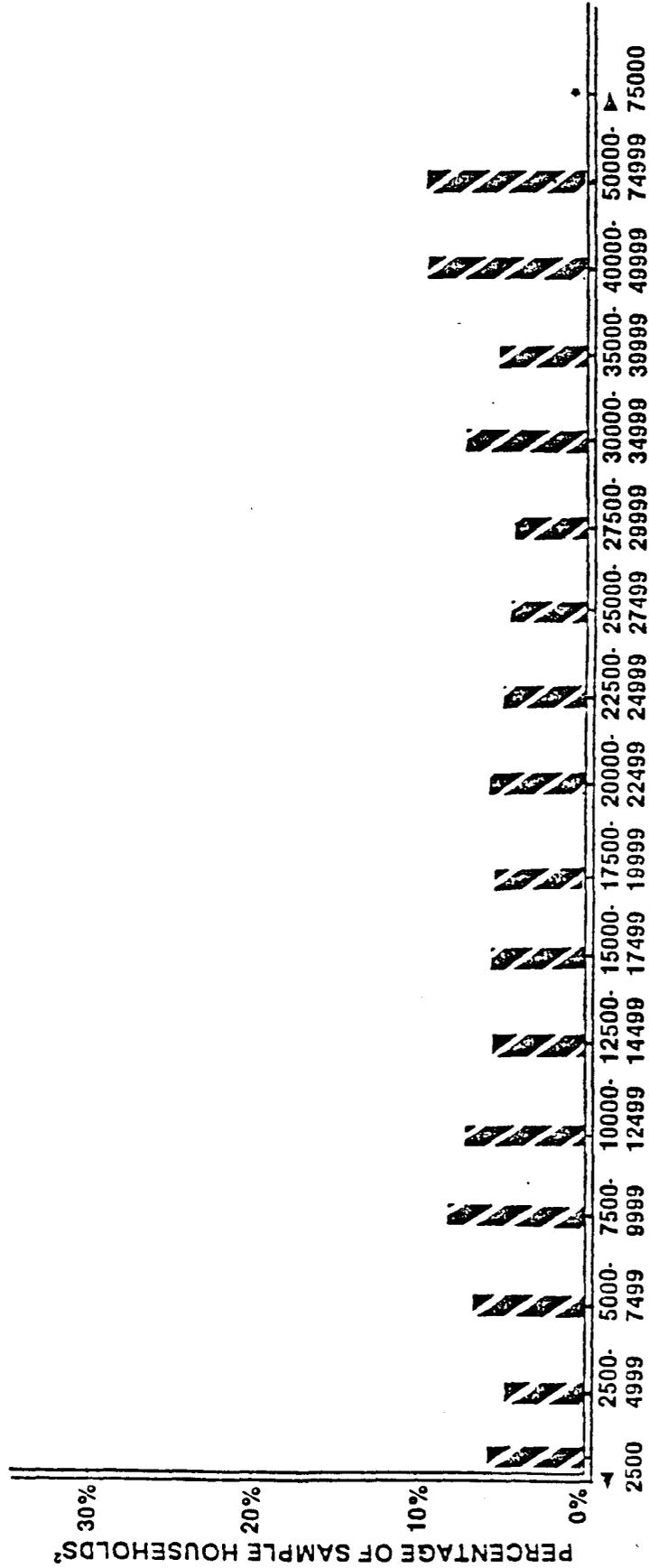


Table 2 Household Income (Dollars) — 1979, Fairbanks

1 U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3

²N = 7,998

* no data available

TABLE 3

INCOME RANGES FROM COMMERCIAL FISHING FOR SALMON AND HERRING,
FAIRBANKS, 1981

Total Number of Commercial Fishermen	61
Number of Salmon and Herring Fishermen	59
Percent earning less than \$1,000	25.4
" " \$ 1,000 - 9,999	37.3
" " \$10,000 - 19,999	6.8
" " \$20,000 - 29,999	11.9
" " \$30,000 - 49,999	10.1
" " \$50,000 - 74,999	1.7
" " \$75,000 - 99,999	*
" " greather than \$100,000	6.8
Total	100.0

* Less than four: due to confidentiality regulations number cannot be disclosed.

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries. (1981)

ENVIRONMENTAL AND GEOGRAPHIC SETTING

Subdistrict Y-6C of the Tanana River fishery spans virtually the entire breadth of the Fairbanks North Star Borough (Figure 1). The subdistrict consists of that portion of the Tanana River drainage from the mouth of the Wood River upstream to the mouth of the Salcha River. Subsistence salmon fishing by permit is confined to approximately 75 miles on the main Tanana River itself. The Chena River enters the Tanana approximately six miles southwest of the city of Fairbanks.

Downstream from the mouth of the Chena River are a series of bluffs that provide an array of eddies productive for the harvest of salmon using set nets. Productive eddies are less common elsewhere in the subdistrict but exist throughout its length. Fishery stocks utilized by households with permits consist of a run of king salmon and a concurrent "summer" chum salmon run in July, and a "fall" run principally of chum salmon but also including coho salmon during September and early October.

Major population concentrations in the Fairbanks North Star Borough exist immediately to the north of the Tanana River. The City of Fairbanks was incorporated in 1903 and grew along the banks of the Chena River (Alaska Department of Labor 1981). The 1980 U.S. census recorded a population of 22,645 persons in the city. The City of North Pole is located approximately 15 miles east of Fairbanks. Although these are the only two incorporated cities within the Borough, unincorporated outlying residential, agricultural, military, and industrial areas include Fox, College, Chena Hot Springs Road, Goldstream Valley, Chena Ridge, Ester, Eielson Air Force Base, Fort Wainwright, Moose Creek and Salcha. Most residents in both incorporated and unincorporated areas utilize integrated communications, transportation, and supply networks. Household residence patterns in the Borough range

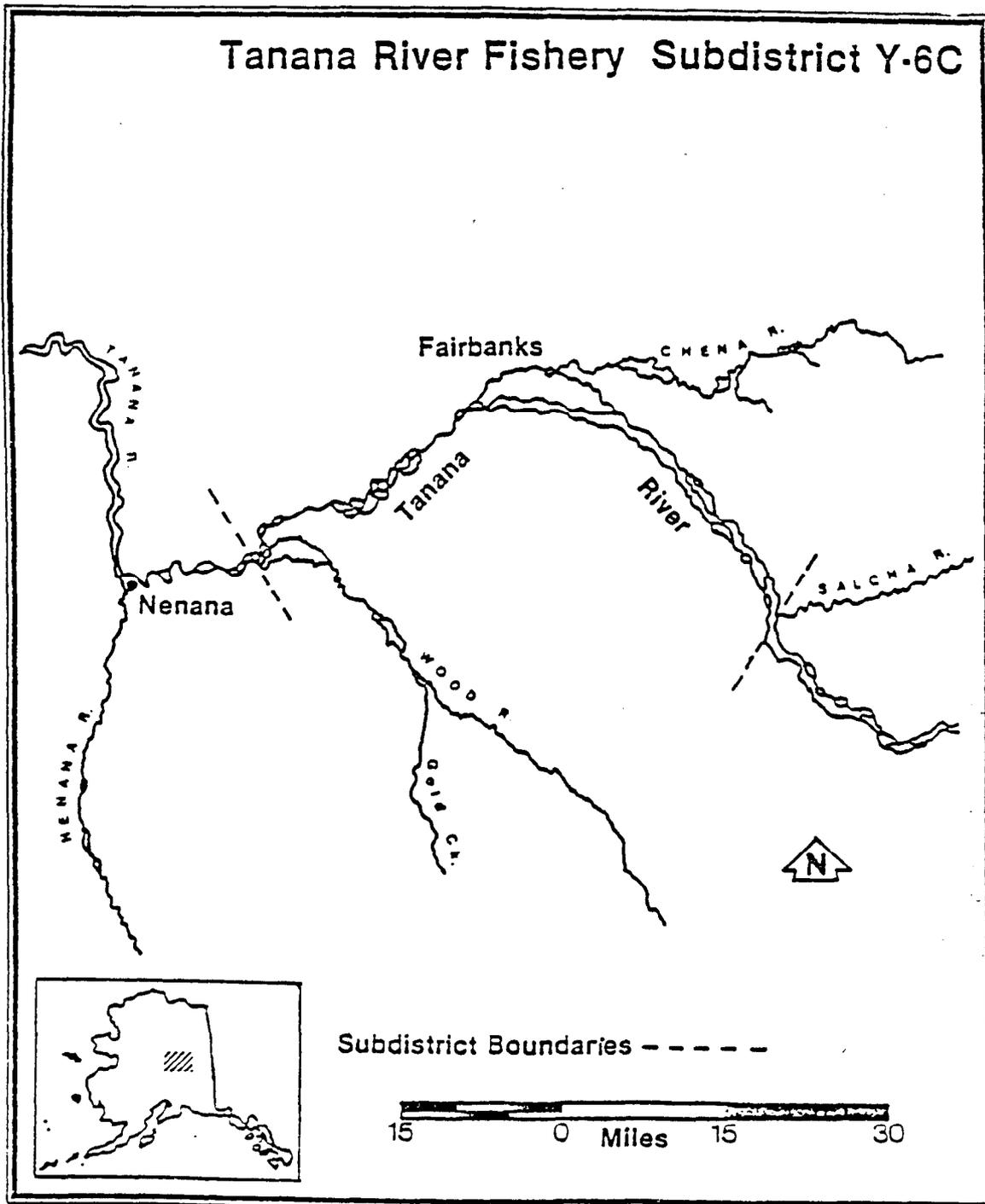


Figure 1. Location of Subdistrict Y-6C of the Tanana River Fishery

from those occupying dwellings with full services such as sewer, water, electricity, and telephone to those occupying remote dwellings with no road access or services. Figure 2 depicts population trends for the City of Fairbanks.

The 1980 U.S. Census for the Fairbanks North Star Borough cites a population of 53,983 persons (U.S. Department of Commerce 1982). The median age of the population was 25.8 years. Ethnic composition of this population is approximately 85 percent Caucasian, 6 percent Alaska Native or American Indian, 6 percent Black, and 3 percent Asian or other race (Table 4). In 1980 there were 18,224 occupied year-round housing units in the Borough with an average of 2.96 persons per unit. Eighty-two percent of all Borough residents live in family households, 12 percent live in non-family households, and 6 percent live in group quarters (Table 5) (U.S. Department of Commerce, Bureau of the Census 1982).

Major sources of wage employment in the Borough derive from government, trade, services, and transportation-communications-utilities sectors of the economy (Table 6). During the first quarter of 1982, nonagricultural wage and salary employment was comprised of about 40 percent government, 18 percent trade, 18 percent services, and 12 percent transportation, communication, and utilities sectors (Fairbanks North Star Borough, 1982). The Borough is a central node for Alaska's highway network and is connected to the Parks, Richardson, Dalton, Elliot, and Steese highways. Fairbanks is the northern terminus for the Alaska Railroad and is the southern surface transportation center for the Dalton Highway (formerly the "Haul Road"). Fairbanks International Airport is served by both domestic and international carriers and is a major logistical center for air transportation to "bush" communities in Interior Alaska.

POPULATION TRENDS: FAIRBANKS

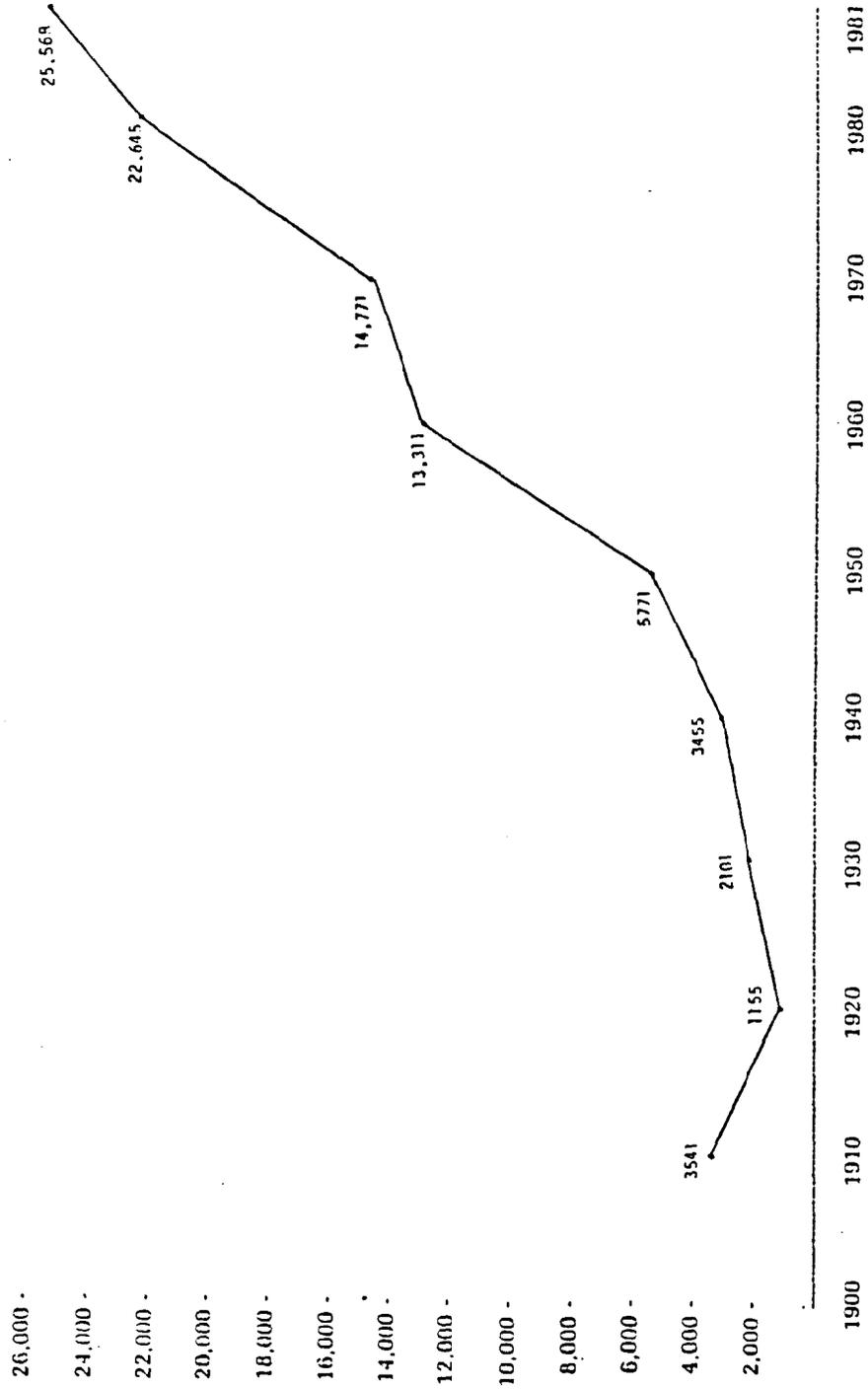


Figure 2 Population Trends, Fairbanks

Source: 1920-1950 data from Rollins (1978); 1960-1981 data from Alaska Department of Labor (1981)
 U.S. Census data may not be reliable for certain Alaska communities.

TABLE 4
 POPULATION BY ETHNIC COMPOSITION IN THE FAIRBANKS
 NORTH STAR BOROUGH, 1980

Race	Total	% of Total
Caucasian	46,106	85.4
Black	3,006	5.6
Alaskan Native or American Indian	2,977	5.5
Asian or Pacific Islander	825	1.5
Other or Unknown	<u>1,067</u>	<u>2.0</u>
<u>TOTALS</u>	<u>53,983</u>	<u>100.0%</u>

HOUSEHOLDS USING THE SUBDISTRICT Y-6C SUBSISTENCE PERMIT FISHERY

Results of the 1981 survey show that the great majority -- 80 percent or more -- of households with subsistence fishing permits have wage employment, demographic, and residency characteristics which reflect the dominant social, economic, and cultural patterns of the Borough (Caulfield 1981). Data for those permit holders surveyed, for example, show that these households generally are small in size, have a moderate median cash income, and have a pattern of consistent participation in the wage economy (Table 7). All 1980 permit holders surveyed were Fairbanks North Star Borough residents.

The data in Table 8 indicate that while many permit holders have lived in Alaska and in Fairbanks for a number of years, there is a high rate of turnover among participants in the fishery. Fully 66 percent of those who

TABLE 5

NUMBER OF RESIDENTS BY HOUSEHOLD TYPES AND RELATIONSHIPS
IN THE FAIRBANKS NORTH STAR BOROUGH

Household Type/Relationship	Total	% of Total
In family households		
Householder	13,029	
Spouse	11,272	
Other relatives	19,020	
Non-relative	718	
	44,039	81.6
In non-family households		
Male householder	3,503	
Female householder	1,692	
Non-relative	1,410	
	6,605	12.2
In group quarters		
Inmate of institution	230	
Other	3,301	
	3,339	6.2
	53,983	100.0%

obtained permits in 1979, for example, did not do so in 1980 (Caulfield 1981).

The distribution and sharing patterns of the majority of households with permits indicate that use of harvested fish was primarily for personal or household consumption and was not accompanied by extensive trading, bartering, or sharing (Table 9). Almost none of the households surveyed own dog teams, although scraps are occasionally fed to household pets (Caulfield 1981).

Interviews revealed that even for households with a substantial income and access to other resources, a relatively high value was placed upon having

TABLE 6

NONAGRICULTURAL WAGE AND SALARY EMPLOYMENT IN THE FAIRBANKS
NORTH STAR BOROUGH, JANUARY THROUGH MARCH, 1982

Employment Type	Total	% of Total
Government	8,383	39.6
Services and Miscellaneous	3,850	18.2
Trade	3,800	18.0
Transportation, Communication, and Utilities	2,550	12.1
Construction	1,317	6.2
Finance, Insurance, and Real Estate	750	3.5
Manufacturing and Mining	<u>500</u>	<u>2.4</u>
<u>TOTALS</u>	<u>21,150</u>	<u>100.0%</u>

a diversity of food sources, especially wild foods. Nearly two-thirds of all households reported that they derive "half" or "some" of their meat and fish from wild foods.

Eighty-eight percent of all surveyed households reported that the enjoyment of being outdoors was an "important" or "extremely important" factor which influenced their fishing effort. Many of these households viewed salmon fishing in subdistrict Y-6C as a recreational outing which also provided the satisfaction of obtaining wild food. Household members reported that they valued the experience even though the cost of equipment, gasoline, and oil often exceeded the cost of buying salmon in a store. Equipment

TABLE 7
 MEDIAN INCOME AND EMPLOYMENT OF HOUSEHOLDS SURVEYED
 WITH Y-6C SUBSISTENCE SALMON PERMITS (N=255)

Household Size (mean)	Median Income	% with No Members Employed Full-time **	% with No Members Employed Part- time/Seasonal**	% with No Members Retired/ Unemployed**
3.0 (1.75)*	\$15-20,000	33.2	52.1	77.0
*standard deviation				
**employment categories not exclusive				

TABLE 8
 MEAN NUMBERS OF YEARS FISHERY PARTICIPATION, DOMICILE AT PRESENT
 LOCATION, AND ALASKA RESIDENCY OF PERMIT HOLDERS (N=255)

	No. of Years Involved in Tanana Fishery (mean # years)	No. of Years At Present Domicile (mean # years)	No. of Years in Alaska (mean # years)
All 1980 Responses	2.1 (1.88)*	8.9 (8.57)*	13.8 (10.89)*
* standard deviation			

used in fishing, including a boat, outboard motor, trailer, and net, can cost \$5000 or more.

The following cases drawn from interviews reveal characteristics common to these households:

Case A

A husband, wife, and their two children live eight miles from downtown Fairbanks and have been Alaska residents since 1973. They fished for salmon in subdistrict Y-6C in 1979 only, but obtained permits in 1980 and 1981 as well. Both are employed in state government and have a

TABLE 9

UTILIZATION OF SUBSISTENCE-CAUGHT SALMON (N=255)

Use	Percent of Households' Harvest					
	All	Most	Half	Some	None	Not Applicable
Household Consumption	39.2	43.8	5.5	6.5	1.8	3.2
Dog Food	0.9	2.3	3.2	11.5	78.8	3.2
Share with Friends	0.5	0.9	4.6	45.6	45.2	3.2
Trade/Barter	0.0	0.0	0.5	6.0	90.3	3.2
Other (includes trapping bait)	0.0	0.0	0.0	2.8	94.0	3.2

combined household cash income which exceeds \$50,000. The household uses only 11 to 25 subsistence-caught salmon each year, primarily for household consumption. None of the catch is shared or bartered. The household has one dog, which receives scraps from fish that are caught. Household members report that they can obtain all the fish they need in only one to five days using a set net. Sources of household food in addition to commercial products are hunting (usually a moose taken annually), gathering berries, and a large garden. Members of the household report that they believe current harvest limits for both king and chum/coho salmon may be "excessive." Their fishing effort is relatively slight because fish are said to be "mushy" and of poor quality. Also cited as a reason for minimal fishing effort was competition for eddies.

Case B

A household comprised of a husband, wife and two children is located in the City of Fairbanks. Both parents are teachers, and household income ranges from \$31,000 to \$40,000. The family moved to Fairbanks from the "Lower 48" states in 1972. Household members have fished with a net for both king and chum salmon in subdistrict Y-6C since 1975. They also dipnetted for salmon on the Copper River one year "to see what it was like." They use up to 50 salmon each year, mostly for human consumption. Between six and fifteen days were spent on fishing activities, and current harvest limits are reported to be more than adequate ("five king salmon is plenty"). A major reason cited by household members for participating in the subsistence fishery is the solitude enjoyed while engaged in fishing.

In contrast to this majority of permit holders a small number of households--probably no more than 20 percent--made more intensive use of the fishery. Often these households had lower cash incomes, less involvement

in the wage economy, somewhat larger household sizes, and longer histories of participation. These households frequently reported the current limits on salmon harvest in subdistrict Y-6C to be inadequate (Table 10). In general, they spent more time engaged in fishing activities, fished both weekdays and weekends equally, and used more fish each year. Typically, they had more dogs than other users and placed less emphasis on the value of being outdoors than on obtaining food for human and canine consumption at a lower cost.

TABLE 10
COMPARISON OF SELECTED VARIABLES FOR HOUSEHOLDS REPORTING
"ADEQUATE"/"NOT ADEQUATE" CHUM SALMON LIMITS, 1981 (N=54)

	Limits Adequate	Limits Not Adequate
Annual Income (median)	\$25,001-\$30,000	\$10,001-\$15,000
No. of Months Wage Employment (mean for all workers)	14.76	5.0
No. of Years Fished Y-6C (mean)	3.13	4.86
No. of Dogs (mean)	1.6	7.6
No. of Salmon Used (median)	11-25	80-100
No. of Days Fished (median)	6-15	16-25

While this subpopulation appears to be quite small, in-depth interviews with some of these households reveal household strategies which are designed to continue utilization of the fishery. The following cases drawn from interviews exemplify these strategies:

Case C

An elderly Native man lives alone at his fishcamp on the south bank of the Tanana river. Born in Nenana, 65 miles downriver, he has lived at this camp and fished from the same location since 1937. He had wage employment only two months during the previous year and trapped during the winter. His annual household income was between \$5,000 and \$10,000. He learned to fish from his parents at an early age and currently uses a fishwheel. His consistent pattern of residency and use of the fishery enabled him to obtain a limited-entry permit. Because of depressed markets in recent years, however, he has only occasionally sold fish commercially. He fishes for subsistence salmon between six and fifteen days each year. Since his household needs for salmon exceed subsistence limits, he often takes fish for household consumption from his commercial catch. His fishcamp on the south bank of the Tanana River serves as his year-round residence and has no road connection. Access to the river and to his fishwheel is solely by boat. A boat landing connected to the Fairbanks road system is located across the river. When not fishing he often spends time with relatives in town.

Case D

Another Native household is located on the north bank of the Tanana River and consists of 11 people. It includes four generations of family members. The head of household has fished and lived along the Tanana River for over 30 years. At one time the location of the household residence was far removed from residential and commercial areas surrounding Fairbanks. As the area population grew and road access was improved, residential areas expanded to and beyond this household's year-round residence. The household is located about 10 miles from downtown Fairbanks and is connected to a well-maintained paved road. Checking fishnets and wheels, however, requires only the use of boats. As in the previous case, the head of household was able to obtain a limited-entry permit because of past residency and participation in the fishery. The household has 10 dogs which are fed from scraps of commercial and subsistence-caught salmon. Virtually all household meat and fish comes from hunting and fishing. Because household salmon use exceeds current limits, fish are taken from the commercial catch for household use. Fishing for household use under subsistence regulations usually involves only one to five days of effort, principally because efficient fishwheels are used.

Case E

A non-Native household of four persons (husband, wife, and two children) has a year-round residence on the north bank of the Tanana River. Access to their home is by boat, snowmachine, or dog team. The nearest road access is 10 miles away. The husband in the household arrived in Fairbanks in 1971 and has lived in the lesspopulated fringe of the Borough since that time. He generally works four months a year as a laborer. Household income averages about \$5,000. Although the household has fished the Tanana River for only three years, the husband had previously fished on other rivers in Interior Alaska. Half of the

household's salmon harvest is used to supplement commercial dog food to feed their five dogs. The household reportedly could use up to 325 salmon per year but is restricted by current limits. Some of their friends who fish commercially often provide fish to make up the difference. Should salmon from other sources no longer be available, household members report that they would be forced to travel outside of subdistrict Y-6C to areas where limits are not in place.

The husband and wife value being locally self-sufficient and usually obtain moose, bear, salmon, whitefish, burbot, pike and grayling for household use. Cranberries, blueberries, and rose hips are also obtained locally. The husband traps to supplement the family income. A net is used to harvest salmon, and the family spends a total of about 30 to 40 days involved in fishing activities.

INTERRELATIONSHIPS OF RESOURCE USE WITH OTHER FACTORS

All users of the subdistrict Y-6C fishery are influenced by the dynamics of resource availability. In some years, poor fish runs or inordinate catches in downriver areas may affect Y-6C permit holders by reducing the number of available fish. If use of the commercial and subsistence fishery expands, conflicts over the use of certain productive eddies is likely to increase. In years when other resources (for example, moose and bear or cash from wage employment are not available, the dependency upon salmon by those who intensively use the fishery may become more pronounced.

Wage employment shapes the use of the subdistrict Y-6C fishery by influencing use patterns. Those employed full-time, for example, may fish more on weekends when time is available. Wage employment also provides income necessary for the purchase of fishing equipment such as a boat, trailer, motor, gasoline and oil, and nets. Most users own both a boat with trailer and a vehicle to transport them. The cost of a trailer and gasoline to drive to the river adds to the total cost of catching fish. Only a few households are located on the river and thus do not need to transport equipment with a vehicle.

Income from, and access to, commercial fishing has provided a partial buffer against restrictive harvest limits for households intensively using the subsistence fishery. Insecurity of fluctuating markets and the poorer quality of upriver salmon, however, are reflected in relatively small cash returns from commercial fishing. Access to a commercial fishery, on the other hand, allows certain households to adapt to more restrictive subsistence regulations by keeping fish from their commercial catch.

Expansion and upgrading of road networks in the Fairbanks area have allowed Borough residents to make greater use of the subdistrict Y-6C fishery by providing increasingly more efficient access to the Tanana River. A Goldstream Valley resident, for example, can now trailer a boat to the Tanana in about 30 minutes whereas 15 or 20 years ago poor roads would have made such a trip much more difficult and time consuming. Not surprisingly, several households with the greatest history of participation in the fishery live near the river and need only a boat to reach their fishing sites.

Roads also have expanded into areas where Borough residents can have greater opportunities to harvest fish and wildlife resources. The Dalton Highway makes it possible for certain Fairbanks area dog mushers to drive to the Yukon River to fish with no limits for salmon. Other residents drive to the Copper River to dipnet for salmon. Still others use the Elliott Highway to reach the Chatanika River where whitefish are speared in the fall. Hunters from Fairbanks travel extensively on highways, on rivers, and by air in search of game.

The history of regulation of the Y-6C fishery shows continually increasing restrictions since 1964, including a permit requirement, reduction in fishing time, and limits on total harvest. Harvest restrictions which

were originally geared to protect salmon escapements after the 1967 flood, for example, were left in place after escapement goals had been reached. Case studies of households which intensively use the fishery show various adaptive strategies to cope with those regulations.

An expanding population clearly has been a factor in the increased use of the subdistrict Y-6C fishery. This is reflected in the larger number of permit holders, competition for eddies, and higher total harvest. Greater human use of the fishery, in particular, has limited harvest levels thereby effectively precluding the feeding of dog teams.

In summary, the majority of permitted households using the subdistrict Y-6C subsistence salmon fishery have wage employment, demographic, and residential characteristics which reflect those of the Fairbanks North Star Borough as a whole. A small number of households exhibit more intensive use of the fishery. Factors influencing use of the fishery include resource dynamics, involvement in the cash economy, expanded access to the fishery through improved transportation, changing regulatory measures, and expanding population.

CHAPTER 3

THE LOWER YUKON RIVER DELTA: RESOURCE USES IN SIX SMALL COMMUNITIES OF WESTERN ALASKA

By Robert J. Wolfe

PREFACE

The following case describes resource uses within six communities on the Yukon River Delta during 1980. The case illustrates resource use patterns in relatively small communities (populations ranging from 103 to 567 persons in 1980) with limited market economies and which are remote from large population centers. Fishing and hunting are components of a socioeconomic system, termed a "mixed, subsistence-based" economy by Wolfe, which stands in marked contrast to resource uses in the previous Tanana River case.

According to these data, fishing and hunting comprise the most secure economic base for Yukon Delta communities. Low and intermittent cash incomes earned by households are invested in a manner which enables success in fishing and hunting. The socioeconomic system is characterized by a complex seasonal cycle of fishing and hunting activities, diversified species selection, high outputs of wild food products, a domestic mode of production, extensive distribution and exchange networks, and traditional land use areas. Fishing and hunting are significant components of the regional livelihood, and communities demonstrate high dependency on wild resource uses.

INTRODUCTION

The lower Yukon River delta illustrates a remote, non-road connected region of Alaska with communities intensively involved in fishing and hunting

economies of long historic time depth. At its entry to the Bering Sea, the Yukon River forms a broad, flat delta of tundra, meandering waterways, and lakes (Figure 3). The Wade Hampton census area which encompasses this region contained 4,665 persons in thirteen winter communities, 93.2 percent Alaska Native, predominately Yup'ik Eskimo (Table 11). The economic systems of six communities connected to this region -- Alakanuk, Emmonak, Kotlik, Mountain Village, Sheldon Point, and Stebbins -- were researched by Wolfe (1981). The communities are small, with 1980 populations ranging from 103 to 522 persons. The communities display considerable homogeneity in terms of the cultural backgrounds of the population and economic patterns among households. As discussed below, the economies of these six communities are characterized by low and intermittent monetary incomes, high reliance on wild renewable resources, high diversity of harvested species, and large volumes of local food output. In social organization, families and communities structure their activities around a traditional pattern of fishing and hunting occupations.

By conventional economic indices, the monetary sector of the region's economy is not strong. The Wade Hampton census area had the lowest per capita personal income in the State in 1979, \$2,737 per person, ranked 29th out of 29 areas statewide (compared with \$11,152 per capita in Alaska) (Tables 12, 13 and Figure 4). The area had the lowest average monthly wage within the state -- \$995 per month in 1979 compared with \$1,741 statewide -- indicative of low-paying and short-term wage employment. Wage unemployment is high: 24.7 percent in January 1981 using the United States Bureau of Labor's conventional definition counting people "actively seeking" paid employment. However, actual wage unemployment is higher, about 48.8 percent of the adult work force counting those who would work if jobs existed

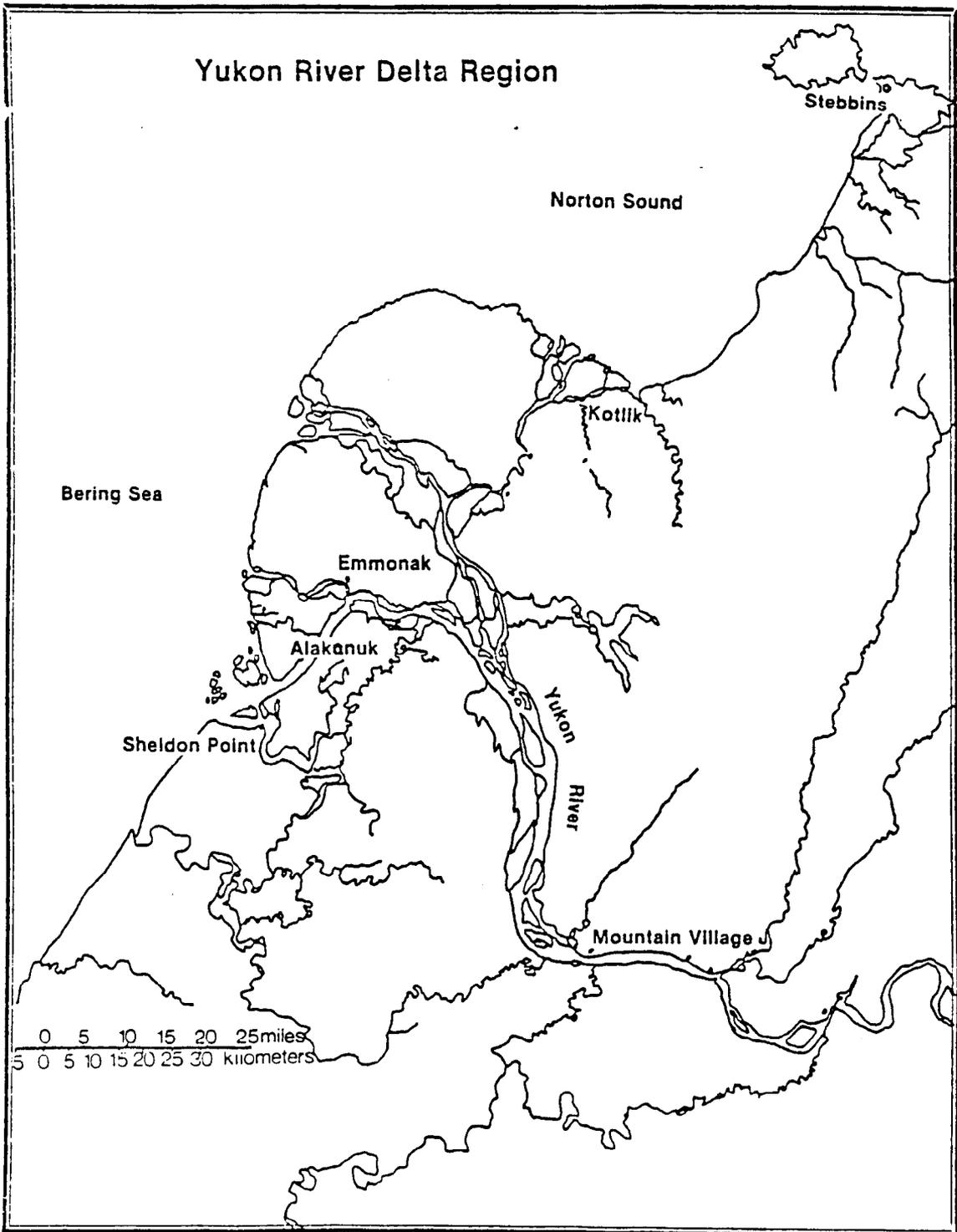


Figure 3. Yukon River Delta Region

TABLE 11
 POPULATION SIZE AND COMPOSITION OF FIVE YUKON RIVER
 COMMUNITIES AND STEBBINS¹

	<u>Population Size</u>	<u>Number of Households</u>	<u>Mean Household Size</u>	<u>Percent Alaska Native</u>
Alakanuk	522	105	5.0	94.1
Emmonak	567	127	4.5	91.2
Kotlik	293	59	5.0	95.6
Mountain Village	583	107	5.4	92.5
Sheldon Point	103	20	5.2	95.1
Stebbins	331	69	4.8	95.5

¹ U.S. Census, Department of Labor, 1980.

TABLE 12
1979 INCOME LEVELS, YUKON-KUSKOKWIM AREA¹

<u>Area</u>	<u>Per Capita Personal Income</u>	<u>Statewide Rank Out of 29 Areas</u>
Wade Hampton Census Division	\$2,737	29
Bethel Census Division	\$5,772	26
Kuskokwim Census Division	\$3,929	28

¹ Alaska Department of Labor (1981) Lower Yukon-Kuskokwim Region Labor Market Analysis, July 1981, p.22.

TABLE 13

INCOME RANGES FROM COMMERCIAL FISHING FOR SALMON AND HERRING, ALAKANUK, ALAKANUK, EMMONAK, KOTIK, MT. VILLAGE, SHELDON POINT, AND STEBBINS, 1981

	ALAKANUK	EMMONAK	KOTIK	MT. VILLAGE	SHELDON POINT	STEBBINS
Total Number of Commercial Fishermen	86	98	76	101	27	39
Number of Salmon and Herring Fishermen	86	98	76	98	27	36
Percent earning less than \$1,000	9.3	5.2	0.0	*	0.0	19.4
" " \$ 1,000 - 9,999	67.4	52.0	19.7	20.4	81.5	69.4
" " \$10,000 - 19,999	17.4	37.6	53.9	51.0	18.5	11.2
" " \$20,000 - 29,999	2.3	5.2	19.7	24.5	0.0	*
" " \$30,000 - 49,999	3.6	0.0	6.7	4.1	0.0	*
" " \$50,000 - 74,999	0.0	0.0	0.0	0.0	0.0	0.0
" " \$75,000 - 99,999	0.0	0.0	0.0	0.0	0.0	0.0
" " greater than \$100,000	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.00	100.0	100.0	100.0	100.0

* Less than four: due to confidentiality regulations number cannot be disclosed.

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries. (1981)

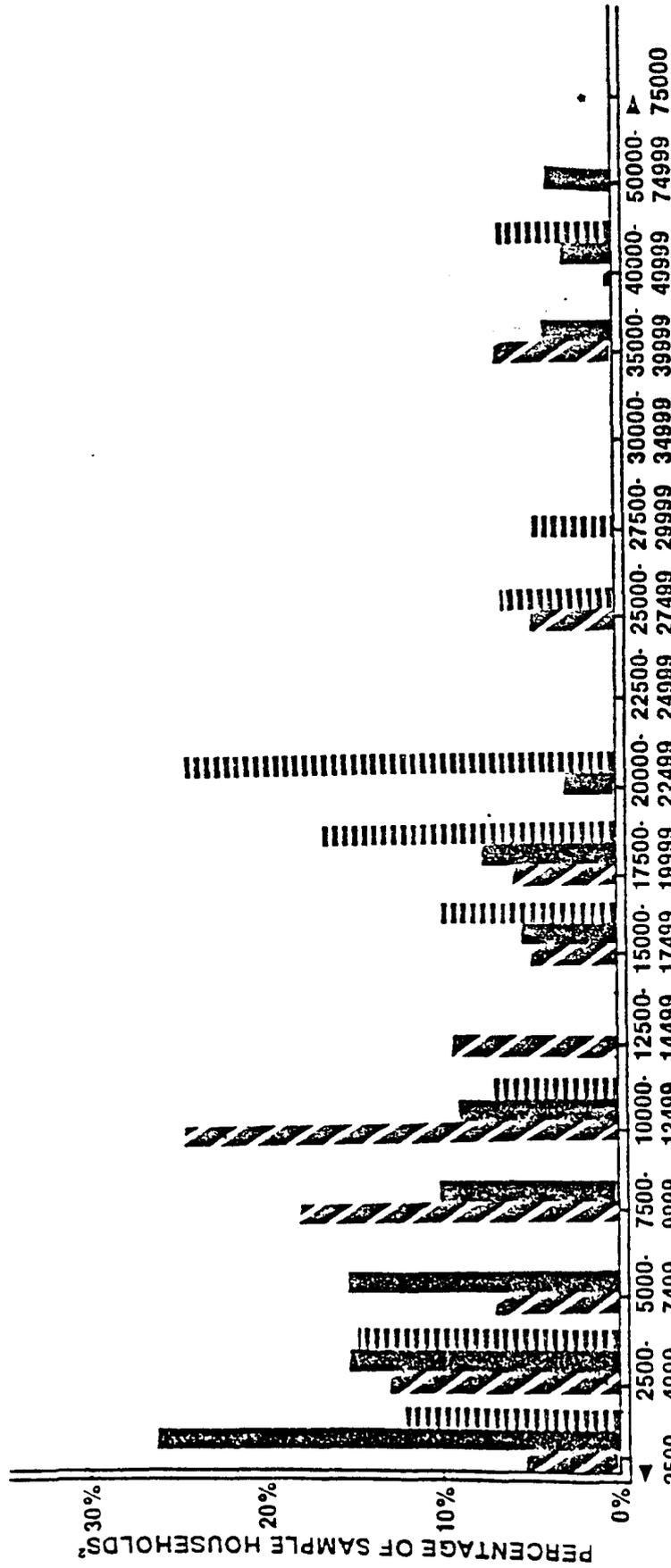


Figure 4a . Household Income (Dollars) — 1979, Alakanuk¹, Emmonak², Kotlik³

1 U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3

²Alakanuk N = 105; Emmonak N = 132; Kotlik N = 62

³ no data available

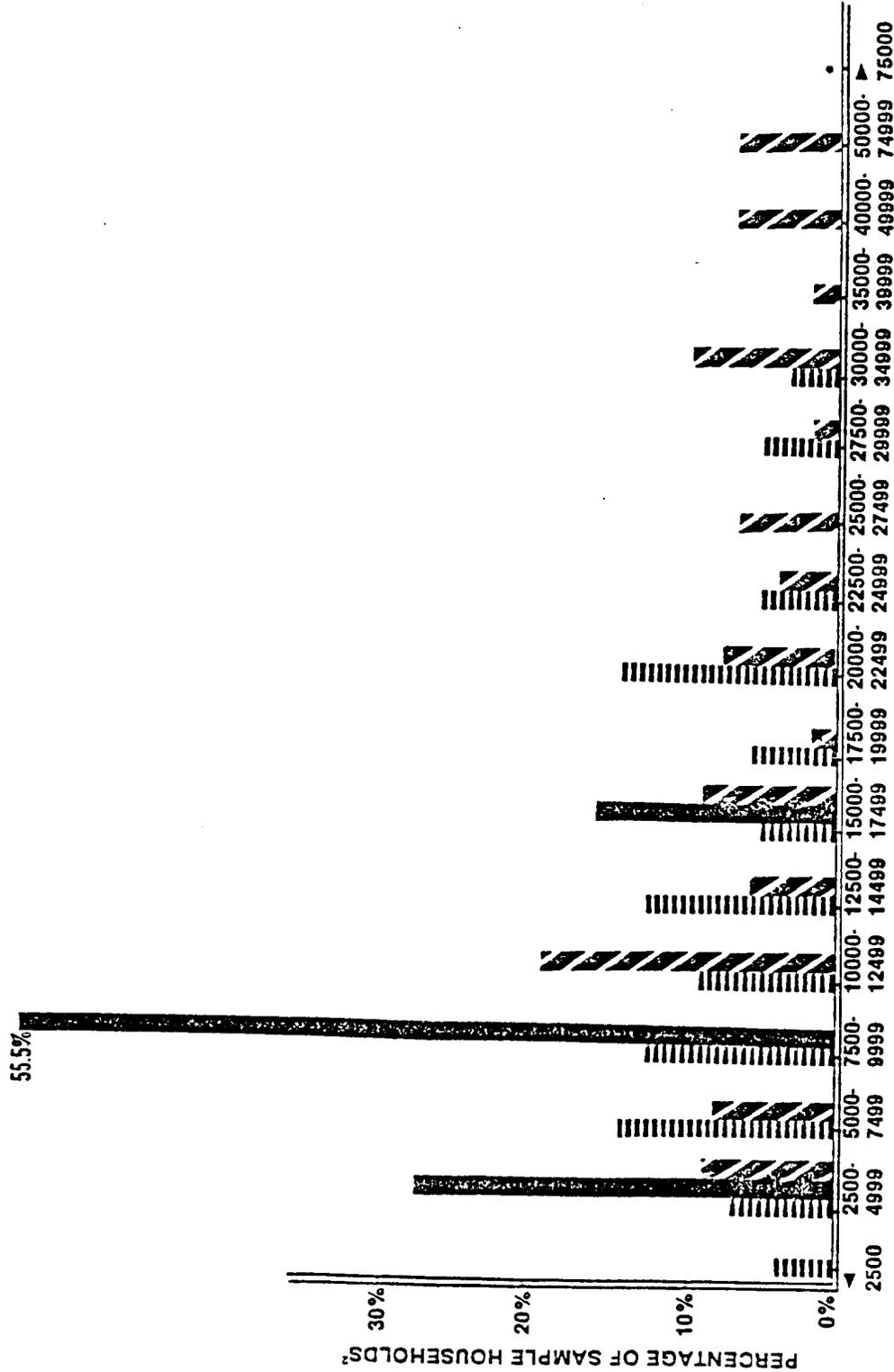


Figure 4b. Household Income (Dollars) — 1979, Mt. Village, Sheldon Point, Stebbins¹

¹ U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3

² Mt. Village N = 100; Sheldon Point N = 18; Stebbins N = 65

* no data available

Mt. Village  Sheldon Point  Stebbins 

but who are not looking because there are few local jobs (U.S. Department of Labor 1981). Nearly one-half of all paid employment and 60 percent of all reported earnings are directly associated with the government sector, while most other employment is the result of government generated activity (U.S. Department of Labor 1981). Consequently, the population cannot rely on wage employment to sustain itself; jobs typically are low paying, intermittent, and insecure.

Conventional economic indices miss the real base of the region's economic system, however. Yukon delta communities have successfully perdured and grown through a strong and flexible economic system based upon fishing and hunting for local use. The economy has been termed a "mixed economy," referring to the fact that production within the community is a combination of fishing, hunting, gathering, and trapping for local use, and remunerative employment activities such as the commercial sale of fish, seasonal wetwork, commercial fur trapping, and cottage industries. The economic system also has been termed a "subsistence-based economy" in recognition that the most stable and reliable economic base of the community is the harvest of renewable wild resources for local use and not the market or wage sector.

The "mixed, subsistence-based" economy is best understood at the level of the family. Production, consumption, and exchange in the six communities are activities of relatively small social units -- cooperative groups typically organized by principles of kinship and alliance. Fishing and hunting for renewable resources occur within these cooperative family groups, and distribution and exchange of products occur between them. Figure 5 illustrates two cooperative groups as examples. The first is a relatively simple extended family composed of parents, four unmarried children, and a married daughter, spouse, and children, living in two neighboring households at the winter

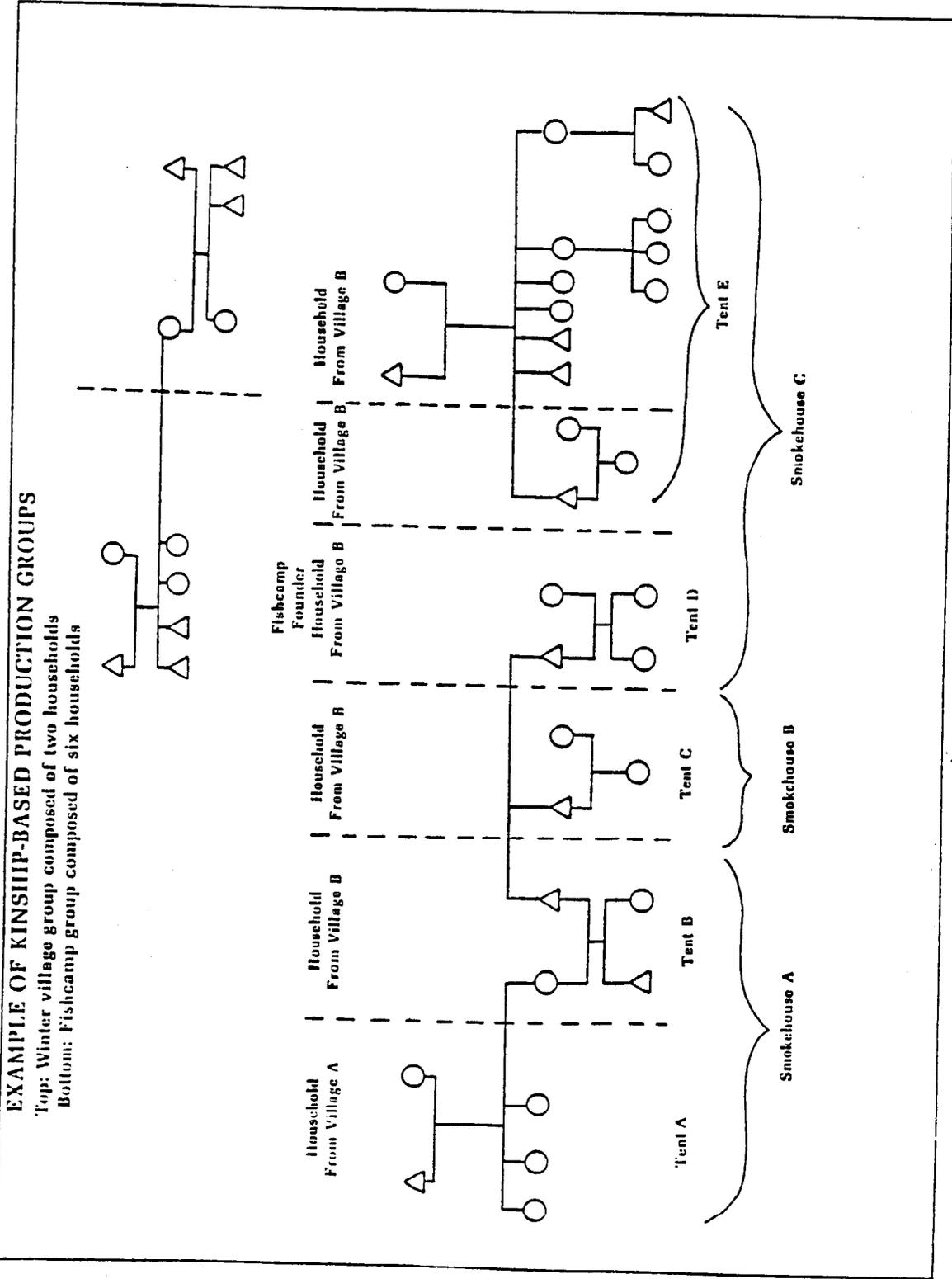


Figure 5. Extended Family Groups Cooperating in Harvesting and Processing Salmon, Lower Yukon River

village. The extended family cooperates in the harvesting, processing, and consumption of wild food products. The second cooperative group is more complex (Figure 5, bottom), with a core of three brothers and their nuclear families, the parents of a spouse and their children, and an unrelated extended family of parents, seven children, and six grandchildren. This group worked together at a summer fishcamp harvesting and processing salmon, occupying five tents, and sharing three smokehouses. During winter members of this cooperative group resided at two communities in six separate households. This system of production and exchange within "domestic units," termed a "domestic mode of production" (Sahlins 1972), contrasts with the major system of production in industrialized areas, which usually occurs in firms of unrelated workers organized by formal contract, distinct from the family network.

Fishing, hunting, trapping, gathering, and other work activities by members of domestic units follow an annual cycle depicted in Figure 6. Families conduct a wide range of fishing and hunting activities, spreading their labor in a diversified production strategy over the course of a year, harvesting a spectrum of resources -- fish, sea mammals, land mammals, and birds. During summer four species of salmon (king, chum, coho, and pink) are harvested with drift and set gill nets, 50-150 fathoms, from skiffs between 15-25 feet, powered by outboards (35-50 horsepower), without gill net rollers or power reels. Fishermen with permits sell a portion of the catch on commercial export markets. The 1980 commercial catch on the lower Yukon River was 143,853 kings, 950,355 chums, and 7,488 cohos, sold at an estimated value of \$4,962,559, an average of \$7,234 per permit holder (there were 403 commercial salmon gill net permits owned by members of the six sampled communities). This comprised 75 percent of the total 1980 Yukon River commercial salmon fishery output (Alaska Department of Fish and Game, Annual Management Report,

SEASONAL ROUND OF HARVEST ACTIVITIES FOR SELECTED SPECIES,
LOWER YUKON RIVER, CIRCA 1980

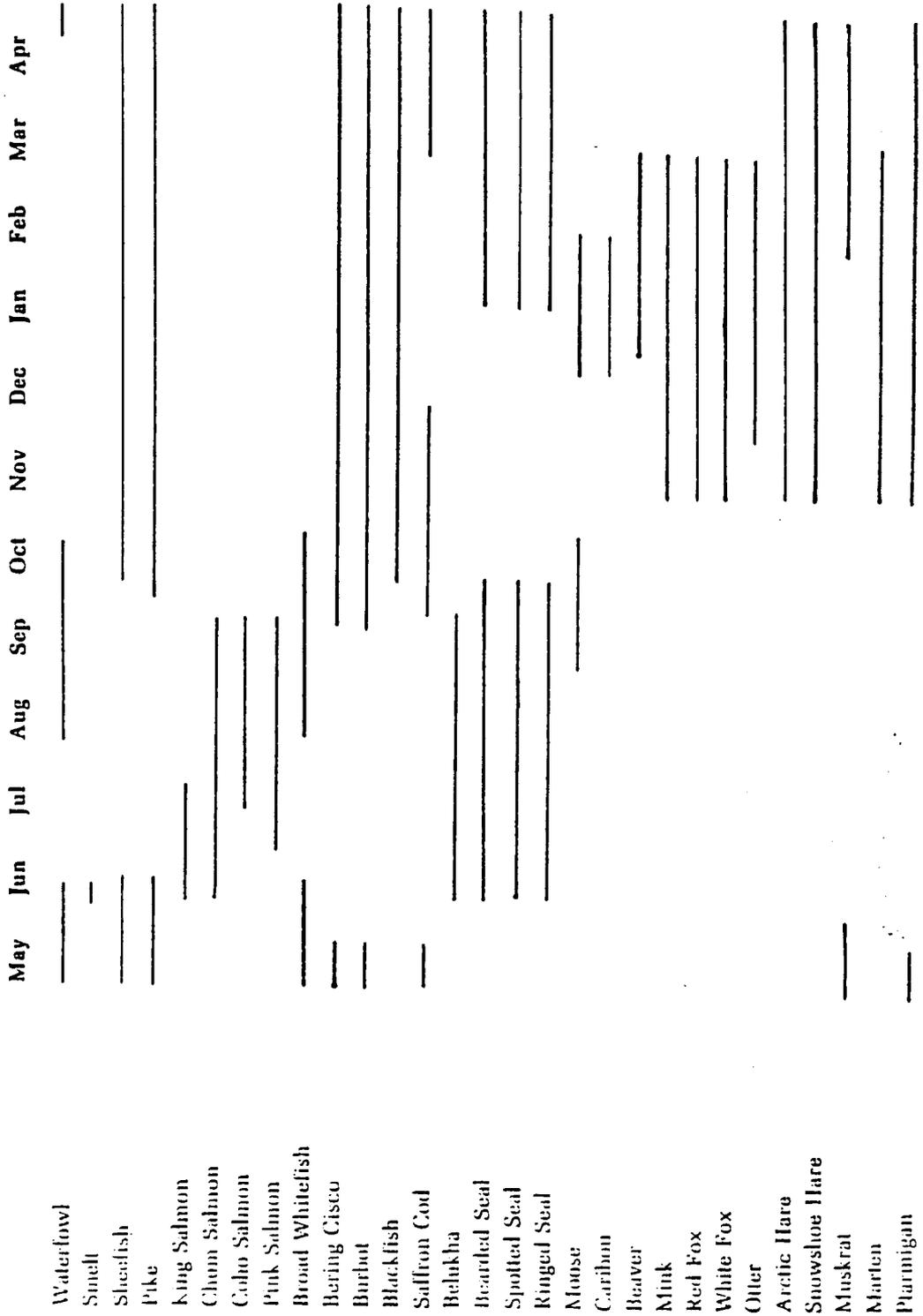


Figure 6. Seasonal Round of Harvest Activities for Selected Species, Lower Yukon River, Circa 1980

Yukon Area, 1980). For most households, commercial salmon income represented the largest and most consistent source of money. For a sample of 88 households interviewed in 1981, commercial salmon earnings comprised 45.8 percent of their annual monetary income during the period June 1980 to May 1981 (Wolfe 1981). In 1981 there were the following number of commercial fishing permits by community: Alakanuk, 87; Emmonak, 104; Kotlik, 79; Mountain Village, 101; Sheldon Range, 26; and Stebbins, 39. Income ranges in 1981 for these communities are presented in Table 13.

Salmon not sold on commercial markets are processed by domestic units at fishcamps or winter communities, and stored as dried and smoked product, a staple food source for the remainder of the year. Other fishing and hunting activities follow in season (Figure 6). Nets and traps are used to harvest non-salmonids such as sheefish, broad whitefish, Bering cisco, burbot, blackfish, saffron cod, smelt, pike, and lamprey. Sea mammals are taken in spring, late fall, and winter, including bearded seal, spotted seal, ringed seal, belukha, and an occasional ringed seal and sea lion. Moose and caribou are harvested during fall and winter in river drainages and hills of the Andreafsky range. A variety of fur bearers are hunted and trapped during winter -- beaver, mink, red and white fox, otter, Arctic and snowshoe hare, muskrat, marten, and bear -- providing meat and furs for local use and commercial sale. The 88 sample households earned about \$1,000 per household from fur sales, although some trappers earned considerably more. Red fox and mink were the region's primary marketable pelts. Other renewable resources harvested included waterfowl, ptarmigan, and a variety of plants and berries. Households integrated wage employment within this customary cycle of production activities, described in more detail below.

The diversified production pattern at the household level is depicted in Figure 7, which summarizes by major resource category the mean household harvests for selected fish and game resources for 1980, averaged by community, expressed as pounds dressed weight (pounds edible product). Rather than specializing on a few resources, a household typically spreads its investments of time and money over a wide range of production activities. Diversification is adaptive for nutritional, economic, and biological reasons. A varied diet imparts greater nutritional benefit, contributing to the health of the population. Diversification provides security in the face of unpredictable variations in availability and accessibility of particular fish and wildlife species from year to year due to cycles in population distribution and disruptions of harvests by poor weather, ice, and water conditions. Diversification promotes sustained yields, since spreading harvests decreases the likelihood of over-exploitation of single resources. The types and quantities of resources taken by a household varies yearly; thus, the harvest figures for 1980 should not be taken to represent a fixed index or measure of food output for these villages. Overall, from June 1980 to May 1981, households in the six communities harvested an average of 4,597 pounds dressed weight of fish and game, or 783 pounds per household member.

Families and communities within the region are linked by networks of customary distribution and exchange. A large portion of food resources produced by a family flows out to other persons as items shared, given, exchanged, and sold. Giving and receiving food are basic to social relationships, and occur so frequently that it seems doubtful any significant social relationships exist without associated food transfers. The giving and receiving of food typically communicates a set of ideas and sentiments

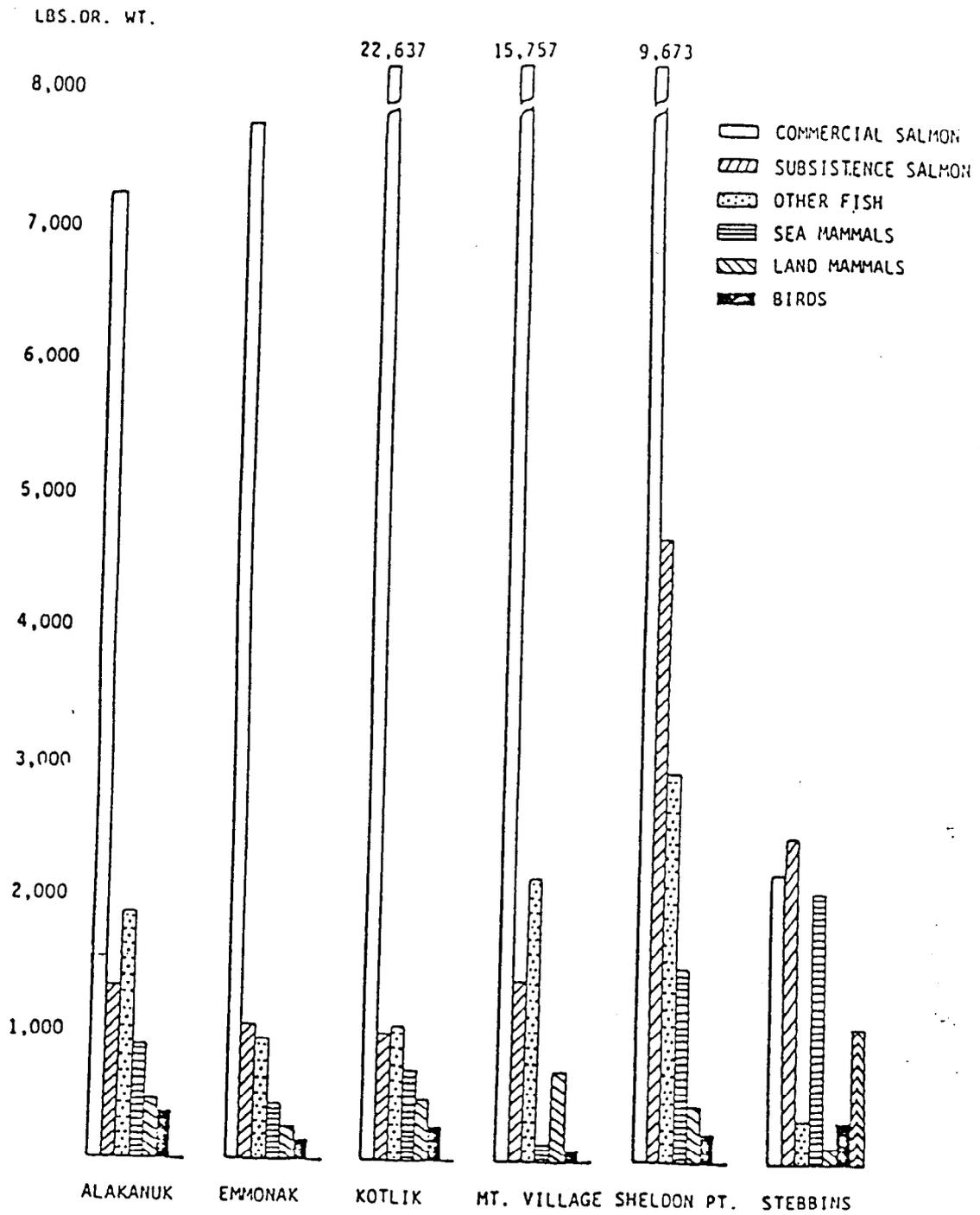


Figure 7. Mean Household Harvests by Community in Pounds Dressed Weight During 1980

between giver and receiver, expressing complex symbolic meanings concerning the structure, strength, and quality of social relationships. Kinship relations define appropriate networks along which food flows. Close friendships and alliances are cemented with food exchanges. Respect for the high social position of the elderly in the community is symbolized by the young giving food to the older segments of the population. The elderly who cannot fish or hunt as effectively are sustained by these customary distribution and exchange networks. Regional trade networks link distinct ecological zones, such as coastal and inland areas. Region-specific products such as seal oil, belukha oil, herring, lamprey, smelt, and whitefish are exchanged widely.

HOUSEHOLD CASES

Case A

This following account illustrates the seasonal round of fishing and hunting pursuits by an Alakanuk household during 1980. The household was composed of a 58-year-old husband, his wife, and four children aged 14 to 22. On May 18 the household moved to a fish camp, located near the mouth of Takwaklanuk Slough, harvesting and processing fish into September. The camp had been there for two years, since his other camp on Aproka Pass had silted up. Three other households share the current fish camp. He placed set gill nets in sloughs where the current was not strong, although other years he has used drift gill nets. During 1980 he harvested about 70 subsistence kings and 400 chums and cohos, which were cut, air dried, and smoked by his wife and children. He sold another 130 commercial kings and 880 chums and cohos. During August, while at fish camp, he set a 15 fathom net for broad whitefish, taking 2 100-pound sacks. After the commercial salmon season, from September through October until freezeup, he set a small mesh net at a slough near Alakanuk, taking about 200 pounds of Bering cisco. The cisco runs continued, but he removed his net when he had "enough." Normally he places a sheefish net after freezeup under the ice for the whole winter, and a blackfish trap near the winter village, but this year he became ill and did not do so. During fall sealing period (August through October), his eldest son, who lives in his own house, took four bearded seal which were shared with his father's household. Before freezeup the household head took one trip along the Black River in search of waterfowl, and he took geese but no ducks (the shells are "too expensive for little ducks"). They used to dry birds, but now they freeze them. During winter he trapped from New Hamilton south on

the tundra and along the mountains near the Andreavsky River, taking beaver, marten, mink, and fox. They ate the beaver, and sold the furs. His son took about 30 hares for the family. During spring he killed 8 ringed seal about 20 miles out on the ocean ice, hunting with his son using snowmachines and a skiff. He shared these seals with others in the community. Overall, the household harvested 5,182 pounds dressed weight of fish and game from June 1980 through May 1981. He earned about \$7,800 income during the same period, \$5,000 from fishing and \$2,800 from a temporary job as a laborer through the village corporation. He had not received foodstamps for the last three years, and received no other type of government transfer payments.

Case B

This household was composed of an older husband (67 years old) and a wife, and four children living at Mountain Village. During 1980 he moved to a fish camp on the main Yukon River shared by the households of two other sons. The father did not fish, but received salmon from his sons who use drift gill nets in front of the camp. His wife put up 14 king salmon and about 190 chum and coho salmon (three 50-pound barrels). He had not sold commercial salmon for the past four years. In August his wife froze 12 bags and one 5-gallon bucket of salmon-berries, picked from along the road where she travels by three-wheel cycle. During September the father took a moose while hunting above Marshall, and a son took another which he shared. He took no waterfowl, but was given some by friends and relatives. After freezeup, from October through April, he set a 4 inch mesh net under the Yukon River ice across from the winter village, taking one or two fish a day, mostly broad whitefish and a few Bering cisco and burbot. He also set a 6 inch sheefish net from February through April, taking about 3 sheefish every other day. He maintained two blackfish traps in small tundra streams during the winter, taking a few pounds of blackfish each check. He did not go "hooking" in the fall, but his boys made one trip to Clearwater and caught some pike, grayling, and Dolly Varden. The sons also made one trip to the Kusilvak Mountains in April and returned with a gunny sack filled with pike. Some were eaten fresh, and the rest were dried. He took no seals, but during spring his son took a ringed seal at Hooper Bay, his wife's family's village. Generally they receive seals from Hooper Bay relatives. For fresh meat during winter he shot with a .22 rifle about 45 snowshoe hares and an occasional ptarmigan. His son took muskrats during early May for meat and pelts. The only monetary income received by the household comes from his old age benefits (\$200 a month) and Aid to Families with Dependent Children for an adopted "granddaughter" they are raising (\$147 per month). From June 1980 through May 1981 the household received \$4,164 income and procured 4,241 pounds dressed weight of fish and game.

DISCUSSION

The complex pattern of domestic production and exchange within the region's mixed, subsistence-based economies has proved eminently adaptive. The restricted monetary incomes derived from periodic wage employment and commercial sales of fish and fur provide a family with investment capital for purchasing consumable goods and technologies for fishing and hunting. Costs of imported goods are high: in 1980, \$2.50 per gallon for unmixed boat fuel, \$102 per 55 gallon drum of stove oil, \$4.62 per pound for imported meats. The most efficient use of limited cash income is to invest a portion into equipment and operating costs for fishing and hunting (an average expenditure in 1980 was about \$3,648 for owning and maintaining a 20 foot wooden skiff, 35 horsepower engine, snowmachine, rifles, and gill nets for king, chum, and whitefish). This investment, coupled with a family's labor, produced a higher volume and quality of food than was possible if an equivalent amount were spent on imported food. For the majority of Yukon Delta families, this is the most viable strategy for survival.

In addition, fishing and hunting activities are imbued with deep social and cultural meanings. The system of fishing and hunting has great historic time depth in this region and forms the basis of social order at the family and community levels. The primary social roles of family members revolve around the annual cycle of activities, usually harvesting by men, processing and storage by women, and essential support roles by children and elderly. The family and community are integrated by the enactment of these customary roles. As fishing and hunting draw upon traditional values, belief systems, and ideological structures of the culture, they provide the fundamental structure underlying the psychological and emotional

well-being of individuals. In this manner, the mixed pattern of fishing, hunting, and remunerative work comprises a viable and satisfying livelihood and way of life for individuals, families, and communities of the lower Yukon River.

CHAPTER 4

NONDALTON: RESOURCE USES IN A SMALL COMMUNITY OF SOUTHWESTERN ALASKA

By Steven Behnke

PREFACE

The third case illustrates a system of fishing and hunting closely resembling resource use patterns of the six Yukon Delta communities. Nondalton is a small, remote community of southwestern Alaska (180 persons in 1982), with long time depth and a relatively homogeneous Athapaskan population. Wage employment opportunities are limited and intermittent, and average household monetary incomes are low.

According to Behnke, fish and wildlife are important to all Nondalton households from nutritional, economic, and cultural perspectives. The community has a system of resource use characterized by a diversity of harvested species (although not as diverse as the coastal Yukon Delta communities), complex seasonal round of fishing and hunting activities, substantial household outputs, and high investments of labor. Fishing, hunting, and processing of wild products are activities of kinship-based groups. Distribution and sharing among families is frequent, socially-expected behavior. Resources are harvested within traditional use areas employing techniques common to the social group and learned through intergenerational transmission. Periodic wage opportunities (nonlocal commercial fishing, firefighting, and construction projects) provide cash which is used to support fishing and hunting activities. In a previous report, Behnke (1982) notes the high costs of living in remote areas like Nondalton and explores the interrelationships between capital costs and resource uses in the community.

INTRODUCTION

Nondalton is an Athapaskan community, population 180, in the Iliamna Lake region of southwestern Alaska. The Division of Subsistence conducted research in Nondalton between 1980 and 1982 to document use of local resources and the role of fish and game in the lives of residents of the community (Behnke 1982). Nondalton is an example of a small, remote community which is without road connections, with very limited and fluctuating wage employment opportunities, and with extensive use of local fish, game, and plant resources.

LOCATION AND ENVIRONMENT

Nondalton is situated on the northeastern shore of Six-Mile Lake, 15 miles north of Iliamna Lake and 190 miles southwest of Anchorage. The community's location gives residents access to hundreds of miles of waterways in the Lake Clark drainage (see Figure 8) and to a diversity of terrestrial habitats, ranging from spruce and birch forest to mountain tundra. These habitats support a major sockeye salmon run, moose, caribou, black and brown bear, dall sheep, beaver, and a wide range of other furbearers, and a wide variety of freshwater fish species. The climate of this region is transitional between maritime and continental, with generally cool summers, moderate precipitation, and moderately cold winters. Weather often fluctuates dramatically in this area, with frequent midwinter thaws and major wind storms throughout the year.

SOCIAL HISTORY AND ECONOMY

The traditional territory of the inland Dena'ina, the ancestors of the present residents of Nondalton, included the Lake Clark, upper Mulchatna,

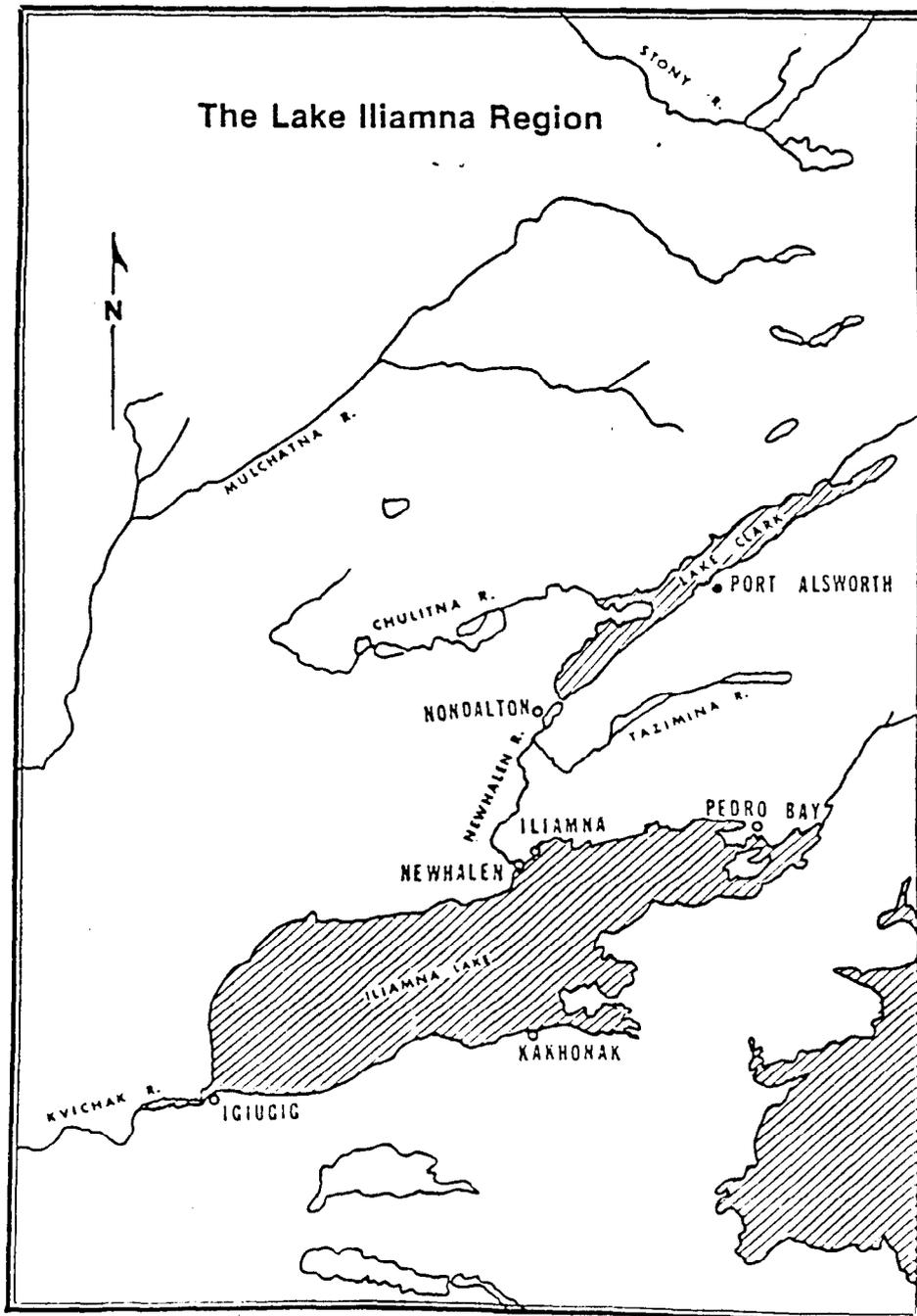


Figure 8. The Lake Iliamna Region

and upper Stony River drainages. Fishing and caribou hunting were central to the economy of these Athapaskan groups. After the Russians arrived in Cook Inlet in the 18th century, people of this area integrated trapping and trading into their hunting and fishing economy.

The village of Nondalton has existed near its present location since the early 1900s. The Newhalen River was important for salmon fishing long before a permanent village was established, and fishing camps on the river are still used by Nondalton residents.

A series of major epidemics decimated the Lake Clark Dena'ina at the end of the nineteenth century. In the early twentieth century salmon runs into Lake Clark were severely depleted by commercial over-fishing in Bristol Bay and during this same period fur prices dropped. These factors appear to have contributed to the consolidation of the remaining population of the inland Dena'ina into the village of Nondalton, which was closer both to early summer salmon fishing areas and to a trading post at Iliamna. A few Dena'ina were traveling to Bristol Bay to work in canneries by the 1920s, and by the 1930's several were involved in commercial fishing.

The economy of Nondalton today centers around hunting, fishing, gathering for domestic use; firefighting; commercial fishing; and occasional construction work. Nondalton residents wage earning opportunities are highly seasonal, occurring primarily during the summer months. Nondalton's distance from Bristol Bay, residents' lack of capital, and fluctuations in salmon runs here have discouraged most Nondalton families from relying heavily on income derived from the short, intense commercial salmon fishery in Bristol Bay. During years when poor salmon runs were predicted in Bristol Bay -- in the early 1970's, for example -- Nondalton people did not commercial fish. Income ranges from commercial fishing in 1981 are

depicted in Table 14. Other wage earning opportunities are also highly variable and unpredictable from year to year. Annual income to the community from firefighting during the 1970s, for example, annually averaged \$57,800 annually, but ranged from a low of \$0 in 1974 to a high of \$240,000 in 1977.

Information on incomes in Nondalton was collected in household surveys by the University of Alaska (1973) and the Division of Subsistence (1980). In 1973 the mean income of 25 households was \$5600. In 1980 the mean income for 14 households was \$12,350, ranging from less than \$5000 to about \$35,000. There were no full-time, year-round jobs in the village. Only three people had permanent seasonal jobs, largely associated with the school, while another five had stable but low-paying, part-time jobs. Occasional short-term employment was available through various government programs. Figure 9 illustrates income ranges for Nondalton residents in 1980.

The cost of imported products is high in Nondalton because of the community's inaccessibility by surface transportation and its distance from transportation and service centers. Shelter, food, and fuel for heating, transportation, and electrical generation, and the equipment necessary for domestic production were all far more expensive in Nondalton than in Anchorage. The village has one store, which carries a limited selection of groceries, hardware, and clothing. Most goods arrive by mail, which comes to Iliamna by commercial air service and is then transshipped by small plane to Nondalton. Prices are at least one-third higher than in Anchorage. Stocks fluctuate considerably, and basic food items are often not available in the village. Only households with very low incomes who do not have the cash to order in a grubstake buy exclusively at the local store. Households

TABLE 14

INCOME RANGES FROM COMMERCIAL FISHING FOR SALMON AND HERRING,
NONDALTON, 1981

Total Number of Commercial Fishermen	23
Number of Salmon and Herring Fishermen	18
Percent earning less than \$1,000	0.0
" " \$ 1,000 - 9,999	*
" " \$10,000 - 19,999	22.2
" " \$20,000 - 29,999	38.9
" " \$30,000 - 49,999	38.9
" " \$50,000 - 74,999	*
" " \$75,000 - 99,999	*
" " greather than \$100,000	0.0
Total	100.00

* Less than four: due to confidentiality regulations number cannot be disclosed.

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries. (1981)

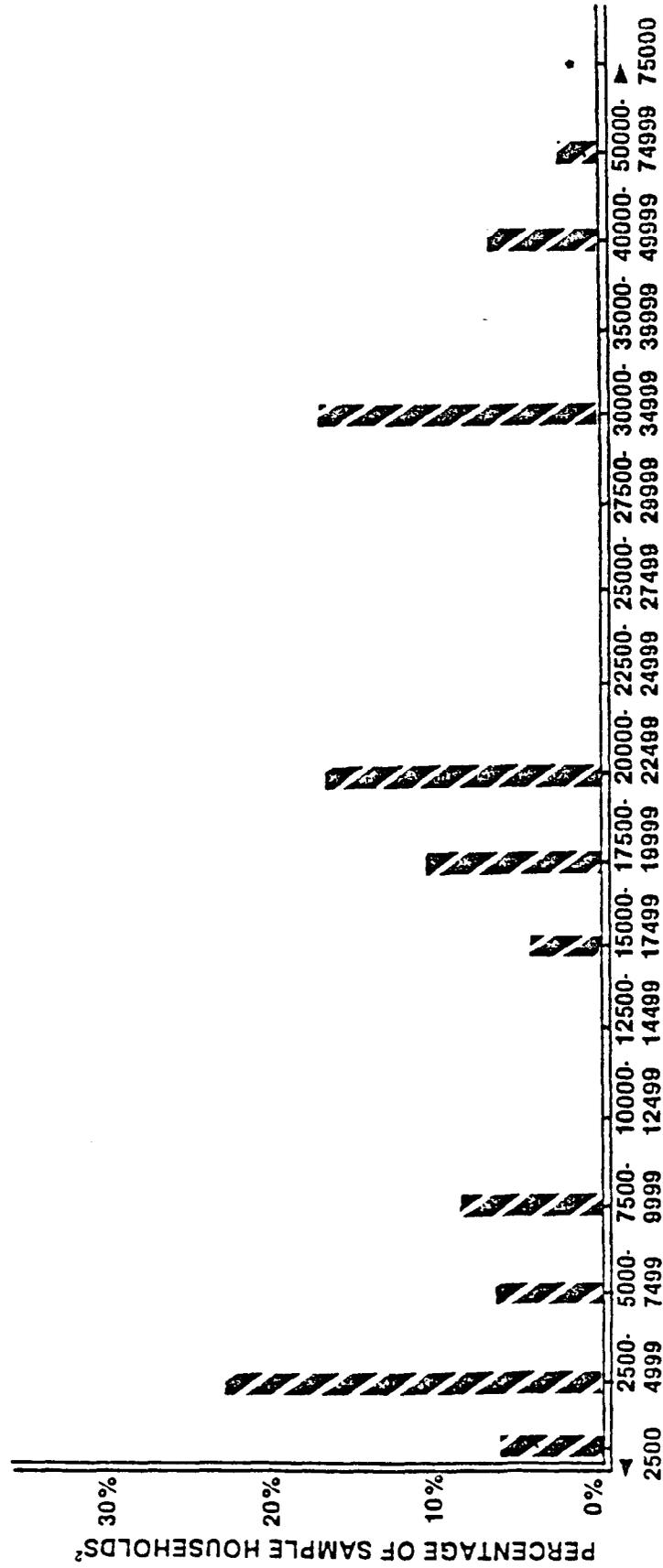


Figure 9 . Household Income (Dollars) — 1979, Nondalton

1 U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3

²N = 48

* no data available

with greater incomes tend to purchase staples in bulk by mail from Anchorage.

POPULATION

The population of Nondalton has remained relatively stable over the last ten years, averaging about 180 people (Figure 10). Census figures mask the dynamic nature of the community's population, however; there is a fairly high degree of circular migration between Nondalton and other communities. Families move out of the village to seek employment, to be near relatives, or to seek medical care, but tend to return to the village after months or even years of absence.

There are about 34 households composed of more than one person and an additional 6 individuals who live alone. The mean household size for all households in 1980 is 4.12 persons, while the mean size for households composed of more than one person is 4.9 persons (see Appendix).

GOVERNMENT, PUBLIC SERVICES, AND TRANSPORTATION

Nondalton is incorporated as a second class city under State law, and as an IRA (Indian Reorganization Act) council under federal law. It is not part of an organized borough.

Nondalton has minimal public services. There is no community electricity, although a power line is being built to the village from Iliamna. There is talk of building a road and bridge across the Newhalen River to connect Nondalton with Iliamna and Newhalen. Presently, supplies such as fuel must either be flown into the village or barged to Iliamna, transported by road to the upper Newhalen River, then hauled by boat to Nondalton. Only one year-round resident of Nondalton owns an airplane, and aircraft are seldom used by most residents of the village for hunting or fishing

POPULATION TRENDS: NONDALTON

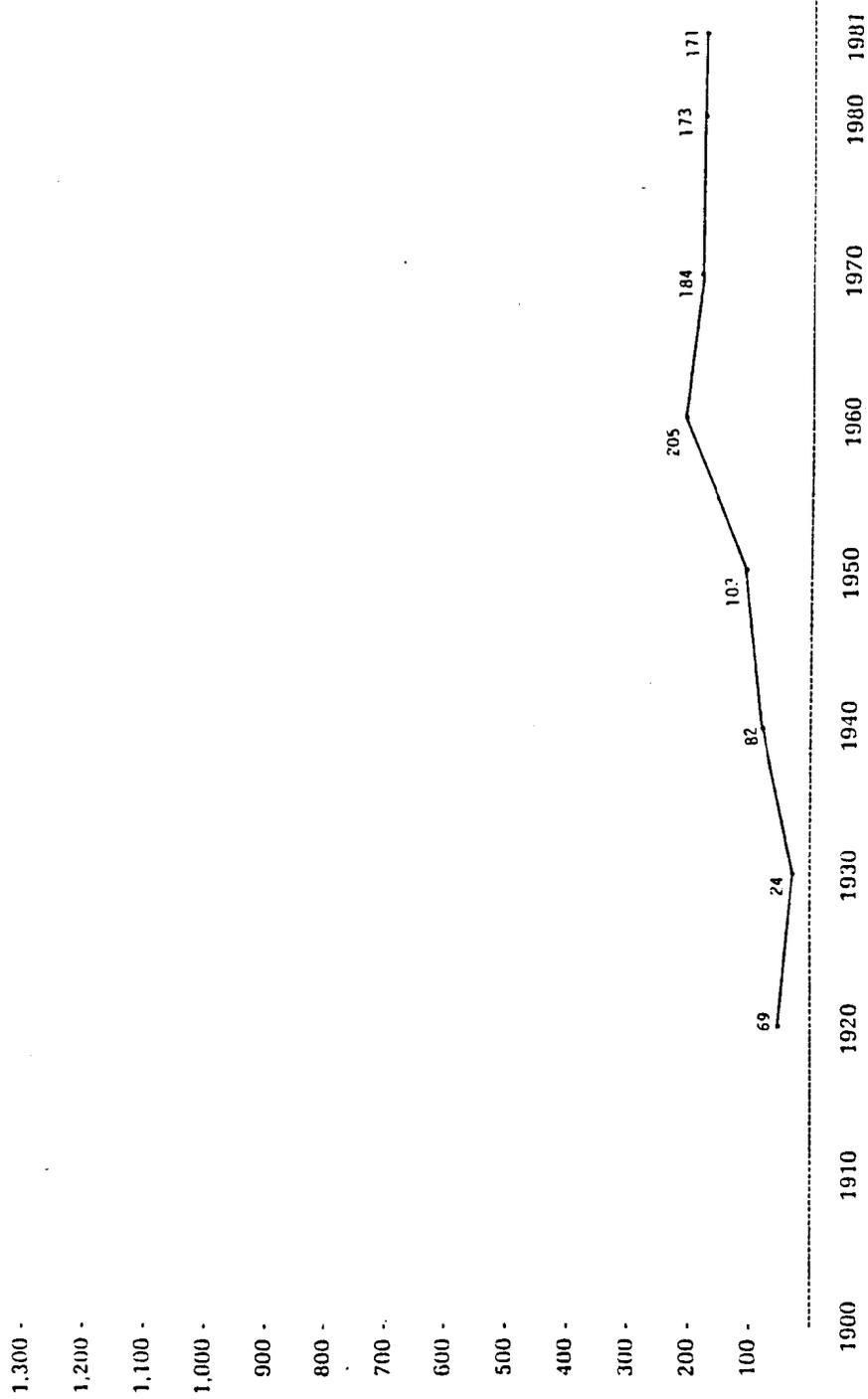


Figure 10. Population Trends, Nondalton

Source: 1920-1950 data from Rollins (1978); 1960-1981 data from Alaska Department of Labor (1981)
 U.S. Census data may not be reliable for certain Alaska communities.

activities. Almost half the households in the community are limited in their hunting and fishing efforts by lack of boats, outboard engines, or snowmachines.

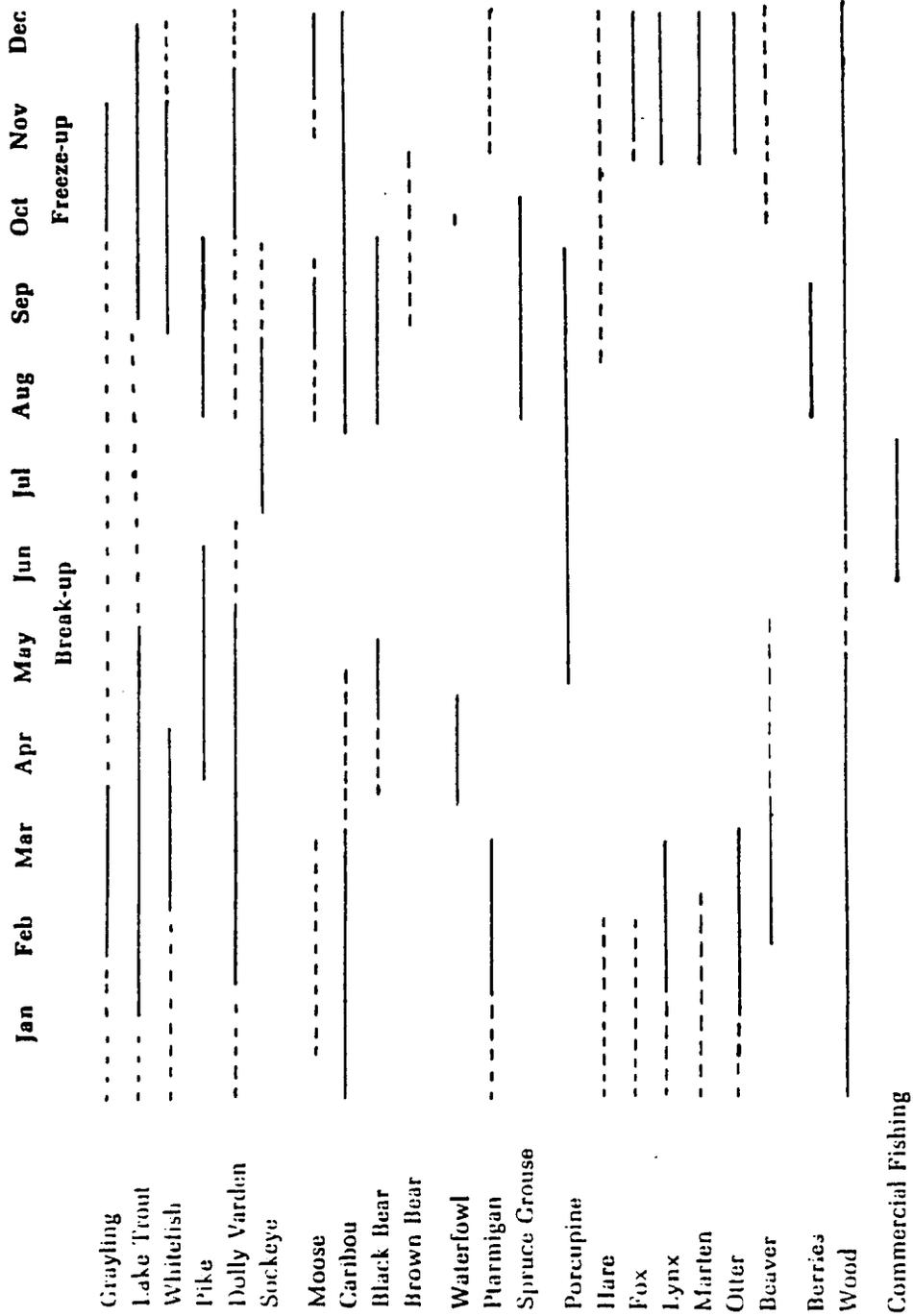
RESOURCE USE PATTERNS

Nondalton households share a basic pattern of resource use. This section briefly describes this common strategy, while the case studies which follow examine some of the variations in resource use patterns between households.

Nondalton households harvest fish and game in every month of the year, and in most months harvest several species. The annual round of hunting and fishing activities is summarized in Figure 11. Sockeye salmon, several species of freshwater fish, moose, caribou, and beaver play particularly important roles in the economy, and, as Figure 12 and Table 15 indicate, are harvested in the greatest quantities. Summer is a particularly critical and busy time, as most cash-earning opportunities occur then, and salmon are available only for a short period. Sockeye salmon are a staple food for all households. Most are preserved by drying, and smaller amounts are canned and salted; few families have freezers. About half the households in the community have small dogteams, and fish are used to feed the dogs. Freshwater fish, particularly grayling, lake trout, and Dolly Varden are harvested close to village after ice forms on Six-Mile Lake. Smaller quantities of fish are also taken by hook and line in the open-water season, and gill nets are used in early summer to take pike, whitefish, and Dolly Varden.

Moose and caribou were traditionally taken through most of the year by Nondalton Dena'ina. Most moose and caribou harvests now occur during fall

**SEASONAL ROUND OF HARVEST ACTIVITY FOR SELECTED SPECIES,
NONDALTON, 1971-1981**



Usual period of harvest effort _____; Occasional effort _____

Figure 11. Seasonal Round of Harvest Activity for Selected Species, Nondalton, 1971-1981

HOUSEHOLD PARTICIPATION IN HARVEST ACTIVITIES DURING 1973, 1980, and 1981,
NONDALTON

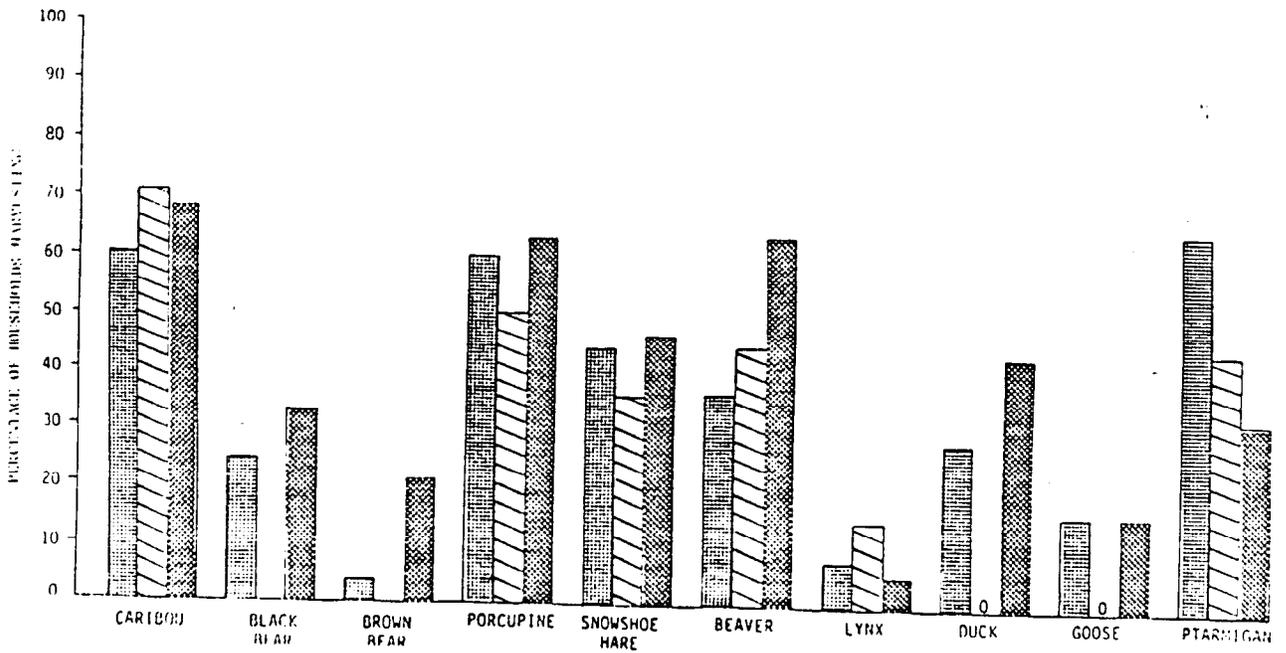
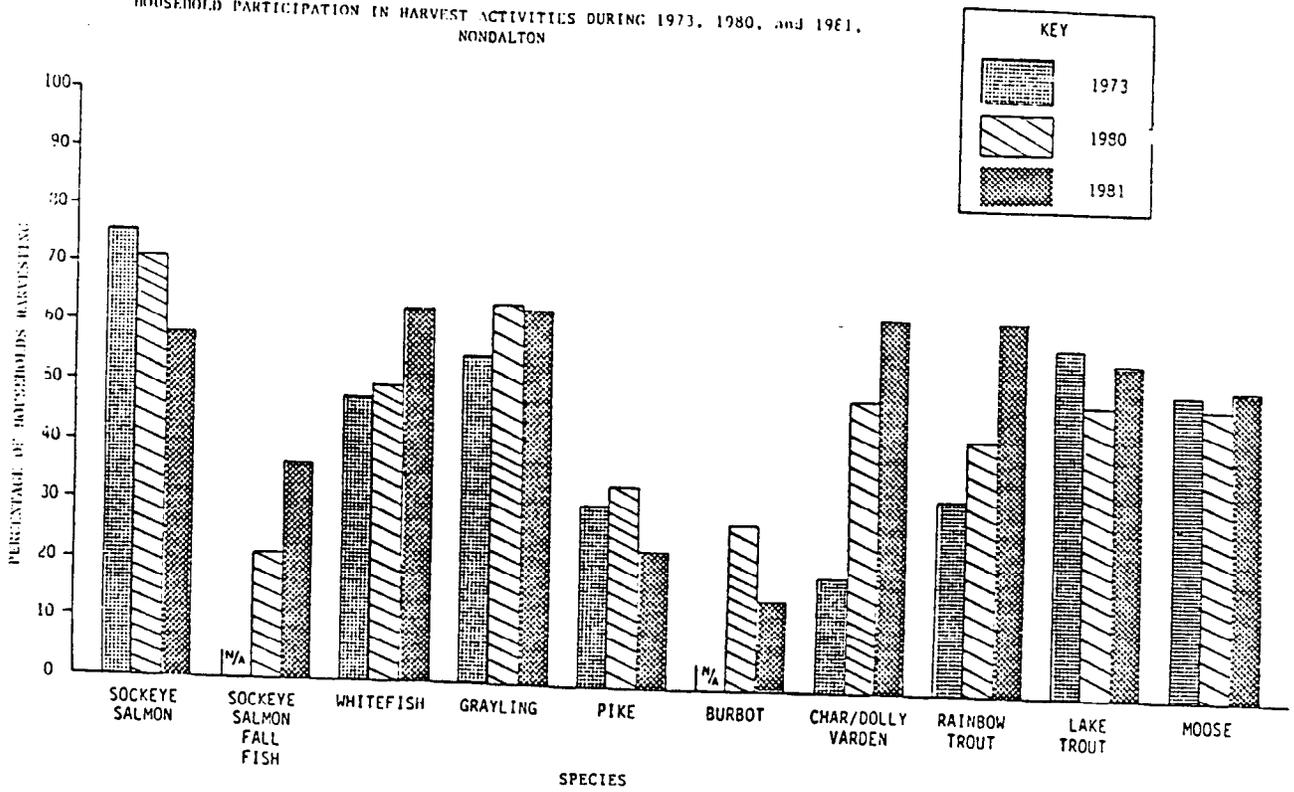


Figure 12. Household Participation in Harvest Activities During 1973, 1980, and 1981, Nondalton

TABLE 15

MEAN HOUSEHOLD HARVESTS OF SELECTED FISH AND GAME RESOURCES,
1973, 1980, 1981, FROM A SAMPLE OF NONDALTON HOUSEHOLDS,
IN POUNDS DRESSED WEIGHT

	1973 (n=25)	1980 (n=14)	1981 (n=19)
<u>Fish</u>			
Sockeye	2,614	3,985	2,883
White Fish	57	18	36
Grayling	44	23	65
Pike	28	5	14
Burbot		1	1
Char/Dolly Varden	2	10	29
Rainbow Trout	9	9	21
Lake Trout	68	64	39
TOTAL FISH	1,811	4,115	3,088
<u>Land Mammals</u>			
Moose	518	366	483
Caribou	576	332	347
Black Bear	32		47
Brown Bear	4		26
Porcupine	34	14	27
Snowshoe Hare	11	4	8
Tundra Hare		6	3
Beaver	114	114	143
Lynx	2		
TOTAL LAND MAMMALS	1,291	836	1,084
<u>Birds</u>			
Duck	4		7
Goose	9		4
Ptarmigan	13	5	5
Spruce Grouse	3	3	7
TOTAL BIRDS	29	8	23
TOTAL SUBSISTENCE FOOD HARVEST	4,142	4,959	4,195

and winter because of the imposition of regulatory hunting seasons. During late summer and fall, many families or hunting groups consisting of related men or "partners" travel by boat up into Lake Clark and the Chulitna River. Hunters watch for caribou and black bear on the mountain-sides and hike up to hunt them. In the fall, moose are hunted along the lake shores and river banks.

Winter moose and caribou hunting often occurs in combination with trapping. Hunting and trapping trips are made by snowmachine by small groups which usually include at least two snowmachines and sleighs. During the winters of the late 1970s, lack of snow and poor ice conditions frequently made it difficult for Nondalton hunters to travel by snowmachine to hunt moose and caribou.

A relatively small group of hunters from four or five families regularly harvests a large proportion of the moose and caribou consumed by the community. These tend to be men who have the equipment and the cash for fuel which is needed to harvest these species successfully. The meat these hunters bring back to the village is widely shared with relatives, friends, hunting partners, and the elderly. While only about 50 percent of the households in Nondalton harvest moose, and about 60 percent harvest caribou, almost every household in the village consumes meat from these species. In addition, moose and caribou meat harvested by Nondalton residents is shared with relatives and friends in other communities.

Almost all of the fish and game harvested by Nondalton residents for household use are taken within forty miles of the village. This area of intensive harvest use has been used by generations of Nondalton families, and has a complex of well known trails, campsites, and Dena'ina placenames.

HOUSEHOLD CASES

Although Nondalton households have generally similar patterns of resource use, differences in economic situation affect the ways households use fish and wildlife. Although the following descriptions treat households as separate units, economic strategies and use of fish and game in Nondalton cannot be understood solely in terms of the behavior of individuals or single households. Each Nondalton household is part of a larger social and economic unit consisting of several interrelated households. These interrelations greatly affect fish and game harvest and use patterns.

Case A

This household, consisting of middle-aged parents and two teenage sons, has a low to moderate income by community standards. The husband is the major wage earner, although the older son was employed briefly in the summer of 1981. The household earned about \$10,000 in 1981, which was about average for the last five years. Approximately half of this income was earned operating heavy equipment, while the other half came from commercial fishing. The family lives in an older log house heated with wood. They spent a total of about \$1800 on all sources of fuel in 1981. Like about half the households in the community, they do not have electricity or running water.

This household owns a basic, though minimal, set of hunting and fishing equipment. They have a three-year old snowmachine which requires constant repairs but is vital to the household economy since it is used to haul firewood and provide transportation for hunting in the winter. It also has an aluminum skiff and 25 horsepower outboard motor. The family also has eight dogs, which are occasionally run as a team by the teenagers and are fed dried salmon and fish scraps.

The family harvests the full range of resources used by Nondalton households. Each year they put up about 1000 dried salmon, and catch several hundred grayling, pike, whitefish, lake trout, and Dolly Varden. They harvest an average of 3 caribou and 1 moose per year, 5-10 porcupine, 5-10 beaver, and small numbers of hare, spruce grouse, ptarmigan, and waterfowl. As noted below, they cut and haul wood.

Most of the family's economic effort is devoted to domestic production, with relatively short periods of time spent on wage earning activities. The family is often short of cash, and the husband actively seeks wage-earning opportunities.

This household cooperates closely with the household of their married son in many harvest activities, and often supplies his household with

dried fish. In addition, they supply a variety of products to the household of the husband's elderly mother.

Case B

This household consists of an elderly woman and her adult unmarried son, and is an example of a household that harvests few resources. This family has a very low cash income, less than \$5000 in 1981, largely from transfer payments, but supplemented by occasional wage employment by the son. He is handicapped, however, and earns little.

The household does not have the equipment needed to cut and haul wood, which must be brought several miles. They purchase wood or fuel oil to heat their house, which was built by a government program and is both poorly constructed and uninsulated. Even though they do not have electricity, fuel expenditures take over a third of the family's income.

The only resource harvested by this household in significant quantities is fish, which are primarily taken by the elderly woman. These are generally consumed immediately or shared with other households, although some fish are dried. The man occasionally snares beaver for food.

Although this household is not very productive, they consume a relatively wide range of resources, including moose, caribou, beaver, porcupine, sockeye salmon, and six species of freshwater fish. They receive gifts of food from relatives and friends and frequently eat meals in other homes.

Case C

This is an example of a relatively high income household, which harvests much fish and game and shares this harvest with other families. The household consists of a husband in his early 50s, his wife, and four children. The 1981 income of this household was about \$35,000. The husband and a son in his early 20s fished commercially in Bristol Bay and the man and his wife both had part-time jobs in the village during the winter. They have a relatively new house, which was built with a loan. They have a generator, cook with propane, and heat with fuel oil, supplemented with wood. In 1981 their fuel costs were about \$4000.

This household harvests a large quantity and diversity of fish and wildlife. They do not have dogs, and therefore dried only about 300 sockeyes. In 1981 they took 2 moose, 5 caribou, 1 black bear, and 18 beaver. They did not devote much effort to fishing for freshwater species, but did take several dozen fish. They also received fish from other families.

This household's social and economic activities were closely tied to those of three other related households. Labor for hunting, transporting, and processing various resources and transportation were largely recruited from within this larger group. Equipment and food

were shared extensively, and visiting was frequent among these households, which were located close to one another. Meat also was provided to people outside this cluster, including the households of elderly villagers.

INTERRELATIONSHIPS

Use of fish and wildlife by Nondalton households is greatly influenced by the community's location and environment, its sociocultural characteristics, and the local economic situation. Fish and wildlife are nutritionally, economically, and culturally important to all Nondalton households. The village's location on an inland lake and river in the boreal forest makes a particular set of fish and wildlife species accessible by boat and snowmachine. Every household in the community uses a large proportion of the fish and wildlife species available in the local area. They generally do not travel more than forty miles from the community to harvest these resources.

Employment opportunities in Nondalton are typical of many areas of interior rural Alaska. There are no major export-based industries nearby, and employment opportunities in the region are highly seasonal, variable from year to year, and limited in number. Some people leave home for several months a year to earn cash. Cash incomes in the community are far below Alaskan averages. At the same time, the costs of goods and services are much higher than in urban areas. Uncertainty and risk in the monetary sector have contributed to the maintenance of hunting and fishing as important to the economy of the community. However, the high cost of purchasing fuel and maintaining hunting and fishing equipment limits the ability of some Nondalton households to harvest fish and wildlife.

CHAPTER 5

DOT LAKE: RESOURCE USES IN A SMALL, ROAD-CONNECTED COMMUNITY OF INTERIOR ALASKA¹

By A. Gayle Martin

PREFACE

In several respects the Dot Lake case parallels the Yukon River Delta and Nondalton cases. It illustrates that fishing and hunting patterns of small, remote settlements can characterize communities connected by roads to major Alaskan cities. Dot Lake (population 50 persons in 1982) is about 160 miles from Fairbanks on the Alaska Highway. Fishing and hunting are central components of the community's economy and of household activities, integrated with the area's limited, seasonal wage employment opportunities (there were four permanent, full-time jobs in the community in 1982).

Martin's research reveals that about 70% of the Dot Lake population is related in extended family networks. Hunting, fishing, gathering, and processing of wild resources frequently occur within these networks, but also among unrelated members of the community. There is frequent sharing, distribution, and exchange of resources. The pattern of resource use is relatively homogeneous among households. Children and persons moving into the community are socialized into the community pattern. The patterns of hunting and fishing are learned from parents and have long time depth for many residents, whereas persons marrying into the group have adopted the practices more recently. Resource uses are characterized by a large number of harvested species, diverse use of resources (for instance, the head, entrails, hooves, and bones of moose are used), and relatively large

¹ Findings presented in this chapter are based on Division of Subsistence fieldwork involving all Dot Lake households during the summer of 1982.

investments of time in procurement and processing. Most resources are taken in areas around Dot Lake (except for salmon which are harvested at Copper River); trucks, riverboats, and snowmachines provide access to resource use areas.

Hunting, trapping, fishing and plant gathering are perceived by community members as a way of life central to their nutritional, economic, social, and psychological well-being. There is perceived competition with non-local user groups for certain resources due to the access to Dot Lake by paved highway. Temporary wage employment commonly modifies the seasonal round of resource harvest. However, resource use provides economic security to households.

PLACE

The present community of Dot Lake lies between Tok and Delta Junction on the Alaska Highway, between the foothills of the Alaska Range and the marshy flats of the Upper Tanana River valley in interior Alaska (see Figure 13). The site was traditionally used as a trapping camp by Athapaskans of the Upper Tanana region. During construction of the Alaska Highway in the early 1940s, a road construction camp was built at Dot Lake. In 1947 a missionary family from Washington bought several of the cabins at the site, and eventually established a church, a school, and a lodge. Several Athabaskan families who had previously camped seasonally at Dot Lake took up permanent residence during the late 1940s and early 1950s in order to harvest the abundant local wild resources, enroll their children in school, attend church and enjoy the economic advantages of being located on the new highway.

DOT LAKE AND ENVIRONS

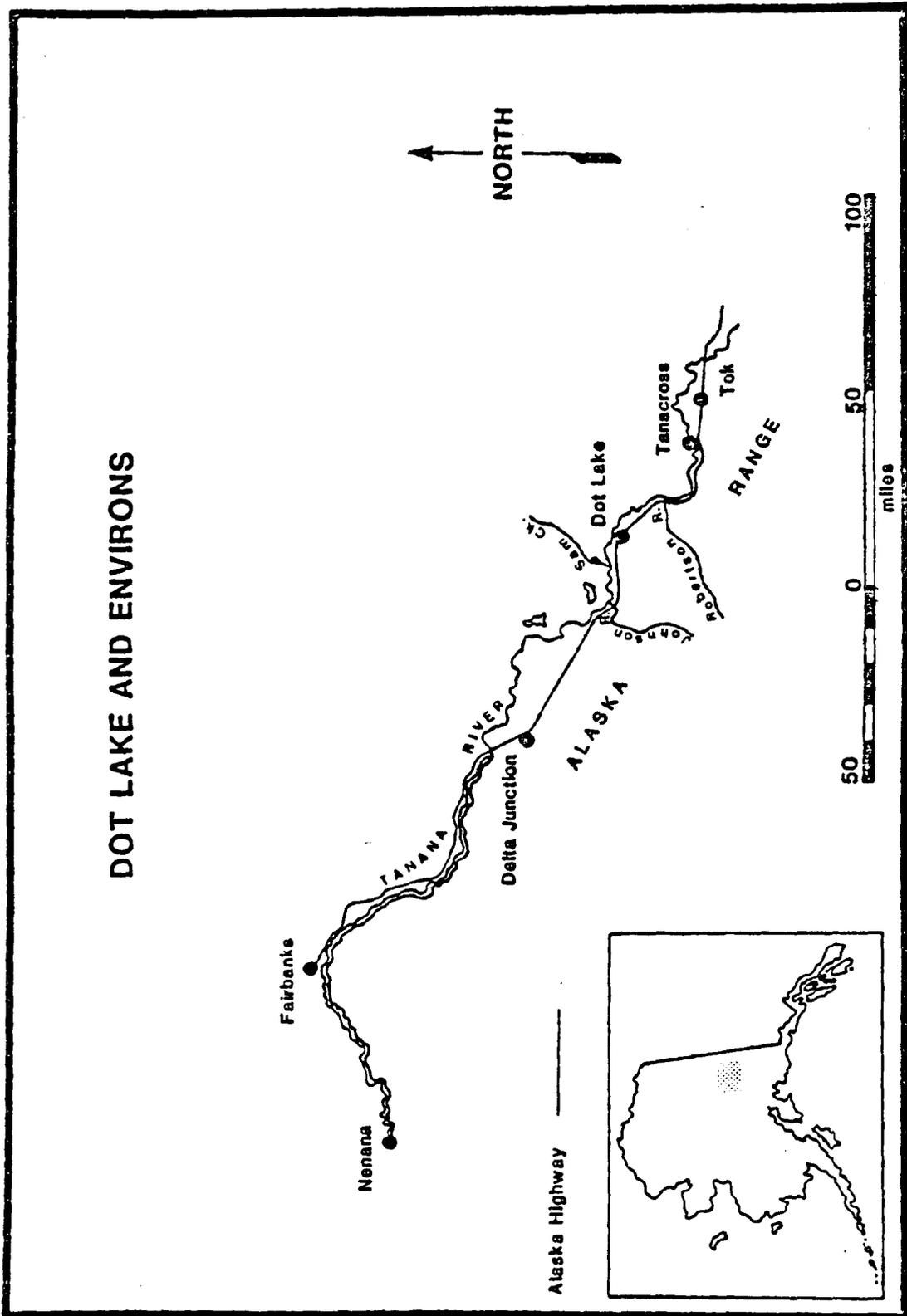


Figure 13

Population trends at Dot Lake are shown in Figure 14. Today 50 people live at Dot Lake in 15 households. The average size of a Dot Lake household is 3.3 persons. Table 16 gives detailed household size information. A variety of household compositions is found in the community, as shown in Table 17. Table 18 gives the ethnic affiliation of Dot Lake residents, and shows the sex structure of the community. The present population of Dot Lake is young, as shown in the Appendix of population pyramids. Length of residency at Dot Lake ranges from less than two years to 35 years, as shown in Table 19. Dot Lake is not included within the boundaries of any organized borough.

Wage employment opportunities in Dot Lake are very limited. A total of thirteen jobs are available at Dot Lake, but only three of these are full-time, year-round positions (see Table 20). Income levels are generally not very high, due to the fact that most jobs are part-time. For example, a housekeeper for the elderly earns approximately \$7.00 per hour, but works only ten hours per week. Some residents hold two part-time jobs, as shown in Table 21. Four Dot Lake men seek employment outside of the community as road construction workers or carpenters through labor unions. These men must commute 100 to 120 miles per day to work, or, in some cases, they must live at a construction site several hundred miles away from home for several weeks at a time. Although a laborer on a road construction project can now earn from \$18.82 to \$20.73 per hour, road construction jobs are seasonal in nature, lasting from May through mid-September. Residents seeking employment through labor unions cannot always depend on obtaining a job. Although one Dot Lake man worked all summer in 1982, another man was not hired until the beginning of September, and worked only two weeks. Commercial fishing is not a source of income to

POPULATION TRENDS: DOT LAKE

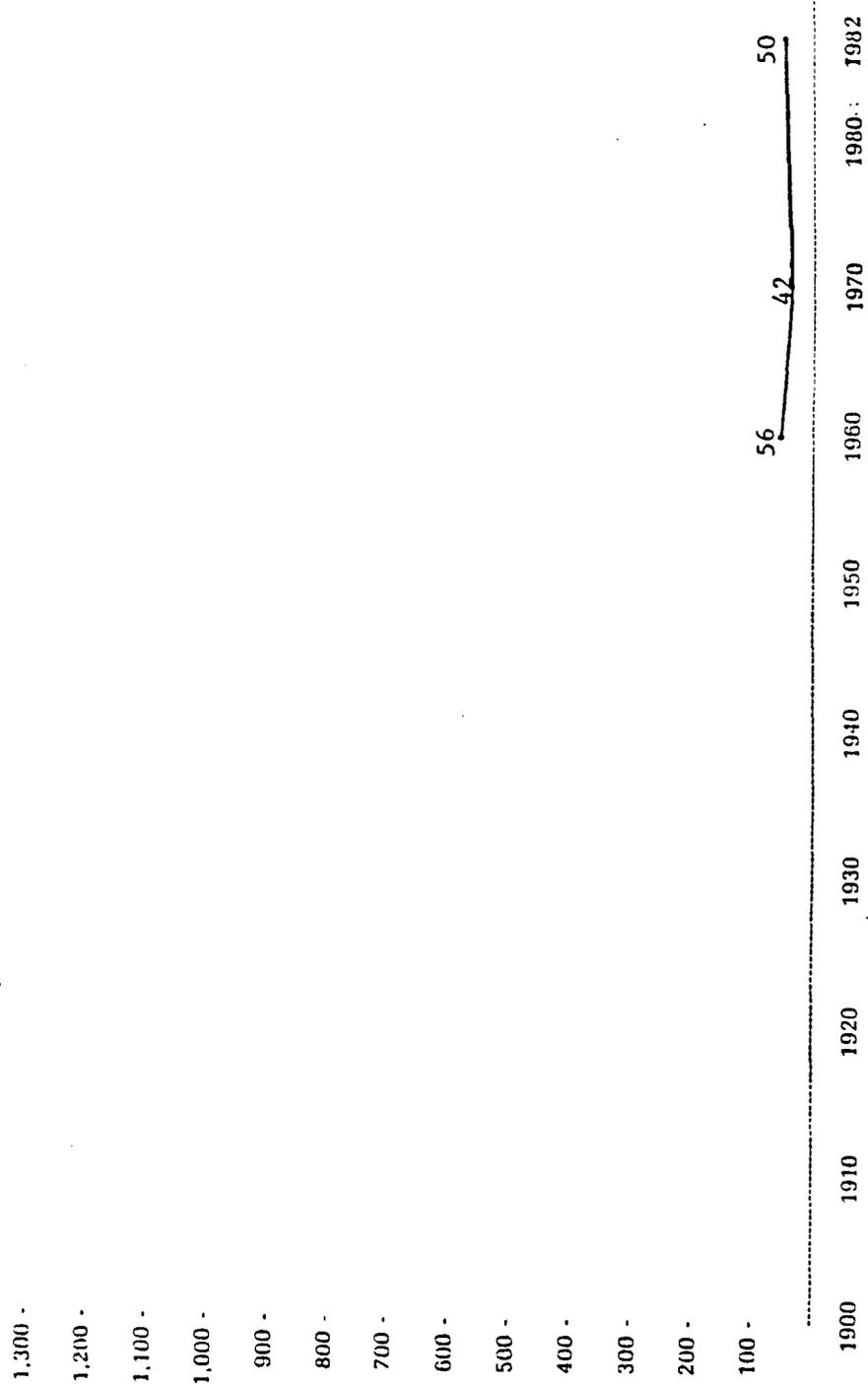


Figure 14. Population Trends, Dot Lake

Source: 1960-1970 data from Alaska Department of Labor (1981);
 1982 data from Martin, Alaska Department of Fish and Game (1982)
 U.S. Census data may not be reliable for certain Alaska communities.

TABLE 16

SIZE OF DOT LAKE HOUSEHOLDS, SUMMER 1982¹

<u>Number of Household Members</u>	<u>Number of Households</u>
1	3
2	3
3	3
4	2
5	2
6	1
7	0
8	1

¹ Martin, 1983.

TABLE 17

COMPOSITION OF HOUSEHOLDS AT DOT LAKE, SUMMER 1982²

<u>Household Composition</u>	<u>Number of Households</u>
Married Couple With Children	6
Married Couple or Single Individual With Children and/or Grandchildren	3
Single Individual	3
Married Couple	<u>3</u>
Total	15

² Martin, 1983.

TABLE 18
 ETHNIC AFFILIATION AND SEX OF DOT LAKE RESIDENTS,
 SUMMER 1982¹

	<u>Males</u>	<u>Females</u>	<u>Total</u>
Athabaskan	14	17	31
Non-Athabaskan	<u>12</u>	<u>7</u>	<u>19</u>
Total	26	24	50

¹ Martin, 1983.

TABLE 19
 LENGTH OF RESIDENCY OF ADULT RESIDENTS IN DOT LAKE
 BY ETHNIC AFFILIATION, SUMMER 1982²

<u>Length of Residency In Dot Lake</u>	<u>Number of Adults (Over 20 Years Old)</u>	
	<u>Athabaskan</u>	<u>Non-Athabaskan</u>
0-5 Years	1	7
6-10 Years	0	3
11-20 Years	0	0
More Than 20 Years	12	4

² Martin, 1983.

TABLE 20

NUMBER OF WAGE-PAYING POSITIONS IN DOT LAKE, SUMMER 1982¹

<u>Number of Positions</u>	<u>Hours Per Week</u>	<u>Months Per Year</u>
3	40	12
1	30	12
3	20	12
3	10	12
3*	20	9

*Two of these three positions are school teachers who are non-residents, since no Dot Lake residents are certified to teach.

¹ Martin, 1983.

TABLE 21

NUMBER OF WAGE-PAYING POSITIONS HELD BY ADULT
DOT LAKE RESIDENTS, SUMMER 1982²

<u>Number of Positions Held per Person</u>	<u>Number of Dot Lake Adults</u>
Unemployed: no positions	13
At Dot Lake: 1 position	7
Away From Dot Lake: 1 position	4
At Dot Lake: 2 positions	3

² Martin, 1983.

members of this community. As Table 21 demonstrates, 48 percent of the adults in Dot Lake are unemployed. Several of these residents, especially the elderly, receive transfer payments from state and federal agencies. Some examples of transfer payments are given in Table 22. Table 23 and Figure 15 illustrate incomes for the community, based on census data obtained in 1979. The median household income for 1979 in Dot Lake was \$21,500 (U.S. Bureau of the Census, 1980c). Income levels are too low for most households to depend on purchased groceries alone. A small selection of groceries is available at the Dot Lake Lodge, but most residents buy supplies at larger stores for lower prices in Tok, Delta Junction or Fairbanks.

Every household in Dot Lake owns a car or a truck, but none of these vehicles is new. Riverboats and snowmachines are owned by approximately one-third of the households; these are usually owned by households with wage-earners.

HOUSEHOLD PATTERNS

The annual round of resource harvest activities of Dot Lake residents is shown in Figure 16. This figure portrays contemporary patterns which differ from historical patterns, in part because of increased regulatory restrictions that have been imposed in the past decade.

Moose is the big game species upon which residents depend most heavily as a source of wild meat. During moose hunting season in September, hunters, either singly or in pairs, pursue moose during the early morning and evening hours with one of three strategies: 1) hunters hike 4 to 6 miles into a camp on a lookout, a hilltop which offers a far-reaching view over the surrounding flats and from which moose can be spotted; 2) hunters

TABLE 22

EXAMPLES OF TRANSFER PAYMENTS MADE TO DOT LAKE
RESIDENT'S HOUSEHOLDS¹

Food Stamps

February 1981, 9 households, totalling 15 people \$1,288

August 1981, 4 households, totalling 12 people \$1,063

Adult Public Assistance

March 1982, 8 cases \$ 931

July 1982, 7 cases \$1,255

¹ Alaska Department of Health and Social Services, 1982.

TABLE 23

INCOME RANGES OF DOT LAKE HOUSEHOLDS FOR 1979²

<u>Household Income Range</u>	<u>Number of Households</u>
\$7,500 to \$9,999	3
\$20,000 to \$22,499	5
\$30,000 to \$34,999	4

² U.S. Bureau of the Census, 1980c.

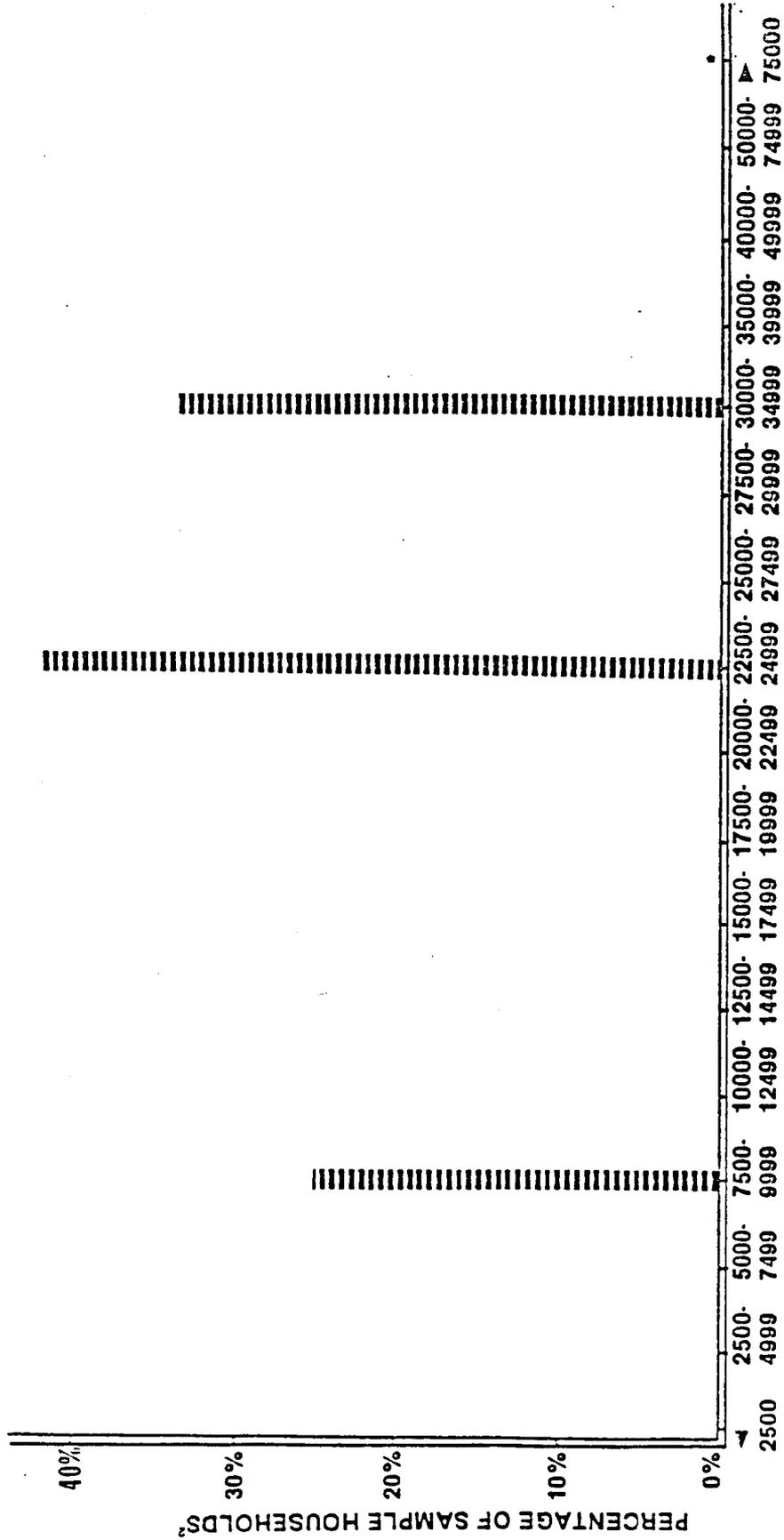


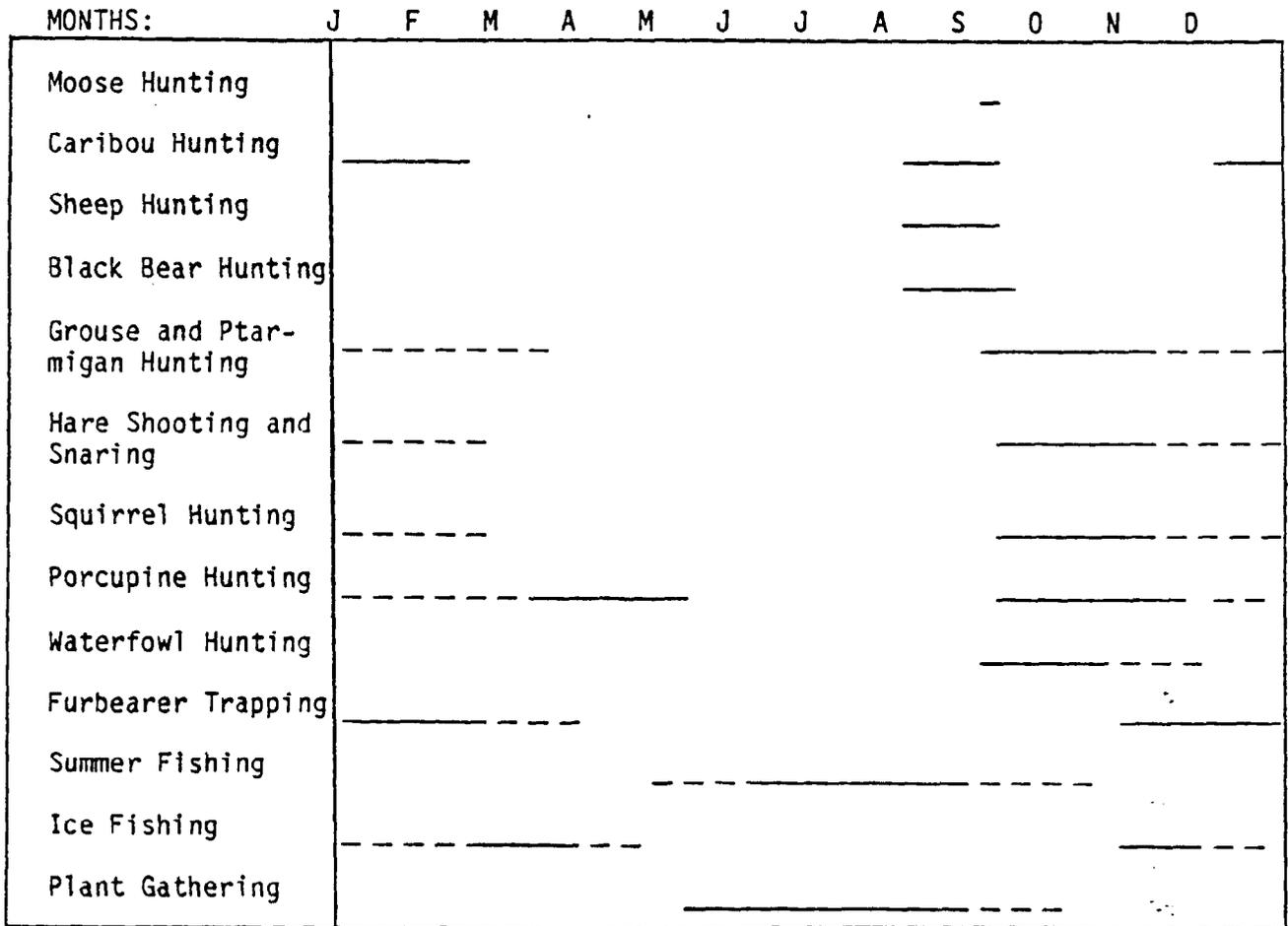
Figure 15: Household Income (Dollars) — 1979, Dot Lake 1

1 U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3

²N = 12

* no data available

FIGURE 16
 CONTEMPORARY ANNUAL ROUND OF RESOURCE HARVEST
 ACTIVITIES OF DOT LAKE¹



LEGEND:

- _____ times of primary harvesting effort
- times of lower effort, due to changing weather conditions, season closure, decreased resource availability or combinations of these factors

¹ Martin, 1983

Note that resource harvest periods today reflect limitations imposed by regulation. For example, moose hunting is limited to a 11-day period in September by current regulations, whereas in prior years, absence of regulations allowed hunters to pursue moose in both summer and winter.

who own riverboats, or who go hunting with boat owners, search a length of the Tanana River approximately 40 miles long, stopping in locations known for good moose habitat and often camping atop lookouts close to the river; and 3) hunters drive slowly along a stretch of the Alaska Highway about 30 miles long in their cars or trucks, looking into the brush for moose, and stopping at high lookouts to scope for moose along the highway and the Haines Pipeline right-of-way clearing. This latter strategy is followed particularly by elderly men at Dot Lake. Moose are usually hunted by men, from teenagers to elders, but some women also participate. After a moose is shot, the hunter(s) may enlist the help of relatives in the village to cut up the carcass and transport the meat home. Some meat is cut into steaks and frozen and some meat is canned. Residents have described how all the parts of a moose are used, including the head, entrails, hooves and bones. Formerly, moose was harvested during the summer when the fat layer on the moose is thickest and when warmer weather allowed residents to preserve moose meat by drying. Residents state that game regulations now prevent them from hunting for moose in the summer. A single moose can generally feed a single Dot Lake household all winter. Not only is moose valued as an important food source which reduces grocery costs, but it is also culturally valued by the Athabaskan residents as "real Indian food" that they were raised on.

Caribou, sheep, and black bear are other big game species sought by Dot Lake residents during the late summer and fall. Generally, these species are less important to residents than moose. Hunters will shoot a black bear if they see one while moose hunting, or they will shoot a nuisance bear. All bear meat is eaten, but the entrails are avoided due to their strong smell. Bear fat is rendered into oil and mixed with berries

or used as cooking oil. Caribou and sheep are found in the mountains of the Alaska Range. Residents report that the increasingly restrictive regulations governing the harvest of caribou and sheep in these areas over the past decade have discouraged them from relying on these species as dependable food sources, and have resulted in an increased dependence on moose. Harvest of these species near Dot Lake requires a permit, and although residents apply for permits, their names are not drawn every year. Dot Lake residents also state that they are discouraged by the high cost of travelling into the remote mountainous areas, competition with non-local hunters and the relatively small amount of meat obtained for the effort. There are exceptions to this trend, as a few hunters who were successful in obtaining a caribou permit made the several trips necessary to pack out meat, hiking six miles one way. Caribou have occasionally migrated into the flats near Dot Lake during especially cold winters, and, if allowed by game regulations, hunters will harvest them.

Hunting for big game may be carried out by single hunters or by parties of two or three. Big game hunters are usually, but not always, men. Hunting parties consist of a man and his son(s), two brothers, a man and his wife, or groups of friends who share equipment and knowledge. Generally, the meat of a big game animal is shared among the members of the hunting party and the helpers who carry meat home. Usually, this distribution occurs along family lines, although meat is also given to households outside of the family who are not successful in hunting. One resident explained that he had what amounted to a whole moose in his freezer, although he'd given half of his moose away and had received parts of two other moose from his brothers-in-law.

Waterfowl are hunted during the fall, usually by a single hunter or two hunters from the same family. Hunters with riverboats travel to lakes near the Tanana River up to 10 miles from home, and other residents without boats travel by car or truck to lakes along the Alaska Highway up to fifteen miles from home. After the birds are brought home whole, the feathers are removed, the down is singed off, the bird is gutted and boiled, broiled or fried. Residents state that because the amount of meat is so little, waterfowl are not usually shared between households.

In the late fall and winter, grouse, ptarmigan, porcupine and hares are hunted. Residents state that these animals can be found anywhere, but that the most efficient hunting strategy is to drive along the highway during the late fall, when the animals' dark colors contrast with freshly fallen snow. During the winter, some elderly residents snare hares close to their homes. As with waterfowl, game birds and hares are usually consumed within the hunters' households.

Trapping furbearers is the primary winter-time activity. Trappers who own snowmachines travel up to 30 miles daily, setting and checking traps and snares. Some trappers walk their traplines on snowshoes covering up to nine miles in a day. Trapping is primarily a man's activity. One man travels over his trapline, checking and setting traps, and brings home the animal carcasses for skinning and preparation for sale to fur buyers from Tok, Northway, Delta Junction, and Fairbanks who come weekly to Dot Lake. Trapping success varies from year to year, and in good years trappers can count on some cash in excess of their operating costs.

Summer is one of the busiest times for all residents of Dot Lake. Residents drive up to 60 miles from home to known berry picking sites. Berry picking involves groups of from two to ten people, usually sisters

and sisters-in-law and their children, or the elderly and their grandchildren. Berry picking is not limited to women, however, as a whole family often goes together. Berries are made into jellies and jams, pies, "Indian ice cream", sauces, relishes, syrups and some are frozen for use later in winter. Berries are valued as a source of fresh, wild fruit, less expensive and of higher quality than fruit from the grocery store. Berry picking is considered an important family activity and a means for elderly people to teach plant gathering to children who are free from school for the summer. Other items are gathered, and include birch bark, spruce root, wild rhubarb, edible roots, chamomile, birch sap, mushrooms, rosehips and firewood.

Four whitefish camps are operated during the summer months by residents of Dot Lake. Several related households participate in fish camp activities, including pulling whitefish from a gill net, cutting, hanging and drying the fish and tending the fire. Other fish species are caught near Dot Lake with rod and reel, including grayling, burbot, pike and lake trout. Some of these are caught during winter through the ice on local lakes. Because salmon are not available in the Upper Tanana River at Dot Lake, most residents travel 150 miles by road to the Copper River to catch a winter supply of salmon. Many Athabaskans at Dot Lake have relatives in the Copper River Basin, and they obtain subsistence permits for three or four days' use of their relatives' fishwheels. As with berry picking, these summer fishing trips to visit relatives afford the Native children an opportunity to learn more about their traditional Athabaskan culture. Other residents have built their own fishwheels or they use dip nets in the Copper River for harvesting salmon. Salmon are brought back to Dot Lake fresh, and are frozen, canned and smoke-dried.

Native residents of the community have repeatedly stressed the importance of harvesting wild food resources which comprise the traditional "real" food which they prefer and feel they need.

CASE HOUSEHOLDS

Examples of two particular households will illustrate the diversity of resource use patterns throughout the year.

Case A

Case A includes an elderly Athabaskan couple who receives approximately \$1,250 per month in transfer payments. Their two granddaughters, aged 7 and 9, live with them. They own no river boat or snow-machine, and rely heavily on an old Plymouth sedan, often seen with a pair of fishing rods tied to the luggage rack. During the summer and early fall, the family gathers several different kinds of berries, mushrooms, "Indian carrots", and rosehips. Some of these plants are close to home, but the family will drive up to 200 miles away to places such as the Denali Highway and Copper Center. Usually, these long trips are made for several purposes, including plant gathering, fishing, small game hunting, visiting, and shopping. The family fishes with rod and reel during the summer months and through the ice in the winter, usually in lakes and streams within 15 road miles of Dot Lake. One granddaughter is particularly fond of boiled eggs from different kinds of fish. During all times of the year, but especially in fall, the man hunts for hares and game birds along the highway. The family sets snares near their home for hares throughout the year. The two granddaughters have their own snares, and are learning to clean and cook hares. The man says that he hasn't been able to shoot ducks near home for the last two falls due to a recent decision made by the Dot Lake Village Council that firearms cannot be discharged in the village. He would like to go to a lake traditionally used by his family to hunt for waterfowl, but he says that he cannot afford to pay someone to take him there by river boat, as the lake lies several miles away from the village by water and is not accessible by road. The man says he is too old with too many health problems to go big game hunting, but he was one of the several Dot Lake residents out on the highway during the 1982 moose hunting season, driving at 20 mph looking for moose during the early morning hours. The sedan is used by the family to travel to various cultural events, such as the World Eskimo and Indian Olympics in Fairbanks, or to visit relatives and friends in other Upper Tanana villages. They often exchange food items with relatives and receive, for example, dried muskrat, which is not available in great quantities near Dot Lake. Other households in Dot Lake often give moose meat to this household. Wild foods are valued by this family as indicated by the wife's feelings: "me, I don't eat sugar, I don't eat butter, nothin'. I just want meat."

Case B

This household is comprised of a non-Native man, his Athabaskan wife and their four daughters, between the ages of 2 and 14. During the winter months, this man runs several traplines as far as 20 miles from Dot Lake by snowmachine. He jokes that of all the trappers in Dot Lake, he works the longest and is the least successful, since he is still learning from some of the older "retired" trappers, including the elderly man of Case A. Although he prefers to trap lynx because of its high value, he says that all furbearer species are worth going after and every pelt helps cover the costs of snowmachine gas and maintenance. He sells his furs to buyers who come to Dot Lake on a weekly basis, or he may travel to Tok or Northway to sell furs. During the late spring, summer and early fall months, he works on road construction projects through a labor union. For the last two years he's been fortunate enough to work close to home, out of either Tok or Delta Junction. Including the necessary 50 mile one-way commute, he is gone up to 12 hours a day, 6 days a week. His wife works as a custodian at the Dot Lake School 20 hours per week for the nine months that school is in session. She also holds a contract for 10 hours per week of housekeeping work for some of the elderly or disabled residents of the community. Although much of this family's time is devoted to wage employment,

they still engage in a wide spectrum of local resource harvest activities. During a holiday weekend in summer, the entire family will travel to the Copper River with several other related households to catch salmon with the use of a relative's fishwheel. Upon returning to Dot Lake, the woman spends several days cutting, freezing and canning fish. The family will also stay for a week at the woman's mother's whitefish camp helping to pull whitefish from nets, cut them, dry them and tend the fire. A predominant summertime activity for the woman and her daughters is berry picking. They will drive as far away as Paxson (150 miles) with the woman's sisters' families and her mother to gather berries in their favorite spots. Most berry picking sites, however, are located within walking distance of the highway, although reaching those sites requires driving 15-20 miles from the village. When not out berry picking, the woman and her daughters are canning, freezing, and making the berries into pies, breads and "Indian ice cream". In the fall they gather roots along the river from the woman's brother's riverboat, as they do not have a riverboat of their own. The couple may drive together in their station wagon during the evenings along the highway during the moose hunting season scoping for moose, or the man may hunt alone on his way home from work. If they are successful in killing a moose, the work of butchering is carried out at home, sometimes with help from related members of other households. This family often gives meat to the family of Case A, although the two families are not directly related.

INTERRELATIONSHIPS

Employment and Income. Opportunities for wage employment at Dot Lake are neither abundant nor dependable. Men who are away from home for seasonal construction work cannot spend as much time engaged in resource harvest activities as they would prefer. Nonetheless, they take advantage of any spare time during evenings and on weekends to fish during the summer and hunt for big game in the fall. If they work full-time, they will tend not to go trapping, since they are concerned that traps should be checked every three or four days. Households with relatively higher incomes can afford to buy snowmachines and riverboats, items which expand their access to hunting, fishing and trapping areas. On the other hand, households with relatively low incomes are active in a diversity of resource harvest activities, all of which incorporate the use of an automobile, even an old run-down one, for transportation.

Roads. Older residents state that prior to construction of the Alaska Highway, camps, cabins and villages were located on the Tanana River, on creeks or at lakes, sites which allowed strategic access to wild resources. Travel was by boat, by dog team and on foot. Automobiles and motorized riverboats have enabled the residents to have continued access to some of the same areas used in the past. Residents with access to riverboats utilize one of three boat landings on sloughs of the Tanana River, each approximately five road miles from Dot Lake. The Alaska Highway represents a corridor of access to nearly all resource harvest activities for all households, including moose and bear hunting, small game and waterfowl hunting, furbearer trapping, plant gathering, and fishing. Compared to other means of transport (such as riverboat or aircraft), automobiles are relatively inexpensive to own and operate and provide all residents of

Dot Lake the means to engage in resource harvest activities, regardless of income level or age.

Regulations and User Conflict. Dot Lake residents report that regulations have become increasingly restrictive over the last several years, especially with regard to big game. They also remark that increased use of local areas by non-local hunters from Ft. Greeley, Ft. Wainwright, Eielson Air Force Base, Delta Junction, Tok, and Fairbanks is resulting in a reduction of game populations (especially moose) and therefore increased competition with Dot Lake residents for wild food resources. The Alaska Highway affords non-local hunters relatively inexpensive access to the local area by automobile. The predominant concern expressed in Dot Lake during the summer of 1982 was that game populations would soon be depleted due to increased hunting pressure and local development and that residents would no longer be able to depend on local resource harvest activities, which have traditionally formed the basis of their livelihood.

CHAPTER 6

NOME: RESOURCE USES IN A MIDDLE-SIZE REGIONAL CENTER OF NORTHWESTERN ALASKA

By Linda J. Ellanna

PREFACE

The Nome case study illustrates resource uses in a regional center which provides service and trade functions for a remote area of Alaska. Systems of fishing and hunting in other regional centers like Barrow, Bethel, Dillingham, and Kotzebue may be similar to these of Nome. Nome is a "moderate" sized Alaskan community (3,249 people in 1982). The community was founded in 1898 and increased rapidly through 1900; it then declined until it reached 852 in 1920. Nome's current population is heterogeneous, with varying places of origin (47.1 percent are from outside the region), different cultural backgrounds (58.5 percent are Alaska Natives), and a range of years of residency in Nome (residency of Native households averages 26.5 years compared with 9.6 years for non-Native households average). Income levels and wage security vary greatly across subgroups in Nome.

There is a long history of resource use in the Nome area. Ellanna's random survey of households revealed substantial levels of resource use by a large proportion of Nome households. Extent of participation in the fishing and hunting system was found to vary by a household's length of residency and place of origin. Nome shows a relatively stable and complex seasonal round of fishing and hunting activities, great numbers of species used, high volumes of output, and substantial labor investments in food production. Harvests frequently are conducted within kinship-based production

units, and extensive networks of distribution and exchange link households.

Ellanna's data reveal that identifiable subgroups, or enclaves, exist in Nome exhibiting somewhat different resource uses. For instance, residents origination on King Island hunt marine mammals during spring with umiak crews. Residents from outside the region generally do not hunt sea mammals and profess a lack of proficiency on spring sea ice. The road system around Nome is used by many households for access to fishing camps and hunting areas. Nome residents commonly maintain ties with persons living in villages of the surrounding region. Nome illustrates that complex system of resource use occur in regional centers with relatively moderate population sizes.

SOCIOECONOMIC AND ENVIRONMENTAL SETTING

Nome, regional center of the Bering Straits Region, is a community of 3,249¹ people located on the southwestern coast of the Seward Peninsula, 535 air miles northwest of Anchorage (Figure 17) (City of Nome 1982). The community is located in a subarctic, coastal setting characterized by rolling topography; tundra vegetation; cold maritime winters with cool summers, moderate precipitation, and high average winds; seasonal sea-ice; and habitats contemporarily supporting numerous species of terrestrial mammals, marine mammals, migratory waterfowl, salmon, anadromous and freshwater fish, and intertidal invertebrates (Table 24 lists resources important to area residents). Various minerals occur in quantities of potential and actual commercial value.

Today, Nome's infrastructure includes an elementary and combined junior-senior high school; city utilities (the sewer-water system coverage

¹ This population total includes the city's 1982 annexed area.

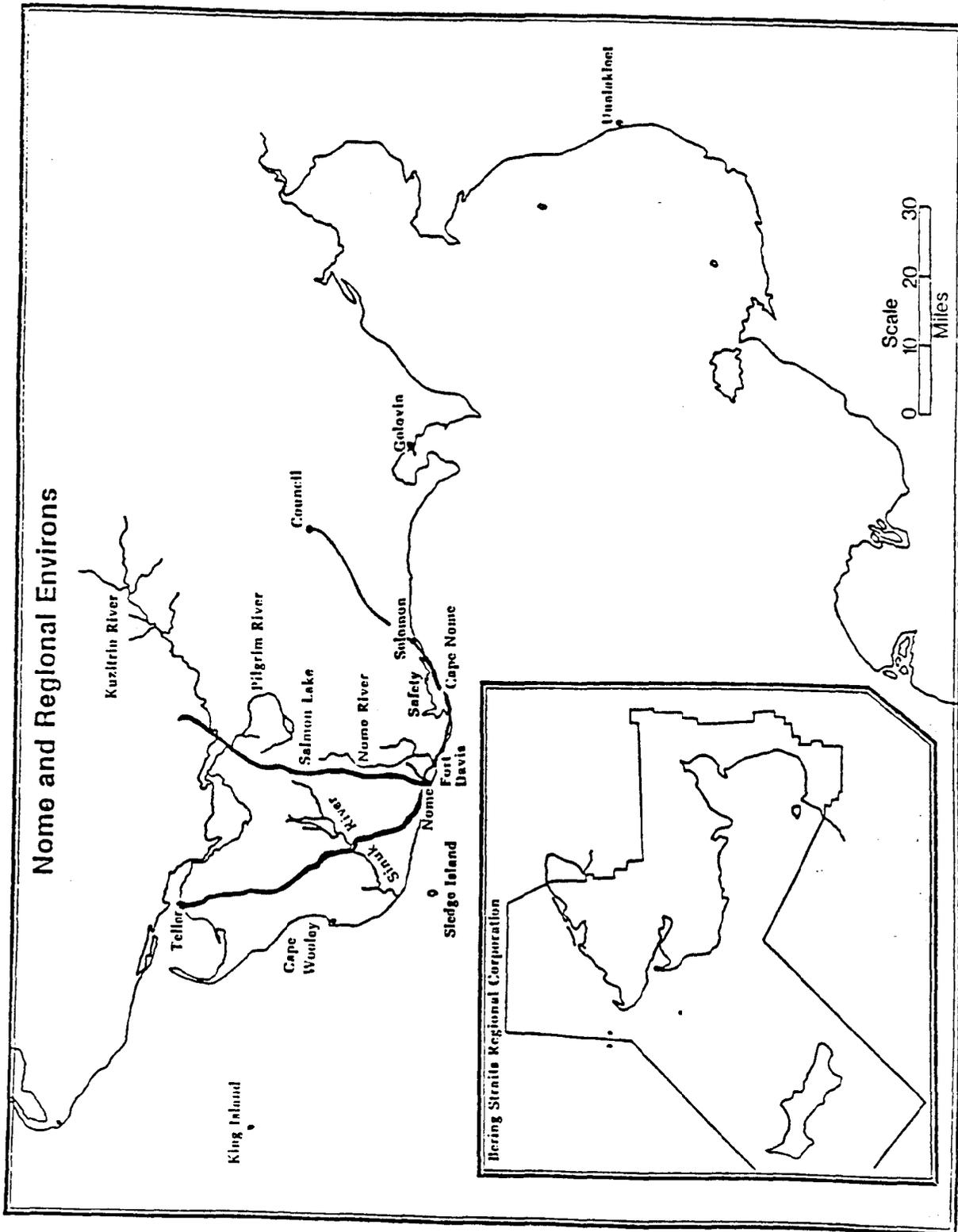


Figure 17. Nome and Regional Environs

TABLE 24

BIOTIC RESOURCES UTILIZED BY RESIDENTS OF THE
BERING STRAIT/NORTON SOUND STUDY AREA ^{1/2}

<u>Common Name</u>	<u>Scientific Name</u>
<u>Primary Food and Raw Material Sources</u>	
whale, bowhead	<u>Balaena mysticetus</u>
whale, belukha	<u>Delphinapterus leucas</u>
walrus, Pacific	<u>Odobenus rosmarus</u>
seal, bearded (<u>ugruk</u> or <u>mukluk</u>)	<u>Erignathus barbatus</u>
seal, harbor or spotted	<u>Phoca vitulina</u>
seal, ringed	<u>Phoca hispida</u>
salmon, king	<u>Oncorhynchus tshawytscha</u>
salmon, silver	<u>Oncorhynchus kisutch</u>
salmon, chum	<u>Oncorhynchus keta</u>
salmon, humpback	<u>Oncorhynchus gorbuscha</u>
salmon, sockeye	<u>Oncorhynchus nerka</u>
moose	<u>Alces alces</u>
caribou or reindeer	<u>Rangifer tarandus</u>
whitefish, broad	<u>Coregonus nasus</u>
whitefish, humpback	<u>Coregonus pidschian</u>
sheefish	<u>Stenodus leucichthys</u>
<u>Secondary Food and Raw Material Sources</u>	
seal, ribbon	<u>Phoca fasciata</u>
whale, grey	<u>Eschrichtius gibbosus</u>
bear, polar	<u>Ursus maritimus</u>
bear, black	<u>Ursus americanus</u>
bear, grizzly	<u>Ursus arctos</u>
beaver	<u>Castor canadensis</u>

¹ Not all of the biotic resources are harvested by all communities within the study area because of the ecological and cultural diversity of the region. However, residents of communities in which certain resources are not accessible may travel to other areas to hunt, fish, or gather desired resources or they may indirectly participate in fish, game or plant foods and raw materials obtained by another community through regional trade networks.

² Ellanna 1980, pp. 241-243.

TABLE 24 (continued)

<u>Common Name</u>	<u>Scientific Name</u>
<u>Secondary Food and Raw Material Sources (continued)</u>	
squirrel, arctic ground	<u>Citellus parryi</u>
porcupine	<u>Erethizon dorsatum</u>
hare, arctic	<u>Lepus arcticus</u>
hare, snowshoe	<u>Lepus americana</u>
auklet, least	<u>Aethia pusilla</u>
auklet, crested	<u>Aethia cristatella</u>
auklet, parakeet	<u>Cyclorhynchus psittaculus</u>
eider, common	<u>Somateria mollissima</u>
eider, king	<u>Somateria spectabilis</u>
eider, spectacled	<u>Lampronetta fisheri</u>
eider, Stellar's	<u>Polysticta stelleri</u>
oldsquaw	<u>Clangula hyemalis</u>
pintail	<u>Anas acuta</u>
black brant	<u>Branta nigricans</u>
snow goose	<u>Chen hyperborea</u>
white fronted goose	<u>Anser albifrons</u>
crane	<u>Grus canadensis</u>
murre, common (particularly eggs)	<u>Uria aalge</u>
murre, thick billed (particularly eggs)	<u>Uria lomvia</u>
ptarmigan, willow	<u>Lagopus lagopus</u>
ptarmigan, rock	<u>Lagopus mutus</u>
crab, king	<u>Chionoectes opilio</u>
crab, tanner	<u>Paralithodes platypus</u>
clams	<u>Macoma calcerea</u>
blackfish	<u>Dallia pectoralis</u>
char, arctic	<u>Salvelinus alpinus</u>
cod, saffron	<u>eleginus gracilis</u>
tomcod, Pacific	Various
flounder, arctic	<u>Boreogadus saida</u>
grayling	<u>Thymallus arcticus</u>
pike, northern	<u>Esox lucius</u>
herring, lake	<u>Coregonus sardinella</u>
herring, Pacific	<u>Clupea harengus</u>
halibut, Pacific	<u>Hippoglossus stenolepis</u>
smelt	<u>Osmerus mordax</u>
mussels (several species)	unknown
sculpin	<u>Cottus cognatus</u>
hurbot	<u>Lota lota</u>
whitefish, least cisco	<u>Coregonus albula</u>
whitefish, arctic cisco	<u>coregonus autumnalis</u>
seaweed	unknown

TABLE 24 (continued)

<u>Common Name</u>	<u>Scientific Name</u>
<u>Secondary Food and Raw Material Sources (continued)</u>	
greens	<u>Rhodiola rosea</u>
potato	<u>Claytonia tuberosa</u>
willow leaves	<u>Salix (species ?)</u>
sourdock	<u>Rumex archius</u>
salmonberry (cloudberry)	<u>Rabus chamaemorus</u>
crowberry	<u>Empetrum nigrum</u>
blueberry	<u>Vaccinium uliginosum</u>
cranberry	<u>Vacconium vitis-idaea</u>
whortleberry	<u>Vaccinium uliginosum</u>
<u>Raw Material</u> ¹	
fox, arctic	
fox, red	
lynx	
marmot, hoary	
marten	
mink/weasel	
muskrat	
wolf	
wolverine	
driftwood	
willow	
alder	
spruce (black & white)	
birch	
sod	

¹ Traditionally most furbearers were not used for food except in times of food shortage. Today they are primarily harvested for use on clothing, for barter, and for limited sale.

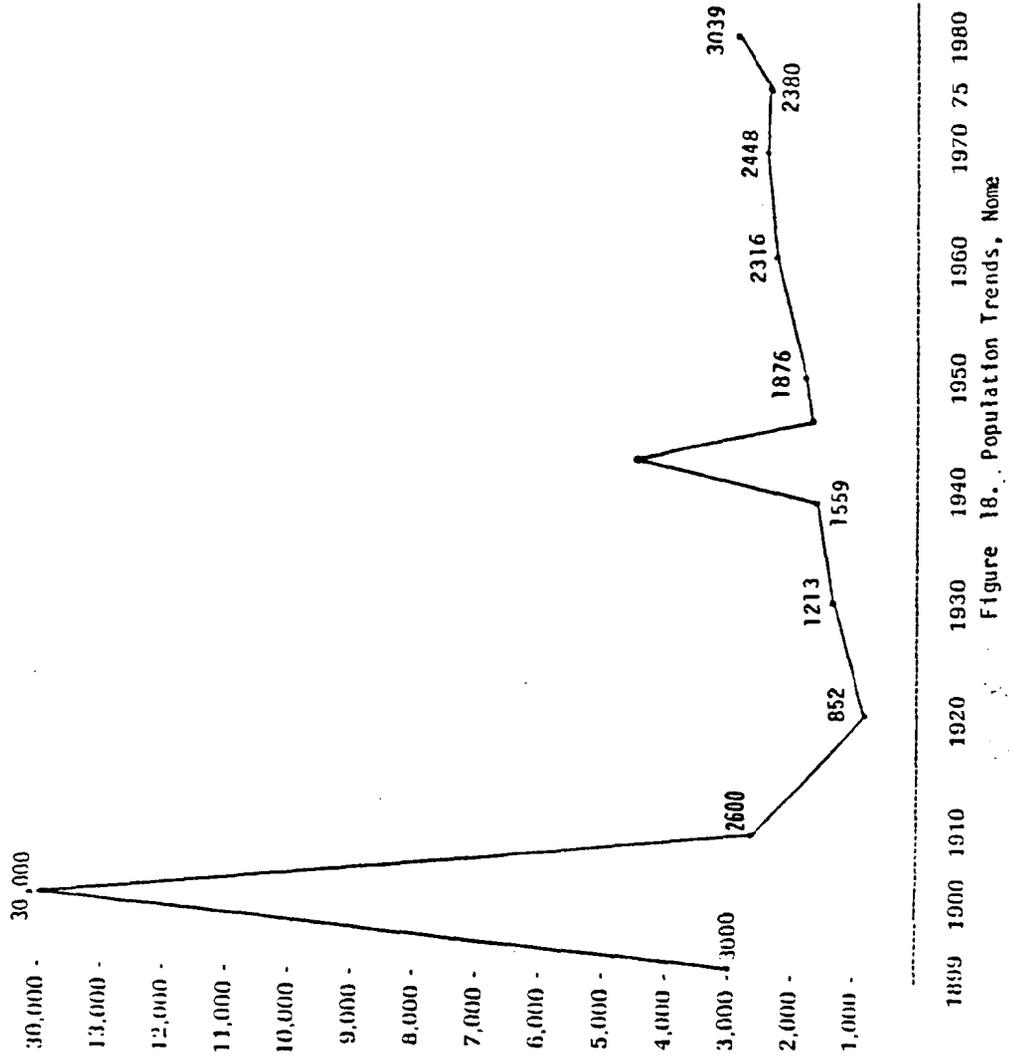
has been limited with major expansion occurring in 1982 and 1983); daily jet service by two carriers and daily local flights by five air taxi operators; a 19-bed hospital/clinic; a jetty and lighterage operation; two radio stations and one television system; Northwest Community College; a senior citizens complex, a youth treatment facility; a state jail; offices of multiple state and federal agencies; and a variety of stores, restaurants, and other businesses.

The community of Nome was established in 1898 following the discovery of gold at Anvil Creek. The population quickly peaked at an estimated 30,000 or more gold seekers in 1900, this rapidly declined to a low of 852 in 1920 (Figure 18).

The specific site of Nome was not a traditional Inupiat village, primarily because of unfavorable sea ice conditions and relatively restricted resource availability. However, the town persisted after the "gold rush" period because of limited continuing minerals extraction and its growing role as a regional service center, the focus of western cash-based commerce in northwestern Alaska. Nome became a trade center for commercial goods, seasonally attracting local Natives who participated in the cash economy through trade, ivory carving, and seasonal work such as longshoring. In addition, disease epidemics of the first two decades of the 1900s decimated large numbers of area residents, resulting in severe social and economic disruption to families and communities. Many survivors of these epidemics relocated in Nome where the western institutions of church and hospital had begun to function.

The community experienced another flurry of population growth and activity during World War II when it was anticipated that Nome was to be the target of a 1942 Japanese invasion. The population increased as Nome was

POPULATION TRENDS: NOME



Source: 1899, 1900, and 1944 estimates based on Ellanna (1980); 1910-1940 and 1950-1970 data from Ender et al (1979); 1975 data from Ellanna and Roche (1976); 1980 data from Alaska Department of Labor. U.S. Census data may not be reliable for certain Alaska communities.

developed into a strategically important military base for the U.S./Russian lend-lease effort and Alaska Territorial Guard. Nome was the location of a large airfield, medical facility, and a substantial residential facility. The related trade and cash employment opportunities resulted in a considerable migration of men, primarily from local villages to Nome during the years 1941-1945. The population leveled off in 1930 at 1500 and has increased gradually to the present time (Figure 18).

Today, Nome's 3,249 population includes both the city proper (population 3,039) and its newly annexed area (encompassing the Icy View subdivision, Alaska Gold, William E. Beltz School, airport, Federal Aviation Administration housing, and State Department of Transportation mobile homes) (City of Nome 1982). This figure includes the relocated Inupiat population of King Island, a spatially, socially, and culturally distinct subcommunity of Nome with a 1976 population of 215 (Ellanna and Roche, 1976). The composition of Nome's population in 1980 was 53 percent male, 47 percent female (see Appendix of population pyramids); 57.1 percent Eskimo, 39.1 percent Caucaasian, 1.4 percent other Alaska Native, and 2.4 percent other ethnic affiliations (see Appendix). The median age was 26.0 years, an increase from 21.6 in 1976 (U.S. Census, 1980). The total number of households in 1981 is estimated by the City to be 963 (with another 49 housing units classed as "unoccupied"), a substantial increase in household number from the 1976 figure of 577 (Ellanna and Roche, 1976). It is expected that the increased number of households largely reflects the recently expanding construction of new housing units, which, in part, has brought about the spatial fissioning of large, extended family households, composed primarily but not exclusively of Alaska Native residents. This observation is verified by the decrease in mean household size from 4.1 in 1976 to 3.1

in 1981. By way of contrast, the King Island subcommunity had 43 households in 1976 with a mean household size of 5.0, reflecting the continued presence of larger, extended family households among this enclave. The random sample surveyed by the Division of Subsistence in September 1982 revealed an average household size of 3.3 for Nome as a whole, the average for Alaska Native households at 3.9 (range 1-10) and the average for non-Native households at 2.1 (range 1-5). Approximately 38 percent of the Native households were extended family households (excluding single individual residence units), but none of the sampled non-Native households was extended.

It is of interest to note that based on 1982 Division of Subsistence research, 29.8 percent of Nome's population migrated from outside Alaska, approximately the same percentage of Nome's population which had "turned over" in the two-year period from 1976 to 1978 (Ellanna, unpublished research, 1978). Additionally, 11.5 percent comes from Anchorage or Fairbanks, 5.8 percent from elsewhere in Alaska, and 32.7 percent from villages in northwestern Alaska. Therefore 20.2 percent of the population reported Nome as their place of origin. The number of households from villages in northwestern Alaska is a reflection of the complex in- and out-migration pattern of Native people between Nome and surrounding villages (Figure 19) and the overall dynamic character of Nome's population. The 1982 data illustrate that duration of household residency in Nome varies widely. The average length of residency in Nome of Native households is 26.5 years, whereas the average for non-Native households is 9.6 years. Both averages are strongly influenced by short-term residency patterns. For Natives this pattern primarily involves village residents who come to town for a short time to engage in wage employment, receive medical care, attend school,

PLACE OF PREVIOUS RESIDENCY OF
NOME HOUSEHOLD HEADS (1982)

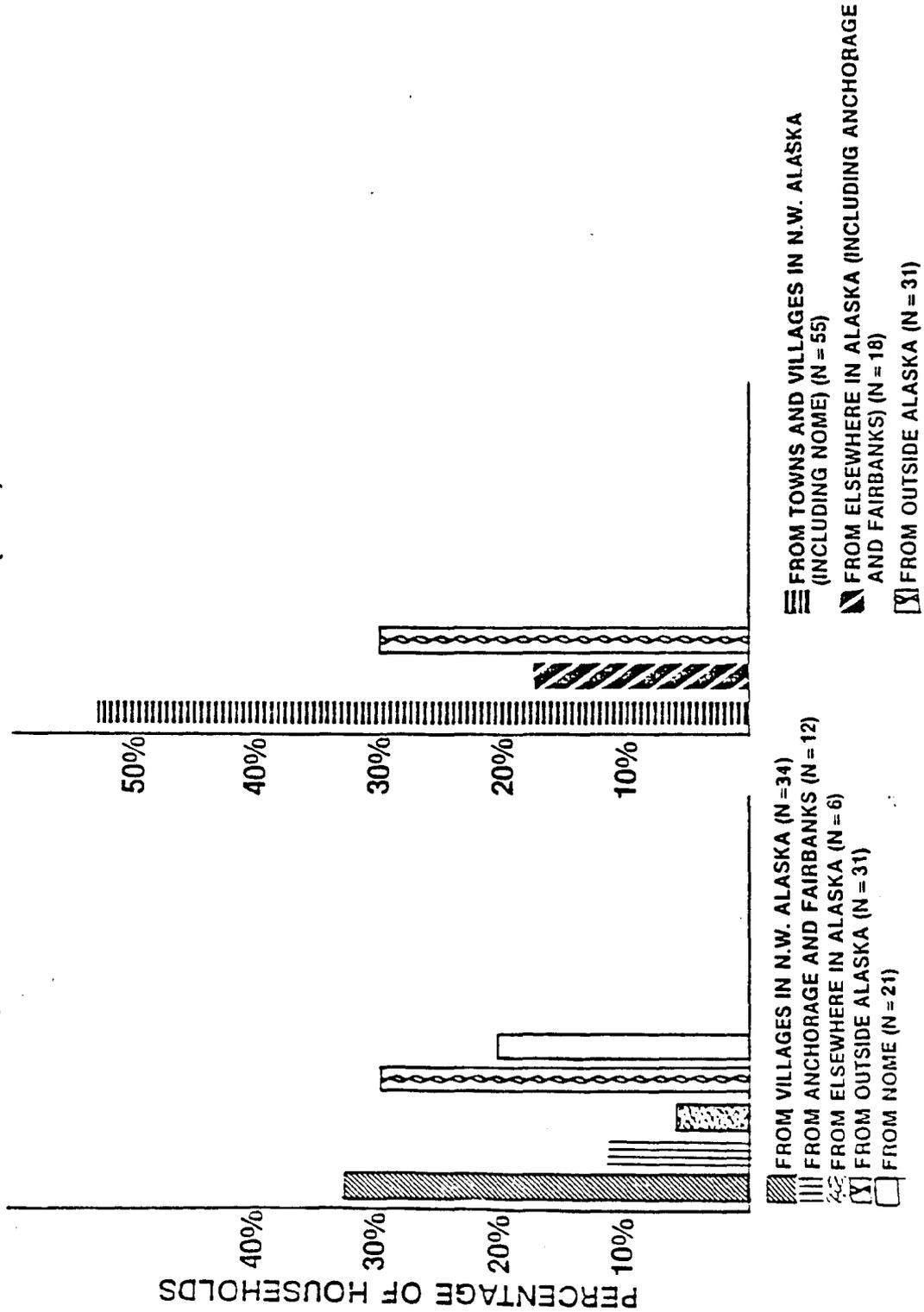


Figure 19. Place of Previous Residency of Nome Household Heads (1982)

or visit relatives who reside more permanently in Nome. For non-Natives this pattern primarily reflects the large number of formally educated and/or experienced professionals hired from outside of Nome to hold high-salaried positions requiring educational levels and/or experience not frequently occurring among Nome's long-term resident population (these individuals turn over in their jobs of approximately every two years on the average).

Nome is the center of wage employment for the region, having 62-66 percent of the region's employment and 70 percent of the regional wages (Ender et al. 1979: 51; City of Nome brochure, 1982). Table 25 and Figure 20 detail categories of positions in Nome and 1982 Nome employment configurations. There are several distinguishing characteristics of employment patterns and wage income in Nome.

The cash economy of Nome is heavily reliant on the community's role as a service center to the Bering Straits Region for both the governmental and private sectors. Whereas the governmental sector is relatively stable (city, state and federal including agencies, such as Norton Sound Health Corporation funded by federal monies), it includes a large number of positions requiring a college degree and/or substantial professional experience. In 1980 42.3 percent of Nome's 57 percent Alaska Native population had attended only elementary school and only 1.2 percent had four-year degrees (U.S. Census, 1980). In contrast 43.5 percent of the 39 percent non-Native population of Nome had at least four years of college. These statistics reflect the fact that employees for many of Nome's government-related service positions are recruited from outside of Nome and, in part, from outside of the State. Even organizations dedicated to local hire, such as Norton Sound Health Corporation, employ a staff which includes only 50

TABLE 25

NOME EMPLOYMENT DISTRIBUTION - NOVEMBER 1979^a

Category	Units	Full- time Employ- ment	Part- time Employ- ment	Total full-time Employ- ment	Summer Seasonal Adjustment			
					Local Hire	Non- Local	Total	
Mining	1	25	0	25	+50	+110	+160	
Construction	3	10	0	10	Depends on Contracts ^b			
Manufacturing	2	2	3	3.5	---	---	---	
TUC ^c	17	129	13	135.5	+ 3	+ 27	+ 30	
Air Transportation	(6)	(64)	(5)	(66.5)	---	---	---	
Trade	32	148	24	160	+ 8	---	---	
Fire ^d	6	24	1	24.5	No Reliable Info.			
Services ^e	37	261	17	269.5	No Reliable Info.			
Churches	(10)	(15)	(0)	(15)	Summer Camps			
Federal Government	9	66	0	66	0	+ 4	+ 4	
BIA	(1)	(24)	(0)	(24)	---	---	---	
FAA	(1)	(21)	(0)	(21)	---	---	---	
Post Office	(1)	(8)	(0)	(8)	---	---	---	
Natl. Weather Svc.	(1)	(6)	(0)	(6)	---	---	---	
State Government	16	185	54	185	- 3	---	- 3	
Transportation	(1)	(88)	(0)	(88)	(+10)	---	(+ 10)	
Natl. Guard	(1)	(15)	(46) ^f	(15)	---	---	---	
Correctional Ctr.	(1)	(13)	(0)	(13)	---	---	---	
NWC College	(1)	(13)	(8) ^g	(13)	(-13)	---	(- 13)	
Local Government	3	191	2	192	-114 ^h	---	-114	
City	(1)	(24)	(2)	(25)	---	---	---	
Bering Strait School Dist.	(1)	(35)	(0)	(35)	(-15)	---	(- 15)	
Nome Public School	(1)	(132)	(0)	(132)	(-99)	---	(- 99)	
TOTAL		<u>126</u>	<u>1041</u>	<u>114</u>	<u>1071</u>	<u>-56</u>	<u>+141</u>	<u>+ 85</u>

a. Taken from Ender et al., 1979, p. 33

b. Construction employment is unpredictable with large scale employment tied to summer opportunities.

c. Transportation, Utilities, Communication.

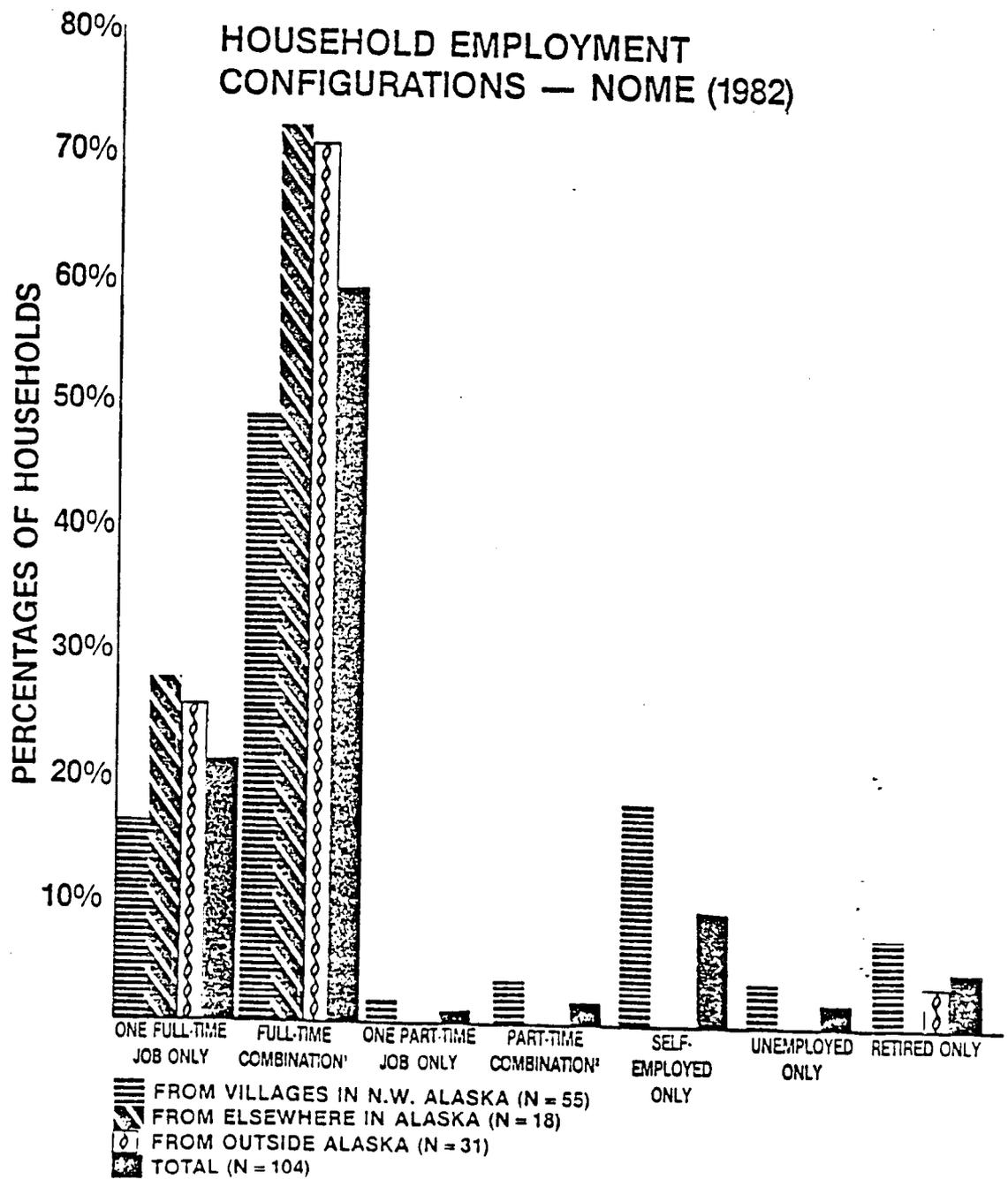
d. Finance, Insurance, Real Estate (including profit native corporations).

e. Services includes Norton Sound Health Corporation and non-profit Native corporations.

f. Uniformed weekend personnel not counted in civilian employment.

g. Adjunct faculty primarily not counted elsewhere as full-time employees, or not counted here.

h. All counts here are school teachers who are considered full-time employees. They are noted here because a portion seek summer employment or pursue subsistence activities even though full-time equivalent.



¹ Two or more household income sources, at least one of which is a full-time job (including two or more full-time)

² Two or more household income sources, at least one of which is part-time and none of which are full-time (including two or more part-time jobs)

Figure 20. Household Employment Configurations, Nome, (1982)

percent local residents -- largely because of the corporation's need for medical expertise. Nome employment statistics which fail to make these distinctions are misleading.

Conversely, unskilled wage employment is both seasonal and sporadic (such as employment with Alaska Gold Company and construction work). It is estimated that in Nome there are 200-300 new jobs, mostly unskilled, during summer months (mid-June through the end of August). For example, in 1981 Alaska Gold employed 180-190 people during July and August. Of the 100-158 unskilled positions, 30-53 involved local hire; 26 of 31 skilled, non-management positions were locally hired; and only one management position was locally hired. Although the construction companies employ greater percentages of local residents (for instance, in 1982 Doyon-Ghemm employed local residents for approximately 60 percent of its summer positions), the level of construction activities in Nome varies greatly from year to year and depends on a complex of other factors in the local, state, and national economies.

The limited or sporadic nature of opportunities for wage employment in Nome and the large population segment of Nome lacking a college education and/or significant levels of professional experience contribute to a high turnover rate within jobs, considerable competition for unskilled wage positions, and an unstable cash flow for many resident households. In 1978 a single large employer, Norton Sound Health Corporation, reported a 50.2 percent staff turnover, while employment turnover for the community as a whole was 72 percent (Ender et al. 1979).

Income levels in Nome reflect the nature of wage employment described above. Figure 21 illustrates the distribution of household incomes in 1980. In 1979, 26.4 percent of the non-Native and 64.2 percent of Native

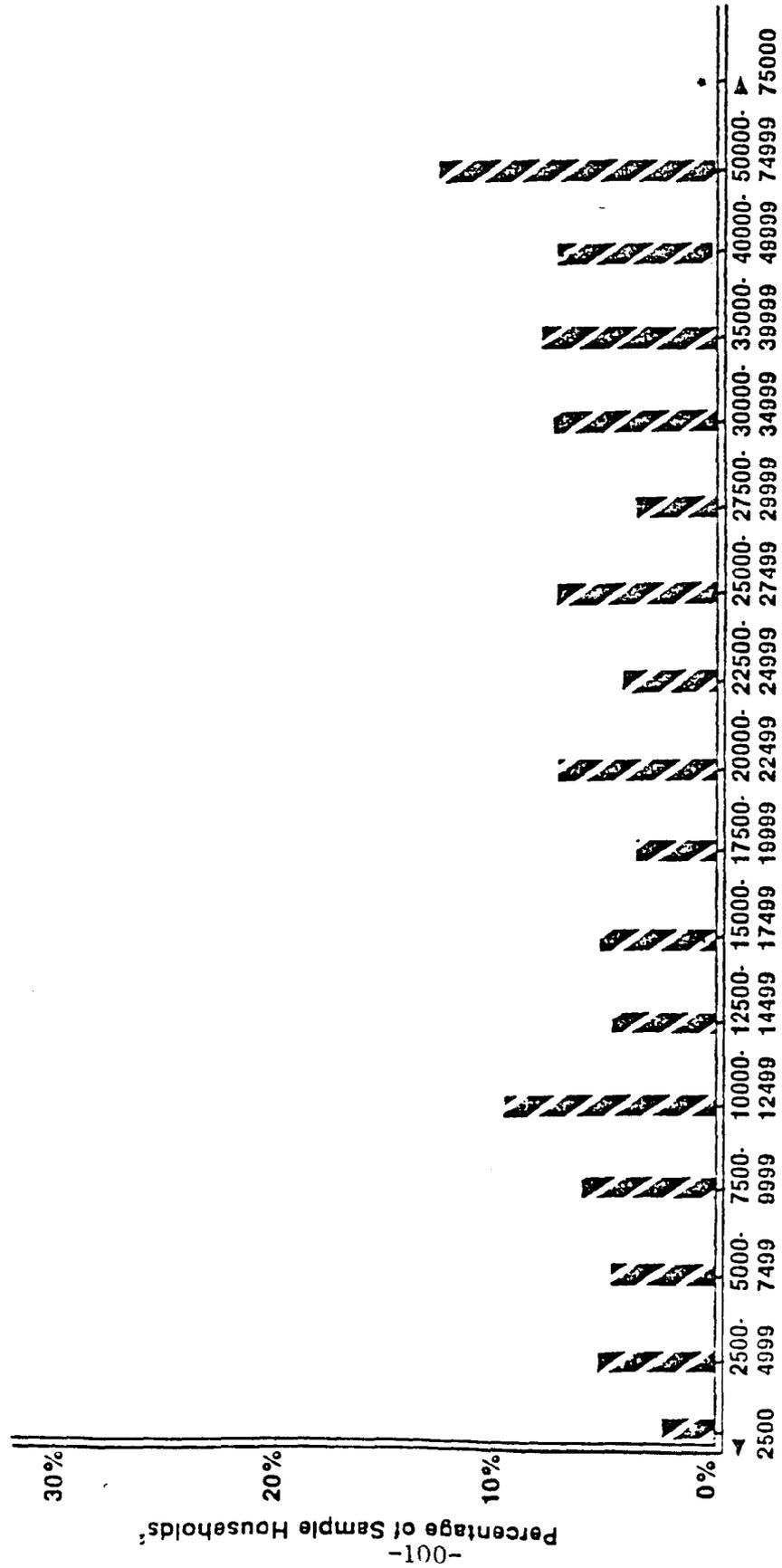


Figure 21: Household Income (Dollars) — 1979, Nome 1

1 U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3

²N = 693

* no data available

families made less than \$25,000 annually (U.S. Census 1980). The median family income in 1979 was \$27,407. Unskilled summer laborers can expect to gross \$16-17,000 in a season. No income data were elicited in the 1982 Division of Subsistence survey. Income should, of course, be evaluated in light of price differentials between Nome and the remainder of the state. Ender et al. (1979) established that in 1978 a moderate standard of living in Nome cost 1.7 times more than the same level in Anchorage. The 1981 family budget required for a moderate standard of living in Nome, computed by the Alaska Department of Commerce and Economic Development, was \$43,389. Cost of living differentials are extended mainly to people with full-time employment; therefore little economic buffer is provided to households deriving the majority of their cash income from part-time or self-employment.

Commercial fishing is not a major source of cash to Nome residents. In the period 1969-1976 the number of commercial fishermen reporting Nome as their home community increased from 7 to 24. In 1981 there were 34 commercial fishermen resident in Nome. Income ranges from commercial fishing are depicted in Table 26.

Transfer payments supply cash to a small minority of Nome households. In July 1982, there were 137 cases receiving adult public assistance; in February 1982, 47 households received food stamps; and in October 1980, 11 cases of Bureau of Indian Affairs general assistance (this last program terminated March 1, 1982).

Self-employment plays a significant economic role in Nome. These cash-earning activities include, but are not limited to, ivory carving, skin sewing, trapping, and commercial fishing (discussed separately above). In the 1982 Division of Subsistence survey, 40.9 percent of Native households and 32.0 percent of non-Native households engaged in some form of

TABLE 26

INCOME RANGES FROM COMMERCIAL FISHING FOR SALMON AND HERRING,
NOME, 1981

Total Number of Commercial Fishermen	34
Number of Salmon and Herring Fishermen	29
Percent earning less than \$1,000	24.1
" " \$ 1,000 - 9,999	75.9
" " 10,000 - 19,999	*
" " 20,000 - 29,999	*
" " 30,000 - 49,999	*
" " 50,000 - 74,999	0.0
" " 75,000 - 99,999	*
" " greater than \$100,000	0.0
Total	<u>100.0</u>

* Less than four: due to confidentiality regulations, number cannot be disclosed.

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries. (1981)

cash-based self-employment. Reference to Figure 20, however, suggests that the only households reliant solely on self-employment as a source of cash were the households from towns and villages in northwestern Alaska. There were no households from outside Alaska or elsewhere in Alaska that did not have at least one member employed full-time.

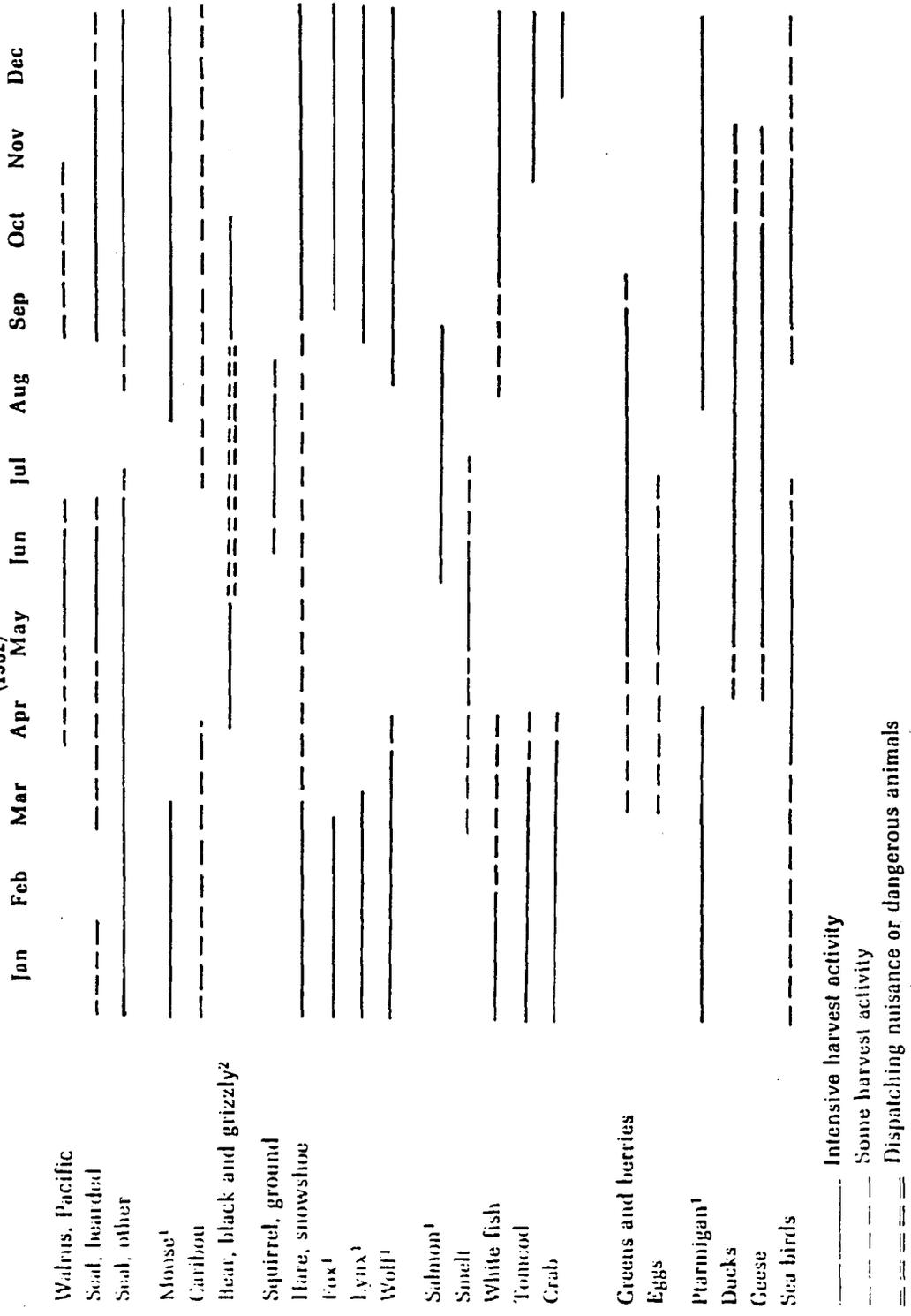
As will be clarified in the following section, the economy of the majority of households in Nome can be described as "mixed," since it integrates a heavy reliance on locally harvested fish, game and plant resources with cash derived from wage and/or self-employment and, minimally, transfer payments.

RESOURCE USE PATTERNS

Figures 22 , 23, and 24 depict the seasonal round of harvest activities for selected resources, the number of resource categories used, and the percentage of Nome households harvesting specific resource categories in 1982, respectively. These will be discussed individually.

It is important to note that patterns of resource use in Nome are homogeneous enough to permit their graphic depiction in a single seasonal round. Resource use patterns are in large part, influenced by the seasonal availability and accessibility of particular species. Accessibility is affected by both environmental and technological factors. For example, locally harvested king crab are usually taken by handlines within the first mile of shore ice. Harvesting king crab further offshore (three or more miles) is very risky in the winter because of the dynamic nature of the shore ice. Harvesting offshore in the summer requires the use of at least a large skiff and crab pots; neither these items of technology are used by most Nome resource users. Thus, the accessibility of king crab to Nome

SEASONAL ROUND OF HARVEST ACTIVITIES FOR SELECTED SPECIES, NOME
(1982)

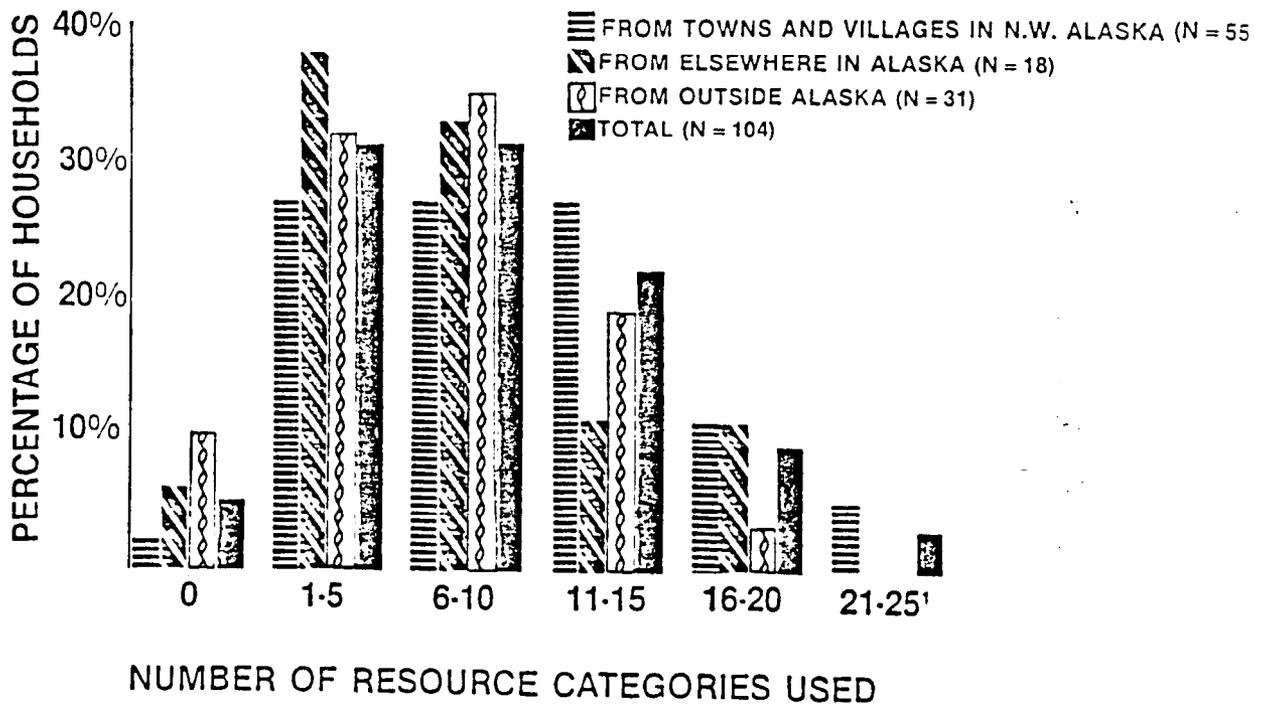


Intensive harvest activity
 Some harvest activity
 Dispatching nuisance or dangerous animals

¹Harvest periods are determined by Alaska Department of Fish and Game regulations
²Harvest periods are determined by Alaska Department of Fish and Game regulations, occasional taking of nuisance or dangerous bears also occurs in summer

Figure 22. Seasonal Round of Harvest Activities for Selected Species, Nome (1982)

NUMBER OF RESOURCE CATEGORIES USED BY HOUSEHOLD'S PLACE OF PREVIOUS RESIDENCY



¹ This number of categories must include marine mammal use.

Figure 23. Number of Resource Categories Used by Household's Place of Previous Residency.

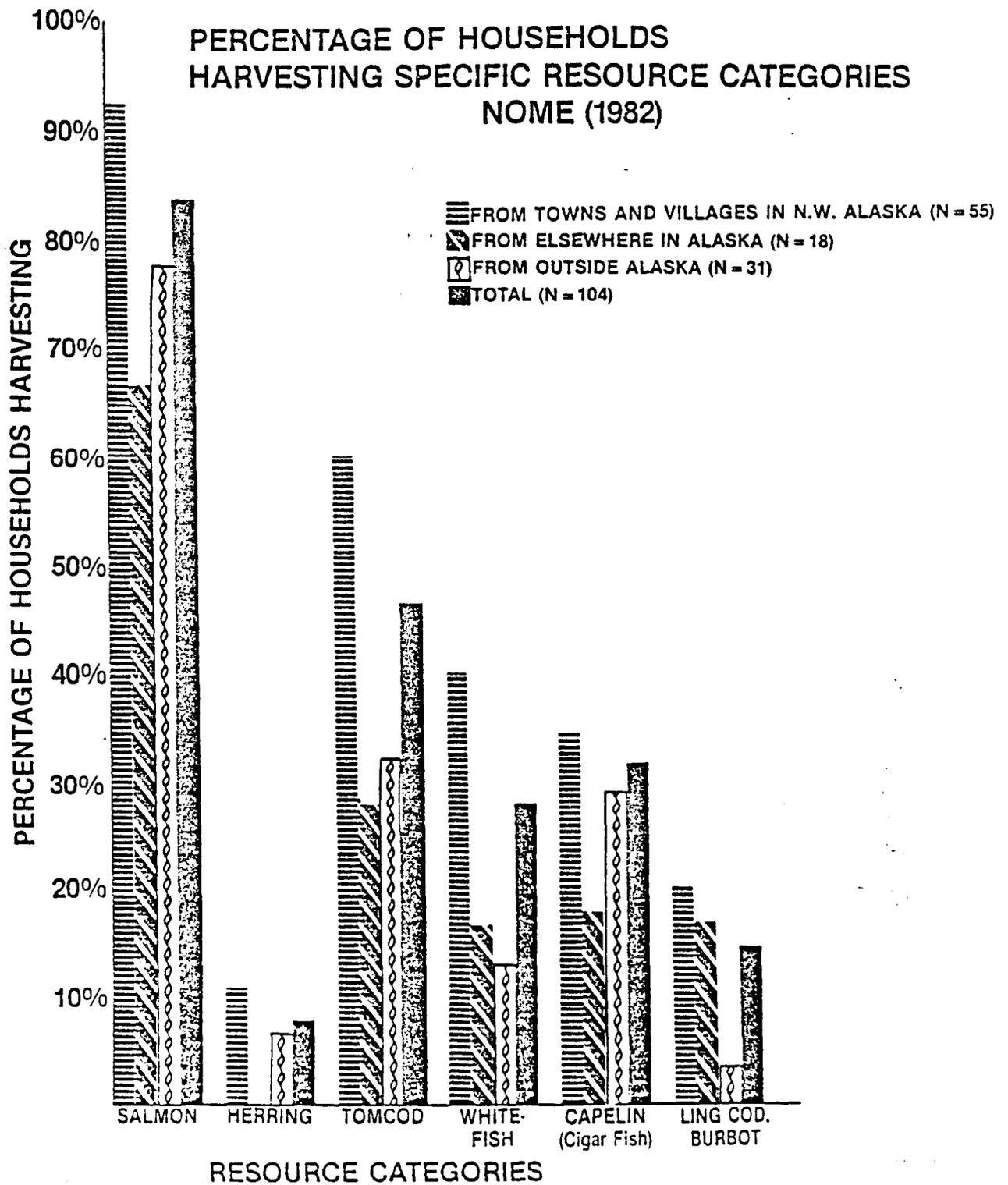


Figure 24. Percentage of Households Harvesting Specific Resource Categories, Nome (1982)

PERCENTAGE OF HOUSEHOLDS
 HARVESTING SPECIFIC RESOURCE CATEGORIES
 NOME (1982) (CONTINUED)

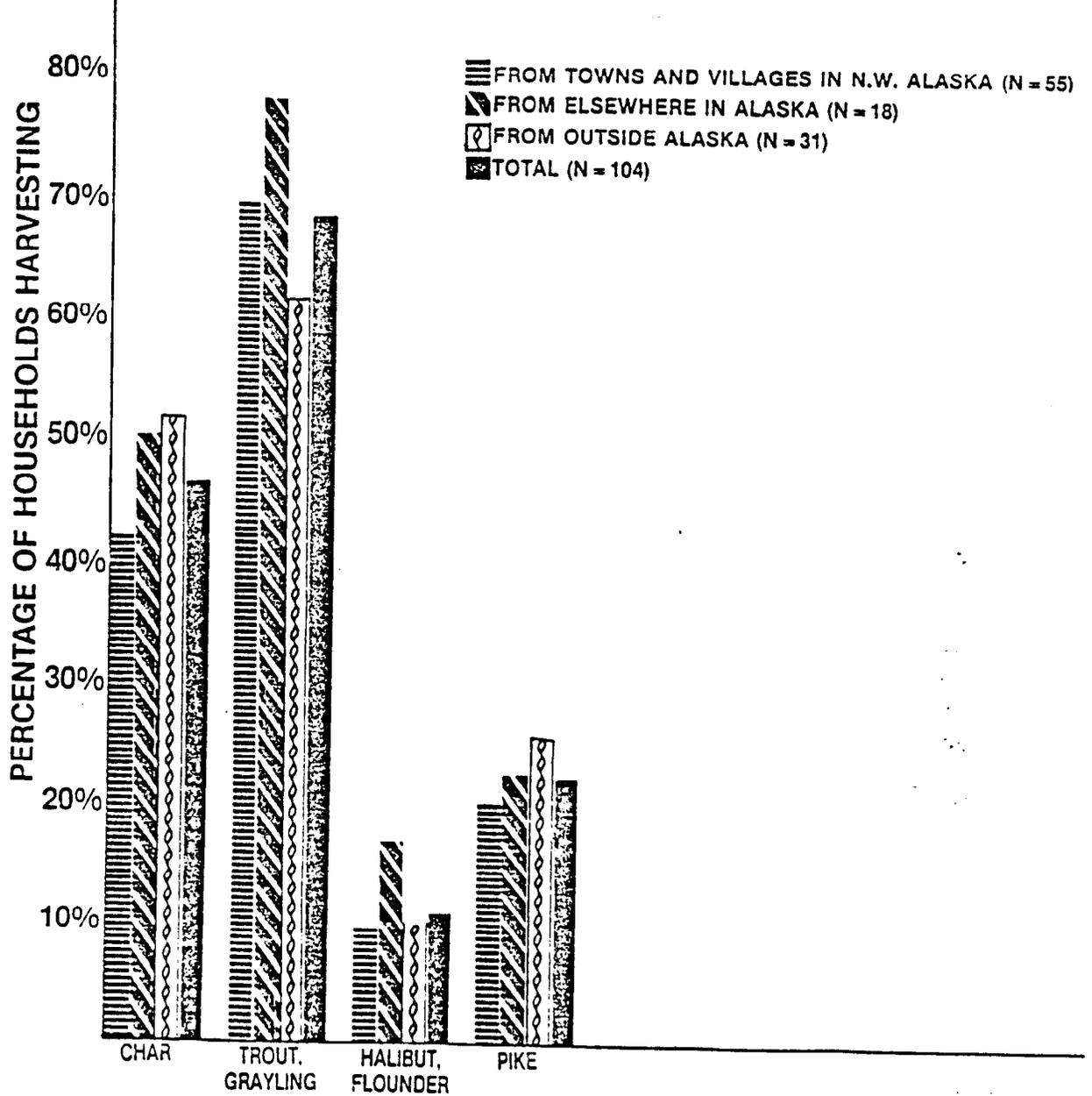


Figure 24 continued. Percentage of Households Harvesting Specific Resource Categories, Nome (1982)

PERCENTAGE OF HOUSEHOLDS
 HARVESTING SPECIFIC RESOURCE CATEGORIES
 — NOME (1982) (CONTINUED)

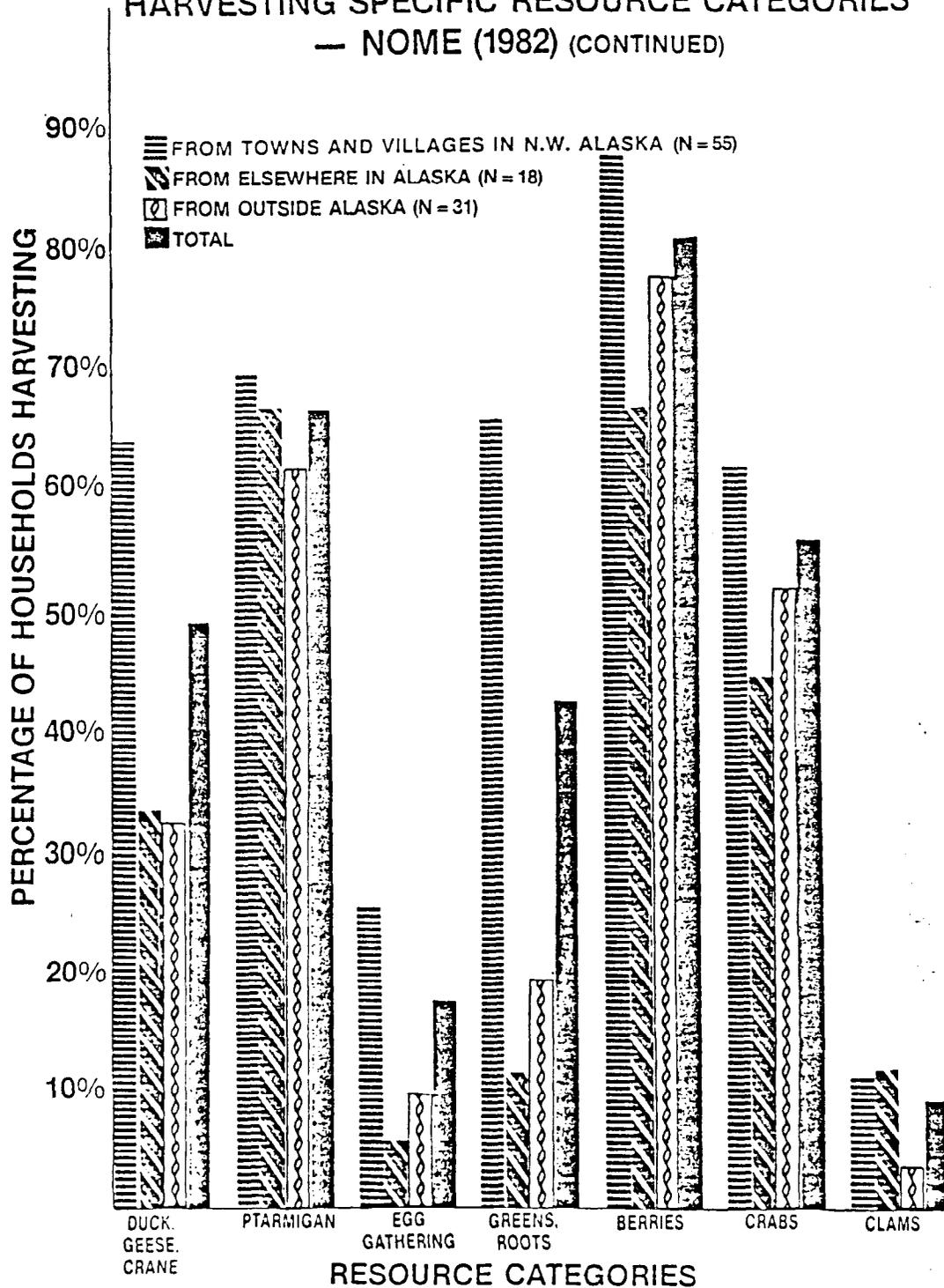


Figure 24 (cont.). Percentage of Households Harvesting Specific Resource Categories, Nome (1982)

PERCENTAGE OF HOUSEHOLDS
HARVESTING SPECIFIC RESOURCE CATEGORIES
NOME (1982) (CONTINUED)

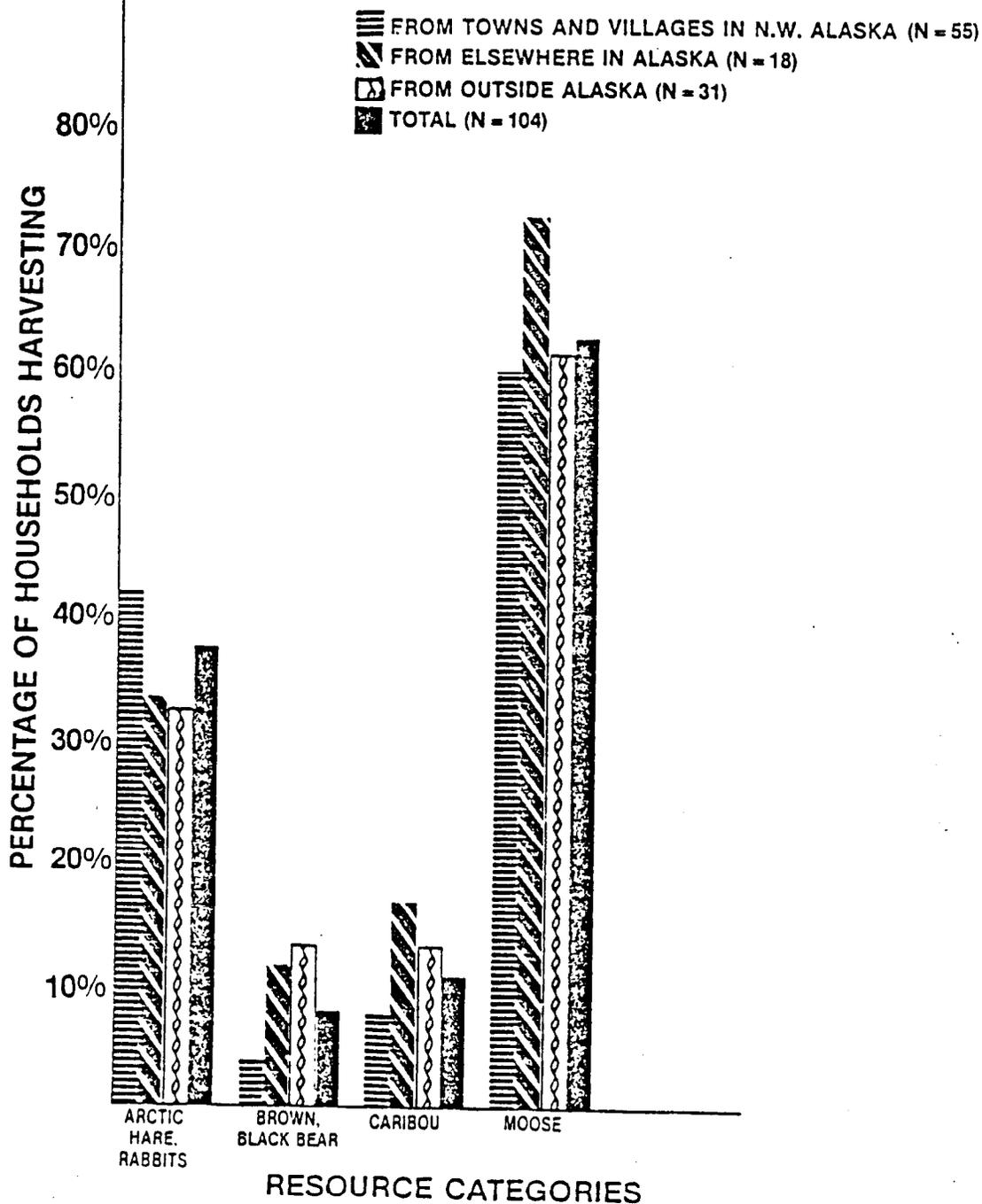


Figure 24 (cont). Percentage of Households Harvesting Specific Resource Categories, Nome (1982)

PERCENTAGE OF HOUSEHOLDS HARVESTING SPECIFIC
RESOURCE CATEGORIES — NOME (1982) (CONTINUED)

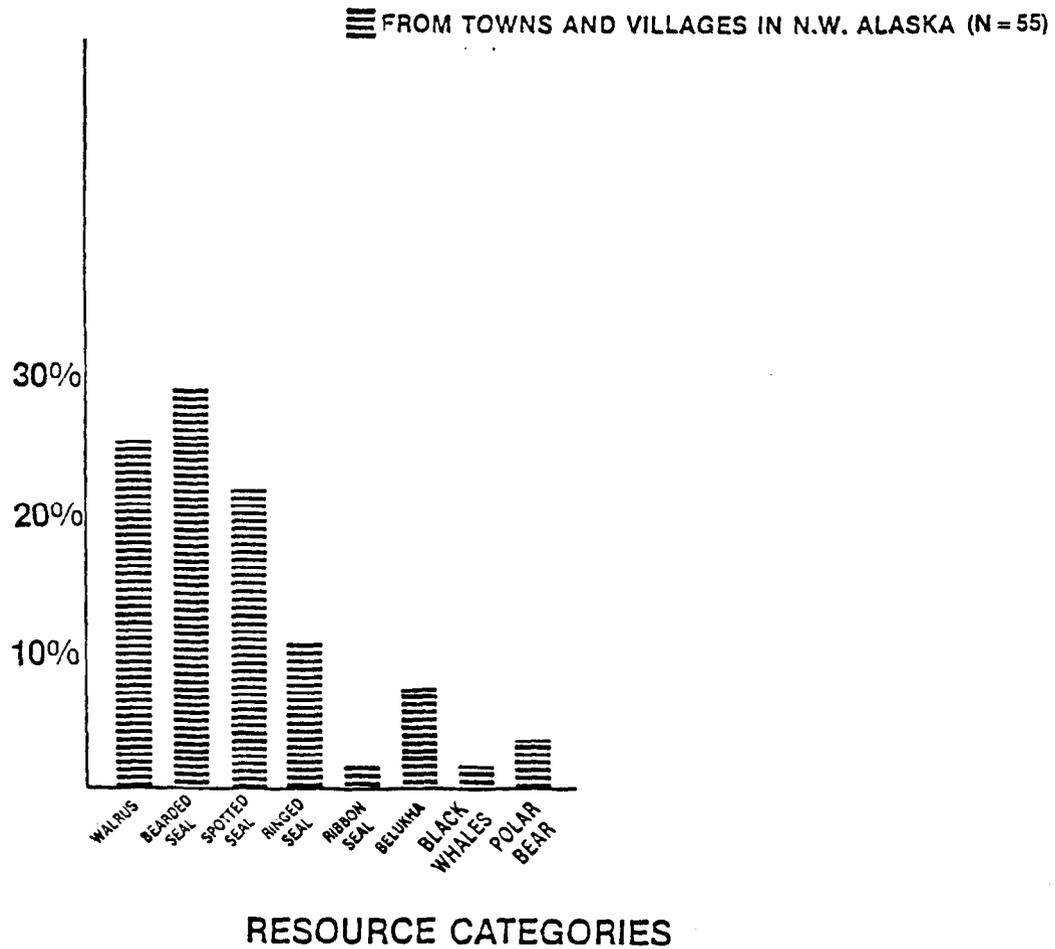


Figure 24 (cont.). Percentage of Households Harvesting Specific Resource Categories, Nome (1982)

residents is restricted by environmental and technological constraints.

The total number of resource categories used by a household surveyed in 1982 can be used as one quantitative measure of reliance on local fish, game, and plant resources. Figure 23 depicts number of resources used by the household's place of previous residency. As shown in Figure 23, only a very small percentage of households (5 percent from all residence categories) use no local resources; and in general households originating in Alaska use more resources than those from outside. It should be mentioned that some proportion of non-Native residents might harvest marine mammals if it were legal for them to do so.

The percentage of households using resources on a species by species basis is shown in Figure 24. These data suggest that Nome, as a community, is heavily reliant on the harvest and use of locally available resources. Variation in patterns between species and between residency subgroups depicted in this figure reveals information about cultural differences, resource availability and accessibility, dependence on local resources, and other factors. As suggested in earlier Nome research (Magdanz 1981), these data also verify that salmon, berries, trout, ptarmigan, and moose, in that order, are harvested by the greatest numbers of households across all residency categories. With the exception of some species of marine mammals, herring, brown and black bear, clams, and halibut, in that order, are used by the fewest of households across residency categories. A larger percentage of households from villages in northwestern Alaska (including Nome) use all species of resources, with the exception of clams (which are available only in areas of Norton Sound proper or at Wales); brown and black bear; caribou (available in the Kotzebue Sound area, in the far interior of Seward Peninsula, or in the hills adjacent to the eastern and southern

coastal margins of Seward Peninsula); moose (relatively new to the Nome area and a popular focus of both sport and subsistence hunting); char, trout, and pike (all favorite sport and subsistence species), and halibut (usually available only in the deeper water around the Bering Strait islands). Marine mammals are currently restricted to Native harvest by federal legislation. All major resource use findings of this 1982 random survey concur with the findings of another Division of Subsistence research project focused on residents who use the Nome River fishery (Magdanz 1981).

Harvest levels were not elicited for most species except marine mammals in the 1982 survey. However, documented harvests of salmon, bear (brown, grizzly, and polar), moose, and crab were compiled for the 1974-1982 period based on Alaska Department of Fish and Game data (Table 27). With the exception of king crab,¹ harvest levels of other species have increased, each year, although the rate of increase for moose harvest has been gradual.

Based on previous Division of Subsistence fieldwork in Nome and the Bering Strait area (Thomas 1980; Magdanz 1981 and 1982; Ellanna, unpublished data), there exists a well-established resource distribution network for sharing, trading, and bartering fish, game, and plants. Ellanna's data on subcommunities of Nome (King Island village and previous residents of St. Lawrence Island, Little Diomed Island, and Wales) suggest that resource distribution networks for subpopulations that have previously migrated to Nome from a village in northwestern Alaska are most well-developed within that subpopulation and between Nome and the community of origin. These networks are focused along kinship lines but extend to other social categories of "kin" not normally recognized by non-Eskimo society. Networks

¹ See Magdanz (1982) for a discussion of the decline of King crab available for handline harvest in the Bering Strait and Norton Sound areas.

TABLE 27

DOCUMENTED HARVESTS, NOME, 1974-1982

	Salmon ¹ (Nome Subdistrict)			Bear, brown grizzly ² (nonresident/res of Alaska)	Bear ³ polar (Nome resident)	Moose ⁴ (GMU 22)	Crab ⁵ (Nome resident)
	Commercial	Subsistence	Total				
1974	18,295	4,014	22,309	2/8	0	222	n.d.
1975	10,848	9,224	20,072	2/4	0	138	3,236
1976	8,989	7,399	16,388	2/9	0	240	2,863
1977	16,129	15,498	31,627	5/7	3	244	4,372
1978	31,670	17,618	49,288	8/6	0	297	4,701
1979	11,289	10,757	22,046	38/12	0	270	1,554
1980	23,937	30,515	54,452	19/12	0	228 ⁷	1,284
1981	22,380	15,938	38,318	n.d.	n.d.	298	n.d.
1982	33,162	25,889 ⁶	59,051	n.d.	n.d.	season not over	n.d.

- 1 Alaska Department of Fish and Game, Division of Commercial Fisheries (Annual Management Reports), 1980, 1981, 1982, Nome Subdistrict.
- 2 Alaska Department of Fish and Game, Division of Game (Big Game Data Index File), 2/25/81; represents GMU 22 non-residents and residents of Alaska.
- 3 Alaska Department of Fish and Game (Annual Report of Survey-Inventory Activities), December 1979, Nome residents.
- 4 Alaska Department of Fish and Game, Division of Game (Big Game Data Index File), 1/25/82; and personal communication C. Grauvougel 11/16/82 for GMU 22.
- 5 Alaska Department of Fish and Game, Division of Subsistence, 1981. Nome.
- 6 It is estimated that about 10 percent of those returning permits (178) were non-residents (personal communications Len Schwartz, 11/8/82).
- 7 About 135 moose were harvested by Nome residents; figure calculated based on C. Grauvougel's comment 11/16/82 that the percent of harvest of antlerless moose by Nome residents fairly accurately represented the percent of total harvest (59.2 percent listed in 1980 survey and inventory report x 228 = 135).

also extend to the elderly or others who have no primary producers within their household or family unit including individuals and households outside the subpopulation. As the household cases will demonstrate, the overall Nome resource distribution network cross-cuts ethnic affiliations, income levels, family affiliations, household boundaries, social class distinctions, place of household origin, and community boundaries. For the Nome River fishery, Magdanz (1981) found that short-term residents are most likely to share with friends, whereas long-term residents most frequently share with relatives. He also established that less than 20 percent of Nome residents who participated in the Nome River fishery shared no salmon with anyone outside of the household (Magdanz 1981: 24). Among Nome River fishermen, salmon were shared with relatives and friends in other villages in northwestern Alaska, Fairbanks, Anchorage, and other places where family members were living. Short-term residents occasionally shared with relatives outside the state. As Magdanz (1981) points out, the sharing of work occurs in addition to the sharing of the catch. The 1982 survey recorded the use of marine mammals by households who did not harvest them, evidence of distribution networks. Case households also reported distributing a wide range of resources to friends, relatives, and those in need.

The 1982 survey indicated that exactly 50.0 percent of Native households and 26.3 percent of non-Native households owned boats. Additional data on other technologies used to harvest resources and the preparation of resources is presented in the case households.

CASE HOUSEHOLDS

The following five household cases were selected from the random survey sample. Information related to resource harvest and use, employment,

household technology, resource distribution and receipt, and values related to local fish and game resources was elicited in more detail from case households. These cases were selected as representative of the range of diversity in employment, ethnic affiliation, cultural connections, longevity in the region, and resource use which is demonstrated in Nome's population today. It should be noted that although the following case descriptions treat households as autonomously operative units, in reality economic strategies and the use of fish and game resources in Nome often transcend household boundaries. In particular, Native households tend to function economically and socially with other households for purposes of producing, distributing, and consuming locally harvested resources. These interrelationships significantly affect resource use patterns.

The cases are presented in a relative sequence from low to moderate to high levels of local resource use. Households A and B use very few resources (a total of 3 resource categories), and may represent the 21.2 percent of Nome's households that use 0-3 categories of local resources.

Case A

This household is composed of a non-Native man and woman, both 34 years of age. They have lived in Nome for four years and are originally from outside the State. The husband works in a State human services program and the wife, trained as a nurse, is self-employed in more than one contractual part-time job. Their annual net household income is approximately \$65,000.

This household harvests very few local resources. Although last year they did subsistence seine for salmon with two other families in the lagoon behind Fort Davis, harvesting a total of 600 salmon divided equally between the families (200 each), this year they were too busy working on their home to fish. According to the husband, they would hate to have to rely on locally harvested resources, and fishing for them is "purely recreational." They also occasionally go "out into the country" to fish for trout and grayling in spring and fall, but they are unable to do this often because the husband is required to be in Nome on call for his job over half the days in any given month. The wife harvests a few buckets of berries annually during August. They receive no other resources from their own efforts or from the efforts of others, as they participate in no resource

distribution network. They also do not have a snowmachine, boat, or four-wheel-drive vehicle for getting out of town, so their potential access to resources is limited to those available near roads which are maintained only during summer months. The husband views work-related time restrictions as the major factor in their low level of resource harvest and use.

Case B

Case B represents the households which harvest 5 to 10 categories of resources. Household B is composed of a 48-year old retired military officer and his 48-year old wife. Their only child, a son in his 20s, now lives in a separate household in Anchorage. Husband and wife work for city and state government agencies respectively, and together they earn in excess of \$70,000 net annually. They have lived in Alaska for nine years, eight of which have been in Nome.

Their primary resource harvest activity is fishing. "I love fishing," the wife said. "I'm down at the mouth of that river [the Nome River] at five every morning when the silver salmon are running." She fishes more than her husband, and recalls she had her first fishing pole at the age of five, whereas her husband did not begin fishing or hunting until ten or fifteen years ago, and then did so only sporadically. This year the household members harvested approximately 100 pink salmon, 50-60 silver salmon, 50-60 Dolly Varden, 4-5 grayling, a portion of a shared moose, and an undetermined quantity of blueberries and cranberries. Most of their hunting, fishing, and gathering activities takes place along the road system, especially at the Nome, Sinuk, and Snake rivers and occasionally inland on the Pilgrim River. They have a boat but have not used it for three years. They also have a snowmobile but usually use their four-wheel-drive vehicle for resource harvest-related transportation.

Interestingly neither eat much fish except for Dolly Varden. Most salmon are smoked and given away to two or three older people in town or to other friends. Salmon are also preserved by freezing. In the winter friends give them crab, which are taken with handlines or pots through the ice in winter. "It's too spooky out there on the sea ice for me," the wife states. This year they were unsuccessful in harvesting a moose, but their son in Anchorage did and shared it with them. If they had been successful and their son had not, they would have reciprocated. Moose is preserved by freezing. Summer is their busiest resource harvesting period, primarily because of resource availability, road access, and time not committed to work (longer days, vacation time). To this household the ability to use and harvest local resources is an important part of living in northwest Alaska.

The next two cases represent significant levels of household resource use (over ten categories of resources) but exhibit other differences such as income level, range of resources used, technology employed, household

size, place of origin, and other socioeconomic factors. According to the survey, 43.3 percent of Nome's population uses ten or more categories of resources annually like these two case households.

Case C

Household C is composed of a husband in his late 30s, his wife in her early 40s, an adult son, and a six year-old son. The husband is Eskimo and has lived in Nome all his life. The wife is not Native, but she has lived in Alaska for 22 years, 9 of which have been in Nome. Both husband and wife are professional educators, although the husband was unemployed at the time of the survey. The older son is employed as a laborer for the city and carves part-time. The combined household annual net income varies depending on whether or not their contracts extend into the summer months, but averages between \$40,000 and \$50,000.

This household estimates that during most years 75 percent of their protein foods are derived from locally harvested fish and game. This summer, however, the husband had to attend school in Fairbanks for three months and their four-wheel-drive vehicle was broken down, so only about 50 percent of this winter's protein is composed of locally harvested resources. The household has two camps, one at Cape Nome (18 miles east of town). This summer (June 15 to the end of August) they seined for salmon at Fort Davis with a non-related fishing partner, together harvesting 200 pinks, 150 chums, 25 silvers, and 1 king. Their half of the fish was dried, requiring the occasional help of a married son and his wife and an average of 2-3 hours' labor a day to care for the drying fish. Much of the salmon was distributed to XYZ (an organization which provides meals to elderly Native people) and to individual older households without adequate resource support. Some dried fish and moose meat are traded for marine mammal products such as walrus meat and belukha muktuk.

Other fish taken by this household include Arctic Cod ("tomcod") which are taken through the ice in winter, dried, and shared with others (75 were harvested this last winter); whitefish, harvested by the older son in nearby rivers; or capelin ("cigar fish") taken on the beach in late July; and arctic char, taken from rivers with a seine or rod and reel and smoked (an activity often undertaken simultaneously with moose hunting). This household uses both a seine and rod and reel for fishing, but reports that the outcome of both techniques is the same, a means for obtaining food. The wife states, "I wouldn't catch a fish I wasn't going to eat--it would be a silly waste of time." They would like to fish through the ice in winter, but lack adequate knowledge about where the holes are located.

Moose are very important to this household, and they are successful in harvesting at least one every year. Moose meat is also shared with XYZ and with people they "owe things to."

Although marine mammals are used for food and raw materials by household members, the husband does not own a boat and so can hunt only when there is room for him on a friend's boat. He was unable to participate this spring, but, as previously mentioned, obtained some food through trade of other resources.

Waterfowl are not as accessible as the household would like because they have no boat, but someone in the household will harvest various species if they have a chance to hunt with someone else while visiting a village. Husband and wife normally eat ptarmigan, but this year they were scarce and only 5 were taken. All household members will participate in crabbing for king crab through the ice, but the last couple of years crab have not been abundantly available in nearshore waters; and, according to this household, many people in town are both discouraged and think it is too risky to go out on the necessary 3 or so miles of ice to harvest this resource. Blueberries, salmonberries, moss berries, greens, and roots are also harvested in summer, primarily by the wife.

Not only does this household provide resources to other households both within and without Nome, but they participate as recipients in a resource distribution network that spans hundreds of miles. The husband's mother and sister reside in Homer and share halibut, clams, and occasionally seal with this Nome household. Cousins in Kotzebue send 2-3 sacks of sheefish and caribou (as much as they can after they have met their own family's needs) each year.

Although this household states they could physically "survive" without local resources, to do so, in their view, would dramatically reduce the quality of every aspect of their lives -- nutritional, economic, social and cultural. The wife learned to harvest and depend on resources in Washington state with her family, and came to live and work in rural Alaska to continue that life. Her husband grew up in an Eskimo family, and values the harvest and use of local resources above almost all other things in his life. As his wife states, "I don't know any Eskimo male who would be happy if he couldn't participate in resource harvest -- it is not simply a matter of choice but rather a reason to exist."

Case D

This husband and wife are both 33-years old and support a family of six children (ages 10 months to 13 years). The husband works for an airline cargo operation, and their net family income is approximately \$24,000. The husband is a lifelong Eskimo resident of Nome. The wife was born in Seattle, is not a Native, and has lived in Nome about 15 years. Resources used by this family include salmon, herring, whitefish, capelin, Dolly Varden, grayling, northern pike, ducks, geese, cranes, ptarmigan, hare, moose, willow shoots, sourdock, wild celery, blueberries, blackberries, salmonberries, and king crab. Summer is their most active time, both because of the availability of resources and because of his summer working schedule (four days on, three days off, compared to five days on in the winter). He fishes for grayling year round, hunts hare, and ptarmigan in the winter, and

hunts waterfowl in the fall. In most cases, he said, the quantity of the family's harvest was not great. Only grayling are taken in considerable numbers.

A significant feature of their harvesting is the involvement of his family. As, no one in his immediate household fishes for salmon, the husband and wife get their salmon from his mother, who sets a net and shares her catch, and from relatives in Unalakleet who send them king and silver salmon. He hunts with his father, who has a flat-bottom boat with a jet unit ideally suited to Nome area rivers. "Ever since I can remember, I went out with my Dad," he said. He has helped his brother fish commercially for herring, although they did not keep any for their own use. His own children enjoy berry picking and love the capelin fishery.

The family has a camp at Salmon Lake, about 40 miles inland from Nome, where they pick berries and greens in the summer time. Other times of the year, they travel by car, snowmachine, or boat out from Nome.

Most of this family's harvest is used by their immediate family, the husband's relatives, and his friends in Nome. "Once in a while, my mother will have me ship some to my sister-in-law in Fairbanks."

Case E

Based on intensive Division of Subsistence research with subpopulations of Nome, Case E is the most illustrative of the majority of Nome's Native population and a minority of Nome's non-Native population based on several criteria, including a relatively large household size; extended composition of the household (includes relatives beyond the nuclear family); unstable level of cash income including a heavy reliance on self-employment such as carving or sewing as a source of cash; long-term residency; well-established knowledge of the area; substantial reliance on multiple categories of available resources; use and maintenance of established camps outside of Nome proper; participation as a giver and receiver in a resource distribution network that is operative within and beyond the community; substantial investment of time, money, and knowledge in the technology required to harvest local resources; and use of resource harvest strategies which are both well-planned and opportunistic. That is, harvest strategies

involve the taking of multiple available species simultaneously as opposed to single species focused endeavors.

Household E is composed of a Native man, 78, originally from King Island; his wife, 74, a Native originally from Mary's Igloo; their unmarried 50 and 42-year old daughters, 27-year old granddaughter and her 6-year old daughter. They moved to Nome from King Island in 1947 so the husband could work for a mining company, and they have continued to reside in the King Island subcommunity of Nome throughout the intervening years. The head has been an important skinboat captain, a marine mammal hunter of noteworthy reputation, and has continued to hunt despite his advancing age. The husband and wife support the entire household through their State pensions for the elderly, his carving, and her skin sewing. No other member of the family works for wages, although the oldest daughter sews and son carves. The granddaughter receives State assistance for her child. The net annual household income approximates \$16,000.

The most important resource harvest period for this household occurs in spring (mid-May to June) during which time the harvest of walrus is central and the harvest of oogruk, smaller seals, and migratory waterfowl is secondary. Marine mammal hunting usually is conducted from their large skinboat, or occasionally an aluminum boat, and the household head commands a crew of 6-10 men normally including his adult son and/or grandsons and other related males. During walrus hunting the crew, along with other crews, may try to reach their seasonally abandoned home community on King Island. Last spring this household harvested 7 walrus and 5 oogruk. All marine mammal products are extremely important sources of fresh meat during this season and are opportunistically harvested during marine mammal hunting.

In the summer months salmon fishing is of primary importance. Early runs are gill-netted from the beach at the household's camp at Cape Wooley and at the mouth of the Sinuk River while marine mammal hunting continues. Net fishing also is conducted later in the season at the household camp at Safety Lagoon. Most fish are cut and hung to dry, although some are eaten fresh, frozen, and given away to other related and/or needy households. This year the household harvested approximately 600 salmon, primarily chums, pink, and silvers (kings are rare in this area). In past years a third camp at Salmon Lake was also used as a base for fishing for red salmon, but in recent years this stock has been protected by regulation. Normally males in the household pick the nets and females cut, hang, and care for fish, although individuals sometimes cross roles to accommodate the advanced age of the household head and spouse. Children and younger adults will opportunistically engage in river-based rod and reel fishing for salmon and other species such as grayling, but compared to gill netting this technique is not very productive for salmon.

Greens and roots are harvested in the late spring and early summer, whereas salmonberries, blueberries, and mossberries are gathered in the late summer, usually, but not exclusively, by women and children.

In good years enough berries are harvested to feed the family throughout the year, to share with related households, and to trade with more distant relatives and/or hunting associates in other communities for needed resources. For instance, berries are traded to Little Diomedea in partial exchange for female walrus hides or other marine mammals products in short supply). Also, waterfowl eggs are gathered from rookeries on King Island or, occasionally, Sledge Island in July. They provide a highly valued source of food and are gathered by younger adults and older children.

In the last decade since moose have been more abundant on Seward Peninsula, moose hunting is a major fall activity. This household has an older pickup truck which they use on the road systems in the area for spotting and hauling moose back to town. The younger men in the household hike off the roads in pursuit of a moose if one is spotted. Moose meat is frozen, dried, and like almost all other resources, shared. During most moose hunting trips, relatives outside of the household who have no transportation are invited to accompany household members for day-long trips. Ptarmigan and migratory waterfowl may also be taken opportunistically during fall moose hunts.

In the past, winter ice provided an environment conducive to the hunting of seals at open leads. The head of this household is too old to pursue this strenuous activity today, and the adult son and grandsons have not taken it up with great zeal. Nonetheless, winter and early spring ice also provides the appropriate environmental setting for the household harvest of tomcod, an important species dried to be used during spring boat hunting; and king crab, a species which is eaten fresh and shared and which was harvested in relatively large quantities (about 100-300 per winter) until their decline three years ago. In addition, most carving and skin sewing takes place during winter months.

Until the last five years there were many other species of importance to this household, but the variety of species used as well as the overall harvest success rate have declined in direct relationship to the advancing age of the household head and spouse. However, they continue to provide the lead in household resource harvest and cash-earning activities.

This household functions as a social and economic part of the King Island subcommunity of Nome. Resource harvest and distribution along kinship networks provide a central theme to subcommunity integration. This household maintains that their ability to harvest fish, game, and plant resources on King Island, at Cape Woolley or Nome, is the single most important element in all facets of their lives, in the past, present, and for their children's and grandchildren's future.

INTERRELATIONSHIPS

The data presented in this case suggest several interrelationships between the cash economy and resource uses in Nome. The majority of Nome's population participates in a complex economic system which combines some level of cash derived from wage employment and reliance on a wide spectrum of locally available fish, game, and plant resources. This subsistence-focused mixed economy is, for most households that are long-term residents of northwestern Alaska, a successful adaptation to the natural environment of the region integrated with a limited cash economy which was introduced to residents of the Bering Strait and Norton Sound area in the 1650's. Most of these residents derive cash from a combination of economic patterns including self-employment, part-time employment, and occasional full-time employment. For these residents, wage opportunities are seasonal or sporadic, scarce, low-paying, and, most often, unskilled. Job mobility is frequent and horizontal in nature. The majority of users place a high value on resource harvest and use, a value set which has emerged out of individual, family, and community tradition.

A minority of people in Nome participate more heavily in the cash economy, particularly if they are short term, impermanent residents of northwestern Alaska, coming to Nome specifically to assume a wage-paying position. Many of these households are moderate to high users of local resources.

There appears to be no direct, simple relationship between level of cash income and use of on local resources. Length of residency in northwestern Alaska, community of origin of household head, household size, level of formal education, learned (cultural) patterns of resource harvest and use, intensity and type of involvement in the cash sector of the economy, household technology, the extent and nature of social ties within the

community, knowledge of the environment and natural history of resources, and many other factors must be considered in assessing the relationships between cash and resource harvest and use for households and the community at large.

Regional centers like Nome have become a focus for the in and out-migration of residents from small, subsistence-based communities. Immigrants may form distinct subcommunities or enclaves within a regional center. As such they continue to practice the patterns of resource harvest and use characteristic of their home communities. They also tend to remain economically tied to the resources and to maintain strong bonds with residents of their communities of origin.

Overall the community of Nome, as revealed in the 1982 Division of Subsistence random survey and other socioeconomic data, exhibits a pattern of relatively heavy and diverse resource use integrated with a limited wage economy.

CHAPTER 7

KENAI PENINSULA BOROUGH

INTRODUCTION

The next case area is the Kenai Peninsula Borough. Five distinct communities were selected for study to illustrate the numerous and dispersed settlements of the borough: the City of Kenai, Homer, Ninilchik, Seldovia, and Tyonek (Figure 25). The first three communities are road connected within the borough; the last two are not. Each is described and analyzed separately below.

In order to examine some of the generalizations about resource uses based on earlier research, the Division of Subsistence undertook a survey in January and February 1983 of a random sample of households in the City of Kenai, Ninilchik, the City of Homer and the "Homer area" (the Diamond Ridge and Fritz Creek census districts, including Kachemak City). The random sample included 197 Kenai City households (10.6% of city's total), 24 Ninilchik households (11%), 97 Homer City households (9.0%), and 52 Homer area households (7.2%). Some of the results of this survey have been incorporated into this chapter (Figures 26a, 26b, 26c; Tables 27a, 27b, 27c, 27d); full results will be presented in a forthcoming Division of Subsistence paper on resource uses by Kenai Peninsula residents.

The Kenai Peninsula Borough, encompassing 25,600 square miles, is located south and west of Anchorage. The Borough includes most of the Kenai Peninsula as well as 6500 square miles on the west side of Cook Inlet between Katmai National Park and Beluga Lake (Figure 26). Ninety-nine percent of the Borough's population resides on the Kenai Peninsula. Major communities include Kenai, Soldotna, Seward, and Homer, connected by the

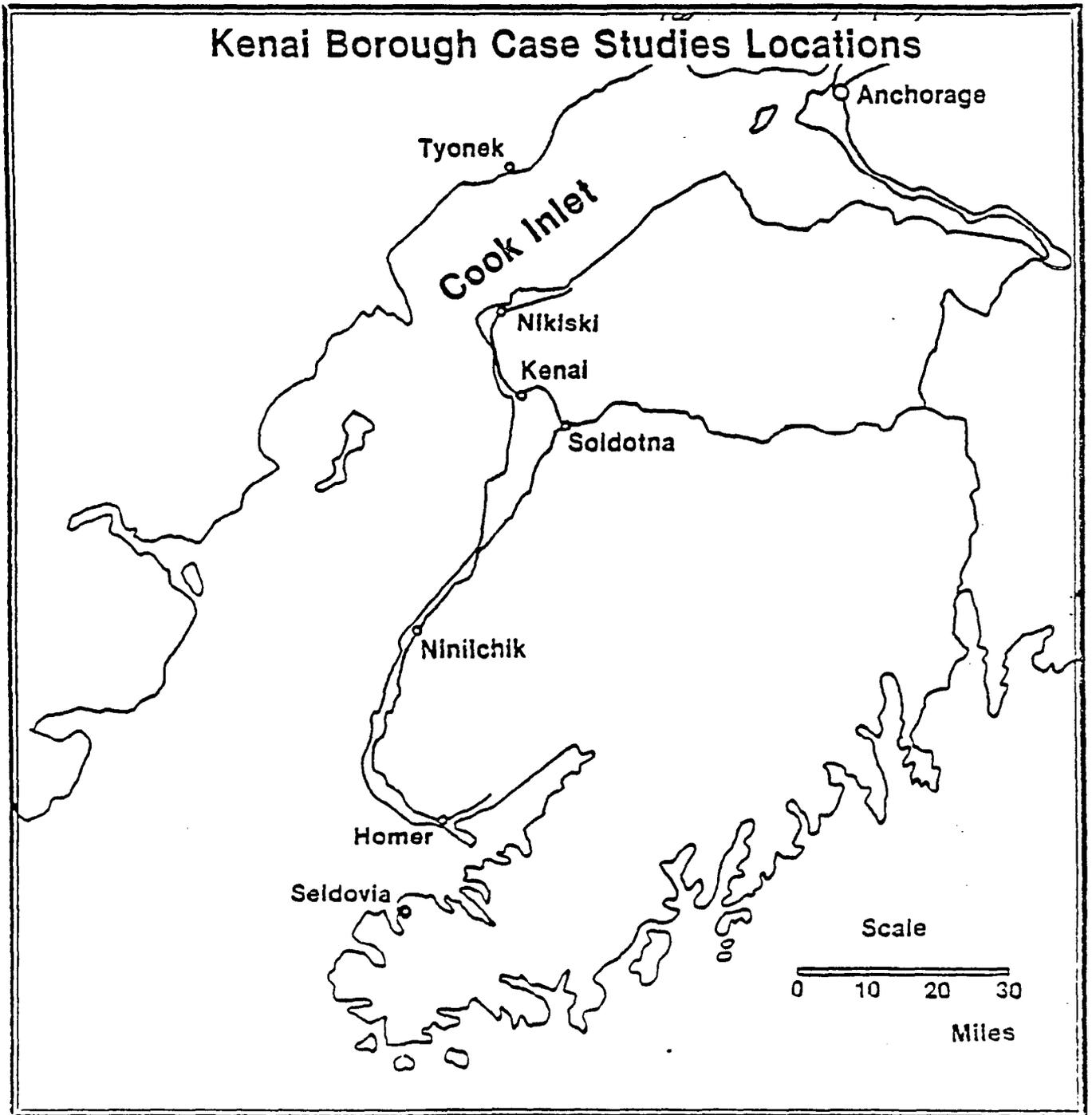


Figure 25. Kenai Borough Case Studies Locations

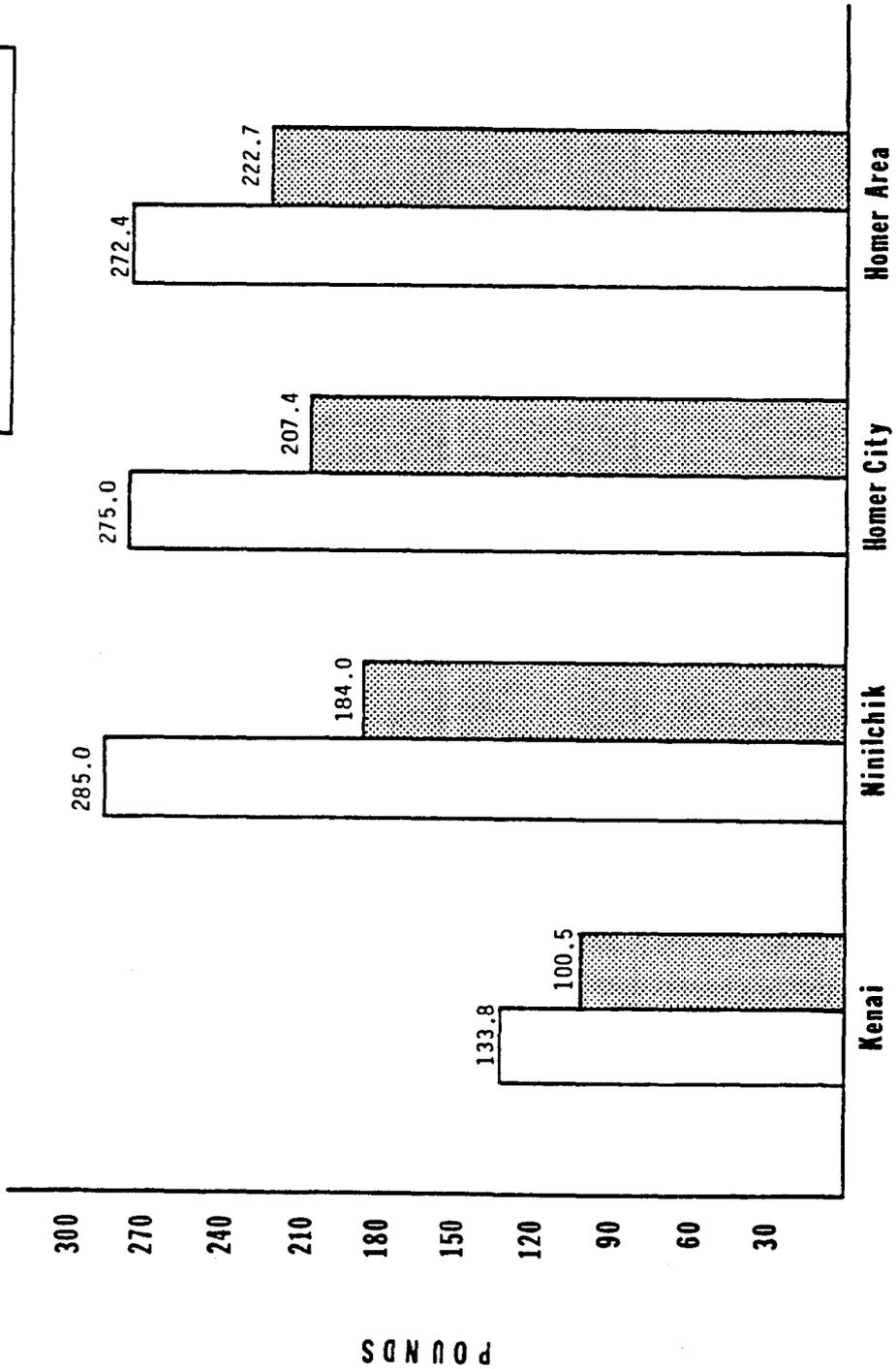
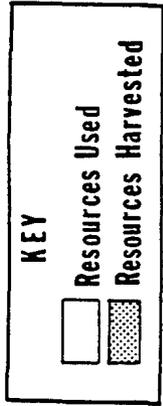


FIGURE 26a. Mean Household Harvests and Quantities Used of Six Resources (king salmon, red salmon, silver salmon, halibut, clams, moose, in pounds dressed weight), 1982

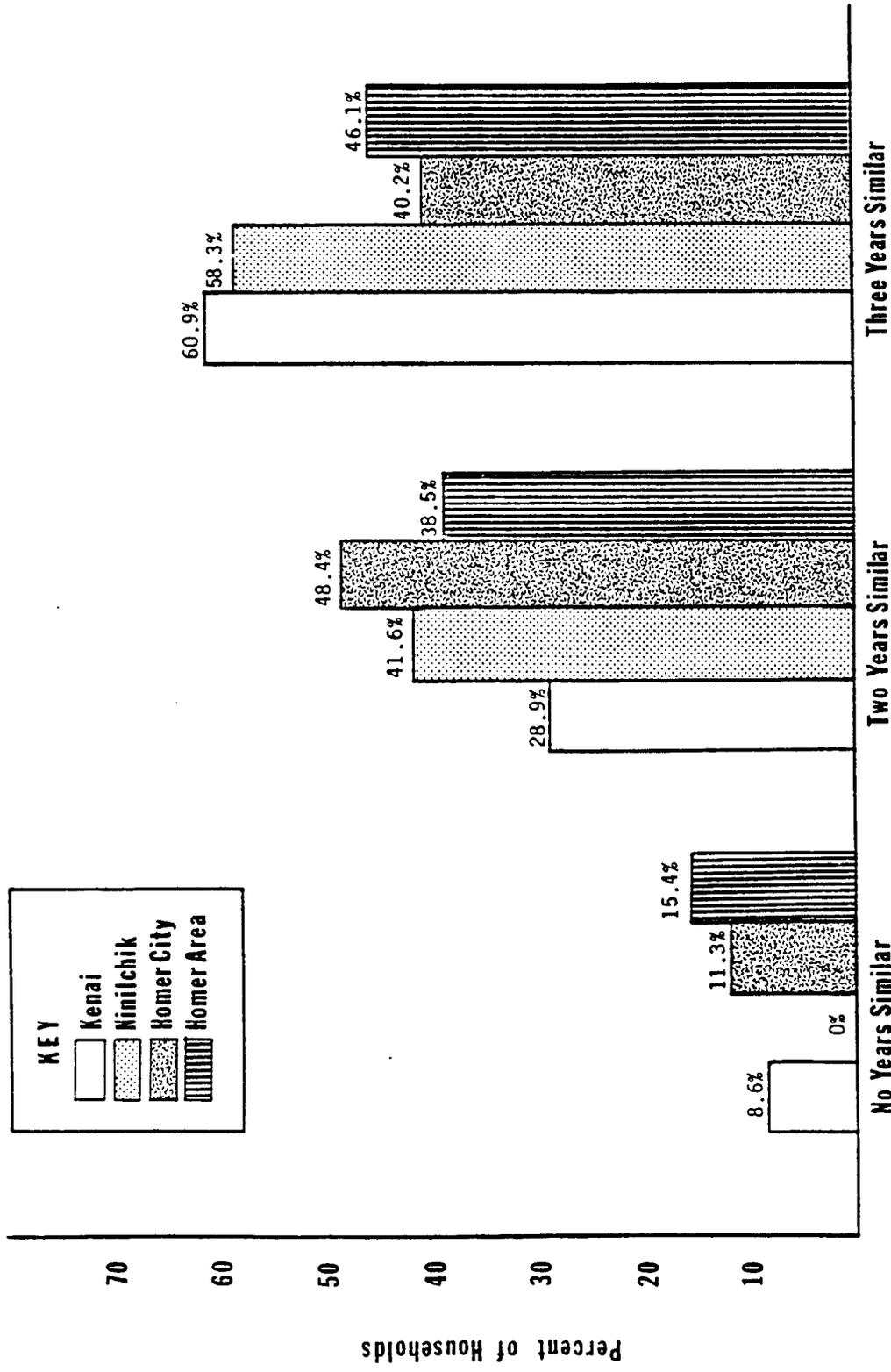


FIGURE 26b. Stability of Procurement Methods for Salmon, 1980-82 (percent of households). Three years using same method is most stable, while no years similar is least stable.

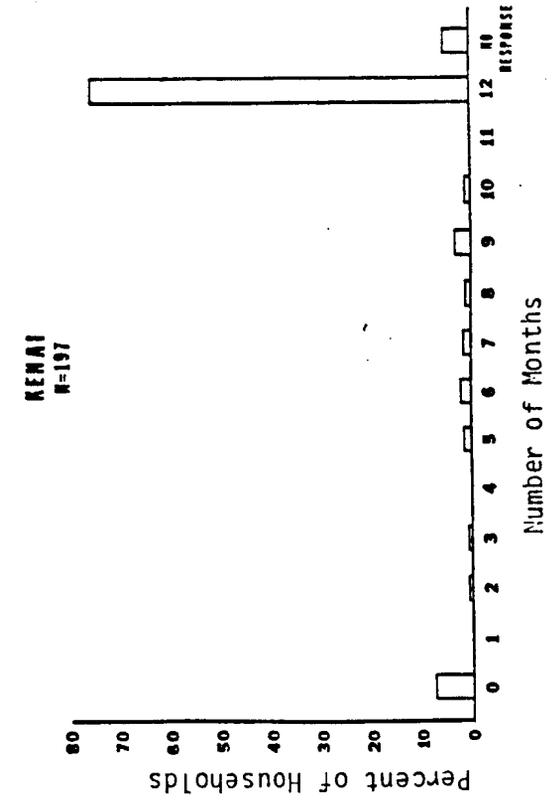
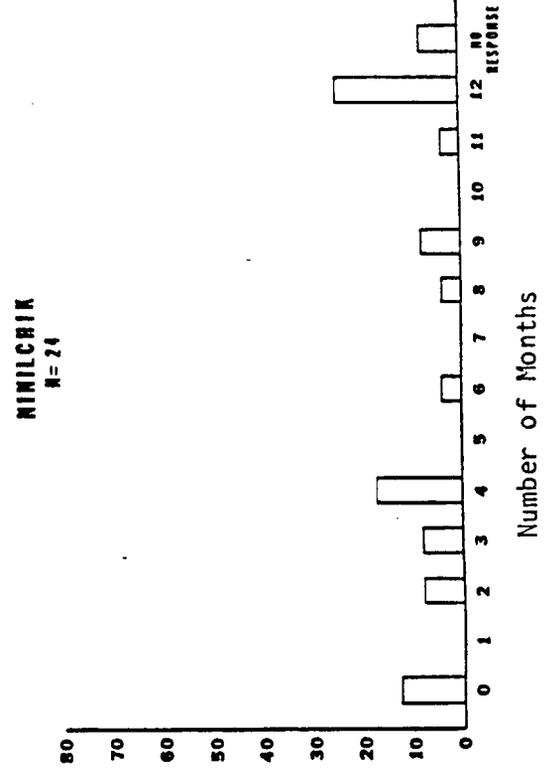
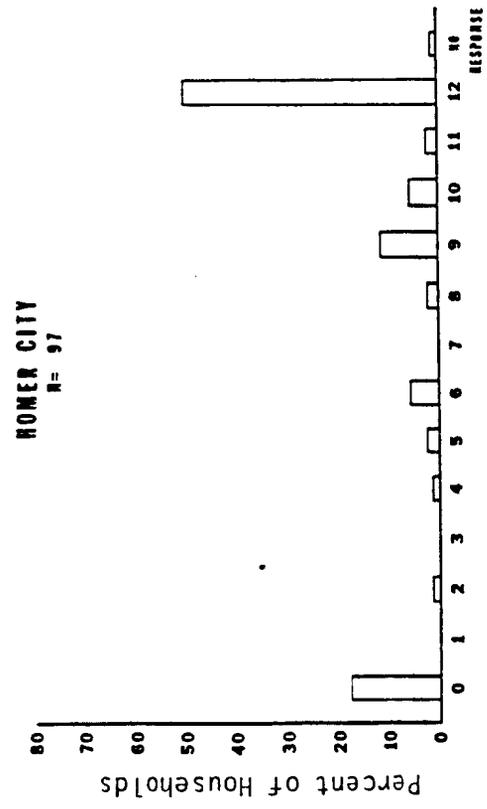
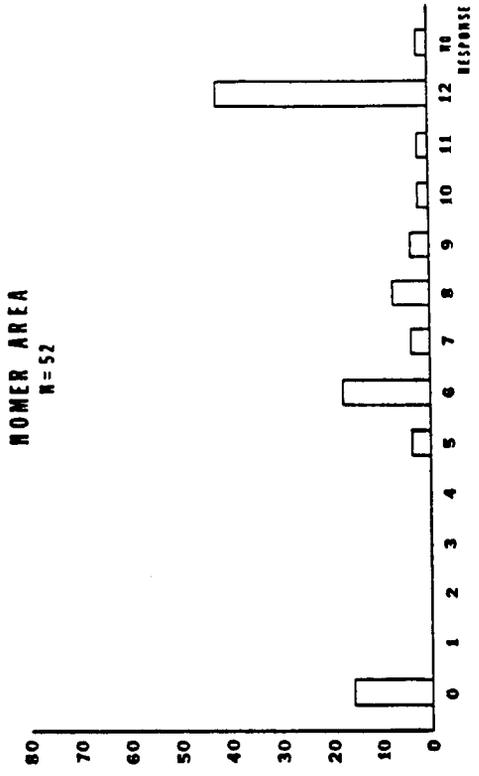


FIGURE 26c. Months Employed by Head of Household, 1982
(percent of households)

TABLE 27a. Resource Uses for Six Species, 1982

	<u>KING SALMON</u>				<u>RED SALMON</u>				<u>SILVER SALMON</u>			
	% House- hold Used	% house- hold Harvested	Mean* Pounds Used	Mean* Pounds Harvested	% House- hold Used	% House- hold Harvested	Mean* Pounds Used	Mean* Pounds Harvested	% House- hold Used	% House- hold Harvested	Mean* Pounds Used	Mean* Pounds Harvested
KENAI (N=197)	40	28	17.0	12.7	58	45	21.0	18.5	63	46	22.5	19.2
NINILCHIK (N=24)	63	42	44.5	29.7	50	38	25.5	9.5	54	33	18.6	12.3
HOMER CITY (N=97)	47	29	36.0	19.1	45	18	20.5	12.5	63	30	18.6	12.7
HOMER AREA (N=52)	50	31	42.4	40.3	40	17	9.0	2.5	67	42	41.2	36.3
	<u>HALIBUT</u>				<u>CLAMS</u>				<u>MOUSE</u>			
	% House- hold Used	% House- hold Harvested	Mean* Pounds Used	Mean* Pounds Harvested	% House- hold Used	% House- hold Harvested	Mean* Pounds Used	Mean* Pounds Harvested	% House- hold Used	% House- hold Harvested	Mean* Pounds Used	Mean* Pounds Harvested
KENAI (N=197)	70	27	41.0	28.3	35	26	11.1	9.6	23	4	21.2	12.2
NINILCHIK (N=24)	88	42	57.2	37.4	83	83	48.3	48.2	66	8	90.9	46.9
HOMER CITY (N=97)	91	47	107.3	91.4	55	42	24.0	20.2	38	13	68.9	51.5
HOMER AREA (N=52)	88	37	91.9	84.4	54	46	18.5	18.2	48	10	69.4	38.9

*Household mean for sampled households

TABLE 27b. Locality of Employment (percent of sampled household)

	<u>KENAI</u>	<u>NINILCHIK</u>	<u>HOMER CITY</u>	<u>HOMER AREA</u>
LOCAL	69.5	66.6	61.8	59.6
NON-LOCAL	11.6	12.5	4.1	11.5
BOTH	7.6	8.3	14.4	11.5
NO JOB	2.0	-	5.2	1.9
RETIRED	5.5	12.5	13.4	11.5
NO RESPONSE	3.0	-	1.0	3.8

TABLE 27c. Percent of Households Raising gardens and Livestock

	<u>GARDEN</u>	<u>LIVESTOCK</u>
KENAI	37.6	4.1
NINILCHIK	70.8	29.2
HOMER CITY	38.1	8.2
HOMER AREA	69.2	38.5

TABLE 27d. Number of Years Harvesting Resources on the Kenai Peninsula
(Percent of sampled households)

	<u>KENAI</u>	<u>NINILCHIK</u>	<u>HOMER CITY</u>	<u>HOMER AREA</u>
1-5 years	36.5	4.1	37.1	28.8
6-10 years	20.3	12.5	19.5	19.2
11-15 years	20.3	16.6	8.2	-
16-20 years	9.6	4.1	10.3	5.7
21-25 years	.5	25.0	6.1	7.7
26-30 years	2.5	8.3	7.2	17.3
31-35 years	2.0	16.6	2.0	5.7
36-50 years	1.5	4.1	1.0	3.8
50+ years	1.5	8.3	-	-
mean years	10.8	22.8	11.8	15.8

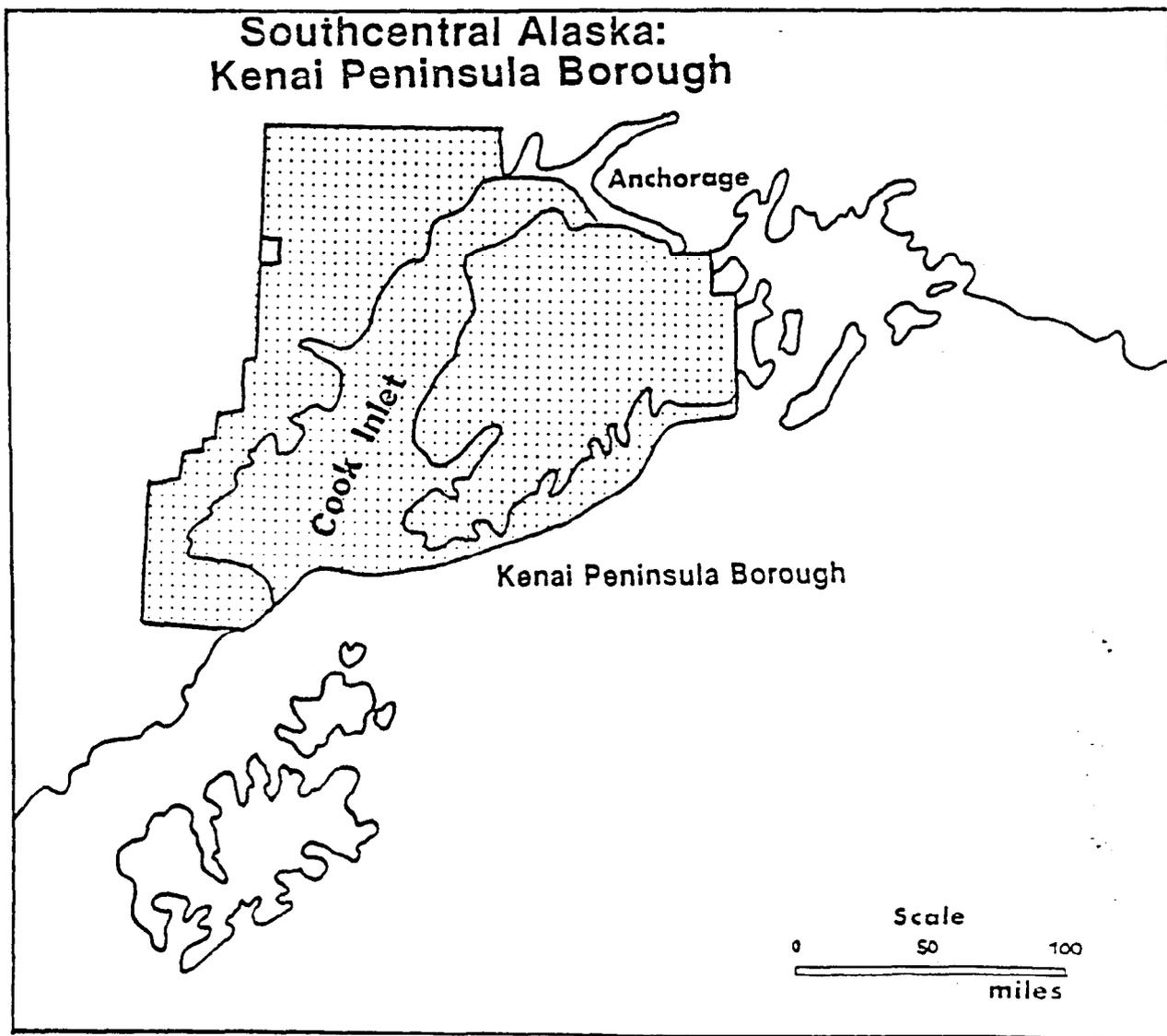


Figure 26. Southcentral Alaska: Kenai Peninsula Borough

Seward and Sterling Highways with Anchorage. The marine ferry system links Seward, Homer, and Seldovia with points in Prince William Sound, Kodiak, and the Alaska Peninsula. In contrast, the portion of the Borough on the west side of Cook Inlet is not currently accessible by road or ferry. Except for the village of Tyonek and facilities associated with oil and gas production, there is little settlement or development on the west side of the Inlet.

The eastern and southern Kenai Peninsula is a mountainous region of high peaks and icefields. The Kenai Mountains drop sharply to the sea on the outer coast of the Peninsula and the southern shore of Kachemak Bay, creating a series of deep fjords. With a milder climate and heavier rainfall, the southern Kenai Peninsula is characterized by lush forests and heavier undergrowth than other parts of the Borough. In contrast, the western Kenai Peninsula has a relatively straight coastline and rolling lowlands covered with boreal forest, small lakes, and patches of muskeg. The Tyonek area has similar vegetation. The Chigmit Mountains, a portion of the Alaska Range, dominate much of the Borough's inland area west of Cook Inlet.

Kachemak Bay, reportedly one of the richest bays in the world, supports several species of marine mammals, five species of salmon, halibut, shrimp, crab, clams, and other marine and inter tidal life. Although most of these species are also found in portions of lower Cook Inlet, the brackish and silty waters of the upper inlet do not support halibut, crab, shrimp, clams, and other marine invertebrates. Salmon, however, is found throughout Cook Inlet, and hooligan is available in the upper inlet in spring. Harbor seals and belukha pursue the migrating salmon north to the mouth of the Susitna River in the spring and summer months. A typical assemblage of

northern mammals is found throughout the Borough, although moose are not common in the Seldovia area.

In 1980 the population of the Kenai Peninsula Borough was 25,282 -- an increase of 280 percent since 1960. Most of this growth has been centered in the Kenai-Soldotna area, the site of onshore and offshore oil and gas development in the late 1950s and 1960s. The populations of Homer and the smaller peninsula communities on Cook Inlet have also grown substantially in the past ten years. Demographic and income data for the Borough and the six selected communities are summarized in the Appendix. Today the Kenai Peninsula is a popular recreational destination for Anchorage residents and visitors.

The Kenai Peninsula Borough, incorporated in 1964, has areawide powers, including assessment and collection of taxes, education, planning and zoning, and solid waste disposal. The Borough has also assumed three non-areawide powers, including hospitals (two service areas), fire (two service areas), and recreation (one service area). In addition, the Borough plays a role in developing and implementing the Coastal Zone Management Plan within its boundaries. Five first class or home rule cities are within the Borough. These are Kenai, Soldotna, Homer, Seldovia, and Seward.

The Kenai Peninsula Borough represents a complex area for socioeconomic study because of its large size and population, numerous settlements, and recent rapid socioeconomic changes. Research by the Division of Subsistence has just begun in Kenai Peninsula Borough communities (except for Tyonek). The following five community descriptions present preliminary findings of this research effort, providing as yet tentative and suggestive generalizations about resource uses in this complex area of Alaska.

PART I

KENAI: RESOURCE USES IN A MIDDLE-SIZE, INDUSTRIAL-BASED, ROAD-CONNECTED COMMUNITY OF THE KENAI PENINSULA BOROUGH

By Susan E. Georgette

PREFACE

The first case community within the Kenai Peninsula Borough illustrates resource use in an area with rapid economic development due to petroleum-related industries. The moderate-sized communities of Kenai (4,300), Soldotna (2,000), and North Kenai (3,500) have shown growth rates of 22 to 93 percent from in-migration during the past ten years. Combined they now form a large community cluster with a total of 10,100 people in 1980. The area is developing a diversified economic base including oil extraction, refineries, government, trade, transportation, communication, commercial fishing, and tourism. There have also been historical changes of cultural groups -- from Eskimo and coastal Dena'ina prehistorically to Russians at Fort St. Nicholas, to English-speaking whites -- resulting in substantial cultural admixture. Households currently are characterized by high wage involvement (76 percent of Kenai household heads work 12 months a year), relatively high median household incomes (\$29,937 at Kenai), relatively small households (2.6 persons per household in Kenai), and short time depth; 56.8% of Kenai City households have harvested resources on the Kenai Peninsula for ten years or less (Table 27d).

According to Georgette, fishing and hunting patterns reflect the heterogeneity of the socioeconomic system, that is, there are substantial differences between households which use resources. A large proportion of households comprises non-users of local resources for food (Kenai, 41 percent;

Soldotna, 46 percent). The mean household harvest of 100.5 lbs. for six major resources in 1982 was the lowest of any Kenai Peninsula study community (Figure 26a). For most households who do fish and hunt, the activities are peripheral to wage employment. The wage employment is central to the economy of households and communities. Data suggest that there are variable and opportunistic strategies used by households for obtaining resources from year to year--purchasing from commercial fishermen, gleaning from a relative's commercial catch, fishing with rod and reel, use of the Kenai Peninsula's personal use fishery, and non-local fishing and hunting (Figure 26b). Thus, there is nothing that can be characterized as a community pattern--household strategies are unstable and sporadic. No extensive distribution and exchange networks appear to integrate members of the community; no cultural rules prescribe distribution as expected or proper behavior. Fewer species are harvested and lower volumes of food are produced in comparison with the Yukon Delta, Nondalton, Nome, and Dot Lake cases.

The Kenai-Soldotna-North Kenai cluster represents in certain respects an extension of the cultural and socioeconomic patterns of the Anchorage area--the transplantation of an urban settlement pattern and economic system to the Kenai Peninsula. A small subset of Kenai's population may still engage in fishing and hunting practices as they existed in the area prior to Kenai's transformation. For most who use resources today, fishing and hunting are valued for "recreation and pleasure," "healthy foods," and a perceived "independence and self-sufficiency." Others express distaste for wild foods and activities--"I see too many fish during the commercial season to have an interest in eating fish year-round;" "I don't like to kill animals." Development has been associated with certain barriers to resource uses such as increased regulations, perceived competition among

users, perceived depletion of resources (especially moose), and perceiving danger from other hunters. Procurement of food from wild sources presents a scheduling problems for households, with fishing and hunting treated as peripheral to wage occupations and other household responsibilities.

INTRODUCTION

In this report, the Kenai area comprises three communities: Kenai, Soldotna, and North Kenai(or Nikiski). The combined population of these communities is 10,500. Complete demographic and income data for Kenai and Soldotna are presented in Figure 27 and the Appendix.

Kenai, the largest city in the Kenai Peninsula Borough with a population of 4,324 in 1980, is located on Cook Inlet at the mouth of the Kenai River, approximately 12 miles northwest of Soldotna. Kenai was incorporated as a home rule city in 1960. Between 1970 and 1981 the population of Kenai grew by 29 percent, in part as a result of the employment opportunities which were associated with the expansion of a local petrochemical plant between 1975 and 1977. By 1978 the economy was in a downswing. However, between 1980 and 1981 the population of Kenai still grew by 5.4 percent, possibly reflecting both a migration of North Slope workers relocating from Anchorage to the Kenai area and a number of new state residents seeking employment. In 1980, there were 1,506 households in Kenai with a mean size of 2.87. Kenai can be reached from Anchorage by 160 miles of paved highway, first opened as a dirt road in 1951, or by 30-minute scheduled flights operating almost 50 times daily. These flights are heavily used by North Slope workers commuting to their jobs as well as by businessmen, sport hunters, and sport fishermen.

Eskimos inhabited the Kenai area 2000 to 3000 years ago, followed by the

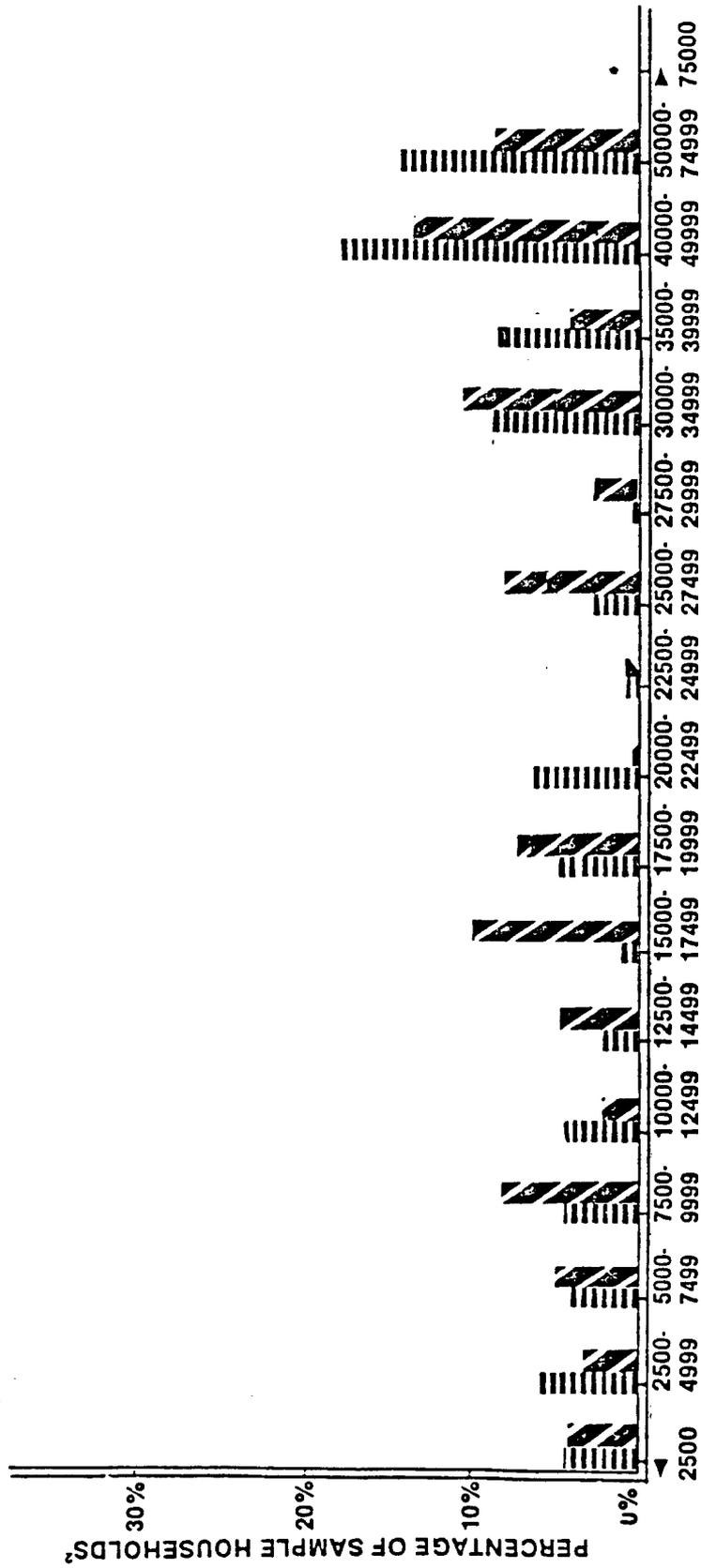


Figure 27 . Household Income (Dollars) — 1979, Kenai III , Soldotna

1 U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3

2 Kenai N = 1453 Soldotna N = 798

* no data available

Tanaina Athapaskans. In 1791 the Russians established Fort St. Nicholas at present day Kenai. The Americans abandoned this fort after they purchased Alaska, and Kenai remained a small, largely Native village engaged in commercial fishing until it was connected to Anchorage by road in 1951 and the Swanson River oil field was discovered in 1957. The oil discovery set off a long boom period for Kenai, bringing substantial economic and population growth and changing the community from a small fishing village to a large oil town (Figure 28). This economic expansion, however, was punctuated by periods of declining growth and employment when construction associated with oil and gas activities slumped. However, in 1982 the Kenai Peninsula Borough reported that the Kenai-Cook Inlet economy is "moving away from a total reliance on primary industry, and towards a more diversified and stable market and service economy" (Kenai Peninsula Borough, 1982). This is expected to reduce the effects of a slump in construction in the future.

Employment patterns in Kenai are varied. The largest group of workers in Kenai is involved in the mining, oil, and gas production industry (20.5 percent), with the second largest in government (16.3 percent), and the third in construction (14 percent) (Hitchins, 1977). In 1978, 375 people in Kenai and Nikiski held commercial fishing permits (Environmental Services, 1979). Commercial fishing income ranges are presented in Table 28. In 1982, 76 percent of Kenai heads of household worked 12 months per year (Figure 26c). Kenai and Soldotna also serve as a trade and service center for the central Kenai Peninsula. With the area's wide and growing range of goods and services, several Peninsula residents commented that they seldom need to go further than the Kenai area to make their purchases. Because of the large size of Kenai's major industries such as oil and gas, tourism is

POPULATION TRENDS: KENAI, - - - - - SOLDOTNA

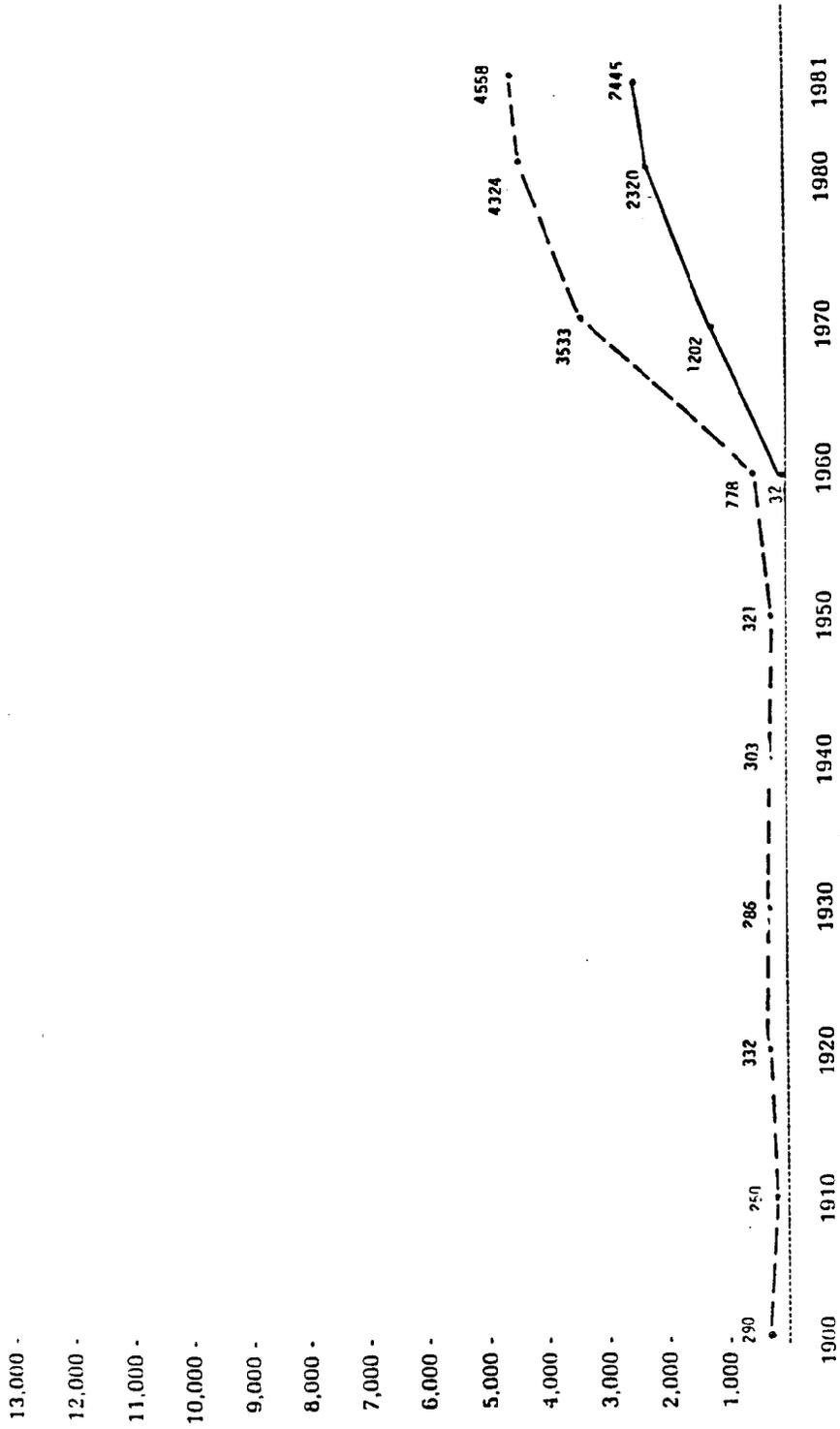


Figure 28. Population Trends, Kenai and Soldotna

Source: Kenai, Fall (1981); Soldotna 1960 from Rollins (1978), and Soldotna 1970-1981 data from Alaska Department of Labor (1981). U.S. Census data may not be reliable for certain Alaska communities.

TABLE 28

INCOME RANGES FROM COMMERCIAL FISHING FOR SALMON AND HERRING,
KENAI AND SOLDOTNA, 1981

	SOLDOTNA	KENAI
Total Number of Commercial Fishermen	164	221
Number of Salmon and Herring Fishermen	147	199
Percent earning less than \$1,000	8.8	10.6
" " \$1,000 - 9,999	27.2	20.6
" " \$10,000 - 19,999	27.2	35.2
" " \$20,000 - 29,999	15.0	21.6
" " \$30,000 - 49,999	13.6	9.0
" " \$50,000 - 74,999	4.1	3.0
" " \$75,000 - 99,999	4.1	*
" " greater than \$100,000	*	*
Total	100.0	100.0

* Less than four: due to confidentiality regulations number cannot be disclosed.

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries. (1981)

a substantially smaller portion of the city's total economy than it is in other Peninsula towns. Income ranges for Kenai-Soldotna are graphically depicted in Figure 27.

North Kenai, population 3,836, is the center of much of the oil and gas development, with refineries, chemical plants, and industrial suppliers located there. Before the development of the petroleum industry, North Kenai was primarily a relatively isolated homesteading area. The North Kenai road was constructed in the early 1960s for access to the newly constructed industrial installations associated with oil and gas processing and offshore drilling. The road now extends almost 30 miles north of Kenai, with the North Kenai community dispersed along most of its length. A high percentage of North Kenai residents is employed in oil-related jobs; some long-term Kenai residents moved to North Kenai in the 1960s because of rising taxes within the city. North Kenai is not incorporated, and so does not have a city government.

In contrast to Kenai's and North Kenai's industrial character, Soldotna is a growing commercial center with much of its employment in the areas of transportation, communication, utilities, and trade and service. In 1980, Soldotna's population was 2,320; it contained 808 households with a mean size of 2.87. In 1976 25 percent of Soldotna's workers were employed in service industries, and 73 percent of heads of household worked 12 months per year (Hitchins, 1977). Tourism is a moderately important seasonal component of the economy, since large numbers of visitors are attracted to the area's excellent salmon fishing. Soldotna's population increased 103 percent between 1970 and 1981 to a total of 2,445 (Kenai Peninsula Borough, 1982). This is substantially more than Kenai's growth during the same

period, possibly due to greater availability of land in the Soldotna area and its non-industrial character.

Soldotna can be reached from Anchorage by 150 miles of paved highway or by light aircraft, and was incorporated as a first class city in 1967. It is now the Kenai Peninsula Borough's second largest city. Soldotna is a relatively new community, having first been settled in the 1940s by non-Native homesteaders attracted by the availability of land. Along with Kenai, Soldotna experienced a long boom period following the discovery of oil in the late 1950s.

PATTERNS OF HUNTING AND FISHING

Case studies of Kenai area households and their patterns of resource use were obtained between June and September 1982 through informal interviews conducted by a field researcher in the homes of selected informants. The informants were selected to represent a range of employment types, lengths of residency, ethnicity, and levels of resource use.

According to a survey conducted for the Kenai Peninsula Borough in 1976, 46 percent of Soldotna residents and 41 percent of Kenai residents get none of their food from fishing, hunting, or gardening (Hitchins, 1977). However, the same study reported that wild resources contribute 25 percent or more of the total food supply to 22.4 percent of Soldotna's households and 11.3 percent of households in Kenai. Because the survey included no North Kenai residents, it is not known if similar patterns exist in that community.

In 1983, a survey of a selected sample of 197 Kenai City households found that the mean harvest of king salmon, red salmon, silver salmon, moose, razor clams, and halibut was 100.5 pounds dressed weight. In

comparison, Ninilchik households harvested 184 pounds, and Homer area households had a mean harvest of 222.7 pounds of these resources.

With the exception of case A, the households discussed below illustrate the diverse patterns of resource use which exist in the Kenai area among households using a substantial amount of fish and game.

Case A

Case A is a Soldotna household that harvests very few wild resources for domestic use. The household consists of a husband and wife, both in their 40s, and four children. The husband works nine months a year as a school district administrator; in summer he runs a commercial set net in Ninilchik with his brother and two oldest sons. The wife has no wage occupation. The family has lived in Soldotna since 1970 and in Homer for ten years before that.

Despite the availability of salmon through their commercial set net, the household uses very little fish for family consumption. Occasionally the household uses 4 or 5 salmon which they take with a rod and reel when they "feel like it." The husband said he started commercial fishing four years ago to earn extra income for his children's college educations; he said he sees "too many fish" at his set net in summer to want to eat them year-round. Last year he fished with some Anchorage friends during the August non-commercial gillnet season, mainly because these friends wanted to use his gear to get salmon.

Every two or three years, the husband takes halibut with a rod and reel from a friend's boat off Ninilchik. Although he has occasionally hunted moose in the past, the husband said he no longer hunts because he does not have much time and does not like to kill animals. The household uses no other local resources.

Case B

By contrast, Case B is a Kenai household that heavily uses resources. This household consists of a Native woman, age 64, who is a lifelong resident of the community. She formerly fished a commercial set net, but is now retired. Her daughter and son-in-law, both in their 40s, live on an adjacent lot. The older woman shares many of the following resources with her daughter and son-in-law.

The woman ideally could use 30 king salmon each year which she smokes, cans, pickles, and freezes. Kings, however, are difficult to get because she is no longer engaged in commercial fishing, does not have a boat for trolling in Cook Inlet, and has never learned to fish in rivers with a rod and reel. In addition, she considers salmon in the rivers to be too decomposed to eat. As a result, the woman has had to purchase most of her kings from commercial fishermen during the last three or four years. This year, kings sold for \$1.25 a pound; the household purchased \$400 worth. She prefers the early kings that

arrive in May, because these have traditionally been used by Kenai residents, are the first fresh salmon available, and run when the weather is cool and dry enough for smoking. However, there is no commercial or non-commercial season on these early kings and, hence, salt water kings are not available. The household also has started using other salmon species, including 18 silvers this year from her son-in-law's commercial gillnetter and 10 reds, which she obtained in five days of fishing with three other people in the new Kasilof River "personal use" gillnet fishery. The woman gets some of her salmon by smoking other people's fish for a one-half share. She distributes fish widely to her many relatives in the community and to old and sick people who cannot get their own. She said salmon is very important to her because she has eaten and preserved it this way all her life.

The woman and her daughter use about four cases of clams each year which they usually harvest from Clam Gulch or Ninilchik. This year, however, they did not go clam digging because they had some remaining from last year. The older woman puts out a hooligan (eulachon) net on Salamatof Beach in April and May, eating what she wants fresh. She also lets friends and neighbors use her net to get hooligan.

The two households usually use a moose every year. The older woman and her now deceased husband formerly hunted moose, but now she relies on her daughter and son-in-law for moose. However, this year the daughter and her husband had only a week to hunt, because the husband was working on the North Slope, and for the first time they were not successful harvesting a moose. Frequently it takes them 10 to 20 days to harvest a moose, and they usually hunt in the Swanson River area. She rarely buys meat in the store. She said she seldom receives fish or game, even though she frequently shares fish with others. "People don't share like they used to, not even relatives," she said.

Case C

Case C is a Soldotna household that moved to the area in 1979, and harvests resources, they say, primarily for pleasure. The household is comprised of a husband and wife, both in their 50s, and a daughter and son-in-law temporarily living with them. The husband usually works on the Cook Inlet offshore platforms, but was recently laid off due to a slump in the drilling industry. The wife and her daughter run a ceramic business in their house mainly as a self-supporting hobby.

The household drives to Seward in their recreational vehicle for a week each August to fish for silvers, which they take with a rod and reel. They have been doing this since they first moved to Anchorage in 1966. The household said they never get their limit of three each per day; usually they get 15 to 20 fish which they smoke, can, and freeze for use during winter. The household does not fish for other salmon species or for freshwater fish.

The household annually uses 150 to 200 pounds of halibut caught from their boat 40 miles out of Homer. A new boat suitable for this activity usually costs at least \$20,000. The household has a commercial

halibut permit and fishes the commercial season in early summer, but sells little of their catch. Their commercial long-line halibut operation, they say, is mainly a tax deduction, although it is also more efficient than sportfishing for taking halibut. Occasionally, however, they fish for halibut and other bottomfish with a rod and reel in the Seward area, usually throwing back the bottomfish. The household said they catch enough halibut to give away more than they eat; halibut is distributed to friends and elderly people in the community who cannot harvest it themselves.

In the past the household set crab and shrimp pots in Kachemak Bay, but the Bay has become too crowded with pots, they said, and it is too easy to get one's boat "hung up on all the lines." Crab and shrimp resources have also been depleted, they said. The husband went clam digging this year for the first time, but did not like digging or cleaning the clams, so does not plan to go again.

The husband formerly hunted moose on the Kenai Peninsula but quit five years ago because there were too many inexperienced hunters in the woods and too much competition for the game. Last year he hunted moose near King Salmon on a company-sponsored trip, but did not get one. The household enjoys eating 40 to 50 rabbits harvested by their son-in-law in the local area each year.

The household said they harvest wild resources mainly for pleasure and not because it is a cost-effective way to get food. However, the harvest of wild resources, they said, offsets the expense of hunting and fishing, which in this case includes gear, gasoline, and maintenance for their recreational vehicle and boat. The household said they fish more now that they live in Soldotna rather than in Anchorage because harvest areas are closer. However, they were concerned about depletion of fish and game and the decreasing availability of some resources due to increased competition.

Case D

Case D is a North Kenai household that takes salmon with their commercial set net. The household includes a husband and wife, both in their 40s, and four daughters. The entire family works a commercial set net in summer in North Kenai. The husband also fishes the commercial herring season, but neither he nor his wife works at other remunerative employment in winter. The household has lived in North Kenai since 1966.

The household annually uses 50 to 60 red salmon which they retain from their commercial set net harvests; these are first frozen, then canned or smoked when the family has time after commercial season closes. The household also fishes for silvers with a rod and reel in the Swanson River in late August and September, mainly, they say, for recreation. Before they had a set net, the household harvested all the salmon they used with a rod and reel. They generally do not give away much fish, except the silvers taken with a rod and reel if the household already has enough for the winter. These are given to friends and neighbors who do not have time to fish for themselves.

The household also has fished in the local August subsistence or non-commercial gillnet fishery when it was open in previous years. The household said they eat fish two or three times weekly year-round; they prefer it to other kinds of meat because it tastes better and is healthier.

The household uses 150 to 200 pounds of halibut each year. The husband previously fished the commercial halibut season, keeping part of his catch for the household. This year the family fished for halibut with a rod and reel in late August from a friend's boat off Deep Creek. In total, they harvested 280 pounds of halibut, half of which their friend kept.

The household occasionally sets crab and shrimp pots in Kachemak Bay, about 90 miles distant. The household says that the cost of gasoline and a boat makes this activity more recreational than economical because depletion of resources in the Bay means that it is no longer possible to harvest enough crab and shrimp to compensate for the costs. The household occasionally digs clams at Clam Gulch for pleasure but generally gives them away because they do not like to eat clams. In winter, the household fishes for pleasure through the ice on local lakes for land-locked silvers.

The husband tries to get a moose each year but does not consider himself an "aggressive" hunter. He hunts very near his house, considering it is dangerous to be in the woods with all the inexperienced hunters. The husband has not harvested a moose in three years. He hunts spruce grouse locally in fall, using as many as he gets. In the fall, the family also gathers low- and high-bush cranberries, raspberries, currants, and blueberries, making about three to four cases of jam which they use each year. The household harvests wild resources, they say, because they enjoy the activities and value the self-sufficiency resulting from wild food harvests. Because the household works seasonally, they have time to take these resources.

Case E

Case E is a Kenai household that heavily uses wild resources but does most of their harvesting in non-local areas. The husband, a Native, is a lifelong Kenai resident; the wife moved to Kenai from Oregon in 1967. The husband is a Cook Inlet gillnetter and fishes the commercial herring, halibut, and salmon seasons. Depending on his income from fishing and the availability of jobs, the husband frequently works as a millwright in winter, often locally but occasionally on the North Slope or in Valdez. The wife has no wage occupation. The income of this household is probably fairly high, though not always dependable due to the variability of commercial fishing income.

Each year this household uses 3 to 4 cases of salmon (about 5-15 fish total), which they smoke, can, or freeze. Although they prefer kings because the husband has eaten them all his life, the household also will use silvers. They seldom use other salmon species because they consider these to be of inferior quality. The household gets their fish from the husband's commercial catch this year, however, he caught

only two kings, so the household smoked chum salmon for the first time. The husband does nearly all the salmon harvesting and preserving; salmon are very important to him, he reported. However, the wife has not eaten salmon all her life, does not consider it so important, and does not know how to harvest or process fish.

The household uses halibut which they get from the husband's catch, usually eating it twice monthly, year-round. The husband gets clams about twice yearly across Cook Inlet at Polly Creek, which he reaches in his floatplane. He said he prefers to dig clams there because the clams are bigger and taste better. The household does not like to clean clams, however, so they keep enough for a meal and give the rest away to friends and relatives. The household occasionally uses crab or shrimp which the husband harvests while commercial fishing for other species. The household likes hooligan, but the husband is commercial fishing during the run and has no time for harvest activities. The household occasionally receives hooligan from friends or relatives because it is easy to get and people tend to harvest more than they can use, but the household would use more if it were available. As with salmon, the wife has no interest in or knowledge of harvesting and processing hooligan. In winter the husband occasionally fishes through the ice for rainbow trout on local lakes, mainly, he says, for pleasure.

The husband hunts elk in the fall on Afognak Island which he reaches in his floatplane. He considers elk to be easier to get and more tender than moose. If the husband cannot get elk, he hunts either moose in the Stony River area or caribou across Cook Inlet. The household rarely buys meat in the store; only once in the last 15 years have they not had enough wild game. If wild game were not available, however, they would buy a side of beef. Although it is expensive to fly to hunt, the husband says it is almost impossible to get a moose locally because there is too much competition, so he has given up trying. The household does not think it is more expensive to fly to hunt than to buy beef in the store. In addition, wild game is important to the husband, he says, because he has eaten it all his life. He does not consider himself a "recreational" hunter. The family also gathers cranberries, blueberries, and raspberries in the fall.

Because the wife has little interest in or knowledge of wild food harvesting, the husband does nearly all the harvesting and preservation. Because of the limited knowledge of and interest in wild resources on the part of the wife, the amount of wild resources the household uses depends on how much time the husband has. Although the husband has many relatives in the area, the household does not receive much fish or game. With a relatively high income, the household can afford equipment such as a floatplane, which gives the husband access to harvest areas not available to most local residents and facilitates his resource harvesting activities.

INTERRELATIONSHIPS

Despite the economic growth in the Kenai area over the last two decades and the multitude of available goods and services, the above cases demonstrate that many Kenai area households still use and value wild resources. Salmon is by far the most widely used resource, accounting for about one half the mean household harvest (Table 27a, Figure 26a). Although many households also harvest and use clams, halibut, moose, and berries (Table 27a). Clams and halibut, however, are not available locally; residents must travel at least to Clam Gulch or Ninilchik to harvest these resources. Some households interviewed also used trout, herring, hooligan, cod, crab, shrimp, duck, spruce grouse, ptarmigan, rabbit, beaver, porcupine, elk, and caribou.

With the rapid population growth in the Kenai area over the last twenty years, the communities of Kenai, Soldotna, and North Kenai have become increasingly heterogeneous. Their households exhibit a spectrum of attitudes and approaches to resource harvest. These include lifelong residents who have eaten king salmon all their lives as in cases B and E; households who fish and hunt for recreation such as case C; others who value a self-sufficient way of life, such as case D; and others who do not use wild resources at all as in case A. The harvest methods and range of resources used varies from household to household as each one develops harvest techniques that fits its particular circumstances, including time availability, values and beliefs, access to resources, and economic alternatives.

Lifelong and long-term Kenai area residents generally seem to use a larger quantity and wider diversity of wild resources than do new residents, possibly in part because they have done so most their lives and highly

value that kind of diet. Generally, long-term residents also have the skill and local knowledge necessary for the successful harvest of resources. This is in contrast to many new residents, especially those who have relocated from other states, who must learn techniques and locations for local harvest activities, as well as acquire the necessary equipment. Equipment might include fishing rods, nets, guns, truck, boat, all terrain vehicle, freezer, pressure cooker, and can sealer; access to these usually precedes harvesting resources. Some long-term residents, however, do not use resources as heavily as they did in the past, partly due, they say, to the resources' declining quality and diminishing stocks and the increased competition for resources. This is particularly the case with moose. Frequently older residents are limited in their harvest activities by poor health; several of these residents depend on receiving road killed moose as a source of meat.

Some new residents also use an abundance of wild resources once they have gained adequate local knowledge and skill for harvesting, and they have sufficient income to afford gear, equipment and travel. In fact, some new residents say they moved to the Kenai area in order to be able to hunt and fish locally. Yet with the periodically booming Kenai economy, it is likely that a large number of people moving to the area may be attracted more by economic opportunity than by proximity to harvest areas, and hence may use fewer resources. According to a 1976 survey, 60 percent of Kenai respondents cited job availability as their major reason for moving to the community (Hitchins et al., 1977). In Soldotna 40 percent of the residents responded similarly. This contrasts with smaller communities such as Ninilchik where a primary reason for moving there might be access to resources and a self-sufficient way of life (Baring-Gould 1977).

A household's use of wild resources is influenced by personal circumstances and time constraints during harvest seasons. Households with full-time, year-round employment frequently have little time available for resource harvest. Other households use only those wild foods available when they have time for harvesting, even if they would prefer to use a wider range of resources. None of the households interviewed seemed to adjust their employment strategies to their resource harvest needs. In one household where the husband worked as a deckhand in summer, the wife did all the household's salmon harvesting and preservation. In case E, however, where the husband also worked in summer as a commercial fisherman, the wife did virtually no harvesting or preservation. These differences probably are the result of individual households' values and choice of way of life, and affect the extent to which employment might limit a household's ability to harvest resources. Many residents who have been using wild resources for years have changed their harvest strategies as access to these resources, especially moose, has diminished. Some households have given up moose hunting, while others now use expensive equipment such as planes and all terrain vehicles to reach game. Still others have turned to raising livestock for meat. Many residents stated they now feel "lucky" to get a moose. Competition from both the growing local population and the large numbers of Anchorage residents who hunt on the Kenai Peninsula has at least partly caused the declining availability of moose. This competition has also discouraged residents who hunt because they "like to be outdoors"; with larger numbers of hunters, these people no longer regard the activity as enjoyable.

For households not engaged in commercial fishing, access to salmon also has diminished over the past two decades. The recent yearly changes

in local subsistence and non-commercial gillnet fishing regulations have led some residents no longer to have access to the fish they normally would use, especially for households using 30 or more salmon annually. Although most people in the Kenai area live relatively close to rivers with salmon runs, long-term residents tend to find the crowds during king salmon season unacceptable or have never learned to use a rod and reel; most of these people are accustomed to taking their salmon with a set net. In addition, many long-term residents eat only salmon caught in saltwater, because that is what they have done all their lives. Households have tried new approaches to getting fish, such as using less desirable salmon species, smoking fish for others for a one-half share, buying fish, or even harvesting outside the regulatory system.

The distribution of fish and game resources among Kenai area households does not follow a single pattern. Sharing resources seems to occur rather frequently between lifelong residents and between parents and children. However, even older residents who have lived in the community for a long time often say they cannot depend on receiving resources from others; one lifelong resident said that old people in the community without children are "out of luck" when it comes to getting fish and game. Other lifelong residents remarked that "people don't share like they used to." Another woman explained that many resources have become "too precious" to share with others. Households new to the area generally seem not to share their resources widely, possibly because they do not have the social of family connections of longerterm residents. For example some newer residents reported that they do not know the names of their neighbors.

Due to greater local economic opportunities, commercial fishermen in the Kenai area have more opportunities to work at other jobs in winter than,

for instance, do fishermen from Ninilchik. Kenai area residents also seem to hunt and fish more in non-local areas than do Ninilchik residents, also possibly indicating greater local economic opportunities and, hence, higher income in the Kenai area. Most Kenai area residents appear to have an economic choice between using wild or store-bought resources; none of the households interviewed appeared to be entirely economically dependent on harvest of wild resources. One household, however, reported receiving 100 pounds of fish last year from their church because the household could not afford to purchase other food. Yet, despite the usual economic choices, wild food harvesting is still highly valued by nearly all of those engaged in it.

PART II

HOMER: RESOURCE USES IN A MIDDLE-SIZE, ROAD-CONNECTED COMMUNITY OF THE KENAI PENINSULA BOROUGH

By Carolyn E. Reed

PREFACE

The second case community on the Kenai Peninsula is Homer, a city of moderate size (population 2,250 in 1980), 240 miles from Anchorage. Like the Kenai-Soldotna-North Kenai cluster, Homer has recently experienced substantial growth and economic diversification. According to Reed's research, a segment of Homer has registered public concern about potential industrial development and high density settlement. Since the early 1920s Homer's local economy has included small-scale farming and ranching. Self-perceptions of many Homer residents include its "small town" and "country" attributes. These self-perceptions are linked to uses of fish and game resources by a sizeable portion of the population.

Like the previous case, Homer manifests a heterogeneous population, making generalizations about resource uses across households difficult. Many households do not fish and hunt. Households that do fish and hunt display variable seasonal rounds of harvest activities. Most fishing and hunting reported for this case is scheduled around wage employment (average income is \$21,300 per household). There are a few target species -- silver salmon, halibut, and clams. Other resources include berries, mussels, trout, moose and greens. Fishing and hunting are perceived to be "family activities," inculcating expressed values of independence, self-sufficiency, country living, and freedom in combining economic options (such as gardens, livestock, fishing, self-employment). In comparison with Nondalton, the

Yukon Delta, and Dot Lake, low volumes of resources are harvested within the family and distribution and exchange appear to be less extensive. Resource uses are combined with other economic options to provide food and a form of valued activity. Some residents state they choose to live in Homer because of the opportunities for fishing and hunting. Although fishing and hunting for local use cannot be said to be the central focus of the economy of the community, it is an aspect of a perceived country-like way of life valued highly by many Homer residents.

SETTING

Situated within the Kenai Borough, the city of Homer is located on the north shore of Kachemak Bay at the southern tip of the Kenai Peninsula in southcentral Alaska. The city's population is 2,897 (Kenai Borough Census 1982), which comprises about one-third of the south peninsula population. In 1982, Homer contained 1,077 households. The mean household size was 2.7 persons (see Appendix). Homer's annual growth rate in the past decade has been 7 percent to 8 percent, which is higher than the rest of the borough. (Figure 29).

Homer is connected by paved highway to the state road system and Anchorage, which is 240 miles away. This road first opened in 1951. Homer is also accessible by sea and air through the Alaska Marine Highway and three airlines which provide daily flights to Anchorage.

Homer originated as a place of commerce in the 1890s because of its unique resources and location. Coal was mined from the bluffs and transported by rail to the sandspit, which extends several miles out into Kachemak Bay; from there it was exported by ship. From the 1920s on, the Federal Homestead Act encouraged development of the area's agricultural

POPULATION TRENDS: HOMER

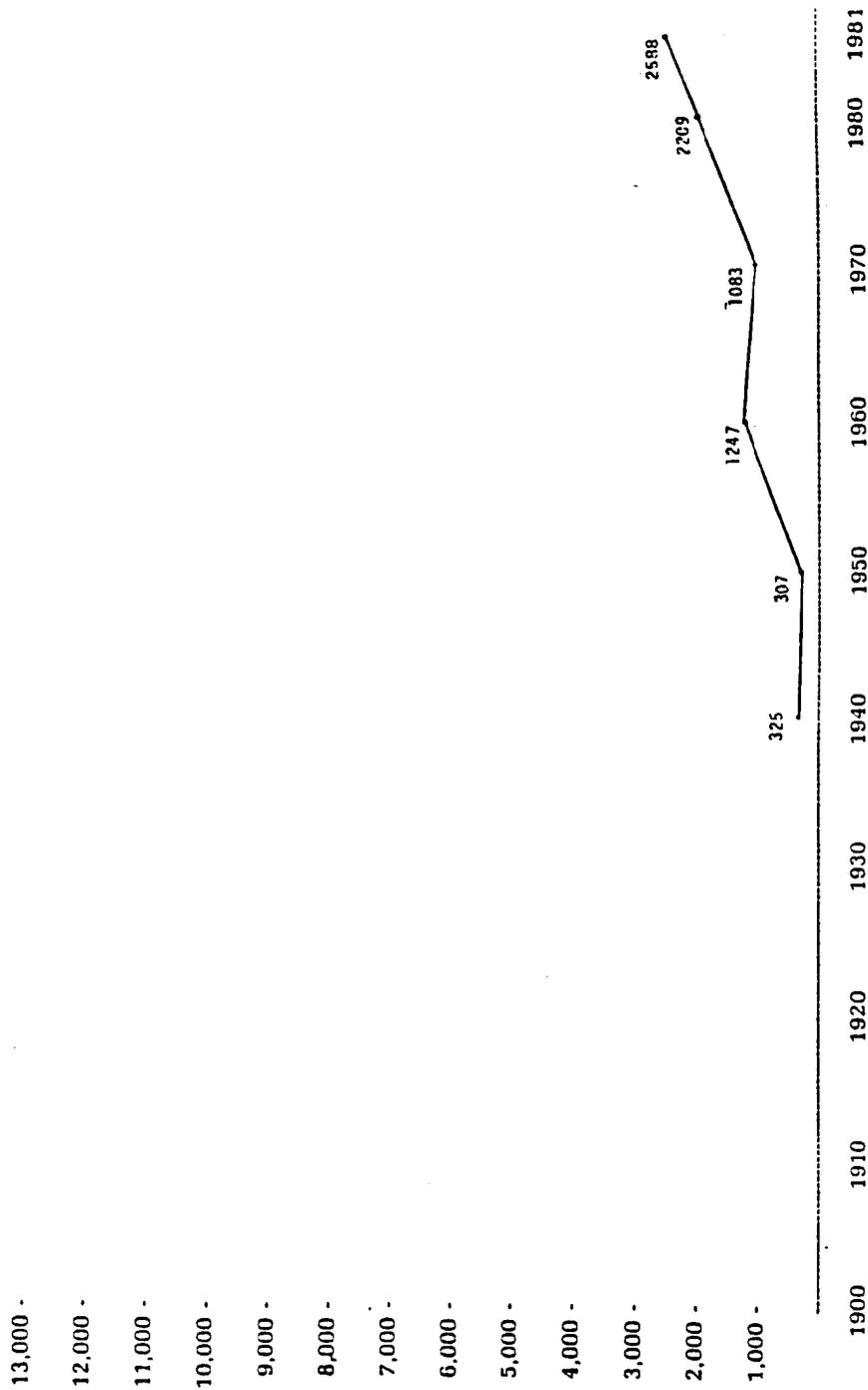


Figure 29. Population Trends, Homer

Source: 1939-1960 data from Rollins (1978); 1970-1981 data from Alaska Department of Labor (1981)
 U.S. Census data may not be reliable for certain Alaska communities.

potential and of many homesteaders settled in the Homer area. Within several decades, over 250 homesteads were established (Klein, 1981).

While the city itself covers an area of 10 square miles, Homer also serves as the primary center of commerce for about 1700 residents of outlying areas and other smaller communities of Kachemak Bay (Kenai Borough, 1981). In this report, the "Homer area" includes, in addition to the city itself, the communities of Anchor Point, Nikolaevsk, and the residences outside the city limits along both shores of Kachemak Bay, excluding Seldovia. Homer's public services include a museum, library, state courthouse and recording offices, other state offices, a hospital, and a radio station. A broad range of supplies and services is available, although most shops are small, with more limited inventory and higher prices than in Anchorage. For those living out of town, a day's trip to Homer might include grocery shopping, using the laundromat, purchasing building supplies or equipment parts, dinner, and a movie.

The Homer area's economy has three major segments. Of importance is the fishing industry, including both commercial fishing vessels and processors. In 1978, 324 Homer residents owned limited entry permits (Environmental Services, 1979). Most fishermen are permanent local residents and many have invested in onshore businesses in addition to fishing. In 1976, fishermen and related laborers accounted for 17.6 percent of Homer's work force (Baring-Gould and Heasley 1977) (see Table 29).

Also of great importance are tourism and recreation, which are based upon the area's natural environmental attributes and abundant variety of fish and game resources. In 1974 the proportion of tourist-related businesses to total businesses in the area indicated that the economic effect of tourism on Homer's economy was heavy (Environmental Services, 1979).

TABLE 29

INCOME RANGES FROM COMMERCIAL FISHING FOR SALMON AND HERRING,
HOMER, 1981

Total Number of Commercial Fishermen		299
Number of Salmon and Herring Fishermen		190

Percent earning less than \$1,000		3.1
"	" \$1,000 - 9,999	14.2
"	" \$10,000 - 19,999	18.4
"	" \$20,000 - 29,999	17.4
"	" \$30,000 - 49,999	12.6
"	" \$50,000 - 74,999	7.4
"	" \$75,000 - 99,999	8.0
"	" greater than \$100,000	18.9
	Total	<u>100.0</u>

Source: Alaska Department of Fish and Game, Division of
Commercial Fisheries. (1981)

Since 1974 tourism has continued to grow.

Government agencies and commercial businesses provided another source of employment in the Homer area in 1976, 41.1 percent of household heads within the city found employment in these areas. This contrasted with a reported 16.8 percent of the heads of households outside the city limits. This latter group was more likely to be employed by construction companies (15.2 percent outside the city; 5.2 within). In the same year, 17.2 percent of the city's work force was comprised of professionals, such as doctors and teachers. Professionals accounted for 4.7 percent of the workforce living outside the Homer city limits.

A smaller but noteworthy part of the Homer area's economy is agriculture and animal husbandry, made possible by favorable climates and soils. The average growing season is 107 days, which is relatively long for Alaska. Although agriculture and animal husbandry were widespread during the homesteading era, they are now less important on a commercial scale within the city, particularly in light of the present growth in fisheries and tourism. Increasing population density in the city has resulted in land parcels too small to farm economically, but raising livestock and gardening on a family level remain important (City of Homer, 1978). In 1982, about 38 percent of City of Homer households raised gardens, and 8 percent raised livestock (Table 27c). Outside the city where land parcels are larger and grazing leases are available, commercial-scale ranching and agriculture still occur. About 10 percent of a sample of male heads of households in this area in 1976 reported their occupation to be "homesteader" or "farmer". In contrast, no city residents reported these occupations (Baring-Gould and Heasley 1977:6). In 1982, about 69 percent of the "Homer Area" households reported growing gardens, and 39 percent raised livestock (Table 27c).

The area's agricultural potential is not yet fully developed, and the University of Alaska operates experimental research stations in the area in an attempt to learn effective means of making agriculture and ranching successful.

A survey in 1976 found that 55 percent of Homer's work force was employed year-round, including merchants, school teachers, professionals such as doctors and attorneys, and service people (Hitchins, 1977; Figure 26c). At present 18 percent are non-locally employed in the remote oil-fields or as marine pilots (Pacific Rim Planners, 1982; Table 27b). Many others are seasonally employed as fishermen, laborers, ranchers, artists, and craftsmen, frequently holding several different jobs a year. About 11 to 13 percent of Homer's population is retired (Table 27b). Homer's income ranges are graphically depicted in Figure 30. It is important to note, however, that differences in income between city of Homer residents and other Homer area residents may be substantial. For example, a survey conducted in 1976 (Baring-Gould and Heasley 1977) found the median family income within the city to be \$17,000; for those families outside the city, median income was \$11,300.

The city's current plan for growth and development, implemented by zoning regulations, calls for a small centralized commercial district surrounded by large residential tracts. The only industrial land designated is the spit, which has been planned for light industry related to commercial fishing and onshore facilities to serve outer continental shelf oil development. One side of the spit is now being held for recreational use, further reducing the industrial area. Homer residents have strongly opposed the development of heavy industry in the area (Hitchins, 1977). Baring-Gould and Heasley (1977) found that 44.4 percent of a sample of

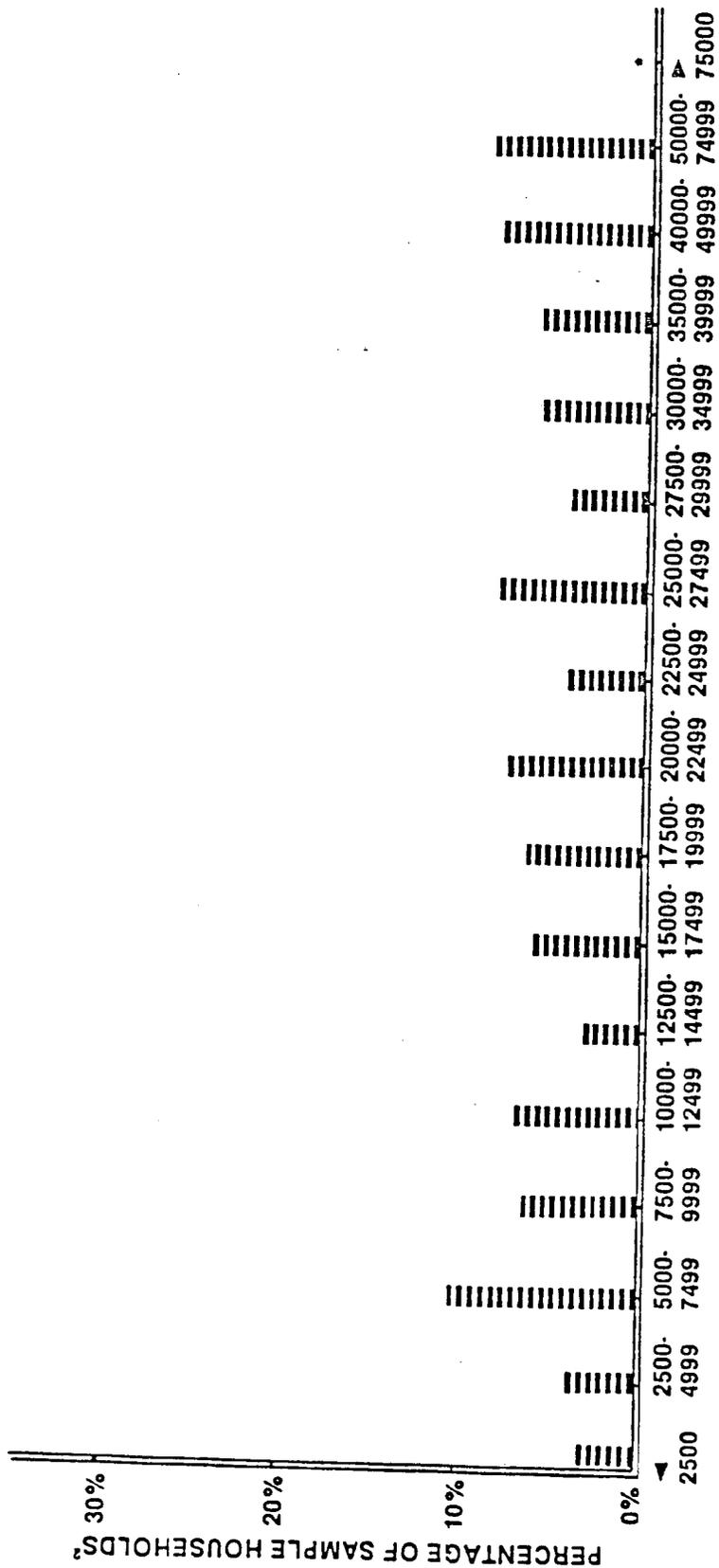


Figure 30. Household Income (Dollars) — 1979, Homer 1

1 U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3
 2N = 782

* no data available

Homer households gave "small town qualities and lifestyle" as a reason for moving to the Homer area; this was the reason most frequently cited by respondents.

PATTERNS OF HUNTING AND FISHING

The following case examples of Homer area households illustrate the harvest and utilization of fish and game resources by local residents within the context of a diversified cash economy. While virtually all Homer area residents participate in the cash economy, a survey in 1976 showed that 84 percent of the area's residents also harvest some fish and game resources for household use (Table 30). In fact, 30.5 percent reported that they relied on wild fish and game for most or all of their supply of meat and fish. However, differences existed between the reported degree of use of these resources by city residents and that of households residing outside the city. For example 25.8 percent of the city sample did not use any wild resources; the figure for those living outside the city was 9.4 percent. While local harvests accounted for half or more of the meat and fish supply for 38.2 percent of the city residents, 65.3 percent of the outlying households reported this level of use (Baring-Gould and Heasley 1977: 7).

However, in 1983, a survey of 149 randomly selected households in Homer City and the Diamond Ridge and Fritz Creek census district by the Division of Subsistence found virtually no difference in reported quantities of use and harvest between those households residing within the city limit and those outside the city (Figure 26a). Differences did occur in the harvest levels of particular species. For example, Homer area households harvested almost three times as many silver salmon as did city

TABLE 30

PROPORTION OF FAMILY FISH AND MEAT SUPPLY COMING FROM
HOUSEHOLD HARVESTS IN THE HOMER AREA¹

	Homer City	Outside City	Total Homer Area
None	25.8%	9.4	15.6
Little	35.9	25.3	29.2
Around Half	19.3	27.4	24.3
Most	15.9	28.2	23.4
All	3.0	9.7	7.1
			<hr/> 30.5

¹ Baring-Gould and Heasley 1977:7.

residents. City dwellers reported higher harvests of red salmon and halibut (Table 27a). Exploration of reasons for these reported differences must await future research.

A variety of edible terrestrial and marine resources are available to residents of the Homer area. The most commonly harvested species are salmon, halibut, and intertidal species such as clams and mussels. Other commonly used resources include moose, crab, shrimp, trout, berries, greens, and mushrooms. Resources taken occasionally include waterfowl, grouse, bear, goat, and beaver. Few people harvest the total variety of resources available. Instead they make choices of one or more resources, based on individual preference, values, and access to the resource.

The following cases were chosen as examples of the major categories of economic endeavor in the Homer area, in order to illustrate how these choices are made and how resource harvested and uses may take place along with other economic activities. These broad categories consist of year-round employed people, those seasonally employed, those employed outside the local area, and retired people. The following data were gathered during the summer of 1982 through informal interviews with local residents. Although the statistical significance of these cases relative to the larger populations is not known, each case is not dissimilar to others in Homer. Together these cases demonstrate the heterogeneity of the community in terms of patterns of resource use.

Case A

This household illustrates an economic strategy pursued by a number of Homer area residents interviewed in this study and which incorporates several types of seasonal wage employment, wild resource harvesting, and local plant and animal husbandry.

The household unit includes a husband and wife and two small children living on two acres of land just outside the city limits. The husband works as a shipwright for several months during the winter, commercial fishes during the summer months, and moves buildings at other times of the year. Additionally, the family raises meat, milk, and vegetables. The entire family participates in the late summer subsistence salmon fishery on Kachemak Bay. This year they utilized a friend's site onshore at Mud Bay and in several days harvested about 30 silver salmon, enough to meet their needs. Having no skiff with which to transport the fish, the husband carried them a mile along the beach to his truck. They were preserved by freezing for the family's winter use. This household does not hunt game, stating they have no need to do so since they raise their own meat. The wife sometimes gathers greens and berries, although most produce comes from their garden. They report that the only food they need to buy is grain. Believing in self-sufficiency, this family built their own home, much of it from salvaged materials, and they heat their home with locally-gathered coal.

Case B

This household illustrates efforts to develop ranching as a viable dimension of the Homer area's economy.

The domestic unit consists of a husband and wife in their 30s and two small children. In contrast to the previous case, this household lives on a very large compound of several homesteads belonging to the husband's family, and has several hundred acres of their own. The husband was born and raised on this ranch and the wife grew up at Ninilchik, moving to the Homer area when she was married. The household's primary livelihood is ranching -- raising livestock and hay for sale. However, the husband also works as a registered guide in the fall and has periodically worked on the North Slope for extra cash. They also earn money occasionally by boarding livestock for the winter. The wife operates a small saddle shop on their property. They also have a large garden for family use. The wife explained, "The land provides all our vegetables, meat, and milk. We're poor but never hungry with this ranching lifestyle." The husband and wife regularly harvest moose, bear, and goats, hunting on horseback in the Fox River valley and North Fork drainage, areas which are contiguous to their ranch. Such hunting is their primary wild resource harvesting activity, and is highly valued by the household. For extra cash, the husband often serves as a guide to others on these hunting trips, but the household would hunt even if the husband did not guide. Hunting parties are usually made up of members of the extended family, including the husband's parents and siblings. Salmon are sometimes harvested from the beach below their ranch, but access is somewhat difficult due to the high bluffs. In contrast to game, salmon is less important as a food source, and this family seldom "finds time" to fish, as they have committed their time to ranch work and hunting during the fishing season.

Case C

This household illustrates a strategy in which the harvest of local wild resources and full-time, year-round cash employment are both elements.

The unit consists of a single female and her teenage daughter. The family moved to the city of Homer five years ago, after living elsewhere in Alaska, because of a business opportunity and an environment they found appealing. The mother is the owner of a local business, and is able to take time off whenever she desires to fish or gather resources. Having no family members locally, they participate with friends in the August subsistence fishery on Kachemak Bay, fishing for silver salmon on the beach below their bluff home at Miller's Landing. They put up 10 to 15 fish by freezing and canning. They gather mussels on the same beach throughout the year and eat them fresh. They fish for halibut by skiff off the same beach, catching and freezing about 50 to 150 pounds per year. With the skiff they also fish in saltwater with hook and line for trout, catching a dozen through the summer. They often give these to friends who bring them gifts of shrimp and crab. During the spring and summer they dig clams on the Homer spit, as the clams and cockles there are considered better than the redneck clams at Miller's Landing. They also gather greens for immediate consumption including nettles, goose tongue, and wild parsley. The family conducts extensive berry picking in late summer and fall, and these are frozen as well as used fresh. This household does not hunt moose or other wild game, stating they have neither the equipment nor the knowledge of how to go about it. They say they enjoy resource harvesting because it brings them closer to the country, as well as helping them financially.

Case D

This household is representative of some of Homer's retired residents which as discussed above, form a relatively high proportion of the population.

This unit includes a husband and wife in their 60s who retired from Anchorage eight years ago after raising their children there. They returned to land in the Homer area that they homesteaded in 1954. The husband says he has ample time now and spends much of it harvesting wild resources as well as raising a large garden and sometimes a pig. The husband hunts for moose each fall on horseback in the hills around Ohlson Mountain. He fishes with hook and line for halibut on a friend's boat in Kachemak Bay, and he subsistence fishes with a set gillnet for silver salmon at Mud Bay. He has used this set for the last eight years. He and his wife put up 30 to 40 salmon annually by smoking, canning, and freezing. The husband works the net with other elderly people, and enjoys the camaraderie with neighboring set-netters who also are retired. This family eats only wild game and fish, saying they do so because it is healthier and a way of life they have followed since the 1950s when they homesteaded. The raised their children exclusively on wild game, even during the years they resided in Anchorage.

Case E

This household illustrates how resources are used by local residents employed outside of the Homer area.

The household consists of a husband and wife, and three small children. The husband works offshore in Cook Inlet piloting ships. His work takes him away from home for periods of several weeks at a time. The family has a large cabin cruiser, from which he fishes with rod and reel in Kachemak Bay when he is home. They say they prefer to live on fish in the summer, although acknowledging they could well afford to buy meat at the store. Using their boat, they usually harvest 5 to 6 king salmon from Halibut Cove, which are smoked, canned (three canners full), and frozen. In previous years, they have put out a net on the beach in front of their home during the subsistence fishing season to catch silver salmon. However, this year the husband was to be out on the job and the wife did not want to do all the work by herself. In August during low tides, the family also harvests approximately six buckets of clams at Halibut Cove. These, too, are frozen and canned. Last year the husband took a moose, but this year he will be unable to hunt due to work constraints. This family has been in Homer for about four years and feels that the harvest of local resources is a part of what they enjoy about living there. Most of these activities are done as a family unit, although they sometimes take friends along as well.

INTERRELATIONSHIPS

Household use of the resources of the Homer area tends to vary depending upon several factors. The location of a household in relation to particular harvest areas influences which resources they use. For example those who live on the beachfront bluffs utilize fish and other marine resources more than those who live in the hills surrounding Homer where terrestrial resources are more accessible. Access to resources is also dependent upon physical skill, ability, knowledge of how to harvest a particular resource and equipment, such as in Case C where access to moose is limited by lack of knowledge about harvest methods and equipment. Of the households observed in this study, when access to one resource was limited, a household usually concentrated their energy on another resource.

Numerous roads provide access to hunting areas around Homer. Some hunters use horses and all terrain vehicles (for instance, cases B and D) to travel far beyond the ends of the roads in search of game. The waters of Kachemak Bay produce more than sufficient harvestable resources to meet the needs of local residents. However, much of the beach is inaccessible except by skiff because of high bluffs, and this limits the number of participants in the set gill net salmon fishery.

Access to deep water resources such as crab, shrimp, and halibut is limited to those Homer residents who can afford a boat with motor. In the cases investigated during this study, access to resources was influenced by the household's mode of cash employment. Retired people (such as case D) seem to have the most time available to fish and hunt. Many self-employed working people, such as those in cases A, B, and C arrange their work schedules to accommodate resource harvests. Nonlocally employed persons, as in case E, may have the most difficulty integrating work and harvest activities.

Residents of the Homer area also can reduce the costs of fuel because firewood is readily available from local spruce, alder, and birch. Coal is another natural resource utilized for heating homes by a number of Homer residents. Fall storms break up the beachfront coal veins and wash manageable sized chunks of coal onto the beaches. Gathering firewood and coal is a widespread pre-winter economic activity.

The moderate climate and fertile soils of the Homer area offer residents the opportunity to supplement their livelihood by raising at least a portion of their own food. Gardening was a frequent food-producing activity among the participants in this study and was especially important to retired people. The family level agriculture now occurring is an outgrowth

of a traditional land use pattern established by the original homesteaders who settled in Homer. Likewise the extensive use of local coal resources follows a tradition which has continued since the inception of Homer as a coaling station in 1890.

Combining a variety of economic activities is especially important to those whose cash income is limited due to seasonality of employment, such as in Case A. As well as being one of several viable economic options for Homer residents, the harvest of local fish and game resources is practiced by those households observed in this study for several other reasons. For Homer's retired people (such as case D), the harvest of local wild resources along with gardening have meaning as useful and productive work. Many retired people have come from elsewhere in Alaska, but have been attracted to Homer by the moderate climate and the ability to enjoy the harvest of wild resources, thus retaining the independence and practices which they had previously known elsewhere in Alaska.

Younger families raising children, such as cases A, C, and E, utilize the resource harvest activity as a focus of the family unit. The family unit is thus strengthened as a production unit. Also, the Homer area's "small-town values" are expressed in lateral ties of mutual aid through non-relatives working together in resource harvests.

PART III

NINILCHIK: RESOURCE USES IN A SMALL, ROAD-CONNECTED COMMUNITY OF THE KENAI PENINSULA BOROUGH

By Susan E. Georgette

PREFACE

The third case community on the Kenai Peninsula is Ninilchik, a small community (population 341 in 1980) on the road network linking Anchorage (190 miles distant), Homer (36 miles), and Soldotna (38 miles). A community with a long time depth, Ninilchik has shown recent rapid growth due to in-migration. The Ninilchik case illustrates how a previously remote community can fall within the shadow of a larger urban area while in many respects remaining distant from it. The transplantation of industries in surrounding areas like Soldotna and Kenai has not occurred at Ninilchik. Aside from increased tourism, Ninilchik's local employment opportunities remain limited. By and large, Ninilchik's population does not commute to jobs outside the community. Food and materials are commonly purchased from Kenai-Soldotna, less frequently from Anchorage.

Resource uses by Ninilchik households display similarities to particular households in Homer and Kenai -- heterogeneous resource patterns across households, restricted range of resources harvested (salmon, halibut, clams, moose), low harvest levels, limited time invested in fishing and hunting, and low distribution and sharing of fish and game products. There exists a "supplemental" fishing and hunting pattern wherein resource procurement is scheduled around wage employment and supplements food sources. Certain households report difficulties integrating the two pursuits. Households manifest what seems to be opportunistic methods for acquiring salmon

and halibut; these methods differ across households and from year to year (Figure 26b). A range of value orientations prevail, from those who express a "need" to eat salmon to those who dislike it. Ninilchik appears to be a community within the interstices of an expanding economic and social network linking portions of the Kenai Peninsula with the greater Anchorage area. Current resource uses reflect this position.

INTRODUCTION

Ninilchik is an unincorporated village of 341 people (U.S. Bureau of Census, 1980) located on the central Kenai Peninsula coast approximately 38 miles south of Soldotna and 36 miles north of Homer. Since 1951 the community has been accessible from Anchorage by 190 miles of road, which terminate at Homer. The highway is more heavily used in summer than winter, due mainly to the large number of visitors to the Kenai Peninsula. Ninilchik is within the Kenai Peninsula Borough. The mean size of Ninilchik's 117 households is 2.92. Demographic data for Ninilchik are presented in the Appendix.

Before the road, the Ninilchik community was physically confined to an area near the mouth of the Ninilchik River, now referred to as the "village." As roads were constructed, however, new areas became accessible and the Ninilchik community spread. Today the community is geographically dispersed along twenty miles of the Sterling Highway and over a network of unpaved roads leading inland from the coast.

Ninilchik is one of the peninsula's oldest communities. It was originally settled in the 1830s by former employees of the Russian American Company and their Native spouses. Even in the late 1890s, there was a remarkable absence of American influences at Ninilchik; commercial fishing

economically sustained the community throughout the 1900s. The population of Ninilchik was relatively stable until the 1970s when the subdivision of homesteads enabled it to increase from 134 to today's 341 (Figure 31). Although growing tourism over the past decade has provided a few economic opportunities, according to interviewed residents, many have been primarily attracted to Ninilchik by a desire for a small town way of life. Natural increase has also accounted for some of Ninilchik's population growth. Because there has been little economic growth in the community, new residents have commonly been employed non-locally, usually on the North Slope or the Cook Inlet offshore drilling platforms. These new residents have come to Ninilchik from other states as well as other parts of Alaska, bringing with them a wide range of values, beliefs, skills, and cultural traditions. Today Ninilchik is a heterogeneous community but still retains a sizeable core of lifelong Ninilchik families engaged in commercial fishing. With the population increase of the past two or three years, several residents remarked that they no longer know or recognize all the residents of the community. Yet the community is not heavily transient. In 1976, 64 percent of Ninilchik households had lived in the community for more than eight years (26 percent had lived there more than 20 years), and 77 percent planned to live there permanently (Baring-Gould, 1976).

Ninilchik has a school with grades K-12, a small health clinic, a library, a post office, a small boat harbor, a landing strip, fairgrounds, volunteer fire and ambulance crews, four churches, and several state recreational waysides. Ninilchik residents usually shop for goods and services in Kenai or Soldotna because of the limited local retail selections

POPULATION TRENDS: NINILCHIK

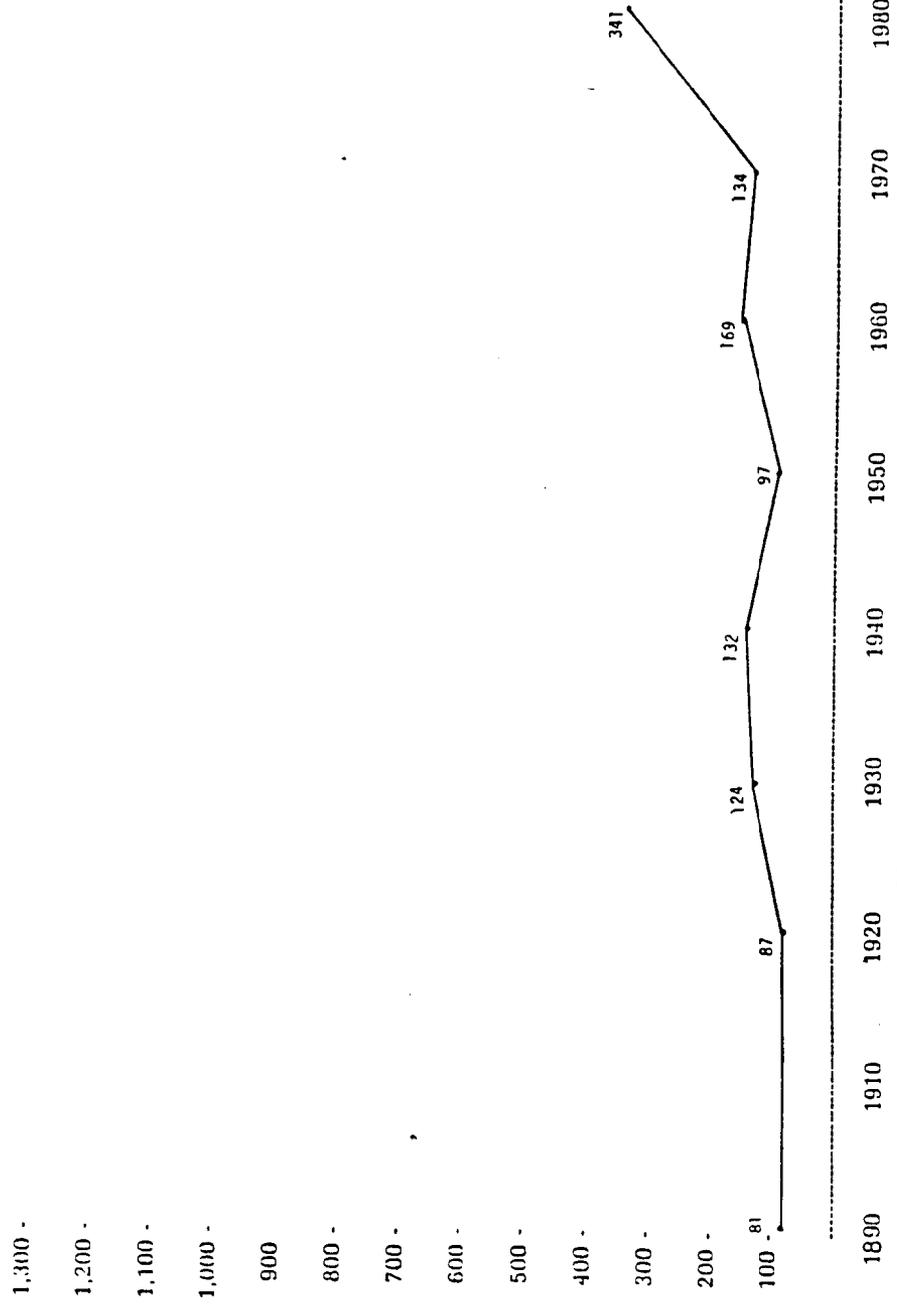


Figure 31. Population Trends, Ninilchik

Source: 1880-1950 data from Rollins (1978); 1970-1981 data from Alaska Department of Labor (1981)
 U.S. Census data may not be reliable for certain Alaska communities

and the higher prices in Homer. Generally, residents seldom go to Anchorage unless they have close family members there.

Wage employment in Ninilchik is more seasonal than in Kenai or Homer; in 1982, only one quarter of the heads of households were employed 12 months, while 49.7 percent were employed from 2 to 9 months (Figure 26c).

Most employment opportunities in the Ninilchik area are restricted to commercial fishing, the school, a handful of government positions, and about twenty small family businesses. Residents regard commercial fishing as the primary economic base for the community; in 1975, 66 Ninilchik fishermen owned 88 limited entry permits, 63 of which were for salmon, mostly for set nets (Braund and Behnke, 1980). A 1983 Division of Subsistence survey found that commercial fishermen are present in 41.7% of Ninilchik households. Table 31 depicts income ranges for commercial fishing. About half of the family businesses, including the lodge, craft store, automobile repair, tackle shop, realty, and fish taxidermy, are directly supported by the heavy summer visitor traffic to the southern Kenai Peninsula. Many of these visitors stop to fish with rods and reels in the Ninilchik River and Deep Creek. Several other Ninilchik businesses, such as the bar, gasoline station, and grocery store are patronized by local residents to some extent, but these also benefit significantly from highway travelers. Without a heavily traveled highway, it is unlikely that the Ninilchik community would be able to support most of its existing businesses and the local economy might be notably less diverse. However, several residents remarked that most local people believe they do not benefit from tourist dollars, and find the heavy summer visitor influx disruptive to the community. Figure 32 depicts income ranges for the community as a whole.

TABLE 31

INCOME RANGES FROM COMMERCIAL FISHING FOR SALMON AND HERRING,
NINILCHIK 1981

Total Number of Commercial Fishermen	77
Number of Salmon and Herring Fishermen	67

Percent earning less than \$1,000	8.9
" " \$1,000 - 9,999	31.4
" " \$10,000 - 19,999	32.9
" " \$20,000 - 29,999	11.9
" " \$30,000 - 49,999	8.9
" " \$50,000 - 74,999	*
" " \$75,000 - 99,999	*
" " greater than \$100,000	6.0
Total	<u>100.0</u>

* Less than four: due to confidentiality regulations number cannot be disclosed.

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries. (1981)

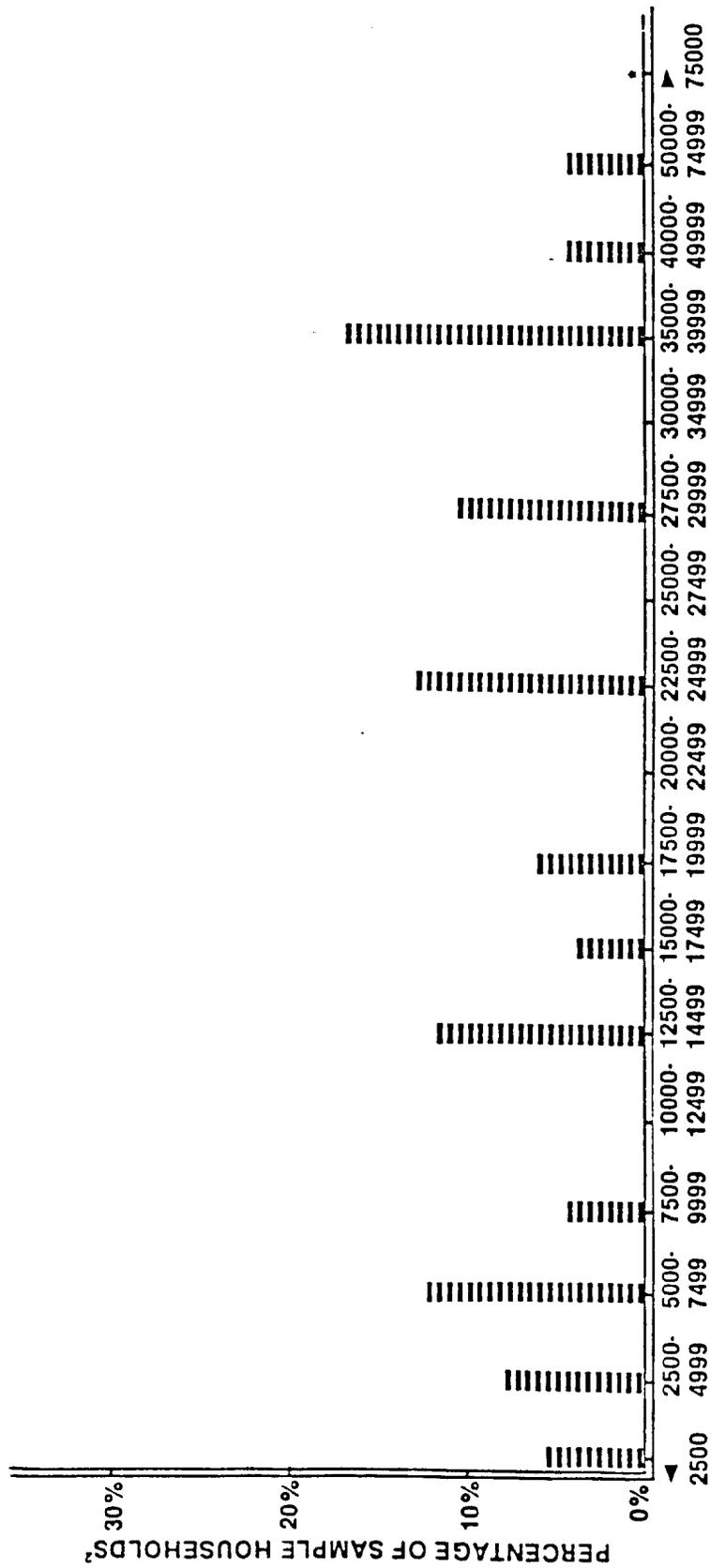


Figure 32 . Household Income (Dollars) — 1979, Ninitlichik¹

1 U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3

²N = 88

* no data available

The road also makes it relatively easy for Ninilchik residents to be employed non-locally on the Cook Inlet offshore drilling platforms or the North Slope. These residents usually make a weekly hour-long commute to Kenai to connect with flights to their job locations. However, local people say virtually no other Ninilchik residents commute to Kenai, Soldotna, or Homer for jobs because the daily drive is too long, residents' vehicles are not always adequate, and the wages most Ninilchik residents earn in the jobs available in these communities do not sufficiently compensate for the trouble and expense of commuting. In 1982, 20.8% of Ninilchik households contained at least one member who was employed non-locally (Table 27b). Because of the predominance of commercial fishing in the local economy, unemployment in winter is high. With few local employment opportunities, most commercial fishermen do not work in winter unless the fishing season has been particularly poor, in which case they usually must leave the community to seek employment, frequently in Anchorage or on the Cook Inlet platforms or on the North Slope.

The loss of a large Ninilchik cannery to fire in 1979 eliminated at least 100 jobs.

PATTERNS OF HUNTING AND FISHING

Case studies of Ninilchik households and their patterns of resource use were obtained between June and September, 1982 through informal interviews conducted by a field researcher in the homes of selected respondents. They were selected to represent a range of employment types, lengths of residency, ethnicity, and levels of resource use.

Case A

This example illustrates a household that gets half to most of its meat and fish from wild resources. In addition this household is an example

of one of the lifelong Ninilchik households engaged in commercial fishing.

Case A is composed of a husband in his 40s, a wife in her 30s, and three school-age children. The husband, an Alaska Native, is a lifelong resident of Ninilchik; the wife, a non-Native, has lived in the community since the mid-1960s. The entire family works their commercial set net in summer. The wife also has a 10 hour per week, year-round job in the community. The husband is usually unemployed during winter, although this winter he plans to work on the North Slope due to a poor fishing season.

This household uses 4 to 6 cases of salmon (about 15-30 fish) each year, mainly reds and silvers from their commercial set net. They prefer the taste of kings and consider them superior fish for preserving, but believe they cannot afford to use them since kings were worth \$1.25 a pound compared to \$1.10 a pound for reds and \$.75 a pound for silvers in 1982. The household preferred getting their fish during the local August subsistence fishery when it was open in previous years, because obtaining fish for family consumption did not compete with the commercial fishing endeavor. It is important to the household to save as much cash as possible because of the variability in their commercial fishing income from year to year. The household also has more time to preserve fish after the commercial season closes in mid-August. The husband has eaten salmon all his life and has a strong preference for it over other kinds of fish and meat. The wife said she feels secure knowing she has fish preserved for the winter in case the household runs into unforeseen financial troubles, certainly a possibility during winter when the household has little cash income.

The household reported they preferred to use 150 to 200 pounds of halibut each year, but the amount they actually get varies. The household frequently traded kings for halibut with a local friend who commercial fishes; this year they traded clams for halibut with another friend. In other years, they purchased halibut from a commercial fisherman they know. The household is "too busy" preparing for commercial fishing in May and June to have time to get their own halibut. The household annually uses about 12 pints of canned clams which the wife harvests from Ninilchik beaches in June and July; they do not use more because some family members do not like to eat clams. The household normally uses a small number of hooligan (eulachon) which they get by trading halibut with the husband's brother, but they do this only if they have surplus halibut. The household usually freezes hooligan in saltwater. Hooligan are not available in the Ninilchik area, but can be harvested near Kenai.

Although in some years the husband hunts moose locally, this year the household said "we never got around to hunting" because of other activities needing to be done before winter. The husband also believed there is a greater likelihood of accidents when many inexperienced hunters are in the woods. The wife frequently gathers berries in the fall, but this was a poor year for berries, so she did not harvest any. The household burns 9 to 10 pickup truckloads of coal each winter which they gather from the Ninilchik beach.

Case B

This case illustrates a household that also uses a large amount of wild resources and includes one lifelong resident of the community. This household, however, is not engaged in commercial fishing and has therefore developed other ways of getting fish.

The household is composed of a husband and a wife, both in their 50s. The husband, a non-Native, is employed full-time, year round with the State of Alaska. The wife is an Alaska Native and lifelong resident of Ninilchik, with many relatives in the community. By their own account, the household uses approximately 20 king salmon, 20 reds, and 10 silvers each year. Although the household previously fished non-commercially with nets for all the salmon they needed, they now purchase most of their fish in summer from Ninilchik commercial fishermen. Purchasing is necessary, they believe, to get the amount of fish they use, since they do not engage in commercial fishing; non-commercial gillnet fishing has not been open regularly in recent years; rod and reel stream fishing is viewed as crowded, time-consuming, and not dependable; trolling requires a boat which the household does not have; and few fish are given to them, possibly because others think the household can afford to buy what they need. The wife would prefer to use only kings, which long-term Ninilchik residents traditionally have used most frequently, because these are firmer and more oily, making them ideal for smoking and preserving. However, she has started using other salmon species because kings are difficult to get. Since there are no local commercial or non-commercial net fisheries for kings, they are only available by rod and reel fishing on local rivers on certain weekends, by trolling in Cook Inlet, or purchasing the incidental king catch from commercial set netters. This year the household fished with a gillnet in the new Kasilof River "personal use" fishery with six other people, equally sharing the 20 reds which they caught. The wife cans, freezes, smokes, kippers, and salts salmon, giving some of this preserved fish to the families of her two adult children. With the cost of fish, cans, and time, she estimated it costs her \$5 to \$10 for each pound of salmon her household uses. Yet salmon is very important to her, she said, because she has eaten and preserved it this way all her life, and does not find storebought meat satisfying.

The household uses other resources in addition to salmon. The wife digs clams on Ninilchik beaches a total of 30 times during the months of May, June, and July, trying to get her limit of 60 clams each time. Clams are accessible to the wife since they can be easily harvested by one person with a shovel. The household uses 200 pounds of halibut each year which they purchase from a commercial fisherman since the husband works full-time and most Ninilchik women prefer not to fish from boats alone. Halibut usually sells for \$2.00 per pound. Because the husband is employed full-time, the wife does most of the seafood harvesting and processing. She highly values these activities, she reports, because she has done them all her life.

Although the household would like to get a moose, the husband has given up hunting because of the competition for game in the Ninilchik area, especially from non-local residents. The household has not harvested a moose since 1971. The wife believes her household is "better off buying meat" than spending \$200 to \$300 to hunt in a non-local area where the chances of successful harvest are better. The wife also raises a large garden as do about 71 percent of Ninilchik households and gathers a variety of berries and mushrooms (Table 27c).

Case C

Case C is a household that is not part of the core of lifelong Ninilchik residents engaged in commercial fishing. However, this household also harvests more than half of their meat and fish from wild resources.

The household consists of a non-Native husband and wife, both in their 40s, and four children, three of whom are teenagers. The husband is a teacher in the local school, earning between \$32,000 and \$42,000 annually; the wife is not employed. The family has lived in Ninilchik since the mid-1960s.

The household ideally would like 50 salmon each year, but what they actually get varies from year to year. Typically, the husband trolls for kings in June off Ninilchik and takes silvers with a rod and reel from the Ninilchik beach in August. Last year for the first time, however, the husband and some of his children fished on five to seven occasions in the Kasilof River personal use dipnet fishery with homemade dipnets, successfully harvesting 50 reds. Two years ago, the household's only salmon was one king that was given to them. The household did not fish in the Kasilof River personal use gillnet fishery this year because they do not have access to the required gillnet. This year the husband's father gave them an old 18-foot boat which they plan to use to harvest salmon and halibut in the future by rod and reel fishing in Cook Inlet. A boat is necessary for harvesting halibut and makes it possible to troll for kings rather than compete with crowds during the limited weekend rod and reel openings for kings on Ninilchik area rivers.

The household ideally would like 50 to 100 pounds of halibut each year. The amount they use varies from year to year depending on the number of times the husband fishes and his harvest success. He takes halibut with a rod and reel from a boat off Ninilchik. Before he got his own boat, he would have to find a friend to take him halibut fishing. The household normally uses 20 to 30 packages of frozen clams each year. The husband and children dig these clams from Ninilchik beaches. The household also gets steelhead every year from a guide in exchange for allowing him access across their property to the Ninilchik River.

The husband hunts moose each fall, but has not taken any in six to seven years. He uses his airplane to spot moose, but does the actual hunting on foot in the local area. The husband said he formerly was

able to get a moose with two weekends of hunting, but they now are scarce. Because hunting season overlaps with the school year, the husband can hunt only on weekends.

The husband reports that he does not fish or hunt for recreation. He said he values the self-sufficiency that comes with harvesting wild resources, but would not do it if it were not an "economical" way to get food. He would fish more if there were not other chores that needed to be done around the house in summer, and he would hunt more if he did not have a full-time job. He spends as much time fishing and hunting as he always has, but said his reduced success is due to diminishing stocks in local areas.

Case D

This case is an example of a non-locally employed household that recently moved to the community.

The household includes a non-Native husband and wife, both in their late 30s, and two school-age children. The husband works on the North Slope on a week on-week off schedule; the wife is not employed. The family has lived in Ninilchik since 1979 and in the Cook Inlet region for the last 10 years.

The household annually uses about 12 salmon, primarily silvers but also reds. The wife prefers silvers because they remain firm when canned and are "easier to handle than the big kings." Last year, the household took salmon by borrowing a net and fishing in the August non-commercial fishery. This fishery was not opened this year; instead the wife loaned her pressure cooker to a friend in exchange for five silvers. In other years, the household has traded extra halibut for salmon or purchased salmon from commercial fishermen.

The household uses about 200 pounds of halibut each year. The husband has a commercial halibut permit and fishes the commercial season from his 18-foot riverboat if the season coincides with his days off. (A new boat of this kind usually costs \$4000 to \$5000.) He takes what he wants for the household from his catch, and prefers fishing the commercial season because the legal gear and absence of a bag limit allow for a more efficient harvest of halibut than does sportfishing. His week on-week off schedule and relatively high income give him the time and cash to participate in this fishery. If he does not get enough halibut during the commercial season, he fishes with a rod and reel during non-commercial periods. The husband also digs clams on Ninilchik beaches on his days off during summer clam tides. The household eats fresh clams in summer and freezes 20 to 30 packages of clams for winter.

The household usually sets crab and shrimp pots once a year in Kachemak Bay, about 40 miles distant. The wife said they do this mainly for pleasure, since they seldom harvest enough crab or shrimp to be worth the gas and time. The household also occasionally fishes for pleasure on local lakes for rainbow trout and Dolly Varden. In winter

they sometimes fish through the ice at Engineer Lake near Sterling, mainly, they say, to be outdoors.

The husband usually hunts moose each year with a friend across Cook Inlet at Granite Point, which they reach by boat. They try to harvest two moose, but will split one if that is all they get. Sometimes they are not successful. The husband also occasionally goes to Kodiak in a friend's boat where he hunts deer with friends. The household said they are not sure it is less expensive to hunt in these areas than buy meat in the store, but the husband enjoys being outdoors and likes being productive while he is there. If they do not get a moose, they buy a side of beef. He also enjoys hunting spruce grouse in the local area each fall. In addition, each fall the wife gathers blueberries, low-bush cranberries, and high-bush cranberries in the local area.

If the household harvests more fish than they can use, they give it to friends and neighbors who "do not have time to get it themselves." The husband's work schedule permits him time to harvest resources throughout the year. The fish and game which they harvest reduce their grocery bill. The household enjoys living in Ninilchik because it is a "quiet community."

Case E

Case E is a household that does not use any wild resources.

The household is composed of a husband and a wife, both in their 50s. The husband is employed by the local school full-time, year round; the wife has no paid occupation. They came to Ninilchik from the lower 48 in 1967 because the wife had a good job opportunity; the family of one of their children also lives in Ninilchik.

The household said they do not fish or hunt because the husband has no time and the wife is not interested in harvesting resources. They are not particularly fond of fish or berries and feel they can get a "better deal" buying meat in the store than using game. In order to hunt, the husband said he would need to purchase an all terrain vehicle or other means of access to the backcountry as well as take time off work, losing salary with no assurance he would get a moose. In addition, he fears being in the woods with all the other hunters and finds hunting to be difficult work. He has hunted only once since he moved to Ninilchik 15 years ago.

There are additional survey data gathered from Ninilchik in 1976 which provide some insight into hunting and fishing patterns. The survey asked, "How much of your total meat and fish comes from subsistence?" The results were as follows:

	<u># of respondents</u>	<u>Percent</u>
None	7	22.6
Little	9	29.0
Half	9	29.0
Most	4	12.9
All	<u>2</u>	<u>6.5</u>
	31	100.0 (Baring-Gould, 1976)

INTERRELATIONSHIPS

A large number of Ninilchik households harvest wild resources for family consumption. Salmon, halibut, clams, and moose are the most commonly used resources, although in general moose is less widely harvested than fish because it is scarcer and requires more time and expense to harvest. For these most commonly used resources, the 1983 Division of Subsistence survey found that Ninilchik households used a mean annual quantity of 284 pounds, higher than the mean quantity used in Kenai, Homer City, or Homer area (Figure 26a). However, Ninilchik households harvested a mean quantity of only 184 pounds of these six commonly used resources, possibly indicating a relatively high frequency of trading, sharing or purchasing resources. Methods of acquiring wild food, levels of use, and range of species used vary between households and within households from year to year. Several factors influence these variations, including differing values and beliefs, availability of time, accessibility to resources, regulatory changes, and economic alternatives.

Ninilchik's expanding population accounts for an increasing diversity of values, beliefs, and resource harvest and use patterns among its residents. At one time Ninilchik residents were largely a homogeneous group with similar hunting, fishing, and employment patterns. Over the last twenty years, however, people have moved into Ninilchik in increasing numbers, attracted by its accessibility, small-town qualities, and mild climate. With their different backgrounds, skills, and attitudes, the

influx of new residents has made Ninilchik a heterogeneous community. Today there are Ninilchik residents who have used salmon as a dietary staple all their lives as in Cases A and B, others who perceive hunting and fishing as highly-valued recreational activities such as Case D, others who hunt and fish as an "economical" alternative to store-bought groceries, but do not consider such activities to be recreational, such as Case C, and some who do not use wild resources at all as in Case E.

In Ninilchik, a household's use of wild resources is influenced by economic choices and time constraints during harvest seasons. Time to harvest might be limited by types of remunerative employment, as in the case of school personnel working full-time during moose hunting season. Households stated they have no time to hunt or fish some years because of other competing events or activities, such as building a house, repairing equipment, gardening, traveling, or entertaining visiting friends and relatives. In general, the data suggest that Ninilchik residents' choice of employment is not so much determined by their financial need for harvesting resources; rather their resource harvest strategies are shaped by their type of employment. For instance, store owners with a busy season in early summer might fish for silvers in late August or September even if they would prefer to fish for kings in June. Similarly, a household with a wife who does not enjoy wild food harvesting might use only those resources the husband has time to harvest.

New residents frequently stated they moved to Ninilchik for its "quality of life" which included "a safe and quiet town" and the ability "to hunt and fish without going far." While the 150 percent growth in Ninilchik's population between 1970 and 1980 has certainly increased competition for local resources, particularly moose, residents suggest that

this growth is insignificant compared with competition from non-local resource users. Ninilchik can be reached from Anchorage with a five-hour drive, and with Anchorage's growing population, competition for resources between local and non-local people in Ninilchik has increased. Several Ninilchik households said this competition has discouraged them from moose hunting. A developing network of local roads in Ninilchik over the past two decades has made new areas more accessible, attracting non-local hunters even more than local residents. These roads and the subsequent residential development have also caused habitat disruption.

Accessibility to wild resources on the Kenai Peninsula accounts for some variation in levels of resource use between and within households. For households not engaged in commercial fishing, access to salmon is essentially restricted to rod and reel stream and beach fishing, unless a household has a boat to troll for salmon in Cook Inlet. In the case of king salmon, local residents without a boat must compete with the crowds of non-local sport fishermen during the four three-day weekends open to king salmon fishing on local rivers. For many people, especially those accustomed to fishing with nets, rod and reel fishing is not an efficient way to get salmon. Some Ninilchik residents said they have never learned to fish successfully for salmon with a rod and reel; others said there are years when despite frequent salmon fishing efforts they "just do not seem able to catch a fish." Still others said that fishing with a rod and reel for the 30 or more salmon they use annually consumes too much of their time. Similarly, halibut fishing requires equipment, including a boat, which some households do not have. Clams, on the other hand, are easily accessible on local beaches and do not require a boat or much skill to harvest, possibly explaining their wide use among Ninilchik residents

(Table 27a). With competition for moose from non-local people, Ninilchik residents must increasingly go farther to harvest moose, requiring more time and equipment such as all terrain vehicles or horses to reach these areas. Several residents said they frequently hunt moose every day for two or more weeks. Others take a plane or boat across Cook Inlet to moose hunt. Many households are not successful. Regarding resource use, residents frequently express the attitude, "we use what we can get"; however, they are unable to base their household's livelihood on an assured successful harvest.

Distribution of fish and game among households seems to occur rather often in Ninilchik, though not in large quantities. Several households said they sometimes share "extra" resources with friends or neighbors who do not have time or equipment to harvest it themselves, but these resources tend more frequently to be fish than game due to the latter's scarcity. A few households said they "treasure" king salmon and game, and seldom share it with others. Most households said they rarely receive game, except from their close relatives. One long-term Ninilchik household stated they distribute much of the first salmon of the season to friends and family; another household said they give away a lot of salmon to their older relatives in the community. Both of these households have commercial set nets. Other households frequently stated they would give fish and game to a household they thought really needed it. Regulatory changes over the past several years have contributed to inconsistent harvest patterns by Ninilchik households. Only 58.3% of Ninilchik households have used the same primary method for procuring salmon over the last three years. Regulations relating to areas, seasons, and methods have changed and become more restrictive during the last decade. Thus, access to resources has

varied from year to year. This has encouraged changing, and rather opportunistic approaches towards harvesting wild foods. This is illustrated by techniques for acquiring salmon: as conditions change a household may trade for it, buy it, or harvest it themselves.

Most Ninilchik residents have an economic choice between harvesting wild resources or purchasing groceries from a store; this reduces the risks of not procuring wild resources in any given year. None of the households interviewed appeared to be economically dependent on particular levels of wild food harvest year after year, although residents stated that some Ninilchik households would eat less meat if they had to purchase all of it. Residents widely view harvest of wild food as a supplement to high grocery bills, freeing cash for other purposes. However, despite the general presence of cash for groceries, many Ninilchik households are subject to poor fishing years and hard economic times, and have used wild resources to buffer these difficult economic periods.

The income level of a Ninilchik household does not seem to be a primary determinant of a household's level of resource use; increasing income levels do not necessarily correspond with decreasing levels of resource use. However, households with low incomes frequently cannot afford the equipment, gear, or gas required for harvesting some local resources. Although many residents recognize they have an economic alternative to wild food harvesting, many households continue to harvest resources because they say they value the self-sufficiency, health benefits, or family and cultural traditions accompanying these harvests.

PART IV
SELDOVIA: RESOURCE USES IN A SMALL, NON-ROAD CONNECTED
COMMUNITY OF THE KENAI PENINSULA BOROUGH

By Carolyn E. Reed

PREFACE

The third case community on the Kenai Peninsula is Seldovia, a small community (population 506 people in 1980) on the south shore of Kachemak Bay. The case illustrates resource use patterns similar in many respects to those of Homer and Ninilchik within a more isolated, non-road connected location. Commercial fishing has been the mainstay of Seldovia's economy since the 1890s, currently accounting for about 85 percent of local wage employment. Wage employment tends to be seasonal (35 percent of the workforce held year-round jobs); household incomes show wide variations. The population is relatively stable, ethnically mixed (35 percent are Alaska Native), and includes a large retired group. Seldovia has not experienced the recent rapid growth of Homer and Ninilchik.

According to Reed, resource uses at Seldovia are characterized by variable resource patterns across households and a few target species (primarily salmon, halibut, clams, and moose). Resource harvest levels and distribution/exchange networks may be somewhat higher in comparison with the previous Kenai cases. Many households integrate harvesting for local use with commercial fishing, using similar equipment and skills. Others schedule fishing and hunting for local use around paid employment. Many unemployed household members and retirees spend time in intertidal harvesting and rod and reel fishing. The household practice of purchasing salmon at cannery prices is found at Seldovia as it is in Homer and

Ninilchik, due in part to their inability to harvest sufficient salmon under current regulations.

Seldovia is located on the south shore of Kachemak Bay, at the southern tip of the Kenai Peninsula in southcentral Alaska. Although located within the Kenai Borough, Seldovia is not connected by road with the rest of the Kenai Peninsula or Alaska. It is accessible via the Alaska Marine Highway nine months of the year, and by air year-round from Homer. A town of 506 people (Kenai Borough, 1982), nestled in an area of less than one-half square mile, Seldovia's relatively stable population size over the past decade can be attributed in part to its limited economic opportunities (Figure 33). Ethnically, Seldovia is approximately 65 percent non-Native and 35 percent Alaska Native of mixed Eskimo, Athapaskan, and Aleut heritage (Reed, 1979) (See Appendix). Of the current population, 27 percent have resided in Seldovia for more than 15 years; 59 percent have lived there over 5 years (See Appendix). The stability of the community is suggested in that 67 percent of Seldovians reportedly plan to reside there for more than 10 years (Hitchins et al., 1977).

Seldovia originated as a Native village centered around a non-Native operated trading post. Just before the turn of the century, it became a thriving commercial fishing town and the center for shopping, shipping, and social life for all of Kachemak Bay and Cook Inlet. The population swelled as many Scandinavian fishermen immigrated there, and by 1930 the population had reached 379. It was not until the 1960s that other commercial centers on the Kenai Peninsula outgrew Seldovia.

Seldovia's economy is based overwhelmingly upon the commercial fishing industry, which has been the primary support of the community since the 1890s. In 1975, 105 commercial fishing permits were held by 62 Seldovia

POPULATION TRENDS: SELDOVIA

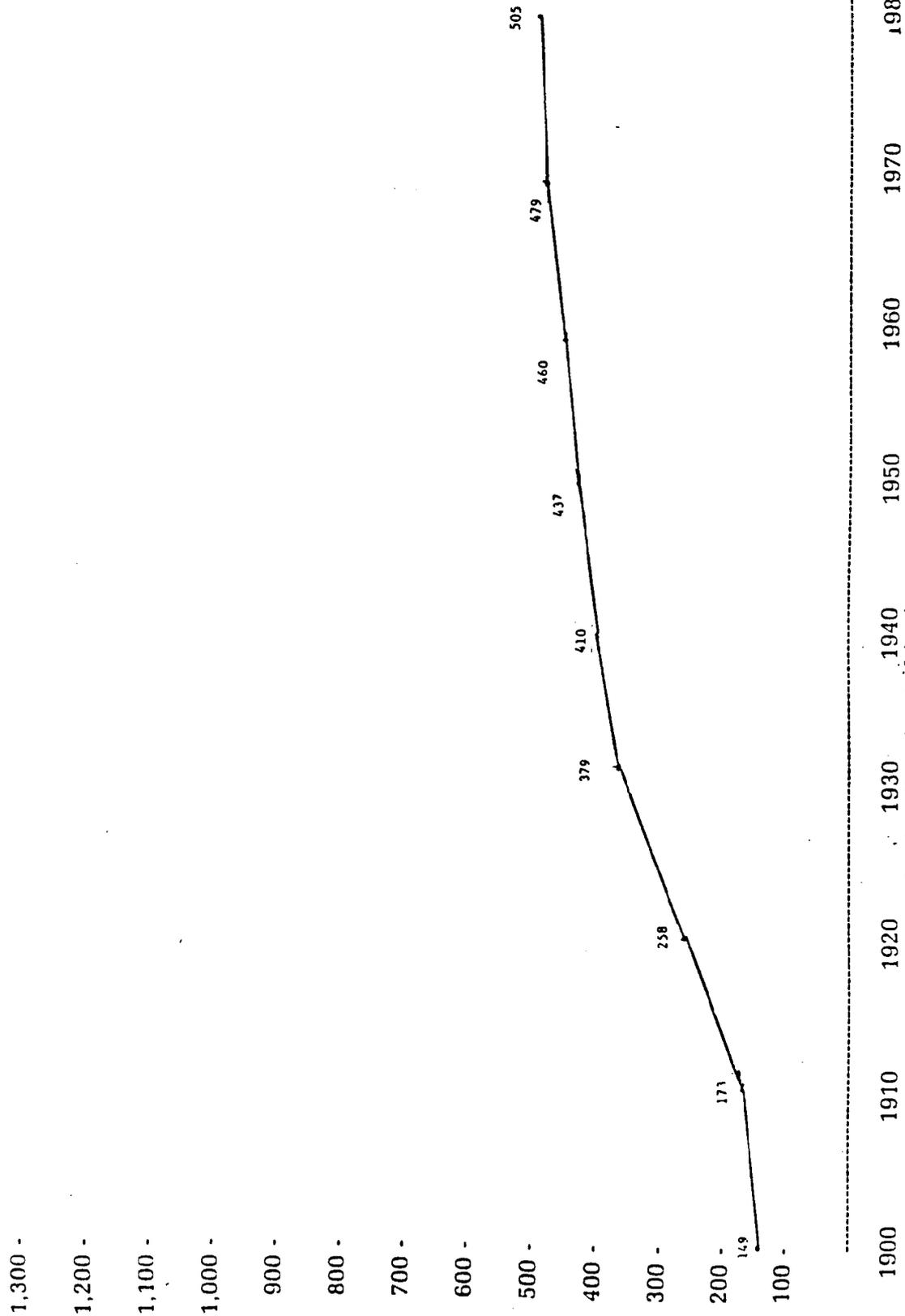


Figure 33. Population Trends, Seldovia

Source: 1900-1950 data from Rollins (1978); 1960-1981 data from Alaska Department of Labor (1981). U.S. Census data may not be reliable for certain Alaska communities.

residents; 54 of these were for crab, 34 for salmon, and the remaining were distributed among halibut, herring, shrimp, and bottomfish (Braund and Behnke, 1980). According to the Seldovia Comprehensive Plan (Pacific Rim Planners 1980), fishing, fish processing, and indirect employment attributable to the two categories account for 85 percent of all present jobs. Ranges of commercial fishing incomes are presented in Table 32. Employment in the fishing industry is seasonal. Both salmon and crab resources have fluctuated greatly over the past several decades in this area, hence incomes from year to year are uncertain.

The timber industry has contributed to the economy in a smaller and more erratic manner since the 1960s. Logging operations have harvested timber in nearby Jakalof, Rocky, Windy, and Seldovia Bays during this time. The companies have brought new families into the community as well as hiring local Seldovians. The logging work has always been seasonal, however, due to the inclement winter weather. The advantages of the area's abundant timber resources and accessible harbor also have been mitigated by fluctuations in world markets.

A small number of people are employed year-round at sales and service. Presently, Seldovia has two grocery and general merchandise stores, at which virtually all residents shop, rather than going to Homer. The community has two bars, three restaurants, two hotels, a service station, automotive repair, laundromat, library, and medical clinic which serve the needs of the local population. Also, an annual average of 25 employees work for the city and borough. Other wage employment may be seasonal. For example, there is a limited amount of construction wage labor available at certain seasons.

TABLE 32

INCOME RANGES FROM COMMERCIAL FISHING FOR SALMON AND HERRING,
SELDOVIA, 1981

Total Number of Commercial Fishermen		58
Number of Salmon and Herring Fishermen		41

Percent earning less than \$1,000		0.0
" "	\$1,000 - 9,999	36.6
" "	\$10,000 - 19,999	24.4
" "	\$20,000 - 29,999	19.5
" "	\$30,000 - 49,999	*
" "	\$50,000 - 74,999	*
" "	\$75,000 - 99,999	*
" "	greater than \$100,000	19.5
	Total	<u>100.0</u>

* Less than four: due to confidentiality regulations number cannot be disclosed.

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries. (1981)

Seldovia has a significant population of retired people (6.5 percent in 1976), most of whom are lifelong or long-term residents. There are extreme highs and lows in Seldovia household incomes with 35 percent of incomes below \$12,000 while 16 percent are over \$45,000 (Hitchins et al., 1977) (See Figure 34). In 1976, only 35 percent of Seldovia household heads worked 12 months in a year. Twenty-four percent of the adult population of Seldovia is employed either full-time or part-time. The remaining are unemployed housewives, students, or retired.

PATTERNS OF HUNTING AND FISHING

Significant utilization of wild resources for domestic consumption complements Seldovia's long-standing cash economy based on commercial fishing. Seldovia occupies an ecological niche which offers residents the opportunity to harvest a wide range of fish and game resources. In 1976 a survey indicated that 86 percent of the Seldovia population utilized local resources. While 13.5 percent of Seldovians used no local resources, 44.2 percent derived up to one-quarter of their food from local resources, 17.3 percent got one-quarter to one-half of their food supply from these resources, and 25 percent of Seldovians said local resources provided the majority of their sustenance (Hitchins et al, 1977).

Because of Seldovia's location adjacent to the sea, a variety of edible marine resources are readily available to local residents. The protected harbor of Seldovia Bay facilitates access to resource harvest areas by foot or with a small skiff. Within walking distance of Seldovia one can harvest clams, salmon, beach greens, seaweed, berries, and waterfowl. With a small skiff one can reach crab, shrimp, and halibut harvest areas.

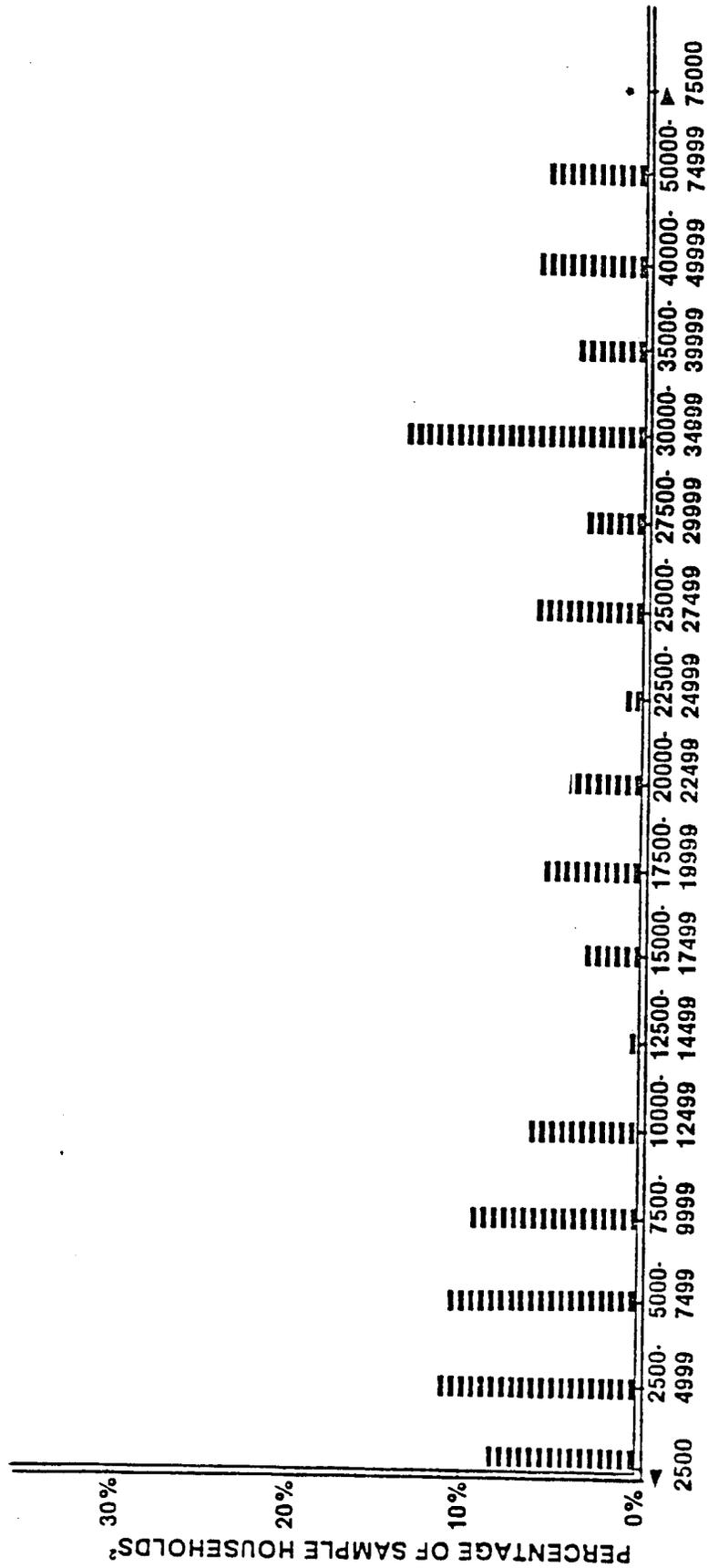


Figure 34. Household Income (Dollars) — 1979, Seidovia 1

1 U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3

²N = 168

* no data available

Several resources, particularly big game, are less readily available to Seldovians and can only be harvested by those with necessary equipment, physical ability, and knowledge. Moose are not generally available in the vicinity of Seldovia, and now, as in the past, moose are harvested only by those able to travel to the central Kenai Peninsula or to the head of Kachemak Bay.

CASE HOUSEHOLDS

The case households illustrate the range of wild resources utilized, and the range of resource use strategies. The cases represent: 1) a long-term commercial fishing family, 2) a retired lifelong resident; 3) a more recent arrival who highly values Seldovia's resource harvesting opportunities; and 4) a newcomer who makes minimal use of wild resources. However, this is not to suggest that these case examples are representative of all Seldovia households with similar backgrounds. It is likely that there are Seldovia households which pursue other kinds of economic strategies.

Case A

This case illustrates the relationship between commercial fishing and the domestic use of wild resources.

The household, a husband and wife in their 20s and their two children, is representative of those lifelong Seldovians who use wild resources heavily. The parents are both descendants of early Native and Scandinavian families. The husband is a commercial crab fisherman and the wife works at a local office. They grew up depending upon wild resources and continue to harvest and consume them.

The wife's parents live in Kenai, and each fall the household hunts moose with them from a base camp on the central Kenai Peninsula. The children accompany the adults and participate in extensive berry picking with the women while the men hunt. Last year they failed to harvest a moose at the Kenai camp, but the husband succeeded in taking one later while hunting with friends on the Rocky River road outside Seldovia, a location reached by four-wheel drive pickup trucks. This gravel road ends 30 miles from Seldovia at the Rocky River which flows into the Gulf of Alaska. Each fall the husband hunts deer and elk

from his fishing boat in the Kodiak area. The husband and friends from the community hunt ducks in the Seldovia area after fishing season ends. Game is frozen for winter use and shared with their many friends and relatives in Seldovia, as well as sent to the wife's parents at Kenai.

The household members put up red and silver salmon every year. Three cases of reds purchased from neighboring Port Graham were canned this year. The household prefers reds for canning, but they must purchase these because there are no local non-commercial sockeye net fisheries and reds are locally considered difficult to take with hook and line. Silvers are caught with rod and reel at Rocky River in late August, and a five gallon bucketfull is pickled. All summer the children catch pink salmon on the beaches in town with rods and reels; these are consumed fresh as pinks are thought not to preserve well. In late summer the wife and children also harvest large quantities of blueberries within walking distance of town.

The wife's mother regularly harvests razor clams and hooligan (eulachon) at Kenai and shares these resources with this household because they are not available around Seldovia. Additionally, throughout the summer the family harvests butter and steamer clams in Seldovia Bay; the butters are canned while the steamers are smoked and then canned.

As seen above, many of this household's social activities as a unit and with close friends in the community take place in the context of local resource harvests. Although the wife complains she gets tired of eating these foods after a lifetime of having done so, they provide economic security for her family, since the family fishing income is seasonal and unstable from year to year due to resource fluctuations.

Case B

Seldovia's retired community, comprising 6.5 percent of the population, consists of long-term residents with a tradition of harvesting and utilizing local resources.

One example is an 86-year-old Russian-Aleut man who has worked on fishing boats, tenders, or local freighters all his life, while harvesting fish and game resources throughout the Kachemak Bay area and the Kenai Peninsula. In his younger days, he would row his skiff from Seldovia to the head of Kachemak Bay to hunt moose in the fall, seal hunting along the way. Presently he is not physically able to hunt, but spends much of his time fishing and clamming on Seldovia Bay. He receives gifts of moose meat from friends. This summer he caught about twenty pink salmon, fishing with a rod and reel from his skiff. These were frozen and canned, and about half of them were given away. He purchased one king salmon from a fisherman, and salted it for winter use. He was given a dozen king salmon heads by friends from the cannery, which he froze for winter use in fish chowder. Prepared this way, king salmon heads are considered a delicacy by many

other Seldovians as well. He dug ten buckets of clams this year, on the monthly low tides, giving most of them away after eating as many as he wanted and freezing a few. Since this man has no immediate family, he regularly gives food to lifelong friends in the community, especially the other elderly people who are physically incapacitated. Although he seldom picks greens for himself, in July he gathered petrouski (wild parsley) to bring to an elderly lady for whom it is a favorite.

This man also fished for halibut with friends in the deeper waters of Kachemak Bay. With rod and reel, they caught their limit of small halibut in one day, and he froze 50 pounds for winter use. He also recently received ten pounds of black bass caught in Nuka Bay by a friend who had been commercial fishing there. When not fishing or clamming, this elderly Seldovian walks two blocks downtown and to the docks daily, where he spends his time visiting and conversing with fishermen friends. Thus his daily thoughts and activities are integrally involved with the harvesting, giving, and receiving of local resources.

This man's only cash resources are Social Security and an Alaskan longevity payment which together total less than \$500 per month.

Case C

The following case is a household which has more recently immigrated to the community but which also makes heavy use of the local resources. The husband, wife, and three children moved to Seldovia four years ago, after living in Homer for ten years. This family came to Alaska from California seeking a quiet, small-town lifestyle and self-sufficiency utilizing Alaska's wild resources. They came to Seldovia when Homer became too populated and "unfriendly" for their liking. This household shares values with 14 percent of Seldovia residents who said the community's small-town values and aesthetic environment were their primary reasons for moving there (Hitchins et al., 1977)

The husband is a commercial fisherman and uses his boat to tender during the salmon season; he then fishes for crab and sometimes halibut during the commercial seasons. The wife teaches school. They built their own home, which is heated by wood gathered by the family. The large garden they raise each year provides all their produce.

The primary resource harvested by this household is salmon. They can two cases of commercial red salmon during June, obtained through tendering for other fishermen. They also purchase and pickle several king salmon during summer. Kings are available only from commercial nets. In August and September the household fishes at Rocky River with rod and reel for silver salmon, usually catching from four to ten fish. These fish are eaten fresh and smoked. Throughout the summer they fish with rod and reel on Seldovia Bay for pink salmon, harvesting enough to can two or three cases to be used for dog food. If the husband fishes commercially for halibut, he brings home several hundred pounds which are preserved for winter use by freezing.

The husband likes to hunt, and each fall he takes his fishing boat and crew up to the central Kenai Peninsula to hunt moose. The moose meat they get is shared among crew members. Last year, the husband hunted on Kalgin Island and brought home a cow moose.

This family harvests three to four bushels of butter clams in the spring and fall. They travel by skiff to the clamming grounds on Seldovia Bay. Formerly they clammed at Jakalof Bay, but they consider the clam beds there to be no longer worthwhile due to overharvesting by tourists who arrive via the ferry or by airplane.

The family supplements the protein resources they harvest with various wild greens, kelp, and seaweed. Kelp is pickled, ribbon seaweed is canned, and nettles, goose tongue, and chamomile are consumed fresh. While the husband is occupied with commercial fishing, the wife and children harvest large amounts of berries. During August they picked about fifty quarts of blueberries which were eaten fresh, frozen, and made into jam. Later in the fall they gather mushrooms such as Orange Delicious, Boletus, and Shaggy Manes. Quantities vary, depending on seasonal abundance.

This household reports that resources are shared with numerous non-related neighbors in Seldovia, in addition to providing for relatives who come to visit each summer. Among their neighbors, they often trade food for labor, in particular, they often smoke fish in exchange for a share of the product.

For the wife, family participation in resource harvests is one of the important aspects of the activities. She considers it good training for her children to learn what food sources are available around them. She teaches her children as well as her students to identify plants and animals by their scientific names. She also says harvest activities teach her children to help their family, which strengthens the family unit. They believe that food gathered from the land is healthier for them than store purchased foods.

Case D

Another household is typical of a smaller number of Seldovia residents who do not commercial fish and who utilize the local resources to a lesser degree; this includes perhaps one-third of Seldovia households.

The household consists of a husband and wife in their 30s, and two small children. The husband teaches school, and they have lived in the community for seven years. The family enjoys outdoor camping and hiking in the Seldovia area. They occasionally fish with rod and reel in the vicinity or at Rocky River, but did not do so this year. They may sometimes gather enough local berries for immediate consumption. The wife explains, "We probably should do more resource harvesting, but we usually go away in the summer, and we are too busy with school activities the rest of the year." They enjoy eating local fish, game, and berries, and occasionally receive gifts of such foods.

However they do not feel any economic necessity for utilizing resources and prefer to spend their time doing other activities.

INTERRELATIONSHIPS

People in Seldovia use a range of techniques for procuring fish and game, and harvest local resources for a variety of reasons and to degrees varying from great dependence to no use at all. In particular, long-term commercial fishing families such as case A make use of local resources for part of their livelihood in order to add to their economic security. These fishermen also have the skill, equipment, and gear that enable them to harvest marine resources. Both salmon and crab fishermen have had very poor seasons as well as lucrative ones. Several respondents relate that wild edible resources help them through difficult economic periods, since, with the exception of fishing, little other employment is available aside from fishing.

For people whose ability to harvest resources is limited by poor health, advanced age, and lack of equipment and money, the sharing of fish, game, and vegetables by other community members is important. Both friendship networks and family relationships form the basis for resource distribution systems.

Some Seldovians participate in the harvest of resources as a carefully chosen way of life. Case B is an example; they came to Seldovia especially to be close to harvestable resources. For this household as well as others, there is an emphasis on family participation in harvest activities. Many informants state that resource harvesting is an important part of life in Seldovia.

Due to the small size of the community, formalized sources of entertainment and recreation which might compete with harvesting activities

are few; there is no movie theater, bowling alley, or recreation center as in Homer, for example. Children entertain themselves by fishing with rod and reel in summer, at the same time contributing to the family welfare. When not working men get together for fishing and hunting trips -- both for the enjoyment of the outing and the reward of the harvest. Both within families and among neighbors in Seldovia, resource harvests are used as an important opportunity for social interaction. Families plan annual camping trips to Rocky River during silver salmon and berry picking season, for example, and male household members join together for annual fall duck hunts. In spring the seasonally extreme low tides provide another occasion for family excursions, as clam beds become available for harvest.

Although wild resources are highly valued by Seldovians for personal consumption, access to many of them has been restricted by regulations in recent years. For example, non-commercial fishing for both king and red salmon is limited because the subsistence gillnet fishery does not begin until August 16, by which time few red or king salmon remain in Seldovia's waters. In 1982 Seldovia residents did not receive permits for this fishery. The silver salmon which are the target for the fishery on the Homer side of Kachemak Bay do not appear in Seldovia's waters in sufficient quantities to make the fishing effort worthwhile. The only means by which Seldovians can obtain red and king salmon for domestic use is commercial nets. Although red and king salmon are much preferred to pink salmon, because they are thought to preserve better, the practice of saving them from commercial catches has become less popular with fishermen as fishing expenses have risen. Thus local residents who do not commercial fish for red and king salmon find it necessary to purchase such fish at cannery prices, although several informants recalled that local fishermen formerly

would give salmon to other local residents without charge. Cannery prices, however, are considered economical in comparison to local grocery store prices for meat and fish.

PART V

TYONEK: RESOURCE USES IN A SMALL, NON-ROAD CONNECTED COMMUNITY OF THE KENAI PENINSULA BOROUGH

By James A. Fall

PREFACE

The last case within the Kenai Peninsula Borough is Tyonek, a relatively small (239 persons in 1980), homogeneous (90 percent Dena'ina Athapaskan), non-road connected community on the western shore of Upper Cook Inlet. Tyonek illustrates a community whose economy and social patterns are dependent upon fishing and hunting for local use, despite the community's proximity to a large urban center (Anchorage is 43 air miles distant). Earned household incomes are low (53 percent were below \$10,000 in 1980) due to limited seasonal local wage employment.

From Fall's analysis, the fishing and hunting patterns at Tyonek resemble more closely those in Nondalton, Lower Yukon Delta communities, and Dot Lake than fishing and hunting patterns on nearby Kenai Peninsula. Resource use patterns are characterized by long time depth, a stable and regular seasonal round of fishing and hunting activities, large numbers of harvested species, relatively high harvest levels, large investments of time by producers, and use areas generally close to Tyonek. Production and processing of wild products are family-based activities; sharing, distribution, and exchange within the community are frequent. Fishing and hunting provide a major means of economic security for households, and Tyonek residents perceive hunting and fishing as central to their community's stability and wellbeing. Fishing and hunting also are imbued with deep

cultural meanings and values within Tyonek's shared cultural heritage, and serve as a symbolic center for the community's identity.

ENVIRONMENTAL AND SOCIOECONOMIC SETTING

Tyonek, a community of 239 people, is located on the western shore of Upper Cook Inlet (see Figure 25). It is 35 air miles from Kenai and 43 air miles from Anchorage. Over 90 percent of Tyonek's people are Dena'ina Athapaskans. The Dena'ina have occupied the Upper Cook Inlet region for at least 250 years. Tyonek was the site of an early Russian trading post and an Alaska Commercial Company store. Diseases took a heavy toll of Dena'ina lives in the 19th and early 20th centuries, but in recent decades, Tyonek's population has grown markedly (see Figure 35). A 26,918 acre reserve was established in 1915. In the early 1960s, the village was awarded \$12.9 million for gas leases on this land. The village elected to participate in the Alaska Native Claims Settlement Act of 1971; title to the surface estate of the former reserve thus passed to the Tyonek Native Corporation (TNC) (Fall 1981; and Arnold 1976).

An IRA (Indian Reorganization Act) council is the village governing body. The Kenai Borough provides the village with 10 school teachers and school support staff. The gas royalties enabled the village to build a portion of the school and 60 new homes, and to install and maintain a water and sewage system, village center, snack bar, and recreational facility. There is a post office, a privately owned store, and an airstrip. A small clinic is funded by the Cook Inlet Native Association, but most Tyonek residents travel to Anchorage for all but minor health care needs (Darbyshire and Associates 1981).

POPULATION TRENDS: TYONEK

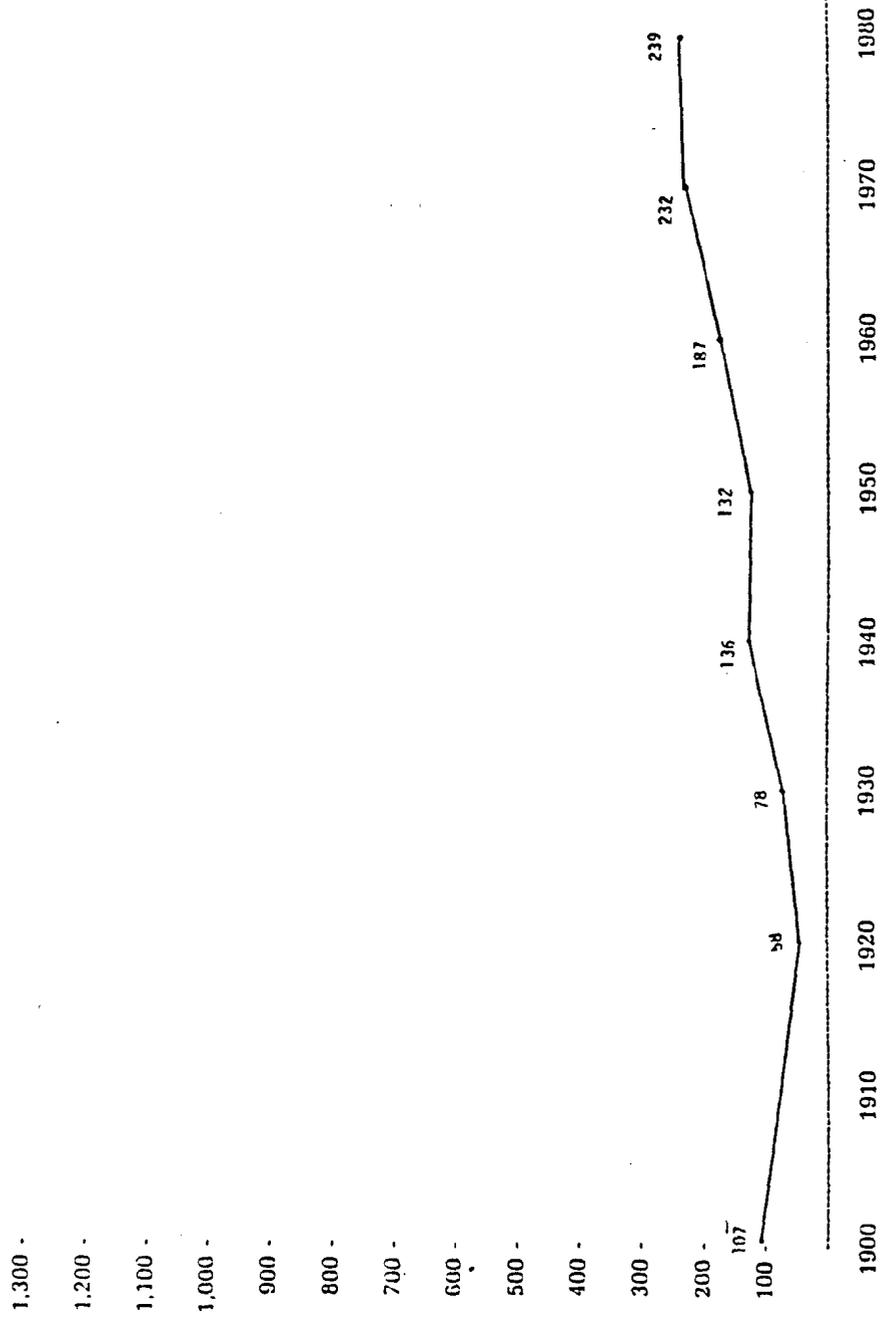


Figure 35. Population Trends, Tyonek

Source: Fall (1981). U.S. Census data may not be reliable for certain Alaska communities.

Demographic and income data for Tyonek are summarized in Figure 36, Table 33, and the Appendix. A survey of 54 heads of the 75 households was conducted in August 1981 (Darbyshire and Associates, 1981). The survey found that 60 percent of the sample had not finished high school, 20 percent lacked an 8th grade education, and 60 percent were unemployed at the time of the survey. Unemployment in Tyonek had reached 70 percent in October 1982. Most Tyonek residents identify "laborer" as their occupation, and permanent jobs in the village are limited to five full-time and five part-time school support staff, six village administrators, two store retailers, one constable, one health aide, one part time health representative, one post office attendant, and three firemen. The snack bar and village sawmill provide two or three jobs. Only a few Tyonek residents have worked at the nearby Kodiak Lumber Mill facility; conflicts over poor attendance records, attributable in part to seasonal hunting and fishing activities, were partly responsible for this. The mill is now closed. The Chugach Electric Association's Beluga station has no Tyonek employees. The TNC, with offices in Anchorage, supplies no local jobs. Most remunerative employment in Tyonek is highly seasonal and is restricted to commercial fishing, heavy equipment operation, and other maintenance-related jobs for the village. Twenty-seven commercial fishing permits are used by Tyonek residents.

All Tyonek households have some cash income, which may derive from combinations of seasonal or part-time wage paying employment and transfer payments. In 1980, annual household incomes ranged from less than \$5000 to over \$35,000, but of a sample of 51 households, 27 earned less than \$10,000 per year (Darbyshire, Inc., 1981:15) (see Figure 36). This can be largely attributed to the scarce employment opportunities in the village



Figure 36. Household Income (Dollars) — 1978, Tyonek¹

1 U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3
²N = 90

* no data available

TABLE 33

INCOME RANGES FROM COMMERCIAL FISHING FOR SALMON AND HERRING,
TYONEK, 1981

Total Number of Commercial Fishermen		25
Number of Salmon and Herring Fishermen		21

Percent earning less than \$1,000		*
"	" \$1,000 - 9,999	33.3
"	" \$10,000 - 19,999	33.4
"	" \$20,000 - 29,999	33.3
"	" \$30,000 - 49,999	*
"	" \$50,000 - 74,999	0.0
"	" \$75,000 - 99,999	0.0
"	" greater than \$100,000	0.0
	Total	<u>100.0</u>

* Less than four: due to confidentiality regulations number cannot be disclosed.

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries. (1981)

and the reluctance on the part of many Tyonek residents to leave their homes and families to seek employment in Anchorage or other cities (Braund and Behnke 1980: 205). Tyonek commercial fishing income ranges are provided in Table 33, although gross income averaged about \$9,000 per permit holder from 1974 to 1979 (Stickney 1980: 7).

The small village store provides staples, canned foods, and frozen meats. A few households shop there exclusively, but prices about 33 percent higher than those in Anchorage and important items are often unavailable. Many households take advantage of the scheduled commercial flights between Tyonek and Anchorage, which are partly a result of timber and mineral development in the area, to purchase large supplies of groceries. The price of a one way ticket (about \$25) and a return chartered flight (\$75) is compensated by the lower cost of foods in Anchorage.

HUNTING AND FISHING PATTERNS

The annual round of hunting and fishing activities in Tyonek is summarized in Figure 37. Peak harvest periods correspond with the open seasons for king salmon fishing and moose hunting. Of a sample of 38 Tyonek households, over 85 percent had participated in both of these activities within the last five years. The degree of participation by these households in the harvest of other resources from 1978-1982 is illustrated in Figure 38. Because of the extensive patterns of sharing in Tyonek, it is probable that the majority of households in Tyonek consume most of these resources during a typical year (Foster 1982a, 1982b). Several examples will illustrate the current patterns of use of specific resources in Tyonek.

Following the disappearance of ice in Cook Inlet in April or May, groups travel by dory approximately 50 to 75 miles south to Little Jack

SEASONAL ROUND OF HARVEST ACTIVITIES FOR SELECTED SPECIES, TYONEK, AK. 1978 - 1982

Species	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Razor Clam	-----					-----						
Butter Clam	-----					-----						
Redneck Clam	-----					-----						
Cockle	-----					-----						
Eulachon	-----											
Herring	-----											
King Salmon		-----										
Red Salmon		-----	-----									
Coal	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Harbor Seal	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Belukha	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Black Bear	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pink Salmon				-----	-----	-----						
Chum Salmon				-----	-----	-----						
Silver Salmon				-----	-----	-----						
Berries				-----	-----	-----						
Edible Plants				-----	-----	-----						
Medicinal Plts.				-----	-----	-----						
Ducks	-----	-----				-----	-----	-----	-----	-----	-----	-----
Geese	-----	-----				-----	-----	-----	-----	-----	-----	-----
Moose						-----	-----	-----	-----	-----	-----	-----
Brown Bear	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Tomcod						-----	-----	-----	-----	-----	-----	-----
Spruce Grouse	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Porcupine	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Wood	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Snowshoe Hare						-----	-----	-----	-----	-----	-----	-----
Ptarmigan									-----	-----	-----	-----
Mink									-----	-----	-----	-----
Marten									-----	-----	-----	-----
Fox									-----	-----	-----	-----
Coyote									-----	-----	-----	-----
Beaver						-----	-----	-----	-----	-----	-----	-----
Otter									-----	-----	-----	-----
Rainbow Trout	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Dolly Varden	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Figure 37. Seasonal Round of Harvest Activities for Selected Species, Tyonek, Alaska, 1978-1982.

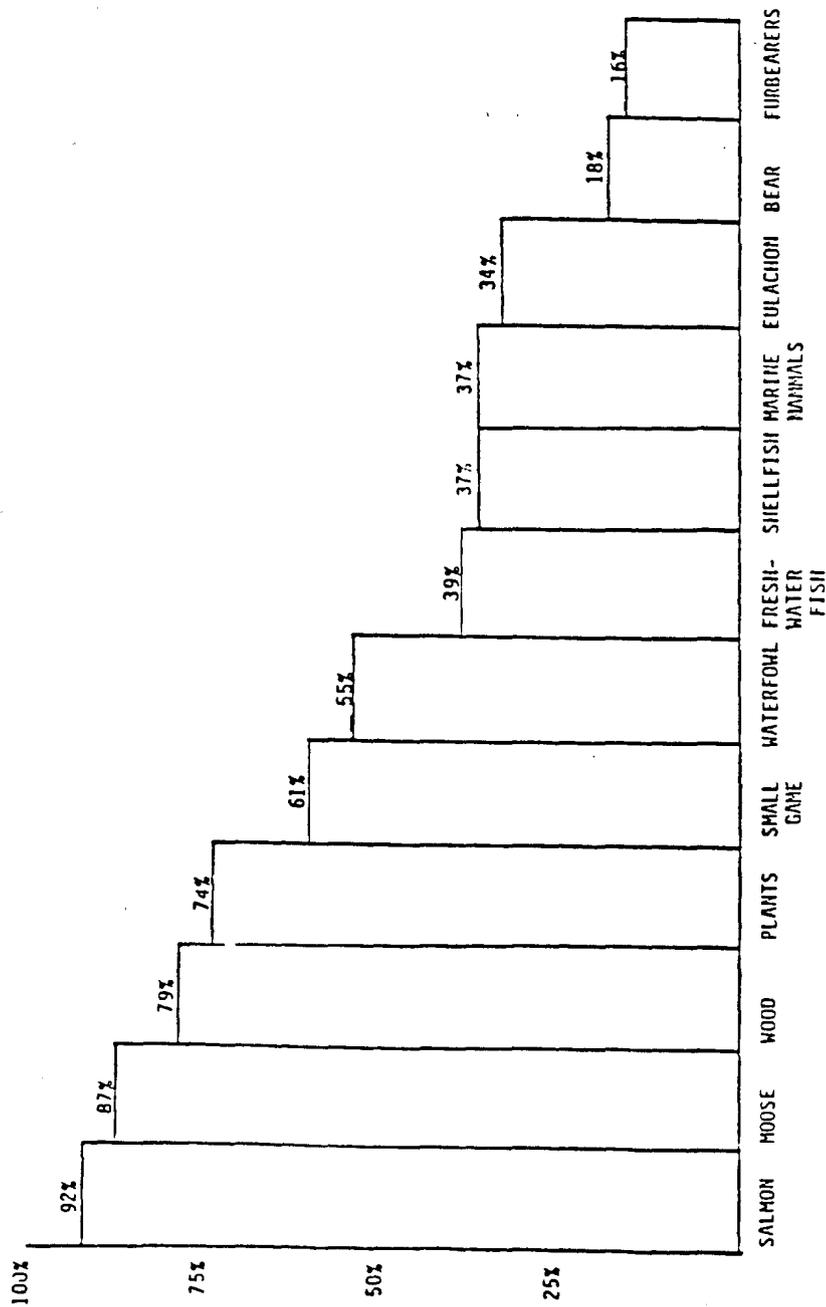


Figure 38. Tyonek Household Participation in the Harvest of Wild Resources, 1978-1982. N=38.

Slough, Harriet Point, or the Crescent River to harvest razor clams, butter clams, and cockles. Seals are also taken during these trips, which are organized and directed by "clamming leaders," generally older, more experienced men who own dories and outboard motors. Two to five dories travel together; each carries five to seven relatives and friends of the clamming leader. Clams are transported back to the village alive in containers of salt water. There, the leaders distribute clams to villagers who request some. Most clams are eaten fresh, but some are canned or frozen for winter consumption. Annual harvests by Tyonek residents average around 3000 razor clams (Stanek, Fall, Foster 1982).

Fishing for king salmon commences along Tyonek beaches in mid-May and lasts about one month. King salmon have long been a major staple for the Tyonek people (Fall 1981). They are highly valued because of their large size, high oil content, and early arrival. After being closed for approximately 12 years, a legal season for king salmon subsistence fishing reopened in 1980. The annual village catch since that time has averaged about 1900 king salmon (Stanek and Foster 1980, Webster 1982; and Foster 1982b).

Many Tyonek people fish for king salmon from camps located south of their homes, while others fish on the beach directly below the village. Some families remain the summer at their camps, but the majority now regularly travel in trucks between the camps and the village along logging roads constructed since 1974. Camps, fishing equipment, and smokehouses are often shared among several households (Foster 1982b).

Men, women, and older children harvest salmon with set gill nets. Camp leaders are usually mature men, who are the owners of the camps and equipment. Smokehouses and other facilities for processing fish are located at the larger camps and at some homes. Prior to 1980, it was

predominately older men and women who prepared and preserved salmon by traditional Dena'ina methods. Since the reopening of the subsistence season, however, many younger people have acquired these skills. In addition, the number of smokehouses has increased by 25 percent since 1980 (Foster 1982b).

In 1982 a survey of 38 households by the Division of Subsistence found that almost 50 percent of the king salmon harvest in Tyonek was preserved by smoking. The remainder was canned (11 percent), frozen (20 percent), salted (13 percent), or eaten fresh (6 percent). Popular salmon products include balik (smoked salmon strips), baba (smoked filets), k'iytin (smoked backbone), k'tsiduggen (smoked head), and qinnalggen (smoked dry roe.)

Following the king salmon season, about 27 Tyonek households fish commercially with set nets at the same camps they used earlier in the spring. Harvests are generally low compared with other Cook Inlet commercial fisheries (Braund and Behnke 1980: 206). Most of the catch is sold to provide cash for household expenses throughout the year.

In the past, moose were hunted year round by the Upper Inlet Dena'ina (Fall 1981). Presently, legal hunting in the Tyonek area is limited to the month of September. Forty-eight Tyonek hunters harvested 15 moose during the open season in 1981. Hunting parties consisted of two to five members, usually relatives or "partners." Both men and women participated, with men doing the actual hunting and women helping to set up camp, prepare food, and care for the meat. The majority of Tyonek hunters now search for moose along the extensive network of logging roads, but at least 15 hunters in 1981 traveled south in dories to the McArthur River drainage and hunted from camps along the river bank. Porcupine and grouse were taken incidentally during the hunts.

In 1981 successful hunters generally shared a significant portion of their moose with relatives, close friends, "partners," and elderly people. A moose was shared among an average of three households, with a range of one to nine households per moose. Almost all of Tyonek households received some moose meat in the fall of 1981. Additional sharing occurred throughout the winter, and was apparently based largely on kinship, need, and age. Freezing, canning, smoking, and drying were the primary means of preserving meat in Tyonek in 1981 (Foster 1982a).

CASE HOUSEHOLDS

The following case examples illustrate several patterns of resource use followed by village households in 1981-1982. Each differs from the others in the range of resources harvested and the size of their harvests, and each is typical of other households in the village. In several important respects however, even these households are similar. Each harvests king salmon, as well as several other resources; consumes a large amount of fish and game throughout the year; and is linked through networks of exchange with other households in the village.

Case A

This is an example of a Tyonek household that harvests a wide variety and a large quantity of wild resources. It is probably representative of about 20 percent of the village households. In 1981-1982, household members included a husband and wife in their early 50s, several unmarried children, and one daughter's children.

The wife held a full-time job in the village, which an adult daughter filled in the summer while the wife fished. The husband fished commercially and occasionally operated heavy equipment for the village. The household thus had a monetary income higher than most Tyonek households. The household owns a variety of harvesting equipment, including a dory and motor, a pickup truck, several all terrain vehicles and snowmachines, plus an assortment of rifles, traps, and nets.

The husband is one of the village clamming leaders. He and his sons harvested razor clams in the spring of 1982 in Redoubt Bay. These

were mostly distributed to village residents, but some were preserved for use in the winter. In May the household moved approximately 10 miles to their fishcamp at Beshta Bay. They harvested their limit of 70 king salmon and a large number of reds and silvers. Later in the summer, the entire household fished commercially at the same site. Between open commercial fishing periods, the male household members hunted seal and belukha. They successfully harvested one belukha in 1982 and struck two others.

In the fall, the household harvested a variety of resources, including one moose, two black bear, grouse, porcupines, and silver salmon. They also picked berries. In the winter, the household used snowmachines to hunt small game and to go ice fishing for trout. They plan to set a trapline in 1982-1983.

The household shared a large portion of its harvest with the households of several relatives, including married children, and the wife's elderly mother and brother.

Case B

This is an example of a Tyonek household that harvests resources from the major categories utilized in Tyonek--salmon, moose, and plants--but does not take resources requiring large expenditures of time for a relatively small return, such as seals or clams. It also is an example of a household that extensively shares resources, facilities, and equipment with other Tyonek residents. In these characteristics, it is typical of the resource use patterns of the majority of Tyonek households. The household consists of a man in his 40s and his teenage son. The father worked full-time for the village in a job that he says demanded most of his time. As a highly respected leader, he aided the other villagers at every opportunity.

The household head owns a fishcamp at Beshta Bay. During the king salmon season in 1982, he shared the camp and his gear with four other households, including that of his other unmarried son; an unrelated, unmarried man; an unrelated older man and his elderly mother; and a household composed of a temporarily disabled husband, his wife, and their four young children. The fishcamp owner provided transportation in his pickup truck to these people as well. The owner also has a smokehouse in the village which he shared with five other households. Because he had a full-time job, he arranged for his brother to process his salmon in return for one-half of the finished product. He also took some time off in the summer of 1982 to enter into a partnership with a village commercial fisherman.

In the fall, the father hunted moose in his truck along the logging roads. He supplied moose meat to village elders, including those in Case C. This man also collected berries and wood with his truck. The household received clams, bear meat, and waterfowl from Tyonek people who regularly harvest these species. As is typical in Tyonek, no direct exchange was involved; individuals shared resources with no expectation of an immediate return.

Case C

This household consisted of an elderly man and his unmarried son. Both are highly respected for their vast knowledge of Dena'ina history and traditions. Although both men were extremely active hunters, fishermen, and trappers in the past, poor health had restricted their harvesting activities during 1981. Their cash income was small, deriving mostly from the father's transfer payments. This income covered the costs of rent, fuel, and the purchase of staples and some meat (mostly chicken) in Anchorage.

The father and son participated annually in the 1981 and 1982 subsistence fisheries, and harvested about 30-35 king salmon each year. They also incidentally caught 10-20 reds. The son froze, salted, pickled, and canned these fish, although he shared perhaps one-third of his catch with a female relative. The son also occasionally helped others during the commercial season and received fish in return. The son fished for silver salmon with nets in the summer and fall, and caught silvers and rainbow trout in fresh water in September. He fished for hooligan (eulachon) with gillnets and also collected them on the beach when they were washed up by a strong surf. Both men also harvested plants for their food and medicinal qualities. Because of their status as village elders, these men received large quantities of fish and game from relatives and from several village leaders who make a special effort to provide for older Tyonek residents. In 1982 the household received belukha, bear, moose meat, waterfowl, several salmon species, and trout.

INTERRELATIONSHIPS

As in the past, patterns of hunting and fishing in Tyonek today are largely shaped by ecological, historical and cultural factors. The seasonality of many economic activities, such as salmon fishing and clam harvesting, is tied to annual wildlife cycles. Cultural patterning is demonstrated in the organization of harvest groups, in processing and preservation methods, and in distribution networks which include relatives and village elders. Fish and game continue to be nutritionally, economically, and culturally important to the vast majority of Tyonek households.

The persistence of hunting and fishing as a major source of food can be explained in several ways. Tyonek's cultural patterns tend to be homogeneous and there are three or more generations within most village families.

A strong village organization provides services to residents while reinforcing Tyonek's identity as a distinct community. These conditions foster the learning of traditional cultural patterns by young people. Cultural values are expressed as elders, adults, and children perform traditional roles in the harvesting, processing, and sharing of wild resources.

In addition, the Tyonek area has not yet been subject to the tremendous human population growth characterizing most of the remainder of the Kenai Peninsula Borough. Thus, fish and wildlife populations have remained relatively high and accessible. Further, other economic alternatives to hunting and fishing have been scarce and unreliable. Year-round paid employment opportunities are few; most jobs are seasonal and short term, and monetary incomes are typically below Alaska's average. As pointed out above, lack of education and skills plus the desire to remain close to relatives have inhibited many people from seeking jobs in other locations for extended time periods. For all these reasons, overwhelming majority of Tyonek households include hunting and fishing in their economic strategies.

Nevertheless, it is quite apparent that patterns of wild resource use have been dynamic over the last several decades. The Tyonek area has not escaped the impacts of a growing regional population and mineral exploration and development on the fish and game resources of Cook Inlet. Commercial and sport uses have sometimes competed for and reduced fish and wildlife populations and led to food shortages in Tyonek (Braund and Behnke 1980: 181). In order to allow the recovery of king salmon stocks in Cook Inlet, State fishing regulations closed legal access to king salmon for a decade. This temporarily interrupted the transmission of traditional skills to the young. The desire to fish for king salmon at Tyonek remained

strong, however. The successful restoration of the fishery in 1980 reinvigorated the traditions surrounding king salmon, and is one example of the efforts of the people of Tyonek to maintain their opportunities to fish and hunt. Attempts are now underway to restrict the impacts of coal development. These efforts are not motivated solely by economics, but also by culturally-based values and goals. As a result, Tyonek has maintained fishing and hunting as a cornerstone of its way of life despite the proximity to Anchorage and its urban economy.

The monetary sector of Tyonek's economy has grown, especially since the lease sales of the early 1960s. However, the costs of maintaining the village infrastructure are great and consume most of the village's financial resources. For households, the purchase of fuels, hunting and fishing equipment, and commercial foodstuffs — such as coffee, tea, vegetables, and other staples -- requires cash. Commercial fishing and trapping have been sources of cash in the past, but Tyonek's commercial fishery has remained marginal. Today most Tyonek households pursue a variety of seasonal, short-term jobs, which, along with fish and game harvests, are the dominant features of the village's economy.

Increasing resource development is bringing change to the Tyonek area. The local logging operations have resulted in a network of roads that Tyonek hunters now utilize. This facility also has brought competitors for local resources. Beluga coal development may bring an even larger influx of newcomers. There are proposals to construct a road connecting the Tyonek area with Alaska's network of highways. Consequences may be increased competition for, and a severe depletion of, fish and wildlife. With adequate training and opportunity, some Tyonek residents may obtain wage employment as these developments occur, but their access to wild resources may

correspondingly dwindle. The net effects of these developments on Tyonek's pattern of resource use cannot be predicted with any certainty.

CHAPTER 8

SITKA: RESOURCE USES IN A LARGE, NON-ROAD CONNECTED COMMUNITY OF SOUTHEAST ALASKA.

By Robert Schroeder and Richard K. Nelson

PREFACE

The last case is Sitka, a relatively large city and borough of southeast Alaska on the Marine Highway system, non-road connected to major population centers. Sitka illustrates that a community's size and economic base are not simple predictors of household resource use patterns. Sitka has a heterogeneous population of 7,803 persons (1980 census), 21 percent Alaska Native and 79 percent non-Native. The city's economic base is relatively mixed (government, timber, commercial fishing, trade, business, service, tourism) and cyclic (historic upswings have occurred around furs, gold, fishing, defense, and timber).

Survey research by Schroeder and Nelson indicates substantial use of fish and game resources by Sitkan households during 1982 -- substantial reported participation (79 percent of surveyed households hunt, 95 percent fish, 82 percent gather intertidal resources, 94 percent gather land resources); high numbers of trips; substantial outputs (on average, 27 percent of meat and 62 percent of fish used by households come from fishing and hunting); frequent distribution of resources; and high numbers of harvested species. Within this pattern of use, Schroeder and Nelson found great variability among households in terms of harvest strategies, dependency, and values. Many households schedule fishing and hunting around wage occupations; others integrate harvests with commercial fishing; others use fishing and hunting as security against uncertain job situations.

At least four value orientations were identified characterizing users -- economic benefit, Tlingit cultural tradition, nutritional value of "natural" foods, and an "outdoors way of life." Schroeder and Nelson speculate that the apparent high use of fish and game at Sitka may be associated with an abundant resource base, the cyclic market economy, Sitka's relative isolation, the long average tenure of the population, and the choice by households to perpetuate a longstanding cultural tradition at Sitka wherein families participate directly in their own food production. The compatibility of fishing and hunting for local uses with working in a food extractive community economy such as commercial fishing at Sitka may be an additional explanatory factor.

It should be noted that the sample in the Sitka case was not randomly selected. Therefore, the percentage derived from this study cannot be extrapolated to the community as a whole. Nonetheless, a wide range of Sitka households were interviewed in the course of the survey, thereby providing representation of a large number of varying economic and resource use strategies and different household socioeconomic configurations.

BACKGROUND

Environment

Sitka is located on Baranof Island, along the outer coast of southeastern Alaska. It has a temperate maritime climate with cool summers, mild winters, and high annual precipitation. The islands of Sitka Sound create protected waters and permit access to rich hunting and fishing areas by small boat (see Figure 39). A wide array of marine resources is available here, including salmon, halibut, trout, rockfish, herring, crabs, and clams, as well as waterfowl and sea mammals (see Table 34). Important

Sitka and Game Management Unit 4

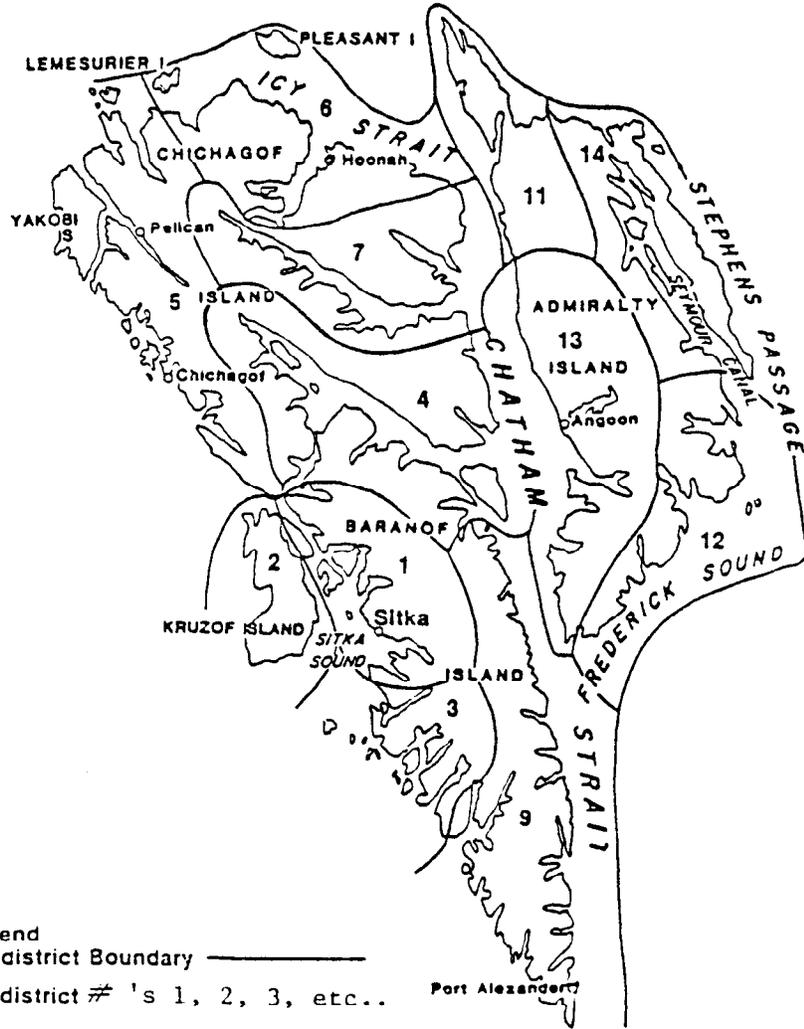


Figure 39. Sitka and Game Management Unit 4

TABLE 34

MAJOR RESOURCES HARVESTED IN SITKA AREA

Hunting and trapping

Sitka deer
 Brown bear
 Black bear
 Mountain goat

 Hair seal
 Sea lion

 Geese [various species]
 Cranes [various species]
 Blue grouse
 Ptarmigan
 Freshwater ducks
 [numerous species]
 Saltwater ducks
 [numerous species]
 Loons
 Cormorants
 Merganser

 Marten
 Mink
 Weasel
 Otter

Intertidal Gathering

Razor clams
 Butter clams
 Littleneck clams
 Horse clams
 Mussels
 Scallops
 Gumboots/chitons
 Cockles
 Sea urchins
 Abalone
 Octopus
 Sea cucumber

 Black seaweed
 Red seaweed
 Kelp

Fishing

Pink salmon
 King salmon
 Coho salmon
 Chum salmon
 Sockeye salmon
 Halibut
 Rockfish/bass [numerous species]
 Red snapper
 Cod/hake
 Ling cod
 Flounder
 Greenling
 Herring
 Dolly Varden
 Other trout species
 Smelt

 King crab
 Dungeness crab
 Tanner crab
 Shrimp/prawns

Land Gathering

At least 22 species of plants and

 Salmonberry
 Blueberry
 Red huckleberry
 Black huckleberry
 Cloudberry
 Elderberry
 Cranberry
 Nagoonberry
 Wild strawberry
 Currants

land resources include deer, mountain goat, brown bear, and several fur bearers. As one Sitkan put it, "The only thing we are lacking around here is moose." Species diversity and temperate climate combine to permit resource harvesting throughout the year.

History

Abundant resources and defensible geography made the site of present-day Sitka an attractive one for the Tlingit people. A major community of the Sitkakwan Tlingit was situated here long before Alexei Chirikof sailed into the Sound in 1741. Somewhat later, in 1799, Alexander Baranof established a Russian settlement near the Tlingit village, drawn by the number and quality of furs to be had in the area. Baranof's Russian American Company maintained its center of operations here until 1867, when Alaska was transferred to the United States. Sitka remained the administrative center and later the capital of the Alaska Territories until 1906.

Population

Sitka's changing economic picture has long been reflected in its population, although the overall picture is one of growth. From 1960 to 1980, the community experienced a population increase of about 72 percent, or a compounding growth rate of 2.7 percent annually. The mean age of Sitka's population today is 26.4 years, skewed upward by the presence of the large Pioneer's Home. In the 1980 census, Alaska Natives constituted about 21 percent of the population. For comparison, about 50 percent of Sitka's population was Native at the beginning of World War II. There were 2,440 households in Sitka at the time of the 1980 census, with a mean household size of 3.05 persons (see Appendix). Sitka's continued population growth

will depend on economic expansion and may be slower than the growth of the last twenty years.

Economy

Sitka's economy has gone through numerous transitions and cycles over the years. The fur trade flourished during the early period, then declined in the latter half of the nineteenth century because of overharvesting and failure of markets. Commercial fishing and cannery operations were underway by the 1870s, but this boom ended in the 1930s, as the overused salmon runs diminished. Gold mining, herring processing, and commercial whaling also came and went earlier in this century. During World War II, military installations around Sitka created a major economic surge and a temporary population growth (see Figure 40).

In the mid-1950s, Alaska Lumber and Pulp established a mill at Sitka, creating about 700 jobs in the community and at nearby logging camps. This was the primary cause for Sitka's population growth between 1950 and 1960. The fishing industry also recovered somewhat from its earlier decline, and Sitka became the home port for a sizable fleet of trollers and purse seiners. Currently, two fish processing plants operate here.

Sitka's present economy is mixed. In 1979 approximately 4,323 Sitkans were employed and average monthly wage was \$1,632 or about \$19,500 per year (City and Borough of Sitka, 1981) (see Figure 41). About 30 percent of salaried jobs are with local, state and federal government, 25 percent in manufacturing, primarily in logging, lumber mill operations and in fish processing, and 35 percent in trade, business and services. Self-employment in commercial fishing and jobs tied to either construction or tourism tend to be seasonal with a mid-winter slack period. Commercial fishing incomes are depicted in Table 35.

POPULATION TRENDS: SITKA

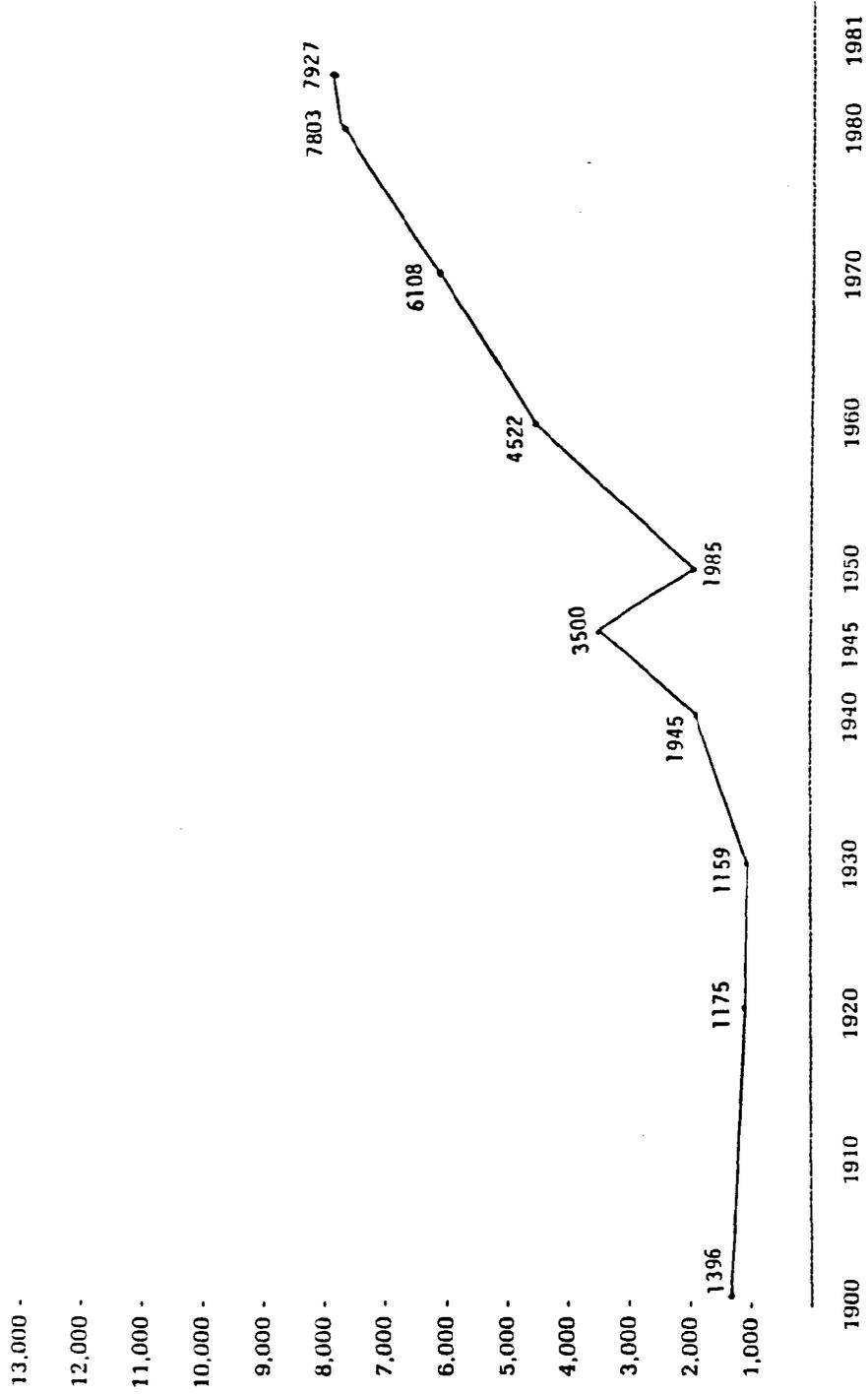


Figure 40. Population Trends, Sitka

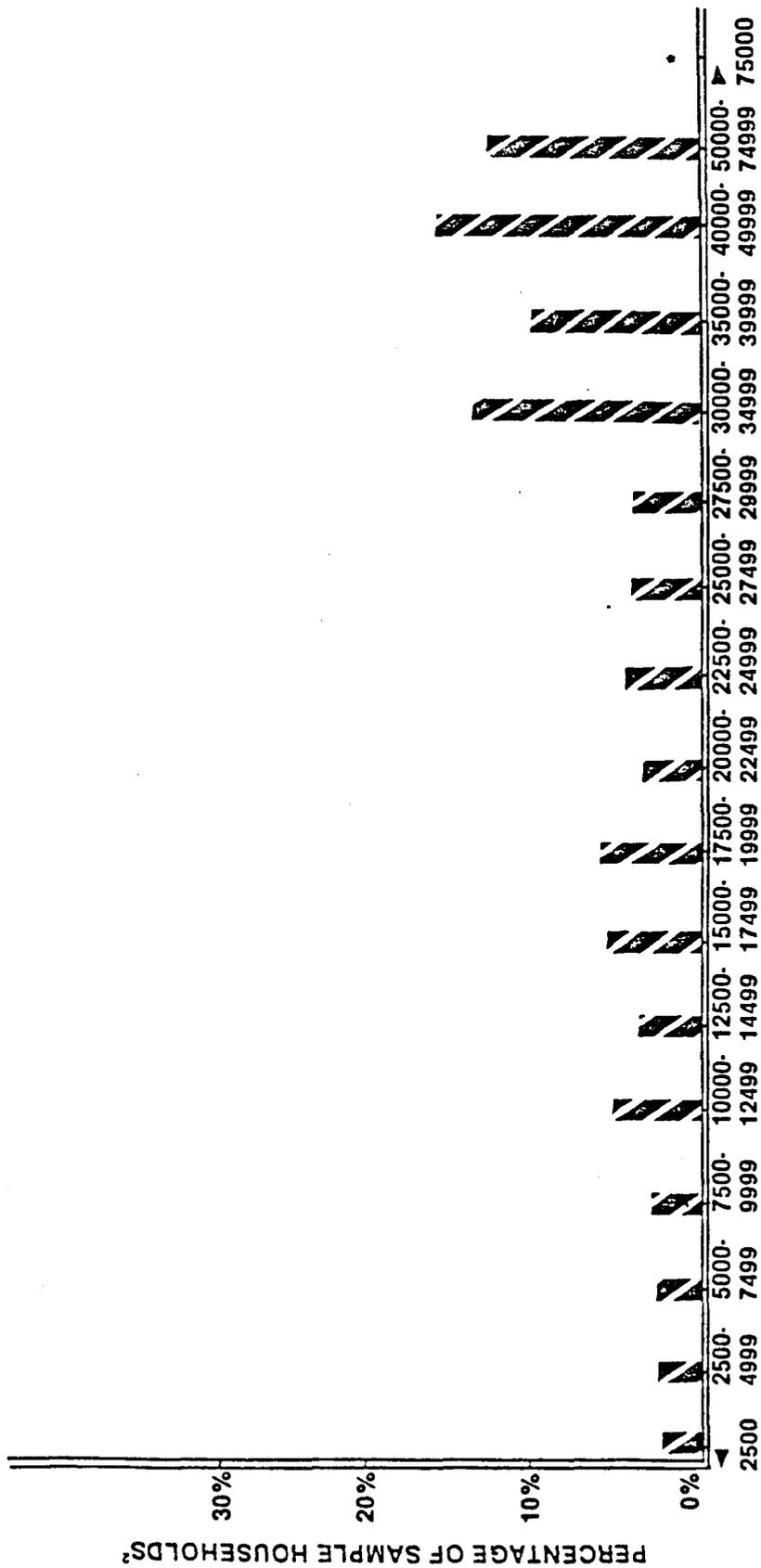


Figure 41. Household Income (Dollars) — 1979, Sitka¹

¹ U.S. Bureau of the Census, 1980 Census of Population and Housing, Summary Tape File 3

²N = 2,405

* no data available

TABLE 35

INCOME RANGES FROM COMMERCIAL FISHING FOR SALMON AND HERRING,
SITKA, 1981

Total Number of Commercial Fishermen		305
Number of Salmon and Herring Fishermen		247

Percent earning less than \$1,000		23.5
" " \$1,000 - 9,999		27.1
" " \$10,000 - 19,999		19.9
" " \$20,000 - 29,999		16.2
" " \$30,000 - 49,999		5.3
" " \$50,000 - 74,999		2.0
" " \$75,000 - 99,999		2.0
" " greater than \$100,000		4.0
	Total	<u>100.0</u>

* Less than four: due to confidentiality regulations number cannot be disclosed.

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries. (1981)

At the present time, Sitka is economically troubled. The Alaska Lumber and Pulp mill is on a reduced work schedule and may shut down due to a poor market. Fishing is down from what it was a few years ago, and government facilities such as Mt. Edgecumbe School, Mt. Edgecumbe Hospital, and the U. S. Coast Guard station are facing cutbacks or closure. Employment opportunities will be very tight in the next few years.

Government and Transportation

The City and Borough of Sitka is a Unified Home Rule Municipality incorporated in 1971. Sitka proper is the only permanent settlement recognized in the Borough. Transportation in and out of the City and Borough is by boat or plane, since there is no road access. Ferries of the Alaska Marine Highway System make about 20 arrivals per month. Most general cargo and consumer goods come to Sitka by barge from Seattle. The few miles of local roads offer only limited access to resource areas, so people depend on privately owned boats for most harvesting activities. In 1982, there was one boat for every 1.7 households in Sitka.

PATTERNS OF RESOURCE USE

The following information was gathered by the Alaska Department of Fish and Game's Division of Subsistence in fall 1982. The study was based on extended interviews with local experts and typical resource users, and on a formal survey administered to 163 Sitka households. These households were an opportunistic sample representing a broad spectrum of social and economic categories. Alaskan Native households accounted for 25 percent of the surveys. Since the sample was not random, however, these data cannot be extrapolated to be exactly representative of community resource use patterns.

Permits and Licenses

At the present time, most harvesting of fish and game for domestic use takes place under sport or commercial regulations. About 1,800 hunting licenses are held by Sitkans; and this total does not include hunters under age 16, who do not need licenses (Loyal Johnson, pers. comm. 1982). Virtually every Sitka household has at least one fishing license. Tables 36, 37, and 38 indicate recorded sport and subsistence harvests for the Sitka area. Subsistence permits for salmon have been issued in increasing numbers over the past fifteen years. About 40 percent of Sitka households had such a permit in 1981, and about half the total number of salmon used domestically at the present time are taken on these permits.

Harvest seasons, methods of harvest, and harvest levels are strongly influenced by fish and game regulations and by active enforcement of those regulations in the Sitka area.

Harvest Technologies

Hunting. Most frequently, hunters travel to preferred hunting areas by boat and then climb to alpine terrain or hunt along the beach. Hunters sometimes bring all terrain vehicles with them in their boats and hunt along old logging roads. Limited hunting areas can be reached by road or on foot from Sitka proper. Hunters use rifles of varying calibers. Sitka deer can be hunted successfully with medium caliber rifles, but many hunters carry large caliber rifles as bear protection. During October and November, deer calls are often used. Later in the deer season, most kills occur at low elevation or on the beach.

Fishing. Most fishing in the Sitka area either is done from a boat or requires a boat to provide access to productive fishing sites. Freshwater

TABLE 36

DATA FROM RETURNED SUBSISTENCE PERMITS¹

Year	#Permits	#Persons in Permit Household	#Salmon caught
1965	166	728	1,190
1970	284	1,491	3,397
1975	275	1,643	3,182
1978	396	1,616	3,532
1979	483	1,833	4,062
1980	734	2,562	6,138
1981	906	3,231	8,897

¹ Source: Robert DeJong, Alaska Department of Fish and Game.

TABLE 37
SPORT AND SUBSISTENCE FISH HARVEST
FOR SITKA AREA
(Mills, 1981)

	Sport Harvest (1980)*	Subsistence Permit Harvest (1981)+
King Salmon	1,489	---
Coho Salmon	2,202	---
Sockeye Salmon	1,395	8,209
Pink Salmon	4,510	1,646
Chum Salmon	370	948
Halibut	4,976	---
Steelhead	35	---
All Trout	6,525	---
Dolly Varden	10,143	---
Smelt	4,103	---
Rockfish	8,848	---
Other	12,174	---
Total Days Fished	36,682	

+ Adjusted figures

* Includes harvest of non-resident sport fishermen.

TABLE 38
 DEER HARVEST, GAME MANAGEMENT.
 UNITS MOST USED BY SITKANS, 1981¹

	Bucks	Does	Total
GMU 04-01	482	131	613
04-02	158	45	203
04-03	93	24	117
04-04	204	59	263
04-05	227	58	285
Totals	1,164	317	1,481

¹ Source: Loyal Johnson, Alaska Department of Fish and Game, Sitka

lake, river fishing, and shore or estuary fishing are most often done with light spin casting gear. Salt water sport fishing gear (rod and reel) is used for trolling for salmon and for bottom fishing for halibut and other species; fishing is done with both bait and lures. In the subsistence permit salmon fisheries in 1981 there were 332 permits for beach seining, 251 for spearing, dip netting and gaffing, 193 for drift gill netting, and 127 for purse seining. Boats are needed to reach permitted harvest sites and to use the subsistence technologies.

Intertidal gathering. Access to the most productive sites is most often by boat. Most gathering is done by shore picking or digging at low tide. Some gatherers use snorkel or scuba gear for gathering some species.

Land Gathering. Significant land gathering for plants and berries can be done in the immediate vicinity of Sitka. Boats are often used to reach more productive plant and berry areas, to gather seaweed and kelp, and to collect driftwood for firewood.

Cost of Technology. Minimum harvesting gear for participation in a full range of harvest activities consists of a skiff with an outboard, fishing tackle and a deer rifle. Minimum cost of these items if purchased new would be about \$2,000 to \$3,000. Because of safety considerations, more expensive Boston whalers are popular boats in the Sitka area. Larger boats with enclosed cabins also are used extensively for domestic harvest of resources. Commercial fishing boats are often used by owners to provide access to harvest sites.

Harvest Participation

Figures 42 and 43 indicate hunting, fishing, and gathering participation and frequency of activity among the surveyed households. Overall,

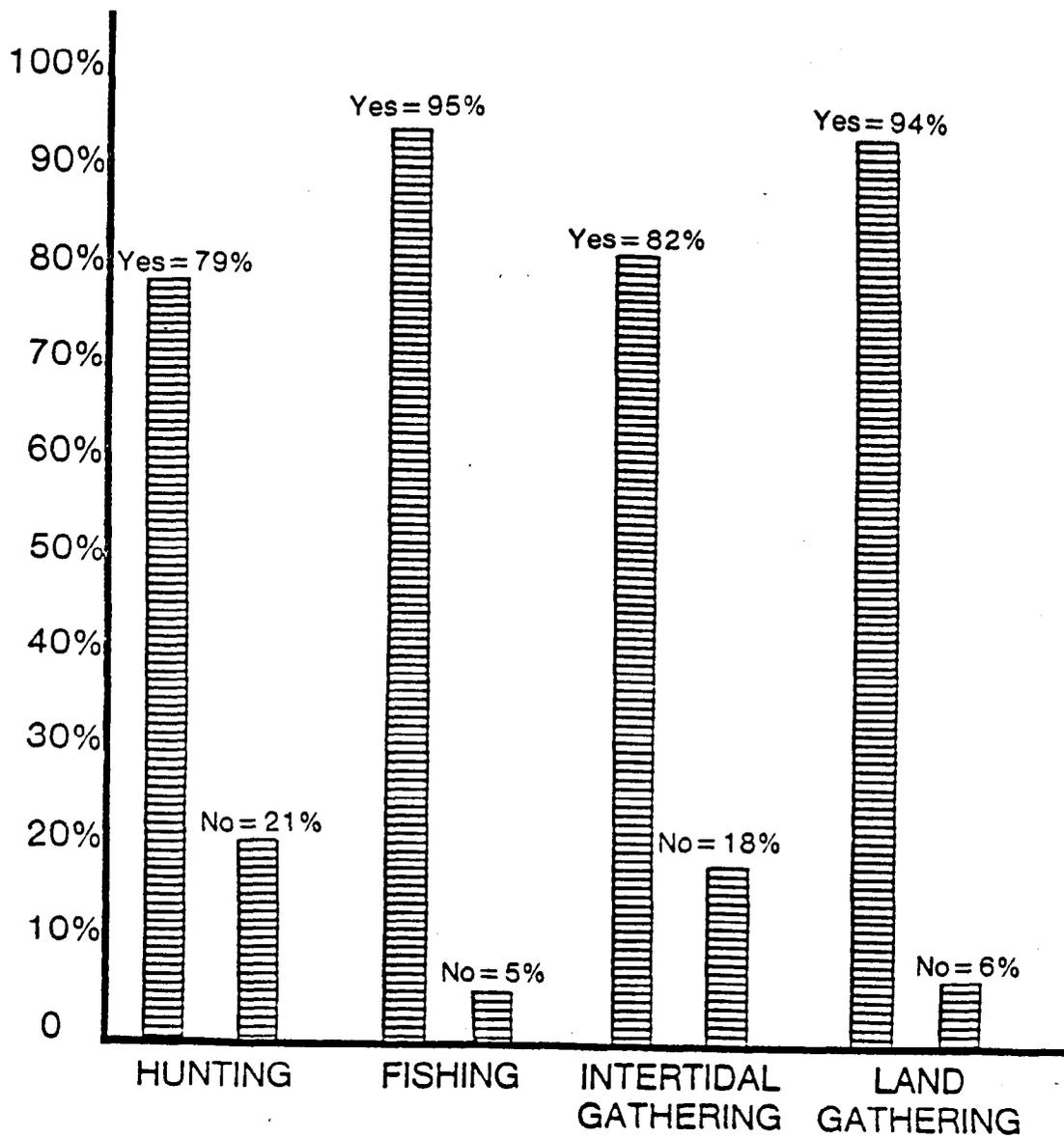


Figure 42.
Household Participation in Harvest Activities during 1981, Sitka.

about 79 percent of participants hunt, 95 percent fish, 82 percent gather in the intertidal zone, and 94 percent gather on the land. Alaska Native participation in hunting and intertidal gathering was higher than non-Native for those sampled.

A majority of our sample fished more than ten times in the past year, and about 20 percent fished more than 30 times. Most hunters hunted at least six times, and about 12 percent of all hunters went out 16 times or more. Adding in land and intertidal gathering, some Sitka households report harvesting natural resources 200 or more times during the year. For most Sitka households, however, natural resource harvesting has to fit in with other life activities. Many Sitka residents complained wistfully that their jobs limited the time they could spend hunting, fishing, and gathering. These problems notwithstanding, household needs for some resources might be satisfied with a fairly small number of trips; correlations between success and effort are not always direct.

The survey asked about the percent of household meat and fish that came from harvested resources. For the whole sample an average of about 27 percent of meat and 62 percent of fish used in a year comes from hunting and domestic use fishing. About 18 percent of sample gets 70 percent or more of their meat from hunting; about 57 percent gets 70 percent or more of the fish they eat from their own fishing efforts. A high standard deviation for these averages indicated much variability in uses.

The more active households contacted reported spending a great deal of time and effort in harvesting activities and that all the meat and fish they used came from hunting and domestic use fishing. Often these households utilize a large number of species and rely heavily on land and intertidal gathering as well. We encountered both non-Native and Native

households of this type. Households who use a wide range of resources were found in all job and income categories, although commercial fishermen as a group tended to report a wide range of uses.

A small number of households interviewed made virtually no use of natural resources. Often these were households of people new to the area who have yet to learn how to make use of resources found here. The majority of Sitka households contacted fell between these extremes of resource utilization.

Distribution of Harvested Resources

We found that a significant aspect of resource harvesting is the distribution of fish, meat, and other harvested products to relatives and friends within the community. Many survey participants also receive these resources from others (see Table 39). This exchange often brings fish and game to people who do little harvesting themselves, involving them as consumers of natural resources. Such exchange is important in establishing and maintaining social bonds between people in the community.

Special use of fish and game occurs in the context of Native Alaskan traditional feasts and celebrations. The favorite foods of the deceased are served at 40-day and other funeral feasts. Traditional foods also figure importantly in Tlingit cultural events and other celebrations.

Changes in Household Involvements

Households surveyed perceived that their involvement in hunting, fishing and gathering has increased in the last five years (see Figure 44). Both the number of hunting licenses purchased and the number of subsistence permits issued have increased faster than population growth in the last

TABLE 39
EXCHANGE OF MEAT AND FISH

1. Households receiving meat - 66%	<u>from</u> average 2.2 sources
2. Households receiving fish - 83%	<u>from</u> average 4.3 sources
<hr/>	
3. Households giving meat - 47%	<u>to</u> average 4.5 receivers
4. Households giving fish - 72%	<u>to</u> average 9.2 receivers

ten years in Sitka. Rising costs of store-bought foods have made harvesting natural resources economically more attractive, many survey participants explained. Others mentioned an increasing awareness of the nutritional value of natural foods as another reason for intensifying their harvest. Among Native participants increased use of harvested foods was related to a strengthening of Tlingit cultural identity. Non-Natives reported a growing interest in the outdoors-oriented way of life possible in Sitka. Increased involvement was reported despite a decline in availability of some species. Survey participants reported that deer have become harder to find in areas closest to Sitka, and that halibut and other bottom fish have become less bountiful. The local decline in abalone harvest success has been well documented (Mills 1981).

Income, Household Size, and Residence

Initial analysis has been done correlating reported dependence on fish and game with income, household size, and years living in Sitka. In our sample, larger households tend to rely more on fish and game than do smaller households. The larger households are also more likely to own the equipment (such as boats, fishing tackle, and rifles) needed to exploit natural resources, and to have a household member free for these pursuits. In addition, the economic value of natural foods might be more noticeable in large families.

Longer residence in Sitka is associated with increased dependence on natural resources. This may reflect the time needed to learn how to harvest fish and game effectively.

No consistent pattern has been found between household income and level of dependence on fish and game. Households with both high and low levels

of use occur in all income categories. These conclusions are tentative, and further analysis may indicate other relationships.

Values and Importance of Domestic Use of Fish and Game

The most frequently expressed values and those which appeared to be most strongly felt are related to tradition, pattern of living, and culture. Non-Native Sitkans said they consider hunting, fishing, and gathering intrinsic parts of a way of life they have chosen for themselves. These activities are frequently mentioned as parts of a proper way to live and to interact with the physical environment. Statements taken from our interviews include the following.

"It is the single most important activity we are engaged in. It is the focus of our family life and the source of our sense of community... It keeps us healthy in every sense."

"Very important, it is one of the main reasons I choose to live in Southeast."

Since non-Native households in our sample have been in Sitka for an average of 14 years, they may have developed long-standing ties with specific local harvest areas.

Native Sitkans most often mentioned the cultural aspect of resource use as being of highest importance. Hunting, fishing, and gathering are seen by many Tlingits as being as much a part of their culture as are Tlingit language, art, family relationships, or other traditions. For many individuals, harvesting resources and using traditional foods is an essential element of Tlingit identity.

"Being brought up in the Tlingit way, this is my way of life, and I would like to keep it as such for my children."

"Subsistence is important in the sense it is the key to cultural values, essential in receiving good nutrients, valuable to those members of the family who are in need of food."

The economic value of harvested foods was the next most frequently mentioned value expressed in study interviews. As indicated in a previous section, large numbers of Sitkans depend on harvested resources for most of the meat and fish their families use. For these users, harvested foods help to save money on food costs; for many families there may be no alternative to natural sources of high quality foods.

"I have seen times when we hadn't money to go to the grocery store, so we ate seafood and wild plants."

"With the uncertainty of my having any work after this place of work closes--there'll be no income--we have to depend on hunting and putting up food to survive."

The high nutritional quality of natural foods was the third most frequently mentioned value expressed by people contacted. People concerned with eating healthy food may want to limit their consumption of store-bought food which they believe may have been treated with dangerous chemicals or additives. As one interviewee commented: "Most important is that we know exactly what is going into our stomachs."

Lastly, harvesting activities and processing natural foods are valued as activities in themselves. Some study participants saw these activities as highly enjoyable and healthy ways of spending their time. A small number of participants saw their own involvement as being primarily recreational.

"I see these activities as important recreational values. I do not depend upon hunting, fishing, or gathering to provide subsistence for my family."

CASE HOUSEHOLDS

The following cases were selected from among low, moderate, and heavy resource users in our sample. Note that our sample also included households

making little or no use of harvestable resources.¹

Case A

This household consists of a couple and their four-year-old daughter. The husband was born in Alaska 52 years ago and the family has been living in Sitka for the past 22 years. Both adults are employed full time, he as a planner and she as an accounts clerk. Their joint house-

hold income is more than \$50,000 per year. The household's level of involvement in use of local food resources has remained constant over the last five years. "Cost savings is probably the most important reason for hunting, fishing and gathering, although our lifestyle places us where there is a good supply of subsistence foods and wood. By using subsistence foods they have become important in our diet and are not available any other way or elsewhere." An estimated 60 percent of the household's meat, 100 percent of the fish, and 5 percent of the fowl used in the past year came from hunting and fishing. They reported obtaining 8 deer and 12 ducks, a good return for the 6-10 times they went out hunting. They fished about 25 times in the past year and obtained 70 salmon (10 kings, 35 silvers, and 25 sockeye); 10 snapper; 10 halibut; 10 ling cod; 10 Dolly Varden; 10 king crab and 30 dungeness crab; 10 pounds of shrimp; 50 pounds of herring roe, and 10 pounds of smelt. From the intertidal zone they gathered clams, scallops, abalone, cockles, two types of seaweed and kelp. They also gathered salmonberries, huckleberries, and cranberries. To preserve their food, the household uses a freezer, smokehouse and methods of pickling and canning. They also exchange harvested foods with relatives and friends.

Case B

This household includes a couple with their three children, school age and below. The parents have lived in the Sitka area all their lives. The household reported an annual income of between \$20,000 and \$25,000. The father is employed as a foreman. The household reported that hunting, fishing, and gathering are fundamental to their way of life and essential for the continuation of Tlingit culture. They saw those things as fundamental Native rights. They reported that all of the fish and fowl, and much of the meat they eat comes from hunting and fishing. They exchange these foods with other community members. They have become more involved in the use of local food resources than they were five years ago. In the past year they hunted and obtained 3 deer, 6 hair seal, and 1 sea lion. In addition to utilizing the meat and pelt, seal oil was rendered from the seal fat. The family fished about 15 times in the past year and harvested salmon with a (25 pinks, 8 kings, 10 silvers, 25 chum, and 25 sockeye); 3 halibut and 5 red snapper. The family also gathered a small quantity of herring and herring roe. They gathered a small quantity of clams,

¹ Minor alterations have been made in biographical data for all cases, to protect the anonymity of survey participants.

sea urchins, and abalone, black and red seaweed, salmonberries, blueberries, huckleberries, and edible plants. They put their food up by canning, pickling, salting, fermenting, freezing, and smoking. They have their own freezer, smokehouse, and maintain an off-road vehicle used for hunting.

Case C

This household consists of a couple in their 20s, their 4-year-old child and a 30-year-old male who lives with the family. They have lived in Sitka and Alaska for five years. The household annual income was reported to be \$5,000 to \$10,000 a year, with adult members employed in part-time service jobs. This household refers to themselves as being vegetarian and reported: "Fishing and plant gathering (are) of the utmost importance to our home. We eat most local greens -- ferns, beach grass and greens, kelp and some seaweed. We make lots of fish jerky, canned fish and... about 20 pounds of (frozen) fish (because we only have use of one shelf in a freezer). Without the use of local fish for pure protein we'd be in some trouble because we don't eat meat and can't afford lots of store-bought protein." In the past year, 100 percent of their fish came from their own fishing activities. They obtained an estimated 16 salmon, 15 halibut, 20 rockfish, 40 snapper, 10 ling cod, 2 flounder, and 6 greenling. In addition, they harvested some crab, small amounts of shrimp, herring, and herring roe. They gathered clams, mussels, cockles, and abalone, black seaweed and kelp. As mentioned, they also gathered large quantities of edible plants, and 7 varieties of berries. They also exchanged harvested foods with others, reporting that in the past year they received fish from at least 50 people and gave fish and edible plants to about 30 people. They preserve harvested foods by freezing, smoking/drying, canning, pickling, and salting.

Case D

This household consists of a couple in their twenties and the husband's father and brother. Household members have lived in Sitka and Alaska for the past 12 years. One member is seasonally employed as a fisherman, one works at the pulp mill, and another is a secretary. Their annual household income is between \$40,000 and \$45,000. They report being much more involved in the use of local food resources now than five years ago: "We do not eat store-bought fish and very little meat. We are able to pursue our lifestyle the way we want to with this subsistence food at our disposal." They estimate that 100 percent of the fish, 60 percent of the meat, and 10 percent of the fowl they eat comes from local harvesting. They fished more than 90 times in the past year, taking about 10 halibut, 30 rockfish, 10 red snapper, 5 ling cod, and 14 salmon. They also took 3 deer, and they harvested herring roe, shrimp, clams, abalone, berries and edible plants. They reported receiving meat from five people and fish from at least ten people in the past year. They gave meat to two households and fish to twenty households. Their method of preserving foods include freezing, smoking/drying, canning, pickling, and salting.

Case E

This household consists of a couple and the husband's nephew, all Alaskan Natives. The head of the household is 48 years old and has lived in Sitka for the past 30 years. The household's annual income was reported as less than \$5,000 a year. The household members are employed part-time throughout the year at such jobs as barkeeping, nurse's aid, and babysitting. One member does some carving. The head of this household stated that locally harvested foods provided his family with "security in life-threatening times when little work was available... I will not apply for aid while I am healthy and capable of fishing and hunting." Not surprisingly the household depends heavily on fish and game for food. About 70% of the household's meat, 95% of the fish, and 10% of the fowl were obtained through hunting and fishing. The household reported that members hunted about five times in the past year. Their efforts brought them two deer, two ducks, and three seal. Fishing, with their own boat, was a frequent activity for the household members in the past year. They utilized a subsistence permit for salmon and brought in about 60 fish. They also caught an estimated 10 halibut, 100 rockfish, 20 snapper, 10 cod, and 15 ling cod. They harvested herring roe, herring, trout, Dolly Varden, smelt, king crab, dungeness and tanner crab, and some shrimp. In addition to obtaining their own food, they received harvested foods from 9 people in the past year. They distributed meat to about 10 people, fish to about 20 people, and edible plants and berries to about 10 people. To preserve food, this household freezes, smokes, cans and salts their harvest.

Case F

This household consists of a single professionally employed man who has lived and worked in Sitka for the past 9 years. His yearly income is between \$20,000 and \$25,000. He reports that, "I do not hunt or fish but am given these products as gifts. I do gather plant foods since it seems such a waste to let so much of the land's bounty go unused. It is a source of recreation to gather for me. I give much of my harvest to others." He has become much more involved in using local resources in the last years and exchanges plant foods for other foods with at least 12 other households. He gathers four species of berries and three species of wild plants in a typical year.

INTERRELATIONSHIPS

The review of existing sources of information and the study conducted by the Division of Subsistence in fall 1982 has led to the following observations.

Resource use

General resource use is high, and many Sitkan households report heavy dependency on natural resources. Resource use is perceived to have been increasing over the last five years, and both the number of hunting licenses and subsistence permits issued in the last ten years have increased much faster than Sitka's population has increased.

Resource availability

Although deer hunting in the immediate vicinity of Sitka, abalone gathering, and fishing for bottomfish have become more difficult, the populations of fish and game resources used by Sitkans have not been substantially degraded (Alaska Department of Fish and Game, personal communication, 1982). Commercial fishing and other factors affecting fish stocks and logging activity damaging watersheds and eliminating deer habitat are probably more important factors in resource availability than the domestic hunting and fishing of Sitka residents.

Values and importance

Domestic use of resources has strong economic and cultural importance in the lives of many Sitkans. Study participants reporting a heavy dependency on natural resources tended to see hunting, fishing, and gathering as part of their cultural tradition and/or part of their chosen way of life.

City and Borough government

Local government itself has facilitated resource use by building and maintaining boat harbors, but generally does not strongly influence resource use issues. Community participation in resource issues takes place through

the advisory committee system and resource management is directly conducted by State Department of Fish and Game personnel rather than through City and Borough governments.

Transportation and economy

Air travel and shipping are of great economic importance to Sitkans. The limited local road system and the Marine Highway System do not give Sitkans access to nonlocal jobs and economic resources. There are significant monetary costs associated with the absence of a road systems for purposes of transporting both people and goods.

Transportation and resource use

Roads in Sitka Borough and the Marine Highway System do not provide major access to natural resource harvest sites. Access is primarily by small boat.

CHAPTER 9

UNDERSTANDING RESOURCE USES IN ALASKAN SOCIOECONOMIC SYSTEMS

By Robert J. Wolfe, Ph.D.

The case studies of sixteen communities clearly show that many Alaskan communities are economically and socially dependent on the harvest of wild and renewable resources for local uses. In this chapter, our current understanding of the role of fishing and hunting in rural socioeconomic systems is presented, drawing upon the information from the previous eight chapters. It will be shown that fishing and hunting activities and resource uses in certain communities are components of complex social and economic systems with particular characteristics. The socioeconomic systems illustrated by the case communities display considerable diversity across regions, and are not easily represented by simple generalizations. Nevertheless, some common threads run through the apparent diversity, discussed below in the comparisons and contrasts of cases.

SOCIOECONOMIC SYSTEMS OF COMMUNITIES AND REGIONS

Patterns of use of wild and renewable resources can be understood only in relation to the "socioeconomic systems" of the communities within which they occur. It is important to define what is meant by a socioeconomic system at onset, before comparing and contrasting examples of these systems from the case studies. In general, a "system" is a set of interacting, interrelated, or interdependent elements forming a collective entity. A socioeconomic system is that functionally related set of elements which provides material and social support for a community or regional population.

The socioeconomic system comprises the basic structural relationships underlying the material and social wellbeing of a group. A breakdown in the system can lead to social disruptions, community disintegration, and economic hardships. Signs of an improperly functioning socioeconomic system can be demographic (such as community population decline, outmigration, low birth or survival rates), economic (such as low standards of living, high real unemployment, and high inflation rates), and social (such as family instability, crime, and substance abuse).

A socioeconomic system is composed of several interrelated elements. The first is a set of socially-constituted groups, such as family units, economic firms, and corporate organizations. These groups are organized to perform essential activities for a community, such as food and material production, exchanges of goods and services, education and rearing of children, and so forth. A division of labor is frequently provided in learned social roles, such as occupations and job tasks. The social groups and social roles organize human interaction in the system.

Two other elements in a socioeconomic system are the mode of production and the economic resource base. The mode of production consists of the technological means for producing, distributing, and consuming goods within the system. The production technology is used to extract and convert material from the base of natural resources. A community's resource base (its lands, waters, and their physical and living assets) are developed to provide a livelihood for the community.

Economic theory categorizes these three system parts as labor, capital, and land. Social science theory calls them social organization, technology, and environment. Either way, the socioeconomic system comprises an arrangement of these factors in a functioning whole which provides for the material

support and continuation of a community.

A socioeconomic system organizes a community or region, and exists at a higher level of complexity than the individual. Individuals operate within the socioeconomic system of a community, becoming part of it by birth or immigration. They learn to enact the social roles within the system, and through their enactment preserve and modify the system. However, the socioeconomic system of a community has an existence apart from any individual member. The system has a history that predates and a future that outlasts particular members. Thus, the system is not reducible to individual characteristics of its members (such as age, health, personality, income, or ethnic status), although these characteristics under certain qualified circumstances might be used as identifying marks of a particular socioeconomic system.

As will be discussed below, the case studies show that in many communities, fishing and hunting for local uses are parts of a socioeconomic system at the community and regional level. The fishing and hunting pattern is not an attribute of an individual, but of an entire community or regional group. The patterns of resource use have a relatively long and continuous time depth within the community, passed on from one generation to the next through instruction and learning. A person may adopt the fishing and hunting patterns by becoming socialized into the community. However, the behaviors of any individual are not a complete or sufficient representation of the socioeconomic system.

TYPES OF SOCIOECONOMIC SYSTEMS AND RESOURCE USES

Alaska is unique because of the cultural diversity and historic depth of her rural communities. Our understanding of the socioeconomic systems

of these communities is just beginning. How the customary and traditional use of fish and wildlife contributes to the material and social wellbeing of communities is a complex matter. The case studies of communities provide some insights.

It is useful to try to classify socioeconomic systems according to characteristics of their social and economic base. Small, dispersed settlements worldwide tend to be characterized by the production of food and raw material, such as by plant cultivation, animal husbandry, forestry, and fishing (Larson 1968:581). The economic base of such communities are "food extractive" in nature. This contrasts with urban areas worldwide which display other economic bases, such as manufacturing, trade, governmental services, finance, and defense.

Many dispersed settlements of varying sizes in Alaska seem to have food extractive economies. It may be useful to view a "subsistence-based" socioeconomic system as one type of system based on the extraction of food and raw materials. In a subsistence-based socioeconomic system, communities are dependent on the customary and traditional procurement and use of fish and wildlife. The community is socially and materially dependent on fish and game. Without the continued access to the fish and wildlife base, there might occur extreme disruptions in a community's social and economic wellbeing.

In a subsistence-based socioeconomic system, the means of production, social groups, the education of children, distribution and exchange networks, and other socioeconomic institutions are intricately connected with the customary and traditional uses of resources. The following comparisons and contrasts provide a picture of the role of fishing and hunting in the organization and functioning of these socioeconomic systems. The discussion

focuses on several characteristics of subsistence-based systems: "mixed economy" characteristics; a "domestic mode of production"; a seasonal round of economic activity; networks of distribution and exchange; traditional systems of land use and occupancy; and systems of beliefs and ideologies.

"MIXED" SUBSISTENCE-CASH SYSTEMS

One common misconception of "subsistence" is that subsistence uses occur within "cashless" economies. Another misconception is that subsistence fishing and hunting do not use "modern" technologies purchased with cash, such as gill nets, plywood skiffs, snowmachines, rifles, or steel traps. On the contrary, the socioeconomic systems of all Alaska's communities utilize currency and current technologies. It is not the presence per se of cash or technology that distinguish subsistence-based socioeconomic systems, but how cash and technology are integrated into the community's economic and social activities. In many subsistence-based socioeconomic systems, cash and technologies are integrated with fishing, hunting, trapping, and gathering for subsistence uses so as to be mutually supportive. In nonsubsistence-based systems, the market sector is central to the community's social and economic organization so as to overshadow and obviate the hunting and fishing sector. These relationships are explored in the following sections with data from the case studies of Chapters 2-8.

The term "mixed economy" has been used to describe the subsistence-based economies of the communities of the Yukon River Delta and Nondalton in the Bristol Bay region (Chapters 3 and 4; cf., Wolfe 1979, 1981; Behnke 1982). The term, "mixed", recognizes that there exists a "subsistence sector" to the community's economy and social life, and a "market sector,"

and that the socioeconomic system is viable because the sectors are complementary and mutually supportive.

In Yukon delta communities and Nondalton, fishing, hunting, and gathering provide major means of economic security for the community. The production of food and materials for local use by fishing and hunting is a major economic base. (As discussed in the cases, Yukon delta communities produced an average annual harvest of 4,597 pounds dressed weight per household of subsistence foods; Nondalton produced between 4,141 to 4,959 pounds per household. These are sizable economic outputs.) The "market" sector of these communities consisted of salmon fishing for commercial export sale, local wage employment (such as fish processing, high school maintenance, and construction), commercial fur trapping, and cottage craft industries. Typically, wage employment activities are of short duration (short-term projects, part-time jobs), seasonal, and low paying. As a consequence, average monetary incomes are low, although on particular years for certain households cash incomes may be higher.

The market sector is integrated at the family level in a strategic manner. Extended family clusters invest cash incomes in fishing and hunting equipment, such as skiffs, motors, nets, snowmachines, fuel, and ammunition, which are used in local fishing and hunting efforts. Combined with labor from kinship-based production groups, the cash produces a greater output in wild fish and game than the equivalent spent on imported foods. Thus, there are two sectors to the socioeconomic system -- a subsistence and market sector. Production occurs in each, and each supports the other. Hence the term, "mixed economy."

On the Yukon River delta, fishing and hunting for local uses is not "welfare mechanism" shoring up a weak market economy. Instead, the mixed

economy is an adaptive, efficient system in its own right, on an equal stature with other resource extractive systems (minerals production, agriculture, and manufacturing). An analysis of kinship-based production units by Wolfe (1979, 1981) showed no inverse relationship between monetary income and wild food outputs. The most successful households in the socio-economic systems are those which can produce both a steady monetary income through remunerative employment and an income of local fish and game products. A major source of income in Yukon River delta communities is commercial salmon fishing during summer, an occupation particularly compatible with subsistence salmon fishing in this region, using similar equipment, labor requirements, knowledge, and value orientations. It is a form of cash generation easily integrated into local patterns of fishing and hunting.

The integration of commercial salmon fishing with subsistence fishing and hunting is somewhat different at Nondalton. Nondalton's participation in commercial fishing is more peripheral, due in part to Nondalton's distance from the coast, the high capital expenses of competing in the Bristol Bay commercial fisheries system, and the less reliable sockeye runs. In comparison with the Yukon River delta communities, Nondalton's integration of wage activities with fishing and hunting is more difficult and less reliable from year to year.

The integration of fishing and hunting with the wage sector of the community's economy at Dot Lake and Tyonek (see Chapters 5 and 7, pt. 5) resemble those of Nondalton and the Yukon River delta communities in several respects. The market sector of each community offers few and sporadic job opportunities and low monetary incomes. These two areas differ from the Yukon delta and Nondalton in that job markets are more accessible by transportation networks (Dot Lake is 160 road miles from Fairbanks, Tyonek is

43 air miles from Anchorage). However, the case studies suggest that road connectedness and proximity do not mean an automatic "spill over" of economic benefits from urban areas. Tyonek residents were not found to be regularly a part of the Anchorage employment market, largely because of lack of skills and education. They earned income from local jobs and in the commercial fishery of Upper Cook inlet. The limited monetary incomes from local sources are invested into local fishing and hunting opportunities to support the community. Periodic trips are made to Anchorage by certain family members to purchase food staples and materials as a cost saving measure.

Another pattern of integrating jobs with fishing and hunting activities occurs at Dot Lake. At times, certain family members secure temporary wage employment outside the community, commonly as laborers on road construction projects. Money from seasonal, nonlocal work is brought back to support family members remaining in the community, some of whom fish and hunt during the wage earner's absence.

When the economic base of a community derives primarily from market industries owned by non-family firms, the relationship between cash employment and fishing and hunting in the community seems to display a different character. The Kenai Peninsula cases may illustrate this type of socioeconomic system. Petroleum development and the southward expansion from Anchorage of manufacturing, service, finance, and trade businesses has led to the superimposition of an industrial-based economy on the pre-existing economy of the Kenai Peninsula. A number of complex developments occurred simultaneously. Jobs of longer durations, more regular schedules, and with higher wage scales became more numerous. Instead of self-employment, more persons could derive income from the sale of their labor. As the

number of occupations diversified, specialization of employment became more common. As land and resources became converted into fee simple title for private development, the potential increases for changes in habitat and wildlife. With these changes, large volumes of in-migrants populated the peninsula as new employees, persons who had never been socialized into a socioeconomic system in which fishing and hunting were major components.

Under these interrelated circumstances, fishing and hunting develop particular relationships with the market sector. For many households in Kenai, Homer, and Ninilchik, fishing and hunting appear as subordinate economic and social activities to the market sphere of production. As illustrated in the case studies, in many households fishing and hunting were foregone, restricted, or scheduled around other activities. Wage occupations were more central to the household's range of activities, and fishing and hunting were more peripheral, in part due to the time constraints of working under schedules set by one's employer or the industrial-based system. For many households, fishing and hunting took on the character of a "recreational" pursuit, scheduled as a break from work activities.

However, other households in the same communities seemed to integrate fishing and hunting differently. For these households, harvesting a few target species was a highly valued activity. Efforts were made to procure resources such as salmon, halibut, and clams for the use of their families.

The Homer, Sitka, and Ninilchik cases seemed to suggest that fishing and hunting for a family's use may regularly occur in association with a community economy including a commercial fishing industry. Many commercial fishing communities commonly experience uncontrollable fluctuations in wage earnings due to cyclic fish runs and market prices. Schroeder's Sitka case described households for which fishing and hunting for local

use provided a form of insurance against household failure during years of low commercial fishing earnings. In these cases, fishing and hunting represented a means of long term food security for households against economic boom-bust cycles. The technology and knowledge utilized in commercial fishing may be used for fishing for personal family use. Also, the seasonal nature of commercial fishing may allow free time for other resource harvests.

The case by Caulfield on the users of the Tanana River salmon fishery illustrates a system where fishing and hunting are not central economic activities for the community (Fairbanks), or for most households who participate in the fishery. The profile of the majority of users indicated a substantial involvement in the Fairbanks wage economy (66.8 percent held full-time wage occupations). Salmon fishing and other resource uses (gardening, moose and caribou hunting, and trout fishing) were scheduled around wage jobs and engaged in for the value of "being outdoors" and "recreation yielding a food return." However, a small number of the sampled fishermen fished for salmon for more economic reasons, for food for families and dogteams, as part of a self-sufficient, "interior way of life." Overall, the socioeconomic system of the Fairbanks area clearly cannot be termed a "mixed" subsistence-based economy.

DOMESTIC MODE OF PRODUCTION

Just as there are differences between communities in terms of the integration and relative contribution of the "market" and "subsistence" sectors to the community's economic base, there are differences in the social mode of production. Production in a socioeconomic system are activities of social groups. The socioeconomic systems of communities in

Alaska can be compared according to the types of social units engaged in production.

In the case communities of Nondalton, Dot Lake, Tyonek, and the Yukon River delta, the primary economic activities of the community occur within social groups typically composed of family members, with a division of labor allocated by the age, sex, skill, and kinship relations of group members. This organizational form, where production occurs within kinship-based units which own the production capital, has been termed a "domestic mode of production" (Sahlins 1962). A domestic mode of production contrasts with the predominate social organizational form of industrial-based economies, where economic production occurs in non-family, institutional firms based on formal contract. In the domestic mode, the production and consumption of goods are activities of the same group, a network of family members. In the industrial mode, production and consumption are separate, as economic firms and families are typically separate. Frequently there are rules forbidding the intrusion of kinship principles into the workplace (for instance, the State of Alaska maintains nepotism rules).

The organization of the domestic mode of production can be complex (Wolfe 1981, Foster 1982). The size and composition of domestic production units can differ depending upon the type of production activity. For instance, in Tyonek and Yukon delta communities, salmon is harvested and processed within cooperative work groups composed of an alliance of several households, usually along bilaterally traced kinship lines. These groups may establish temporary seasonal settlements, share in the use of common capital property (cutting tables, fishracks, smokehouses), and fish from traditionally held use areas. Labor is allocated along traditional lines, men harvesting, women and children processing and storing, older members

assuming roles of leadership and responsibility. The proceeds of the cooperative effort is divided among and consumed by the seasonally allied households. At different seasons for harvesting other species, work groups will be differently constituted. For instance, at Tyonek, one or several boat crews will be organized by a "clarming leader" for the harvesting of intertidal resources and sea mammals. Thus, over the course of a year, the organization of the community's economic production is comprised of a number of these networks of cooperative domestic groups, recruited for the purposes of taking particular types of resources, utilizing capital owned by group members, and exploiting traditional use areas.

Within a domestic mode of production, a community's economy is integrated by the kinship-based production networks formed to harvest wild resources. If there were disruptions in fishing and hunting by these production groups, there would occur disruptions in community integration and stability. The enactment of the complementary social roles involved in fishing and hunting by group members provides order within the extended family networks and the community.

The socioeconomic systems of Fairbanks, Sitka, Kenai, and Homer contrast with production organized at the domestic level. In these communities, economic production occurs primarily in non-kinship based groups. Capitalization of production primarily is owned by non-family firms, and not by family networks. The social organization of economic production utilizes a different social configuration from the organization of fishing and hunting activities. Hence, decreases in fishing and hunting for local use do not have the the same community-wide socioeconomic ramifications as they do under the domestic mode.

The social organization of fishing and hunting activities within these communities are yet to be described fully. In the case studies of Kenai Peninsula communities, some households reported that fishing and hunting activities were performed as "family activities". Compared with a domestic mode of production, the breadth of socially significant activities performed by these family groups are narrower. The case examples suggest that the family groups do not take the structure of complex, extended family units connecting multiple households, as occurs in the case of Nondalton, Yukon Delta, Dot Lake, and Tyonek. The fishing and hunting groups more frequently may be composed of simple nuclear households.

In the heterogeneous communities of Fairbanks and Kenai, fishing and hunting for local uses are engaged in by a subset of the population. Fishing and hunting behavior may be transmitted and learned within the context of smaller, more specialized groups, such as particular families (where a father passes on an individual family tradition), hunting clubs (secondary non-kin associations established to transmit a body of knowledge), and hunting partnerships (sometimes resembling an apprenticeship system). Knowledge about fishing and hunting is to a lesser degree the shared tradition of a whole community as it is the possession of a small body within the community. This contrasts with the domestic mode of production, where most community members are socialized into fishing, hunting, and processing roles, a relatively common body of knowledge, ideas, and sentiments passed on within the community, frequently from older to younger within the context of domestic production groups.

THE SEASONAL ROUND OF PRODUCTION ACTIVITY

Among mixed, subsistence-based socioeconomic systems the types and scheduling of production activities within the community are typically tied to the seasonal arrival and fluctuations of fish and game resources. It is possible to identify a single seasonal cycle of activities to characterize certain community cases, a relatively regular pattern of community activities. Seasonal rounds have been depicted for the communities of the Yukon River delta, Nondalton, Tyonek, Dot Lake, and Nome in the case studies. Variations occur from year to year in timing, species selection, and harvest success, but these are recognizable permutations in an overall pattern.

Some comparisons between cases reveal interesting similarities and differences in the nature of the seasonal round of activities. First, the number of species harvested varies among cases. Some case communities appear to harvest a comparatively restricted range of species. For instance, in Kenai Peninsula cases (Homer, Ninilchik, and Kenai), harvest effort within the community seemed targeted on a few main resources -- salmon, halibut, clams, and to a lesser degree, moose. Similarly, the majority of participants of the Tanana River salmon fishery described by Caulfield mix salmon fishing with a few other harvest pursuits -- moose hunting, trout fishing, and gardening.

This contrasts with the large variety of species utilized by households in other cases. For instance, according to Fall, Tyonek households regularly utilize five salmon species, moose, Dolly varden, rainbow trout, eulachon, razor clams, butter clams, seal, belukha, black bear, ducks, geese ptarmigan, spruce grouse, porcupine, berries, and wood. Although not all households have members procuring these resources, extensive distribution networks supply these products to most households. Ellanna found

that about 65 percent of households in Nome harvested six or more categories of resources, including salmon, berries, trout and grayling, moose, ptarmigan, crab, tomcod, waterfowl, char, greens and roots, hare, whitefish, capelin, burbot, herring, eggs, caribou, bear, walrus, seal, and beluka. Similarly, according to Wolfe, Yukon delta households regularly use a wide range of resources, investing in a diversified fishing and hunting pattern as a strategy against insecurities in the economic system.

The diversity of resource uses also differs between communities, although the cases do not systematically explore this factor. The Kenai Peninsula and Tanana River cases primarily show harvests for consumption by humans and dogs (21 percent of the Tanana River sample gave salmon to dogs). The products utilized are narrow in comparison with other cases, where wild resources are used for food, materials for shelter, handicraft, barter, transportation, and other uses. Dot Lake households use the head, entrails, hooves, and bones of moose for different purposes. Nondalton households dry salmon eggs, backs, fins, and heads in addition to the flesh.

The volume of output differs markedly among case communities, although again the information gathered does not yet allow complete, systematic comparisons. The highest outputs appear to be in Yukon Delta communities, producing an estimated 783 pounds per household member in 1980, and Nondalton, producing 738 pounds per household member in 1981. This compares with outputs at Kenai of 36 pounds per household member, at Ninilchik of 63 pounds, and at Homer of 77 pounds. Caulfield found that the majority of the Tanana River fishery participants from Fairbanks were content with relatively restricted salmon harvest limits. High outputs make greater contributions to a community's economy, as discussed previously.

The stability and regularity of the seasonal round of fishing and hunting activities varies between case communities. There are problems characterizing other communities with a single seasonal round. As shown in the Kenai, Homer, Sitka, and Ninilchik cases, tremendous variations appear between the activities of one household in comparison with others, and even in the activities of a single household from year to year. One household's activities are usually substantially different from another's. In fact, Georgette and Reed found that households in Kenai and Homer commonly did not know the economic activities of their neighbors, a situation not characteristic of smaller communities. This reflects the relative heterogeneity of these communities.

In Kenai Peninsula case communities, an interesting mixture of procurement methods were discovered for taking resources. Halibut and salmon at various times were purchased from commercial fishermen, gleaned from a friend's commercial net, taken by trolling or rod and reel river fishing, dealt for in exchange for services like the use of a smoker or access to land, dipped at Seldovia, and other creative techniques. Some households appeared unsure from one year to the next how salmon would be obtained. This is clearly a sign of an irregular seasonal round of activities. It contrasts with the regular seasonal round of activities in communities like those on the Yukon River delta where salmon is obtained the same way each year, with set and drift gill nets. Part of the irregularity of procurement methods on the Kenai Peninsula may be due to rapidly changing hunting and fishing regulations, affecting means, methods, open seasons, bag limits, and open areas. These changes are associated with expanding populations and user groups creating more competition for peninsula resources.

NETWORKS OF DISTRIBUTION AND EXCHANGE

A socioeconomic system provides for a mechanism for the transfer of goods and services among segments of the community. In industrial-based socioeconomic systems, the economic market provides this mechanism. One characteristic of subsistence-based socioeconomic systems is the presence of substantial non-commercial transfers of food and materials, especially fish and game resources. The Tyonek, Nondalton, Yukon Delta, and Nome cases illustrate these non-commercial distribution and exchange networks. Non-monetary sharing, distribution, and exchange of food products are frequent, occur between a wide range of people, and include a large number of products.

Wolfe (1981) described a number of social contexts within which food and material transfers occur -- several varieties of outright gifts with no obligation for return compensation; division of subsistence products between cooperating members of a hunting party or work group; barter transactions where one product is exchanged for another; limited market transactions where currency is involved; and exchanges and gifts during ceremonial occasions where the products symbolize systems of beliefs and sentiments. The complex flow of goods along kinship networks has been documented by Foster (1982a, 1982b) for salmon and moose at Tyonek.

Research is revealing that production within subsistence-based economic systems is not homogeneous across domestic units. In fact, there is accumulating evidence that a specialization of role tasks commonly occurs within communities. Only a portion of the households in a community may harvest a particular species. For instance, the Nondalton case showed that about half the households successfully harvested moose in 1973, 1980, and 1981. Some households are extremely productive, others are less so

due to a number of factors, such as lack of working members, age, health problems, skill, capital equipment, and so forth. In fact, one characteristic of a domestic mode of production is that normal cycles of productivity occur during the lifespan of domestic units, ranging from high to low periods of productivity. The distribution and exchange networks insure that food and material products produced by a portion of the community is disseminated to support less productive households. The network provides for less fortunate community members, such as the elderly and widows.

Second, the distribution and exchange networks allow for efficiency in production. One household may have the capital and equipment to harvest sea mammals, another the equipment for trapping blackfish. The proceeds from these different capital holdings can thereby be exchanged. Third, there is evidence that the distribution and exchange system may facilitate the integration of the market and subsistence sectors. Some segments of an extended family may participate in wage employment, others in subsistence production, and their activities may support one another. The cash produced by one may pay for the equipment used by another to produce food products.

Once again, the distribution and exchange networks demonstrate that subsistence-based socioeconomic systems operate at a community level. Subsistence activities are not primarily individual or even household concerns. Instead, subsistence activities serve to provide for the social and economic wellbeing of an entire network of extended families that comprise a community.

Distribution and exchange networks in other communities provide interesting contrasts with the cases discussed above. Of the Tanana River

salmon fishery participants interviewed by Caulfield, 83 percent used all or most of the salmon within their own household, and 90 percent used none for barter or non-commercial trade. In Fairbanks, most economic goods and services are provided by the commercial markets, and not non-commercial distribution and exchange networks. The behavior of the Tanana salmon fishermen is consistent with this socioeconomic organization.

In certain Kenai Peninsula communities, especially Homer, "swapping" of products seemed to be a common practice among households which utilized wild products. Outright purchase of salmon and halibut from commercial fishermen, transactions extraneous to regular market channels, was also comparatively frequent. These patterns suggest that distribution and exchange networks outside regular commercial markets may be more common on the Kenai Peninsula in comparison with Fairbanks. According to Schroeder and Nelson's research, there appear to be well developed distribution and exchange networks in Sitka. About 47 percent of sampled households in Sitka reported giving meat to an average of 4.5 other households, while 72 percent reported giving fish to 9.2 other households. This suggests that sharing and exchange of wild products in this community is substantial. In this respect it resembles communities with mixed economies.

TRADITIONAL SYSTEMS OF LAND USE AND OCCUPANCY

One aspect of resource uses not covered in the preceding cases are the traditional systems of land use and occupancy that organize fishing, hunting, and gathering activities. Recent mapping by the Division of Subsistence following methodologies developed in Canada has shown that complex systems of uncodified land use rights frequently exist in subsistence-based socioeconomic systems. Land and resources are frequently organized into

socially-defined geographic areas, and rights to access and use of the resources of these units are allocated among segments of the population.

Some common aspects of these land use systems are suggested from work by Pedersen (1979), Wolfe (1981), Behnke (personal communication), and Caulfield (in press). First, frequently there appear to be definable use areas for particular communities. Residents of communities typically harvest resources within the range of these "village use areas." Use areas of neighboring communities are largely exclusive, although boundaries commonly overlap. Second, within a community's use area, use rights to certain areas commonly are allocated to particular extended kinship groups. For instance, eddy sites for set nets, trap lines, fish camps, and fish trap sites may be recognized as the traditional area of a particular kinship group. Members outside that kinship group can use the areas only after being granted permission from the recognized users. Third, the size and shape of use areas vary considerably across species. The rules of access to these species may vary accordingly. Fourth, enforcement of the land use system occurs at the local community level, usually outside of the formal, bureaucratic legal framework.

In certain areas of the State, traditional systems of land use and occupancy have changed in association with the appearance of an industrial-based socioeconomic system in the area. Land becomes converted under land classifications recognized by the political and jural system of the urban-industrial centers. Land may be parcelled and disposed as fee simple title to private owners. Undisposed land may receive a variety of public land designations, each with a set of rules for access enforcable at the State and Federal levels. Fishing and hunting becomes altered considerably by these systems of land classifications.

THE REGIONAL CENTER AS A SOCIOECONOMIC SYSTEM

The Nome case study by Ellanna documents the patterns of resource use in one of Alaska's "regional centers". A regional center is a community which provides service and trade functions for adjacent remote areas of Alaska. Regional centers are the commercial, transportation, and governmental "hubs" for a network of smaller communities. The regional centers in Alaska, including Nome (population 3,249), Bethel (3,549), Dillingham (1,670), Barrow (2,539), and Kotzebue (2,250), have moderate population levels. Fishing and hunting play important roles in their social life and economy, in contrast with the roles played by fishing and hunting in other communities of comparable size, like Kenai. The socioeconomic systems of regional centers have relatively unique characteristics which reflect the functional relationships between the center and its satellite communities.

Ellanna concluded that Nome has a mixed, subsistence-based economy in which relatively heavy and diverse use of wild resources was integrated with a limited wage sector. From a randomized survey, Ellanna found that 43.3 percent of Nome's households used ten or more categories of resources annually; only 5.0 percent used no local resources. Of all interviewed households, over 80 percent harvested salmon and berries; almost 70 percent harvest grayling and trout, over 60 percent harvested moose and ptarmigan; and about 50 percent harvested crab, waterfowl, char, and tomcod.

These percentages are impressive, especially considering the heterogeneity of the Nome population. Nome's population, as that of other regional centers, is drawn from a diverse number of other places -- 20.2 percent of the population reported Nome as their place of origin. A third (32.7 percent) of Nome's population has immigrated from villages in northwestern Alaska, the villages served by Nome's service functions. A

complex in- and out-migration pattern commonly exists between regional centers and satellite communities, as people move to town to engage in wage employment, receive medical care, attend school, or visit relatives who reside more permanently at the regional center. Consequently, the village and center create a functional pair between which flow a labor force, money, information, services, goods, and other resources. Historically, when a winter village expanded in population, families would bud off or communities would fracture along schismatic lines, these segments establishing new settlements. Currently, families and individuals from rural communities are more likely to move to the regional center or other established villages than establish new winter settlements.

Additionally, 29.8 percent of Nome's population has migrated from outside of Alaska, and 17.2 percent from elsewhere in Alaska. These in-migrants predominately comprise Nome's 41.5 percent non-native population component. The recent in-migrants are likely to have come to Nome to fill professional positions requiring educational and work experiences not frequently occurring among Nome's long term population. These individuals turn over in their jobs approximately every two years. The average length of residency of Nome's Native Alaskan households is 26.5 years, compared with 9.6 years for non-native households.

Thus, one characteristic of a regional center's population is heterogeneity in terms of cultural background, educational levels, and work experiences. The heterogeneous population commonly organizes itself into identifiable enclaves or subpopulations. Subpopulations frequently are defined by village of origin, ethnicity, occupation (especially when employees are housed together, as frequently happens with BIA, hospital, and military personnel), and social class criteria (income and education).

A regional center is a collectivity of identifiable subcommunities, each displaying somewhat characteristic patterns of activities. Ellanna's breakout of resource use data by place of previous residency suggests these differences between subpopulations.

Understanding the role of fishing and hunting in the economy and social life of regional centers must take into consideration the social organization of the community, as well as the interrelationships of the regional center with the villages of its service area. For instance, the King Islanders represent one subcommunity in Nome. Members of this subcommunity harvest walrus and bearded seal from skin and aluminum boats, consistent with the seasonal round of activities of their King Island home. Non-native residents cannot legally harvest sea mammals, but moose, salmon, berries, and waterfowl are commonly taken by this group, especially using the highway system around Nome. Thus, different subgroups in a regional center may harvest a different mix of resources. However, across this diversity of subgroup patterns, there is a high use of resources.

The high level of resource use in part can be attributed to the cultural backgrounds of many of Nome's population. The socioeconomic systems from the population's communities of origin have been partially transplanted to Nome -- the seasonal round of activities, complex networks of distribution and exchange, a domestic mode of production, and traditional concepts of land use and occupancy. Wage opportunities have been integrated within these patterns. For many Nome residents, wage employment positions are short term, relatively low paying, seasonal, and part time. The cash proceeds from work cannot be relied upon to support the household. So the income is used as investment capital into fishing and hunting for domestic use and distribution. Thus, Ellanna calls this a mixed, subsistence-based

economy resembling in many respects those of small villages.

Ellanna also found that long term residents holding relatively well-paying professional positions also participate in the pattern of subsistence activities. Commonly, persons become socialized into the subsistence-based socioeconomic system the longer their terms of residency. The seasonal round is learned. Methods and means of harvest are acquired and practiced. The locations of use areas are discovered, as well as local conventions for access. Ellanna found no single, direct relationship between monetary income and resource participation in the regional economy. Participants in the subsistence sector of the mixed economy occurred at all income ranges.

The socioeconomic systems of regional centers probably are a special type. Unlike in some communities with similar population sizes, there exist in regional centers economic and social dependencies on fishing and hunting for local uses within the community. The high levels of resource use indicated by the case study suggests that the regional center has a mixed economy, where a cash sector and subsistence sector are both important to the community. Cash and subsistence are integrated by domestic production units. And the proceeds are distributed and exchanged along non-market networks integrating households and communities within the regional center's service area.

CONCLUSIONS

This report has provided descriptions and analyses of the role of fishing and hunting in the economy and social life of sixteen communities in seven geographic areas. The cases were selected to examine patterns of resource use that occur in places with a range of characteristics,

representing some of the cultural, historical, and ecological diversity in the State. The information was organized in a manner to encourage the comparative exploration and analysis of tentative generalizations about fishing and hunting in Alaska.

The case studies of the sixteen communities demonstrate that many communities in Alaska are economically and socially dependent on the harvest of wild and renewable resources for local uses. Fishing and hunting activities and resource uses in certain communities are components of complex social and economic systems with particular characteristics.

A "subsistence-based socioeconomic system" was identified as one type of socioeconomic system in the State. A subsistence-based socioeconomic system is "food extractive" in nature, contrasting with economies displaying other economic bases, such as manufacturing, trade, government, finance, and defense. A subsistence-based system has several characteristics:

- (1) a "mixed economy" with mutually supportive "market" and "subsistence" sectors;
- (2) a "domestic mode of production" where production capital, land, and labor are controlled by extended, kinship-based production units;
- (3) a stable and complex "seasonal round of production activities" within the community tied to the seasonal arrival and fluctuations of fish and game resources;
- (4) substantial non-commercial networks of sharing, distribution, and exchange of food and materials;
- (5) traditional systems of land use and occupancy; and
- (6) complex systems of beliefs, knowledge, and values associated with resource uses passed on between generations as the cultural and oral traditions and customs of a social group.

The cases provided several examples of these mixed, subsistence-based socioeconomic systems, including Nondalton, Yukon River delta communities, Dot Lake, and Tyonek.

The "regional center" was identified as a second type of socioeconomic system heavily dependent upon fishing and hunting for local uses. The regional center was a community providing service, trade, and transportation functions for remote areas of Alaska. The case study of Nome showed that regional centers also may display the characteristics of a mixed, subsistence-based economy described above. Heavy and diverse use of fish and game were integrated with a limited wage sector. Regional centers tend to have larger, more heterogeneous populations and complex in- and out-migration patterns. The high use of resources in part reflects the continuance of socioeconomic patterns of regional villages at the regional centers. Wage employment positions for many residents are short term, relatively low paying, seasonal, and part time, so incomes are used for fishing and hunting to support the family units.

The cases explored the role of fishing and hunting in other socioeconomic systems which are different from the mixed economy type. The case studies of Kenai, Homer, Ninilchik, and Sitka showed interesting similarities and contrasts in resource uses within areas having more diversified economic bases. In Kenai City, an area of rapid economic development due to petroleum-related industries, fishing and hunting are peripheral to the central base of the community's economy -- wage employment. Ninilchik and Homer showed higher uses of fish and game than Kenai City, perhaps reflecting differences in economic base and perceived "country-like" lifestyle patterns. However, in comparison with Yukon delta communities and Nondalton, food output was on a different order of magnitude, being one-tenth

the volume. Sitka, a relatively large southeastern community, showed comparatively high uses of fish and game, raising interesting questions as to the factors associated with patterns of resource use.

The fishing and hunting patterns of Fairbank's area residents participating in the Tanana River salmon fishery were found to be part of a non-food extractive socioeconomic system of a large city. The majority of users showed a short history of use, high-turnover rates, short fishing times, low harvest levels, and were engaged in fishing for "recreational" values. Resource harvest for local use was not a central sector of the community's economy.

Alaska is characterized by a diversity of socioeconomic systems and patterns of resource use. Our understanding of these contemporary systems is just beginning. Research like these case studies contributes information on the role of fishing and hunting in the diverse socioeconomic systems of the State. It seems clear that the economic and social stability of many communities depend upon access to and utilization of renewable fish and wildlife resources. Disruptions of the relationships between the community and the resource base may affect the viability of these ways of life. Keeping open options in relation to resource use may allow for the continuance of the socioeconomic systems in Alaska which are based upon the use of fish and wildlife.

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APPENDIX

APPENDIX TABLE 1

ALASKA COMMUNITIES -- TOTAL POPULATION BY DECREASING ORDER OF SIZE
1980 AND 1981

<u>COMMUNITY</u>	<u>POPULATION</u>	<u>BOROUGH OR CENSUS AREA</u>
Anchorage Municipality	180,740	anch
Fairbanks city	25,568	fbks
Juneau city and Borough	21,080	juno
Sitka city and Borough	7,927	sit
Ketchikan city	7,200	ketch
*Eielson AFB	5,232	fbks
Kodiak city	4,678	kod
Kenai city	4,558	ken p
*College	4,034	fbks
Bethel city	3,549	beth
*Adak Station	3,315	aleut
Valdez city	3,279	v-c
Nome city	3,039	nome
Petersburg	3,001	wran
Homer city	2,588	ken p
Barrow city	2,539	n.s.
Soldotna city	2,445	ken p
Wrangell city	2,345	wran
Palmer city	2,275	mat-su
Kotzebue city	2,250	kob
Cordova city	2,223	ken p
Unalaska city	1,944	aleut
Seward city	1,943	ken p
Wasilla city	1,928	mat-su
*North Tongass Highway	1,722	ketch
Dillingham city	1,670	dill
*Fort Greely	1,635	se fbks
*Kodiak Station	1,370	kod
*Nikishka	1,109	ken p
*Metlakatla	1,056	p.w.

Appendix Table 1 continued.

<u>COMMUNITY</u>	<u>POPULATION</u>	<u>BOROUGH OR CENSUS AREA</u>
Haines city	1,017	haines
*Bodenburg Rutte	988	mat-su
Delta Junction city	945	se fbks
North Pole city	928	fbks
*Sterling	919	ken p
Skaqway city	819	skag
Galena city	805	yuk
Hoonah city	799	skag
Sand Point city	697	aleut
Akolmiut city	695	beth
Unalakleet city	672	nome
Hooper Bay city	624	wade
*Shemya Station	600	aleut
Fort Yukon city	599	yuk
Menana city	592	yuk
St. Paul city	591	aleut
*Tok	589	se fbks
Kake city	583	wran
Mountain Village city	580	wade
Emmonak city	568	wade
Craig city	560	p.w.
*King Salmon	545	h.b.
Alakanuk city	534	wade
Savoonga city	530	nome
*Glennallen	511	v-c
Togiak city	511	dill
*Moose Creek	510	fbks
Noorvik city	508	koh
Seldovia city	505	ken p
Anderson city	500	yuk
Point Hope city	531	n.s.
King Cove city	513	aleut
Chevak city	491	wade

Appendix Table 1 continued.

<u>COMMUNITY</u>	<u>POPULATION</u>	<u>BOROUGH OR CENSUS AREA</u>
Saxman city	491	nome
Gambell city	480	nome
Kwethluk city	451	beth
*Clover Pass	451	ketch
Anqoon city	445	skaq
Akiachak city	435	beth
Yakutat	430	skag
*Big Lake	410	mat-su
Quinhagak city	409	beth
Wainwright city	405	n.s.
Kachemak city	403	ken p
*Mountain Point	396	ketch
Shishmaref city	394	nome
Klawock city	389	p.w.
Tanana city	388	yuk
*Ketchikan East	387	ketch
St. Mary's city	382	wade
*Kipnuk	371	beth
Houston city	370	mat-su
Selawik city	372	kob
*Big Horn	360	fbks
*Two Rivers	359	fhks
Stebbins city	357	nome
Hydaburg city	356	p.w.
McGrath city	355	yuk
*Kwiqillingok	354	beth
Nulato city	350	yuk
Kiana city	345	kob
Aniak city	341	beth
*Ninilchik	341	ken p
Old Harbor city	340	kod
*Salmatof	334	ken p
*Healy	334	yuk

Appendix Table 1 continued

<u>COMMUNITY</u>	<u>POPULATION</u>	<u>BOROUGH OR CENSUS AREA</u>
Toksook Bay city	333	beth
New Stuyahok city	331	dill
Pilot Station city	325	wade
*Thorne Bay	320	p.w.
*Salcha	319	fbks
*Naknek	318	h.b.
*Fritz Creek	302	ken p
Tununak city	301	beth
Kotlik city	293	wade
Manokotak city	290	dill
*Big Delta	285	se fbks
Napakiak city	283	beth
*Noatak	273	kob
Saxman city	273	ketch
*Talkeetna	264	mat-su
Fortuna Ledge city	262	wade
Scammon Bay city	249	wade
Lower Kalskaq city	246	beth
Napaskiak city	242	beth
Kivalina city	241	kob
Kaltag city	239	y-k
*Konqiganak	239	beth
St. Michael city	239	nome
*Tyonek	239	ken p
Anatuvuk Pass city	235	n.s.
Tuluksak city	234	beth
Holy Cross city	233	y-k
Chefornak city	230	beth
Huslia city	230	y-k
Teller city	229	nome
*Cold Bay	228	aleut
Elin city	228	nome
Eek city	226	beth

Appendix Table 1 continued

<u>COMMUNITY</u>	<u>POPULATION</u>	<u>BOROUGH OR CENSUS AREA</u>
*Anchor Point	226	ken p
Atnautluak city	226	beth
Port Lions city	218	kod
*Tuntutuliak	216	beth
*Copper Center	213	v-c
Whittier city	211	v-c
Buckland city	211	koh
Nuiqsut city	208	n.s.
Shungnak city	208	kob
Koyuk city	203	nome
Grayling city	202	yuk
*Kasilof	201	ken p
Kaktovik city	201	n.s.
Ambler city	198	koh
Akiak city	197	beth
*Coffman Cove	193	p.w.
Ruby city	190	y-k
Akutan city	189	aleut
Eagle city	186	se fbks
*Sutton	182	mat-su
*Chiqnik	178	dill
Shaktoolik city	177	nome
Mekoryuk city	176	beth
Pelican city	172	skag
Nondalton city	171	dill
Ouzinkie city	170	kod
Russian Mission city	168	wade
Goodnew Bay city	167	beth
Larsen Bay city	167	kod
*Port Graham	161	ken p
Allakaket city	158	y-k
*St. George	158	aleut
Deering city	155	koh

Appendix Table 1 continued

<u>COMMUNITY</u>	<u>POPULATION</u>	<u>BOROUGH OR CENSUS AREA</u>
*Minto	153	y-k
Aleknagik city	152	dill
*Ester	149	fbks
Diomedé city	149	nome
Brevig Mission city	149	nome
*South Naknek	145	b.b
Wales city	143	nome
*Annette	139	p.w.
*Willow	139	mat-su
*Chiqnik Lake	138	dill
*Klukwan	135	skag
Nightmute city	135	
*Tonsina	135	v-c
White Mountain city	135	nome
Newhalen city	135	dill
Tenakee Spring city	132	skaq
*Venetie	132	y-k
Newtok city	131	beth
Upper Kalskag city	128	beth
Shageluk city	127	y-k
*English Bay	124	ken p
*Fox	123	fbks
*Koliganek	117	dill
*Tanacross	117	se fbks
*Cooper Landing	116	ken p
*Northway Village	112	se fbks
*Arctic Village	111	y-k
Anvik city	110	y-k
Perryville	111	dill
*Crooked Creek	108	beth
*Atkasook	107	n.s.
*Sleetmute	107	beth
*Tetlin	107	se fbks

Appendix Table 1 continued

<u>COMMUNITY</u>	<u>POPULATION</u>	<u>BOROUGH OR CENSUS AREA</u>
Chuathbaluk city	104	beth
*Gulkana	104	v-c
*Hope	103	ken p
Akhiok city	103	kod
Sheldon Point city	103	wade
*Chalkyitsik	100	y-k
*Herring Cove	99	ketch
*Gustavus	98	aleut
*Karluk	96	kod
*Stevens Village	96	y-k
Koyukuk city	95	y-k
*Evansville	94	y-k
*Iliamna	94	dill
Golovin city	94	nome
*Kalifornsky	92	ken p
Port Heiden city	91	dill
*North Wale Pass	90	p.w.
*Pennock Island	90	ketch
*Point Baker	90	p.w.
Port Alexander city	90	wran
*Cantwell	89	y-k
Nikolai	88	
*Pitkas Point	88	wade
*Gakona	87	v-c
*Kokhanok	83	dill
Circle	81	y-k
*Levelock	79	dill
Clark's Point city	78	dill
*Hyder	77	p.w.
Ekwok city	76	dill
*Moose Pass	76	ken pen
*Eneqik	75	dill
*Northway	73	se fbks
*Murphy Dome	72	fhks n.s.

Appendix Table 1 continued

<u>COMMUNITY</u>	<u>POPULATION</u>	<u>ROROUGH OR CENSUS AREA</u>
Hughes city	71	y-k
*False Pass	70	aleut
*Twin Hills	70	dill
*Point Lay	68	n. slope
*Tatitlek	68	v-c
*Dot Lake	67	se fbks
*Beaver	66	y-k
*Pilot Point	66	dill
Kobuk city	64	kob
*Deadhorse	64	n. slope
Kasaan city	64	
*Campion Station	62	y-k
*Stony River	62	beth
*Manley Hot Springs	61	y-k
*Nelson Lagoon	59	aleut
*Mentasta Lake	59	v-c
*Oscarville	56	beth
*Suntrana	56	y-k
*Chistochina	55	v-c
Platinum city	55	beth
*Eagle Village	54	se fbks
*Usibelli Mine	53	y-k
*Nikolski	50	aleut
*Prudhoe Bay	50	n. slope
*Rampart	50	y-k
*Clam Gulch	50	ken pen
*Dunbar	50	y-k
*Meyers Chuck	50	p. of wales
Kupreanof city	49	wran
*Slona	49	v-c
*Line Village	48	beth
*Takotna	48	y-k
*Portage Creek	48	dill
*Chiqnik Lagoon	48	dill

Appendix Table 1 continued

<u>COMMUNITY</u>	<u>POPULATION</u>	<u>BOROUGH OR CENSUS AREA</u>
*Eyak	47	eyak
*Halibut cove	47	ken pen
*Tatlina Station	46	y-k
*Cape Newenham	43	beth
*Chitina	42	v-c
*Ivanof Bay	40	dill
*Lower Tonsina	40	v-c
*Montana	40	mat-su
Red Devil	39	beth
*Harding Lake	38	fbks n.s.
*Chicken	37	se fbks
*Jakalof Bay	36	ken pen
*Central	36	y-k
*Cape Lisburne	36	n. slope
*Healy Lake	33	se fbks
*Iqiugiq	33	dill
*Telida	33	y-k
*Perkinsville	33	nome
*Pedro Bay	33	dill
*McKinley Park	32	y-k
*Birck Creek	32	y-k
*Tazlina	31	v-c
*Portlock	31	ken pen
*Paxson	30	v-c
*Port Clarence	29	nome
*Attu	29	aleut
*Cape Pole	29	P. wales
*Elfin Cove	28	skaq
*Indian Mountain	27	y-k
*Sparrevohn Station	26	beth

APPENDIX TABLE 2

DEMOGRAPHIC INFORMATION FOR CASE COMMUNITIES

	<u>ALAKANUK</u>	<u>DOT LAKE</u>	<u>EMMONAK</u>
<u>POPULATION</u>			
TOTAL	522	50	567
MALE	264	26	296
FEMALE	258	24	271
	(50.6%)	(52.0%)	(52.2%)
	(49.4%)	(48.0%)	(47.8%)
<u>ETHNICITY</u>			
CAUCASIAN	30	20	43
NATIVE	491	28	517
ALEUT	-0-	-0-	-0-
ESKIMO	491	7	516
INDIAN	-0-	21	1
OTHER	1	2	1
	(.2%)	(3.0%)	(.2%)
<u>HOUSEHOLD</u>			
TOTAL NUMBER	105	15	127
MEAN SIZE	4.97	3.3	4.47
<u>NUMBER OF PEOPLE</u>			
WHO RENT	17	5	17
WHO OWN	88	10	110
	(16.2%)	(33.3%)	(13.4%)
	(83.8%)	(66.7%)	(86.6%)
<u>MEDIAN FAMILY INCOME</u>	\$10,938	\$21,500	\$6,838

	<u>FAIRBANKS</u>	<u>HOMER</u>	<u>KENAI</u>
<u>POPULATION</u>			
TOTAL	22,645	2,209	4,324
MALE	12,112 (53.5%)	1,174 (53%)	2,215 (51%)
FEMALE	10,533 (46.5%)	1,035 (47%)	2,109 (49%)
<u>ETHNICITY</u>			
CAUCASIAN	18,085 (79.9%)	2,076 (93.9%)	3,935 (91%)
NATIVE	1,596 (7.0%)	66 (2.9%)	265 (6.2%)
ALUET	35	10	186
ESKIMO	523	28	51
INDIAN	1,023	28	28
OTHER	2,964 (13.1%)	67 (2.9%)	124 (2.8%)
<u>HOUSEHOLDS</u>			
TOTAL NUMBER	59	812	1,506
MEAN SIZE	2.78	2.72	2.87
<u>NUMBER OF PEOPLE</u>			
WHO RENT	5,291 (65.0%)	288 (35%)	614 (41%)
WHO OWN	2,854 (35.0%)	524 (65%)	892 (59%)
<u>MEDIAN FAMILY INCOME</u>			
	\$24,315	\$25,911	\$33,650

Appendix Table 2 continued

	<u>KOTLIK</u>	<u>MOUNTAIN VILLAGE</u>	<u>NINILCHIK</u>
<u>POPULATION</u>			
TOTAL	293	583	341
MALE	151	303	174
FEMALE	142	280	167
	(51.5%)	(52%)	(51%)
	(48.5%)	(48%)	(49%)
<u>ETHNICITY</u>			
CAUCASIAN	13	43	260
NATIVE	280	539	58
ALUET	-0-	-0-	58
ESKIMO	280	538	-0-
INDIAN	-0-	1	-0-
OTHER	-0-	1	23
	(4.4%)	(7.4%)	(76%)
	(95.6%)	(92.5%)	(17%)
		(0.2%)	(7%)
<u>HOUSEHOLDS</u>			
TOTAL NUMBER	59	107	117
MEAN SIZE	4.97	5.45	2.92
<u>NUMBER OF PEOPLE</u>			
WHO RENT	7	28	17
WHO OWN	52	79	100
	(11.9%)	(26.2%)	(15%)
	(88.1%)	(73.8%)	(85%)
<u>MEDIAN FAMILY INCOME</u>			
	\$19,750	\$20,278	\$23,068

Appendix Table 2 continued

	<u>NOME</u>		<u>SELDOVIA</u>		<u>SHELDON POINT</u>	
<u>POPULATION</u>						
TOTAL	3,249		479		103	
MALE	1,722	(53.0%)	249	(52%)	60	(58.3%)
FEMALE	1,527	(47.0%)	230	(48%)	43	(41.7%)
<u>ETHNICITY</u>						
CAUCASIAN	1,270	(39.1%)	334	(69.8%)	4	(3.9%)
NATIVE	1,901	(58.5%)	117	(24.4%)	98	(95.1%)
ALEUT			76		-0-	
ESKIMO	1,855		11		98	
INDIAN	46		30		-0-	
OTHER	78	(2.4%)	28	(5.8%)	1	(1.0%)
<u>HOUSEHOLDS</u>						
TOTAL NUMBER	963		175		20	
MEAN SIZE	3.3		2.74		5.15	
<u>NUMBER OF PEOPLE</u>						
WHO RENT	562	(58.4%)	81	(46.3%)	5	(25%)
WHO OWN	401	(41.6%)	94	(53.7%)	15	(75%)
<u>MEDIAN FAMILY INCOME</u>						
	\$27,467		\$18,500		\$8,500	

Appendix Table 2 continued

	<u>SITKA</u>	<u>SOLDOTNA</u>	<u>STEBBINS</u>
<u>POPULATION</u>			
TOTAL	7,803	2,320	331
MALE	4,115	1,197	166
FEMALE	3,688	1,123	165
	(52.7%)	(51.6%)	(50.2%)
	(47.3%)	(48.4%)	(49.8%)
<u>ETHNICITY</u>			
CAUCASIAN	5,768	2,216	11
NATIVE	1,669	72	316
ALEUT	68	21	-0-
ESKIMO	95	26	316
INDIAN	1,506	25	-0-
OTHER	366	32	1
	(73.9%)	(95.5%)	(3.3%)
	(21.4%)	(3.1%)	(95.5%)
	(4.7%)	(1.4%)	(.3%)
<u>HOUSEHOLDS</u>			
TOTAL NUMBER	2,440	808	69
MEAN SIZE	3.2	2.87	4.80
<u>NUMBER OF PEOPLE</u>			
WHO RENT	1,149	255	8
WHO OWN	1,291	553	61
	(47.1%)	(31.6%)	(11.6%)
	(52.9%)	(68.4%)	(88.4%)
<u>MEDIAN FAMILY INCOME</u>			
	\$32,732	\$26,613	\$13,750

Appendix Table 2 continued

	<u>TYONEK</u>	<u>STATEWIDE</u>
<u>POPULATION</u>		
TOTAL	239	401,851
MALE	130	212,321 (53.0%)
FEMALE	109	188,160 (47.0%)
<u>ETHNICITY</u>		
CAUCASIAN	16	309,728 (77.1%)
NATIVE	222	64,103 (15.9%)
ALEUT	6	8,090
ESKIMO	2	34,144
INDIAN	214	21,869
OTHER	1	28,020 (7.0%)
<u>HOUSEHOLD</u>		
TOTAL NUMBER	75	131,463
MEAN SIZE	3.19	3.06
<u>NUMBER OF PEOPLE</u>		
WHO RENT	17	54,800 (41.7%)
WHO OWN	58	76,663 (58.3%)
<u>MEDIAN FAMILY INCOME</u>		
	\$16,136	\$28,400

Appendix Table 2 continued

	<u>ANCHORAGE</u>	<u>JUNEAU</u>	<u>KETCHIKAN</u>
<u>POPULATION</u>			
TOTAL	174,431	19,528	7,198
MALE	90,467 (51.9%)	10,022 (51.3%)	3,669 (51%)
FEMALE	83,964 (48.1%)	9,506 (48.7%)	3,529 (49%)
<u>ETHNICITY</u>			
CAUCASIAN	148,650 (85.2%)	16,459 (84.3%)	5,816 (80.8%)
NATIVE	8,953 (5.2%)	2,190 (11.2%)	1,050 (14.6%)
ALEUT	1,532	65	48
ESKIMO	3,856	115	28
INDIAN	3,565	2,010	974
OTHER	16,828 (9.6%)	879 (4.5%)	332 (4.6%)
<u>HOUSEHOLDS</u>			
TOTAL NUMBER	60,470	7,035	2,644
MEAN SIZE	2.89	2.78	2.72
<u>NUMBER OF PEOPLE</u>			
WHO RENT	26,275 (43.5%)	2,591 (36.8%)	1,356 (51.3%)
WHO OWN	34,195 (56.5%)	4,444 (63.2%)	1,288 (48.7%)
<u>MEDIAN FAMILY INCOME</u>			
	\$30,730	\$35,854	\$29,678

APPENDIX TABLE 3.

PLACE OF RESIDENCY, 1975, PERSONS IN CASE COMMUNITIES IN 1980

	TOTAL SAMPLE	SAME HOUSE	SAME CENSUS DISTRICT	ELSEWHERE IN ALASKA	OUTSIDE
ALAKANUK	523	87.6	9.7	-0-	2.7
DOT LAKE	47	31.9	-0-	48.9	19.2
EMMONAK	465	83.4	7.7	-0-	8.9
FAIRBANKS	20288	27.4	27.4	6.4	38.8
HOMER	2010	38.9	15.7	22.2	23.2
KENAI	3939	28.8	25.1	20.3	25.8
KOTIK	280	71.4	27.2	-0-	1.4
MOUNTAIN VILLAGE	544	82.9	12.9	4.4	-0-
NINILCHIK	292	65.7	8.9	18.1	7.3
NOME	2095	48.0	22.0	10.3	19.7
NONDALTON	164	83.6	7.3	6.1	3.0
SELDOVIA	446	31.4	40.3	10.1	18.2
SITKA	6995	30.5	31.2	12.4	25.9
SHELDON POINT	87	-0-	94.2	5.8	-0-
SOLDOTNA	2102	27.2	29.2	13.4	30.2
STEBBINS	298	64.1	23.1	7.7	5.1
TYONEK	178	20.8	59.0	10.7	9.5
ANCHORAGE	147,997	29.6	32.1	6.5	31.8
JUNEAU	17,805	31.6	30.3	10.8	27.3
KETCHIKAN	6,580	36.4	32.0	6.4	25.2
STATEWIDE	362,846	32.2	27.6	8.7	31.5

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

POPULATION PYRAMIDS

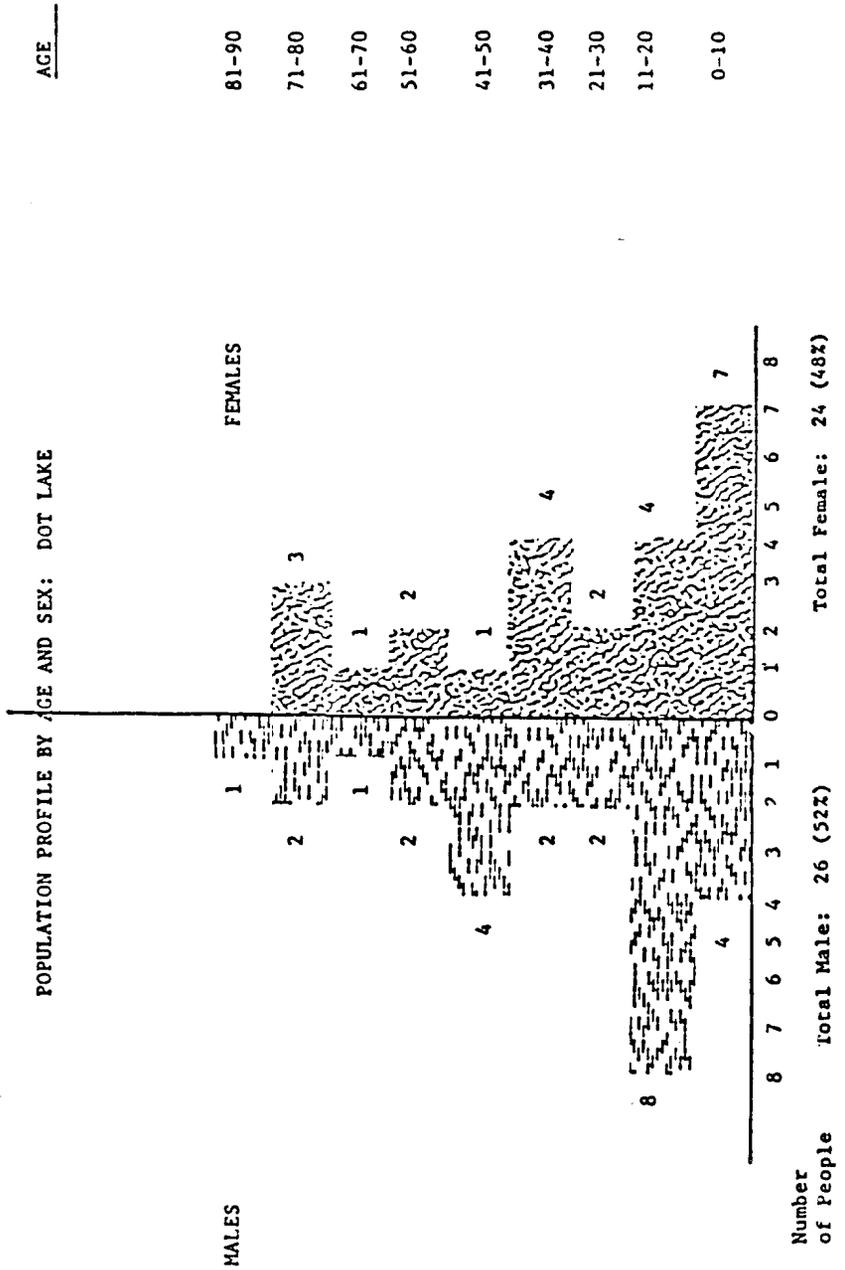


Figure 3. Population Profile by Age and Sex: Dot Lake¹

¹Martini; 1982

AGE

POPULATION PROFILE BY AGE AND SEX
 Home (1975)*

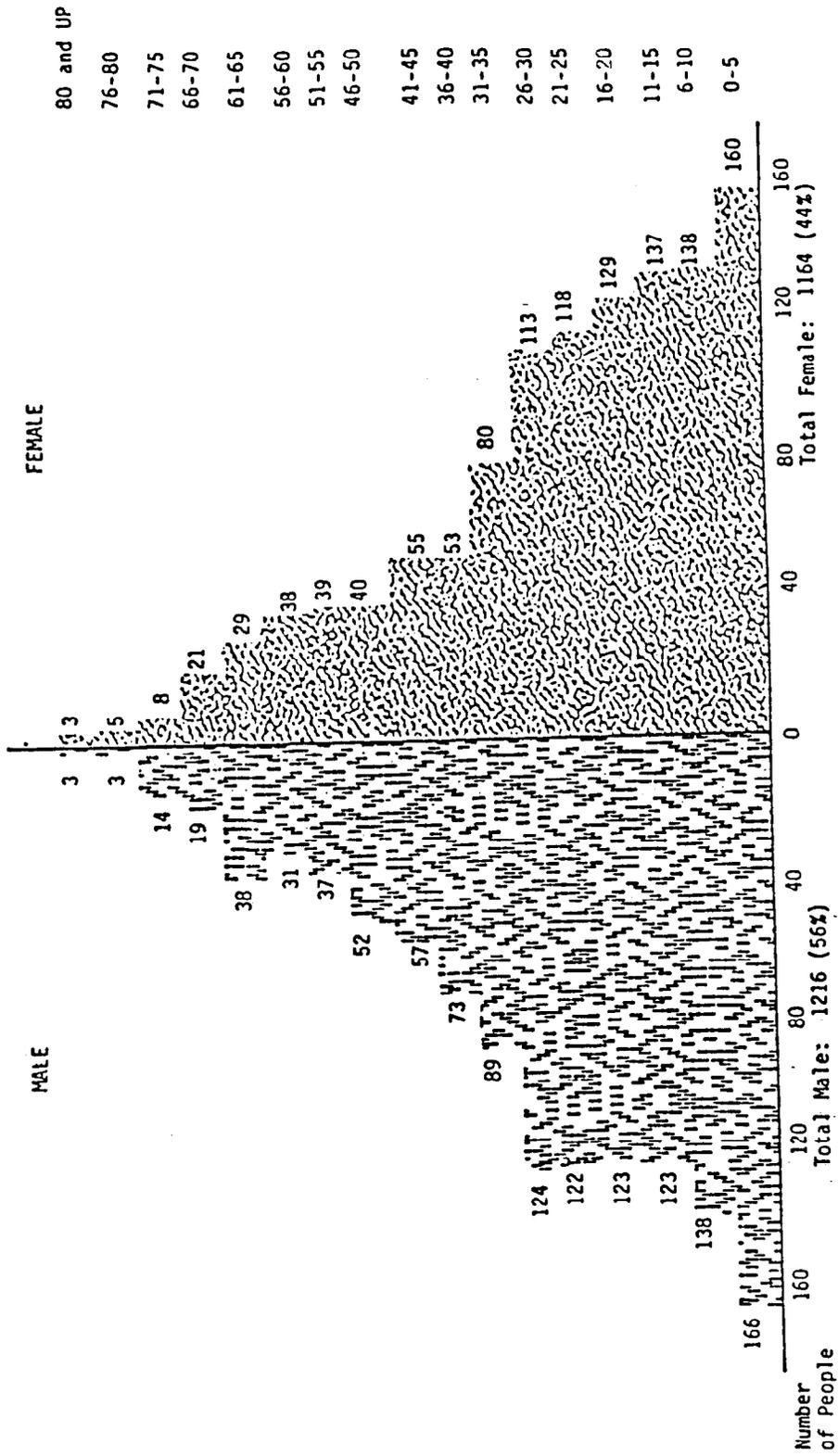


Figure 12: Population Profile by Age and Sex: Nome¹

U. S. Bureau of the Census: (1980)

*Source: Ellanna & Roche (1976)

