THE ROLE OF FISH AND WILDLIFE IN THE ECONOMIES OF BARROW, BETHEL, DILLINGHAM, KOTZEBUE, AND NOME

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INTRODUCTION

This paper presents information for the Alaska Joint Boards of Fisheries and Game to use in determining which places in the state are "rural" for the purposes of the state subsistence law. The subsistence law specifies that subsistence uses occur only in geographic areas or communities that are rural. "Rural" is defined as those areas or communities of the state in which the noncommercial use of wild fish and game is a "principal characteristic" of the economy of the area or community (AS 16.05.940(32)). Subsistence uses do not occur in non-rural areas or communities.

The Department of Law has noted that the legislative history of the federal subsistence statute (Alaska National Interest Lands Conservation Act of 1981) gave five examples of communities that Congress considered to be rural in 1979: Barrow, Bethel, Dillingham, Kotzebue, and Nome (Brown and Spengler 1986). The characteristics of these five named rural communities in 1980 appear to provide the most solid guidance to what the federal legislature intended by the term "rural area or community."

The purpose of this paper is to provide information on the role of wild resources in the economies of the five named places (Barrow, Bethel, Dillingham, Kotzebue, and Nome). To the extent possible, socioeconomic and resource use information is provided for each community dating close to the year 1979 to allow for a description of the communities at that time. In addition, information for more recent years is provided when possible to allow an assessment of whether the role of fish and wildlife use in each community's economy may have changed significantly between 1979 and 1986. As will be apparent by the information that

follows, strictly comparable information between 1979 and 1986 is available for only a few socioeconomic indicators, so interpretations about change must be based on a less than complete set of information. In this report, all quantified information is referenced to the year it pertains to; otherwise, undated statements pertain to the general recent period circa 1979-1986.

THE FIVE NAMED RURAL PLACES IN ANILCA, 1980

General Characteristics

The five communities named in ANILCA as examples of rural places in 1979 were Barrow, Bethel, Dillingham, Kotzebue, and Nome. There are four general characteristics that typified these five named rural places in 1979:

1. moderate population sizes;
2. regional center functions;
3. mixed economies of cash and wild resource uses;
4. diverse populations.

As will be discussed below, each of these continues to typify the five named places in 1986.

Moderate Population Size

By Alaskan standards, the five named rural places in ANILCA (Barrow, Bethel, Dillingham, Kotzebue, and Nome) are examples of "moderately sized" communities. In 1980 (the most accurate population estimate nearest to 1979), their populations ranged between 1,563 and 3,576 people, and they ranked among the 25 largest

communities statewide (Table 1). Similarly, in 1984 their populations ranged between 2,004 and 3,681 people, and among the state's municipalities, Bethel ranked 9th, Nome 13th, Barrow 16th, Kotzebue 19th, and Dillingham 20th. In 1984 there were only 23 municipalities with populations between 1,000-10,000 people in the entire state, containing 15.2 percent of the state's population (Table 1, Fig. 1). As shown in Fig. 1, another 21.3 percent of the state's population resided in communities with less than 1,000 people or in unincorporated area, while 63.4 percent of the state's population lived in three large cities: Anchorage (population 243,829), Fairbanks (population 27,103), and Juneau (population 23,729).

Regional Center Functions

In addition to being mid-sized communities, in 1979 the five named places were "regional centers." In 1986 they continue to provide these regional center functions. Regional centers are communities which act as centers of services, government, commerce, and transportation for a geographic region containing a group of smaller communities. Dillingham serves as regional center for about 18 communities in the Bristol Bay region. Similarly, Bethel serves about 50 communities in the Yukon-Kuskokwim Delta area; Nome serves 22 communities in the Norton Sound-Bering Strait region; Kotzebue serves 11 communities in the Kotzebue Sound region; and Barrow serves 8 communities in the North Slope region. As discussed below, the kinds of wage-paying jobs in the five communities are primarily linked to these government-financed services and administrative functions.

Mixed Economies

A third characteristic of the five named places is that they have "mixed economies." In a mixed economy, households commonly follow an economic strategy that combines employment for cash with traditional fishing and hunting activities for local, noncommercial uses. Fishing and hunting make substantial contributions to the food supplies of many households and to the food supply of the community taken as a whole. Families commonly engage in a traditional seasonal round of fishing and hunting activities. During the year families harvest a variety of resources using efficient, small-scale technologies. The wild resources are used by the family for food and raw materials, and also are shared and distributed between families through noncommercial exchange networks. Cash incomes from wage and other employment are used by families to own and operate equipment (such as snowmachines, boats, nets, and smokehouses) that enables them to participate in these traditional activities.

Diverse Populations

Finally, in 1979 (and currently) the five named places had relatively diverse populations in terms of origins, cultural heritages, education, and work experiences. The communities contain subgroups of people which participate in cash employment and resource harvesting activities in different combinations. A particular household's level of wild resource use commonly is related to the household's economic circumstances, their length of residency in the community, and their family's cultural backgrounds.

These characteristics of the five named places are discussed in detail below using Dillingham as the first case example. This is because the most complete information exists for Dillingham. Information on Barrow, Bethel, Kotzebue, and Nome are then presented to show their similarities and differences with the Dillingham case.

DILLINGHAM'S ECONOMY

As stated above, Dillingham is a moderate sized community in southwest Alaska. Its population has grown from 1,563 in 1980 to 2,100 in 1985 (approximately 34 percent) (Fig. 2). Dillingham is a regional center in one of the world's richest salmon fishing areas. Extracting the fish resources of the Bristol Bay-Nushagak River drainage for subsistence use and commercial export is central to the way of life of the region's population, which in addition to Dillingham numbered 2,428 people in 18 communities in 1984. Historically, the salmon fishery has seasonally drawn additional thousands of commercial fishermen and processors from outside the region. Since the late 19th century, Bristol Bay salmon has been a major subsistence product and commercial export product.

Dillingham's economy is interwoven with the regional economic fishing base. Dillingham is home for fishermen who participate in the local commercial and subsistence fisheries. Dillingham also provides regional center functions (services, administration, retail trade, and transportation) to the region's population for whom fishing is central.

Dillingham has a mixed economy with a "cash sector" and a "noncommercial wild resource sector". The primary sources of income in the cash sector are commercial fishing and wage employment in government and services. Each of these is discussed below, followed by a description of the noncommercial wild resource sector. Unless otherwise cited, information about Dillingham is derived from Fall et al (1986).

Commercial Fishing in Dillingham's Economy

A large proportion of Dillingham's families have members who directly participate in the commercial salmon fishery as fishermen. In 1984, there were 2,804 limited entry salmon permits for the Bristol Bay District, of which 343 (12 percent) were held by persons with Dillingham addresses. This is an increase from the 229 permits owned by Dillingham residents in 1979. In 1984, 224 permits were for drift gill nets, and 119 for set gill nets. In 1984, 44 percent of a random sample of households had members involved in catching commercial fish. In addition to commercial salmon fishing, Dillingham residents held 176 commercial herring permits in the nearby Togiak District. The sac roe fishery began in 1968, and has developed substantially since 1977 due to favorable markets. Only a handful of Dillingham residents commercial fish outside the local waters of the Bristol Bay and Togiak Districts.

Counting all permits used in 1984, Dillingham residents harvested 15.8 million pounds of fish, sold at an ex-vessel value of $7.4 million, or about $20,876 gross sales per fished permit. With a population of 2,004 people, gross fish sales amounted to $3,698 per capita in Dillingham. This was a relatively good fishing

year. However, commercial catches have been variable over the history of the Bristol Bay fishery, and were especially low from 1971-1977, when the region was briefly declared a federal disaster area due to a collapse of the commercial run (Table 2). Many years commercial fishermen's earnings are substantially less.

Wage Employment in Dillingham's Economy

Commercial seafood processing is not an important industry in Dillingham's cash sector, even though commercial fishing is so prominent locally. The processing industry has shifted from shore-based canneries to floating frozen-fish processors hiring non-local seasonal workers. In 1984, non-Alaskan residents comprised 73.8 percent of the employees in the seasonal manufacturing sector within the Dillingham Census District (this reporting district includes the entire Bristol Bay watershed except King Salmon, Naknek, and South Naknek). Non-Alaska residents earned 73.2 percent of the wages, which was the third largest percent of non-resident earnings in the state after the Bristol Bay Borough and the Alaska Peninsula. Excluding government employees, non-residents comprised 53.7 percent of the entire work force in the Dillingham Census Area in 1984 (Alaska Department of Labor 1986:A18). Including commercial fishing and processing, non-Alaska residents earned 57 percent of all income generated in the Bristol Bay fishery from 1970 through 1980 (Pettersen et al 1984:77-79).

Most wage employment held by Dillingham residents is not directly linked to the seafood industry. Instead, wage employment derives from Dillingham's role as a regional center. Figure 3 shows employment by Dillingham residents in 1980, as reported in the U.S. census. Services and government accounted for 55.9 percent of

all people employed, with trade and transportation/communication accounting for an additional 12.1 percent and 12.5 percent respectively. Thus, in 1980 72.1 percent of reported employment was in services, government, commerce, and transportation. A more recent picture for the Dillingham Census Area illustrates the same configuration in 1984 (Fig. 4). In descending order, the largest sources of wages for resident employees was government (41.2 percent), services (23.1 percent), manufacturing (12.2 percent), transportation (9.4 percent), and trade (4.6 percent) (Fig. 4). Major single employers in Dillingham in 1984 included the Bristol Bay Area Health Corporation (about 100 jobs), the Dillingham City Schools (about 80 jobs), and the Bristol Bay Native Association (about 25 jobs). Federal and state government employment covered a range of agencies: courts, natural resources, law, transportation, public safety, federal aviation administration, health and social services, among others. The private business sector was not large in Dillingham. Most private businesses were small, employing limited numbers, often on a part-time basis. Within the cash sector of Dillingham's economy, wage income earned by residents in government and services positions was more stable than income earned by commercial fishing from 1970 through 1980 (Pettersen et al 1984:76, 79).

Cash Income Levels in Dillingham

In terms of income levels, Dillingham residents generally have the highest annual cash incomes among the 19 communities in its region. According to the U.S. census, the median and mean household incomes in Dillingham were $27,292 and $35,573 respectively in 1979, which was a particularly productive commercial fishing year. This was higher than Anchorage 1979 household incomes of $27,375 (median) and $32,073 (mean) (U.S. Census Bureau 1980). Figure 5 shows that

average taxable incomes reported per income tax return from Dillingham for 1976, 1979, 1981, and 1982 ranged from $14,277 to $18,796. In 1979 Dillingham's tax returns were 7 percent lower than Anchorage's, while in 1982 they were 31 percent lower (Alaska Department of Revenue 1985). As stated above, yearly incomes from commercial fishing typically vary in Dillingham, accounting for some of these yearly differences (Table 2).

In comparing earned incomes, it is important to consider cost of living differentials. Food costs are considerably higher in Dillingham compared with Anchorage. From June 1981 through December 1985, a food basket which cost $100 in Anchorage cost $172 in Dillingham (University of Alaska 1986). Thus, the purchasing power of cash income is considerably less in Dillingham because of the high shipping costs of imported goods.

Wild Resources in Dillingham's Economy

Noncommercial harvesting and processing of wild resources for local use is another part of Dillingham's economy. Conventional economic indices typically miss this sector of Dillingham's economy. Like commercial fishing, noncommercial resource harvesting is not counted as a form of employment by Department of Labor statistics, even though both commercial and noncommercial harvesting are economically productive activities. They are not counted because the self-employed are not required to pay into employment benefit programs. In the same manner, none of the food and material products from noncommercial fishing and hunting are counted as income by economic indices (such as in the Federal Census or Internal Revenue Service statistics), even though substantial quantities are

produced. This is because no method of assigning a monetary value to noncommercial harvests has ever been agreed upon by monitoring agencies. Nevertheless, the food and material products have an economic value to the households that produce them. If they were not produced, they might have to be replaced by purchased products at some monetary cost to the family and community.

Like commercial fishing, the best way to represent the noncommercial wild resource sector of a community's economy is through measures of productivity and participation. A commercial fishery is usually described by the numbers of permitted fishermen, fishing effort, and the size of the annual harvest in terms of numbers and pounds of landed fish. (Ex-vessel value is often given as an indirect measure of commercial earnings; however, this measure does not really represent true income to fishermen, who must subtract costs from gross sales. Actual net monetary income to the fishermen is rarely systematically measured in government statistics.) Similarly, noncommercial fishing and hunting can be described by participation rates of households, the size of the annual harvest in terms of absolute pounds, rates of distribution of the harvest between households, and the relative efficiencies of production methods. Through these quantitative indices, the relative size and significance of the noncommercial wild resource component of the community's economy can be ascertained.

There are several sources of information on the wild resource component of Dillingham's economy. The first is a random household survey conducted in 1984 by the Division of Subsistence (Fall et al 1986). The survey describes resource uses as they occurred in 1984. A second source is the annual subsistence salmon survey

conducted by ADF&G providing information over the past decade. A third source is a household survey conducted in 1974 (Gasbarro and Utermohle 1974; Wright et al 1985), representing resource uses in 1973. A comparison of the 1973 and 1984 surveys provides an indicator of change in noncommercial wild resource uses over the past decade.

Species Harvested in Dillingham

The 1984 survey identified 48 kinds of fish, game, and plant resources used by Dillingham households in 1984 (Table 3). The scheduling of resource harvest activities is depicted in Fig. 6. Timing generally corresponds with the seasonal availability of resources in the local area. Most resources are harvested in the Bristol Bay area, especially the Snake River, Wood River, and Nushagak River drainages, as illustrated by the use areas for two major species, salmon and moose (Fig. 7). Dillingham residents travel farther for caribou and marine mammals.

Participation Rates in Dillingham

Household harvest rates in 1984 are shown in Table 3 and Fig. 8. In descending order, 65 percent of all households harvested salmon, 62 percent harvested plants, 56 percent harvested "other fish", 48 percent harvested birds, 32 percent harvested game, and 4 percent harvested marine mammals. The species taken by most households in descending order were berries (62.1 percent), king salmon (56.9 percent), red salmon (49.7 percent), silver salmon (45.8 percent), spruce grouse (39.2 percent), Dolly Varden (29.4 percent), rainbow trout (27.5 percent), caribou (22.2 percent), smelt (21.6 percent), and pink salmon (20.3 percent). For certain

resources, rates of effort were substantially greater than rates of harvest: 32.0 percent of households attempted to harvest moose but only 16.3 percent were successful.

Rates of household use of resources were even higher than rates of harvest. This is because harvests commonly were shared, distributed, or traded between households through noncommercial networks. Therefore, nonharvesting households commonly used resources harvested by another household. For example, 69.9 percent of households used caribou although only 22.2 percent harvested it; 61.4 percent used moose although 16.3 percent harvested it; 26.1 percent used seal oil or meat although only 3.9 percent harvested it. The most commonly shared resources among households were caribou (54.9 percent of households received it), moose (49.0 percent), king salmon (36.6 percent), berries (34.0 percent), red salmon (26.1 percent), silver salmon (25.5 percent), harbor seal (22.9 percent), and smelt (22.2 percent). Resources with relatively low bag limits or small sizes, such as rainbow trout, were shared much less frequently. Resources flowed into and out of Dillingham between communities as well, as documented in Fall et al (1986).

Harvest Quantities in Dillingham

The mean household harvest of wild resources in Dillingham in 1984 was 715 lbs per household (usable weight). The per capita harvest was 242 lbs. Seven resources contributed 76 percent of the mean household harvest: king salmon (156 lbs, 21.8 percent), red salmon (113.7 lbs, 15.9 percent), moose (88.2 lbs, 12.3 percent), caribou (82.4 lbs, 11.5 percent), silver salmon (60.4 lbs, 8.4 percent), berries (23.6 lbs, 3.3 percent), and beaver (20.5 lbs, 2.9 percent) (Table 3). Salmon provided 58.4 percent

of the total harvest by weight, followed by game (27.2 percent), other fish (7.7 percent), plants (3.3 percent), birds (2.2 percent), and marine mammals (1.2 percent) (Fig. 9).

Dillingham's mean harvest levels are substantial when compared with standards of food production and use in the United States as a whole. In 1983, the American and foreign food industries produced for U.S. domestic consumption about 255 lbs per person of meat, fish, and poultry (technically, production is figured as the residual after exports, nonfood use, and ending stocks were subtracted from the sum of beginning stocks, domestic production, and imports) (U.S. Department of Commerce 1984). Of this, 176 lbs were domesticated meat, 13 lbs were fish, and 66 lbs were poultry. In terms of household purchases, households in the Western United States purchased and brought into the family kitchen 222 lbs per person of meat, fish, and poultry in 1978 (U.S. Department of Agriculture 1983). The federal government recommends that American families on a "low cost food plan" purchase at least 163 lbs per person of meat, fish, and poultry each year (University of Alaska 1984). Dillingham's population is harvesting wild resources at high levels relative to these national standards. Dillingham's 1984 harvest of 242 lbs per capita was 94.9 percent of the per capita U.S. meat-fish-poultry production, 109 percent of the per capita U.S. family meat-fish-poultry purchases, and 148 percent of the federally recommended family meat-fish-poultry purchases. In terms of dietary protein needs for human populations, it is estimated that a harvest of 230 lbs per capita dressed weight of wild meat, fish, and birds will supply 100 percent of the average recommended daily human allowance of protein (assuming that two-thirds of dressed weight is consumed; 44 gm protein per person per day is the recommended allowance; and 104.3 gm protein per pound of wild resource). By

this protein standard, 100 percent of Dillingham's protein requirements are available in the community's annual wild food harvest.

Cash and Harvest Equipment in Dillingham

In a "mixed economy" like Dillingham's, where noncommercial harvests provide substantial quantities of food to families, fishing and hunting are central social activities within the community. Resources are harvested by family groups with efficient, small-scale technologies, such as gill nets for salmon. The family's noncommercial harvests are augmented and supported by cash employment. Money earned by households in the commercial-wage sector enables families to capitalize in the noncommercial sector. Money is used to purchase, operate, and maintain the equipment used to fish and hunt. Labor in harvesting and processing most commonly is contributed without pay by family members, or less frequently by unrelated partners. Harvest activities, while often highly productive, are not oriented toward accumulated profit as are commercial activities, but are directed toward meeting the self-limiting food needs of families and small communities.

Comparisons of 1973 and 1984 Harvests in Dillingham

A 1973 harvest survey in Dillingham (Gasbarro and Utermohle 1974) enables a comparison of the 1984 wild resource harvest with 1973 levels. In 1973, sampled households took an average of 1,111 lbs of fish and game, for a per capita harvest of 259 lbs (Table 4). For comparative purposes, plants and berries were deleted from the 1984 harvest totals, since the 1973 survey did not collect harvests for these resource categories. In 1984, Dillingham harvests (without plants and berries)

were 692 lbs per household and 234 lbs per capita (Table 5, Fig. 10). Thus, while household harvests evidently decreased between 1973 and 1984, the decrease is mostly a result of the larger average household size of the 1973 sample. The per capita harvests for the two household samples were virtually identical, suggesting that little change has occurred in the total per capita harvest levels in 11 years (Table 5, Fig. 10).

Levels of household participation in six harvest activities (salmon fishing, other fishing, game hunting, bird hunting, marine mammal hunting, and plant gathering) were also quite similar between 1973 and 1984 (Table 5). However, the species composition of the harvest changed slightly. In 1973, salmon composed 48 percent of the harvest by weight, while in 1984 this share increased to 60 percent. Conversely, the proportion of game dropped from 35 to 28 percent, other fish from 13 to 8 percent, and birds from 3.5 to 2.3 percent. Marine mammals increased slightly, from .5 to 1.3 percent. These indices of productivity and participation suggest there has been no appreciable change in 11 years in the magnitude of the noncommercial wild resource harvests on a per capita basis in Dillingham. Because Dillingham is a larger community, total community harvests since 1973 have increased along with the city's population size. In 1984 the estimated total noncommercial harvest of wild resources for Dillingham was 484,968 lbs, while in 1973 the estimated total noncommercial harvest was about 284,900 lbs (assuming a 1973 population of 1,100 people).

Another indicator of change are subsistence salmon harvest counts conducted ADF&G. The total salmon harvest for Dillingham residents was 19,700 fish in 1973 (which was a low sockeye year in the Bristol Bay region), compared with

20,600 in 1979 and 30,500 in 1984 (Table 6). As with commercial harvests, subsistence harvests show variations between years primarily due to run size and catch conditions. Five-year average subsistence salmon catches for Dillingham residents show few signs of major change: 32,200 fish (1965-69), 21,500 (1970-74), 20,800 (1975-79), and 29,400 (1980-84) (Table 6). These numbers are conservative estimates based on returned permits.

Subgroups in Dillingham

As noted above, one characteristic of moderate sized communities in Alaska is a diverse population. There is substantial diversity in the population in terms of origins, length of residency, ethnicity, education, and occupational status. Differences also occur between segments of the community in terms of the types and levels of participation in cash employment and noncommercial resource harvesting activities.

Dillingham's population has relatively diverse origins. In 1970, 64.0 percent of Dillingham's population was Alaska Native. In 1980, Alaska Natives comprised 57.5 percent of the population. The 1984 household survey found that 47.1 percent of household heads had been born in the Bristol Bay region, 20.3 percent in other parts of the state, and the remaining 32.7 outside the state. In terms of length of residency, 47.1 percent of household heads were resident in southwest Alaska their entire lives, 19.6 percent for 6 or more years (but not born there), 13.7 percent for 3-5 years, and 19.6 percent for less than two years. In terms of education, 32.7 percent of household heads had a college degree, 30.7 percent had some college,

28.8 percent had high school diplomas but no college, and 7.2 percent had no high school diploma.

Households differ in their levels of wild resource harvest and use. The 1984 Dillingham survey found that household resource harvests were not equally distributed among the sample of households. Instead, there were a large number of households who were low producers, and a smaller number of households who were extremely high producers. For instance, 70 percent of all the community's salmon was harvested by 20 percent of the community's households (Fig. 11). A relatively few highly productive households were producing most of the resources. As shown previously, wild resources were shared and distributed to a great extent by productive households to feed other households in the community.

Several factors seem to be associated with different household harvest levels. One factor is cultural background: Alaska Native households harvested greater amounts and a wider variety of resources than non-native households (301 lbs compared to 204 lbs per capita; 6.9 compared to 5.1 resource categories) (Fig. 12). Another factor is commercial fishing status: households with commercial fishermen harvested 366 lbs per capita compared with 162 lbs for households without commercial fishermen (Fig. 13). A third factor is length of residency: household harvests increased with length of residency in Dillingham (Fig. 14). Households living in Dillingham for 1-2 years took 129 lbs per capita, compared to 227 lbs (3-5 years), 332 lbs (6 or more years) and 285 lbs (local origins). A greater breadth of resources harvested and used also is associated with a greater length of residency (Fig. 15). This suggests that people who move to Dillingham become socialized into the prevailing pattern of high use of fish and game resources.

Our understanding of harvest patterns by subgroups in communities is just beginning. Findings like those above show that it is incorrect to assume a homogeneity between households in wild resource harvests and use. Specialization by segments of a community in harvest activities seems to be the common pattern, not only for moderate sized communities, but also for small villages. The factors associated with this specialization are yet to be fully identified, although cultural background, length of residency, and commercial fishing status are associated factors in the Dillingham case.

BARROW

Barrow is another of the communities named as rural in 1979 by ANILCA. As mentioned previously, Barrow is a moderate-sized community on the North Slope in the arctic region. Its population has grown from about 2,207 people in 1980 to about 3,075 people in 1985 (Fig. 2). Barrow's 1980 population was 76 percent Alaska Native, primarily Inupiat Eskimo. Unless otherwise cited, information on Barrow derives from Alaska Department of Fish and Game (1986).

Barrow's History

Barrow's present-day site, know locally as *Utigiagvik*, probably has been continuously occupied for about 1,300 years and intermittently occupied for over 5,000 years (Schneider et al. 1980). It geographic location provides hunting access to both the Beaufort and Chukchi seas. Barrow became a major port of call for Euroamerican exploration and commercial whaling ships during the late 19th century. The end of commercial whaling about 1910 brought a decline in activity and population. In the late 1940s, oil exploration activities, the construction of NARL, and a DEW line installation created unprecedented wage employment opportunities at Barrow. Barrow's population has grown steadily since that time. Barrow was incorporated in 1974 as the North Slope's only first class city. It has become the seat of the North Slope Borough since that time.

Barrow's Economy

Income Sources

During the historic period, Barrow's residents have participated in a mixed economy of cash employment and wild resource harvests. Since the 1970s, revenues from oil exploration and development have increased local cash employment opportunities in Barrow. The North Slope Borough derives most of its income from taxation of the oil industry. In the early 1980s, an estimated 80 percent of North Slope employment was provided by borough government positions or capital improvement construction projects contracted by the borough (Kruse et al. 1983). Few Inupiat are directly employed by the oil industry.

In 1980, 31.8 percent of all workers reported employment in services, 23.4 percent in construction, 19.8 percent in public administration, 12.7 percent in transportation-communication, and 6.4 percent in trade, according to the U.S. Census (Fig. 16). This configuration continued in 1985, when 59.0 percent of all wages derived from government employment, primarily local borough government (Fig. 17).

Income Levels and Cost of Living

Wage rates in Barrow are among the highest in the state, and household incomes are correspondingly high. In 1980, personal income within the North Slope census district was 65 percent higher than the national average. In 1979, Barrow household incomes were $39,990 (mean) and $34,458 (median) according to the 1980

U.S. Census, which was higher than Anchorage at $32,073 (mean) and $27,375 (median). Figure 5 shows that average taxable incomes reported per income tax return from Barrow for 1976, 1979, 1981, and 1982 ranged from $16,421 to $25,701, and were higher than Anchorage each year.

Cost of living is extremely high in Barrow. In 1985, food which cost a $1.00 in Anchorage cost $1.86 in Barrow according to a consumer price survey conducted by the Cooperative Extension Service of the University of Alaska.

Noncommercial Wild Resource Uses in Barrow

A study by Kruse (1982) has shown that households combine wage employment with traditional fishing and hunting activities in Barrow. According to his research, Inupiat men prefer to follow a dual pattern of economic activity involving traditional fishing and hunting and part-time wage employment. Wage earners carry out resource harvesting activities during time off, evenings, weekends, and vacations, and one of the major uses of increased incomes is to purchase equipment (Kruse et al. 1983). Many of the most active hunters also have relatively high incomes.

No complete, systematic surveys of resource harvests by Barrow residents have been conducted to allow a comparison of harvest patterns in 1979 and 1986. The descriptions that follow are for the generalized period 1979-86 (Alaska Department of Fish and Game 1986). The annual cycle of resource harvest activities are depicted in Figure 18. Bowhead whaling overshadows all other subsistence activities in Barrow from April to mid June. As many as 33 crews are involved in

spring whaling at Barrow. Waterfowl, walrus, and ringed seal are also taken in conjunction with spring whaling activities. In early summer, waterfowl and eggs are harvested from traditional camps along the coast to Peard Bay. Hunting for bearded and spotted seal increases as the sea ice retreats. In late summer, caribou hunting intensifies, and inland fishing for whitefish and grayling with nets is productive. Fall whaling occurs in open water areas east of Barrow. With the formation of new sea ice, ringed seals are hunted by some residents. During winter, polar bear, caribou, seal, and furbearers are taken by some residents. Furbearer and caribou harvests intensify with the longer days of spring.

Harvest Levels at Barrow

Reliable, verifiable harvest data have not been systematically collected for Barrow. Pattersen and Wentworth (1977) estimated an annual harvest (circa 1966-73) of about 708 lbs per person in Barrow (Table 7). Estimates of annual harvests of bowhead whale, walrus, seal, and polar bear from 1962-82 by Stoker (1983) are shown in Table 8. The precision of these estimates is not known.

Harvest Areas at Barrow

Harvest areas used by Barrow residents, based on a study by Pedersen (1979) are shown in Fig. 19. The study showed that Barrow residents utilized a large area in aggregate, which varied according to activity, species, and season. Large areas are accessible from the community through the use of motorized boats and snowmachines.

BETHEL

Bethel is a moderate sized community on the Yukon-Kuskokwim Delta in western Alaska. Its population has grown from about 3,576 people in 1980 to 3,681 people in 1985 (Fig. 2). Bethel's population was about 68 percent Alaska Native in 1980, primarily Yup'ik Eskimo.

Bethel's History

The first recorded Yup'ik Eskimo settlement (*Mamterillermiut*, or "settlement of many caches") was located across the Kuskokwim River from present-day Bethel. In the early 1870s a trading post was established across the river from the Yup'ik village. In 1884, Moravian missionaries chose an area near the trading post as their headquarters for the lower Kuskokwim area and named it Bethel. The missionaries opened a school in 1886, built a sawmill in 1893, hosted the region's first western physician in 1896, and maintained a reindeer herd beginning in 1901.

Gold discoveries upriver from Bethel attracted miners, many of whom found fur-buying and retail trade in Bethel more lucrative. Charting the river channel in 1910 made Bethel the most upriver port for deep-draft vessels on the Kuskokwim River. The military built an airstrip and base across from town in the early 1940s, which brought an influx of people and resulted in increased commercial activity. After statehood, government and social services operations based from Bethel multiplied. Subsequently Bethel has become the travel hub, service, and trade center for over 15,000 residents of 56 villages in the Yukon-Kuskokwim Delta region.

Bethel's Economy

Income Sources in Bethel

Public sector employment and commercial fishing provide the monetary base in Bethel. In 1980, 48.8 percent of workers reported employment in services, 19.0 percent in public administration, 11.4 percent in trade, and 10.0 percent in transportation and communication (Fig. 20) (U.S. Census Bureau 1980). This configuration continued in 1985: 62.6 percent of wages came from government employment, 15.5 percent from services, 6.5 percent from trade, and 7.5 percent from transportation and communication (Fig. 21).

There were 157 Kuskokwim area commercial salmon permits and 42 Bering Sea herring permits issued to Bethel residents in 1986. Bethel fishermen sold 2.8 million pounds of fish in 1984, at a gross ex-vessel value of $8,104 per fished permit. Commercial fishing activity increases during summer. However, total wage employment opportunities decrease in summer, due in part to summer vacation for school staff (Fig. 22).

Income Levels and Cost of Living

In 1979, household incomes in Bethel were $26,526 (mean) and $22,468 (median) according to the U.S. Census, compared with Anchorage of $32,073 (mean) and $27,375 (median). Figure 5 shows that average taxable incomes reported per income tax return from Bethel for 1976, 1979, 1981, and 1982 ranged from $11,952

to $18,796, lower than Anchorage. Cost of living is high in Bethel. In 1980, food priced a dollar in Anchorage cost $1.67 in Bethel (University of Alaska 1986).

Noncommercial Wild Resources Used in Bethel

No complete, systematic surveys of wild resource uses exist for Bethel to allow a comparison of 1979 and 1986 resource use patterns. The following descriptions based on qualitative studies pertain to the general period 1979-86. Fish resources harvested for food in Bethel include five species of salmon, several species of whitefish, burbot, pike, blackfish, sheefish, smelt, Dolly Varden, grayling, and trout. Other resources include moose, caribou, black and brown bear, seals (three species), muskox, hare, porcupine, beaver, muskrat, mink, marten, land otter, fox, lynx, ptarmigan, waterfowl, eggs, berries, and other plants (Fig. 23).

Harvest Methods and Areas in Bethel

Both drift and set gill nets are used to catch subsistence salmon, whitefish, and sheefish during summer. Fishing for whitefish, pike, and burbot occurs during winter with set nets under the ice and by jigging. There is a rod and reel fishery for trout, Dolly Varden, and grayling in tributaries of the Kuskokwim River. Fish traps are used to catch blackfish and dipnets are used to catch smelt. Fish is dried, smoked, frozen, aged, salted, or eaten fresh.

Hunting for land mammals occurs by boat during open-water seasons; winter hunting and trapping is done by snowmachine. Sea mammal products usually are obtained through trade and barter, although some Bethel residents originally from

coastal communities seasonally return to these communities to hunt with relatives for sea mammals. Families use fish camps for salmon fishing, and establish berry camps in later summer. Most resource harvests occur in GMU 18, 19A and 21E.

Harvest Participation Rates in Bethel

No systematic surveys of household participation rates by species exist for Bethel. One 1980 survey reported that 70 percent of households participated in at least one subsistence activity. In winter of 1984, 83 nets were set under the ice within a 6-mile stretch of the Kuskokwim River near Bethel for whitefish, pike, and burbot. In 1980 there were 205 fishing families reporting subsistence salmon harvests, compared with 209 reporting subsistence salmon harvests in 1986, with a range of about 114 to 236 during the past decade (Table 9).

Harvest Levels in Bethel

There are no complete systematic surveys of noncommercial resource harvests by Bethel residents. Subsistence king salmon harvests (Table 9) have ranged between about 6,905 fish (1978) and 15,367 fish (1981) over the past decade, with no definite trends. Subsistence coho catches have varied between 1,025 fish (1977) and 13,981 fish (1986) during the same period. Reported 1979-86 moose harvests (Table 10) have ranged from a low of 47 moose (1980-81) to a high of 120 moose (1984-85). Harvests of furbearers sealed with ADF&G for 1979-81 are shown in Table 11. There are no harvest estimates for other wild resources.

Distribution of Wild Resources in Bethel

There are no systematic information on the sharing and distribution of wild resources by Bethel residents. However, sharing of wild resources between households within Bethel, and between Bethel and other communities, probably occurs at substantial levels.

KOTZEBUE

Kotzebue is a moderate sized community in the Kotzebue Sound area of northwest Alaska. Its population has grown from about 2,054 people in 1980 to about 2,981 people in 1985 (Fig. 2). Kotzebue's population was about 76.6 percent Alaska Native in 1980. In 1978, only 38 percent of residents had been born there. Most Kotzebue residents have moved into Kotzebue from other smaller communities in the region, or are non-natives from outside the region. Unless otherwise cited, information on Kotzebue derives from Alaska Department of Fish and Game (1986) and City of Kotzebue (1984).

Kotzebue's History

The peninsula on which Kotzebue is located has been continuously inhabited for at least 600 years. At the time of European contact, Kotzebue was the location of a major winter Inupiat settlement. For centuries Kotzebue has been a center of traditional trading activities. The first missionaries arrived in 1897, and gold seekers soon afterward. Kotzebue continues as a center of commerce, transportation, and government services, and has grown steadily since about the second world war.

Kotzebue's Economy

Income Sources in Kotzebue

Kotzebue has had a mixed economy of cash employment and wild resource harvests throughout the modern historic period. Most employment for cash in Kotzebue derives from its role as a regional center, similar to Dillingham. In 1980, 88 percent of all wage income derived directly or indirectly from government expenditures (NANA Coastal Resource Service Area 1985). In 1980, 41.0 percent of persons reported employment in services, 23.3 percent in public administration, and 13.7 percent in trade, and 14.9 percent in transportation and communication (Fig. 24). In 1985 this configuration continued: 60.4 percent of all wages were directly from government employment, 13.3 percent from services, 7.8 percent from trade, and 11.1 percent from transportation and communication (Fig. 25). A small commercial salmon fishery provided an average of $8,628 gross income to about 187 fishermen in the 1980s (ADF&G 1985).

Tourism contributes to the economy during summer. However, there is a seasonal summer dip in total community wage employment due in part to summer vacations for teachers (Fig. 22). Some residents earn income through the sale of Native handicrafts. If the Red Dog Mine is developed, it is expected to provide revenue to the borough for additional local employment opportunities. Declining state government revenues are expected to negatively affect wage employment opportunities.

Income Levels and Cost of Living

Household incomes in Kotzebue in 1979 were $27,060 (mean) and $23,371 (median) according to the U.S. Census Bureau (1980), compared with Anchorage of $32,073 (mean) and $27,375 (median). Figure 5 shows that average taxable incomes reported per income tax return from Kotzebue for 1976, 1979, 1981, and 1982 ranged from $11,073 to $19,080, in general the lowest among the five named places. Cost of living is extremely high in Kotzebue. In June 1986, one week's food for a family of four cost $134 compared with $85 in Anchorage and $80 in the United States as a whole. Electricity was four times as expensive as Anchorage and fuel oil 80 percent more expensive (University of Alaska 1986)

Noncommercial Wild Resources Used In Kotzebue

There are no systematic surveys of resource use in Kotzebue to compare 1979 with 1985, so the following statements pertain to the general period 1979-85. Caribou is the most widely used land mammal in Kotzebue. Other game used includes moose, sheep, and bear. Kotzebue residents commonly harvest bearded seal, spotted seal, ringed seal, and belukha. Some residents participate in the bowhead hunt based from Kivalina. Fish used includes salmon (primarily chum), char, whitefish, sheefish, tomcod, smelt, burbot, grayling, and pike. Waterfowl, small game, and furbearers are also used.

Harvest Methods and Areas in Kotzebue

Caribou are hunted by boat along major rivers in fall and by snowmachine in winter. Subsistence salmon are taken with set gill nets or retained from commercial catches for home use. Sheefish are taken with nets under the ice or by jigging through the ice. Jigging is also used to harvest tomcod and smelt. Marine mammals are hunted in spring and fall from 16 to 24 foot open skiffs and in winter by snowmachine from leads in the ice.

Kotzebue residents travel widely to harvest resources, particularly in winter and spring when travel by snowmachine is possible. Some residents return to their home villages to hunt and fish during the year. The Kobuk and Noatak rivers are major travel corridors in both summer and winter. Marine mammals are harvested throughout Kotzebue Sound and in the Chukchi Sea as far north as Point Hope.

Harvest Participation Rates in Kotzebue

Based on unsystematic observation, most Kotzebue households use wild resources during the year. Household participation rates by species for harvest and use are not available.

Harvest Levels in Kotzebue

A 1972 study estimated that Kotzebue residents harvested a total of 1,081,973 pounds of wild resources, or about 638 pounds per person (Patterson 1974). The precision of this estimate is unknown. No complete, systematic harvest surveys have been conducted in Kotzebue. In the 1985-86 season, 125 Kotzebue hunters reported taking 623 caribou for an average of 5 per hunter, according to ADF&G

records. It is estimated that one-third to one-half of the actual caribou harvest was reported that year (ADF&G Game Division records). Kotzebue's 1985 subsistence salmon catch was estimated at 13,500 chum (ADF&G 1985).

Distribution of Wild Resources in Kotzebue

Kotzebue's historic role as a center for the traditional trade of wild resources continues into the current decade. Though its level is undocumented, it is thought that trade of wild resources is very common in Kotzebue and between Kotzebue and residents of other villages in the region, particularly with fish and marine mammal products. Wild resources also are shared daily among friends and families in Kotzebue. Many hunting families provide meat to other households. Extensive sharing also occurs between Kotzebue and the region's villages.

NOME

Nome is a moderate sized community in northwest Alaska. Its population has grown from about 2,301 persons in 1980 to 3,184 in 1984, ranking 13th statewide both years (Table 1, Fig. 2). Nome's 1980 population was 57.1 percent Alaska Native. Nome's residents come from many Northwest Alaska communities as well as from outside the region and state. There are some distinct neighborhoods in Nome associated with resident's home communities, especially King Island immigrants (Magdanz and Olanna 1984).

Nome's History

Use of the Nome area of the Seward Peninsula by Inupiat Eskimos has been documented for at least 4,000 years (Bockstoce 1979). Two small Inupiat villages were inhabited in 1880 at the mouth of the Snake and Nome rivers. Larger villages were located at Cape Nome and Sledge Island. Gold was discovered on a tributary of the Snake River in 1898. For a few years around the turn of the century, Nome was the largest community in Alaska. But by 1920 the population was only 852. The 1918 influenza epidemic decimated nearby Inupiat villages, and many survivors settled in Nome. The community grew gradually over the years. Immigrants to Nome from Northwest villages established fishing and hunting camps at Nome River, Cape Nome, and Safety Sound. By 1986, the original gold rush boom town had evolved into a regional center serving about 22 communities in the Norton Sound-Bering Strait region (Cole 1984).

Nome's Economy

Income Sources in Nome

Like Dillingham, Nome has a mixed economy, where many households combine employment for cash with wild resource harvesting for family use. Nome is primarily a center of services for the Norton Sound-Bering Strait region, functions which influence the types of wage employment in the community. According to the U.S. census, in 1980, most cash employment was in services (41.7 percent of persons employed), government (17.9 percent), and trade (15.1 percent) (Fig. 26). In 1984, the *predominent sources of wage earnings were in government (56.7 percent of all wages), services (20.5 percent), and trade (6.2 percent) (Fig. 27). There is a small commercial salmon fishery: in 1985 nine fishermen harvested 6,219 chum, 256 coho, and 21 chinook salmon (ADF&G 1985). A commercial king crab fishery is dominated by non-local large boats and provides no local income. Two mining companies operate during summer. Some residents earn money carving ivory for sale.

Many government-related wage employment opportunities tend to be permanent and year-round. A large number of these professional jobs are held by short-term, non-Native residents, while clerical and technical jobs tend to be held by more long-term residents (Ellanna 1983:96). Construction and mining jobs are mostly seasonal, employing a mix of resident and non-resident workers (Ender et al 1980:33). The seasonality of wage employment at Nome is shown in Fig. 22.

Income Levels and Cost of Living

In 1979, mean household cash income was $27,034 and median household cash income was $23,500, compared to Anchorage of $32,073 (mean) and $27,375 (median) (U.S. Census Bureau 1980). Figure 5 shows that average taxable incomes reported per income tax return from Nome for 1976, 1979, 1981, and 1982 ranged from $12,085 to $19,745 (Alaska Department of Revenue 1985). The cost of living in Nome is high compared with Anchorage. In June 1986, one week's food for a family of four cost $156, compared with $85 in Anchorage and $80 in the United States as a whole (Stetson 1986). Electricity was three times as expensive as Anchorage, and fuel oil 60 percent more expensive.

Noncommercial Wild Resources Used in Nome

A 1982 survey of resource uses in Nome found that salmon, berries, trout, ptarmigan, and moose were the most widely used species (Ellanna 1983:111). Salmon species used were mostly pink and chum, with more occasional use of coho and king salmon. Dolly varden, grayling, and whitefish were other fish species harvested. Bearded, ringed, and spotted seal were harvested for food and raw materials. Walrus were hunted in spring, especially by the King Island subcommunity living in Nome. King crab, tomcod, and hare were harvested in winter, while waterfowl were taken in spring and fall.

Harvest Methods and Areas in Nome

Typical harvesting equipment used in 1982 included 18-foot aluminum or wooden skiffs with a 35-70 hp motors, snowmachines, basket sleds, 3- or 4-wheeled all-terrain vehicles, and pickup trucks. An extensive local road system which runs along the coast east and west, and into the interior to the north was used for hunting and fishing access by residents with trucks. Salmon generally were taken with seines and gill nets, but rod and reels were also used for harvesting coho. King crab were harvested with baited handlines or small, baited pots. Most mammals were taken with rifles and birds with shotguns.

Resource harvest areas used by Nome residents occur throughout Norton Sound, west to Bering Strait, and in all watersheds draining the southern portion of the Seward Peninsula between Golovnin Bay and Port Clarence (Magdanz and Olanna 1986). Some residents return to communities of birth in the region to hunt, fish, and distribute wild resources.

Harvest Participation Rates in Nome

In 1982, 95 percent of a random sample of households reported wild resource use (Ellanna 1983). Ten or more wild resources were used by 43 percent of all households. The percent of household harvesting specific resource categories are shown in Fig. 28.

Harvest Levels in Nome

No estimate of total noncommercial resource harvests exists for Nome. Reported subsistence salmon harvests in the Nome Subdistrict from 1978-1985 are shown in Table 12 based on ADF&G records. They show no apparent trends in subsistence-caught salmon between 1978 and 1985. Total salmon harvests have fluctuated between about 9,000 and 30,000 fish over the past eight years, to a large extent due to highly cyclical pink salmon runs (ADF&G 1985). The five-year average for 1981-85 was 22,701 fish. Recent poor chum escapement in the Nome River has resulted in restrictive regulations for commercial and subsistence fishers in the Nome subdistrict.

In 1985, 683 Nome residents obtained moose permits, 504 reported hunting, and 201 harvested moose, according to ADF&G records. This compares with total reported moose harvests for GMU 22 of 297 (1978) and 270 (1979). In 1985, 8,377 king crab were harvested by 132 permit holders in the Norton Sound district. This is an increase over harvests in 1979 (224 crab), which was the first year of collapse in the local crab population, but a decrease over harvests in 1978 (12,506 crab).

Alaska Native hunters in Nome retrieved an estimated 500 walrus annually during the 1980s, according to U.S. Fish and Wildlife estimates, with harvests ranging from about 150 to 750 per year (cf. Ellanna 1984). Harvest estimates for other sea mammals are not available.

Distribution of Wild Resources in Nome

In 1982, wild resources were widely shared among relatives and friends within Nome, and between Nome and smaller communities in the region, according to

Ellanna (1983:112-113). Proceeds from marine mammal hunts were distributed among hunting crew members from different households. Resources commonly exchanged along traditional noncommercial networks included dried salmon, seal oil, whale muktuk, and ivory.

SUMMARY

ANILCA named five Alaska communities as examples of rural places in 1979 for the purposes of the federal subsistence law: Barrow, Bethel, Dillingham, Kotzebue, and Nome. All five are "moderately-sized" communities by Alaska standards, containing between 1,563 and 3,576 people in 1980, and between 2,004 and 3,681 people in 1984. In 1979 and currently, the five communities act as centers of services, government, commerce, and transportation for the communities of their regions, and are commonly called "regional centers". Most types of wage employment in the communities are in government, services, and trade. Average income levels in the current decade for the five communities have been moderate to high in comparison with average incomes in Anchorage; however, cost of living is also higher than Anchorage, especially for food products.

The five places have "mixed economies" in which households commonly combine monetary employment with traditional fishing and hunting activities. Fishing and hunting make substantial contributions to the food supplies of many households and to the food supply of the community as a whole. During the year, many families harvest a variety of wild resources using small-scale equipment and efficient harvest methods. Wild resources are commonly shared between families within the community.

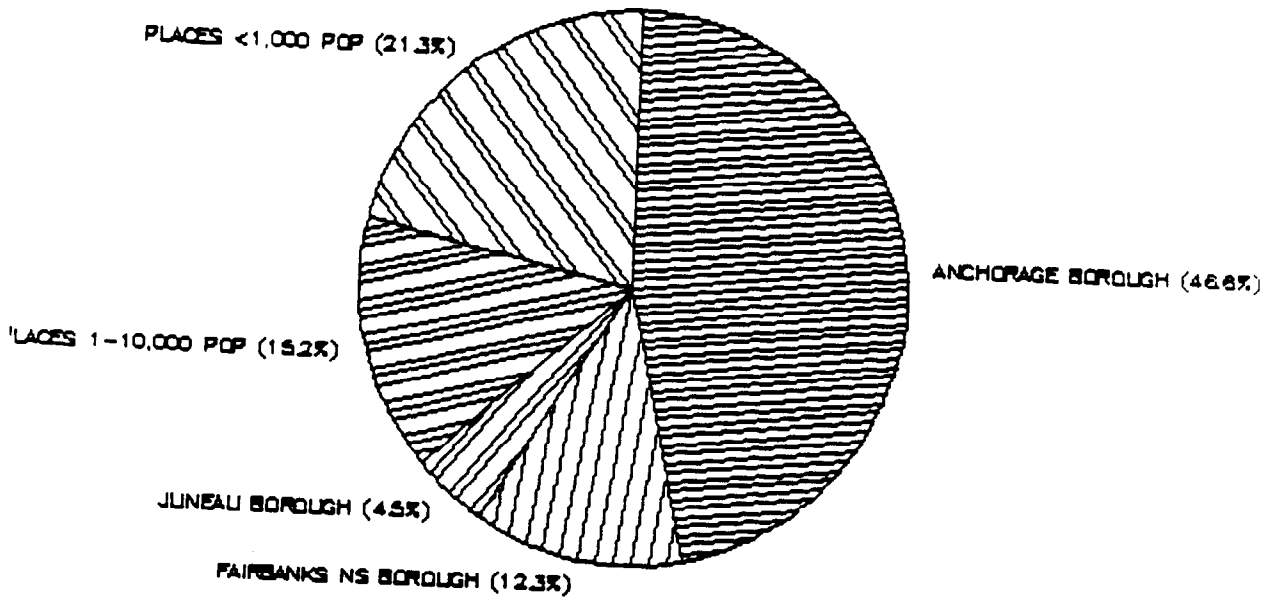
All five communities have diverse populations in terms of origins, cultural heritage, education, and work experience. The communities contain subgroups of people which participate in cash employment and wild resource harvesting

activities in different combinations. In certain communities, a household's level of wild resource use appears to be related to the household's cultural background, length of residency in the community, and commercial fishing status.

FIGURE 1

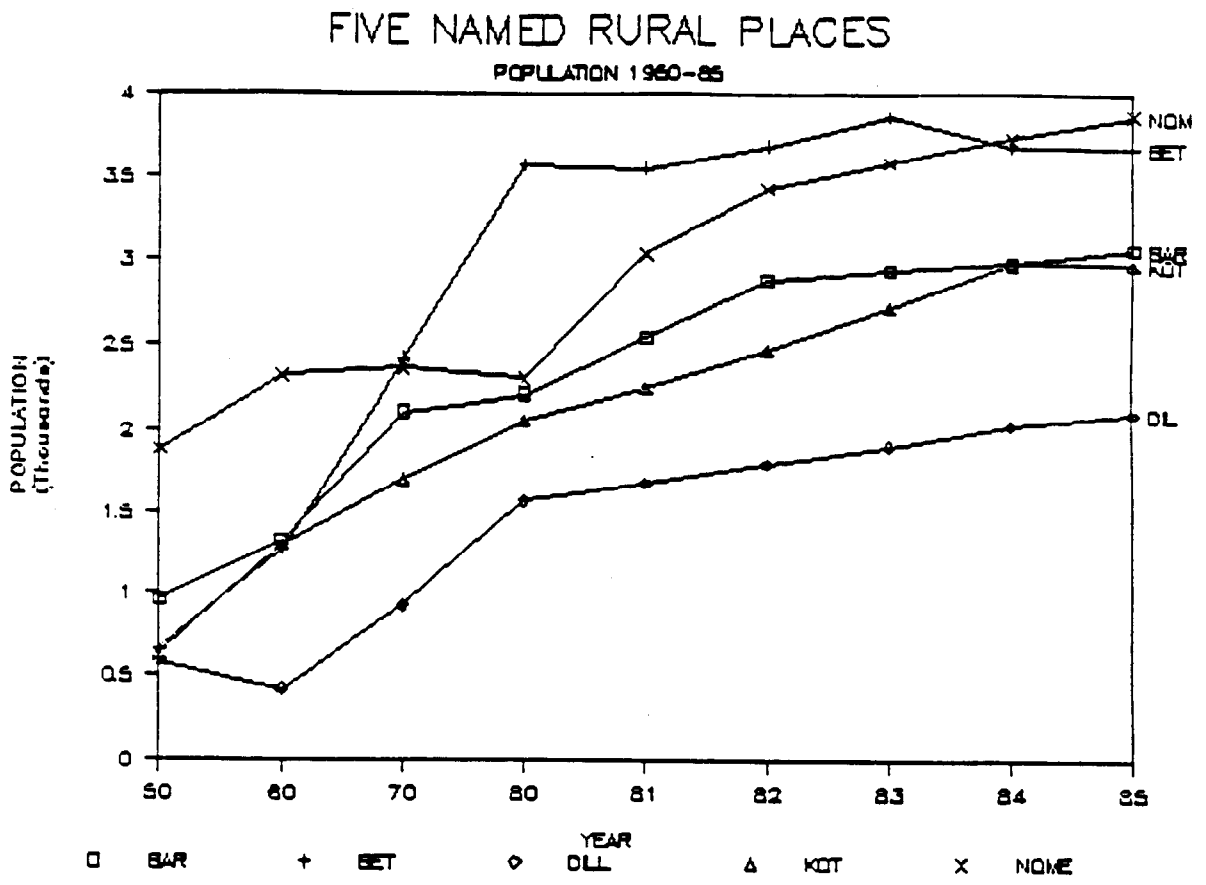
ALASKA'S 1984 POPULATION

BY SIZE OF PLACE



SOURCE: ALASKA DEPARTMENT OF LABOR (1985)

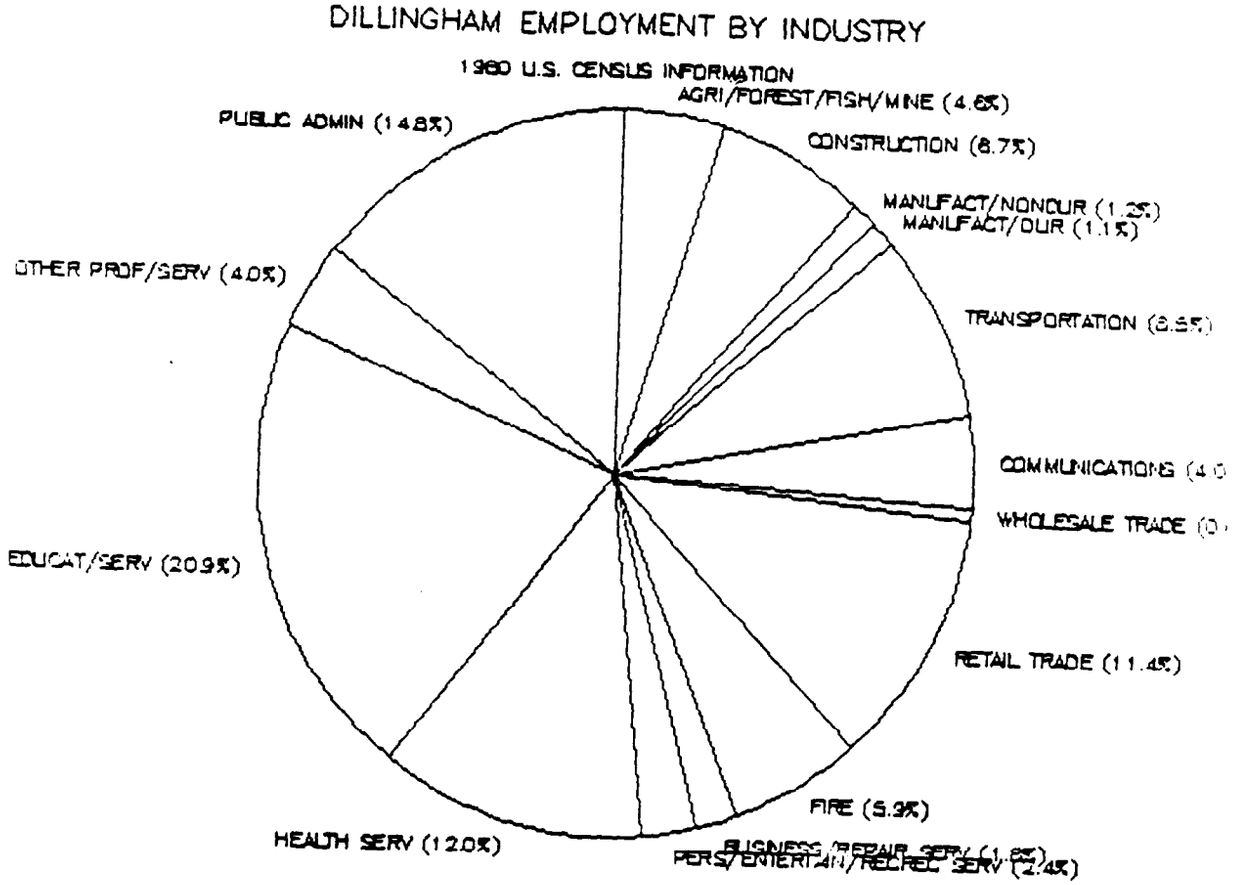
FIGURE 2

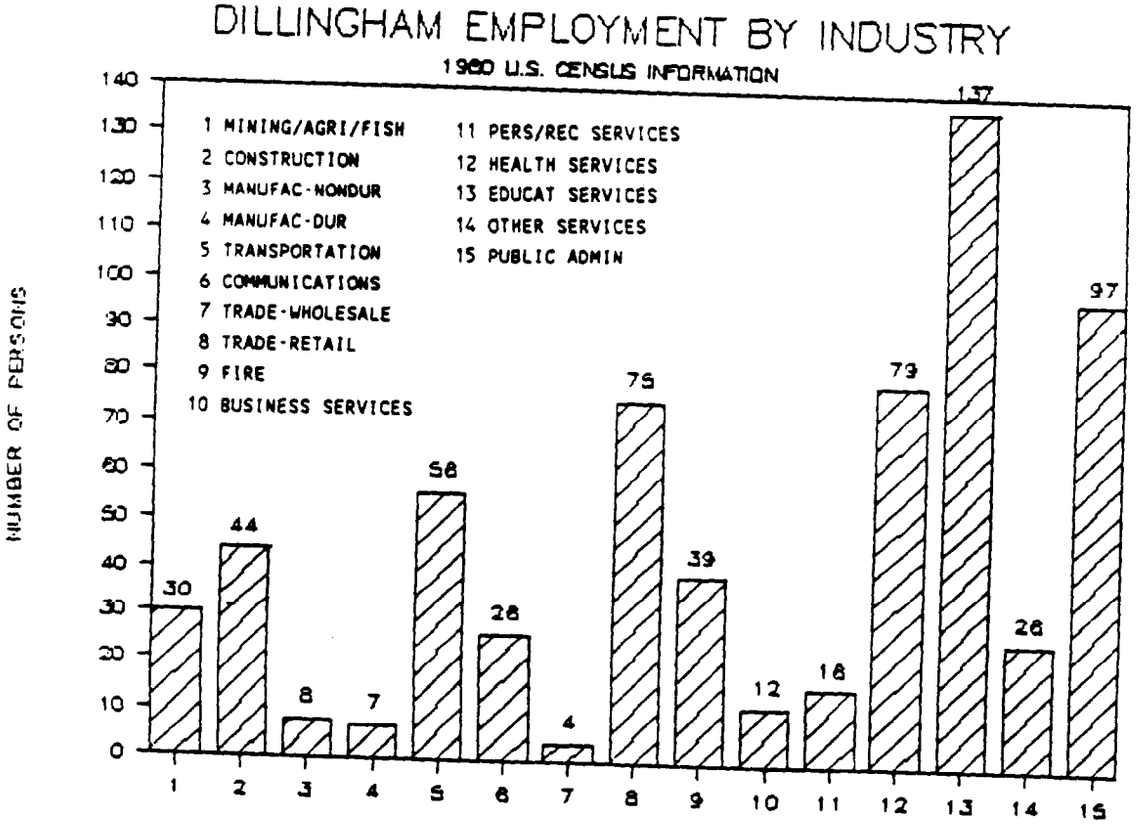


	50	60	70	80	81	82	83	84	85
BARROW	951	1314	2104	2207	2539	2882	2938	2980	3075
BETHEL	651	1258	2416	3576	3549	3683	3869	3681	3681
DILLINGHA	577	424	914	1563	1670	1791	1896	2026	2100
KOTZEBUE	623	1290	1696	2054	2250	2470	2720	2981	2981
NOME	1876	2316	2357	2301	3039	3430	3590	3732	3876

SOURCE: DIVISION OF SUBSISTENCE, ADFG

FIGURE 3


DILLINGHAM EMPLOYMENT BY INDUSTRY
1980 U.S. CENSUS INFORMATION
AGRI/FOREST/FISH/MINE (4.6%)
CONSTRUCTION (8.7%)
MANUFACT/NONDUR (1.2%)
MANUFACT/DUR (1.1%)
TRANSPORTATION (8.5%)
COMMUNICATIONS (4.0
WHOLESALE TRADE (0.
RETAIL TRADE (11.4%)
FIRE (5.3%)
BUSINESS/REPAIR SERV (1.8%)
PERS/ENTERTAIN/RECREC SERV (2.4%)
HEALTH SERV (12.0%)
EDUCAT/SERV (20.9%)
OTHER PROF/SERV (4.0%)
PUBLIC ADMIN (14.8%)


DILLINGHAM EMPLOYMENT BY INDUSTRY
1980 U.S. CENSUS INFORMATION
NUMBER OF PERSONS
1 MINING/AGRI/FISH
2 CONSTRUCTION
3 MANUFAC-NONDUR
4 MANUFAC-DUR
5 TRANSPORTATION
6 COMMUNICATIONS
7 TRADE-WHOLESALE
8 TRADE-RETAIL
9 FIRE
10 BUSINESS SERVICES
11 PERS/REC SERVICES
12 HEALTH SERVICES
13 EDUCAT SERVICES
14 OTHER SERVICES
15 PUBLIC ADMIN
30
44
8
7
58
26
4
75
39
12
18
79
137
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97
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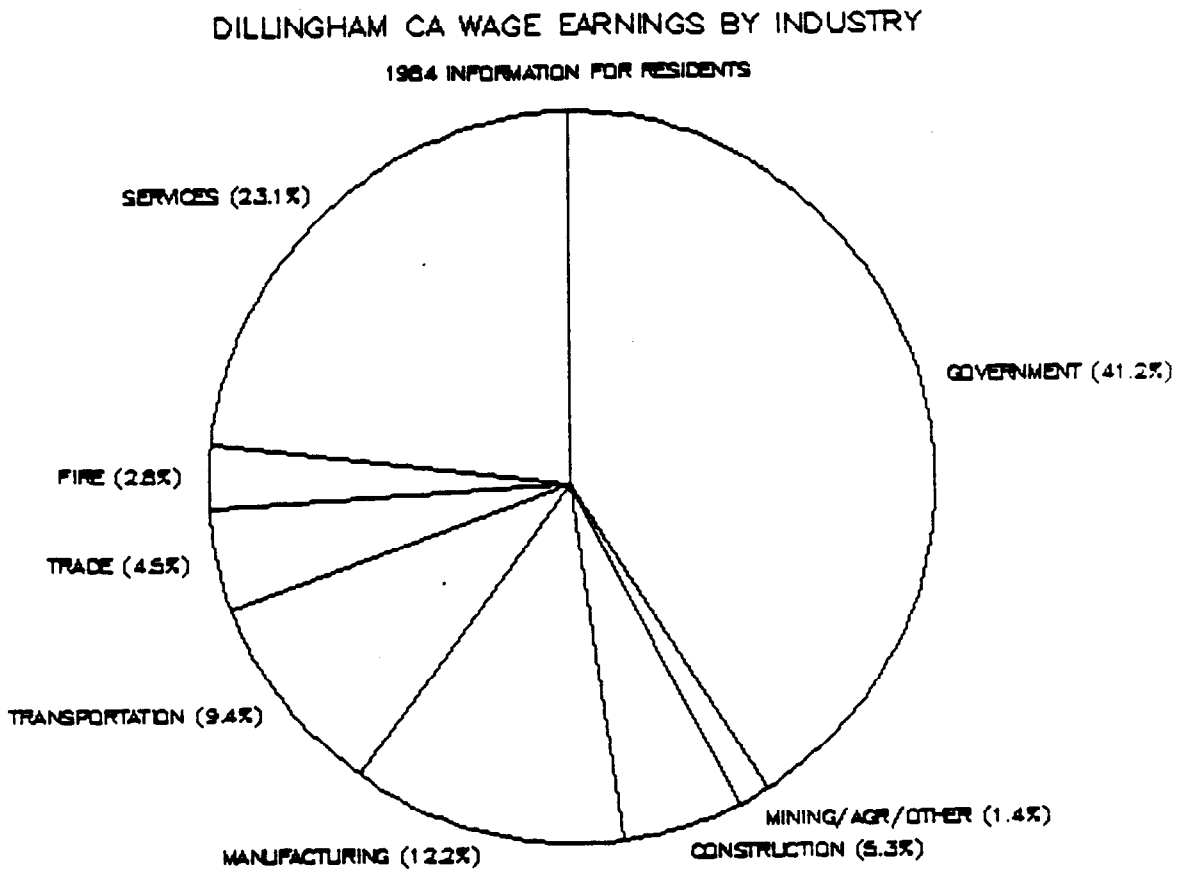
FIGURE 4



SOURCE: ALASKA DEPARTMENT OF REVENUE

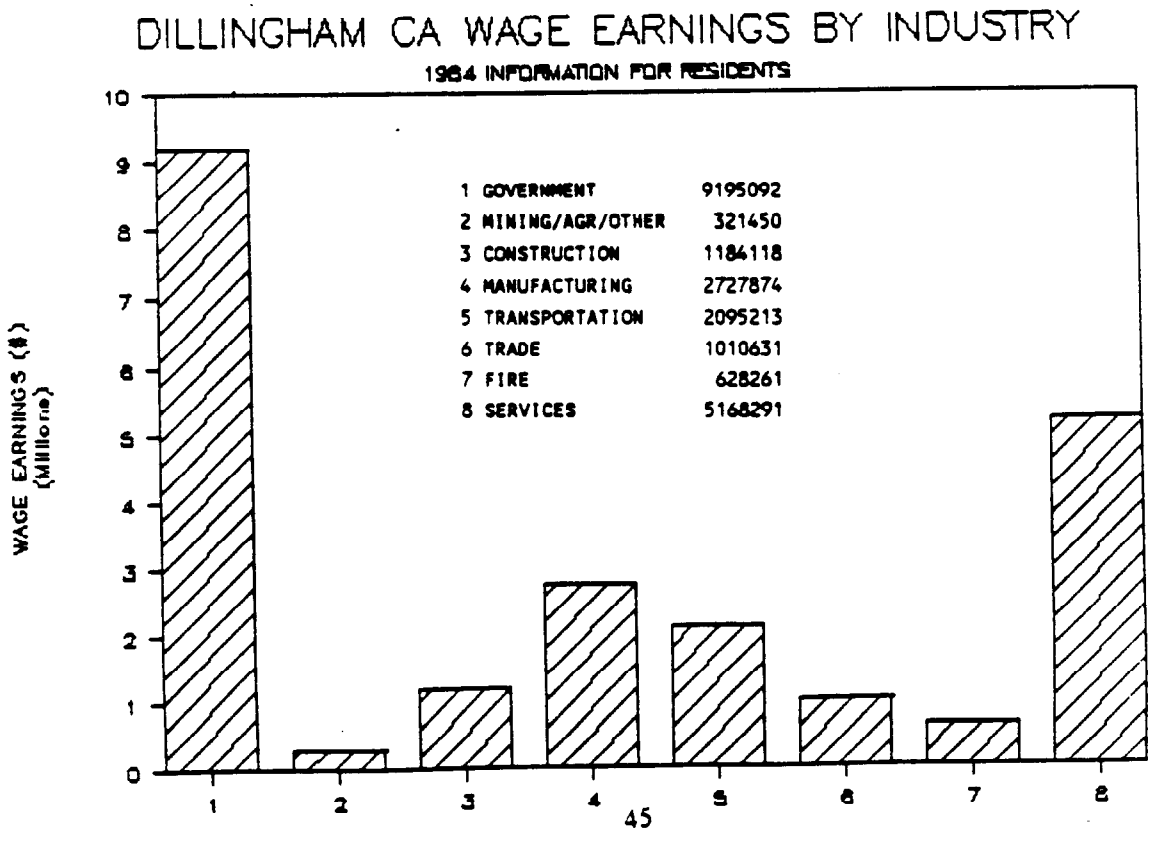
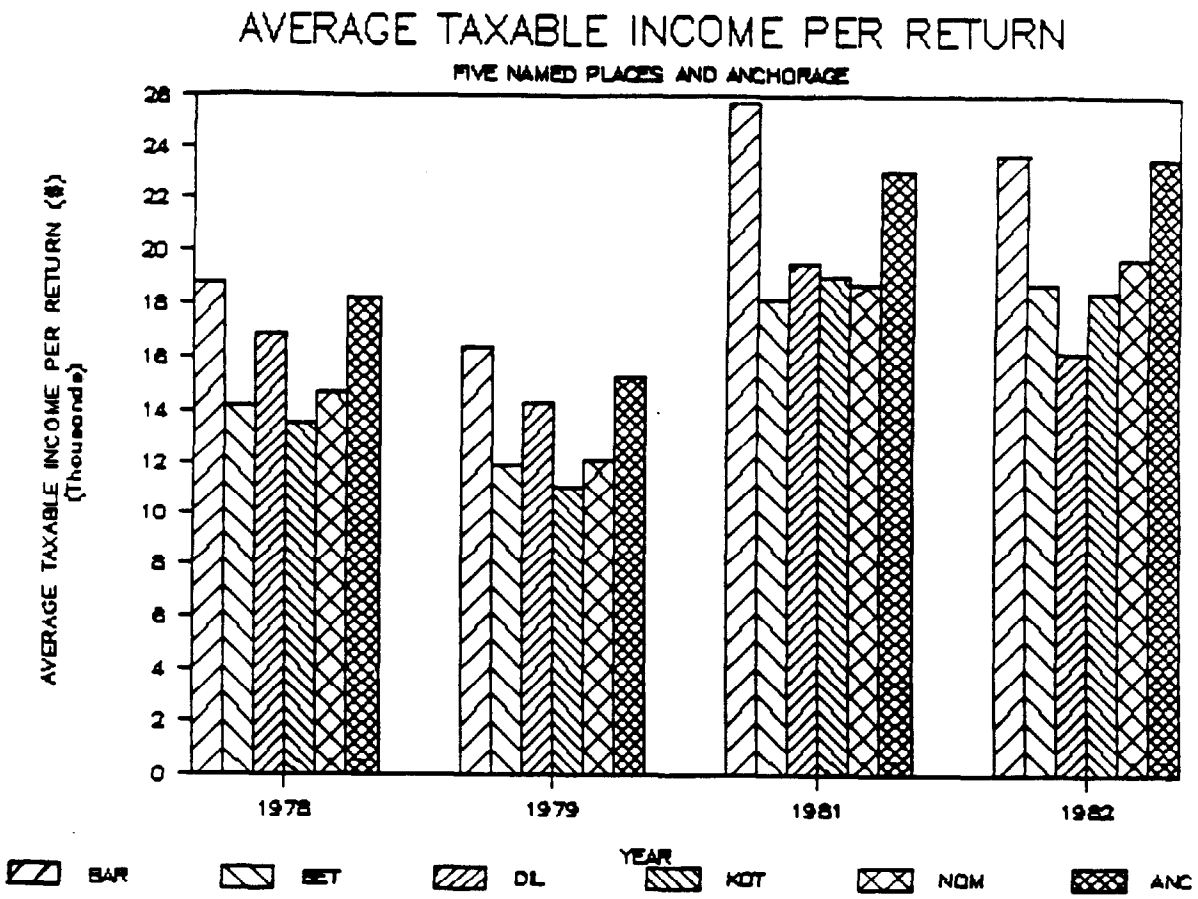
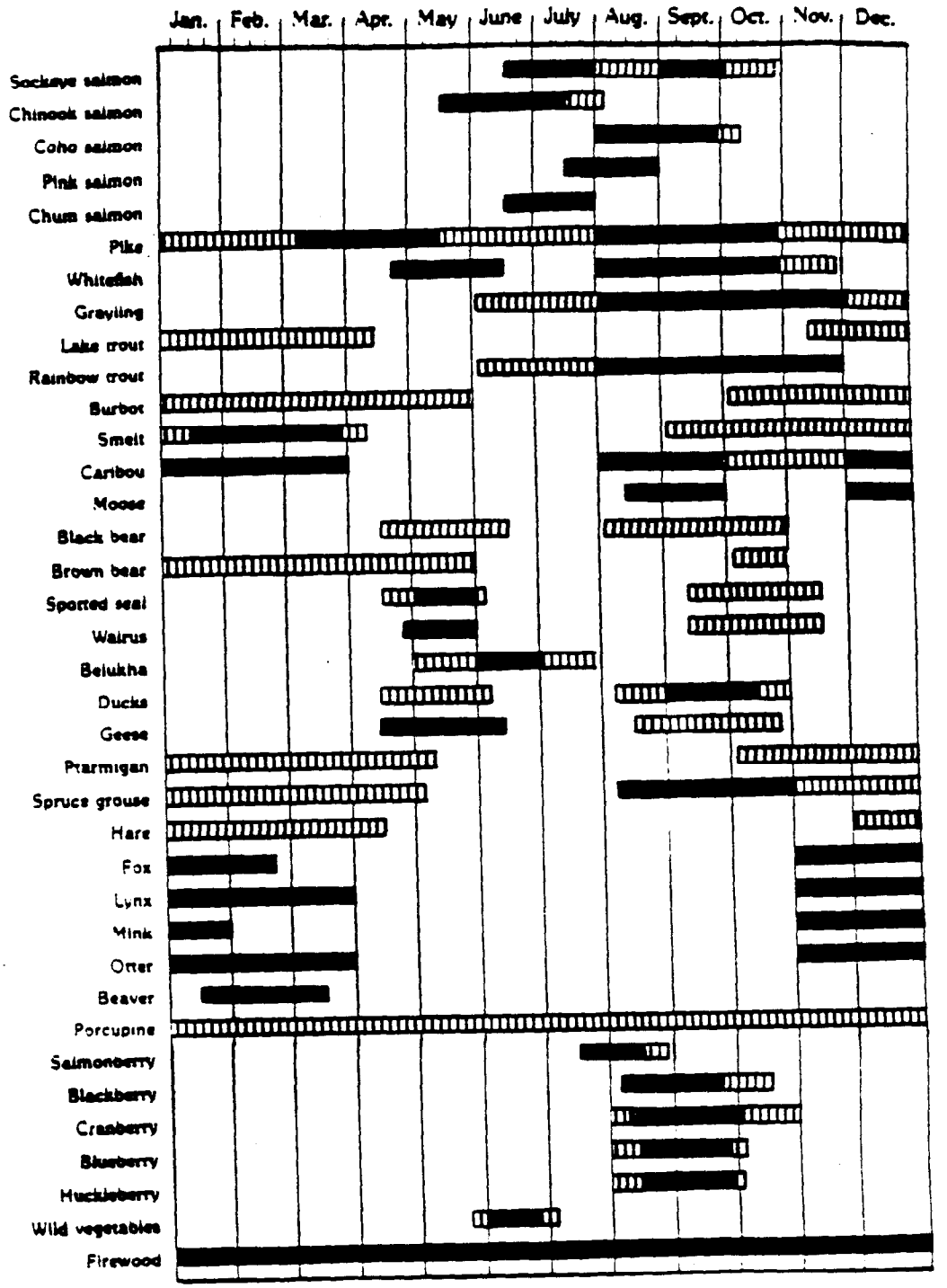


FIGURE 3



	1978	1979	1981	1982
BARROW	18788	16421	25701	23752
BETHEL	14250	11952	18225	18796
DILLINGHAM	16870	14277	19609	16213
KOTZEBUE	13539	11073	19080	18566
NOME	14654	12085	18856	19745
ANCHORAGE	18255	15299	23043	23590

FIGURE 6



Seasonal round of resource harvests, Nushagak Bay subregion. Solid line indicates time when harvest usually takes place. Broken line indicates occasional harvest effort (1982-1983 field interviews, ADF&G, Div. Subsistence).

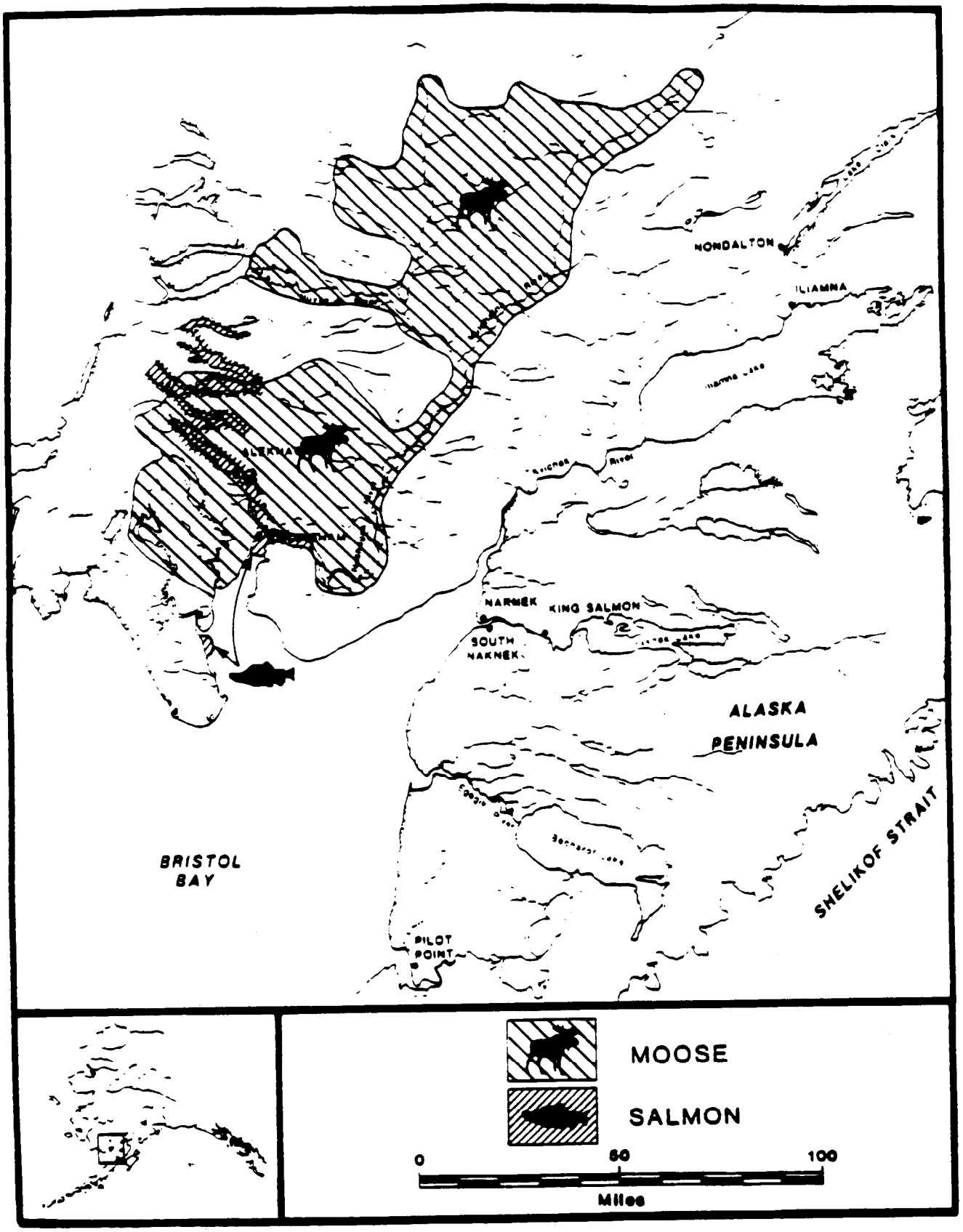


FIGURE 7. Areas used for harvesting salmon and moose by Dillingham residents

SOURCE: FALL ET AL (1986)

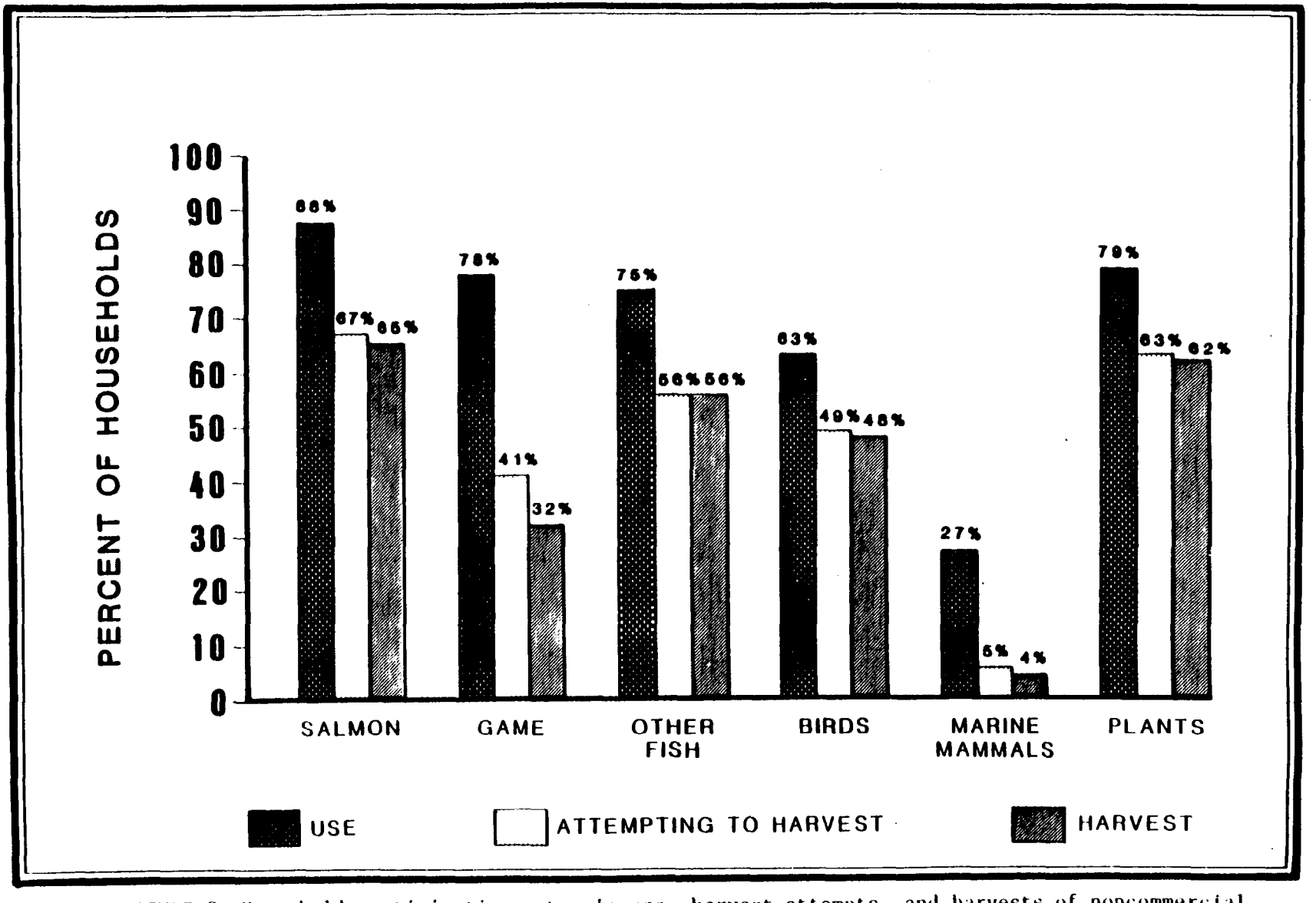


FIGURE 8. Household participation rates in use, harvest attempts, and harvests of noncommercial wild fish and game resources, Dillingham, 1984

SOURCE: FALL ET AL (1986)

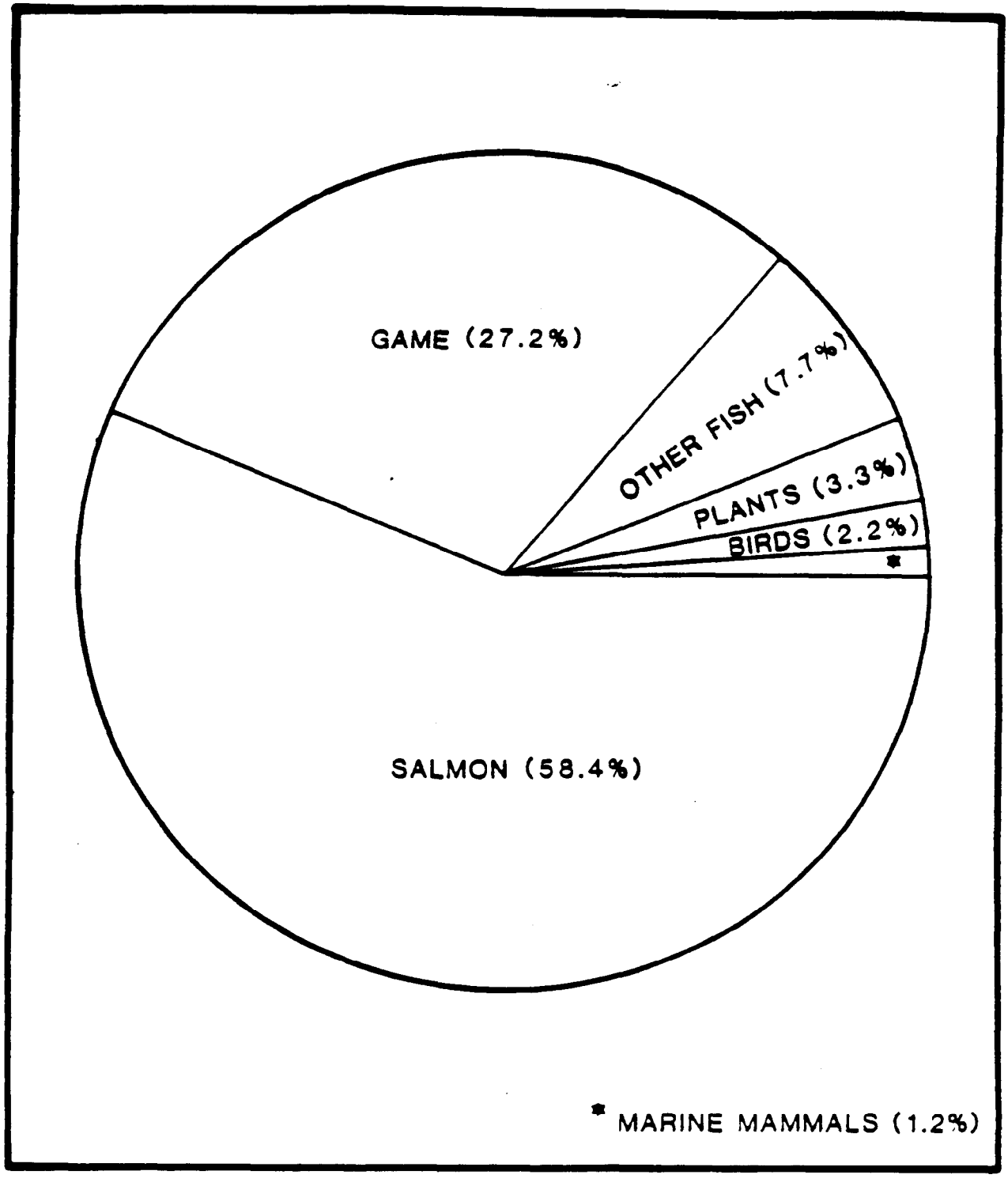


Figure 9. Composition of Wild Resource Harvest by Resource Category, Dillingham, 1984.

SOURCE: FALL ET AL (1986)

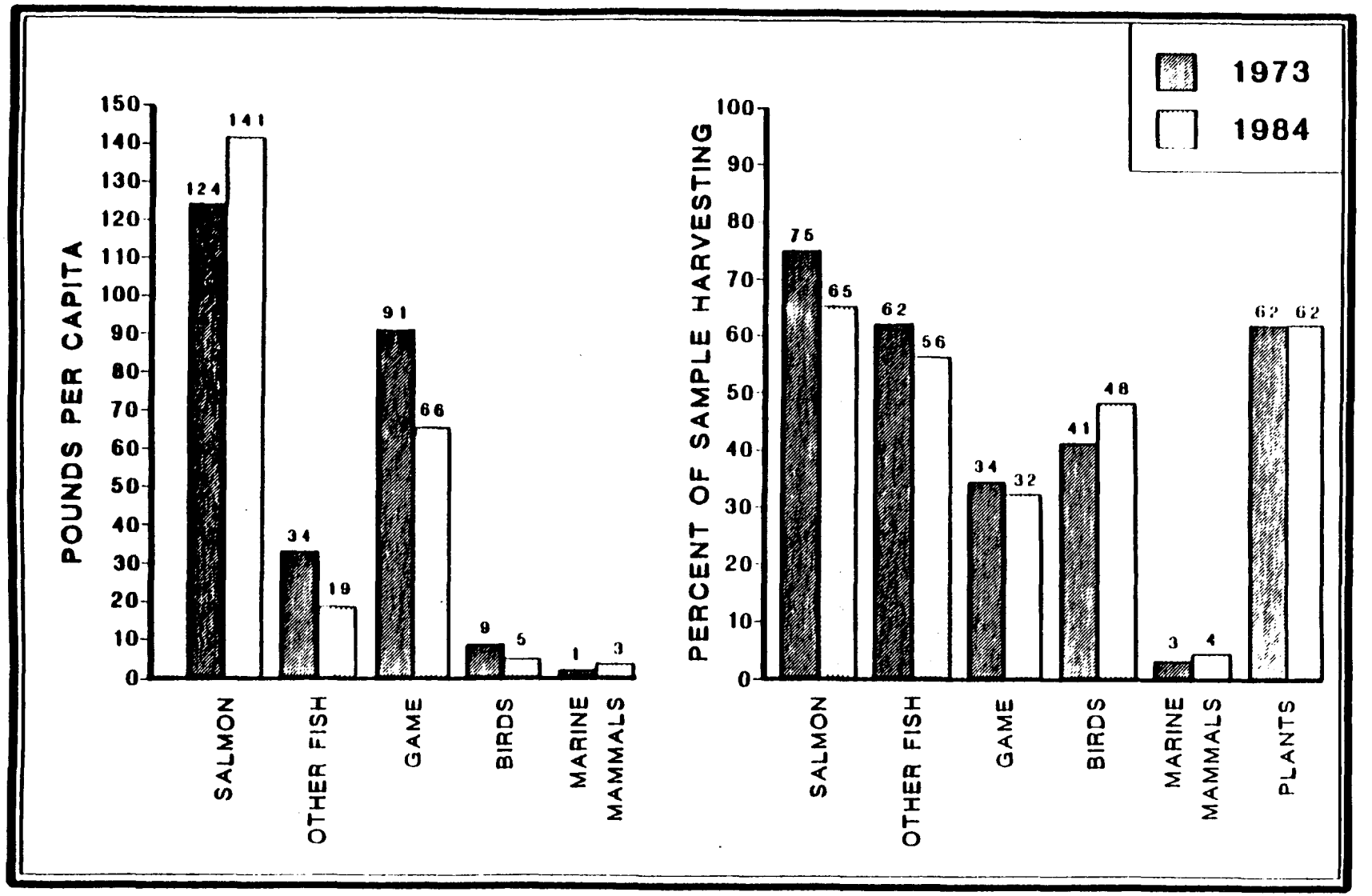


Figure 10. Comparison of Composition of Dillingham Non-Commercial Fish and Game Harvests in 1973 and 1984.

SOURCE: FALL ET AL (1986)

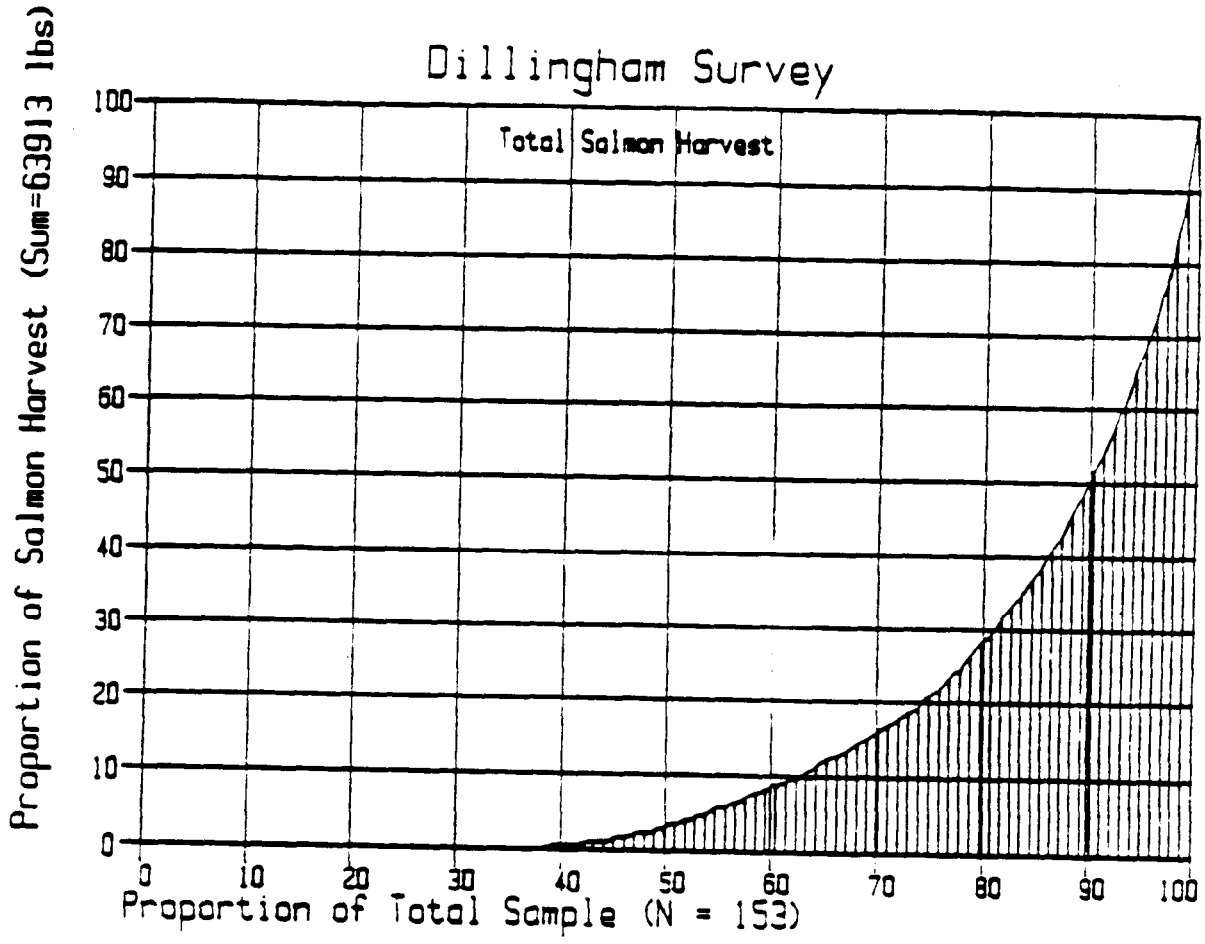
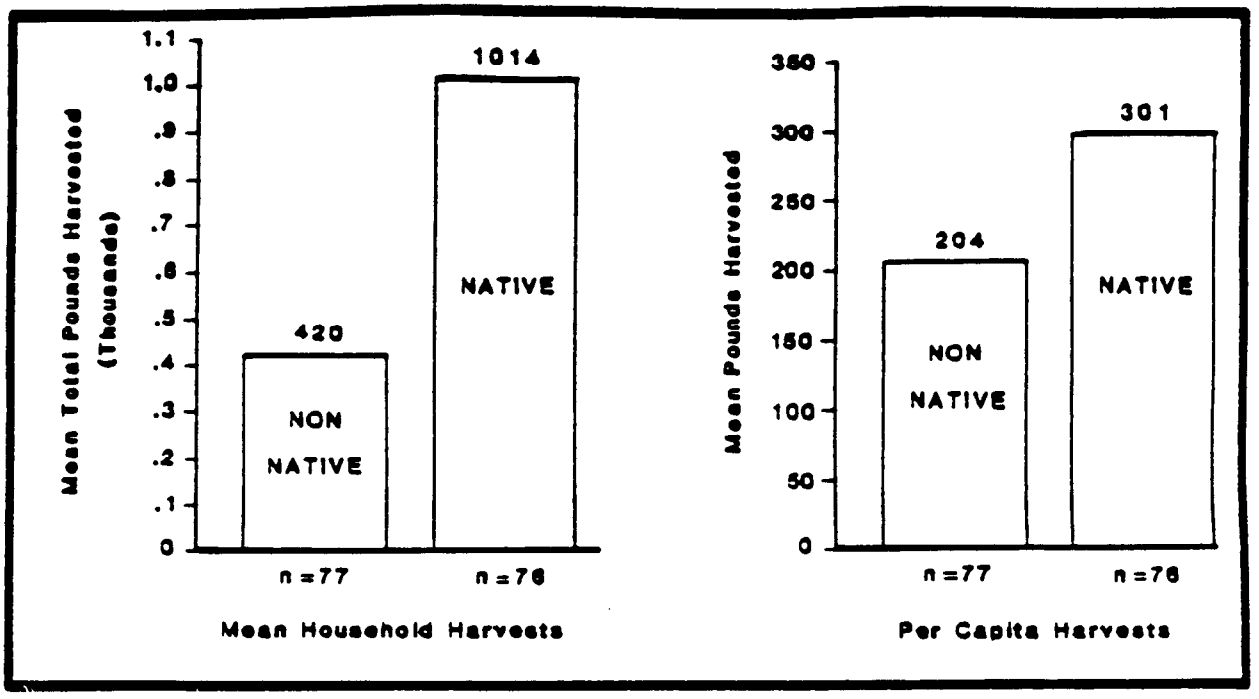


Figure 11. Proportion of Salmon Harvest Taken by Cumulative Percentage of the Sample.

SOURCE: FALL ET AL (1986)



Mean Household Harvest and Per Capita Harvests, Pounds Dressed Weight, by Ethnic Category, Dillingham, 1984.

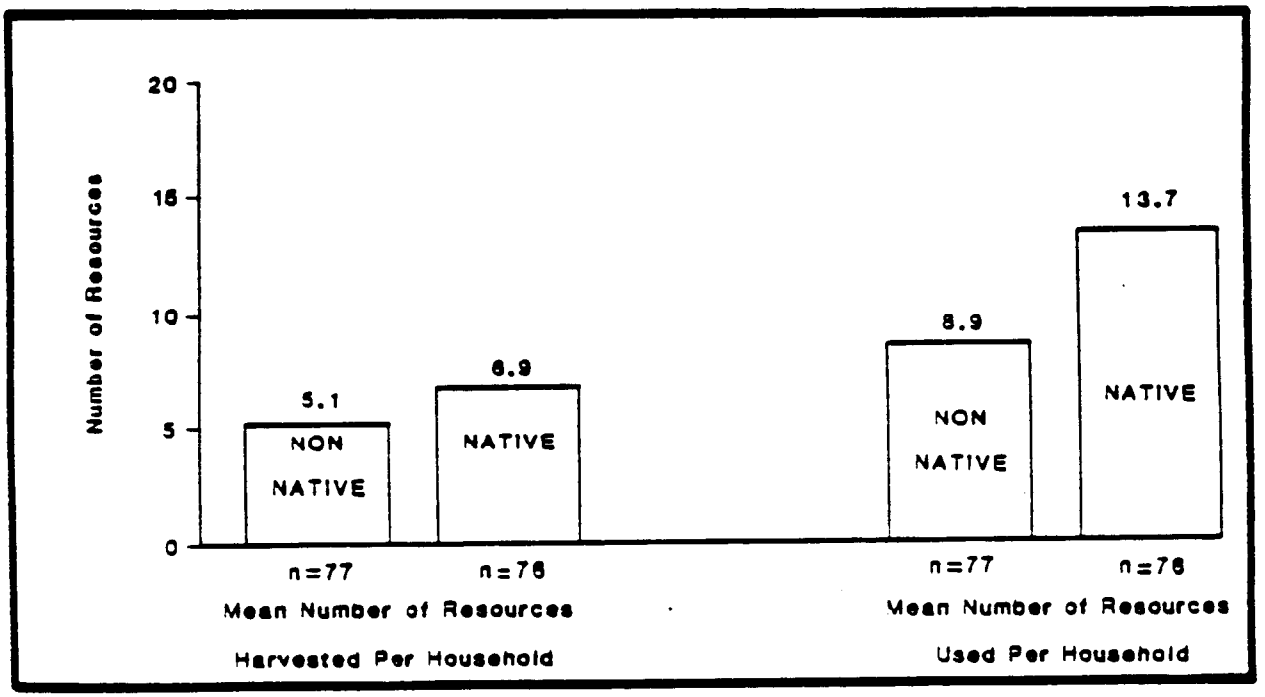
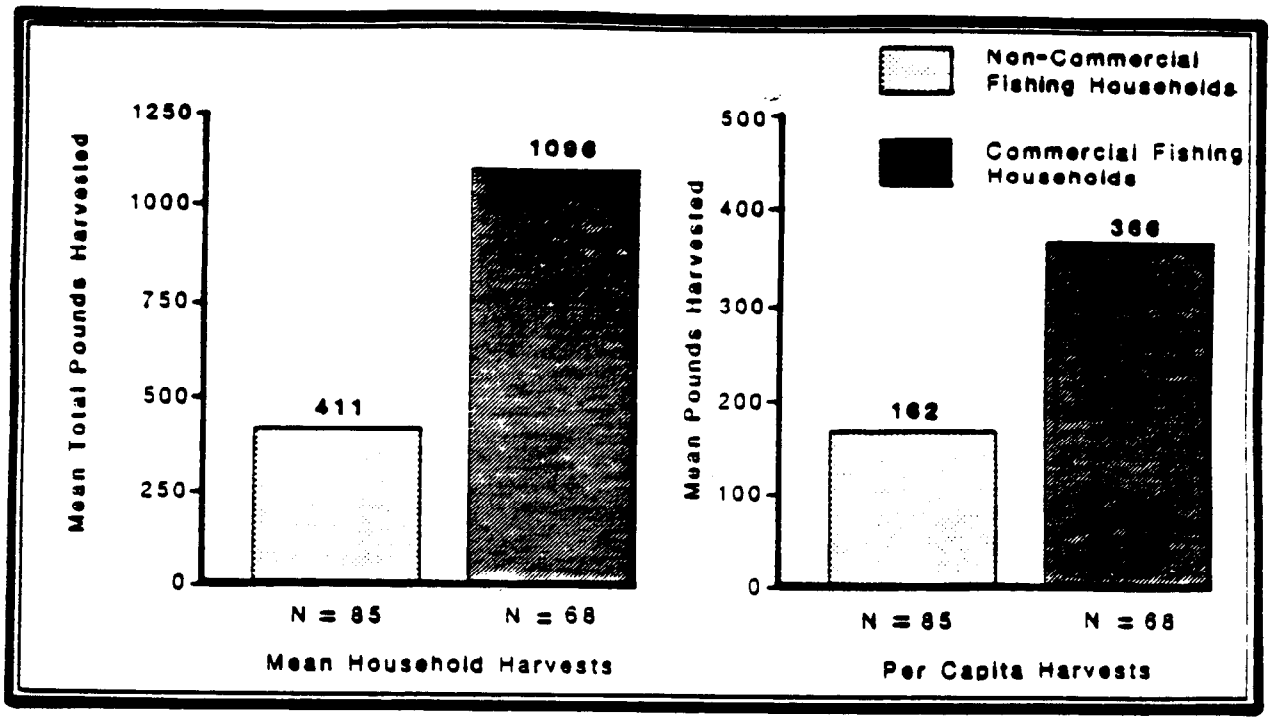


FIGURE 12. Mean Number of Resources Harvested and Used per Household, by Ethnic Category, Dillingham, 1984.

SOURCE: FALL ET AL (1986)



Comparison of Mean Household Non-Commercial Harvests and Per Capita Harvests of Commercial Fishing and Non-Commercial Fishing Households.

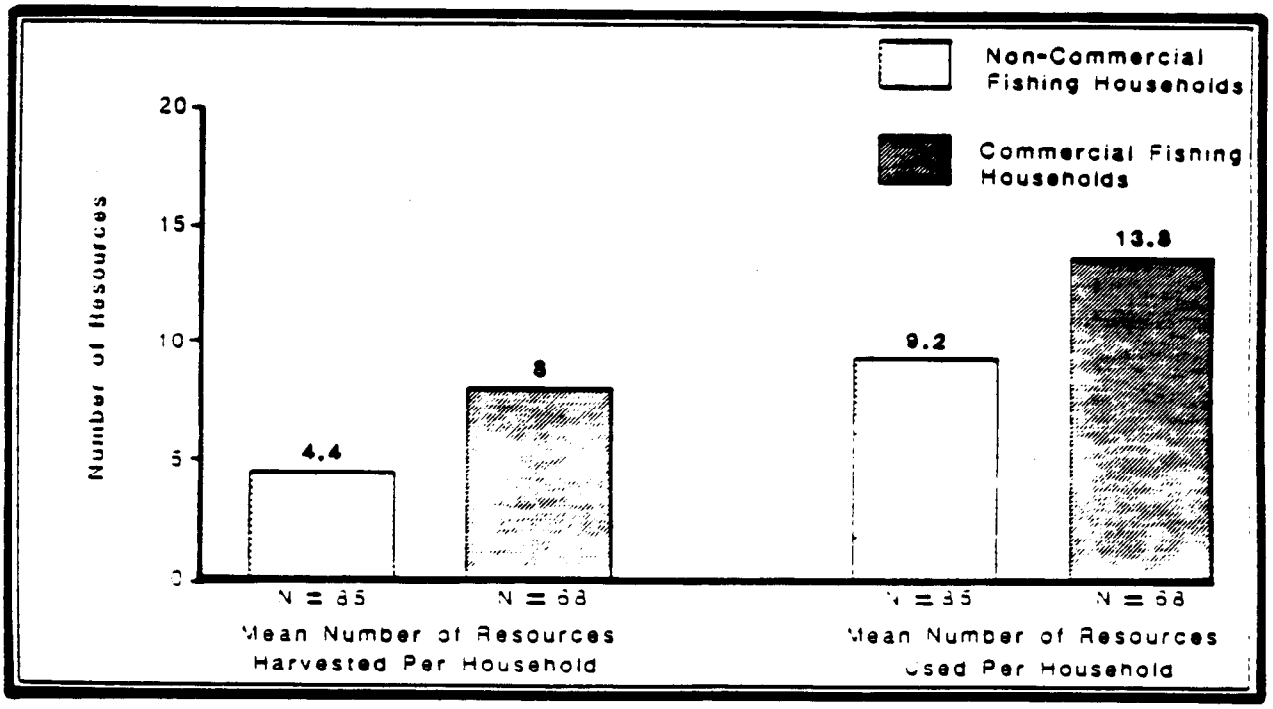


FIGURE 13. Comparison of Number of Resources Used and Harvested, Commercial and Non-Commercial Fishing Households.

SOURCE: FALL ET AL (1986)

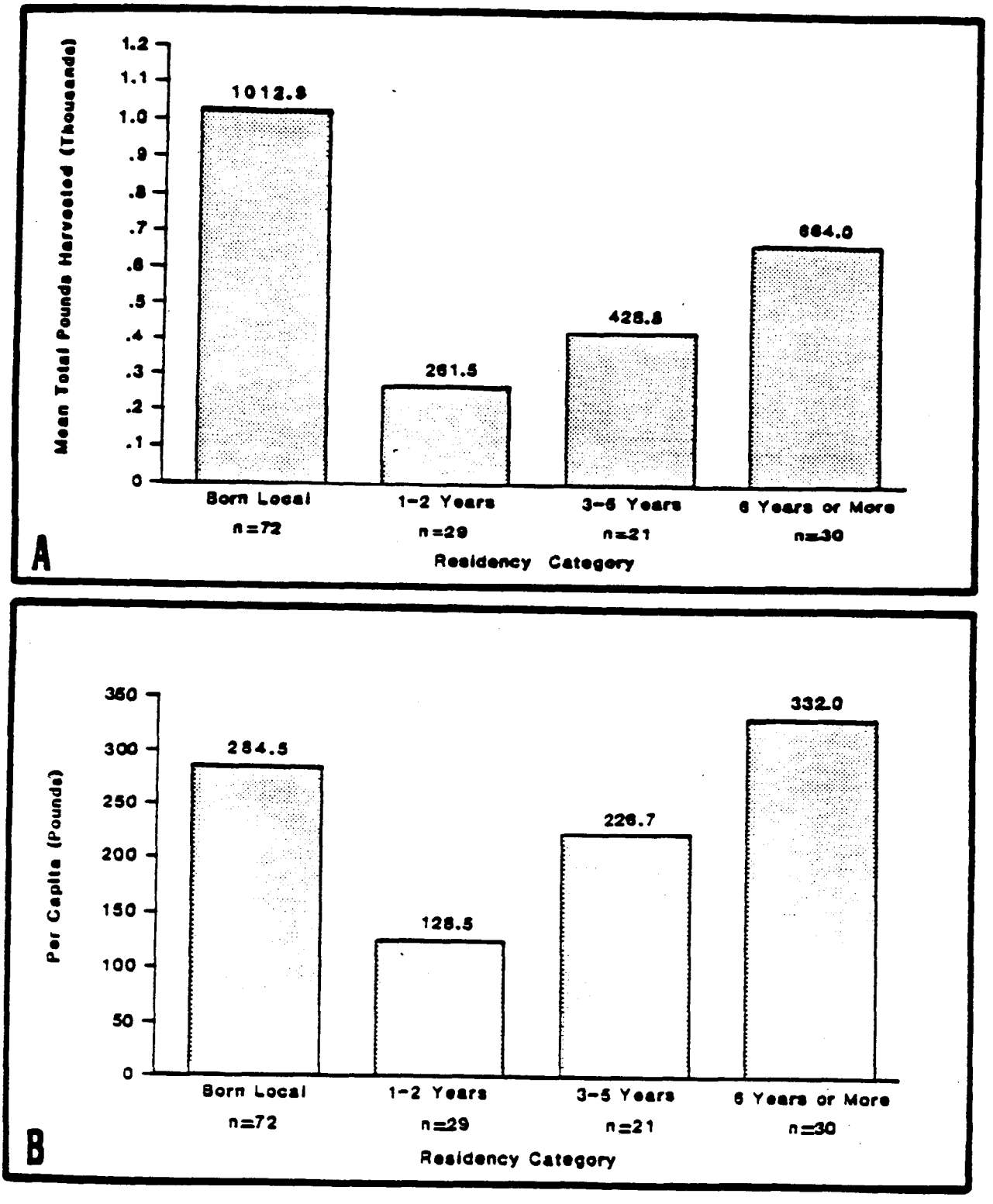


Figure 14. Resource Harvest Quantities by Length of Residency, Dillingham, 1984.

SOURCE: FALL ET AL (1986)

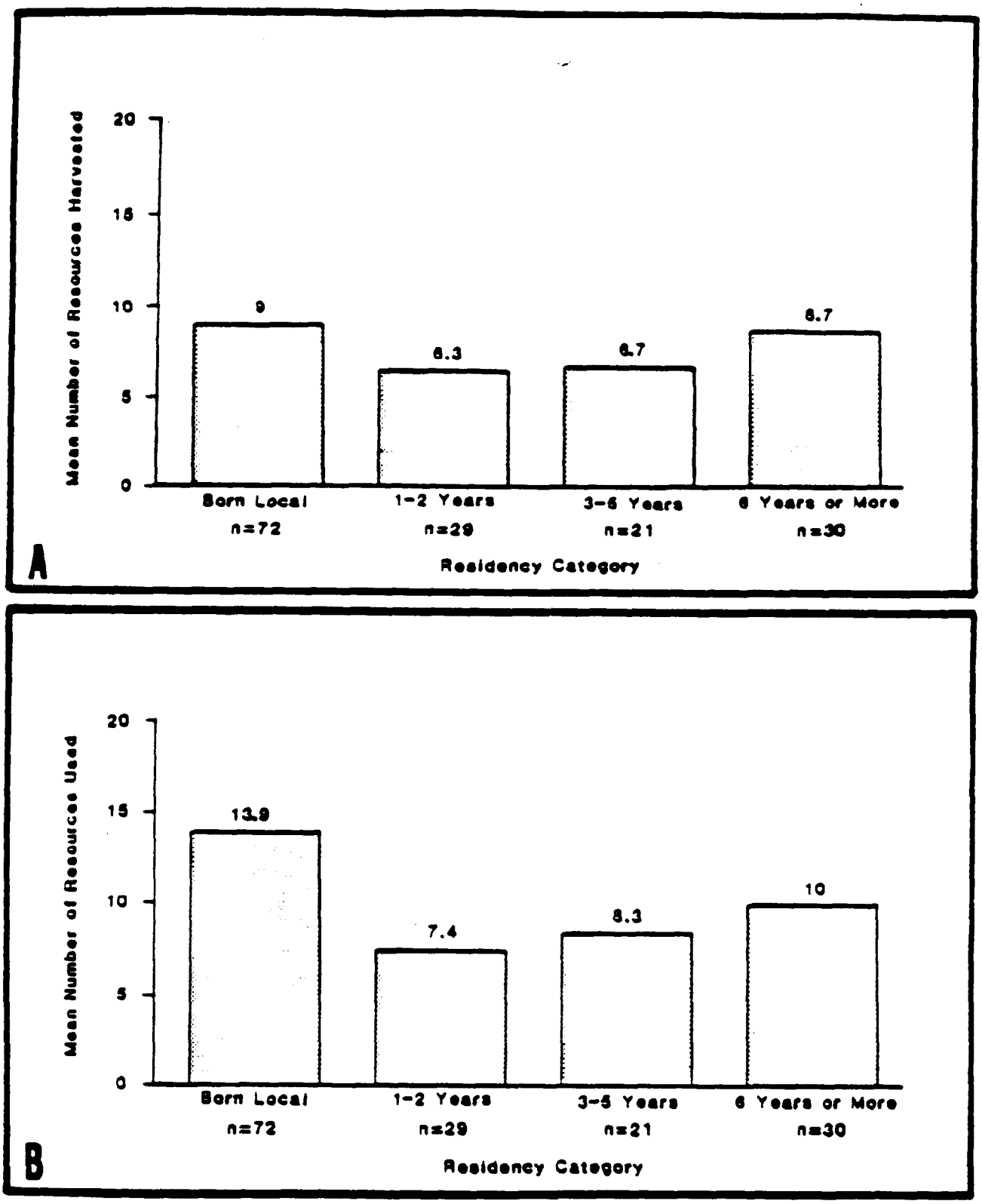
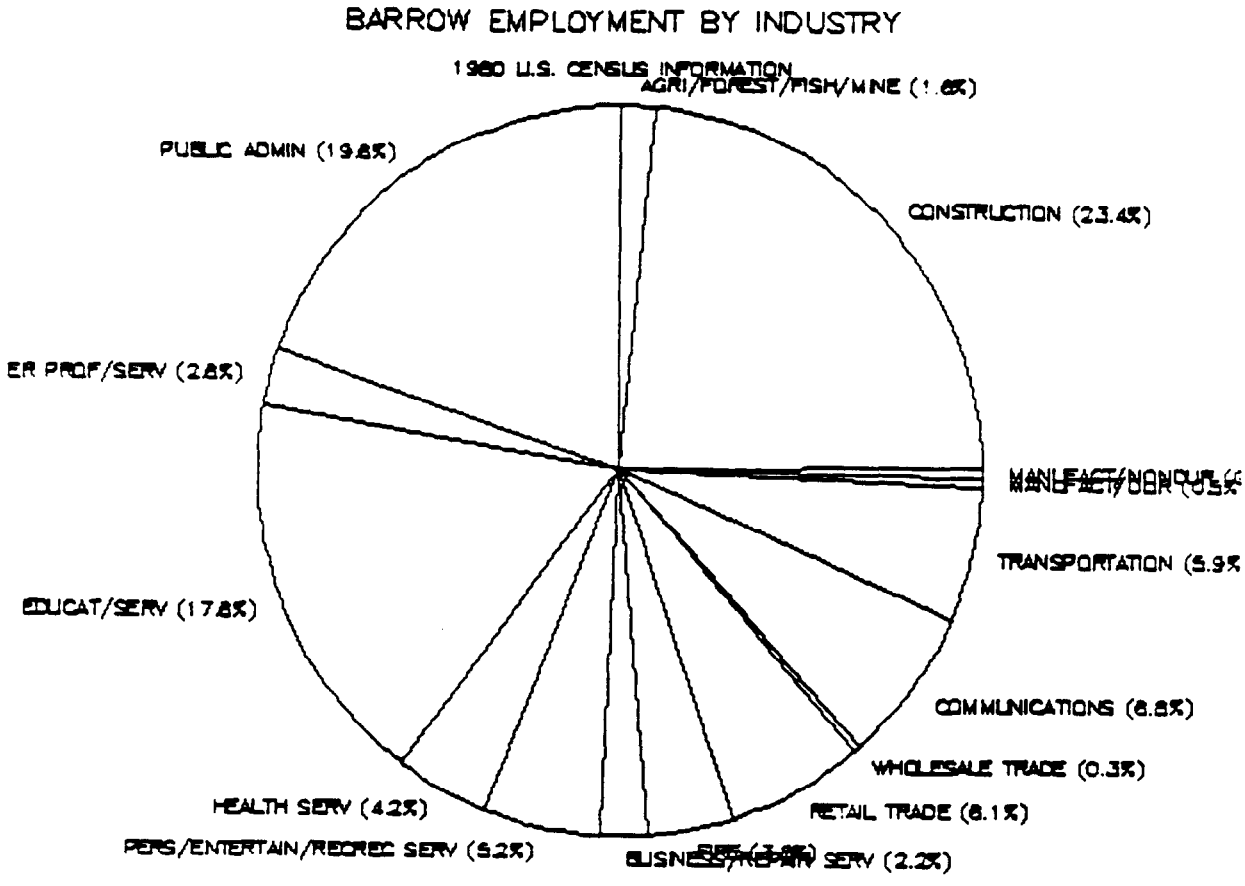


Figure 15. Number of Resources Harvested and Used by Length of Residency, Dillingham, 1984.

SOURCE: FALL ET AL (1986)

FIGURE 16


BARROW EMPLOYMENT BY INDUSTRY
1980 U.S. CENSUS INFORMATION
AGRI/FOREST/FISH/MINE (1.6%)
CONSTRUCTION (23.4%)
TRANSPORTATION (5.9%
COMMUNICATIONS (6.8%)
WHOLESALE TRADE (0.3%)
RETAIL TRADE (8.1%)
BUSINESS/REPAIR SERV (2.2%)
PERS/ENTERTAIN/RECREC SERV (5.2%)
HEALTH SERV (4.2%)
EDUCAT/SERV (17.8%)
ER PROF/SERV (2.8%)
PUBLIC ADMIN (19.8%)

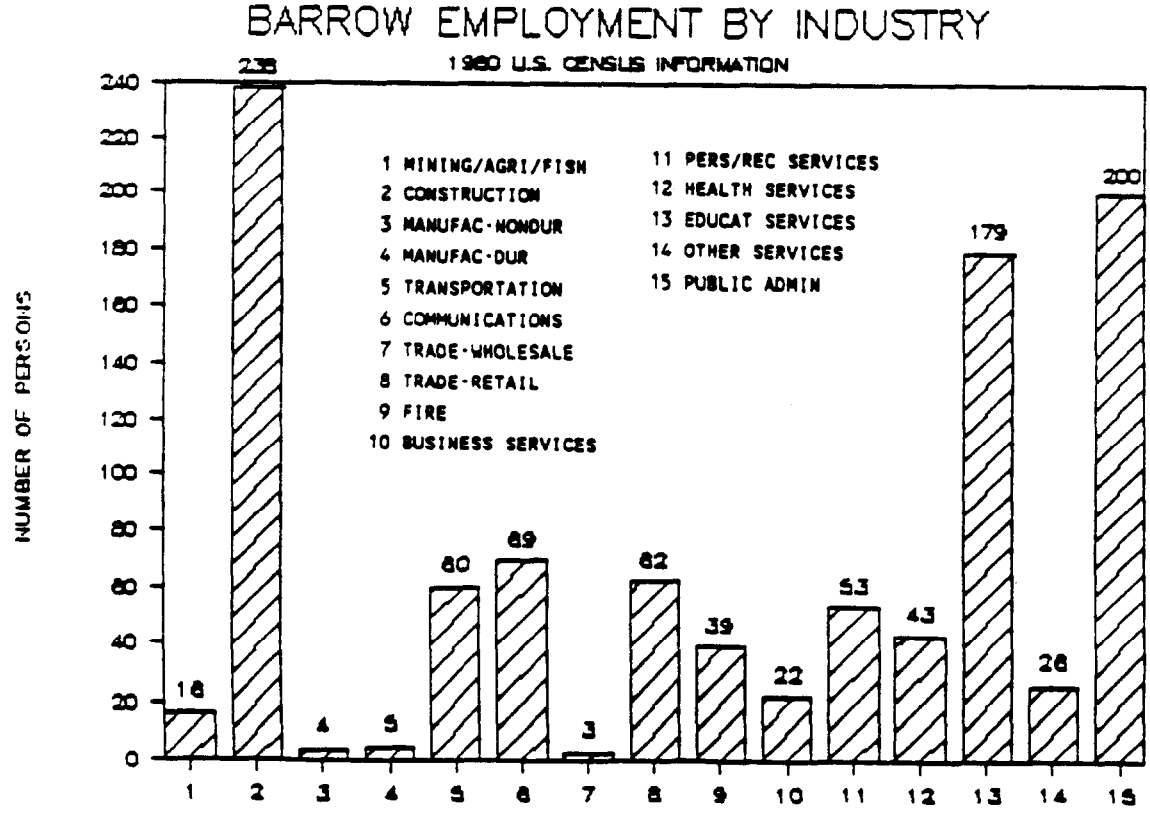

BARROW EMPLOYMENT BY INDUSTRY
1980 U.S. CENSUS INFORMATION
NUMBER OF PERSONS
1 MINING/AGRI/FISH
2 CONSTRUCTION
3 MANUFAC-NONDUR
4 MANUFAC-DUR
5 TRANSPORTATION
6 COMMUNICATIONS
7 TRADE-WHOLESALE
8 TRADE-RETAIL
9 FIRE
10 BUSINESS SERVICES
11 PERS/REC SERVICES
12 HEALTH SERVICES
13 EDUCAT SERVICES
14 OTHER SERVICES
15 PUBLIC ADMIN
18
238
4
5
80
89
3
82
39
22
53
43
179
26
200
0
20
40
60
80
100
120
140
160
180
200
220
240
1
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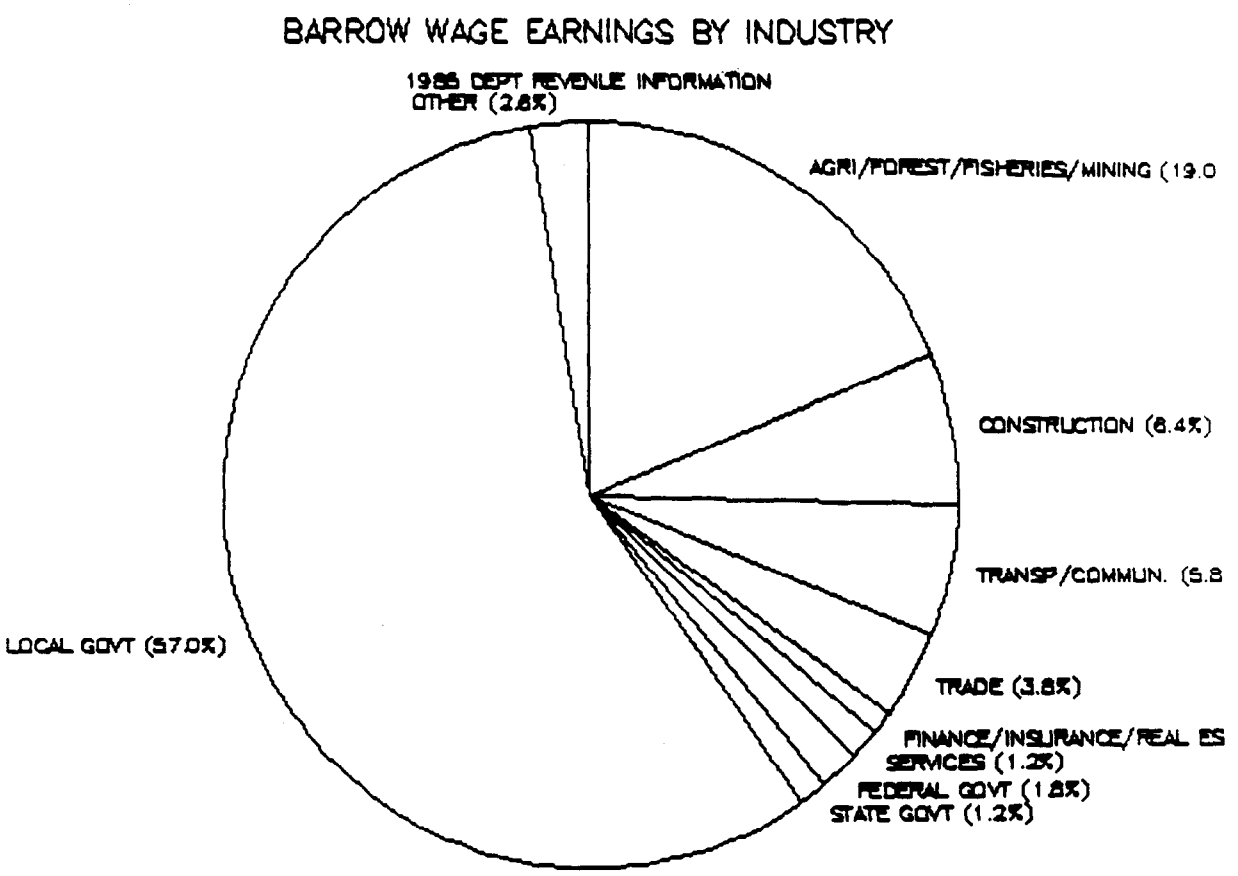
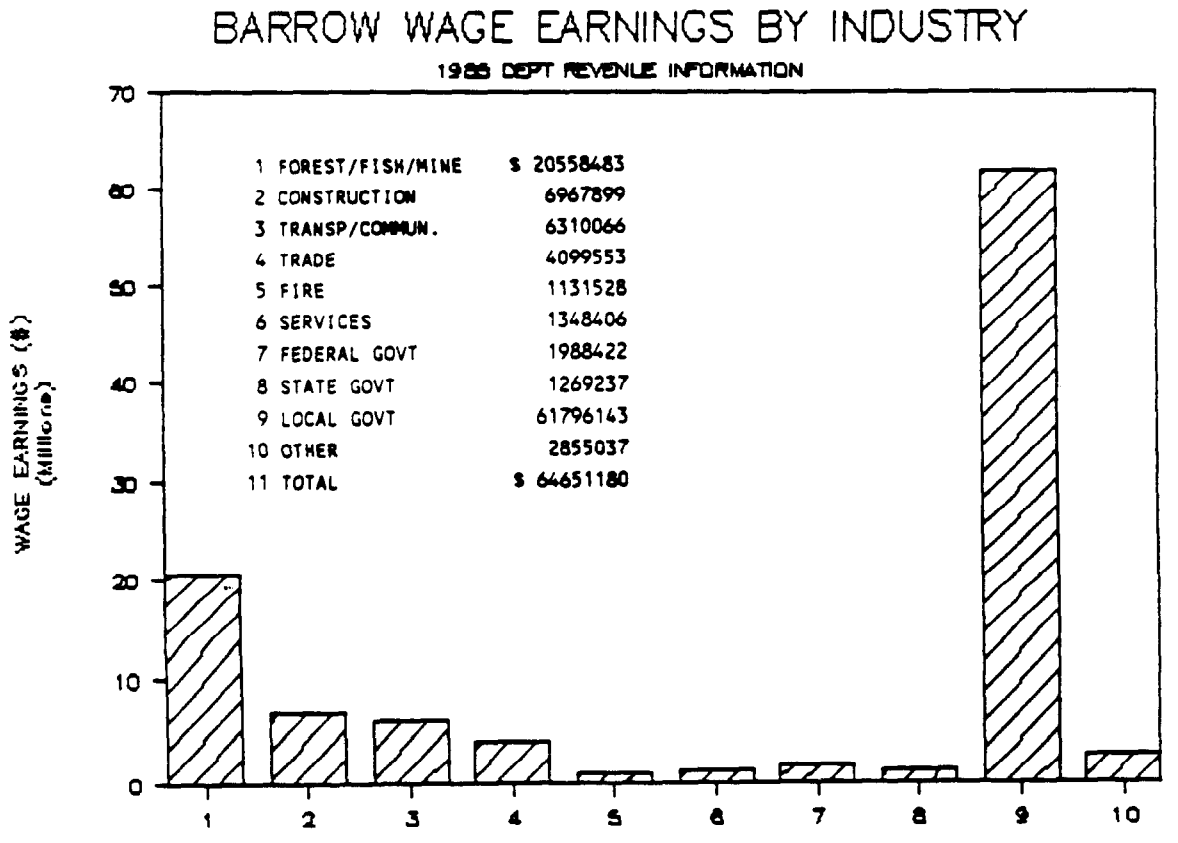
FIGURE 17


BARROW WAGE EARNINGS BY INDUSTRY
1986 DEPT REVENUE INFORMATION
OTHER (2.8%)
AGRI/FOREST/FISHERIES/MINING (19.0
CONSTRUCTION (8.4%)
TRANSP/COMMUN. (5.8
TRADE (3.8%)
FINANCE/INSURANCE/REAL ES
SERVICES (1.2%)
FEDERAL GOVT (1.8%)
STATE GOVT (1.2%)
LOCAL GOVT (57.0%)


BARROW WAGE EARNINGS BY INDUSTRY
1986 DEPT REVENUE INFORMATION
1 FOREST/FISH/MINE $ 20558483
2 CONSTRUCTION 6967899
3 TRANSP/COMMUN. 6310066
4 TRADE 4099553
5 FIRE 1131528
6 SERVICES 1348406
7 FEDERAL GOVT 1988422
8 STATE GOVT 1269237
9 LOCAL GOVT 61796143
10 OTHER 2855037
11 TOTAL $ 64651180
WAGE EARNINGS ($)
(Millions)
70
60
50
40
30
20
10
0
1
2
3
4
5
6
7
8
9
10

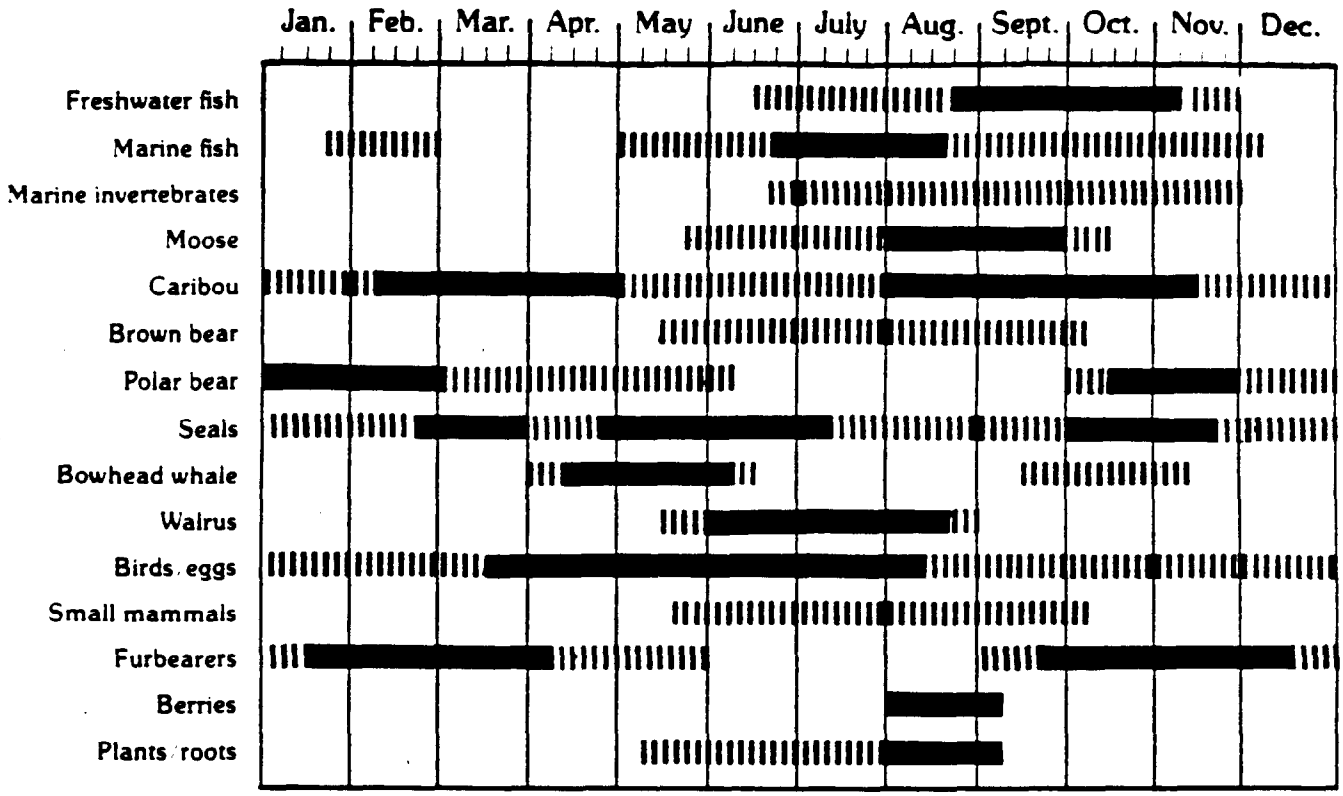


Figure 18. Annual round of harvest activities by Barrow residents. Solid line indicates time when harvest usually takes place. Broken line indicates occasional harvest effort (Schneider et al. 1980).

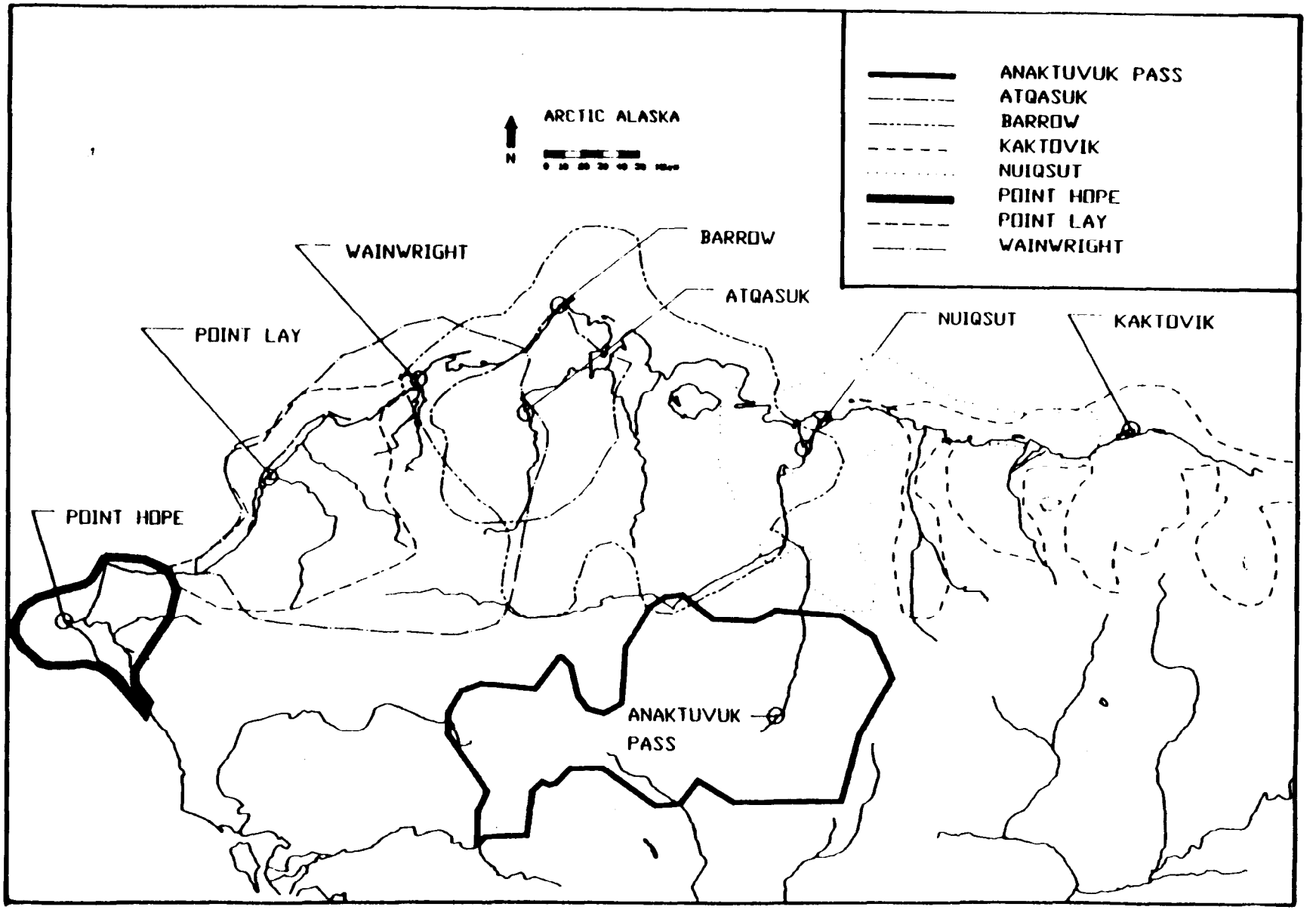
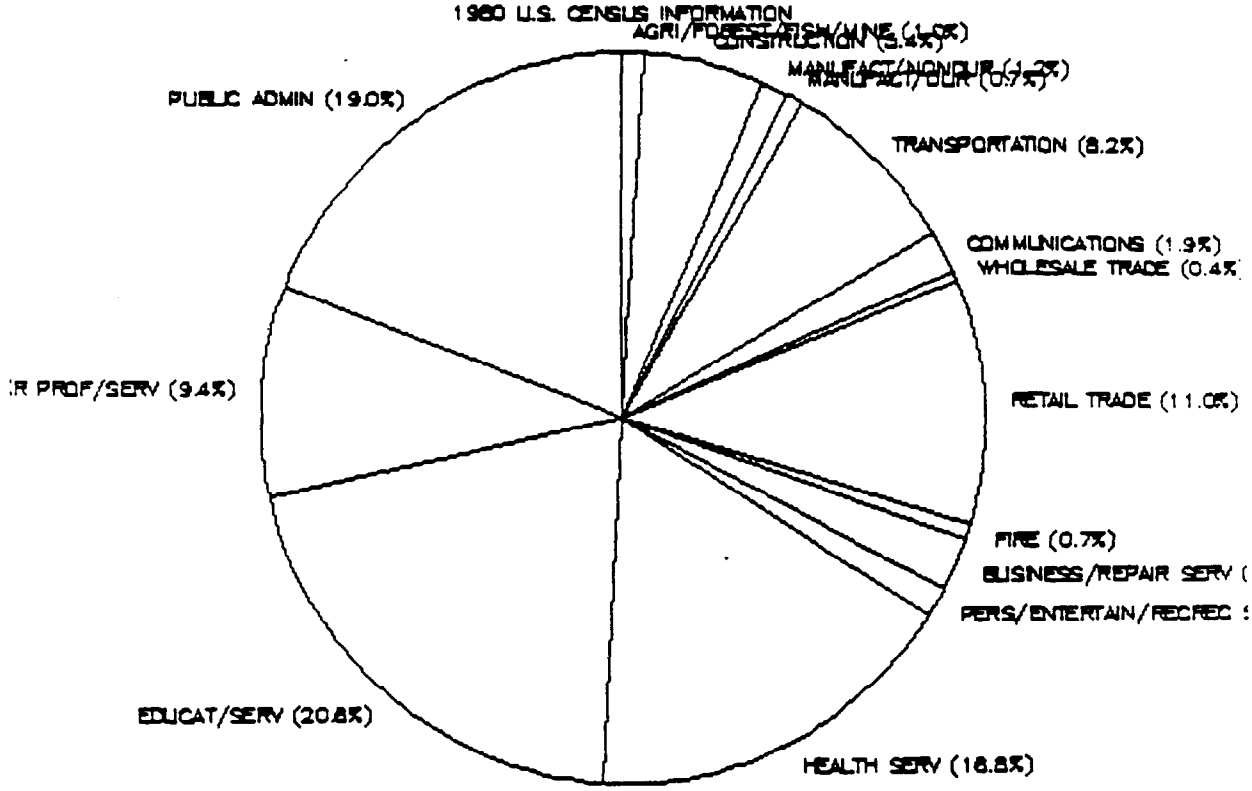


FIG. 19. Subsistence use areas for North Slope communities (Pedersen 1979).

FIGURE 20

BETHEL EMPLOYMENT BY INDUSTRY



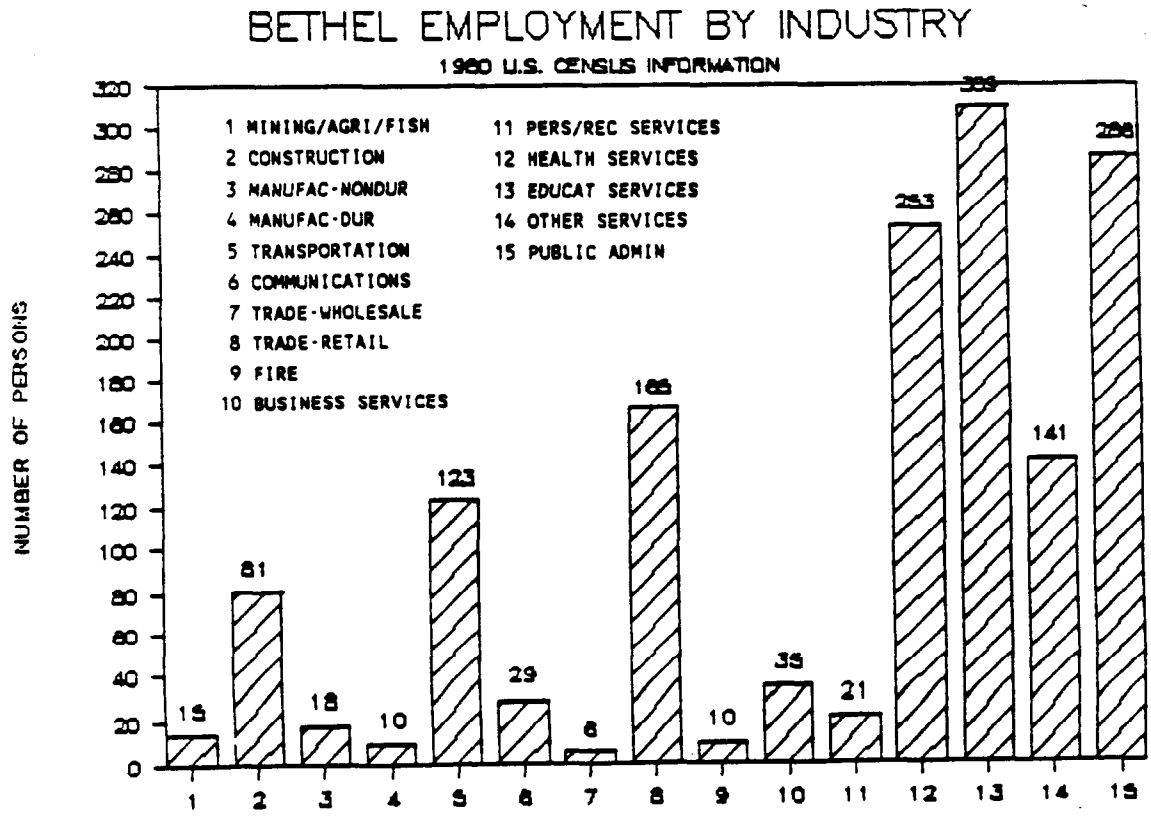
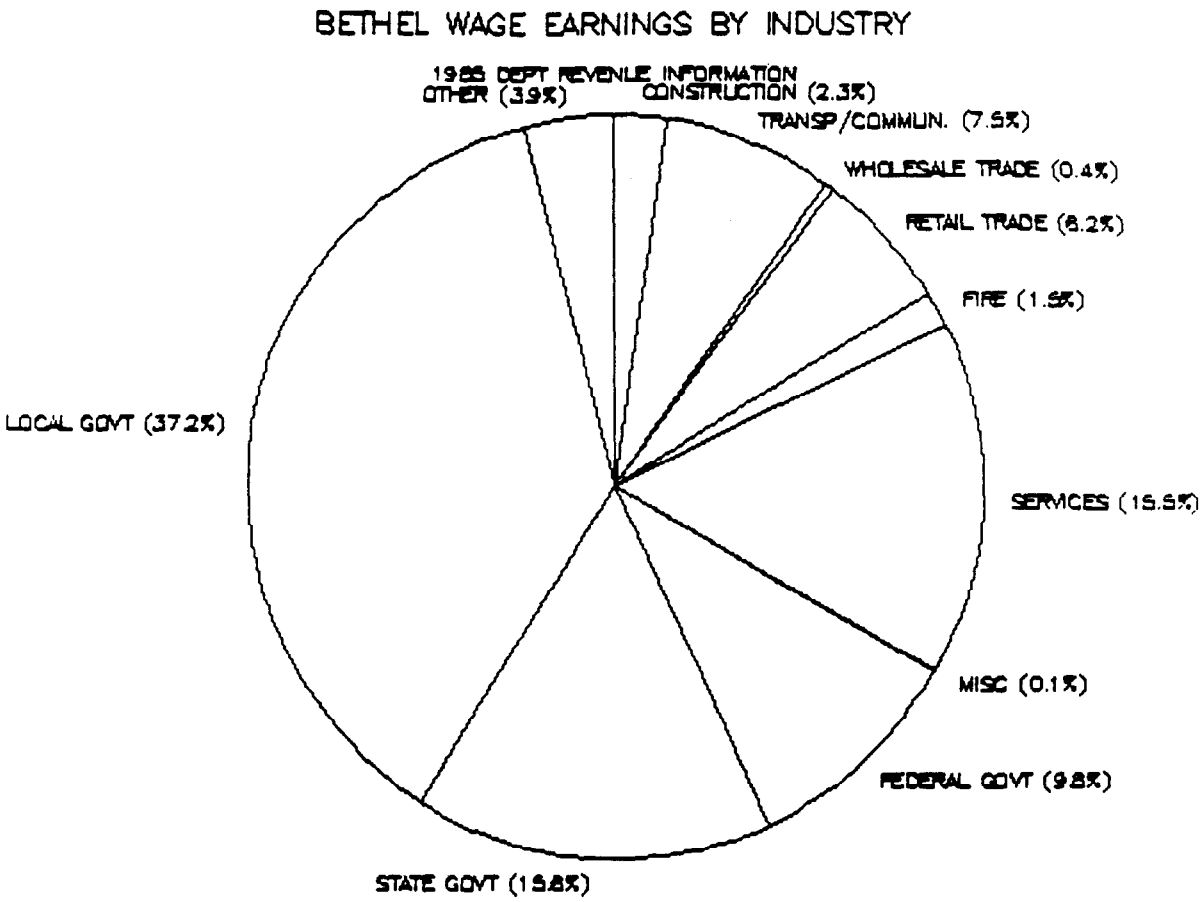
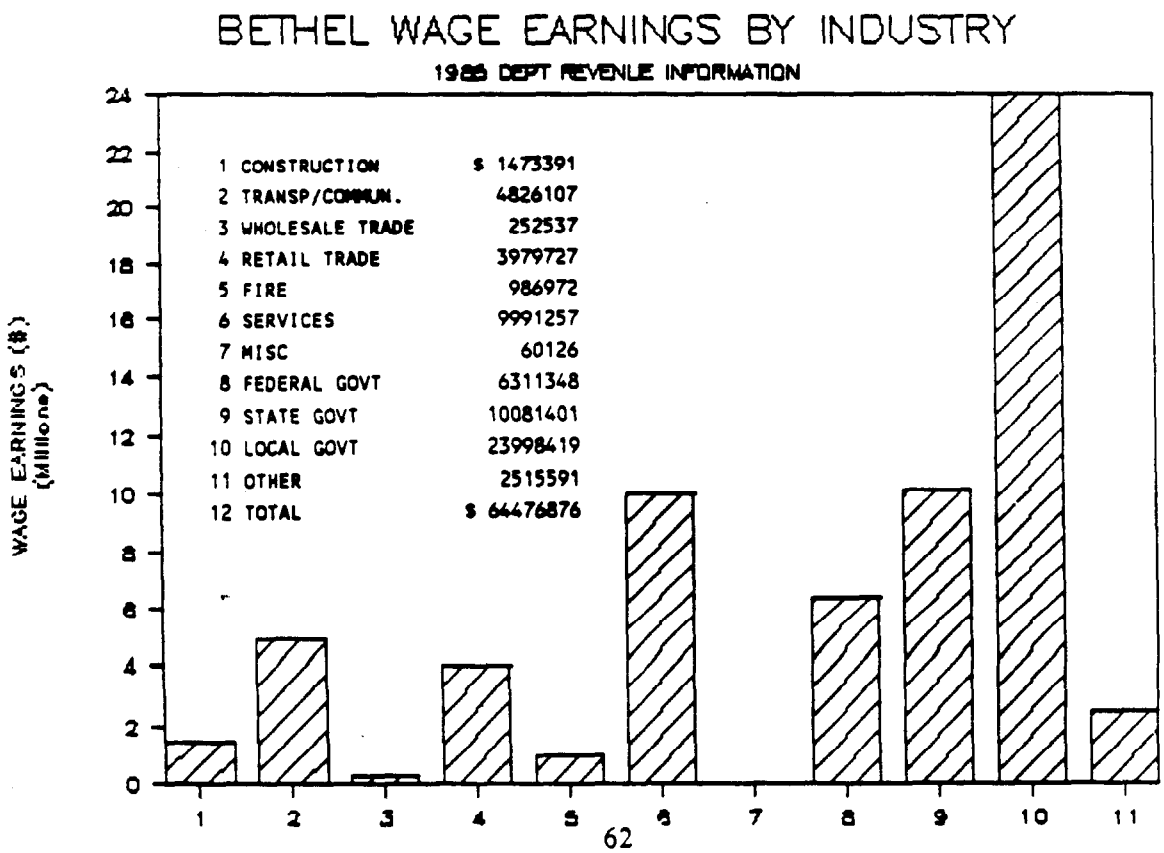


FIGURE 21


BETHEL WAGE EARNINGS BY INDUSTRY
1985 DEPT REVENUE INFORMATION
OTHER (3.9%)
CONSTRUCTION (2.3%)
TRANSP/COMMUN. (7.5%)
WHOLESALE TRADE (0.4%)
RETAIL TRADE (6.2%)
FIRE (1.5%)
LOCAL GOVT (37.2%)
SERVICES (15.5%)
MISC (0.1%)
FEDERAL GOVT (9.8%)
STATE GOVT (15.6%)


BETHEL WAGE EARNINGS BY INDUSTRY
1985 DEPT REVENUE INFORMATION
WAGE EARNINGS ($)
(Millions)
1 CONSTRUCTION $ 1473391
2 TRANSP/COMMUN. 4826107
3 WHOLESALE TRADE 252537
4 RETAIL TRADE 3979727
5 FIRE 986972
6 SERVICES 9991257
7 MISC 60126
8 FEDERAL GOVT 6311348
9 STATE GOVT 10081401
10 LOCAL GOVT 23998419
11 OTHER 2515591
12 TOTAL $ 64476876
0
2
4
6
8
10
12
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16
18
20
22
24
1
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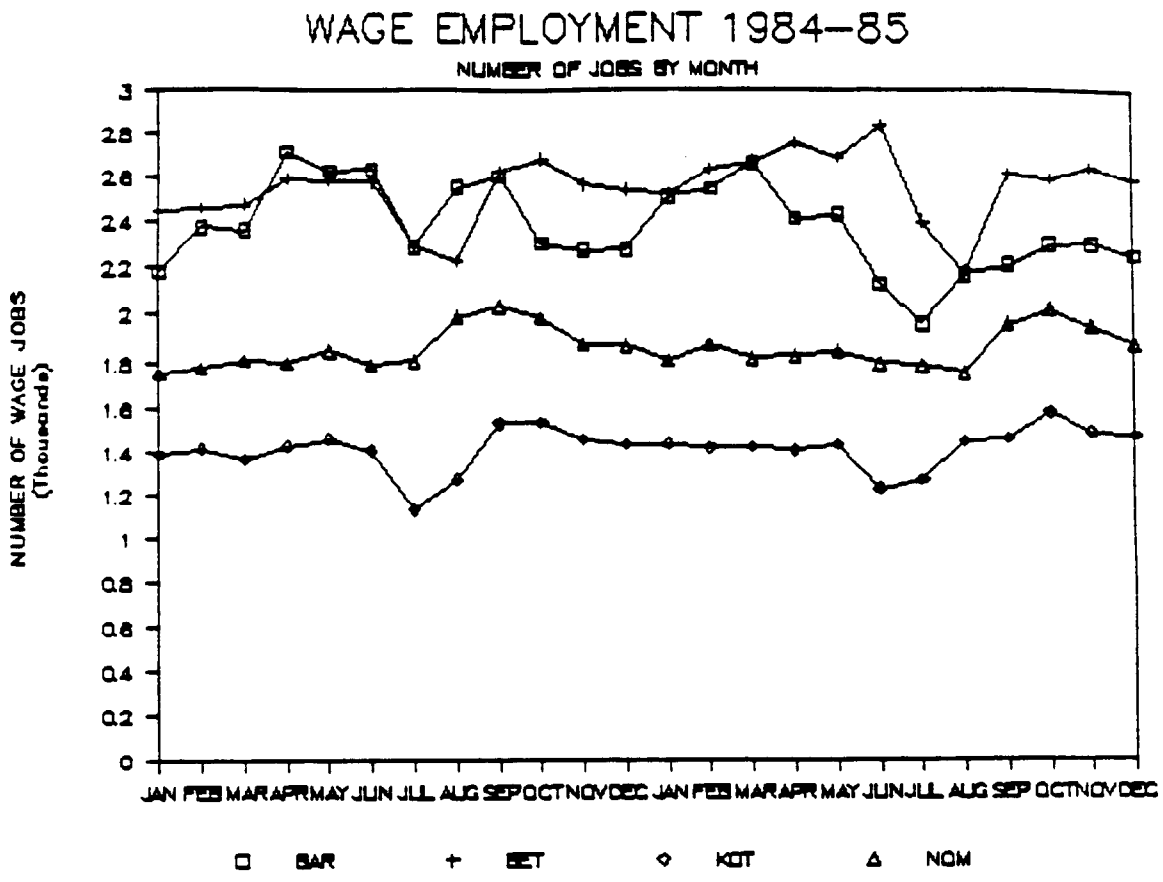
FIGURE 22



SOURCE: ALASKA DEPARTMENT OF REVENUE

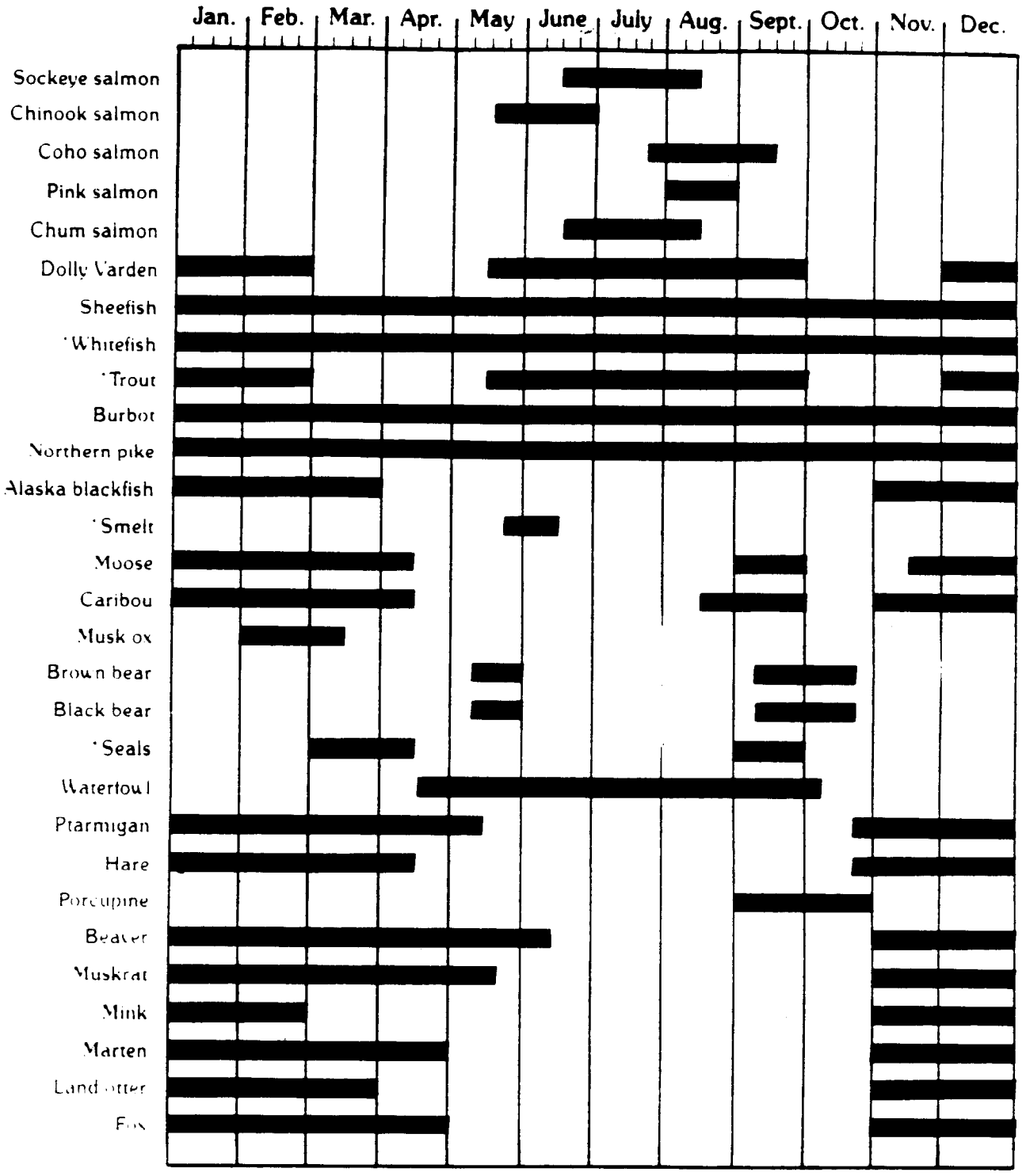


Figure 23. Annual round of subsistence harvest activities by residents of Bethel, 1985 (Pete, pers. comm.)

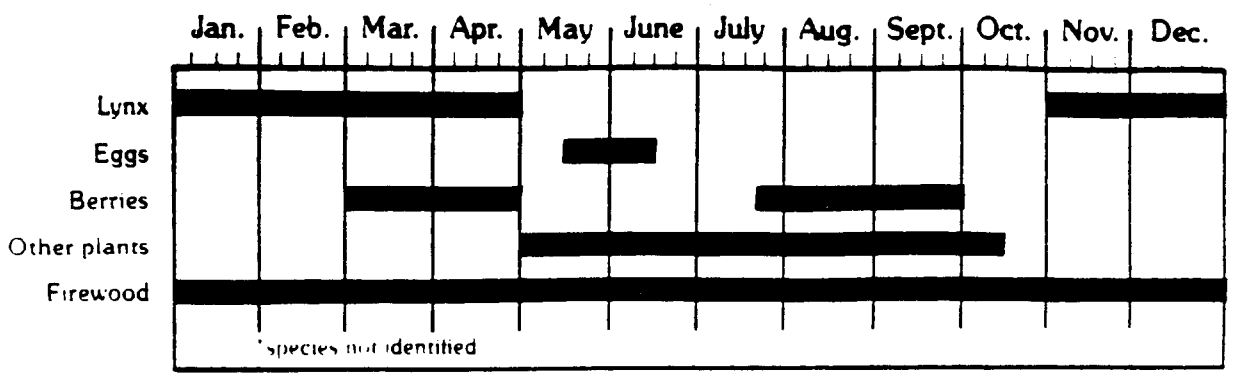
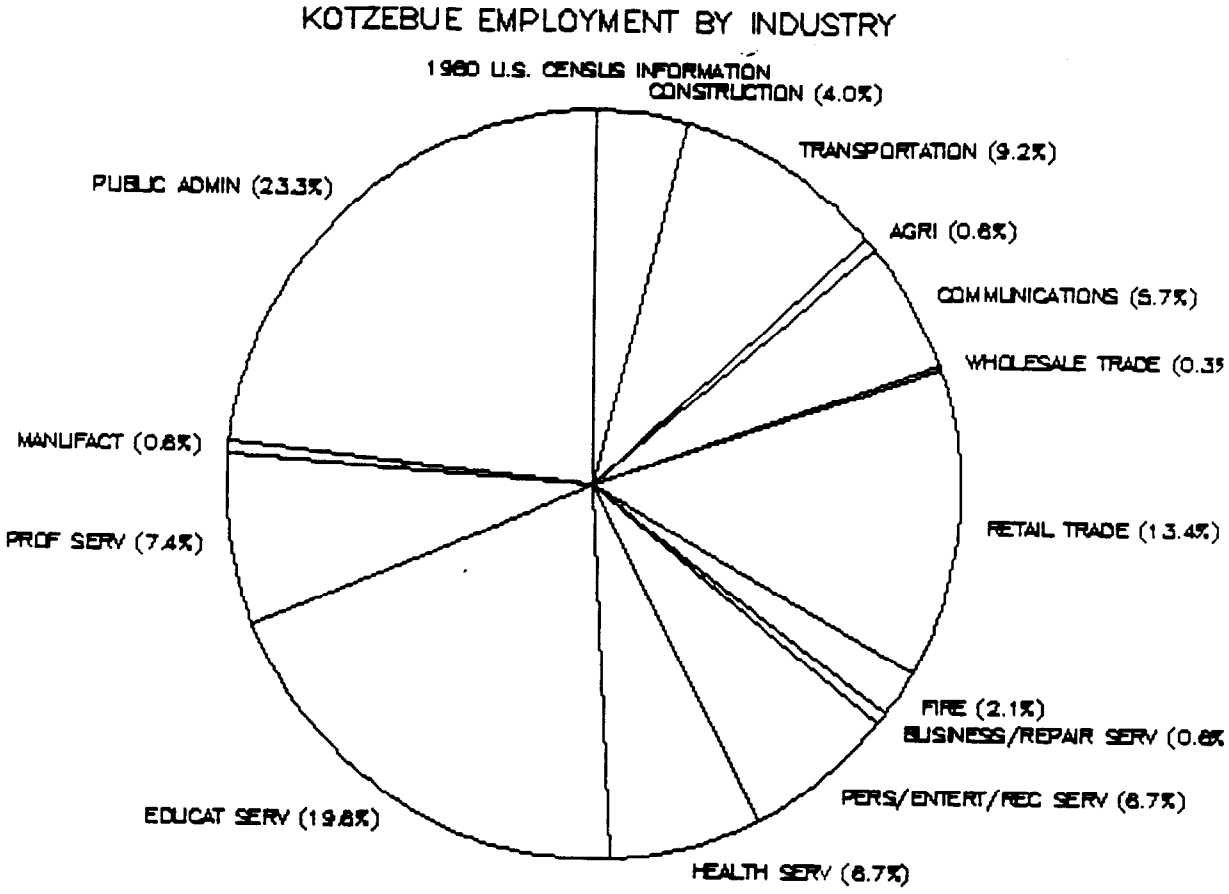


Figure 23. (continued).

FIGURE 24


KOTZEBUE EMPLOYMENT BY INDUSTRY
1980 U.S. CENSUS INFORMATION
CONSTRUCTION (4.0%)
TRANSPORTATION (9.2%)
AGRI (0.6%)
COMMUNICATIONS (5.7%)
WHOLESALE TRADE (0.3%
RETAIL TRADE (13.4%)
FIRE (2.1%)
BUSINESS/REPAIR SERV (0.6%
PERS/ENTERT/REC SERV (6.7%)
HEALTH SERV (6.7%)
EDUCAT SERV (19.8%)
PROF SERV (7.4%)
MANUFACT (0.8%)
PUBLIC ADMIN (23.3%)

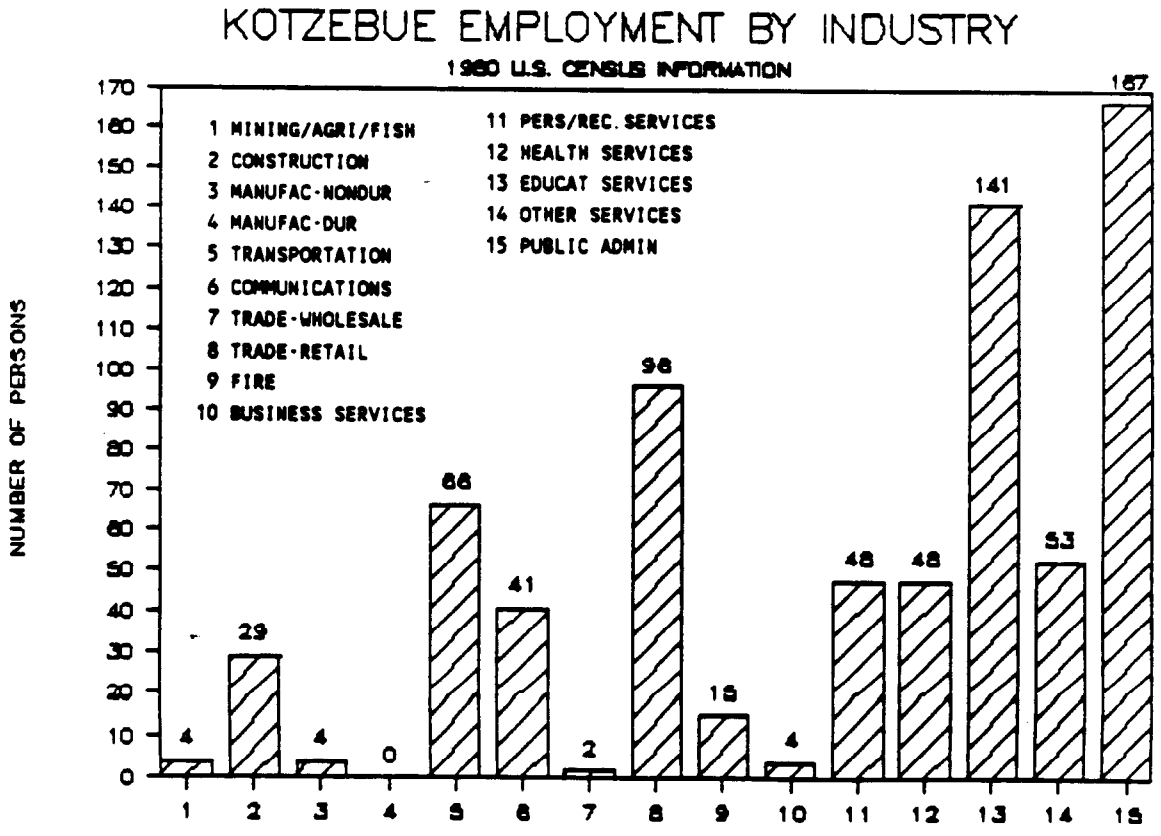

KOTZEBUE EMPLOYMENT BY INDUSTRY
1980 U.S. CENSUS INFORMATION
NUMBER OF PERSONS
1 MINING/AGRI/FISH
2 CONSTRUCTION
3 MANUFAC-NONDUR
4 MANUFAC-DUR
5 TRANSPORTATION
6 COMMUNICATIONS
7 TRADE-WHOLESALE
8 TRADE-RETAIL
9 FIRE
10 BUSINESS SERVICES
11 PERS/REC. SERVICES
12 HEALTH SERVICES
13 EDUCAT SERVICES
14 OTHER SERVICES
15 PUBLIC ADMIN
4
29
4
0
66
41
2
96
18
4
48
48
141
53
167
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
1
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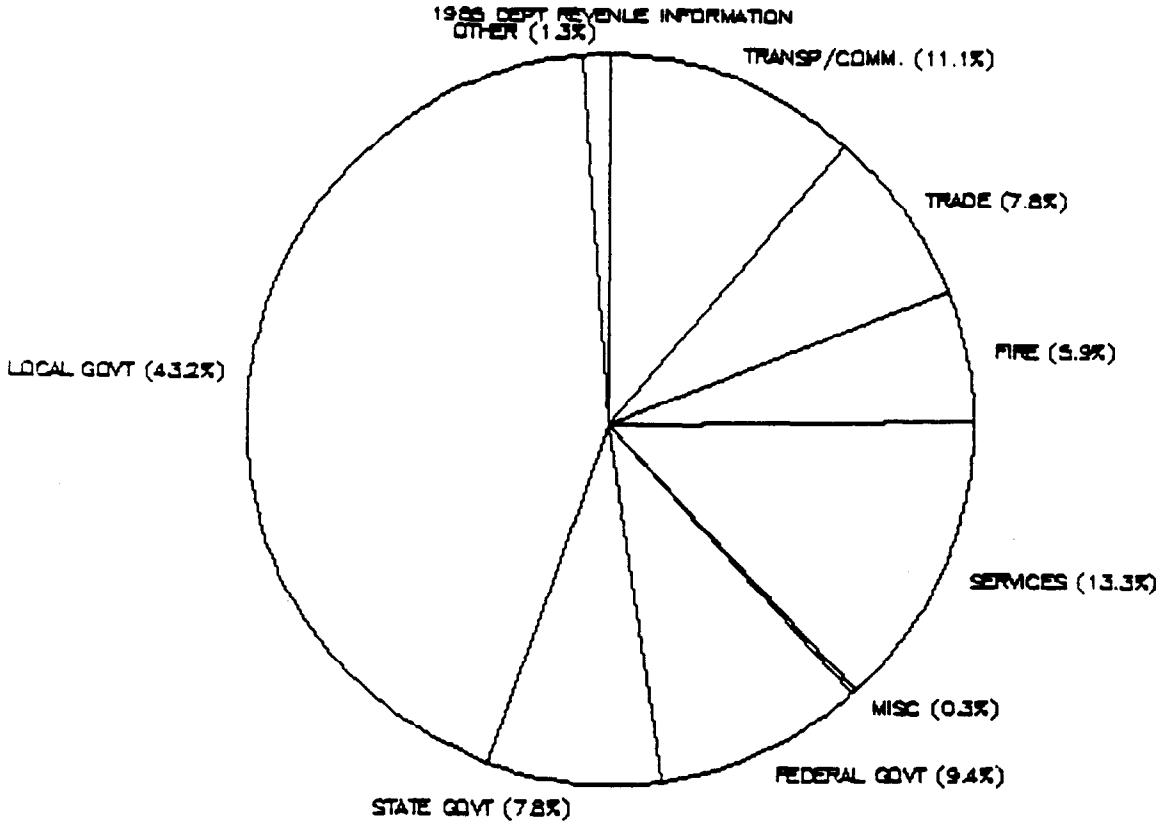
FIGURE 25

KOTZEBUE WAGE EARNINGS BY INDUSTRY



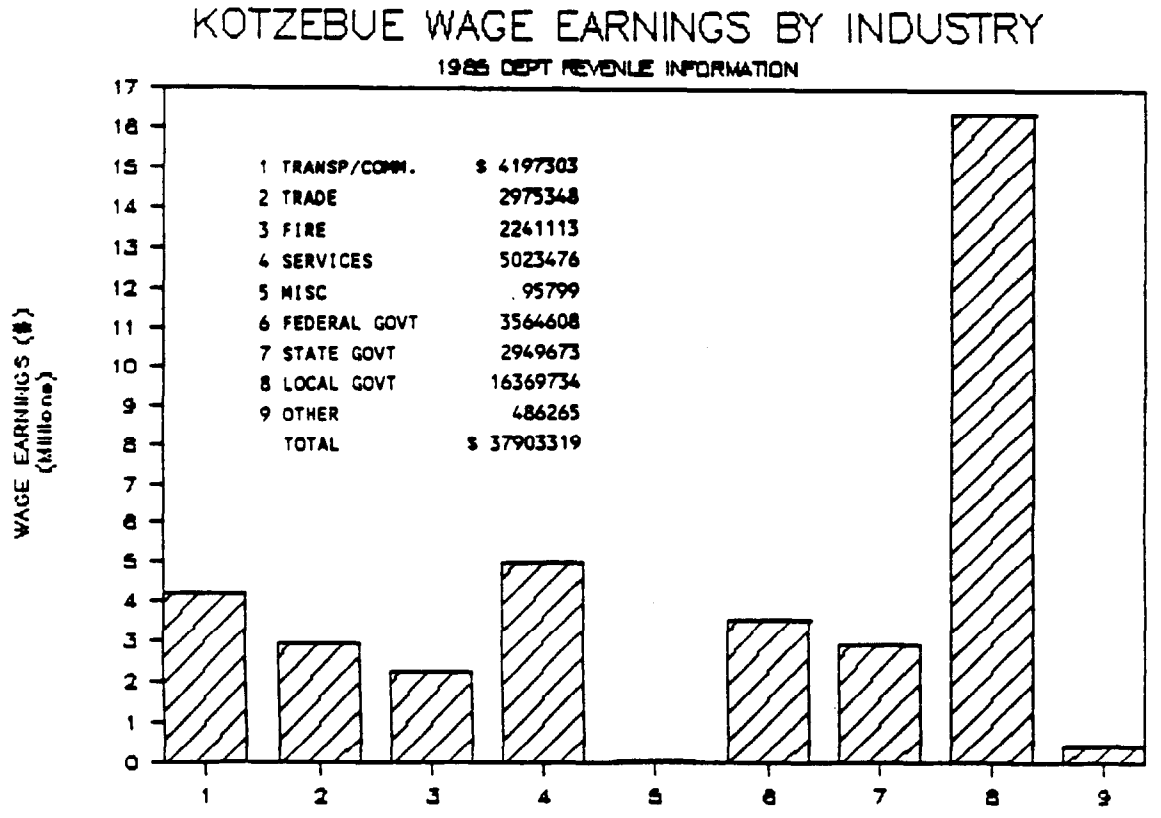
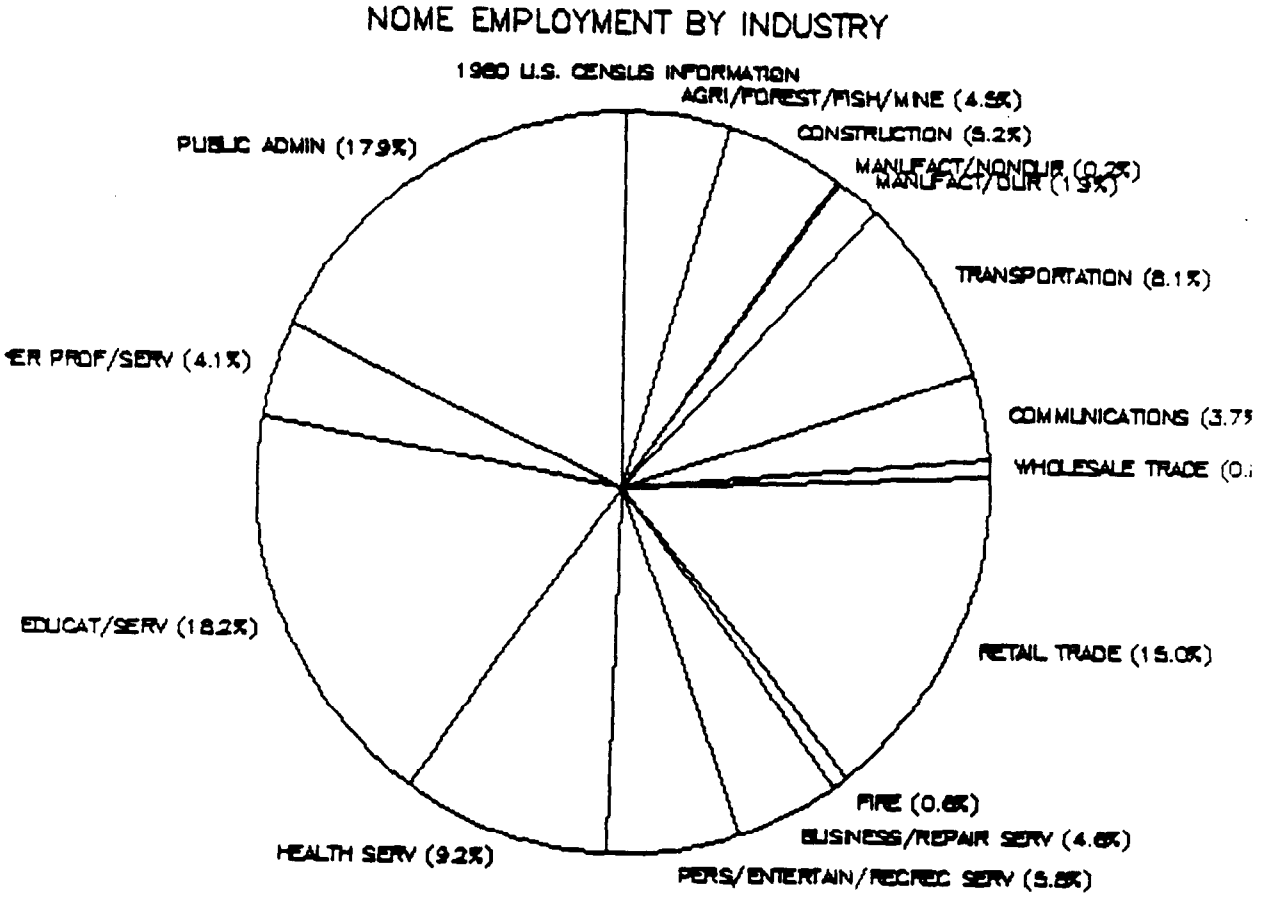


FIGURE 26


NOME EMPLOYMENT BY INDUSTRY
1980 U.S. CENSUS INFORMATION
AGRI/FOREST/FISH/MINE (4.5%)
CONSTRUCTION (5.2%)
MANUFACT/NONDUR (0.2%)
MANUFACT/DUR (1.9%)
TRANSPORTATION (8.1%)
COMMUNICATIONS (3.7%
WHOLESALE TRADE (0.
RETAIL TRADE (15.0%)
FIRE (0.6%)
BUSINESS/REPAIR SERV (4.6%)
PERS/ENTERTAIN/RECREC SERV (5.8%)
HEALTH SERV (9.2%)
EDUCAT/SERV (18.2%)
ER PROF/SERV (4.1%)
PUBLIC ADMIN (17.9%)

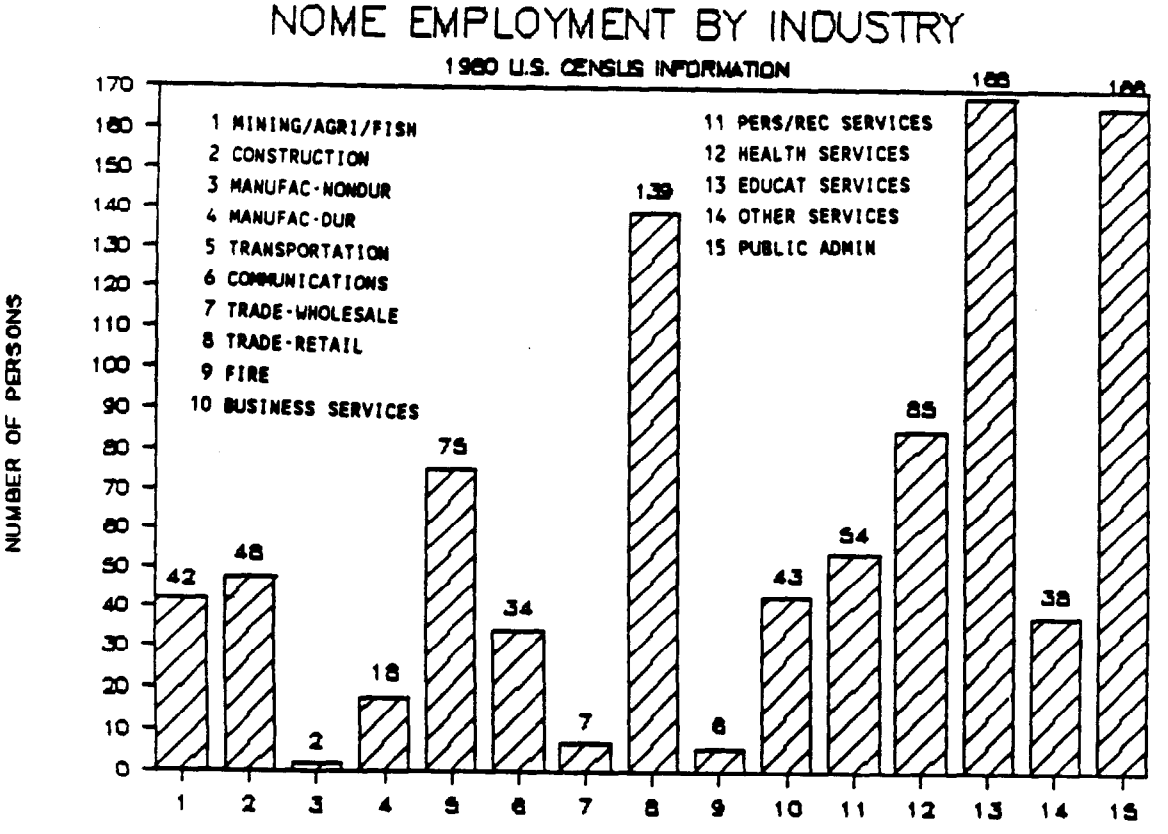

NOME EMPLOYMENT BY INDUSTRY
1980 U.S. CENSUS INFORMATION
NUMBER OF PERSONS
1 MINING/AGRI/FISH
2 CONSTRUCTION
3 MANUFAC-NONDUR
4 MANUFAC-DUR
5 TRANSPORTATION
6 COMMUNICATIONS
7 TRADE-WHOLESALE
8 TRADE-RETAIL
9 FIRE
10 BUSINESS SERVICES
11 PERS/REC SERVICES
12 HEALTH SERVICES
13 EDUCAT SERVICES
14 OTHER SERVICES
15 PUBLIC ADMIN
42
48
2
18
75
34
7
139
6
43
54
85
166
38
168
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
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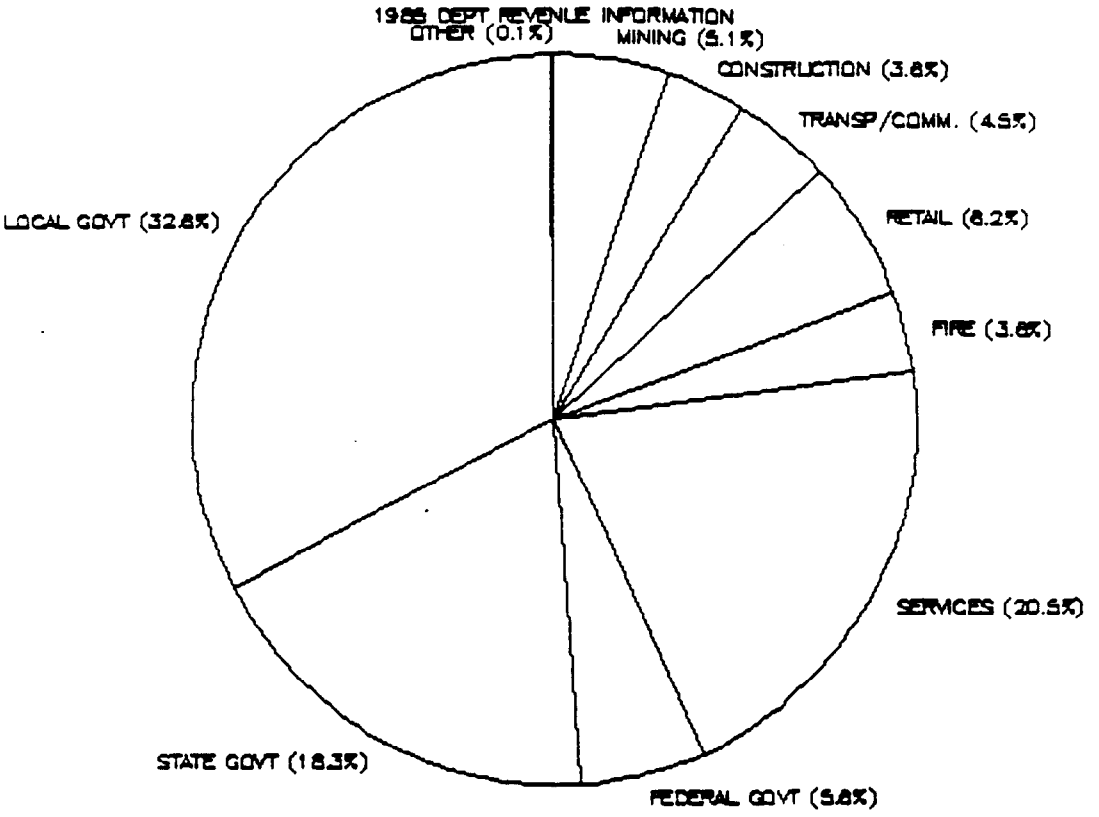
FIGURE 27

NOME WAGE EARNINGS BY INDUSTRY



NOME WAGE EARNINGS BY INDUSTRY

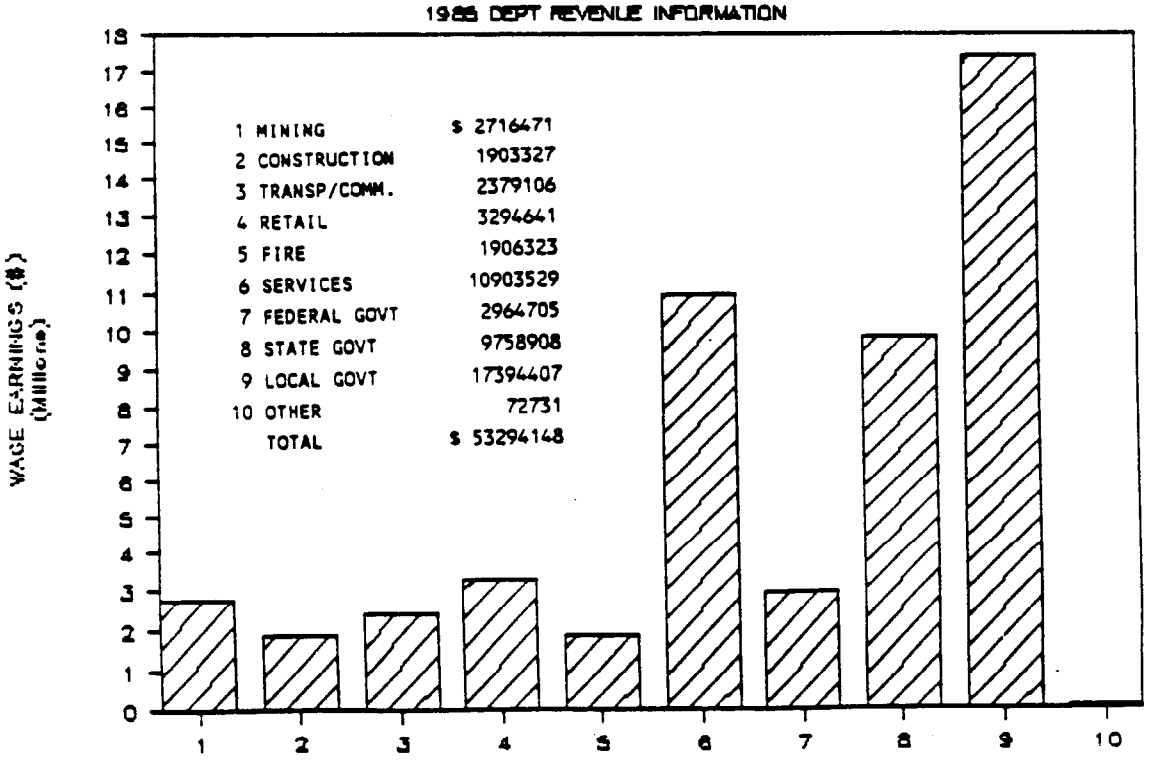
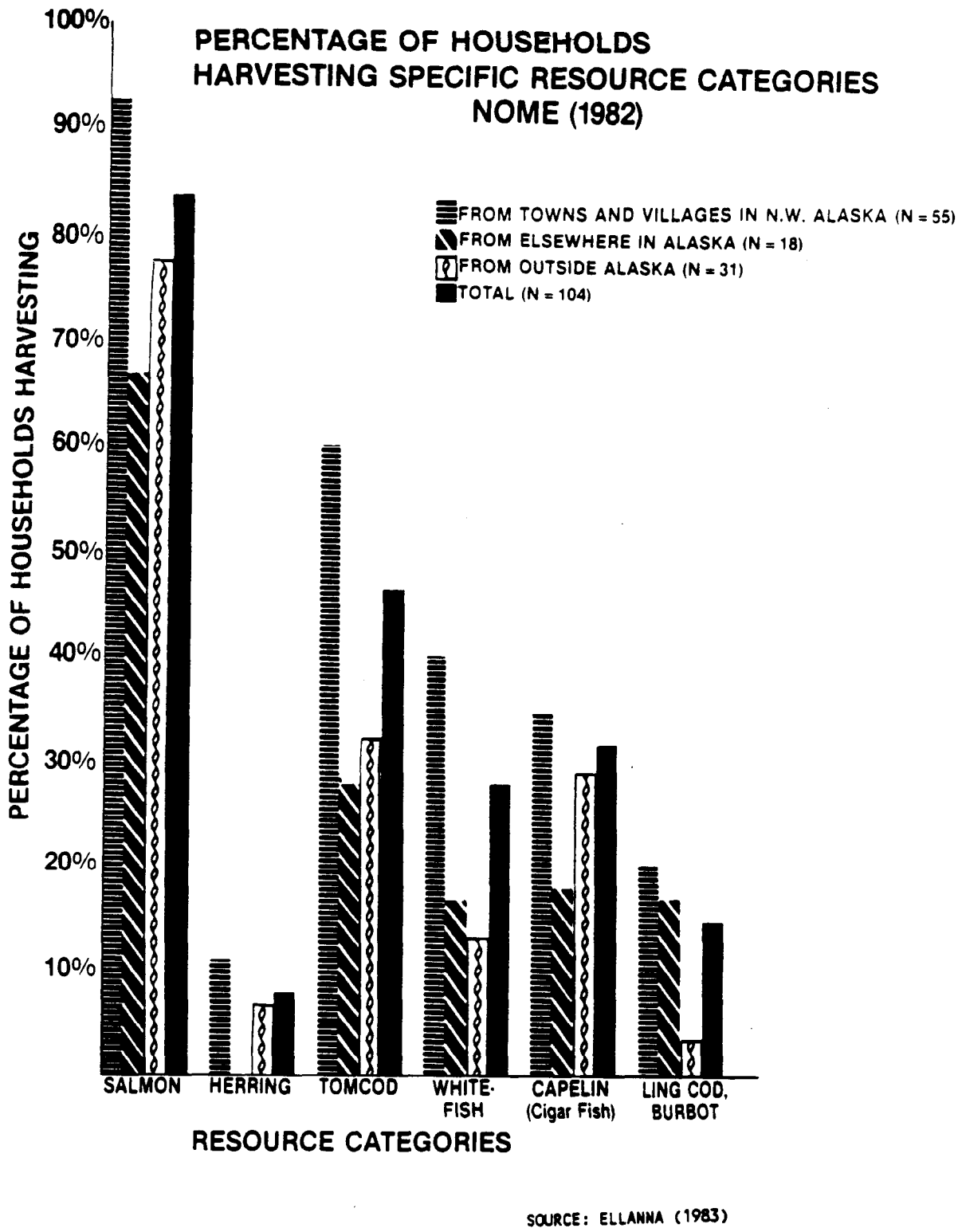


FIGURE 28



SOURCE: ELLANNA (1983)

FIGURE 28 (CONTINUED)

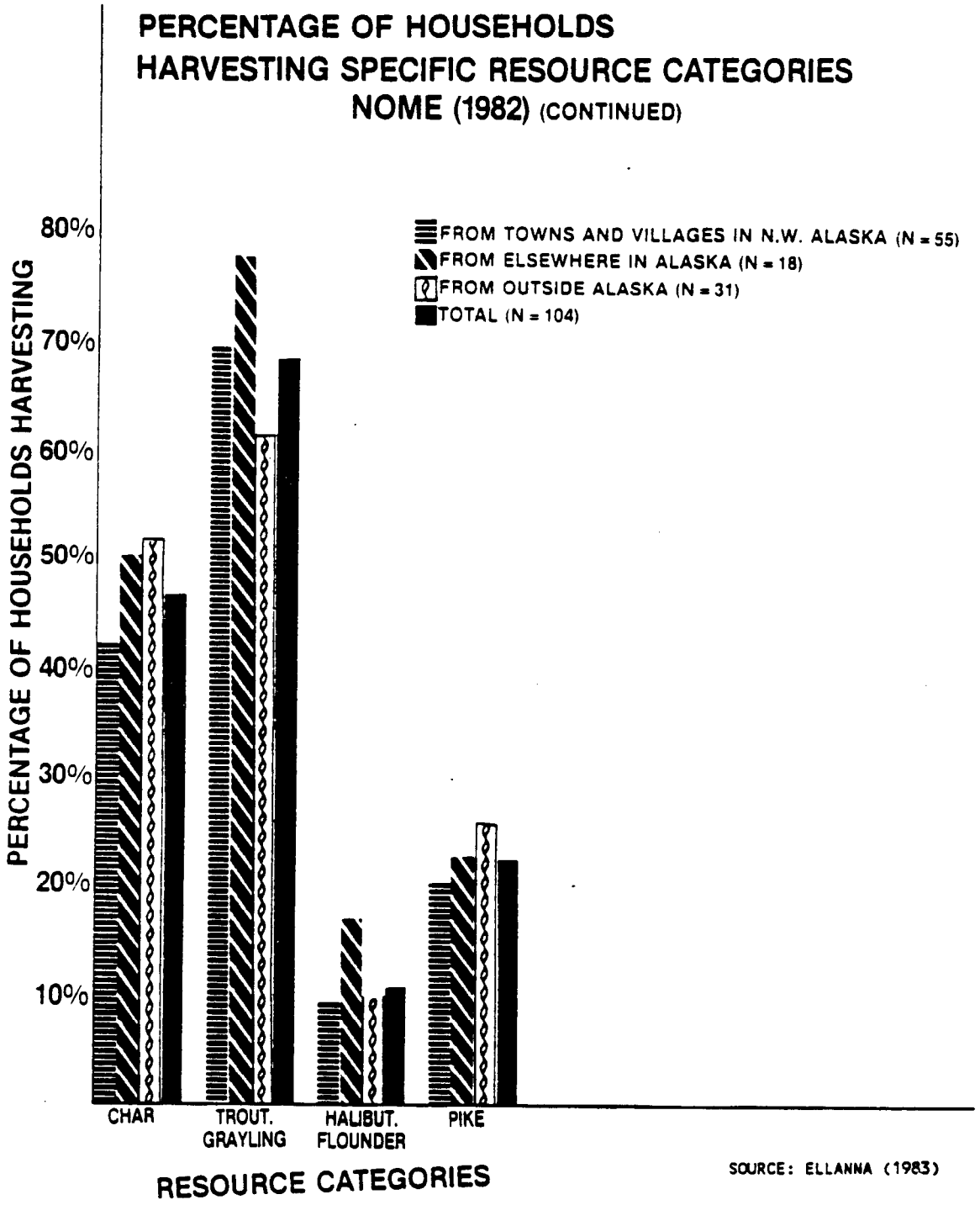
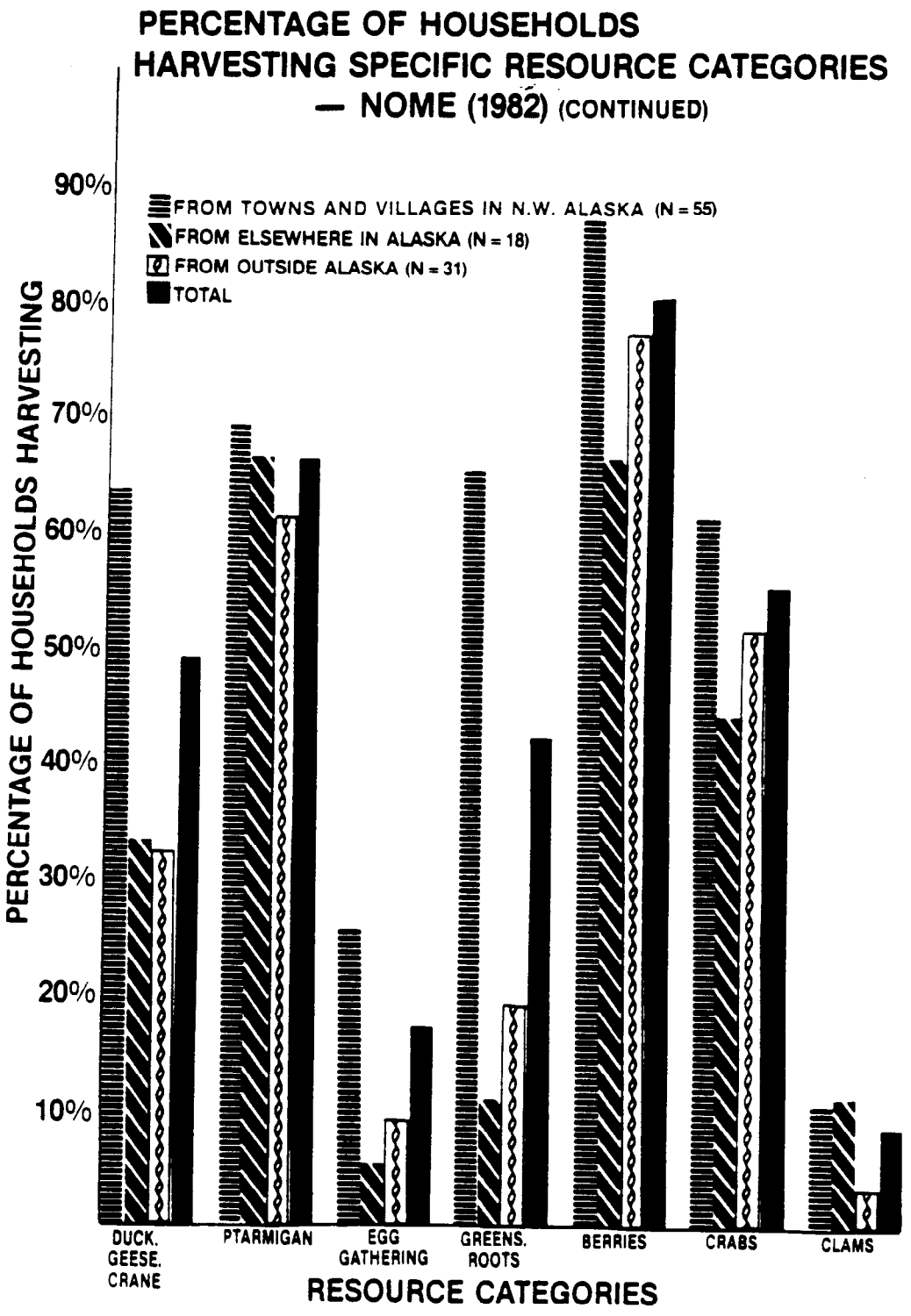
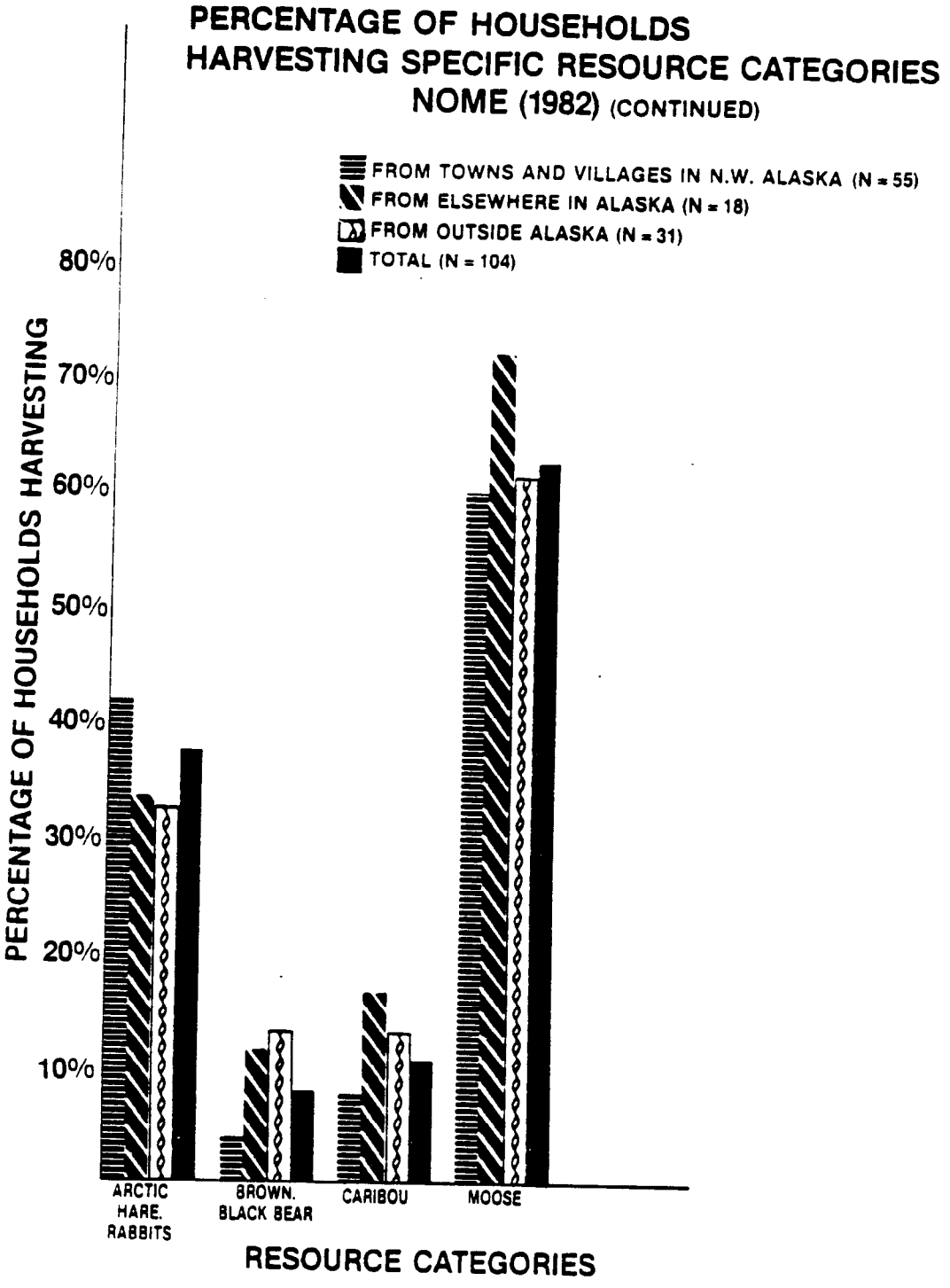


FIGURE 28 (CONTINUED)



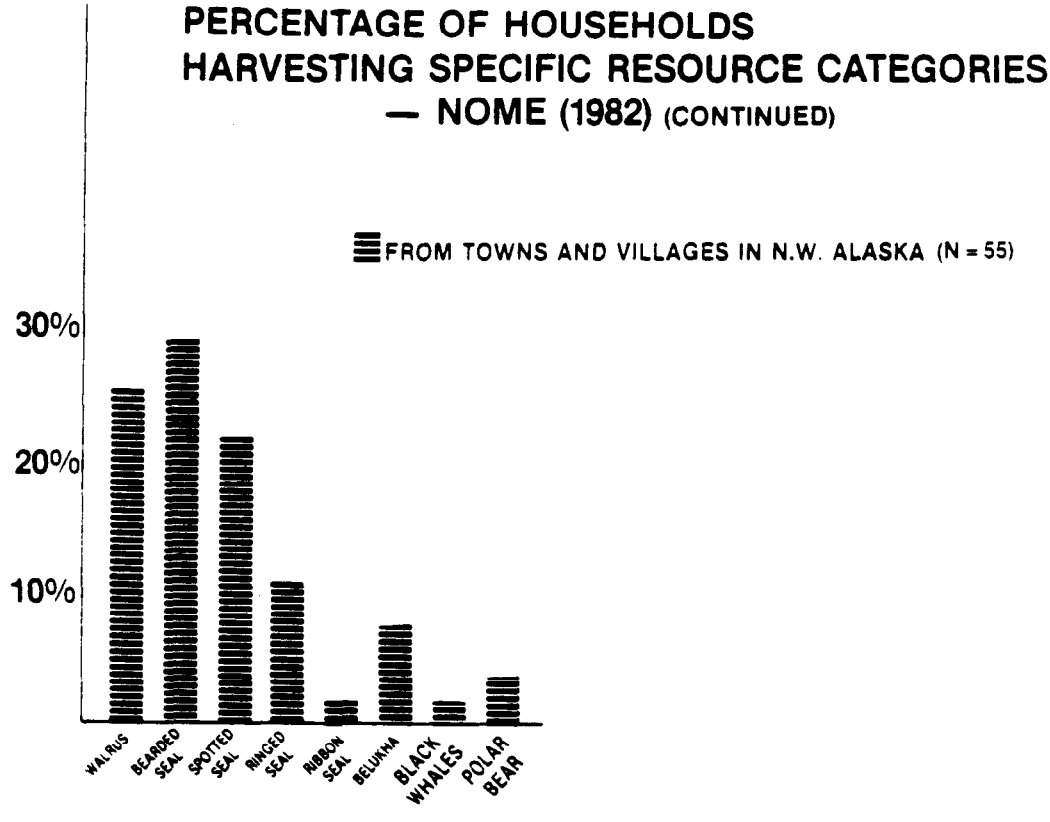
SOURCE: ELLANNA (1983)

FIGURE 28 (CONTINUED)



SOURCE: ELLANNA (1983)

FIGURE 28 (CONTINUED)



SOURCE: ELLANNA (1983)

TABLE 1

MUNICIPALITIES GREATER THAN 1,000 PEOPLE IN 1984,
RANKED BY SIZE, 1984 AND 1980 POPULATIONS

	1984 RANK	1984 POP	1980 RANK	1980 POP
Anchorage City	1	243,829	1	174,431
Fairbanks City	2	27,103	2	22,645
Juneau City	3	23,729	3	19,528
Kodiak City and Station	4	8,489	6	5,756
Ketchikan City	5	7,633	5	7,198
Sitka City	6	7,611	4	7,803
Kenai City	7	6,072	7	4,324
Valdez City	8	3,687	10	3,079
Bethel City	9	3,681	8	3,576
Soldotna City	10	3,538	12	2,320
Wasilla City	11	3,459	22	1,559
Homer City	12	3,373	15	2,209
Nome City	13	3,184	13	2,301
Adak Station	14	3,169	9	3,315
Petersburg City	15	3,137	11	2,821
Barrow City	16	2,943	14	2,267
Palmer City	17	2,772	17	2,141
Wrangell City	18	2,376	16	2,184
Kotzebue City	19	2,345	18	2,054
Cordorva City	20	2,108	19	1,879
Seward City	21	2,038	20	1,843
Dillingham City	22	2,004	21	1,563
Unalaska City	23	1,630	23	1,322
Delta Junction City	24	1,163	25	945
Haines City	25	1,154	24	993
North Pole City	26	1,005	26	724

SOURCE: ALASKA DEPARTMENT OF LABOR (1985)

TABLE 2

COMMERCIAL SALMON FISHING INCOMES, DILLINGHAM PERMIT HOLDERS, 1975 - 1982

Year	Drift gill netting # of permits	Drift gill netting Mean income	Set gill netting # of permits	Set gill netting Mean income
1975	106	$ 4,219	70	$ 2,095
1976	118	14,751	86	$ 5,419
1977	122	14,301	69	$ 3,574
1978	163	36,844	90	$10,962
1979	178	51,767	96	$19,580
1980	181	35,806	95	$12,164
1981	195	65,301	109	$28,373
1982	191	39,302	96	$10,219

Source: Petterson et al, 1984:112 - 113

TABLE 3. LEVELS OF HOUSEHOLD HARVEST AND USE OF FISH, GAME, AND PLANT RESOURCES, DILLINGHAM, 1984. N = 153

Resource	% used	% attempt harvest	% harvested	% gave away	% received	mean hh harvest, lbs	total sample harvest, numbers*
King Salmon	83.7	57.5	56.9	27.5	36.6	156.1	1,571
Red Salmon	67.3	50.3	49.7	23.5	26.1	113.7	3,625
Chum Salmon	23.5	18.3	18.3	7.2	8.5	13.3	415
Pink Salmon	29.4	20.3	20.3	8.5	11.1	12.3	698
Silver Salmon	61.4	47.1	45.8	17.0	25.5	60.4	1,926
Salmon, Unknown	9.8	7.2	7.2	2.6	4.6	61.9	1,973
Smelt	37.3	22.2	21.6	12.4	22.2	12.0	61b
Herring	15.7	11.8	11.8	2.6	9.2	9.0	46b
Herring Roe	22.2	10.5	10.5	5.9	13.1	14.1	54b
Whitefish	13.7	7.8	5.9	2.0	8.5	.9	132
Rainbow Trout	39.2	29.4	27.5	5.2	9.8	3.8	420
Lake/Togiak Trout	11.8	7.2	5.9	.7	4.6	1.1	61
Grayling	28.8	20.3	19.6	2.6	9.2	1.2	269
Dolly Varden	37.3	31.4	29.4	6.5	9.8	6.0	661
Burbot	2.0	2.0	2.0	1.3	2.0	.2	26
Pike	25.5	19.0	17.0	5.9	7.8	3.2	177
Blackfish	3.9	.7	.7	0	2.6	.03	4
Butter Clam	9.8	8.5	8.5	3.3	3.9	2.1	21b
Razor Clam	5.2	2.6	2.6	.7	3.3	1.2	12b
Dungeness Crab	.7	.7	.7	NA	NA	.07	7
Other Fish	1.3	0	0	0	1.3	0	0
Caribou	69.9	26.8	22.2	15.0	54.9	82.4	84
Moose	61.4	32.0	16.3	12.4	49.0	88.2	25
Brown Bear	2.0	0	0	0	2.0	0	0
Porcupine	19.0	12.4	11.1	3.3	10.5	2.8	53
Hare	11.1	6.5	5.2	1.3	7.2	.7	57
Harbor Seal	26.1	3.9	3.9	5.9	22.9	5.1	14
Other Seal	0	0	0	0	0	0	0
Walrus	3.9	1.3	.7	1.3	3.3	3.7	1
Sea Lion	.7	0	0	.7	.7	0	0
Belukha	4.6	0	0	.7	4.6	0	0
Beaver	22.9	6.5	5.9	4.6	17.6	20.5	157
Mink	2.6	2.6	2.6	0	0	NA	25
Fox	5.2	5.2	3.9	0	.7	NA	24
Wolf	2.6	2.6	2.0	0	0	NA	5
Wolverine	1.3	1.3	.7	0	0	NA	3
Land Otter	3.9	3.9	3.3	0	0	NA	19
Muskrat	2.0	2.0	2.0	0	0	NA	9
Lynx	0	0	0	0	0	0	0
Arctic Squirrel	0	0	0	0	0	0	0
Marten	2.0	2.0	2.0	0	.7	NA	82

SOURCE: FALL ET AL (1986)

TABLE 3. (Continued) LEVELS OF HOUSEHOLD HARVEST AND USE OF FISH, GAME, AND PLANT RESOURCES, DILLINGHAM, 1984. N = 153

Resource	% used	% attempt harvest	% harvested	% gave away	% received	mean hh harvest, lbs	total sample harvest, numbers
Spruce Grouse	49.0	40.5	39.2	15.0	17.6	5.7	871
Ptarmigan	31.4	19.6	19.0	7.2	19.6	2.5	546
Sea Ducks	15.7	11.8	11.1	5.9	8.5	5.3**	280
Other Ducks	15.0	12.4	12.4	3.9	5.2	NA	299
Geese #1	17.6	10.5	9.8	4.6	9.2	NA	73
Geese #2	.7	.7	.7	0	0	NA	2
Geese #3	.7	.7	.7	0	0	NA	2
Total Geese	-	-	-	-	-	2.0	77
Cranes	2.0	2.0	1.3	.7	1.3	.1	3
Swans	0	0	0	0	0	0	0
Seagull Eggs	13.7	9.8	9.2	5.2	9.8	NA	62
Murre Eggs	1.3	1.3	1.3	.7	.7	NA	4
Total Eggs	-	-	-	-	-	.02	66
Plants	15.0	12.4	NA	4.6	3.9	NA	NA
Berries	79.1	63.4	62.1	22.2	34.0	23.6	904 g

* Harvests are reported in numbers of fish or animals, except resources marked by "b" (five gallon buckets) or "g" (gallons).

** Includes all ducks.

SOURCE: FALL ET AL (1986)

TABLE 4

RESOURCE HARVESTS, DILLINGHAM, 1973

Resource	percent harvesting	total harvest	mean hh harvest lbs.	per capita harvest lbs.
Salmon[1]	75	3,039	-	-
King	NA	453	198.2	46.3
Red	NA	1,915	239.4	55.9
Chum	NA	520	71.5	16.7
Pink	NA	0	0	0
Silver	NA	152	23.8	5.5
Smelt	NA	7,620	71.4	16.7
Herring	NA[2]	900	11.3	2.6
Whitefish	62[2]	195	6.1	1.4
Rainbow trout	NA	157	6.9	1.6
Lake trout	NA	62	5.2	1.2
Grayling	NA	392	8.6	2.0
Char, Dolly Varden	NA	454	19.9	4.6
Pike	NA	187	16.4	3.8
Clams	22	NA	NA	NA
Caribou	34	36	168.8	39.4
Moose	34	11	185.6	43.4
Brown bear	NA	2	6.3	1.5
Porcupine	NA	18	4.5	1.1
Hare[3]	NA	122	7.6	1.8
Seals	3	3	5.3	1.2
Walrus	0	0	0	0
Sea Lion	0	0	0	0
Belukha	0	0	0	0
Beaver	9	21	13.1	3.1
Fox	NA	37	-	-
Ptarmigan & Grouse	NA[4]	457	14.3	3.3
Ducks	41[4]	286	12.5	2.9
Geese	NA	106	13.3	3.1
Swans	NA	2	.6	.1
Berries	62	NA	NA	NA
TOTAL	-	-	1,110.6	259.2

N = 32 households (14 percent) with 137 people

[1] Reported as "salmon". Catch broken down by species proportional to the reported 1973 subsistence catch for the Nushagak district: red 63 percent; king, 14.9 percent; chum, 17.1 percent; pink, 0 percent; and coho, 5 percent (Wright et al. 1984:95).

[2] Percent of sample harvesting any freshwater fish.

[3] Assumed to be snowshoe hare.

[4] Percent of sample harvesting any waterfowl.

SOURCE: FALL ET AL (1986)

TABLE 5

COMPARISON OF FISH AND GAME HARVESTS OF DILLINGHAM RESIDENTS, 1973 and 1984

	1973			1984		
	% of sample harvesting	Per capita harvest, pounds	% of total harvest	% of sample harvesting	Per capita harvest, pounds	% of total harvest
Salmon	75	124.4	48.0%	65	141.4	60.4%
Other fish	62[a]	33.7	13.0%	56	18.6	7.9%
Game	34[b]	90.7	35.0%	32	65.9	28.1%
Birds [c]	41	9.1	3.5%	48	5.3	2.3%
Marine mammals	3	1.3	.5%	4	3.0	1.3%
Plants	62 [d]	NA	NA	62	e	e
Total	--	259.2	--	--	234.1	--

[a] Percentage of households harvesting freshwater fish; participation data for marine fish not available.

[b] Caribou and moose, each 34 percent

[c] For 1973, only includes waterfowl

[d] Berries only

[e] Harvest total for plants deleted for comparative purposes

SOURCE: FALL ET AL (1986)

TABLE 6

SUBSISTENCE SALMON HARVESTS, NUSHAGAK DISTRICT, 1965-1986

Year	Permits Issued	Number of Fish[a]						Harvest in Dillingham Area[c]
		Sockeye	King	Chum	Pink	Coho	Total	
1965	121	47,500	4,600	18,400	200	5,400	76,100	42,200
66	110	23,600	3,700	6,000	4,900	2,400	40,600	19,000
67	128	34,900	3,700	14,000	800	4,000	57,400	34,700
68	115	30,000	6,600	8,600	5,800	1,900	52,900	31,400
69	162	27,700	7,100	8,200	100	7,100	50,200	33,500
1970	147	41,100	6,300	9,400	1,500	900	59,200	33,300
71	164	42,400	4,400	4,200	0	2,300	53,300	18,100
72	168	24,100	4,000	8,200	1,200	1,000	38,500	12,600
73	216	28,000	6,600	7,600	100	2,200	44,500	19,700
74	261	41,200	7,900	10,200	4,300	4,700	68,300	23,900
1975	340	47,300	7,100	5,600	1,300	4,300	65,600	22,100
76	317	34,700	6,900	7,200	2,700	2,100	53,600	17,700
77	306	43,300	5,200	7,300	200	4,500	60,500	15,700
78	331	33,200	6,600	14,300	11,100	2,500	67,700	27,700
79	364	40,200	8,900	6,800	500	5,200	61,600	20,600
1980	425	76,800	11,800	11,700	7,600	5,100	113,000	47,900
81	395	44,600	11,500	10,200	2,300	8,700	77,300	23,900
82	376	34,700	12,100	11,400	7,300	8,900	74,400	24,700
83	389	38,400	11,800	9,200	500	5,200	65,100	20,100
84	438	43,200	9,800	10,300	6,600	8,100	78,000	30,500
1985	383	37,000	8,000	4,400	700	5,400	55,500	16,900
86	426	49,500	12,900	10,000	5,400	9,400	87,200	25,700
22 Year Total	6,082	863,400	167,500	203,200	58,400[b]	92,000	1,400,500	561,900
22 Year Average	276	39,200	7,600	9,200	5,300[b]	4,200	63,400	25,500

[a] Estimates extrapolated from returned permits, rounded to nearest 100 fish.

[b] Even years only.

[c] Except for 1984, 1985, and 1986, includes harvests by non-residents of Dillingham who subsistence fished in the Dillingham area. Harvests for 1984, 1985, and 1986 are those of Dillingham residents only.

Source: Wright et al. 1985:100; Files, Division of Subsistence, Anchorage.

Table 7. Estimates of Average Annual Harvest Levels of Subsistence Resources in North Slope Communities, ca. 1973

Resources Harvested			Anaktuvuk Pass	Barrow	Kaktovik (Barter Is.)	Point Hope	Wainwright
Resource	Number	Lb (Dressed Weight)	Number	Number	Number	Number	Number
Mammals							
Bear (brown/grizzly)	14	3,150	5	2	2	2	3
Bear (polar)	19	8,550	---	6	5	5	3
Caribou	6,850	1,027,500	1,000	3,500	100	750	1,500
Fox (arctic)	2,655	*	15	2,000	100	40	500
Fox (red)	205	*	100	60	15	20	10
Hare (arctic snow)	30	90	30	---	---	---	---
Marmot	10	120	10	---	---	---	---
Moose	24	16,800	5	6	5	6	?
Porcupine	7	70	2	---	5	---	---
Sheep (dall)	45	4,500	15	---	30	---	---
Squirrel (ground)	1,480	1,480	200	1,000	250	---	30
Weasel	26	*	---	10	12	---	4
Wolverine	59	*	15	15	5	6	16
Wolf	126	*	75	30	10	4	7
Seal (bearded)	410	164,000	---	150	30	180	50
Seal (hair)	3,485	278,000	---	1,000	75	2,060	350
Walrus	117	110,600	---	33	1	33	50
Whale (belukha)	20	9,000	---	5	---	10	5
Whale (bowhead)	19	912,000	---	12	1	3	3
Birds							
Auk/puffin/murre	550	550	---	---	50	500	---
Ducks	16,600	16,600	---	5,000	1,100	10,000	500
Geese	960	3,840	10	400	100	300	150
Ptarmigan	2,450	2,450	500	1,000	750	100	100
Harvest eggs	3,750 doz	7,500	---	---	few	3,750 doz	---

(continued)

Table 7 (continued).

Resources Harvested			Anaktuvuk Pass	Barrow	Kaktovik (Barter Is.)	Point Hope	Wainwright
Resource	Number	Lb (Dressed Weight)	Number	Number	Number	Number	Number
Fish							
Arctic char	4,700	18,800	100	100	2,500	2,000	---
Ling cod	130	1,300	30	100	---	---	---
Tom cod	3,500	3,500	---	500	---	3,000	---
Grayling	5,650	5,650	1,000	2,500	---	2,000	150
Herring	10,500	5,250	500	10,000	---	---	---
Coho salmon	200	1,000	---	200	---	---	---
Pink salmon	6,250	12,500	---	200	---	6,000	50
Chinook salmon	230	2,990	---	200	---	---	30
Smelt	2,000	2,000	---	---	---	1,000 lb	1,000 lb
Trout	5,750	17,250	500	50	1,000	4,000	200
Whitefish, large	8,000	40,000	---	8,000	---	---	---
Whitefish, small	13,600	13,600	500	8,000	2,500	2,000	600
Totals (lb dressed weight)							
Mammals		2,530,000	156,555	1,284,550	91,500	537,600	469,455
Birds		30,940	540	7,600	2,300	19,300	1,200
Fish		123,840	3,950	61,550	15,500	40,000	2,840
Totals		2,691,440	161,045	1,353,700	109,300	596,900	473,495
Native enrollment, 1973		2,869	124	1,912	127	386	320
Per capita harvest, 1973		938	1,299	708	861	1,546	1,480

Source: Patterson and Wentworth 1977.

* Furbearers are not generally used for human consumption.

Table 8. Annual Harvest of Bowhead Whale, Walrus, Hair Seal, and Polar Bear in Barrow, 1962-82

Year	Bowhead Whale	Walrus	Hair Seal*	Polar Bear
1962	5	---	450	---
1963	5	165	412	---
1964	11	10	---	---
1965	4	57	114	---
1966	7	12	63	---
1967	3	55	31	---
1968	10	16	102	---
1969	11	7	2,100	---
1970	15	39	2,000	---
1971	13	51	1,800	---
1972	19	150	1,700	6
1973	17	20	1,500	5
1974	9	35	1,000	7
1975	10	15	1,000	10
1976	23	136	1,000	9
1977	20	62	1,000	15
1978	3	30	---	5
1979	3	30	---	1
1980	9	---	---	9
1981	4	---	---	6
1982	0	---	---	---

Source: Stoker 1983.

--- means no data were available.

* Includes ringed and spotted seal. Seal harvest figures are estimates only and are probably on the low side.

TABLE 9. SUBSISTENCE SALMON CATCH DATA, BETHEL, 1960 - 1986[a]

Year	Chinook	Sockeye	Coho	Chum	Pink	Fishing Families
1960	1,923	6,908	c	6,064	b	c
1961	4,150	5,164	c	7,681	b	c
1962	1,378	1,384	c	7,086	b	c
1963	7,019	b	c	b	b	c
1964	4,114	b	c	b	b	64
1965	3,371	b	c	b	b	43
1966	8,046	b	c	b	b	87
1967	13,925	b	c	b	b	113
1968	6,205	b	c	b	b	109
1969	7,472	b	11,552	14,615	b	76
1970	17,026	b	2,341	b	b	141
1971	8,731	b	3,184	b	b	95
1972	8,371	b	352	b	b	110
1973	8,898	b	8,902	b	b	124
1974	4,631	b	9,461	b	b	133
1975	11,688	b	c	b	b	124
1976	13,215	b	437	b	b	97
1977	9,408	b	1,025	b	b	116
1978	6,905	b	1,337	b	b	174
1979	11,564	b	9,800	b	b	236
1980	12,591	b	10,605	b	b	205
1981	15,367	b	7,705	b	b	151
1982	13,516	b	12,853	b	b	141
1983	8,492	b	b	b	b	139
1984	11,066	b	b	b	b	114
1985	6,940	3,409	6,094	9,260	77	162
1986	9,289	4,808	13,981	9,404	357	209

[a]Derived from Alaska Department of Fish and Game, Division of Commercial Fisheries and Division of Subsistence.

TABLE 10. NUMBER OF MOOSE HARVEST TICKETS ISSUED AND REPORTED USED BY BETHEL RESIDENTS, 1979-1986[a]

Regulatory Year	Number Harvest Tickets Issued	Number Reported Hunting	Number Reported Sucessful
1979-80	324	33	15
1980-81	351	132	47
1981-82	395	165	65
1982-83	494	176	64
1983-84	564	223	94
1984-85	599	242	120
1985-86	599	228	94

[a] Derived from Alaska Department of Fish and Game, Division of Game Files, Anchorage.

TABLE 11. REPORTED FURBEARER HARVESTS BY BETHEL RESIDENTS FROM GAME MANAGEMENT UNIT 18, 1979 - 1981

Regulatory Year	Beaver	Mink	Muskrat	Marten	Otter	Fox	Number of Harvesters
1979-80	119	17	737	18	10	196	87
1980-81	27	207	642	123	3	58	51

[a] Derived from Alaska Department of Fish and Game Files, Division of Game, Bethel.

TABLE 12.

NONCOMMERCIAL SALMON HARVESTS
REPORTED FOR NOME SUBDISTRICT, 1978-85
BY SPECIES

YEAR	CHINOOK	COHO	PINK	CHUM	TOTAL
1978	35	225	13,063	4,295	17,618
1979	11	1,120	6,353	3,273	10,757
1980	129	2,157	22,246	5,983	30,515
1981	35	1,726	5,584	8,579	15,938
1982	21	1,829	19,202	4,831	25,889
1983	74	1,911	8,086	7,091	17,215
1984	83	1,795	17,182	4,883	23,949
1985	56	1,054	2,117	5,667	9,008

SOURCE: Charles Lean et al (1985) Annual Management Report, 1985, Norton Sound-Port Clarence-Kotzebue, Alaska Department of Fish and Game. Division of Commercial Fisheries

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