PATTERNS OF WILD RESOURCE USE IN ENGLISH BAY AND PORT GRAHAM, ALASKA

Technical Paper No. 104

by

Ronald T. Stanek

Division of Subsistence
Alaska Department of Fish and Game
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ABSTRACT

Research on the use of fish and game resources was conducted at English Bay and Port Graham on the lower Kenai Peninsula. Monthly household harvest calendars, field observations, and informal key informant interviews were used to collect information during a three year period between May 1981 and October 1983.

The populations of these communities are primarily Chugach Eskimo, and in 1980 numbered 124 in English Bay and 161 in Port Graham. Residents of the two communities have a long history in the area dating back to 1786 when English Bay was founded as a trading post by the Russians. The early economy of the region was based on the foreign trade in sea otter pelts and the use of wild resources as food. After the purchase of Alaska by the United States, cash largely replaced the trade and barter system. Commercial fishing became the major cash component of the economy in the late 1800s.

Historic hunting and fishing information collected in this study indicates that many traditional harvest methods existed until the 1950s and 60s when they were eliminated through regulation. Many use practices such as sharing, usufruct land rights, and resource preservation techniques have continued to the present day.

Harvest data demonstrate both communities used a wide variety of local fish and game resources, and combined this use in a mixed cash-subsistence economy. During a 12-month period from May 1981 to April 1982, harvest calendar data indicate that salmon were 66.5 percent, and other fish (primarily halibut) were 21.3 percent of the annual harvest in English Bay. In contrast, salmon were 38.0 percent and other

fish were 39.6 percent of the harvest in Port Graham. Other resources, such as marine mammals, were 15.2 percent of Port Graham's and 5.9 percent for English Bay's annual harvests. Mean household harvests in edible weight were 644 pounds for English Bay and 564 pounds for Port Graham.

Annual harvests of some resources such as salmon and marine mammals varied by more than one hundred percent. This was due to factors such as abundance of resources, timing of harvests, weather conditions, and availability of cash employment in each community.

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CHAPTER I

INTRODUCTION

BACKGROUND

This report describes historical and contemporary uses of wild resources in Port Graham and English Bay, communities of the Lower Kenai Peninsula in southcentral Alaska (Fig. 1). The report is based on information collected by the Alaska Department of Fish and Game, Division of Subsistence, during three years of fieldwork between May 1981 and the summer of 1984. Because of their geographic proximity, common ancestry, and comparable resource use patterns, the two communties are discussed together throughout the text.

In 1980, Port Graham had a population of 161 and English Bay's population was 124. The majority of residents consider themselves Aleuts, although they are not closely related to the inhabitants of the Aleutian Islands. Their Native ancestry can be traced to locations such as Tatitlek, Kodiak Island, Yalik Bay, and Chignik. Most families also have ancestors of Russian background who immigrated to Alaska in the 18th and 19th centuries in association with the fur trade and the Russian Orthodox Church. In addition to English, most residents speak Chugach Alutiiq, an Eskimo language spoken by people of Port Graham, English Bay, a few people in Seldovia, and Prince William Sound. Linguists classify Chugach Alutiiq as being closely related to the Eskimo languages of Kodiak Island and the Alaska Peninsula (Leer 1978:3) (Fig. 2).

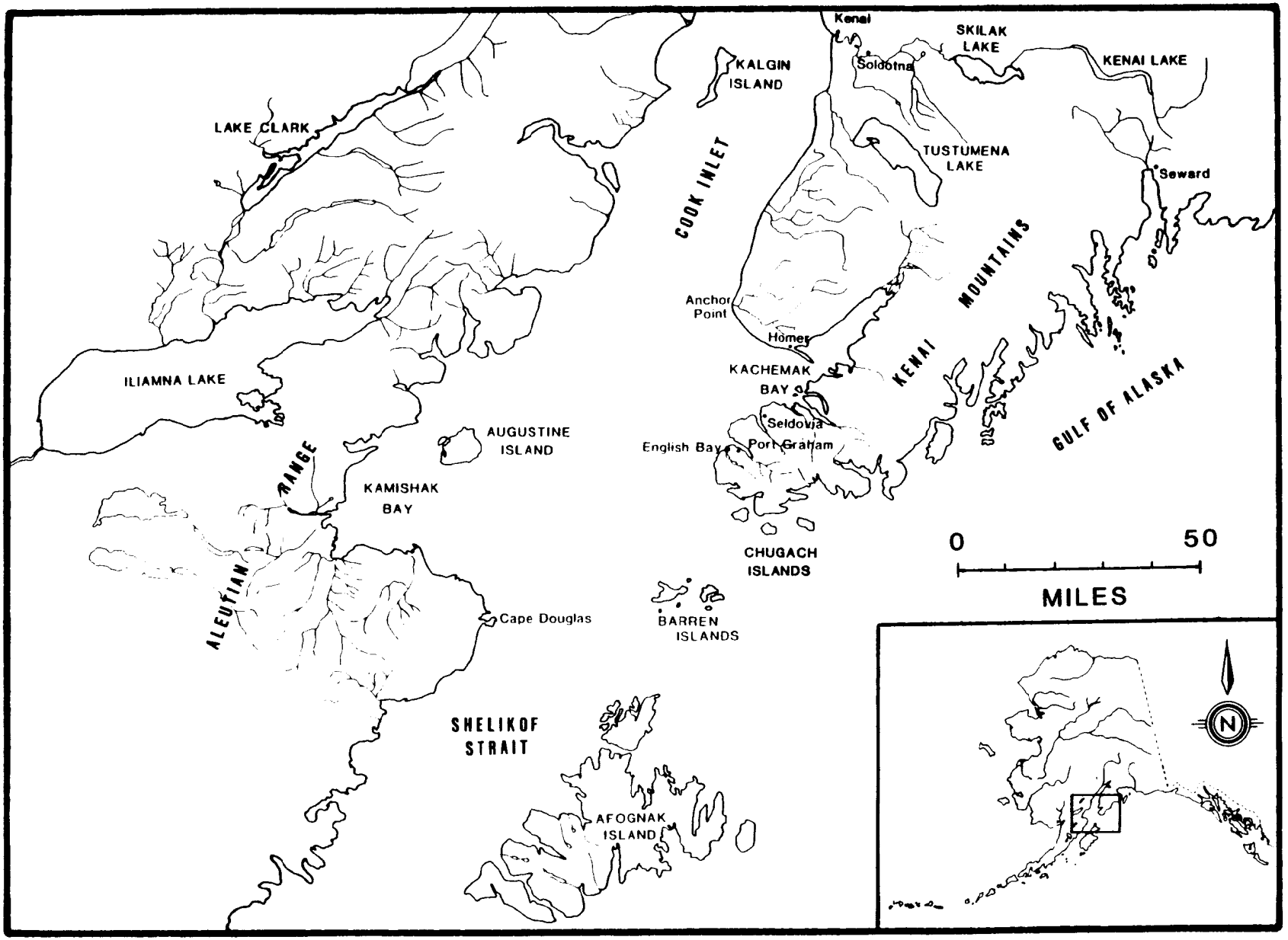

Figure 1. The Lower Cook Inlet, Gulf of Alaska area.

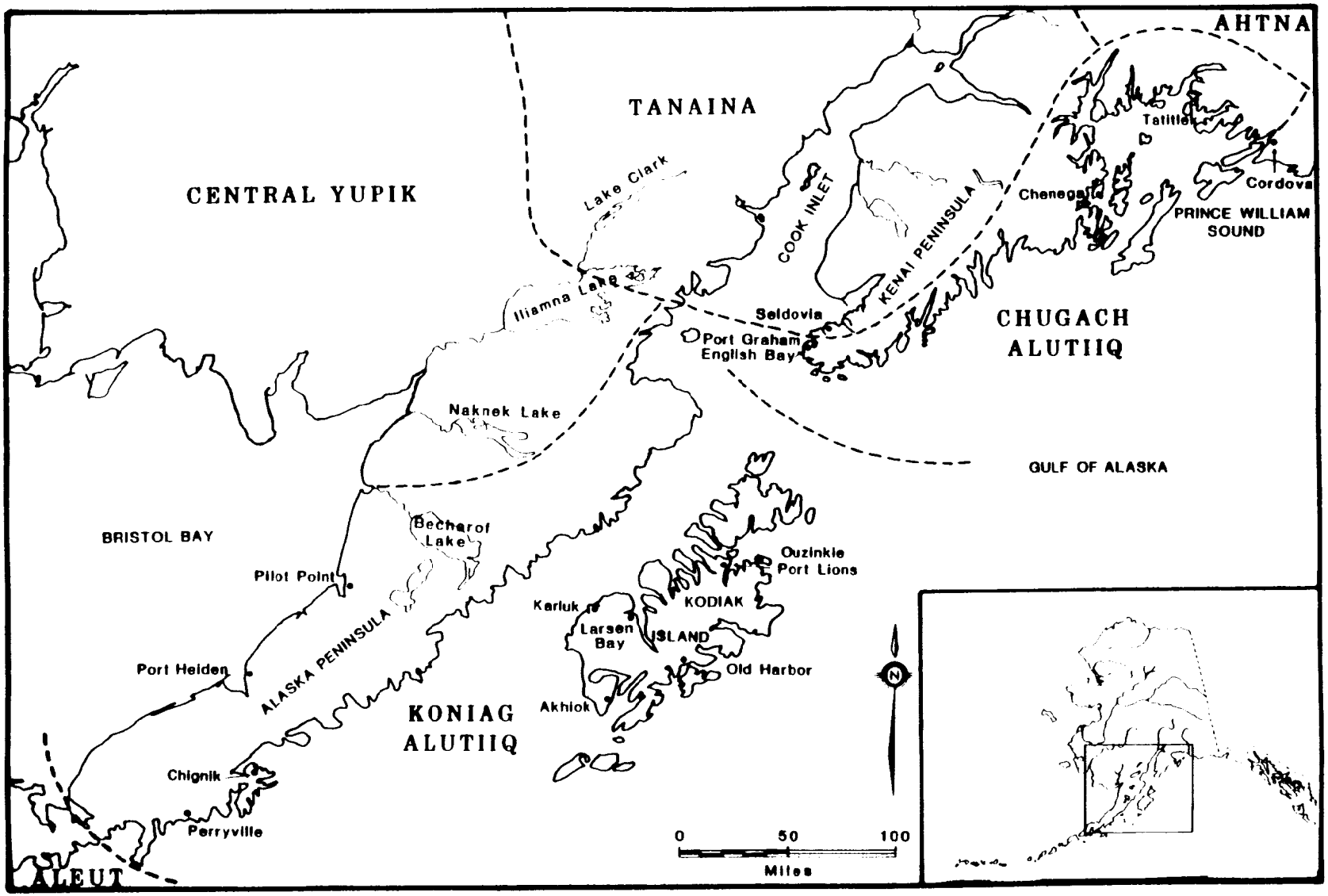

Figure 2. Languages of the Natives people of Southcentral Alaska.

In December 1980, the communities of Port Graham and English Bay requested that the Board of Fisheries establish by regulation a subsistence fishing season for salmon in their vicinity. For resource management purposes this request resulted in the need for information about the use of salmon and other resources in these communities. Although estimates of harvest quantities were presented to the board at the time of the request (The North Pacific Rim 1980), relatively little information was available detailing the traditional resource use practices of these two communities. Because salmon run sizes were adequate to meet anticipated commercial and subsistence harvests, the board decided not to set harvest limits, but instead to monitor the subsistence fishing effort in order to determine current harvest levels.

In order to gather data on salmon harvests, the board, the local fish and game advisory committee, and village council members agreed that a catch calendar system would be an appropriate method to measure harvest. The Subsistence Division was given the responsibility to develop the appropriate instrument and methods of gathering data. A calendar system was designed, modeled on that used on the lower Yukon River (e.g. Crawford 1979). Along with this assigned task, the division carried out its statutory responsibility to collect information on all aspects of local resource utilization on a year-round basis. The three year resource use study was conducted in three phases. The first phase utilized a series of harvest calendars beginning in the spring of 1981 and continuing through the summer of 1982. The second phase of field observations continued through the spring of 1984 and was followed by a third phase of data analysis and report writing. Throughout the study period interim reports (Stanek 1981, 1982; Stanek, Fall, and Foster

1982) provided preliminary results of the research and were presented at the December 1981 and March 1982 Board of Fisheries meetings.

Throughout the course of the research in the two communities, contacts with elders and middle-aged people provided information on historic methods of resource harvest and use -- in these people's words, "The way we did it in the old days." As a result, a section on historic hunting and fishing technology is provided. This should serve as a bridge to the recent past, and help in understanding the ways in which the continuity of resource use has remained despite dramatic social and technological changes.

Briefly, the research found that during the study period the economies of both communities were dependent upon two primary sources of income, goods, and services. One source was the nonlocal cash, materials, and services provided by federal, state, corporate, and private entities such as the Bureau of Indian Affairs, Housing and Urban Development, Kenai Peninsula school system, North Pacific Rim, and private business. The second source was earnings from sale of commercially harvested resources, food produced locally from wild resources, nonedible products produced locally, and services provided by local people, many of which were nonpayment relationships like hauling wood and packages.

Natural resource harvests followed a clearly defined annual round and, as in many other coastal Alaskan communities, a large variety of locally harvested natural resources were consumed. Associated with these harvests were definable land and water areas where resources were sought. The quantities of resources harvested varied greatly from year to year and among households. These variations were dependent upon

weather conditions, resource availability, community, social and economic conditions, and resource related regulatory frameworks. Resource harvests, production effort, harvest areas, and equipment were shared widely among members of groups of related households.

PURPOSE OF THE STUDY

The primary purpose of the study was to document the contemporary harvest and use of wild resources in the two communities of Port Graham and English Bay. A second purpose was to compile additional information on prehistoric and historic resource uses, patterns of settlement, ecological and socioeconomic trends, and cultural characteristics which affect contemporary resource use patterns.

The information compiled in this report is intended for use by: (1) village councils and local residents; (2) regional profit and nonprofit organizations; (3) local fish and game advisory committees; (4) state and federal government agencies; and (5) other researchers, resource users, and students of resource utilization and regional development patterns. It is hoped that the information will also provide a basis for decisions regarding the allocation and conservation of fish, game, and land resources in the Port Graham and English Bay area. Also, the information may provide a baseline of resource use information useful in documenting changes in local use patterns.

STUDY OBJECTIVES

For both communities the study objectives included:

(1) A description of the current annual round of resource harvest;

(2) Estimates of quantities of salmon used annually by each community;

(3) Estimates of quantities of resources other than salmon used annually;

(4) A determination of numbers of households participating in resource use;

(5) Documentation of current harvest methods;

(6) Maps of geographic areas used for resource harvest; and

(7) A description of community economic activities.

METHODOLOGY

Harvest Quantities

Harvest data were collected with the aid of a daily harvest calendar initially placed in 38 Port Graham and 22 English Bay households. Calendar format and monthly resource listings were developed with the assistance of the local Fish and Game Advisory Committee, the Port Graham and English Bay village councils, the North Pacific Rim Subsistence Coordinator, and Alaska Department of Fish and Game staff.

The calendars were originally intended to monitor only salmon harvest; however, the opportunity was taken to survey a sample of other

resources. The calendars included five salmon species and those resources documented by the North Pacific Rim (1981:9-10) as being harvested by 25 percent or more of the households. Although crabs were not harvested above the 25 percent level in 1979, they were included on the 1981 calendar because of impending regulation changes and the need for management information. The calendars could not list all 113 resources available in the area, but additional opportunity was provided for resources not specifically listed to be recorded under the category of "other" on the back of the calendar. Many resources not used as food were not included for lack of space. Wood, for example, was utilized extensively but the harvest was not quantified on the calendars.

Calendars were collected during monthly household visits by the researcher. At the time each calendar was collected, harvest reports were verified by talking to the household members who had been hunting, fishing, or gathering resources. Whenever possible the researcher accompanied local residents and made observations of harvest activities. From these data were derived the current annual round of resource harvest activities and an estimate of the relative quantities of resources harvested.

Before the opening of the 1981 subsistence salmon set net season on May 10, the researcher distributed harvest calendars to all households with members planning to participate in the fishery. The calendars also served as salmon permits. Users were carefully instructed how to complete the calendars as they harvested resources. Because of the difficulty in separating amounts taken for family use from that taken from commercial, subsistence set net, and rod and reel fisheries, no differentiation was made in the data with regard to gear type or the

regulations under which salmon were harvested for domestic use. Salmon taken from commercial and rod and reel catches for domestic consumption were recorded on the calendar along with salmon taken with set nets during subsistence openings.

In September 1981, calendars for monitoring resource harvests for an additional three months were distributed to all households harvesting resources. These calendars also were collected monthly. In December 1981 another four month set of calendars was distributed; these were collected bimonthly. Prior to the 1982 subsistence salmon set net season, a final set of calendars was distributed. The monthly procedure of verification and collection was followed. Thus, August 1982 marked the end of a 16-month period of documentation with harvest calendars. In September 1982 only the salmon harvest was documented. All calendars were terminated at the close of the subsistence set net season on September 30. While the researcher was collecting September harvest calendars during October, a substantial coho salmon harvest was observed taking place at English Bay. Field observations and household interviews were used to estimate the level of this coho harvest to supplement calendar information.

Calendar return figures for the 16-month period are provided in Table 1. Throughout this monitoring period calendar returns varied as a few households either lost their calendars, did not record harvests, or had no harvest activities. In the first two situations, the user was interviewed about his or her harvest activities, including timing of harvest, quantities taken, and species harvested. In almost all of these cases, the responses allowed the researcher to document that user's harvest activities and include them in harvest reports. To

TABLE 1. HARVEST REPORT CALENDAR RETURNS FOR MAY 1981 THROUGH AUG. 1982

	1981							
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
PORT GRAHAM	42	33	34	36	32	28	21	20
ENGLISH BAY	28	19	21	22	19	9	9	9

	1982							
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
PORT GRAHAM	22	24	23	18	36	33	36	33
ENGLISH BAY	7	8	9	10	26	22	22	22

determine the reliability of salmon harvest data in 1981 and 1982, on-site observations were made monthly. In both communities it was possible to observe up to half of the reported monthly harvest either on drying racks or in smokehouses.

Although every attempt was made to assure accurate harvest reporting, harvest reports probably are systematically biased towards underreporting for many species. With salmon this is most likely to have occurred in instances where salmon for domestic use were taken during commercial fishing periods or by rod and reel. The accuracy of harvest reports may have been influenced by the respondent's perception of the importance of reporting individual resource groups to outside management agencies. For example, most small intertidal species like chitons, snails, mussels, and octopus probably were perceived as being of lesser importance to outside managers than clams, cockles, and crabs.

Those resources perceived by respondents to be of highest levels of importance to the reporting scheme were salmon, halibut, and flounder. Other resources including marine birds, ducks and geese, bird eggs, and seals were of high importance but may have been underreported because they were highly sensitive items due to regulations restricting their harvest and controversy over the harvest priority given to Natives.

Consequently, harvest data are considered more reliable for some groups of resources than others. Those groups thought to have the highest degree of reliability include salmon, freshwater fish, flat fish, and clams. Groups with moderate levels of report reliability include crabs, berries, and marine mammals. At the lowest level of reliability are land mammals, waterfowl, sea birds, and plants.

The researcher found that while calendars were a good method of reminding people to document their monthly household harvests, routine contacts were necessary to maintain interest and to gain reliable recall of specific harvest activities. It is thought that the highest degree of reliability was maintained during the spring and summer months, when a monthly visitation schedule was maintained. During fall and winter as harvest activities decreased, the researcher visited every three months, and the perceived level of importance to report harvests may have lessened in some households. Therefore, harvest data during winter periods should be viewed as minimum levels.

Levels of effort were collected on the calendars only for salmon. This was due to the difficulty in separating the actual amount of time spent searching for and collecting individual resources when four or five different resources may have been collected during the same trip.

Following the 16-month period during which calendars sampled harvests levels, the researcher continued to visit many of the most active households and informally requested information on resource harvests. Visitations were less frequent than during the formal calendar period and informants were asked to recall what they harvested during specific seasons rather than during a certain number of months. Informants were most able to recall quantities harvested on special occasions and for major resources like bear, seal, moose, or ducks. They were less confi- dent trying to recall quantities of resources like snails, chitons, or berries. Visits to gather harvest estimates were therefore made either during or immediately following particular seasons of harvest.

Historical Information

Documentation of historical methods of resource harvest was accomplished through informal personal interviews with ten knowledgeable informants ranging in age from 30 to 80 years. Throughout the study period the researcher heard numerous accounts of historic resource harvest practices. These accounts were recorded in field notes. During many interviews, people recalled former harvest techniques they had used and those they had been told about by their parents or grandparents.

As more historical data were collected, a more formal approach was taken to verify the information. This included meeting with informants and asking a series of questions concerning: (1) dates of events and equipment items used (dates were generally arrived at by referencing them to birthdays, marriages, etc.); (2) methods used or circumstances

when equipment items were seen or used; (3) descriptions of actual events when equipment was used; and (4) Alutiiq Sugestun words for equipment, geographic locations, or activities (words were recorded either with a tape recorder or by hand and later translated by the Alaska Native Language Center). Informants prepared drawings of equipment which were redrawn by a draftsperson and then corrected by the original informants. Whenever possible, descriptions of equipment and activities were compared with information in the ethnographic literature and with archaeological specimens (e.g. Birket-Smith 1953; Osgood 1937; de Laguna 1934; and the University of Alaska, Anchorage, Archaeology Laboratory).

Workgroup Compositions

Genealogical diagrams depicting resource harvest groups were prepared during interviews with key informants in each community. Resource distribution networks were traced by talking to heads of households and other production group members.

Harvest Area Maps

Mapped information showing resource harvest areas was collected through interviews with three people in Port Graham, and two from English Bay who were identified by village officials as being knowledgeable of the areas used by each community. Preliminary maps were developed at a scale of 1:63,360 on United States Geological Survey maps. Draft maps were supplemented with current information collected

by the researcher through on-site observations and interviews with resource harvesters. Revised maps were finally submitted to each community for public review. Harvest areas shown on the maps are therefore community-wide areas. The maps depict areas which residents of each community have used regularly during their lives. Historical use areas are those areas which have not been used for the past 10 to 15 years. Maps with historical use areas are defined here. Some of the historical areas are considered by community residents to lie in "reserve." That is, they will be utilized in the event that current use areas become less productive. The lifetimes of elderly people interviewed dated back to the 1920s when some of them were young hunters.

Language

Native place name data were obtained from existing lists recorded in Alutiiq and English by the Alaska Native Language Center (Leer 1980). In this report, Alutiiq terms are also used in naming resources, resource products, and equipment items. A list of Alutiiq and scientific names of resources referred to by their English names in this report appears in Chapter 7.

Report Organization and Findings

This report is organized into two parts totaling eight chapters. The first part includes Chapters 1 through 4. It provides background information describing events and circumstances affecting Port Graham

and English Bay prior to this study. Chapters 5 through 8 comprise the second part and describe the social and economic conditions and the resource uses of the two communities during the study period. Chapters 7 and 8 discuss findings of the study, and provide conclusions regarding the role of wild resources in the lives of village residents.

CHAPTER 2

THE REGIONAL ENVIRONMENT

AREA GEOGRAPHY

The communities of Port Graham and English Bay are located in Southcentral Alaska on the southwest end of the Lower Kenai Peninsula, near the confluence of Cook Inlet and the outer reaches of Kachemak Bay. As referred to here, the Lower Kenai Peninsula is that part of Kenai Peninsula located south of an east-west line at Anchor Point. Cook Inlet itself is a large tidal estuary of the Gulf of Alaska and is approximately 231 miles (370 km) long and 83 miles (133 km) wide at its mouth. Kachemak Bay is about 46 miles (75 km) long, located on the eastern side of Lower Cook Inlet and is divided into inner and outer regions by the Homer Spit. Shoreline areas on the east and south of the Bay are quite rugged with many fjords, bays, and coves (Selkregg 1974:19).

Lower Cook Inlet is bordered by the Aleutian Mountains to the west, by the Upper Inlet and Kenai Lowlands to the north, by the Kenai Mountains on the east, and the Gulf of Alaska on the south (Fig. 1). Mt. Iliamna and Mt. Redoubt in the Aleutian Range have peaks to heights of 10,000 feet, while peaks in the Kenai range reach only 6,000 feet (Selkregg 1974:15). Other prominent geographical features include the active Augustine Island Volcano in Kamishak Bay, and the Kenai Fjords located on the eastern side of the Kenai Mountains. Mountainous areas are typified by extensive glaciers and snow fields which contribute heavy silt loads to rivers in the region.

Depths of Cook Inlet waters range from 100 fathoms (180 m) in its southernmost part in Kennedy Entrance, to more shallow areas of 40 fathoms (70 m) in the Upper Inlet. Water depths 10 to 40 fathoms can be found in Kachemak Bay and in the vicinity of the two communities. Cook Inlet has some of the largest tidal fluctuations in the world, with highs in the Lower Inlet of 22 feet. Strong tidal currents are associated with the extreme tidal fluctuations, and mid-channel speeds of 3.8 knots are typical with some tidal areas having speeds of 6 to 9 knots. Wave action too is characterized by extreme situations, especially during winter storms which generate 20 to 30 foot waves. Spring and summer months have calmer conditions with 2 to 5 foot waves typical (Selkregg 1974: 20).

CLIMATE

The climate of the area is classified as maritime and is influenced largely by the warm water currents of the North Pacific Drift. Located on the north side of the Lower Kenai Peninsula, the two communities are buffered from many North Pacific storms by low mountains in the Kenai Range. Temperatures for the area average 29°F (-5°C) during winter months and 55°F (+13°C) during the summer. Precipitation levels average 60 inches (150 cm) per year with the major portion falling as rain and snow in the winter months. Spring is usually the driest period. Winds in the area are generally from the southwest in spring and summer, and from the north to northeast in winter. Wind speeds average 12 to 18 knots with extremes of 50 to 75 knots in the winters during stormy periods (Selkregg 1974:12).

MARINE AND ESTUARINE ENVIRONMENTS

Vegetation

The marine environment of Lower Cook Inlet is extremely rich in varieties and numbers of mammals, birds, fish, and plants. In large part this abundance of life is a result of the variety of marine and coastal habitats and the high food production capacity of area waters. Summaries of information which follows were taken primarily from ADF&G (1978:2.3-5.4). Although little information specific to Kachemak Bay marine vegetation is available, Selkregg (1974:132) gives a description of the Gulf of Alaska Region. Figure 3 depicts the general marine vegetation pattern in Lower Cook Inlet.

The Gulf of Alaska is rich in marine flora which is dominated by brown kelp and other algae groups. This vegetation provides food and habitat for a wide variety and abundance of marine animals.

The coastal salt marshes and wetlands also have an abundance of plant species. Over 16 different families of plants grow in most areas. A typical transition of salt marsh zones from farthest to nearest saltwater areas are ryegrass, hairgrass, and sedges. Green marine algae and brown marine algae can be found in brackish stream mouths. Eel grass, which is an important food and habitat for many wildlife including waterfowl, salmon, and other fish species whose young are spawned and reared in esturaries, grows in saltwater bays.

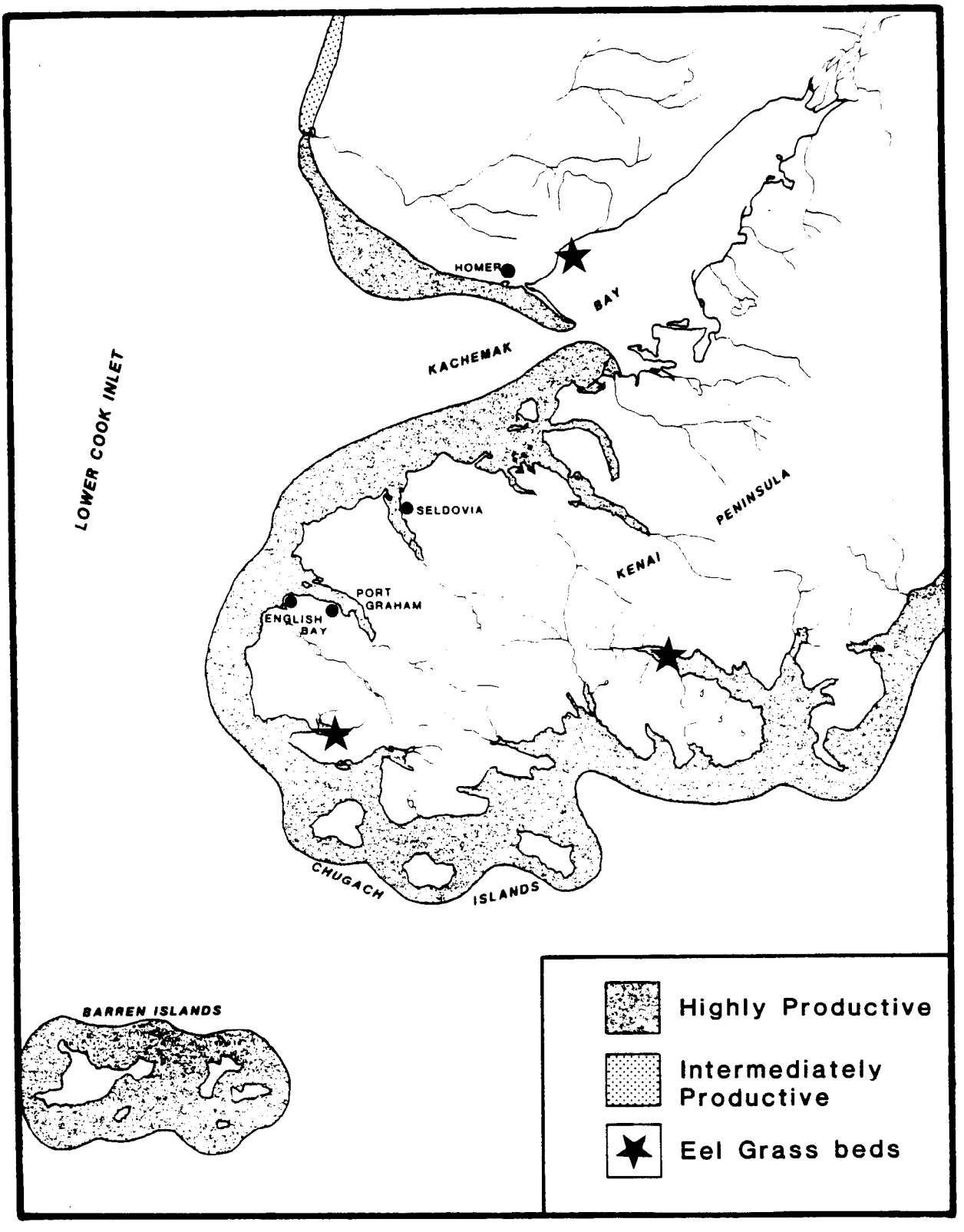

Figure 3. Marine algae distribution in Lower Cook Inlet (after data collected by R. Rosenthal and D. Lees in Dames and Moore, and in NOAA 1977).

Marine Mammals

A variety of marine mammals inhabit both coastal and off-shore waters. Among these are at least 13 species of whales including belukha, minkie, killer, gray, and several species of porpoise including dall and harbor. Harbor seals, sea lions, and sea otters are also found in abundance.

Those species currently of direct importance to the two communities are sea lions and harbor seals. Sea otters are of indirect importance currently due to their impact on shellfish. All three species occur in the area year-round and have haulout and pupping areas in the immediate vicinity of both communities (Fig. 4). Populations estimated for harbor seals in Lower Cook Inlet range around 6,000, and for sea lions about 1,000 animals (U.S. Department of the Interior 1976:254-260). Major concentration areas within the region include the Chugach Islands and the Barren Islands where haul-out and pupping areas are found. Harbor seals seasonally move to smaller concentration areas in Kachemak Bay. Sea lions can be found along the south shore of Kachemak Bay foraging away from rookeries. Concentrations of 25 to 120 harbor seals occur near Yukon, Cohen, Hesketh and Chugachik Islands, and on the Bradley River Flats (K. Pitcher pers. comm., 1985). Sea otters inhabit Lower Cook Inlet and outer Kachemak Bay. Their range and population are reported to be expanding (Schneider 1976), and they are believed to be having increasingly heavy impacts on local shellfish populations (Calkins pers. comm., 1983).

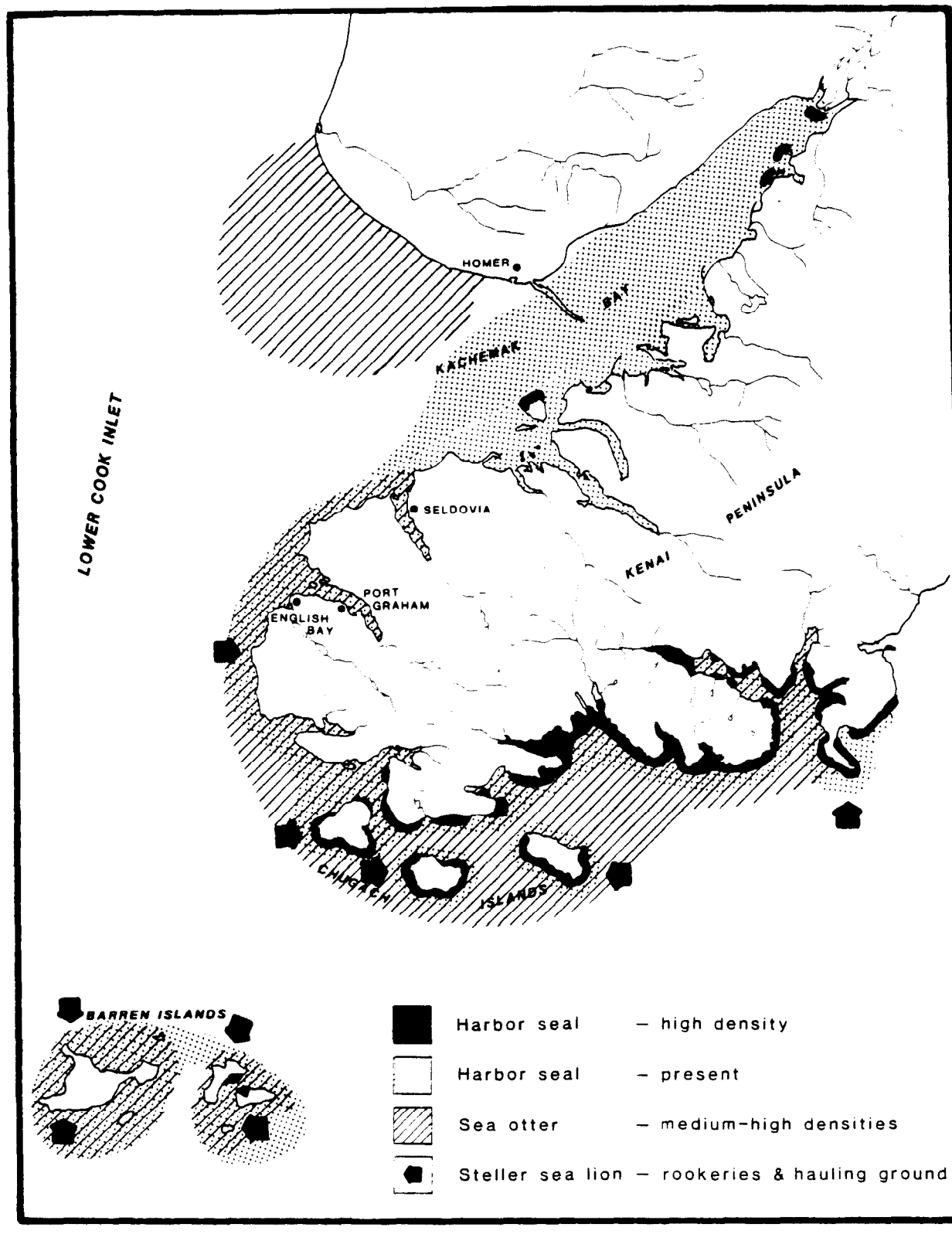

Figure 4. Marine mammal concentrations in Kachemak Bay and Lower Cook Inlet (after data colected by K. Pitcher and K. Schneider in NOAA 1977) (K. Pitcher pers. comm., 1985).

Marine Birds

About 100 species of birds inhabitat the marine and intertidal areas of the Lower Cook Inlet area (ADF&G 1978:2-38). Many species of waterfowl, gulls, and shorebirds use the Kachemak Bay and Lower Cook Inlet for over-wintering, for migration stopover, and as breeding grounds (Fig. 5). Upwards of four million migrate annually through the area. Many species that occupy in the area year-round are able to use it as a result of the relatively mild marine climates and abundance of marine foods. Some species such as gulls, kittiwakes, murres, and puffins have established nesting colonies along the southern shore of Kachemak Bay and the Lower Inlet (Table 2). The outer portion of Kachemak Bay is an important over-wintering area for scooter ducks with over 14,000 reported (ADF&G 1978:2-40). The Fox River Flats and Koyuktulik Bay are also important resting and feeding areas for migrating waterfowl.

Marine Fisheries

According to Blackburn (1977:15), there are eight dominant families of finfish occupying Lower Cook Inlet. These families are salmon, herring, sculpins, codfish, greenlings, lingcod, smelt, and flounders. Major seasonal changes occur in three families during the spring and summer months when large numbers of salmon, herring, and smelt occupy the entrance of Cook Inlet as they move from deeper Gulf waters into shallow areas of the Inlet and tributary streams to spawn.

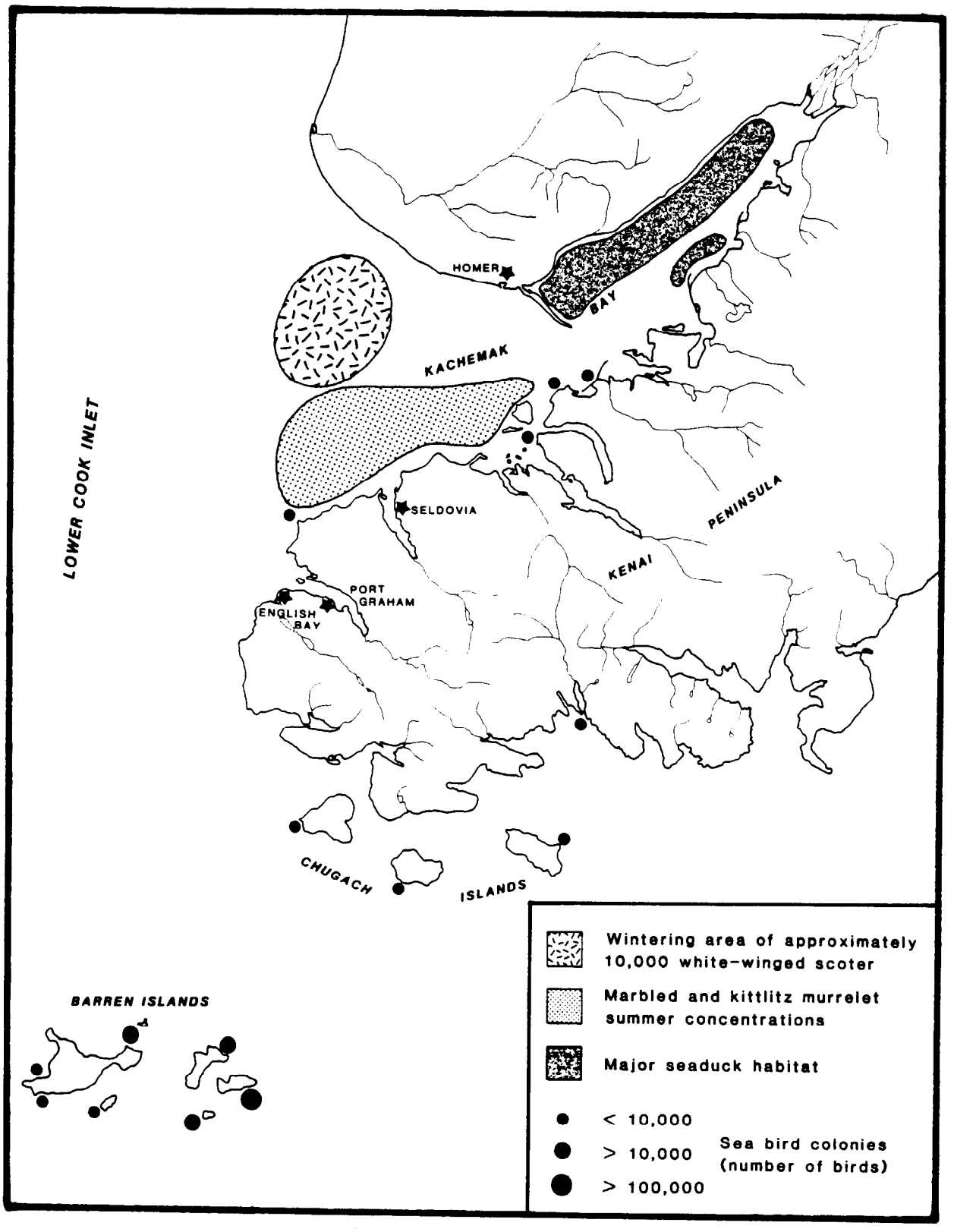

Figure 5. Marine bird concentration areas and colonies in Lower Cook Inlet and Kachemak Bay (after data collected by D. Erikson and P. Arneson, ADF&G in NOAA, 1977; and U.S. FWS in ADF&G, October 1978).

TABLE 2. MARINE BIRD COLONIES AND POPULATION ESTIMATES IN KACHEMAK BAY, 1976

Colony Location	Species	Species Population Estimates
Point Pogibshi	Tufted puffin	20
Hesketh Island	Horned puffin	4
	Pigeon guillemot	20
Grass Island	Black-legged kittiwake	40
Sixty Foot Rock	Tufted puffin	54
	Common murre	350
	Black-legged kittiwake	86
	Glacous-winged gull	64
Gull Island	Common eider	2
	Glaucous-winged gull	216
	Common murre	3,000-5,000
	Red-faced cormorant	62
	Pelagic cormorant	222
	Tufted puffin	530
	Horned puffin	10
	Pigeon guillemot	12
	Black-legged kittiwake	3,194

Based on data from D. Erikson and P. Arneson 1976 in NOAA (1977:33)

Adult salmon move into coastal areas and streams along the Lower Kenai Peninsula where they congregate before spawning. Juvenile salmon migrate out of their natal streams and into estuarine areas. The peak of the adult salmon migration is reached during mid-summer when upwards of 800,000 salmon migrate into the Kachemak Bay area (ADF&G 1976). Several salmon spawning streams are located on the Lower Kenai and they produce moderate numbers of salmon. Table 3 indicates streams in the vicinity of Port Graham and English Bay and their average salmon escapements. Small numbers of coho salmon also migrate into most of

these areas. Actual salmon production in the region is higher, but no estimates are available by river system. For instance, during 1983, the southern district commercial fishery produced 858 king salmon, 130,667 sockeye salmon, 3,489 coho salmon, 690,098 pink salmon, and 14,281 chum salmon.

TABLE 3. ESTIMATED ESCAPEMENTS FOR SALMON SPAWNING STREAMS NEAR PORT GRAHAM AND ENGLISH BAY*

River	Average Escapement Level	
English Bay River	7,200	Sockeye Salmon
Port Graham River	1,800	Chum Salmon
Port Graham River	15,000	Pink Salmon
Seldovia River	1,200	Chum Salmon
Seldovia River	40,000	Pink Salmon
Dogfish Lagoon	6,000	Chum Salmon

*ADF&G 1985

Abundant shellfish populations occupy the Lower Cook Inlet and Kachemak Bay areas. Among the most commercially significant groups are the dungeness crab and several species of shrimp which are seasonally migratory and primarily occupy deeper offshore waters. Butter clams, blue mussels, cockles, and scallops are important for personal use, and occupy intertidal and nearshore subtidal areas. A variety of less economically important groups occupy most of the intertidal zone and include chitons, octopus, sea urchins, sea cucumbers, whelks, and snails.

TERRESTRIAL ENVIRONMENT

Vegetation

The plantlife on the Lower Kenai Peninsula is strongly influenced by the relatively mild maritime climate produced by the warm water currents in the Gulf of Alaska. With the high levels of moisture in the area vegetation tends to be thick and luxuriant. Three dominant vegetative zones characterize the Port Graham-English Bay area (Fig. 6). First, from sea level to about 500 to 1000 feet grows a band of coastal western hemlock and sitka spruce. Second, above the forest is a band of thick alders and patches of salmon berries. Third, covering the open, higher elevations is alpine tundra and barren grounds. The elevation at which timber line occurs is highly variable depending upon soil types, slope, and moisture levels. Within the forested areas is a heavy undergrowth of mosses, ferns, devil's club and bushes among which high-bush blueberry is common. Most forest clearings and edges are dominated by thick patches of either alder in disturbed areas or salmonberry in areas where a thick humus soil layer remains. In riverine areas, particularly in gravelly soils, grow stands of cottonwood and alder. Grasses are a common understory in dry alder areas, while skunk cabbage and ferns grow in wetter stands. In tundra grow arctic willow, dwarf birch, mossberry, low-bush blueberry, grasses and sedges.

The band of coastal hemlock-spruce forest extends around Kachemak Bay and gives way to spruce-birch popular forests north of Anchor Point. On the highland bench areas north of the bay are extensive alder stands, openings of wet tundra, and muskeg.

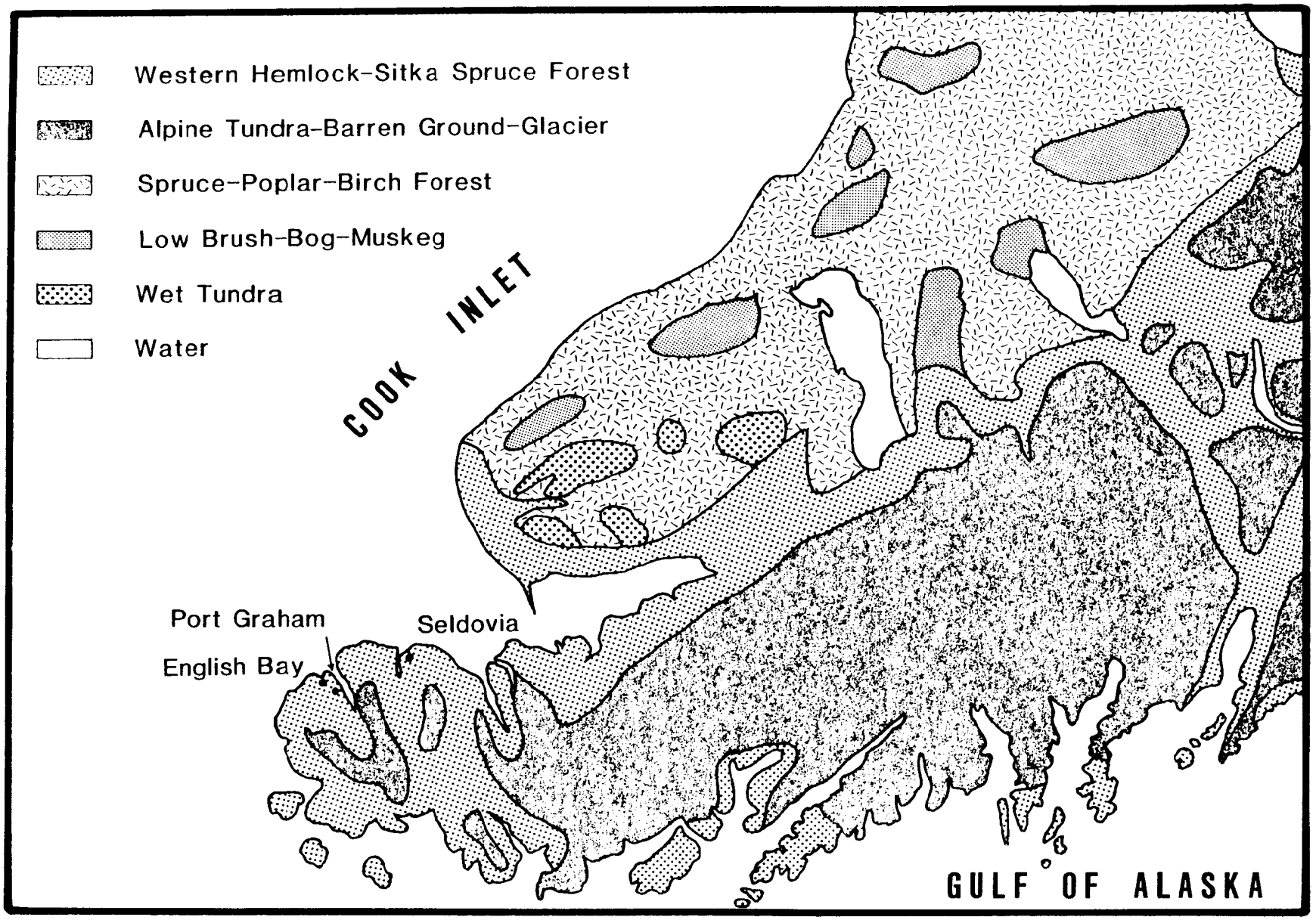

Figure 6. Major terrestrial vegetation distribution of the Lower Kenai Peninsula (after Selkregg 1974).

Land Mammals

Approximately 38 species of land mammals inhabit the region. The most common and widely ranging large mammal on the Lower Kenai Peninsula is the black bear. They can be found from coastline to tundra during spring, summer, and fall. Bear seek specific hibernation areas in late fall, and are inactive until March. In March and April, the first sign of black bear activity appears as tracks across snow patches. Bears are readily visible on open, south-face slopes where they search for roots and the first green vegetation. As spring progresses and the vegetation greens up, bears are less visible. Throughout the summer and fall bears are found most places. They congregate along salmon streams in early fall and move to tundra areas in search of berries during mid-to late fall.

Moose are few in the Port Graham and English Bay area. Most of the forest and alder growth on the Lower Peninsula is mature or in advanced stages of growth, so productive moose habitat is limited. Greater numbers of moose are found at the head of the Kachemak Bay and on the north side where there are extensive areas of transitional spruce-birch forests and stands of young willow and alder.

The extensive areas of barren, rocky, mountainous terrain provide excellent locations for mountain goat. Goats are found on many rocky cliffs and peaks neighboring the two communities and along the outer peninsula coastline.

Furbearers occurring in the area and which utilize coastal areas to a large degree include wolverine, wolf, coyote, lynx, fox, river otter, mink, and weasel; the latter four are the most common species.

Although common on the Upper Peninsula, marten, beaver, and muskrat are rare on the Lower Peninsula near the two communities. Other small land mammals inhabiting the area include red squirrel, red-backed and tundra vole, masked shrew, and hoary marmot.

Birds

The larger terrestrial bird species found in the area include spruce grouse which inhabit the narrow spruce forest band, and willow, white-tail, and rock ptarmigan inhabiting alder and willow patches, high meadows, and alpine tundra. Bald eagles are commonly seen in coastal areas as well in higher alpine areas. Several other species of smaller birds of prey are found in the spruce forest including goshawks, and sharp-shined hawks. A variety of passerine species such as fish crows, ravens, magpies, varied thrush, robin, yellow-rumped warblers, and golden-crowned sparrows are common in appropriate habitats.

Freshwater Fish

Most common of the freshwater fish in the area are Dolly Varden and rainbow trout. Both are found in lakes and streams throughout the year. Dolly Varden migrate in and out of local lakes and river systems. They are seasonally abundant in streams and can be found in large numbers when salmon are spawning in shallow lake shore waters.

Varying numbers of the five Alaskan salmon species seasonally move into local river systems to spawn. Pacific tomcod also spawn in lower

stream areas in winter months. Species of whitefish and smelt also make annual spawning migrations to a few streams on the Lower Peninsula during spring months.

SUMMARY

Overall, the Lower Kenai Peninsula and Lower Cook Inlet areas are populated by a great variety and seasonal abundance of fish, wildlife, and plant species. The maritime climate conditions and the rich marine environment are primarily responsible for this abundance and availability. Tidal activity also is responsible for making many intertidal resources easily accessible in predictable and frequent cycles. The highly convoluted southern shorelines of Kachemak Bay and the outer peninsula provide protection of hundreds of miles of shoreline for resource production and harvest opportunity.

The local marine environment is by far more productive in biomass than neighboring terrestrial areas. Although many land mammal species are present, there are not large numbers of game mammals. Land areas also produce abundant supplies of timber and other plant resources. Land surfaces give rise to numerous streams and rivers which annually produce hundreds of thousands of salmon and other fish.

CHAPTER 3

PREHISTORY

Archaeological studies on Kodiak Island and other Gulf of Alaska sites indicate occupation of the Gulf Coastal area for nearly 6,000 years by people who were maritime hunters and food gatherers (Workman 1978:49). The first archaeological exploration of the Kachemak Bay area was conducted by Johan Jacobsen (1977) in 1883. Further work by Fredica de Laguna from 1930 through 1932 (1934) is most notable for establishing a cultural sequence for the area (Table 4). Most recently (in 1974, 1977, 1978, 1980, and 1981) William Workman, John Lobdell, and Karen Workman conducted studies at Cottonwood Creek, Chugachik Island, and Yukon Island (Workman 1977; Workman, Lobdell, and Workman 1980). De Laguna (1975:15-26) identifies the locations of villages and occupation sites (Fig. 7), some of which were occupied in historic times. These sites are located throughout Kachemak Bay and along the outer coastline of the Lower Kenai Peninsula. All are of maritime orientation.

The prehistoric period of the Lower Kenai Peninsula and Kachemak Bay is characterized by a complex and incompletely understood series of movements of two cultural groups, Athapaskan Indians and Pacific Eskimos. Within the Eskimo tradition, a series of cultural periods was established. The time span represented was estimated to be about 1,500 years (de Laguna 1934:121). More recent carbon-14 dating has narrowed this estimate to 1,000 years (K. Workman pers. comm., 1985).

TABLE 4. PACIFIC ESKIMO AND TANAINA INDIAN CULTURAL SEQUENCES FOR KACHEMAK BAY

Cultural Sequence	Characteristics	Period
Kachemak I	Yukon Island Flaked stone tools; primative toggle harpoon similar to Norton Culture.	1500 B.C.
Kachemak II	Chugachik Island; Yukon Island Large notched stones; stone lamps; polished slate blades; ulos; fish hooks; fish spear; sewing needle; labret; ear plug.	Pre-400 B.C.
Kachemak Sub-III	Chugachik Island; Yukon Island Small notched stones; stone lamp; polished slate blades; ulo; drill; slate awl; dart head; fish hook; bird bone pendant; buckle; ivory doll; paint; flexed burial with artificial eyes, labrets and clay masks; semi-subterranean houses; hearth pit.	400B.C.- 1 A.D.
Kachemak III	Chugachik Island; Yukon Island; Cottonwood Creek. Many small notched stones; stone saw; whetstones; stone dish; pottery chipped stone blades; polished stone polished stone blades with owner's mark; elaborate burial ceremonialism.	1 A.D. to between 500 A.D.-600 A.D.
	END OF KACHEMAK TRADITION	
Late Prehistoric Period of Kachemak Bay	Yukon Island bluff; Cottonwood Creek; Seal Beach; Tanaina Indian influx; splitting adzes; bone awls; bone chisels; native copper; slate blades; little carry-over from earlier Kachemak traditions.	500 A.D. to 1800 A.D.
Contact Period	Russian Fur Traders enter area.	1780 A.D.

Adapted from: de Laguna 1934; Workman, Lobdell, and Workman 1980

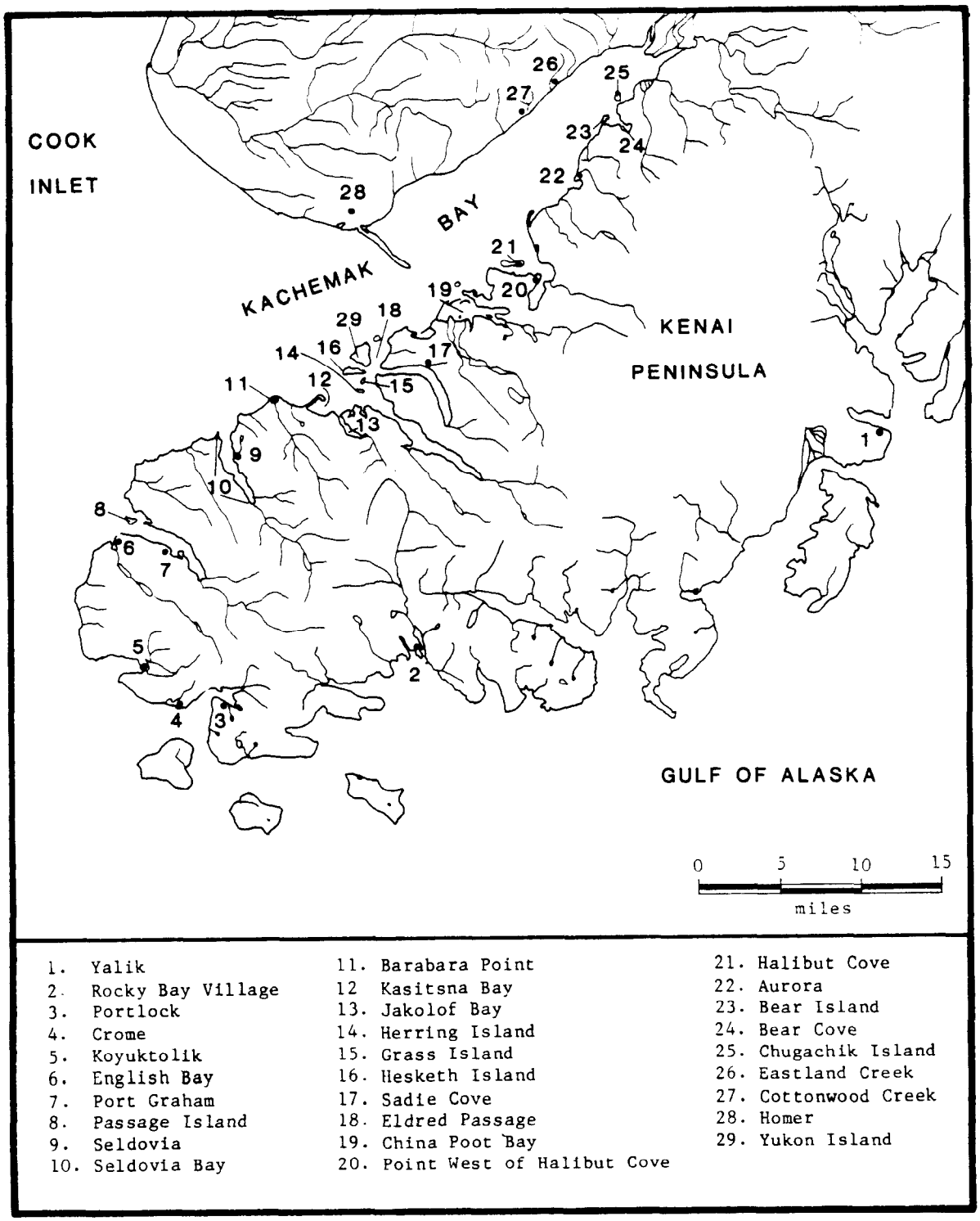

Figure 7. Locations of prehistoric sites on the lower Kenai Peninsula. (Sources; de Laguna 1937; Workman; Lobdell, and Workman 1980)

Because of the strong reliance on marine resources, most prehistoric habitation sites were located at the edge of the sea, usually on low protected landforms. Most sites on Kodiak Island and Kachemak Bay were located close to the water's edge where inhabitants processed marine mammals and birds, fished for a variety of species, and gathered shellfish (Workman 1978:82). Several hypotheses have been developed to explain the depopulation of Kachemak Bay by prehistoric Eskimos. Lobdell (1981) proposed that overuse of the area's resources may have contributed to the human emigration from the bay. This is supported by Workman and Workman (1985) who suggested that the marginal nature (from the standpoint of supporting large human populations, and as compared to Kodiak or the outer Kenai Peninsula) of the Kachemak Bay environment, particularly the upper bay above the Homer Spit, may have been responsible for the depopulation. The latter suggestion included such factors as the lack of salmon runs, occasional freezing of the upper bay, and siltation of inner bay tidal zones. In summary, Kachemak tradition peoples were Pacific Eskimos with a marine orientation, but the bay was marginal for this type of adaptation.

The next occupants of the bay arrived in the area about 1,000 years after the Eskimo occupation. Around 1600 A.D., Tanaina Indians arrived in the area and occupied the bay at the time Russian explorers entered Alaskan waters.

Remains from the earliest levels of occupation in Kachemak Bay are similar to those of the Norton Culture on Nunivak Island and typical of maritime cultures found on Kodiak Island and the northern Alaska Peninsula. The middle range of the Kachemak tradition is well represented by stone and bone artifacts, stemmed projectile points, and

faunal remains. Findings indicate relatively little taking of land animals but strong orientation toward the marine environment, with seals representing the largest number of animals harvested. Other faunal remains which indicate a strong marine adaptation are porpoise, belukha, halibut, cod, flounder, sculpin, and whelk. Lobdell (1980:179-180) suggests that the large numbers of notched stones found were used in nets to catch waterfowl. Analysis of bird remains in the Chugachik Island sites indicated a predominance of species taken in the spring.

Lobdell (1980:97-266) detailed information about the importance of natural resources to prehistoric inhabitants of Kachemak Bay based on the relative quantities of animal bones found in the three major archaeological sites. The primary emphasis of Kachemak Bay archaeological sites was marine mammals and secondarily land mammals. Harbor seals made up 41.1 percent of the animal remains; of those over one-half were immature animals. The evidence also suggests that seal harvests took place during summer months when animals could be easily approached at haul-out areas. Marmots were second in abundance and porpoises ranked third. However, the latter was probably a more significant food source (K. Workman pers. comm., 1985). Sea otter remains were not found in abundance in Kachemak Bay sites and are presumed not to have been important in prehistoric times. The taking of large whales by Kachemak people was not indicated by remains or obvious whaling gear such as whale harpoons, although small whales were represented. Likewise, there is little evidence of the harvest of sea lions by inner bay inhabitants and no evidence of rookeries. It is postulated that outer Kachemak Bay inhabitants and people living on the

outer coast may have been involved in some sea lion harvest owing to the presence of rookeries in these areas.

Of terrestrial mammals, hoary marmots were the most frequently represented species in Kachemak Bay sites. At the Cottonwood Creek site, the faunal assemblage was composed of 50 percent marmot remains. Because of their seasonal availability, it was assumed that marmots were taken during spring and summer. However, at the Cottonwood Creek site, human occupation was found to occur primarily in winter or early spring. As this site contained a high level of marmot remains, this may indicate that marmots were taken primarily in spring as they emerged from hibernation.

Canids (wolf, fox) do not appear to have been important in prehistoric times. Dog remains were found in the Kachemak Bay sites but were not an important food item. Rather, dogs were probably used for hunting and protection, and as pets, as some dog burials were found.

Although they were present in the area, very few bones of moose and caribou were found in the sites. Perhaps they were killed distant to human habitations and most of the bones were not brought back with the meat. No remains of sheep or mountain goats were found, and no explanation for their absence was suggested by Lobdell, although the same reason could apply.

Bear remains were found in all sites, but they were not abundant at the Cottonwood Creek and Chugachik Island sites. Like other large land mammals, it is assumed from the remains (mostly foot bones), that animals were boned out and only the meat and possibly the hide brought back. Other small land mammal remains found at all or some of the sites

included snowshoe hare, muskrat, mink, porcupine, beaver, land otter, and wolverine.

As to the lack of evidence for the utilization of salmon, there has been little explanation put forth. There were, however, relatively few salmon in the bay, and none of the sites were located near salmon streams. Also, salmon bones preserve relatively poorly (K. Workman pers. comm., 1985).

From archaeological evidence collected at coastal sites throughout southcentral Alaska, Lobdell (1980:150) concludes that the small sea mammals were of prime importance to the diets of prehistoric peoples of this area in all time periods, and that land mammals were much less important even though they were readily available. The abundance of marine resources and the availability of a quick and easy form of transportation to concentrations of animals also allowed coastal inhabitants to live in centralized village sites.

The archaeological record for the period between Eskimo and Indian habitation lasted about 1,200 years and there has been little archaeological evidence found. The Russian explorers and traders who arrived in Cook Inlet in 1785 encountered Indians who had adopted items of Eskimo technology such as kayaks, harpoons, and gut parkas. These adaptations probably occurred in relatively recent times as suggested by Workman et al (1980:398), and were probably influenced by Prince William Sound, Koniag, and Alaskan Peninsula Eskimos. Thus, the successful occupation of the bay area by Tanaina Indians was apparently accomplished by a blending of a northern Athapaskan adaptation to exploit terrestrial resources and an adoption of Eskimo technology for utilization of the marine environment.

CHAPTER 4

HISTORY

BACKGROUND

The history of the Lower Kenai Peninsula and of Port Graham and English Bay is linked to that of the Gulf of Alaska and the Chugach Region. The following summary provides a general background of historical events significant to the villages of Port Graham and English Bay (Table 5). The recorded history of the area covers the past 240 years, and can be divided into three general periods: first, European exploration between 1741 and 1791; second, Russian period between 1780 and 1867; and third, the American period, from the time the United States purchased Alaska in 1867 to the present. During the historic era, a new cash economy was introduced, but only marginally. The local economy was thus altered early and significantly, but later became depressed. Throughout this period, subsistence hunting, fishing, and gathering served as a continued economic buffer. Also important factors in sociocultural change in English Bay and Port Graham were intermarriage with immigrants from other parts of Alaska and from outside the state, Russian Orthodoxy, and schools.

EXPLORATION

The period of exploration and first recorded history of the region began in the early 1700s with the voyages of explorers and entrepreneurs from Russia, Spain, and Great Britain. The voyages of Vitus Bering,

TABLE 5: SIGNIFICANT HISTORICAL EVENTS AFFECTING PORT GRAHAM AND ENGLISH BAY

1725	Vitus Bering appointed by Peter the Great to search out the East Arctic Passage.
1742-84	Russian fur trade (Promyshlenniki move into Aleutian Islands and expand fur trade into Alaska).
1778	Captain James Cook sails into Cook Inlet.
1781	Shelikhov and Golikov establish the American-Northeastern Fur Company.
1784	Permanent Russian settlements established on Kodiak Island.
1785	Russian Fort established at Alexandrovsk (English Bay).
1786	Portlock and Dixon visit Lower Cook Inlet and map the area.
1794	First missionaries sent to Kodiak from Russia.
1799	Russian-American Company receives charter for Alaska.
1804	Baranov moves the Russian-American Company headquarters from Kodiak to Sitka.
1855	Coal mine established at Coal Village on Port Graham Bay.
1867	Alaska purchased from the Russians.
1874	Nickolas Moonin born in Alexandrovsk - father and grandfather of a large portion of present-day (1980) population.
1870	Yalik residents moved to English Bay.
1880s	Alaska Commercial Company active in Alexandrovsk.
1884	Flu epidemic hits Lower Kenai Peninsula - a large part of Alexandrovsk residents die.
1890s	Ashivak residents relocated.
1912	Fidalgo Island Seafoods cannery established at Port Graham.
1915	Portlock established with halibut cold storage, and later mining activity and timbering.
1925	Schools established at Port Graham and Portlock.
1927	Salmon trap numbers all-time high in Alaska.
1928	Peak of the Kachemak Bay herring industry.
1930	Height of fox farming in the Kachemak Bay area.
1940s	Fox farming industry crashes due to World War II.
1950	Portlock is abandoned - residents move to English Bay and Port Graham.
1952	School established at English Bay.
1959	Salmon traps outlawed.
1958	Airstrip built at English Bay.
1960	Cannery at Port Graham burns.
1964	Great Alaska Earthquake.
1974	Expanded airport at Port Graham.
1981-83	Building of 43 new housing units; new community center; roads; telephones to each household.

Adapted from: Alexandrovsk No. 1, 1980:25-26.

which began in 1725 in an attempt to determine any land connection between Russia and North America, were the first to enter the Gulf of Alaska and make an initial landing at Kayak Island (near present-day Cordova) in 1741 (Pethick 1979:121).

Following Bering's voyages, Russian fur traders and hunters, called promyshlenniki, settled the Aleutian Islands and colonized the Alaskan coastline between 1742 and 1884. The next major explorers were the British Captain James Cook, who sailed into Prince William Sound and Cook Inlet in 1778, and the Russian, Zaikov, and the Spanish explorer Arteåge in 1779. All were looking for lands and resources to claim for their mother countries (Pethick 1979:121). The Russians were determined to capture the Alaskan fur trade and prevailed over Spanish and British interests by establishing permanent forts, villages, and an active trade along the Alaskan coastline (op. cit.).

THE RUSSIAN PERIOD

The Russian Period in Alaska lasted 120 years from the time of early seasonal fur trade exploits in the Aleutian Islands in 1747 until 1867, and included the establishment of permanent settlements after 1781. The primary concern of the fur trade was sea otters which were sold in Russia and the Orient. Other furs like fox, marten, and fur seals were marketed in large quantities, but nothing compared with sea otter harvests which nearly exterminated the species from Alaskan waters (Petroff 1884:61).

The first major effort in the fur trade came in 1781 when Gregor Shelikof organized the American Northeastern Company. Shelikof founded

the first European colony in Alaska at Three Saints Bay (Old Harbor) on Kodiak Island in 1784. Shelikhov later sent an exploration party to Cook Inlet, and a fort was established at Alexandrovsk in 1785 (later to be named English Bay), the first settlement on the Alaskan mainland (Tikhmenev 1978:14).

The English and Spanish continued their exploration of the Pacific coast of North America during the 1780s. In 1786 Captains Nathanial Portlock and George Dixon traded with the inhabitants of Alexandrovsk (Hully 1970:102). This activity only encouraged the Russians to expand their efforts to colonize and achieve a fur trade monopoly.

Throughout the late 1700s, additional Russian settlements were established on the Alaska mainland. In 1787, the Lebedev-Lastochkin Company founded a trading settlement at Saint George (later to be called Kasilof). In 1791, this company established Fort St. Nicholas at the current location of the city of Kenai. These two communities became the foci for an active inland fur trade between Russians and Tanaina Indians (Townsend 1974:4) as sea otter numbers dwindled. Throughout the later 1700s, several Russian companies vied for trade with the Indians of Cook Inlet. In 1799, the Russian-American Company gained a monopoly over the trade and remained in control until the sale of Alaska in 1867.

To achieve their dominance in the fur trade, the Russians applied a system of forced labor on the Natives. Leaders in the Native communities were appointed by Russian traders to supervise hunting and trapping activities. Furs taken by Native hunters were traded to companies often for much less than the real value. To enforce this system of slavery, the traders took captive the children and wives of the hunters (Okun 1951:197-200). Although this system worked well on

the Aleuts, it met with considerable resistence when dealing with the Koniag, Chugach, and Tanaina. Skirmishes with the Natives occurred at Nuchek in Prince William Sound, Three Saints Bay on Kodiak Island, and at Fort St. George and Trading Bay in Cook Inlet (Bancroft 1886; Townsend 1974; Tikhmenev 1978). A new system of trading with the Natives resulted which did not involve force and coercion, but it was no more equitable in paying fair value for furs than the earlier system. Natives continued to accumulate debts at company stores as a result of credit extended by the trading companies.

Throughout their time in the Cook Inlet, the Russian companies tried to develop commercial industries including agriculture, mining, fishing, and fur farming. In 1850, mineral explorations by Peter Doroshin on the Kenai Peninsula led him to the coal deposits discovered by Portlock in 1786, at the entrance of Port Graham Bay. The Russian-American Company established a mine in 1855. By 1862, the mine had exported 5,000 tons of coal, and the community of Coal Village had grown to be the third largest Russian-American Company community in Alaska, with about 100 people. Coal was exported to California to supply the demand created by the gold rush of 1849. The trading post at Alexandrovsk was moved to Coal Village. The coal was low grade, and the mine closed when other higher grade supplies became available in California. The village site of Alexandrovsk again became active.

The Russian Orthodox church has a long history in the Gulf of Alaska. In 1794, the first Russian missionaries were sent to Kodiak at the request of Shelikhov and Golikov for instructing the natives in Christianity (Tikhmenev 1978:35-36). In 1845, Monk Nicholus located in Kenai for serving Cook Inlet communities. Travel to communities in the

region was long and arduous. In order to reach all their constituency of the Kenai Peninsula, missionaries requested Natives living in the largest Kenai Peninsula coastal villages at Yalik and Nuka Bay to move to Alexandrovsk (Porter 1893:69). The residents complied with this request. During the 1860s, John Moonin, of Russian, Indian, and Spanish ancestry and born in California, moved to Kodiak Island. There he married a woman of Koniag and Russian parents, Helen Medvidnikoff, and subsequently moved from Kodiak to Seldovia as volunteer missionaries (Melsheimer 1980:29-38). Moonin later relocated to Alexandrovsk where he raised his family. His son Nikolas, who became a teacher and priest, was the ancestor of many of today's residents. The church probably had its most profound impact on the Natives by providing a new set of beliefs and customs to replace many traditions destroyed by early Russian oppression. For example, Lantis (1970:284-291) reports that in Southwestern Alaska the Russian priests tried to help the people by providing a rationale for their existence. This came as great relief, "from the labor and hazard of service for the Russians." The Russian Fur Company policy toward Natives during the mid-1800s was probably less oppressive than earlier times because of the more resistent attitude encountered among the Eskimos and Indians than among the Aleuts.

Russian presence in Alaska ended when conflicts with Great Britain threatened a possible takeover of Alaska, the returns on government investments in trading companies became uneconomical, and an impending gold rush which the Russians feared would result in annexation to the United States combined to make it impossible to further govern the territory (Sherwood 1967; Bancroft 1886). Most Russians left Alaska, but most of their Creole descendants remained. Many carried on trading

activities of the new American companies and conducted the teachings of the Orthodox church.

THE AMERICAN PERIOD

After the purchase of Alaska by the United States in 1867, the Alaska Commercial Company took over the Russian American Company post at English Bay. The Americans were no less interested in the commercial exploration of furs and minerals than were the Russians, and these two activities continued into the early 1900s in the Kachemak Bay area. The Alaska Commercial Company continued the trading patterns of the Russian American Company. They, however, removed the rotational hunting restrictions imposed by the Russians, and this led to further decimation of the sea otter (Bancroft 1883). In 1911, sea otter were protected under the Fur Seal Treaty Act.

The Americans continued the policy of offering the Natives supplies and trade goods in exchange for furs. This allowed extended credit to the Natives for upcoming fur harvest. Because competition for the fur trade was allowed by the new American government, extremely high prices were paid for fur, and the market became inflated. The extended credit policy was carried to an extreme in order for trading companies to secure Native business. A period of wealth prevailed among the Natives, large debts were accumulated, and cash entered the local economy as a result of the stiff competition among traders. This ended when the fur market collapsed in 1897 (Townsend 1974). Outstanding debts to the Natives were collected by taking the season fur harvests and giving no credit, resulting in great social and economic hardships.

The major American influence on the local economies came to Alaska in the 1880s with the canneries and the commercial fishing industry (Scudder 1970:3). Canneries had their beginnings in Kachemak Bay around 1910 (Klein 1981:54). They probably had their most profound affect on Native people by disrupting the annual seasonal round. This disruption came at a crucial time when traditionally English Bay residents were putting up salmon for winter supplies (Davis 1977:8). The labor intensive work and lengthy days working in the canneries, on traps, and net fishing pulled people away from traditional subsistence activities. The availability of storebought goods and permanent housing also contributed to the more sedentary way of life for the Natives. In later years, the hiring of nonlocal labor further impacted the Natives by leaving them jobless. In part this was due to the Natives need to put up a winter's supply of fish (Liljeblad 1978).

Regional settlement patterns also were influenced by cannery locations. Some villages grew overnight, while others were abandoned or depopulated during the fishing seasons. Communities like Seldovia, Halibut Cove, Port Graham, and Portlock had their beginnings with the canneries (Table 6; Fig. 8). English Bay was almost totally abandoned during the summer fishing seasons, while Portlock boomed between 1920 and 1940.

The levels of commercialization in the new fishing economy were never sufficient to allow the Native communities of Lower Cook Inlet to become totally dependent on imported food and materials. On the average they made far too little money to purchase gear necessary for commercial

TABLE 6. HISTORIC POPULATION TRENDS IN KACHEMAK BAY AND LOWER KENAI PENINSULA COMMUNITIES 1775 - 1983

Community	Pre 1880	1880	1890	1900	1910	1920	1929	1939	1950	1960	1970	1980	1983**	1984**
ASHIVAK (CAPE DOUGLAS)	NDA	46	85	Aband.	--	--	--	--	--	--	--	--	--	--
ENGLISH BAY (ALEXANDROVSK)	20	88	107	NDA	NDA	NDA	107	48	75	78	58	124	152	172
COAL VILLAGE	100	Eng. B.	--	--	--	--	--	--	--	--	--	--	--	--
YALIK	NDA	32	Eng. B.	--	--	--	--	--	--	--	--	--	--	--
SELDOVIA (OSTROVSKI)	NDA	74	99	144	173	258	379	410	460	460	437	473	578	435
KASLIOF (SAINT GEORGE)	31	31	117	159	NDA	87	124	62	62	89	71	203	491	567
NINILCHIK	--	53	81	NDA	NDA	NDA	NDA	132	97	169	134	336	403	427
LAIDA	NDA	29	Aband.	--	--	--	--	--	--	--	--	--	--	--
PORT GRAHAM	--	--	--	--	Est. 1912	NDA	NDA	93	92	139	107	161	160	174
PORTLOCK	--	--	--	--	Est. 1915	47	NDA	31	Aband.	--	--	31	--	--
KACHEMAK BAY	--	--	--	--	--	--	--	13	--	--	76	402	302	320
HOMER	--	--	--	--	--	--	--	325	307	1247	1083	2211	3114	3373
HALIBUT COVE	--	--	--	--	--	--	--	23	--	25	44	45	52	52
ELDRED PASSAGE	--	--	--	--	--	--	--	13	--	--	--	--	--	--
ANCHOR POINT	--	--	--	--	--	--	--	20	65	171	102	229	310	317
JAKALOF BAY	--	--	--	--	--	--	--	--	--	--	--	36	87	84
FRITZ CREEK	--	--	--	--	--	--	--	--	--	--	27	302	1218	1414

** Alaska Population Overview: source

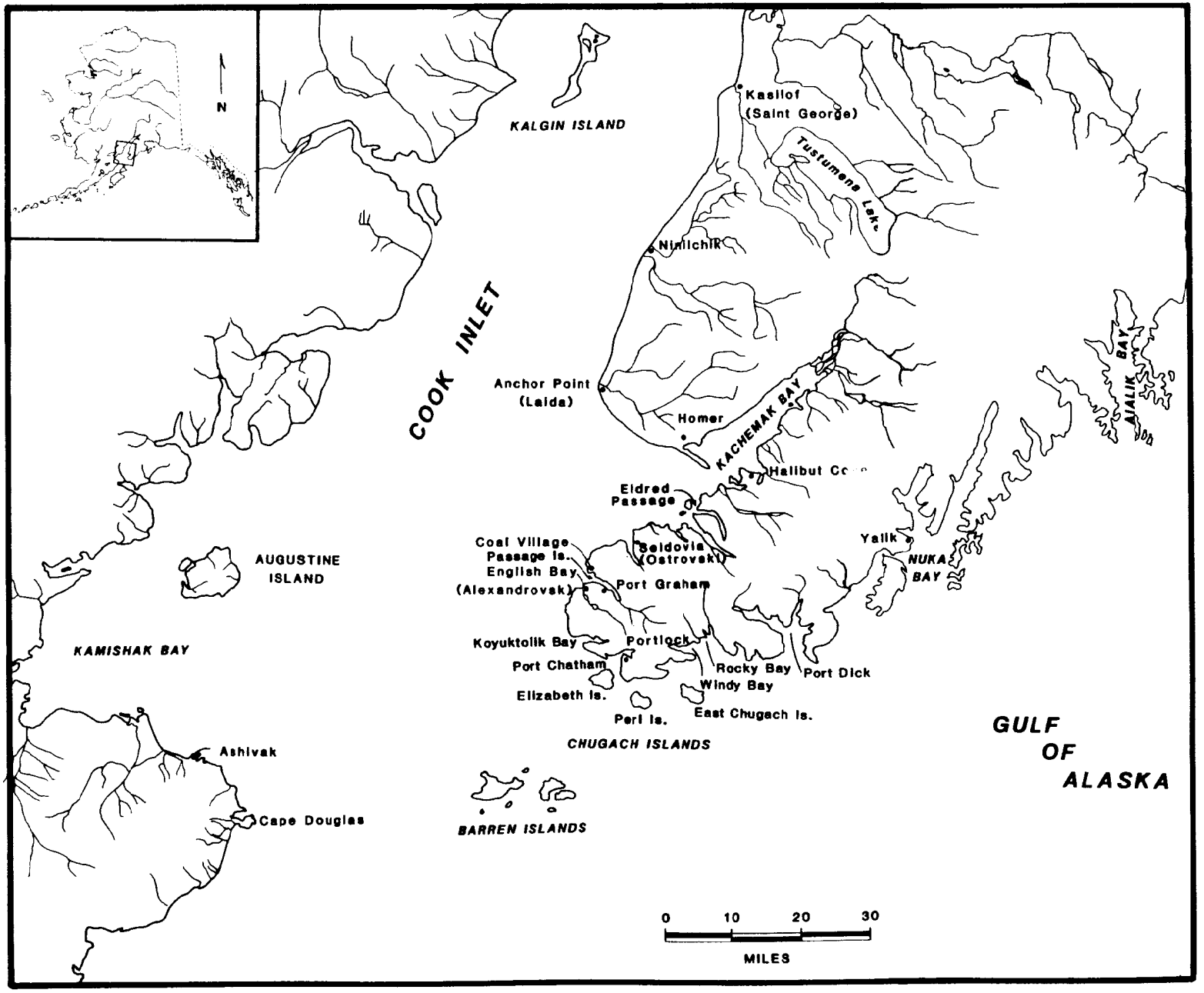

Figure 8. Locations of historic communities in the Lower Cook Inlet.

fishing, yet they were irrevocably tied to the salmon industry (mostly cannery and fish trap labor) for the cash component of their livelihood.

The turn of the century was a time when economic activities flourished on the lower Kenai Peninsula. Around 1915, a chrome mine was opened at Port Chatham (on the tip of the Kenai peninsula). Later, a halibut cold storage unit was set up there, and the area also became an important source of logs for fish trap pilings and other construction. Most people moved away from English Bay to Portlock or Port Graham for work. Fox farms appeared in many areas of Alaska, but in 1930 Kachemak Bay was the center of the industry in Southcentral Alaska and they too employed local villagers as laborers. One farm was on Elizabeth Island and in 1920 another on Passage Island, while others were scattered throughout the bay. The herring industry in the bay boomed between 1911 and 1930. By the early 1930s, herring stocks and habitat were destroyed and the fishery ended.

Through the Great Depression of the 1930s, people in the bay area had plenty of local resources on which to rely and they were not impacted economically like many parts of the country. However, the relentless exploitation of salmon took its toll and stocks decreased dramatically. The fishing industry then evolved from being controlled by the canneries to being dominated by independent net fishermen. Until after World War II, local residents were, however, limited to set netting, working for the canneries, and utilizing wild resources for subsistence purposes (Braund and Behnke 1980:173-77). Since then, Port Graham fishermen have acquired their own drift and seine boats, while English Bay fishermen have remained set netters. Recently, the Port

Graham Corporation bought the Whitney-Fidalgo cannery located there and operates it through contractual management.

Local control of labor and cannery profits will now be possible and will be distributed to corporate shareholders. This may provide substantial incentives for local residents to become actively involved in the cannery's operation - a factor largely absent under the former management.

Numerous noneconomic factors brought about changes to most lower Kenai Peninsula communities. For example, in the 1930s, schools were established in Portlock and Port Graham. The schools were a means for suppressing the use of Native languages and forcing English to be spoken. New customs and values were taught and old values discouraged (op. cit.).

By 1950, Portlock's importance as an economic center had diminished. The mines became uneconomical, and there was no longer the need for trap pilings as driven traps were being phased out and the cannery burned. Portlock residents moved back to English Bay, Port Graham, and Seldovia.

Meanwhile, in English Bay the influence of Euro-American culture was substantially less than in other Kachemak Bay communities. English Bay residents worked in the Port Graham cannery and fished commercially. There were no local economic activities centered in this community. Apart from the summer, the year was spent in traditional subsistence activities. Not until 1958 did BIA build a school (op. cit.) Between 1960 and 1981, only one housing project brought any substantial development. In 1981, a major road and housing construction project

changed the face of English Bay, and brought a new financial burden to its residents' home loans.

The 1964 earthquake had major effects on Seldovia. When the land subsided in Seldovia, subsequent high tides flooded buildings and piers. After money was acquired for rebuilding, all except one cannery moved from Seldovia. Its importance as the economic center of lower Cook Inlet was gone. A road connecting Anchorage to Homer, Kenai, and Soldotna in the 1950s further changed the focus of economic activities.

In the 1970s, Kachemak Bay communities had to face major decisions and changes brought about by oil leasing and the Alaska Native Claims Settlement Act (ANCSA). A major outer continental shelf oil lease was opposed by Port Graham and English Bay to protect their way of life and local wild resources. New demands by the ANCSA created political entities which gained tremendous responsibilities for large tracts of land. In 1991, these lands will become taxable. Shareholders are now faced with the problem of how to generate income to pay taxes and, as with the oil issue, not jeopardize their way of life and the local wild resource base. During the past 20 years, the villages have been involved with land claim and settlement issues. Each village had its own corporation and obtained grant monies for new public service buildings, homes, and electricity supplied by power lines from Homer. Water lines, septic systems, and new roads were installed in recent years and in 1983, telephones were installed in most homes.

Overall, the economy of Port Graham and English Bay has, for the past 200 years, centered around the use of local wild resources. Although the prosperity of the area fluctuated greatly, residents have relied on a variety of income sources to derive needed cash for the

purchase of store-bought items. In addition, however, they have continuously relied on local wild resources to supply a significant portion of their annual food supply.

CHAPTER 5

HISTORIC RESOURCE USE PATTERNS

THE HISTORIC ANNUAL ROUND

The following description of the annual seasonal round for the period from the 1880s to the 1940s was developed from accounts in the ethnographic literature and from descriptions by knowledgeable individuals during this study (J. Tanape pers. comm., 1982; W. Meganeck pers. comm., 1982). Geographic areas utilized during this time period are depicted in Figure 9. Since spring is traditionally viewed by these people as the beginning of a new annual cycle, the discussion begins with that time of year.

Spring

Spring, summer, and fall were spent harvesting resources in the Kachemak Bay area. In April, cod fishing occurred in the shoreline areas near English Bay, Port Graham, Portlock, and Dogfish Bay. Bears emerged from their dens at this time and hunters took them on the hillsides and along shorelines. Spring was the preferred time for harvesting shellfish (cf. Birket-Smith 1953:23) especially during bad weather when ocean travel was impossible. Shellfish harvests were highly seasonal, being determined by the timing of tides (spring tides having low minus levels), and by beliefs that shellfish poisoning occurred at certain other times of the year. According to Osgood's

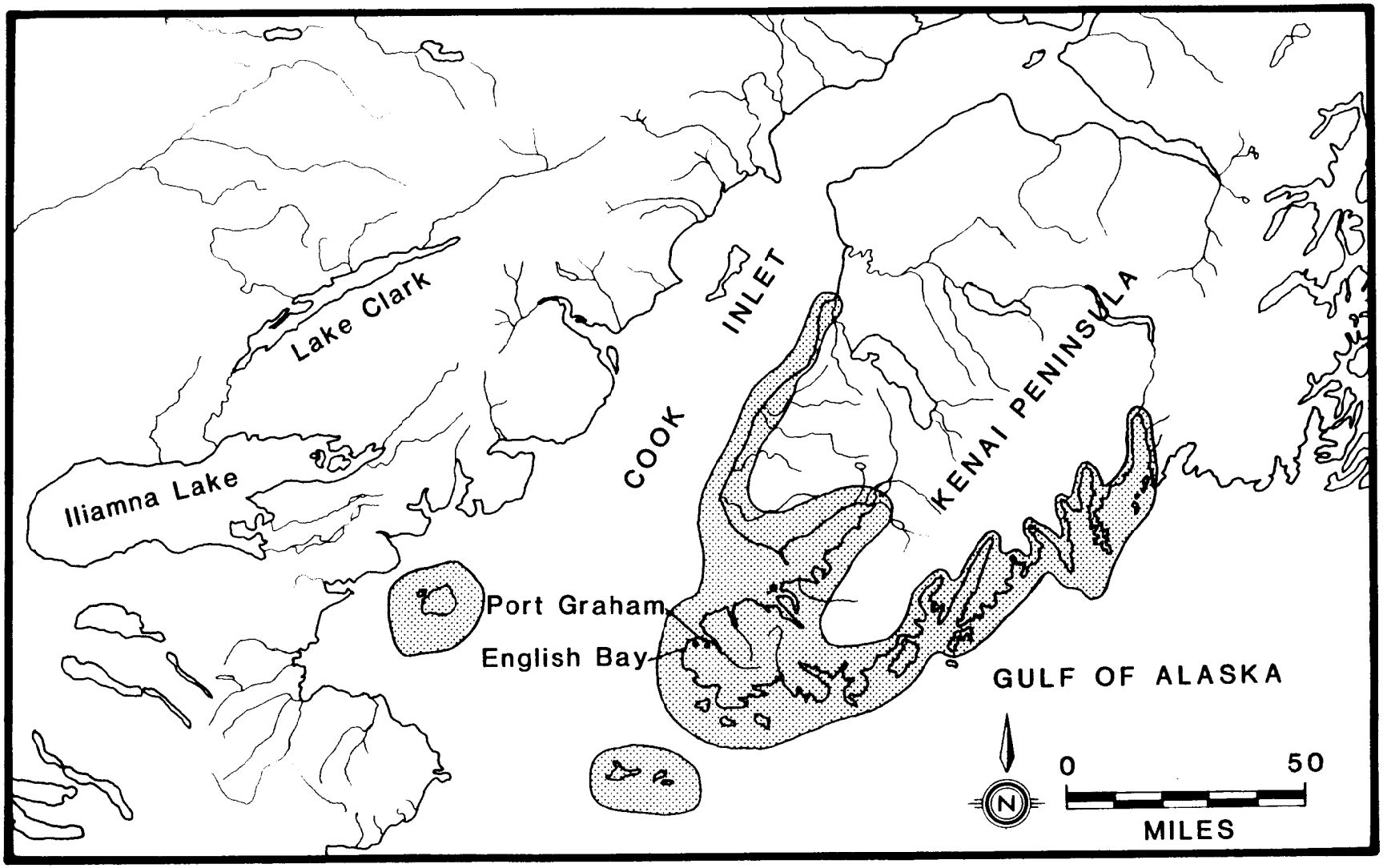

Figure 9. Resource Use areas of Port Graham and English Bay residents, 1880's to present.

Tanaina informants (1937:31), shellfish in Kachemak Bay could be eaten year-round with no ill effects. Around the first of June people stopped bear hunting, and many villagers began working at Seldovia and Port Graham canneries.

Summer

Throughout the summer concurrent with cannery work, people put up dried red and pink salmon and halibut. Usually family members not working directly for the cannery harvested and processed subsistence fish (Birket-Smith 1953:23-24). Cannery workers did what they could in their spare time and sometimes subsistence fished instead of working in the cannery.

In late summer and early fall, people helped each other gather wood for the winter. Some young people went from house to house helping others with wood gathering and other types of work. This was done in exchange for food, clothing, payment, or to fulfill family obligations.

Fall

As soon as silver salmon, berries, and wood were harvested in September and October, some trappers and hunters moved to hunting camps on the outer coast shoreline. Although this area has frequent winter storms, the waters are often calm. In addition, Gulf Coastal weather patterns may have changed since early times. Southerly exposure provides greater opportunity for warm camp areas. Favored places included Windy Bay, Nuka Island, and East Chugach Island. Other locally

known places included Moonshine Bay, One-Hole Bay, and Anderson Beach. In these areas they spent the winter trapping, hunting marine mammals, bears which had denned up, and waterfowl (J. Tanape and W. Meganeck pers comm., 1982). Perhaps several reasons for preferring this area for huning include: (1) the high density of marine mammals; (2) the numerous protected bays; and (3) the practices of hunting seals by taking them during stormy weather when they took refuge in sheltered bays in the lee of islands and points (Davydov 1977:22)

Winter

Some men traveled in skin kayaks to the Seward area where they met Seward area residents, some of whom were relatives, and hunted and trapped together during the winter months (J. Tanape pers. comm., 1982). As local people became more active commercial fishermen (learned skills and acquired fishing equipment) the practice of moving to winter trapping and sealing camps diminished. The need for cash was met in early 1900s by trapping and collecting seal bounties.

January and February were spent during the 1880s in hunting and trapping camps in Nuka, Yalik, and Aialik Bays. Walter Meganeck, his father, and other villagers trapped in Windy and Rocky Bays in the 1920s and 30s. This was at the end of the trapping season and trapping groups had to move out during periods of calm weather. Usually by March the weather and ocean conditions worsened along the outer peninsula. Fur and meat were taken back to villages and summer camps such as Alexandrovsk, Dogfish Bay and Portlock where people stayed until the next fall.

By the 1940s and 50s, cash was earned by commercial fishing and working in canneries. Wild food supplies were harvested more locally from temporary camps rather than remote winter camps. By the 1930s and 40s motors also made travel to distant areas faster. Trips which formerly took several days were accomplished in a few hours.

As economic activities became more oriented around Seldovia and Port Graham, February and March were months when hunters took seals along the southern shore of Kachemak Bay. In late winter and early spring, Halibut Cove was the most popular hunting area (W. Meganeck pers. comm., 1982). Camps were set up on Cannery Point. Seals and belukha were shot as they came into the cove after herring. The animals were butchered and the fat heated to render out the oil. "The whole area smelled of ('cooking') fat and wood smoke" (Meganeck pers. comm., 1982). Products of the hunt were then hauled back to the villages. By the 1920s, Port Graham and English Bay residents had Norwegian dories which they rowed up the bay on incoming tides and back on the outgoing tide. It usually took several days to make the trip.

TRANSPORTATION METHODS

In the late 1800s there was still widespread usage of seal skin boats (qayaq or baidarka). The anglicized term "kayak" is also used for these boats. Groups of people regularly traveled in skin boats between communities and to major bays and islands along the coast. They traveled in search of fish and game resources and to summer and winter camps. Two men (J. Tanape and W. Meganeck pers. comm., 1982) described going to hunting camps in the Port Dick, and Windy Bay and Nuka Bay

areas in 1917 and during the 1920s. Semi-subterranian houses (barabara) served as shelters there.

In 1920, a man transported a family in a kayak from their temporary camp in Port Graham to their winter home in English Bay (Norman 1980:10). Another man (J. Tanape pers. comm., 1982) reported traveling with his father and grandfather in skin boats about 1915 to the Seward area where they met other hunters.

Moonin (1982:47) describes four different types of skin boats. The qayanguaq (Fig. 10), qayarpak, and paitaalek had one, two, and three holes respectively. A fourth large open skin boat called angyaq was used for hauling large freight loads. The three-hole type was apparently a modification made by the Russians (Birket-Smith 1953:45).

Manufacturing of skin boats required a high degree of skill and knowledge. A variety of hand tools such as scrapers, knives, and awls were used to form long strips of wood for the framework. Wood strips were bent and lashed together with tree roots, and were said to be so strong they could not be moved or twisted in any way. After the framework was dried in the sun, seal skins were dehaired and stretched over the frame. The skins of anywhere from 9 to 36 seals were required to cover a skin boat depending on hide size. The skins were sewn together by the women with belukha whale sinew, and the kayak left to dry. When it was dry, seal oil was applied to preserve and waterproof the skins. After several years of use, the hides became worn and were removed and replaced with new skins. Both Birket-Smith (1953:47-48) for 1933, and Tanape (1980:73-74) for 1915 provide descriptions of how skin boats were constructed. The following account is from Tanape.

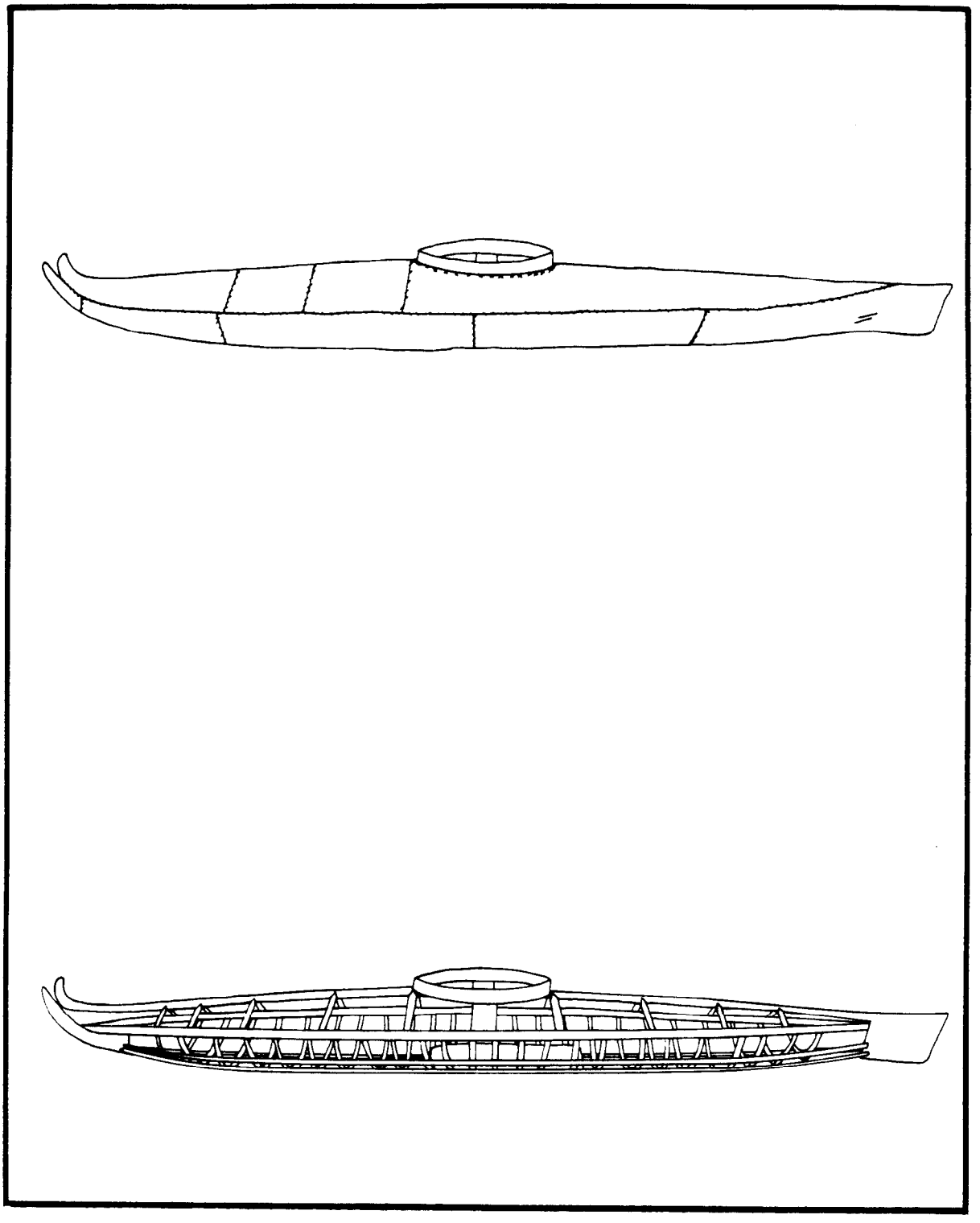

Figure 10. A one-hole kayak, qayanguaq, used as recently as the early 1900s by English Bay residents. Used for local hunting, fishing, and transportation (source Moonin 1981:48; Wasilla Historical Museum).

"First, he put some rocks into a container of water and made the water boil so when he was ready to bend the frames, he just had to put them in the water. That made them bend easier. Then they put the ribs and frames together with sinew, you know, to tie them together. When that was finished, he let his wife sew the seal skin on the frames. The women used whale vein for thread sometimes because it was strong. They used two different kinds of bird bones for sewing needles (large and small bone needles). They made their best boats down by the beach so they wouldn't have to carry them down to the beach from their home to try them out. Birdarkies were the main way they traveled and hunted in those days."

Skillful boatsmen used two and three hole skin boats for spearing and killing seals or sea lions, and spearing bottom-dwelling animals in shallow tidal areas. One-hole kayaks were limited to use in local areas for fishing and retrieving small game animals and for fishing for small bottom-fish. Fishing kayaks usually had a place on one side to attach a spear. Grass or root baskets for holding the catch were placed in front or behind the paddler (W. Meganeck pers. comm., 1982).

As late as the 1930s, several men still had and used skin boats around English Bay. By 1933, Birket-Smith (1953:49) reported that skin boats had all but disappeared from Prince William Sound. Wooden rowboats were owned by some Port Graham and English Bay residents in the 1920s to 40s. It was not uncommon for men to row from Portlock or English Bay to Seldovia for supplies (W. Meganeck pers. comm., 1982).

FISHING METHODS

Fishing methods during the late 1800s and early 1900s were still very similar to those of the Russian trading period (late 1700s and early 1800s). Salmon fishing for family use was primarily with spears and traps. Spears were particularly important and were widely used for

gathering many near-shore and intertidal resources, and for fishing in streams. During historic times, in most instances metal replaced the bone and stone points of spears, and rope and string replaced leather and sinew wrappings. People learned to temper the steel points, making them strong and able to retain a sharp edge. The points of this spear could be designed in different ways. The three designs in Figure 12 were made of slate or iron.

Several different types of spears were described by elders. For example, Tanape and Meganeck (pers. comm., 1982) and Birket-Smith (1953:41) described spears (tuqsiiq) which had points (chingik) made to release from a throwing shaft. Small varieties of this spear were used for fishing (Fig. 11). Fish spears had long tapered shafts. A cord joined the spear point to the narrow end of the shaft. This streamlined the shape and possibly allowed the spear to move straight through the water. There was a long coil of rope attached to the handle so the spear could be retrieved. A large struggling fish could easily dislodge the spear or break the point if it was attached firmly to the shaft. With the detachable point, a fighting fish could struggle while still tethered by the flexible cord, thereby exhausting itself. The fish was then retrieved and removed from the point; the point was reinserted into the shaft and the spear reused. For very large fish the point was not teathered to the shaft, but was attached to a hand held line.

The person usually threw from a distance of around 20 feet to hit selected fish in streams or calm water. An elderly lady commented that her father was so good with a spear that, "you just had to point out the one you wanted, he could hit it every time."

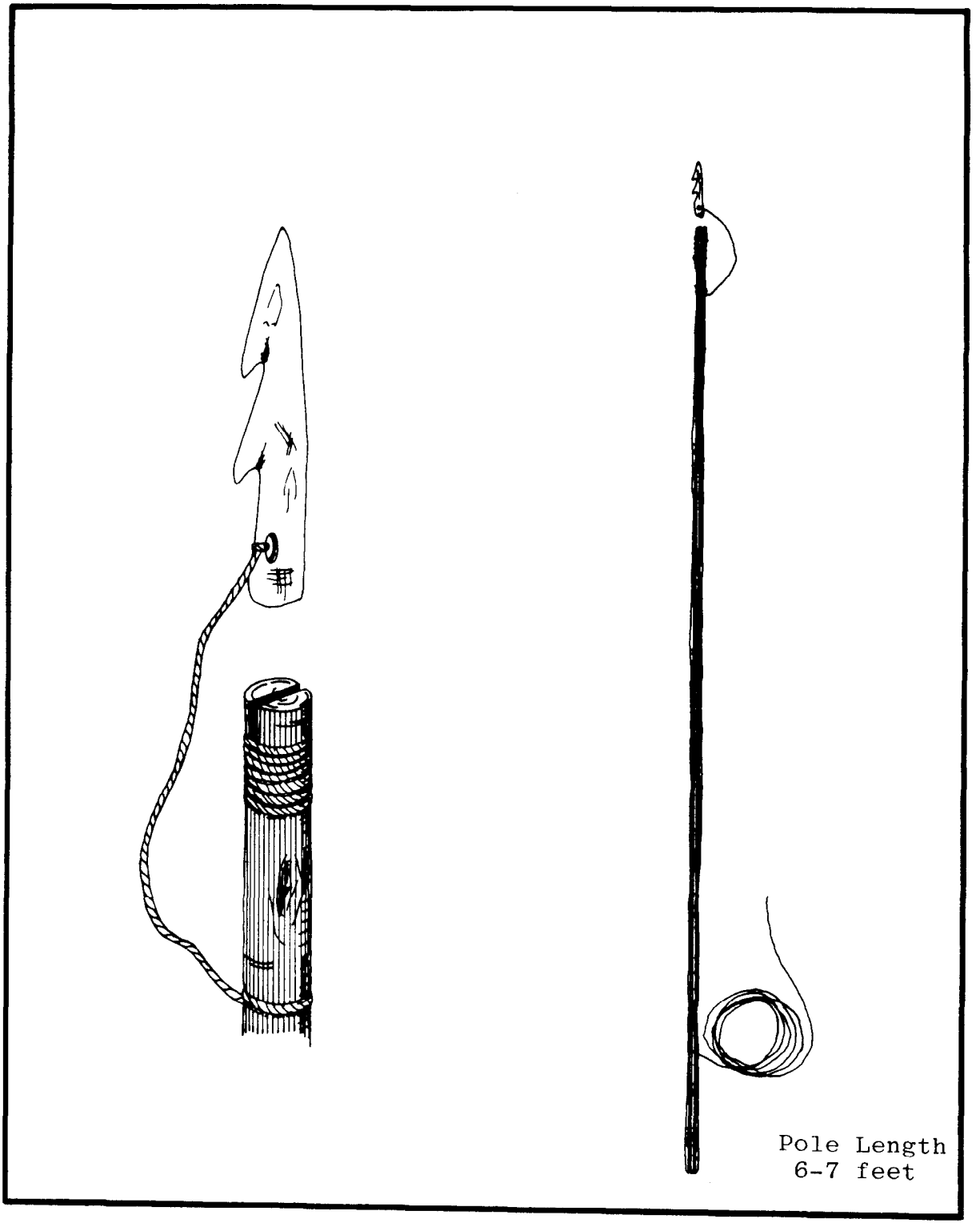

Figure 11. Fish spear (tuqsiiq), used for spearing fish in streams and shallow tidal areas.

The use of fish spears continued up until 1950s, as was recalled by several people in their 40s in 1985. Just before statehood spears were outlawed by federal authorities and rods and reels became the adopted legal method for instream fishing.

A third type of fish spear described by Meganeck (1980) had a fixed point with a fairly long narrow shaft (Fig. 12). This spear was called panaq and was used primarily for bottom-dwelling, intertidal organisms collectively referred to as uyangtaaq. This term includes crabs, small halibut and flounder, sea urchin, sea cucumber, sculpins, rock cod, and just about anything which could be gotten in shallow tidal areas from a kayak, dory, or while walking.

Snagging-lines also were utilized for catching salmon in streams. Hooks were made by bending several nails and fastening them together at a common center shaft. The hook was then tied to a long handline. Fish were caught by throwing the hook into the group of salmon and giving it a hard jerk. A variation made in the 1920s used cod hooks tied together in a cluster. Pieces of painted wood or red and white cloth were attached as lures, and sinkers were attached to the end of the line. The hook would thereby remain off the bottom and move in the stream current.

Two other types of salmon hooking devices used in the 1920s and 1930s included the kapuqaa'un and the kluk (V. Kvasinoff and B. Ukatish pers. comm., 1983) (Fig. 13). The kluk was a gaff used primarily for removing fish from traps and wiers. A kapuqaa'un was a gaff with a releasable hook fixed by a line to the shaft of a pole. The hook was thrust at the fish. As it hit, the hook released from the handle. A short tether attached the hook to the pole and the fish could be brought

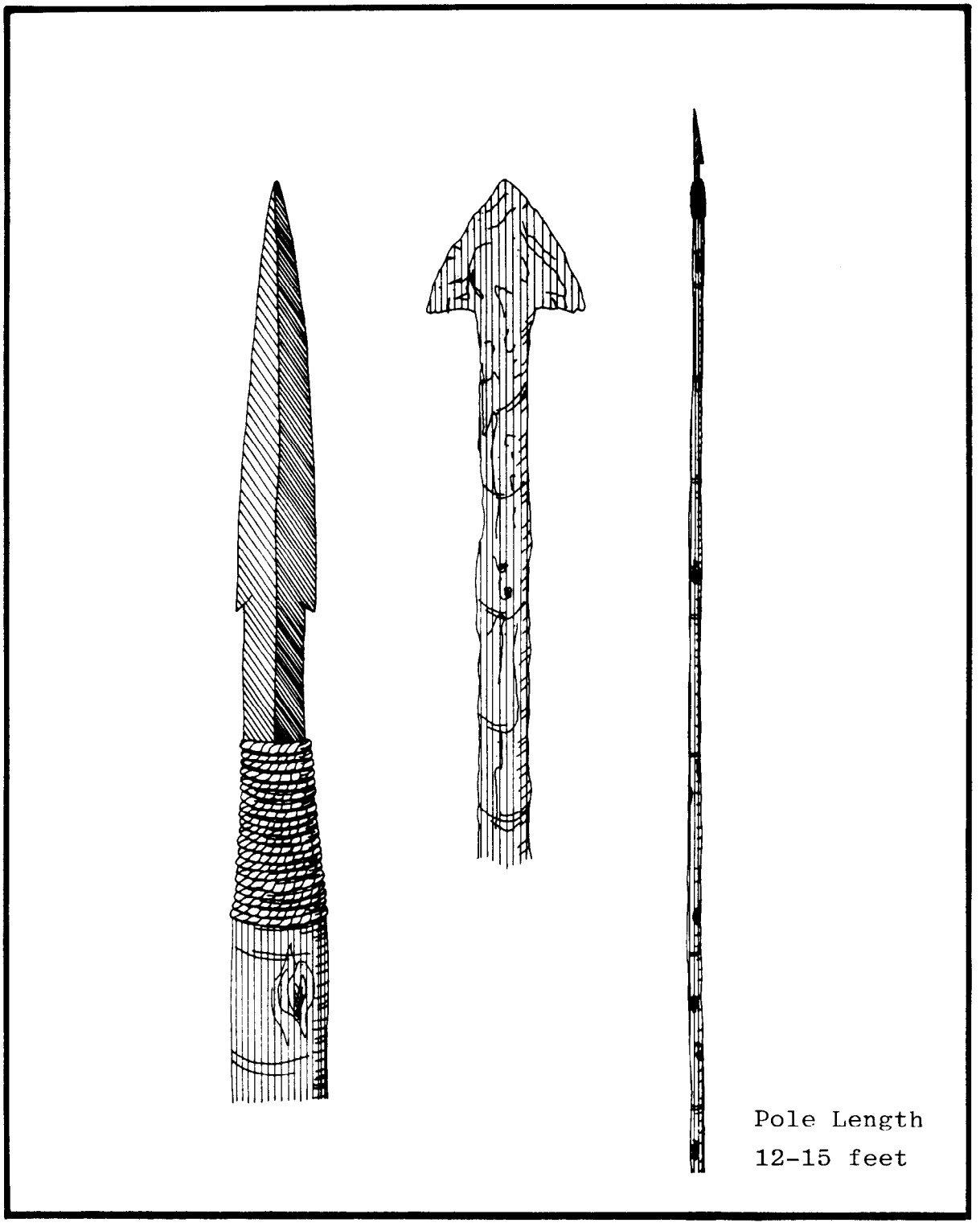

Figure 12. This type of spear called panaq, was used for spearing a variety of animals including intertidal fish and shellfish, and for retrieving marine mammals.

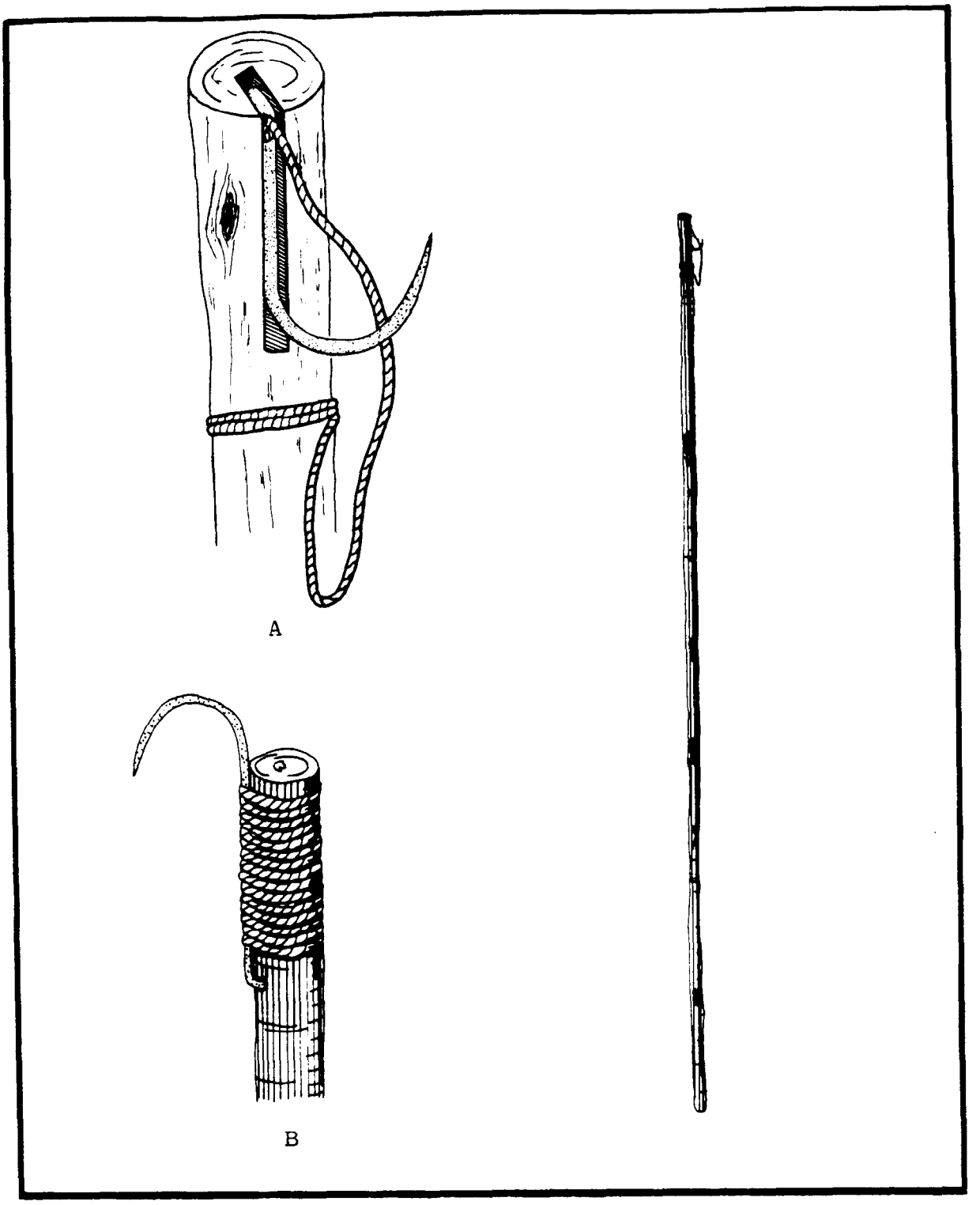

Figure 13. Salmon gaffs: (A) kapuqaa'un, used like a spear; (B) kluk, used to remove fish from traps. Based on sketches by Vincent Kvasnikoff and Ben Ukatish.

in while holding onto the pole. The hooks of these implements commonly were made of bent nails and wire and tethered with cord or sinew.

During the 1930s and 40s, purchased hooks fully replaced the homemade nail hooks. Shortly thereafter, rods and reels were introduced. The use of spears continued into the 1950s; for example, spears were used to take salmon and crab in the English Bay lagoon and at low tidal periods in Port Graham Bay (C. Tanape pers. comm., 1982).

Although spears were effective methods of taking a few fish in shallow waters, large quantities of salmon required for winter were harvested using hand-driven traps and weirs placed in rivers. One trap method frequently used in the English Bay River (C. Tanape pers. comm., 1982) is illustrated in Figure 14. It was constructed in the lower reaches of the river influenced by tidal action. At extreme low tides a wall of poles and logs was built with a gate in the middle and open on one end during high tides. As the tide came in, salmon moved into the lagoon and deep parts of the stream where they often spent several days milling before going up the creek. During high tide, people in kayaks entered the mouth of the river and beat the water surface, chasing the fish upstream through the gate and around the end of the weir. An upstream kayak and other people standing in shallow water prevented fish from passing. At the right moment when the tide was receding, the gate was closed, trapping the salmon on the upstream side of the weir. The fish were removed with hooks or nets.

A second type of fish trap was built at the waterfalls on the middle reaches on the English Bay River. A fence constructed of spruce saplings was built part way across the falls near its base. Fish ascending the falls frequently fell back down against the fence.

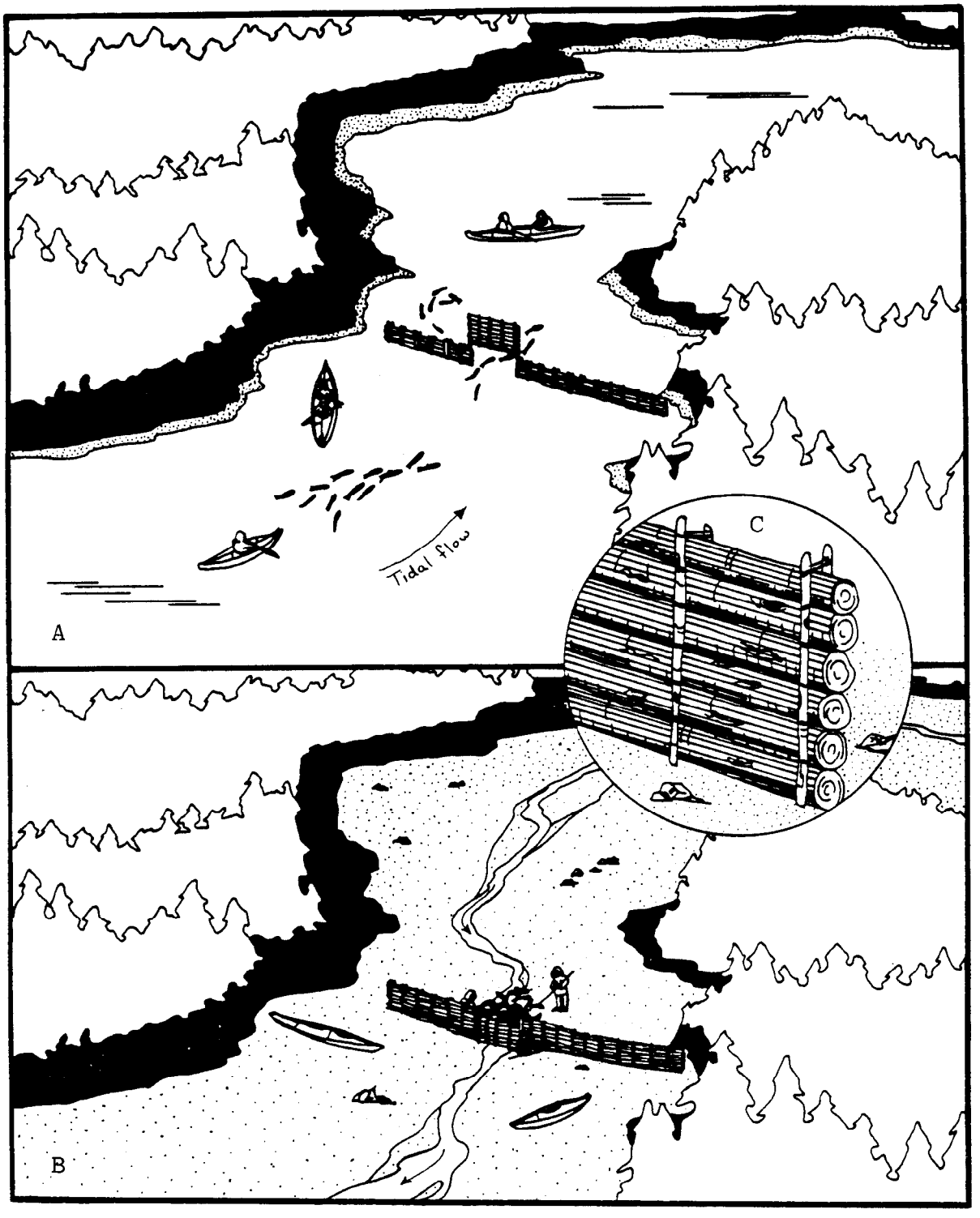

Figure 14. A fish trap and weir used in the English Bay River. (A) With the incoming tide fish pass the weir. (B) During the outgoing tide, the gate is closed and fish are caught behind the fence. (C) Fence construction allowed water to flow between the logs. Based on descriptions by Joe Tanape.

People standing on the upstream side of the fence used gaff poles to remove fish caught against the fence (cf. Birket-Smith 1953:41).

Temporary camps were set up near fish traps for fish processing. Fish were cleaned, split, and hung on tree branches and racks for partial drying. Partly dried fish were then transported to the village for further drying in smokehouses or other shelters. Temporary fish camps were also established along the English Bay River and on the shorelines of First and Second lakes. In these camps, both fresh and spawned out fish were partially dried before being taken to the village where either smoking or further drying took place (J. Tanape pers. comm., 1982).

The importance of using instream traps was to catch large quantities of fish and process them quickly when optimal weather conditions prevailed. Sunny, breezy days were required for putting a proper glaze on the dried fish. Such days were often interrupted by several days of rainy, cloudy weather characteristic of the lower peninsula. Consequently, fishtraps enabled the quick processing of large quantities of fish.

Saltwater fish such as halibut, sculpin, and cod were taken with several varieties of handlines. Usually a handline was attached to a horizontal bar from which several hooks and weights were suspended (Fig. 15). In a second hook arrangement, still used today, one or two hooks were attached to a main line. Before rope was available, line called nuakatat was made of smoke-dried kelp roots rolled tightly together or of sinew (W. Meganeck pers. comm., 1983). As stronger lines and hooks became available, baited hooks were attached to long lines and laid out

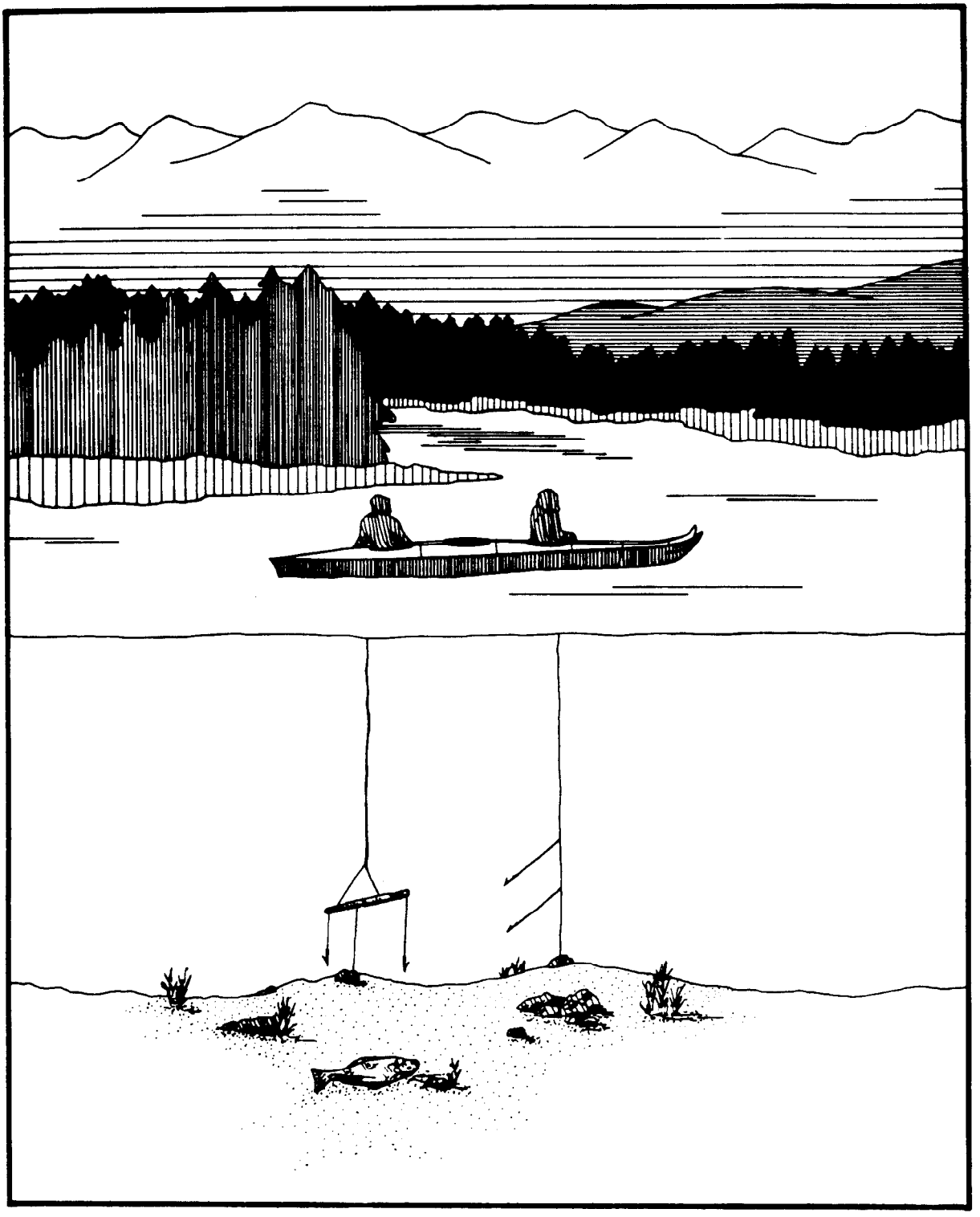

Figure 15. Two hook arrangements for bottom fishing handlines. Hooks were usually baited. Based on sketches and descriptions by Walter Meganeck.

on the beach at low tide. Halibut and other bottom species which swim along the shoreline at high tides commonly were caught by this method.

According to ethnographic accounts, salmon and bottomfish were the most important sources of food for native people living in the Gulf coastal area. In the Kodiak area, large numbers of cod and halibut were taken in the spring (Davydov 1977). Halibut were taken by handlines attached to shoreline anchors (Birket-Smith and de Laguna 1938:119-121). The Eyak caught halibut and cod throughout the year by hook and line from canoes using clams as bait (Lobdell 1980). The Chugach fished for these species only during the summer. Apparently in some areas these species had more defined seasonal movements than in other areas. Such was the case around Yakatat where the Tlingit fished halibut during the winter, spring and early summer, and in Kachemak Bay where the Tanaina fished halibut in the shallow water during summer. The Tanaina fished with toggle hooks and spears in shallow water (Osgood 1937:29-30). This method was used in English Bay in the 1930s (S. Moonin pers. comm., 1982).

Lobdell also concludes from his assessment of historic fishing accounts that bottomfishing in the Kachemak Bay area was a year-round activity limited only by weather. There were seasons when some species were more readily available such as cod in the spring and halibut in the summer, flounder could be taken during any season. Various methods of harvest were utilized which took advantage of tidal action, habits of the resource, and the abilities of individual people.

SHELLFISH

Historically, Kachemak Bay groups harvested shellfish in the spring. This may be related to the lack of other resources during that season, the exhaustion of stored food resources like salmon, and harsh weather conditions which prevented hunters and fishers from venturing far from their homes (Lobdell 1980).

Several informants (R. Meganeck pers. comm., 1982; and C. Tanape pers. comm., 1982) recalled spearing crab in their childhood and recounted spearfishing for dungeness and king crab in the 1950s in Port Graham Bay. Spears made of sapling spruce about 10 to 12 feet long were armed with points (Fig. 12). During historic times, points were made of soft metal available from traders, canneries, and sawmills. In the 1960s, commercial crabbers moved into the Port Graham Bay area depleting the crab population. Subsequently, harvesting crab in shallow waters with spears became unproductive. At about the same time, people acquired pots and began crabbing in deeper waters.

HUNTING AND TRAPPING METHODS

In the 1930s, men from Port Graham and English Bay trapped furbearers along the shoreline areas in the Nuka, Yalik, and Aialik Bays in winter and spring from hunting camps (W. Meganeck pers. comm., 1981 and 1984). During that time, people from Alexandrovsk, Seward, and Tatitlek met at the camps, and hunted and trapped together.

In the early 1900s, trappers primarily used steel leg-hold traps. Several traditional methods were also used. Deadfalls using a flat

stone or other heavy object were used to take small furbearers (Fig. 16). This was the favored method for taking weasel and mink. Its name, naneryaq, means "it falls down." Birket-Smith (1953:38) described the same type of trap used by Chenega residents.

A second deadfall, (aciirc'estaaq "to go through), used for larger animals like otter was made of one or two logs (Fig. 17). Like the previous trap, it was placed on a game trail or unbaited. Animals following the trail walked through the opening between two logs, tripped a trigger mechanism, and were crushed between the heavy falling log and two logs buried in the ground.

Land Mammals

Land mammals like bear and moose were not easily killed except by very experienced and aggressive hunters who were physically very strong and agile. Black bear in particular were actively hunted and were a favored food item, especially in the fall when bear were feeding on berries. Bear were also killed during the winter in their dens, marked by hunters earlier in the year. Denning bears were used as a "reserve" source of fresh meat.

For hunting land mammals, one basic type of spear was used in the early 1900s (W. Meganeck pers. comm., 1982). The hunting spear had a broad and flat point securely fastened to a short, stout shaft. It was used to jab and was seldom thrown. During several informants' lifetimes, points were fashioned from scrap metal found around canneries. A "stopper" was often attached at the base of the blade so

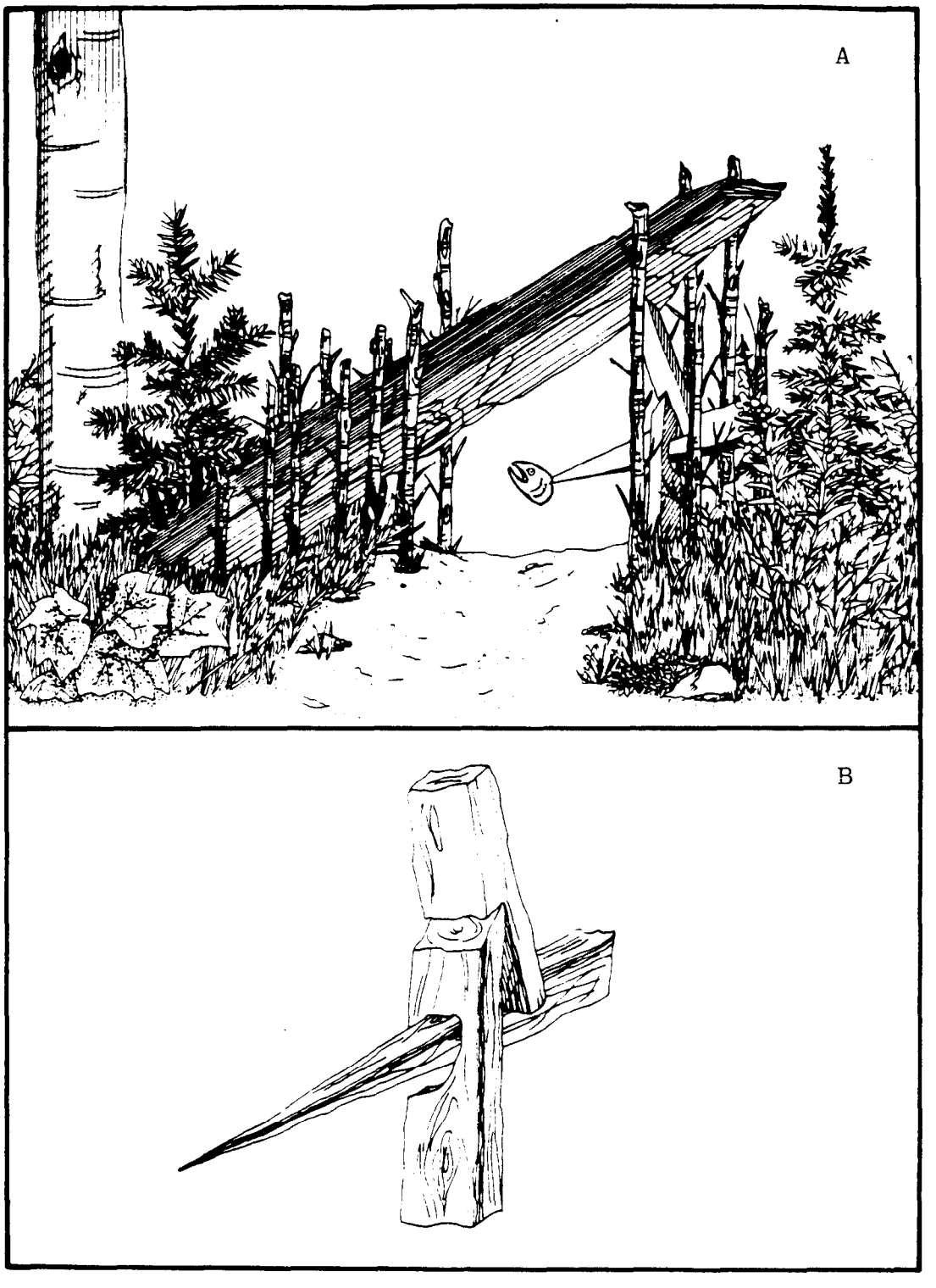

Figure 16. (A) Small deadfall trap used historically for small furbearers like mink and weasel. (B) Trigger mechanism. The trigger was usually baited. Both drawings based on a model constructed by Walter Meganeck.

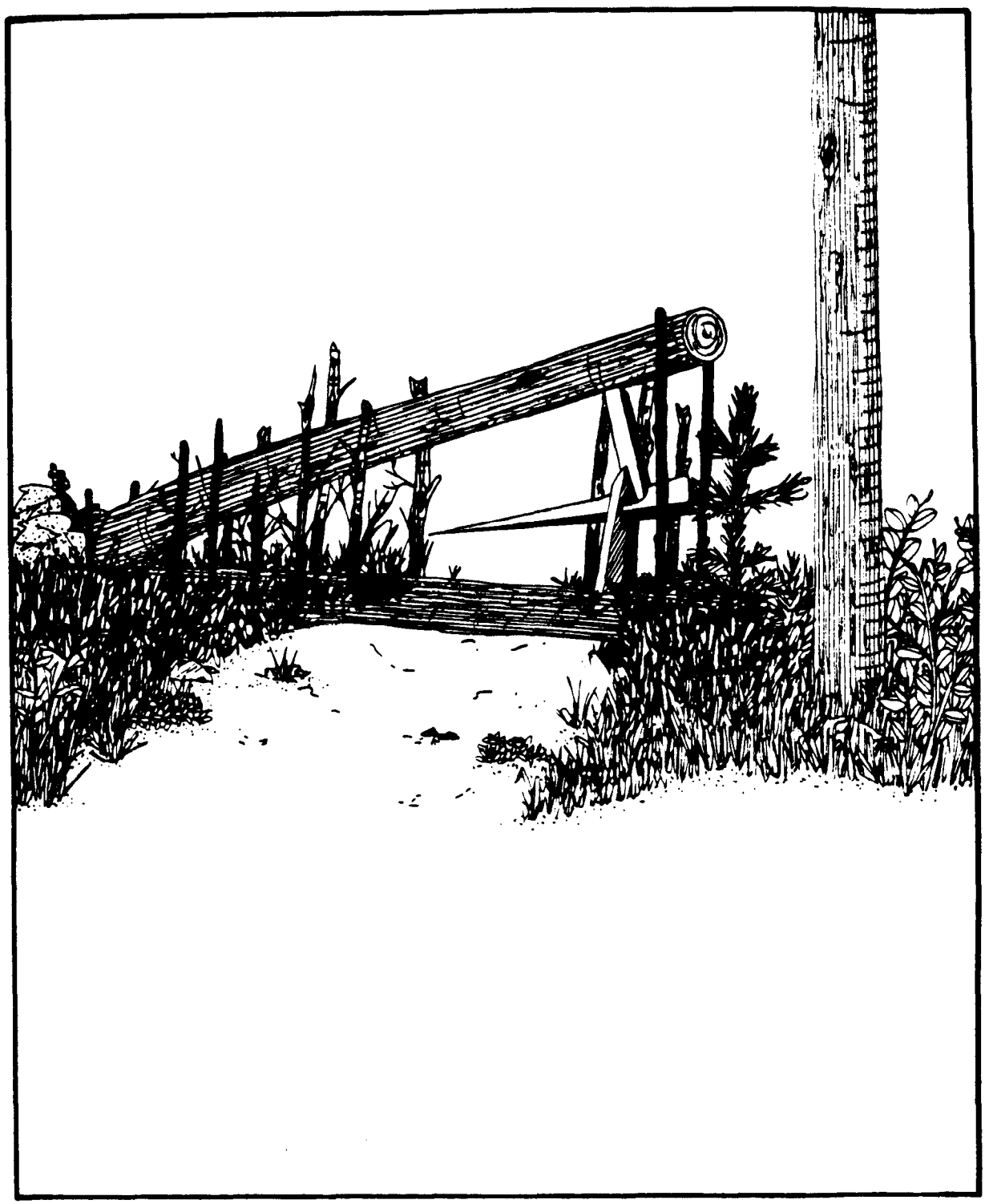

Figure 17. A large deadfall trap made of logs. The bottom log was buried in the ground just at the surface. Used historically for large furbearers like land otter, beaver, fox, or wolverine. The trigger could be baited. Drawing based on a sketch by Walter Meganeck.

the spear could be quickly pulled out and another wound inflicted, or the spear put to the users protection by pushing the animal away. A second type of spear, (the panaq), sometimes used for land mammals is described below.

In hunting bears, Southcentral Alaskan people practiced care and special treatment, and a degree of ceremonialism was involved. The skull and bones of bear were usually buried in a special way facing inland where the bear was killed (Birket-Smith 1953:38). Bears were taken during hibernation by the people of Prince William Sound and the Tanaina (Osgood 1937:33; Birket-Smith and de Laguna 1938 In Lobdell 1980:134). The locations of bear dens were kept in mind by people and were searched out during winters when food supplies dwindled.

The historic Tanaina of Kachemak Bay took marmots in deadfalls by mimicking the whistle of a marmot to make it sit up near its hole (Osgood 1937:35). Marmots were snared with nooses at their burrow openings (Davydov 1977:213-214). Some marmots were also domesticated and fattened until ready to eat. Although marmots could be taken from spring through fall, animals taken late in the season were most desirable because of prime pelts and a thick layer of fat. Marmots were used for their meat, fat, and fur (W. Meganeck pers. comm., 1982). The hillsides around both Windy and Rocky Bays were the best areas to hunt groundhogs (J. Tanape pers. comm., 1984).

Dogs were kept by both the Indians and Eskimos of the region. The Tanaina had dogs for pets and hunting other game. The Chugach Eskimos harnessed dogs in groups to pull toboggans and used individual dogs as pack animals. However, primarily they were used for tracking animals (Birket-Smith 1953:50, 191, 225). The Kenai and Chugach people used

dogs in bear hunting (Davydov 1977:209). A Kenai woman was reported to have killed 10 to 12 bears a year using dogs.

Little is reported on the use of wolves, coyotes, and foxes during early historic times. Because of their relatively recent appearance in the region, coyote were of little importance. Foxes were of primary importance during the fur industry. Wolves were caught in pits and by baited nooses set in the crown of a tree bent to the ground (Davydov 1977:210).

Both moose and caribou have been used historically by Kachemak Bay residents, and bone parts were found in archaeological sites. Caribou in the vicinity of the bay were extirpated by commercial hunters in the early 1900s (Lutz 1974:27-30).

Small game animals taken by the Tanaina included hare which were snared for food (Osgood 1937:35) and their hides were made into parkas (Davydov 1977:211). Muskrats were taken by the Tanaina on inland marshes, lakes and streams with the use of deadfalls (Osgood 1937:36). Beaver were taken year-round by the Tanaina who used dogs to find them, and spears and gaffs to catch them. Deadfalls were also used for beaver. The meat of beaver was an important food item in Indians' diet, especially in the spring. Ground squirrels were not available in the Kachemak Bay or Kenai areas, but were either obtained from Tyonek or taken on islands between English Bay and Kodiak (Osgood 1937:136); and (W. Meganek pers. comm., 1982) reported going to the Barren Islands for small mammals.

Members of the weasel family were not taken for food by any people. River otter and mink were taken for their pelts by the Tanaina and Chugach. Chugach Eskimos feared river otter and believed that lost and

drowned people turned into otters (Birket-Smith and de Laguna 1938:102). Wolverines were thought by the Tanaina to be too difficult to catch in traps so they took them with bows and arrows opportunistically (Osgood 1933:36).

Marine Mammals

Two types of marine mammal spears were described by village elders (W. Meganeck pers. comm., 1981; J. Tanape pers. comm., 1984). The first was used primarily for killing seals, sea lions, and small belukha whales (Fig. 18). This spear had a broad, barbed point which could be stuck into the animal, twisted, and would remain. Called a panaq, it sometimes had a float bladder attached to a long sinew line. A second marine mammal spear called binangaluk was used to retrieve shot or wounded animals which were freely floating near the surface. Birket-Smith (1958:126-127) describes similar harpoon and spearing devices used by the Chugach Eskimos.

The taking of seals is widely reported in the ethnographic literature. Lisiansky (1814:206) reported that the Koniag took small seals with harpoons and floats, and that any seal taken in deep water required a spear with floats so as not to lose wounded animals. Davydov (1977:222) reported that the Chugack killed seals by two methods, harpooning them in water on warm stormy nights when the animals sheltered in bays, and on ice floes during the spring for which a kayak concealed with chunks of ice was used. Another method reported for the Koniag by Father Gideon was to place nets weighted with small stones in the water. Nets were dragged up onto the beaches and the seals clubbed.

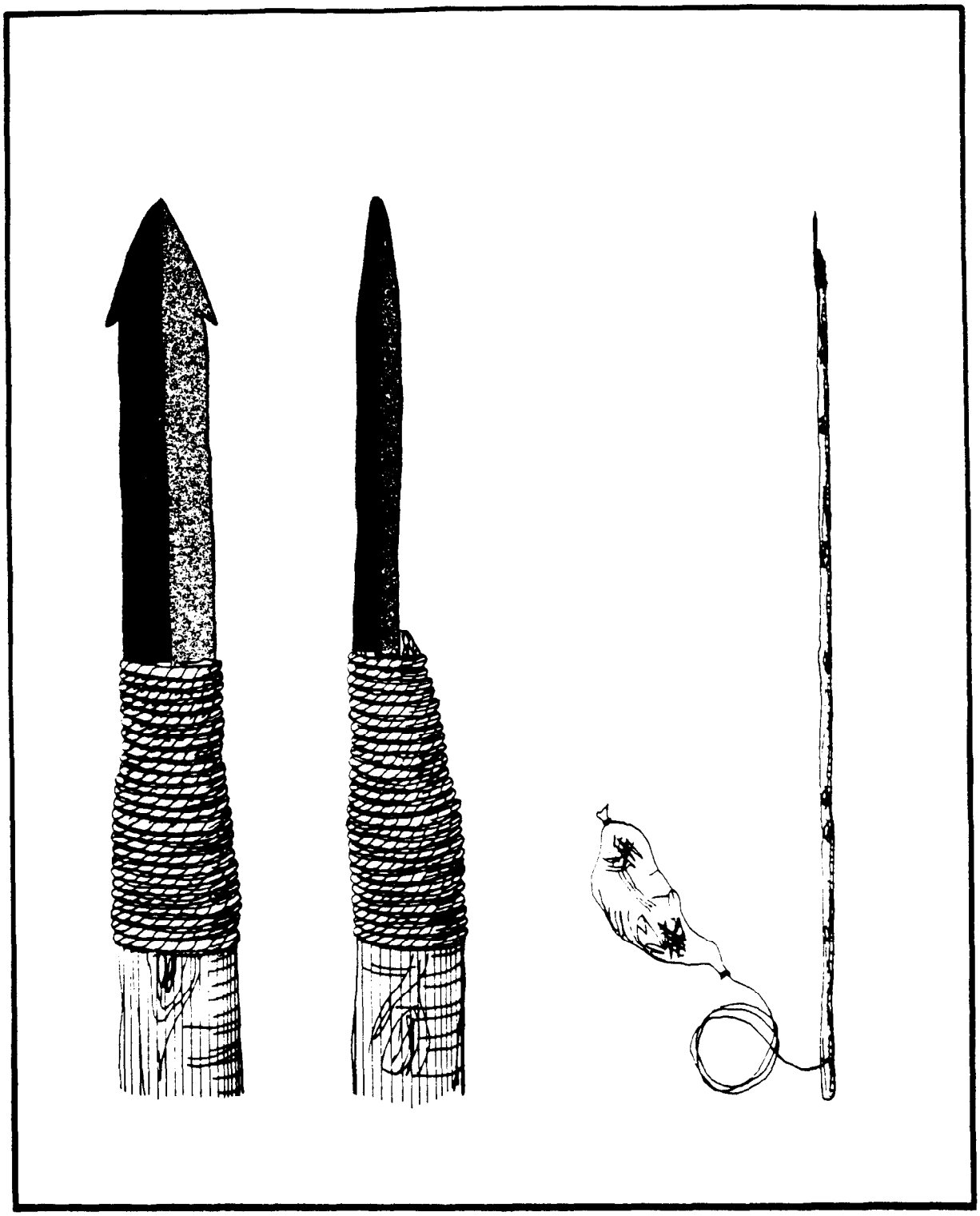

Figure 18. A marine mammal spear called panaq equipped during historical times with either stone points found locally or metal points made from soft metals gotten from ships, canneries, or sawmills. After sketches by Walter Meganeck and Joe Tanape.

Both the Tanaina and the Eyak snuck up on basking seals on sandbars and speared and clubbed them (Lobdell 1980:115). The latter method was often done by an individual who swam up on the basking group. Birket-Smith (1958:24) reported that harpoons were out of use in Prince William Sound by 1933.

Overall, seals were extremely important to people living in coastal areas. Their meat was eaten, and their fat rendered into oil for use as food, light and heat, the preservation of foods, and as waterproofing on garments and equipment such as kayaks. Cold weather clothing was made from the hides of seals. The gut was made into waterproof clothing and equipment. One of the main uses of seals was in the making of skin boats.

There is very little information on the taking of porpoises. Osgood (1937:39) described the Kachemak Bay Tanaina hunting porpoises during the spring and summer during periods of quiet water and plentiful daylight. Davydov (1977:255) reported that porpoises were extremely wary animals and had to be approached very quietly before they sounded. Hunters usually led the animal and threw their harpoon well ahead of it and into the water in which it was diving. Porpoises were used by the Koniag for meat and by the Yakatat Tlingit for sinew. Porpoise remains were an important component of prehistoric sites in Kachemak Bay (Workman et al. 1980:396).

Sea otter were widely exploited in the Russian and American Periods in Alaska by Native people for the fur trade. Birket-Smith (1953:28) details the hunting of sea otter by the Chugach Eskimos with bow and arrow or harpoon. The animals were taken primarily for their hides which were used in China and Europe.

Whales of all sizes and species were taken by North Pacific coast peoples. Birket-Smith (1937:33-37) described whale hunts. Various rituals and superstitions surrounded whale hunting. Davydov (1977:224) reported that among the Koniag, whale hunters utilized parts of human remains in performing ceremonies prior to hunts. Little is known about whaling in Kachemak Bay, and nothing was mentioned by informants in this study except that belukhas were taken at the turn of the century up to the 1930s at Halibut Cove.

Sea lion hunting in Kachemak Bay was probably very limited owing to their general absence from the inner bay. They were more accessible to outer bay inhabitants and people along the outer coast (Lobdell 1980:123).

Bird Hunting

The harvest and use of birds as recorded in the ethnographic literature is limited. Most hunting in the Gulf of Alaska took place in August when birds were molting and flightless. Waterfowl were driven ashore by the Eyak Indians where they were surrounded and killed (Birket-Smith and de Laguna 1938 In Lobdell 1980:178). Chugach Eskimos hunted birds with bows and arrows and commonly netted and snared such species as commorants and other sea birds at night. Eagles were taken with baited snares and with slings (Birket-Smith 1953:38-39).

Tanaina living in the Kachemak Bay area hunted birds with a sling shot, bows and arrows, and snares. Loons and gulls were hunted extensively in the Bay. Other birds such as grouse, murres, murrelets,

and puffins were also harvested. Osgood reported that eiders were raised for eating, and geese, ducks, and gulls as pets (1934:41).

The best documented birding practices are those of the Koniag Eskimo. Evidently, commorants or pigeon guillemots were netted and their skins used to make very warm, water resistant parkas (Lisiansky 1814:205). Like the Eyak, the Koniag also took waterfowl during molt and drove them to land for clubbing. They also took birds like puffins and other alcids from their burrows. A favorite harvest method, according to Davydov (1977:228), was netting. A low, weighted net was stretched across a narrow strait, usually at sunset or sunrise. This method worked well for low-flying ducks and other birds which became entangled in the nets.

In English Bay and Port Graham, people used nets and steel jaw traps to take waterfowl (W. Meganeck pers. comm., 1983). Nets were set in salt water across the mouths of bays and where ducks had been feeding. When the birds were leaving the area on the outgoing tide, they often swam out and dove under the water as they went. Some got caught in the nets and drowned; they had to be removed before the tide reversed or they dropped out. Steel leg-hold traps were set along shoreline areas where ducks were being baited. Especially where small freshwater rivulets trickled over the rocks, ducks were baited and trapped as they came for the water.

Bird eggs peksutt and young fledglings were gathered from colonies and nesting areas wherever these were accessible to people. Gull eggs, puffin eggs, and young were the most desired. However, loons, cormorants, and other obtainable sea birds and ducks were taken. Swans,

too, were taken, especially in Koyuktulik Bay, which derives its name from the swans' presence.

Certain areas were good for certain species. Windy and Rocky Bays were famous for large numbers of mergansers; and their eggs were collected from island nesting areas. These two bays were also good locations for hunting eider ducks and getting their eggs. Nagahut Rocks and Flat Island were the favored places for gathering puffin eggs. The activity of going to get eggs in the burrows of puffins was an exciting event of the spring (W. Meganeck pers. comm., 1983).

Generally, egg harvesters left some eggs in each nest and took only what they needed. Other people could then find enough for their needs, and the birds would return the next year. To emphasize the need to leave some eggs for others, a story is told explaining the absence of gulls on Flat Island. It was said that two well-intended young boys once went there and collected all the gull eggs (op. cit.).

Clothing and Household Items

Many clothing items around 1917 were made of various animal products (J. Tanape pers. comm., 1984). Shoes, for example, were made with seal skin soles; uppers were made from cloth or thin hides which were water proofed with seal oil. Burlap was used as a foot wrap, acting as a sock. The same type of shoes as above were made oversize for winter use in order to accommodate extra layers of wrapping, thereby providing added warmth.

Coats and pants for use on the water were made of seal, bear, or moose intestines. The stomachs and intestines were inflated, dried and

split. Several pieces were sewn together to make a raincoat and pants. Raincoats were also made from the feather and skins of cormorants.

Many other household items were made of animal products. The outer shells of mattresses were often made with bear skins and stuffed with duck feathers. Blankets were made of sewn parka squirrel (gotten from the Barren Islands) and marmot hides. Windows of homes were made of dried bear and moose stomachs or intestines. Thread for sewing was produced from tendons by drying and then stripping their individual fibers apart.

Birket-Smith (1958:52-71) provides a detailed discussion of Prince William Sound habitations, household utensils, personal clothing, and adornments. He also describes in detail the duties of men and women as practiced in the 1930s.

CHAPTER 6

COMMUNITY CHARACTERISTICS

POPULATION TRENDS AND CHARACTERISTICS

Human population figures for Port Graham and English Bay are presented in Table 7. English Bay's population has fluctuated dramatically throughout its history. Numbers increased during its first 100 years of existence from 25 people in 1786 to a peak of 107 between the 1880s and 1929. Decreases occurred until the 1970s, when English Bay began its current growth trend. Although figures for Port Graham's early history are unavailable, the seasonal cannery operation would have caused large fluctuations. Its population increased steadily throughout its history. The very large increase between 1950 and 1977 may account for the corresponding decreases at English Bay.

During its first century of growth, English Bay was a center of trade and the location of an Orthodox church. Under the pressure from the orthodox church in Kenai, outer Kenai communities relocated to English Bay, Port Chatham, and Koyoktulik Bay. After a cannery was established in Port Graham in 1912 and in Portlock in 1915, families moved to those commun- ities. When Portlock closed in 1950 people moved back to Port Graham and English Bay. Port Graham continued to increase in size as an employment center during the 1950s and 1960s. Federal housing projects also made residences available in both communities, and as a major segment of the population reached child-bearing age numbers increased rapidly. Aside from this long-term trend, annual population fluctuations occurred in both communities, owing to the seasonal nature

TABLE 7. POPULATION TRENDS FOR PORT GRAHAM AND ENGLISH BAY

YEAR	English Bay			Port Graham			Grand
	Native	Non-Native	Total	Native	Non-Native	Total	Total
1786[e]	-	-	ca 25	-	-	-	ca 25
1880[a]	76	12	88	-	-	-	88
1890[b]	-	-	107	-	-	-	107
1929[b]	-	-	107		Established 1912		107
1939[b]	-	-	48	-	-	93	141
1950[b]	-	-	75	-	-	92	167
1960[b]	-	-	78	-	-	139	217
1970[b]	53	5	58	96	11	107	165
1977[c]	100	6	106	158	18	176	282
1980[b]	97	23	124	141	20	161	285
1983[d]	-	-	152	-	-	165	317
1984[f]	-	-	172	-	-	174	346

[a] Petroff, I. 1880 Census.
[b] U.S. Census Bureau.
[c] North Pacific Rim Health Department 1977
[d] Village Council Estimates
[e] Tikmenev, 1888
[f] Alaska Census 1984

of employment, variability in the fishing industry, and the pursuit of educational and employment opportunities. Braund and Behnke (1980:183-186) and The North Pacific Rim (1979:128-129, 139-141) provide additional discussions of demographic trends.

Compared to other Kenai Peninsula communities, Port Graham and English Bay populations have shown relatively slow and even growth. The total Kenai Peninsula population, exclusive of the two villages, increased by 65 percent from 1960 to 1978 (Braund and Behnke 1980), compared with 13.8 percent for the villages combined. The 1983 village population estimates reflect only English Bay's increase, due to completion of 20 single family housing units financed by federal Housing and Urban Development (HUD) loans. Most of the old energy inefficient

dwellings were torn down making way for new insulated units. Its population grew at a rate of 11.3 percent during the four-year period of 1980 to 1983. In 1984, however, both communities show dramatic increases after completion of HUD housing.

Village population composition has remained predominately Native throughout historical times. Alaska Natives comprised 78.2 percent and 85.0 percent of the English Bay and Port Graham populations respectively in 1980. As mentioned previously, the population refers to itself as Aleut.

The age structures of the communities' populations differed considerably in the 1980 census (Figs. 19 and 20). Port Graham had twice as many people as English Bay in the 40 year and older categories. Even more dramatic, however, was the fact that only one person over age 65 lived in English Bay while 12 lived in Port Graham. Several factors contributed to this situation including good access to medical services, a larger, more accessible airstrip, more reliable sources, a wider, cheaper variety of storebought goods, and a tendency for older people who worked at the cannery during their younger years to continue work at the cannery and settle in Port Graham. Many of the young men in Port Graham work as crew members on commercial fishing boats.

THE LOCAL MONETARY ECONOMY

The lower Kenai Peninsula area has at times over the past 150 years been an active location for trade, logging, mining, trapping, and tourism. Although residents of Port Graham and English Bay have participated in all these industries, the economies of these two

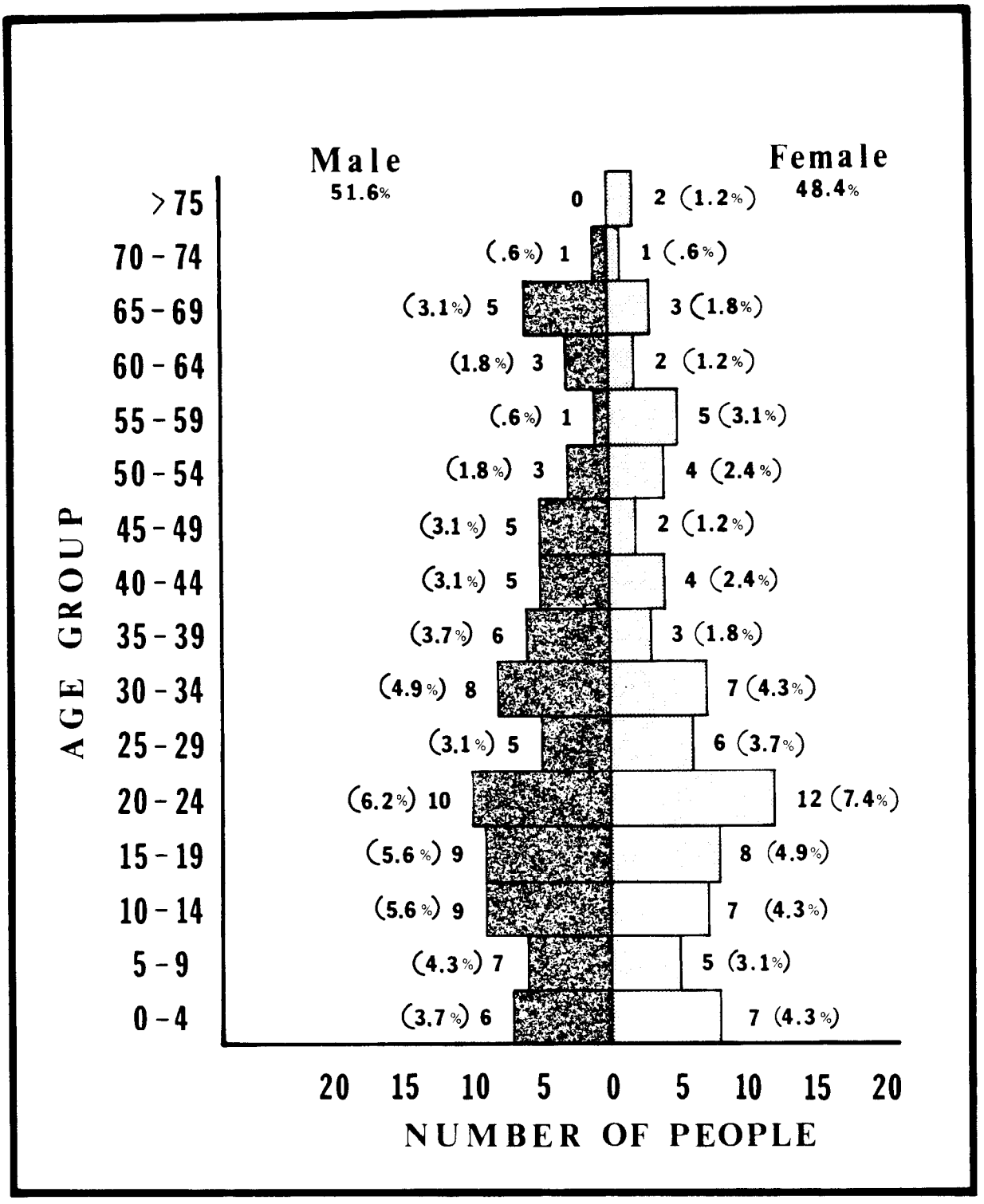

Figure 19. Age and sex structure of Port Graham households in 1980. N=53 households, 161 people (Source: U.S. Department of Commerce, Bureau of the Census 1980).

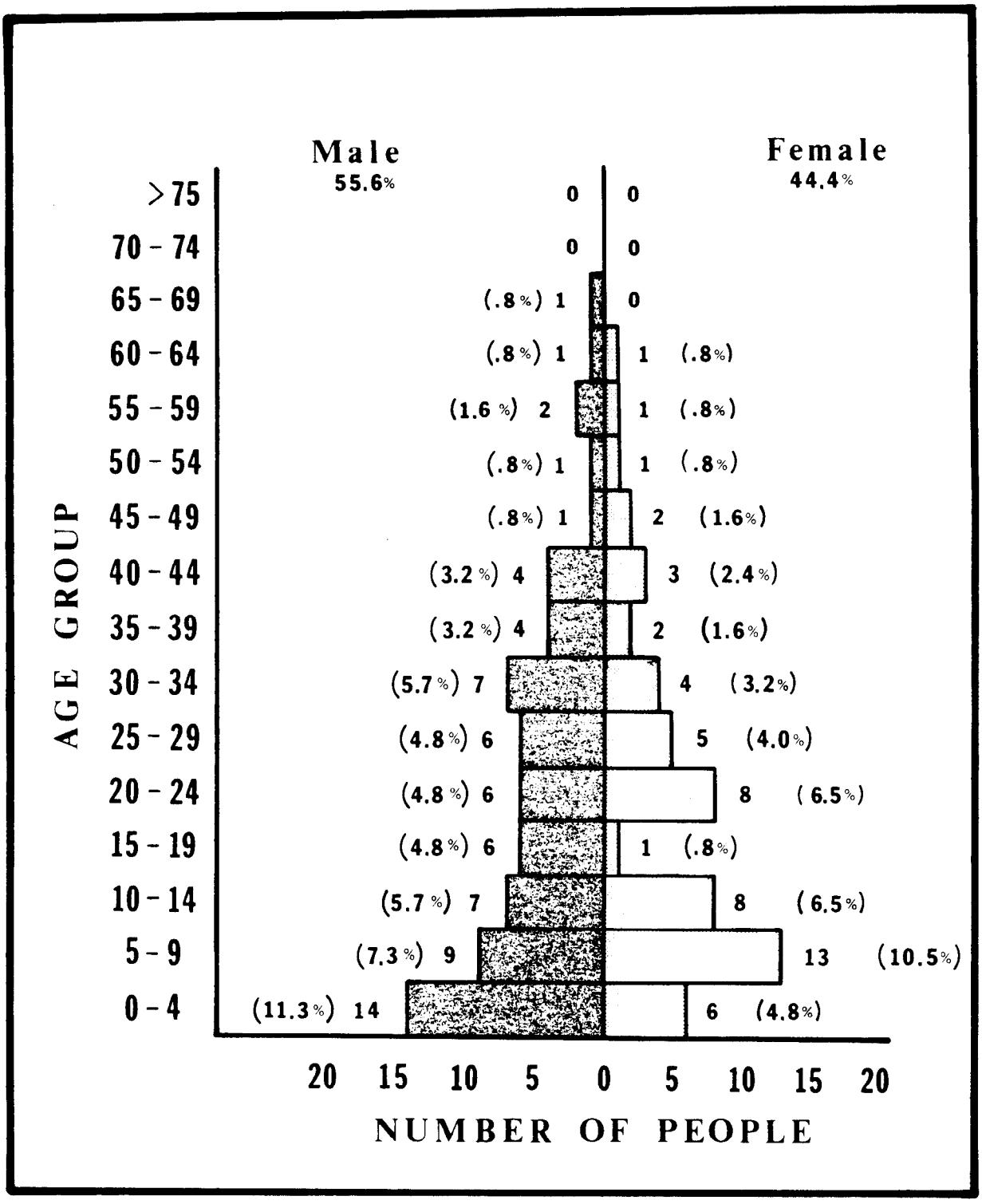

Figure 20. Age and sex structure for English Bay households in 1980. N=28 households, 124 people (Source: U.S. Department of Commerce, Bureau of the Census 1980).

communities since the early 1900s have been based primarily on the seasonal commercial fishing industry and an annual round of subsistence hunting and fishing.

Cash employment opportunities have expanded in the two communities in recent years. More local wage jobs are available and more local control is exerted over these opportunities. Examples of cash income opportunities available in Port Graham and English Bay during 1981-1984 are provided in Table 8. Although there is a variety of work, most jobs are low paying or short-term and seasonal.

While the commercial fishing industry, excluding cannery operations, was a primary source of cash income, it too provided little income per household. Although commercial fishing generated approximately $373,600 gross ex-vessel value in 1982 for both communities, this was only $7,472 per permit, or $4,612 per household (CFEC 1983). A variety of fishing permits were held by local residents (Table 9) with salmon and halibut permits the most common. Port Graham held more permits (.24 per capita) than English Bay (.09 per capita). The majority of fishing and fish processing jobs were located in Port Graham and lasted from late April to mid-August or September.

Local commercial fishermen employed people mostly as crew members of salmon seine and drift boats or at set net sites. A few residents also participated in the commercial halibut fishery or as crew members in commercial crabbing. Several people worked during the winter months as crew members on large crab boats in the Bering Sea or Kodiak area.

In addition to commercial fishing between May and August, local residents also worked in the Port Graham cannery, run by Fidalgo Island Seafoods Incorporated during 1982. There were usually 8 to 15 local

TABLE 8. EXAMPLES OF CASH INCOME SOURCES - PORT GRAHAM/ENGLISH BAY

HUD Housing Project 1981-1983
Weatherization 1983
Water and Sewers Installation 1971
School Additions 1984
BIA Road Project 1980

State Airport Maintenance
Health Aide and Outreach
Village Government Positions
- Administrative Assistant
- Center Staff
- Village Public Safety Officer
- Sewer and Water

Store Manager and Staff
Port Graham Corporation Staff

Witney-Fidalgo Cannery (mostly labor jobs)
Commercial Fishing Boats (crew members)
Commercial Set Netting (crew members)

Federal Tribal Revenue Sharing
State Longevity Payments
Food Stamps
Aid Families with Dependent Children
Alaska Public Assistance

Source: Port Graham and English Bay Village Councils

TABLE 9. COMMERCIAL FISHING PERMITS, 1980

Permit Type	Port Graham	English Bay
Salmon Seine	13	3
Salmon Drift	5	-
Salmon Set Net	5	5
Saltwater Finfish	2	-
Halibut	7	3
Herring Seine and Gill Net	3	-
Shellfish	4	-
TOTAL	39	11

Source: ADF&G 1980

workers and up to 50 nonlocal workers employed by the cannery. Cannery work included such jobs as stripping and packaging herring eggs, cutting and canning salmon, packing cans, and maintaining cannery facilities.

During the study period, a variety of short-term community improvement projects employed local residents. In the spring and summer of 1982, a HUD housing project employed approximately eight Port Graham people as laborers and journeymen craftsmen to build 20 new homes. Initially, all workers for the project came from outside Alaska. A few of them left their positions and jobs opened for local hire in the spring of 1982. Concurrently, this same project in English Bay employed four to six local people from time to time as laborers.

Installation of water, sewer, electrical, and telephone service lines provided an additional number of short-term laborer jobs, as did funding for cleanup and landscaping around new facilities. The construction of school extensions and the upgrading of insulation and weatherization of older homes provided employment for two to six people as laborers throughout the summer of 1984.

Generally employment opportunities in both communities were doled out by the village council. Jobs were divided among workers from several households in order to give more than one household the chance to earn some cash to pay small bills, buy heating fuel, make small boat repairs, and buy small equipment items for hunting and fishing.

Unemployment levels varied by season and level of project activity in each community. Levels ranged from 85 to 90 percent unemployment in winter to as low as 10 to 20 percent in summer. During years with poor commercial fish production, many people left the villages to seek part-time, nonlocal employment. For example, the summer of 1983 was a

relatively unproductive commercial fishing season for about half of the local fishermen. Consequently, eight household heads temporarily moved outside the villages for part-time employment. Three people were unable to find jobs and later returned to the villages only to be forced by economic circumstances to draw food stamps and welfare.

Income Levels

Family incomes for the two communities in 1982 averaged two to four and one-half times lower than other Kenai Peninsula areas (Table 10). Between the two communities considerable differences occurred with regard to median incomes. Port Graham median household incomes were two to three times higher than median incomes in English Bay households (Fig. 21). This was attributable to the large number of commercial fishing permits in Port Graham, and the greater overall number of jobs. Although 14 Port Graham households had relatively large incomes, these were commercial fishermen who also had large operating costs for crews and boats.

Cost of Living

In 1983, the estimated average annual cost of living for a three person household in Port Graham was $13,400 (Table 11). This estimate was $645 (4.7 percent) higher than the median household income level.

The costs of goods in English Bay ranged from 15 to 25 percent higher than for Port Graham, and the cost of living was 60 percent higher than the median annual income level. The cost of storebought

TABLE 10. HOUSEHOLD INCOME LEVELS 1982

Community	Median Household Income
Port Graham	$13,355
English Bay	3,929
Kenai Peninsula	23,660

Source: Institute of Social and Economic Research, February 1983

TABLE 11. ESTIMATED COST OF LIVING FOR FAMILY OF THREE FOR ONE MONTH IN PORT GRAHAM**

Electrical	avg.	$ 136
Fuel & Heating*		200
Food		700
House Payments		100
Telephone (optional)		$25-50

* Each house also has a wood burning stove. Household either cut their own wood or had someone (sometimes paid) cut and haul it for them.
** Source: Port Graham Village Corporation, June 1983.

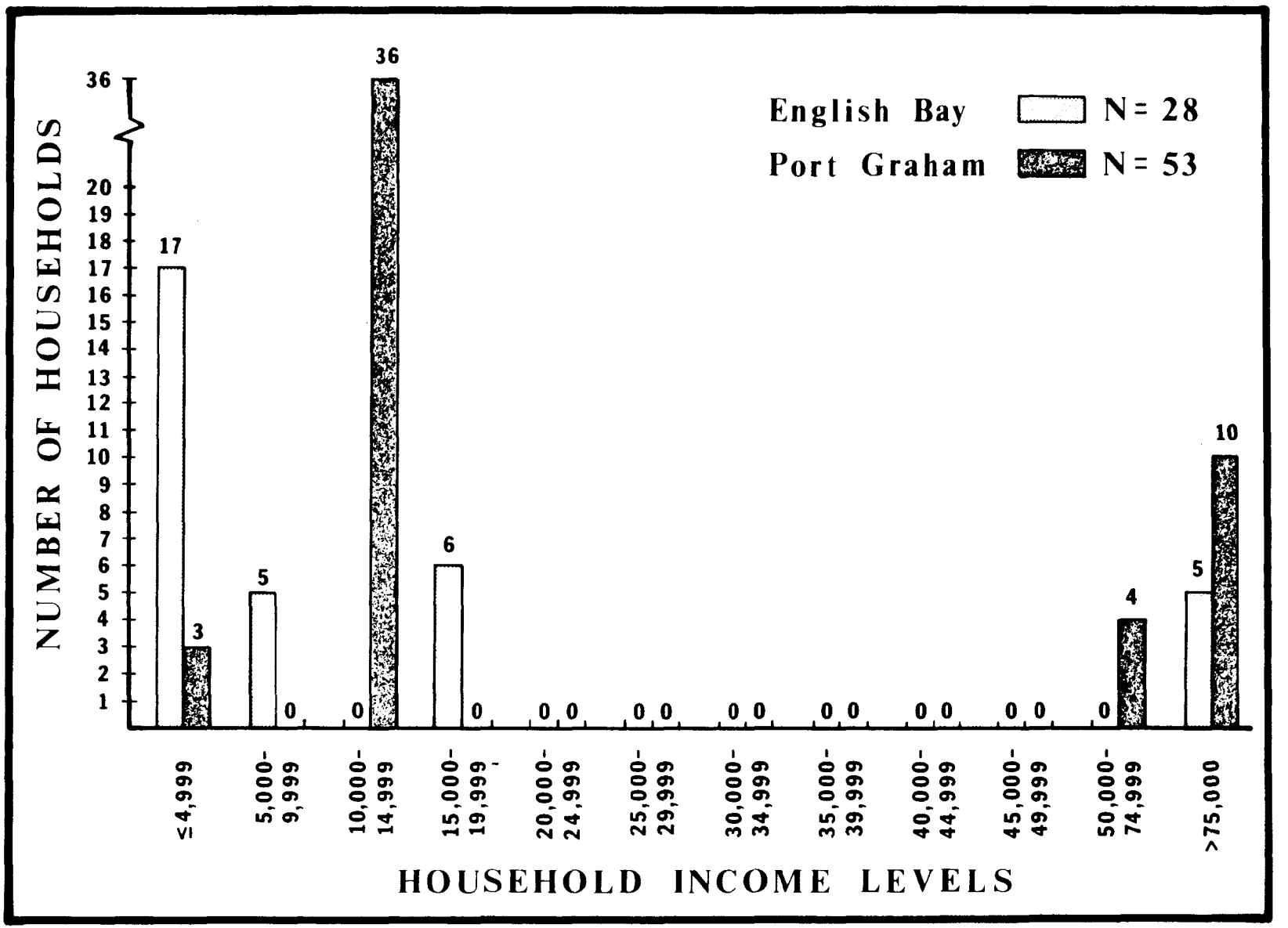

Figure 21. Annual household income levels for Port Graham and English Bay households in 1980 (Source: ISER 1980).

the median annual income level. The cost of storebought goods in both communities ranged from 10 to 100 percent higher than goods in Homer (Table 12).

Transportation between the villages and Homer was usually by air. Air fare averaged $65 for a round trip ticket and 13 cents per pound for freight. Many people traveled by small skiff between English Bay and Port Graham. People often traveled in groups with a large commercial fishing boat for travel to Seldovia and sometimes to Homer. Travel and freight costs were lessened significantly by splitting them among group members.

At the beginning of the study period, housing in both communities was in short supply. About one-half the families in Port Graham and one-third of those in English Bay lived in houses built by the BIA in the 1950s. Most of these houses were badly in need of repair and weatherization. Approximately one-fourth of the families in each community lived in houses which they had built and which were in good condition. The remaining families occupied very old houses, many built in the 1920s. Most of the houses had no insulation and were beyond economical repair. In 1981, a major HUD housing project built 40 new homes in Port Graham and English Bay. Most of the old homes were replaced, and a number of additional new houses provided for the increasing numbers of families. The later housing project added a new dimension to the economies of both communities by requiring annual mortgage payments by the occupants. Payments were prorated over a 30 year period according to annual income levels, and averaged about $100 a month.

TABLE 12. FOOD AND SUPPLY PRICES IN PORT GRAHAM STORES, MAY 1982

Fresh Frozen Meat	Price/Lb.
Chicken	1.85
Wieners	2.20
Hamburger	2.00
Pork Chops	4.80
Beef Stew	2.35
T-bone Steak	4.95
Bacon, sliced	3.30
Bologna	2.78
Salami	2.78
Roast Beef	3.45
Canned Meat	
Chicken	0.92
Beef Stew	1.61
Corned Beef Hash	1.77
Meat Balls	1.57
Vienna Sausage	2.52
Light Tuna	3.99
Spam	2.95
Sardines	6.77
Other Protein	
Cheese	3.10/1b
Evaporated Milk	0.45/5.3oz
Powdered Milk	2.50/1b
Eggs/dozen	1.65
Peanut Butter	2.28
Cereal Products	
Flour	0.46
Rice	0.68
Pilot Bread	1.60
Quaker Oats	0.97
Corn Flakes & Raisin Bran	1.76
Saltine Crackers	1.15

Canned Vegetables	Price/Lb.
Pork & Beans	0.82
Peas	0.89
Corn	0.85
Spinach	0.87
Carrots	0.68
Beans,cut green	0.72
Canned Fruits	
Apricots	0.92
Peaches	1.08
Fruit Cocktail	1.00
Pears	1.12
Pineapple	0.77
Beverages	
Apple Juice	0.77
Orange Juice	1.33
Grape Juice	1.14
Soda Pop	0.59/can
Coffee	3.53
Frozen Apple Juice	2.70
Tang	2.05
Other	
Sugar	0.67/1b
Salt	0.48/1b
Shortening, liquid	3.43-8.39/gal
Shortening, Crisco	0.43.1b
Wesson, oil	10.10/gal
Candy Bars	0.35 ea
Cookies	2.00/1b
Supplies & Fuel	
Blazo	6.49/gal
Paper Towel	1.19/roll
Toilet Paper	1.64/4 rl
Detergent	3.56/49 oz box
Gasoline (regular)	1.30/gal
Disinfectant (Lysol)	4.02/18 oz bottle

COMMUNITY FACILITIES AND GOVERNMENT

During the late 1970s and 80s, community infrastructure changed dramatically. New roads were built in both communities replacing foot paths and three-wheel Honda trails. Since the first airport was built in 1958 in Port Graham, the strip was widened and lengthened. In contrast, in English Bay, the gravel bar separating the ocean from the lagoon remained the only feasible gravel landing strip. Village water systems supplied homes in both communities. Up until about eight years ago, both villages had electrical generators to supply power. In 1977, both received power from electrical lines running from Homer and serviced by the Homer Electric Association (HEA). Prior to 1983, each community had a single microwave telephone, or utilized shortwave radios and CBs for communication. In 1983 each home received its own telephone.

During the study period, health needs were met in each community by clinics staffed by trained health aides. Doctors and nurses from Homer periodically visited to provide for each community's monthly and annual health needs. When the roads were completed in English Bay in 1982, residents received their first fire engine and, like Port Graham, recruited a group of volunteer firemen and emergency medical technicians.

Each community had a community center, which in Port Graham housed the village government offices. In English Bay the center was used primarily for meetings and informal get-togethers. The village government was housed in another building.

Each community had a village corporation, with an elected board and president, which directed the profit activities of shareholders. The nonprofit village governments were run by six-member councils. They were responsible for administering development projects and the daily village operations. Staff members were employed by the councils for daily support activities.

Each community had a Russian Orthodox church. Port Graham also had a Baptist church. Ministers and priests periodically visited each community to conduct services and hold special ceremonies. Various church committees were active in each community to help raise funds for programs, organize special events, and provide assistance for special issues or events.

Owing to the strong Russian Orthodox backgrounds of village residents, the primary annual holiday celebrations were those associated with the church. For this reason too, all religious holidays were observed under the Julian calendar. Examples of some of the holidays included Russian Christmas, from January 6 to January 9; New Years, celebrated on January 14; and Lent, observed between February and April. Certain days throughout the year were recognized in honor of saints and other religious figures. Masking, maskala'taq, was a traditional Native activity said to have been practiced before Russian times in recognition of hunting activities. Moonin et. al. (1980:58-59) reports being told by his grandfather of this activity taking place in Yalik. After Russian times, the meaning of masking was intended to symbolize the Biblical event of King Herod's soldiers disguising themselves in the attempt to kill the baby Jesus.

ANNUAL ACTIVITY CYCLE

The annual cycle of economic and social activities in both communities occurred in a relatively predictable order during the study period and was determined largely by the timing of resource harvests (Fig. 22). An estimated 90 percent of the households in each community had members annually involved in commercial fishing from May through September. About 60 to 80 percent of the households had members participating in various subsistence hunting, fishing, or gathering activities. Throughout each year, a small percentage of households had members employed either full-time or part-time primarily working for the village councils, corporations, health clinics, cannery, or local stores. Whenever special projects such as building maintenance or utilities installation were active, a few more people were employed. Typically, most of the full-time and regular part-time jobs were held by women. This was due to the men's involvement in commercial fishing and their major roles in subsistence harvest activities.

For local hunters and fishermen, there were usually a number of economic activities from which to choose during the period of spring through fall. An individual could choose to fish or hunt when wild resources became available. People integrated these activities with work on part-time employment opportunities. Typically, a person who held a commercial fishing permit had to decide whether commercial fishing would produce as much as he might earn working a part-time job. Similarly, non-permit holders sometimes had to chose between a number of opportunities that might be available, including cannery work, commercial fishing or subsistence hunting, fishing or gathering. Families

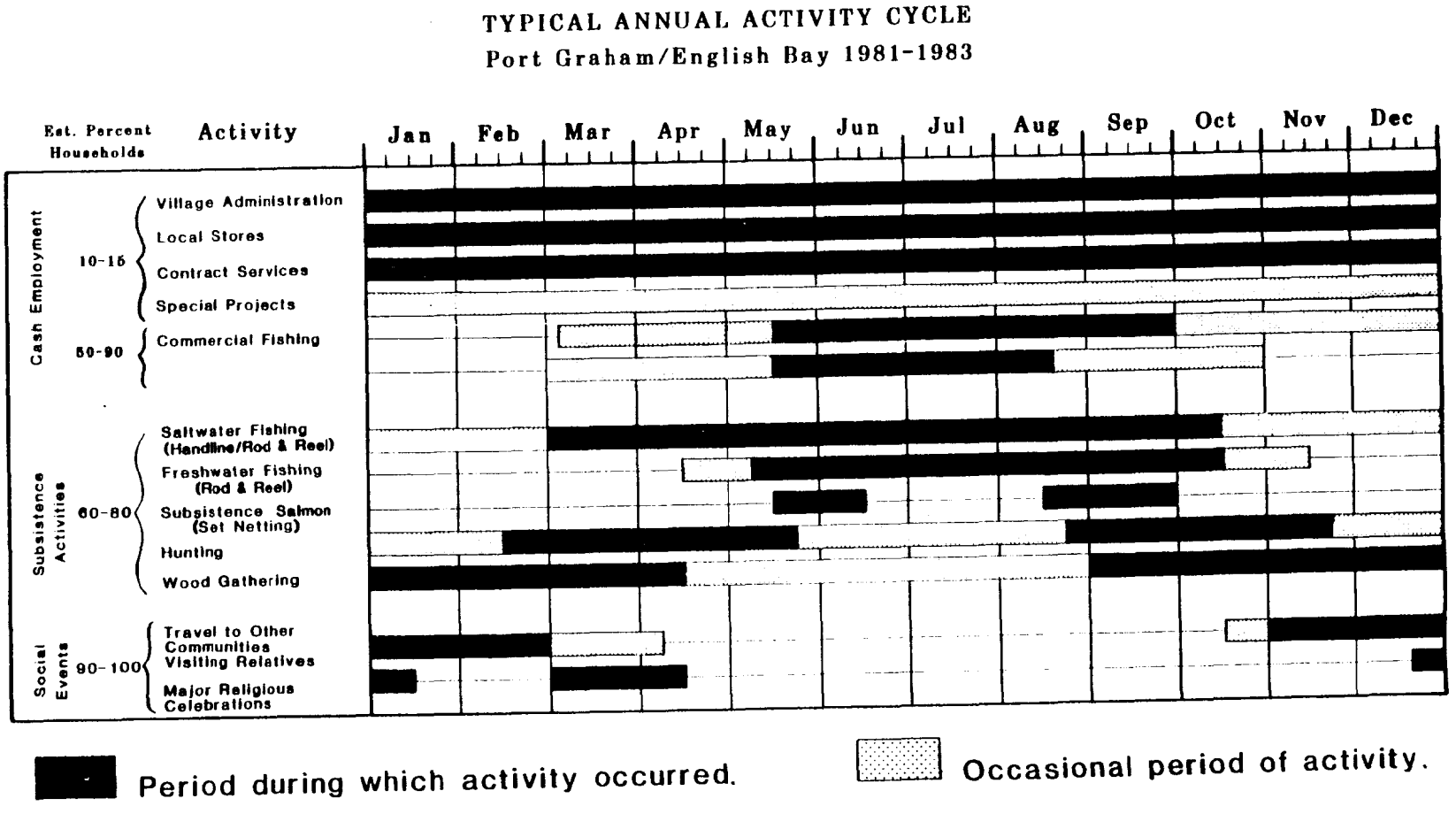

Figure 22. Typical annual activity cycle for Port Graham and English Bay residents.

combined the various opportunities and lived off the subsistence harvests and earned monetary income that resulted from year to year.

Typically following the end of the fall work season, preparations began for the holiday season's religious celebrations and visitations to friends or relatives in Port Graham or English Bay, Seldovia, Anchorage, or Homer. Many people made shopping trips to the above locations in combination with visits to relatives. Every household was usually in some way involved in holiday celebrations. An ever popular activity in recent years has been the sharing of video-tape cassettes among households owning video recorders and watching regular TV programs, especially during winter months.

CHAPTER 7

CONTEMPORARY RESOURCE USE PATTERNS

This section describes the use of wild resources in Port Graham and English Bay as they occurred during the study period between May 1981 and October 1984. First, the seasonal round of subsistence activities is described. A more detailed description of uses and harvest practices then follows.

THE ANNUAL ROUND

The annual seasonal round of current hunting and fishing activities for particular kinds of resources followed by the people of Port Graham and English Bay in the early 1980s is illustrated in Figure 23. This figure was compiled from information collected during 16 consecutive months in 1981 and 1982, interviews with key informants, and general field observations between the spring of 1981 and the fall of 1984. The pattern of activities was an integral part of a larger activity cycle common to both communities (see Chapter 5).

Variations occurred in timing of subsistence activities during the three-year study period. These variations were due to both natural and regulatory factors. Natural changes in resource abundance and variation in local environmental conditions affected resource availability. Although many natural resources were locally available year-around, harvest often did not occur until local environmental conditions, like

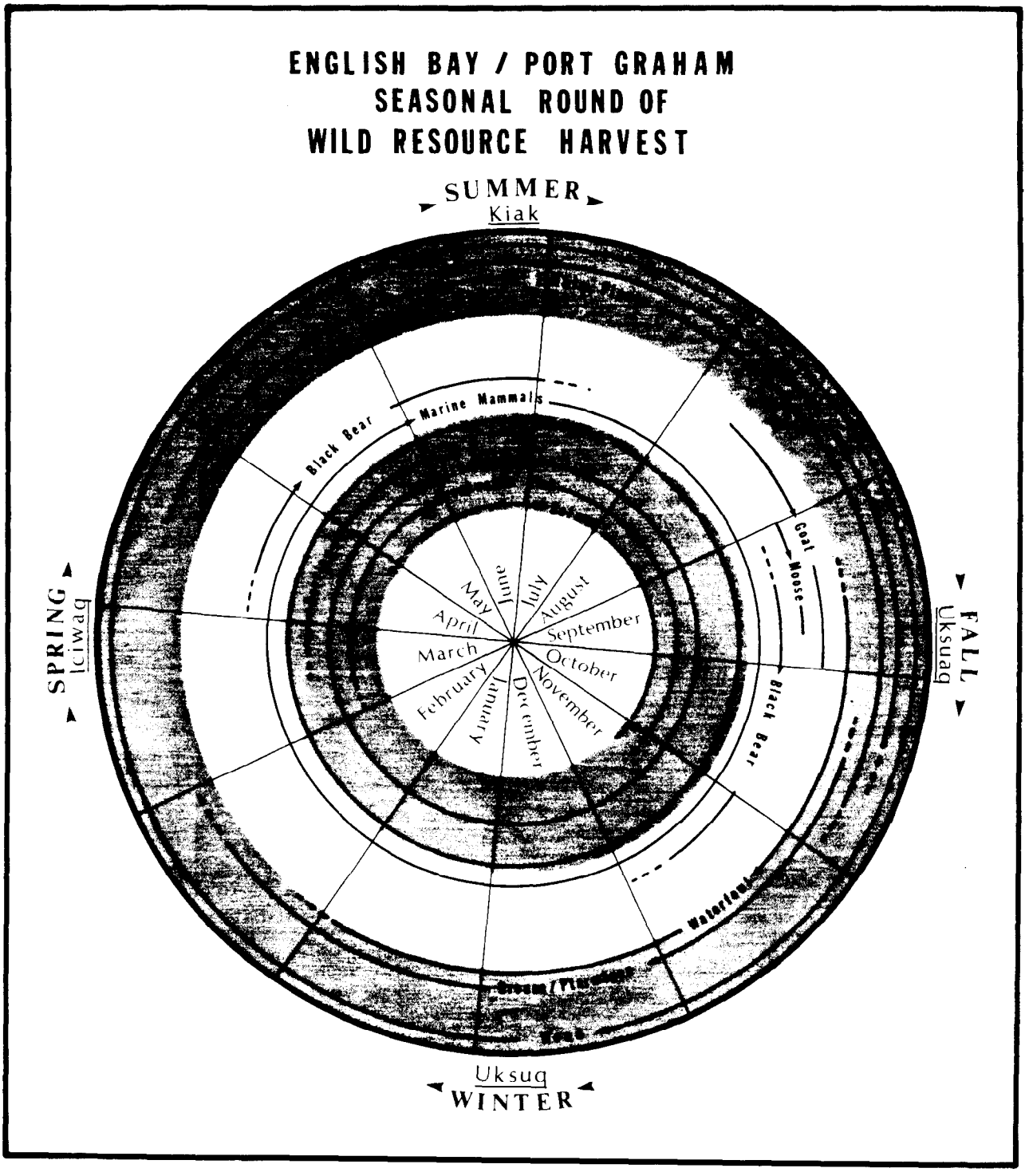

Figure 23. The annual seasonal round of wild resource harvest for Port Graham and English Bay.

tidal size and periods, available daylight, and weather conditions, were suitable.

The most favorable environmental conditions for resource harvesting occurred in the spring and summer. The combination of low tidal conditions and long day lengths was then optimal for gaining access to areas of abundant intertidal resources and migrating marine fish. The harvest of salmon and herring, which were only seasonally available in suitable harvest areas and sizeable quantities, are significantly influenced by weather, run timing, run size, and season dates.

In the discussion which follows, variations in harvest activities occurring as part of the annual seasonal pattern are described. To simplify the discussion the year was divided into the four seasons, although different harvest activities did not always occur exactly within the calendar dates of each season. Chapter 6 provides a discussion of economic activities in the community which also influenced hunting and fishing activities during the study period.

Spring (March-May)

Along the Outer Kachemak Bay shoreline spring (March through May) brought a gradual warming of coastal waters during the study period. The snowline slowly receded up the mountains exposing south-facing slopes. Melting ice and snow in the Port Graham River and English Bay River and lake systems increased stream flow. Fishing activities which were at moderate levels of participation during winter months intensified as the weather warmed and became more favorable for boating on outer Kachemak Bay.

The appearance of Dolly Varden in stream mouths and coastline areas attracted rod and reel fishermen. Jigging for halibut, flounder, Irish lords (sculpins), and other bottom species took place in Port Graham Bay and in nearby waters (from skiffs and pier) during calm weather. English Bay fishermen fished for Dolly Varden in the mouth of the English Bay River, and a few tomcod were caught in the lagoon. On calm days a few boats went out to deeper waters for bottomfish. As halibut began moving closer to the shoreline and weather conditions cleared, fishing effort increased from both communities.

During minus tidal periods in spring and early summer, shellfish harvest activities reached their peak. Small groups of fishing partners collected snails, chiton, butter clams, cockles, octopus, and an occasional sea urchin and sea cucumber from shoreline areas within walking distance of the villages. Perhaps because some of these areas had been heavily harvested in the past, or due to the intensive activities of sea otters, people traveled to areas away from the villages for some intertidal species, especially clams.

In early May, large numbers of sockeye and chinook salmon migrated in shoreline water in the vicinity of the villages. At this time set gill nets were used to harvest salmon in a regulated subsistence season. Herring also swam through the same waters and nets were set near spawning areas. Late spring and early summer was also time of cool breezes, sunshine, and no flies -- ideal conditions for drying and smoking fish.

As south-facing hillsides warmed up and snow cover melted, hunters watched for the first signs of black bear. The meat and fat of bear are highly favored among residents of both communities. Rendered bear fat

is considered the best for baking. Hunters usually went with one or more partners, and often made trips to distant locations away from the villages where bears are more abundant and less wary. The search for black bear continued into June until green vegetation concealed bears.

As the ground warmed up, several species of plants produced tender shoots and stems used by many households. Cow parsnip (wild celery) and sour dock (wild rhubarb) were the two most commonly used plants at this time of year. Marine shoreline areas produced narrow-leaf plantain or "goose tongue" used as flavoring on baked salmon. Kelp and seaweed were gathered from intertidal areas at low tides. Several species of marine birds, including seagulls and puffins returning to their nesting areas, were hunted for their meat. Their eggs were taken to be eaten fresh and used in cooking.

Summer (June-August)

By mid-June, the first part of the subsistence salmon set net season ended and many people concentrated their efforts on either commercial salmon set netting or preparing for commercial salmon seining. Halibut fishing reached its peak at this time. Most households went out daily to fish for halibut.

The increased day-length and warmer temperatures allowed long working days and considerable time was spent repairing boats and motors, mending fishing nets, and preparing for commercial fishing. A few people fished commercially for halibut. Depending on funding, several small village work projects such as litter clean-up and housing repairs

were underway. A few households prepared small garden plots for growing potatoes, lettuce, cabbage, and turnips.

As salmon moved into streams to spawn, hook and line fishermen continued building their winter supplies of dry fish. Commercial salmon set net fishermen began fishing during the second week of June and were usually active throughout June, July, and August, sparing little time for putting up resources for home use. Other family members not involved in commercial fishing harvested salmon, halibut, and other species of saltwater fish.

During July and August, commercial fishing activity peaked with runs of pink salmon harvested primarily by seine boats. Fishermen from both communities traveled to Tutka Lagoon, Seldovia Bay, Dogfish Bay, Port Dick, and Windy Bay for commercial openings. On these trips, especially to Outer District areas, some of their time was spent hunting seal and fishing for bottom fish while waiting for commercial openings. Generally the Port Graham cannery operated until August 15 at full capacity, with workers putting in 12-hour shifts.

The harvest of plants required knowledge of their identification and uses, but usually only moderate physical effort. From mid to late summer, greens and berries were harvested and preserved by canning or drying, or were eaten fresh. Several species of berries were gathered in large quantities. Salmon berries especially were abundant and favored by most households.

Silver salmon became the focus of fishing activity at the end of summer. Rod and reel fishing in Port Graham Bay and at the mouth of the English Bay lagoon was directed at silvers, preferred for freezing, salting, and cutting into strips for smoking.

Fall (September-November)

In September moose, coho salmon, berries, seal, and black bear were harvested in a final effort to meet food storage requirements. Near the end of the salmon runs in early fall, fishing efforts shifted from salmon to other finfish like Dolly Varden, rainbow trout, and halibut and to game such as moose, bear, grouse and waterfowl. In September, hunters from both communities planned trips to their favorite hunting locations. Although not abundant in the area, moose were hunted each year by residents of both communities. Parties of hunters usually walked to forest edges along the Port Graham and English Bay rivers. Camps were established around the English Bay lakes and were used as bases of activities. Several hunters had built cabins on their Native allotments and spent two to three weeks hunting, fishing, and picking high-bush cranberries. Black bear were hunted in productive berry areas above timberline and at moose kills. Goats were hunted in the early fall, particularly at Dogfish Bay and Port Chatham. Hunting parties also went by boat to the head of Kachemak Bay and to Dogfish Bay where they hunted moose, bear, and waterfowl. Marine mammals were hunted opportunistically during these trips. Seal hunting parties traveled to Yukon or Elizabeth Islands.

Winter (December-February)

The winter period between December and mid-February had relatively low levels of resource harvest activity. This was a time when most households participated in Russian Orthodox holiday activities and when

large quantities of the fish and game preserved during the summer and fall months were distributed and consumed among households. Feasting was associated with all special events like Russian New Year, Masking, and Russian Christmas.

Wood gathering was a common resource harvest activity at this time. Snowmachines and three-wheelers were used to haul wood from neighboring forests.

In early winter, waterfowl were hunted as they congregated in nearby bays. Intertidal resources, especially chiton, snails, and clams were gathered from intertidal areas. These resources provided a ready supply of fresh fish and meat. Some people used lanterns and flashlights to search tidal areas at times when low tides occurred during darkness.

In late winter, as day lengths increased, a few people fished for rockfish, greenling, and tomcod during calm days. Fishermen usually did not venture far from Port Graham Bay. Some people fished off the dock at Port Graham. At English Bay, the lagoon ice often froze thick enough to walk on. Tomcod were caught through the ice by jigging with handlines or with rod and reel.

RESOURCE HARVESTS AND THEIR UTILIZATION

Whereas the previous section gave a general overview of the annual cycle of resource harvest activities, the next section is a detailed description of resource harvest methods and uses as they occurred during the study period. Approximately 110 different groups or individual resources were available in the lower Cook Inlet area, and had been

reported by the North Pacific Rim (1981) as having been harvested by the two communities (Table 13). Resources are discussed individually or grouped into categories depending upon the patterns of their harvest and upon the regulatory structures governing harvest. Regulatory information is provided for each resource category to give background for a fuller understanding of harvest activities.

Resource Harvest Levels

Harvest information from this study indicates the utilization of a wide variety of natural resources from both marine and terrestrial environments. A diversification in harvest composition is typical of many coastal communities in Alaska (Wolfe and Ellanna 1983). The composition of Port Graham subsistence harvests was 38.4 percent salmon, 39.6 percent other fish (including marine and freshwater species), 0.4 percent land mammals, 15.2 percent marine mammals, 4.3 percent marine invertebrates, and 2.5 percent other resources (including birds and plants) (Table 14). For English Bay the composition of subsistence harvest was 66.5 percent salmon, 21.3 percent other fish, 0.3 percent land mammals, 5.9 percent marine mammals, 1.9 percent marine invertebrates, and 4.0 percent other. These percentages were calculated by converting reported harvests to pounds edible weight per household (see Appendix D and Table 14). The two communities differed significantly in two categories of resource harvest, salmon and marine mammals. English Bay's relative percent of salmon harvest was 18.5 percent higher than Port Graham's, and its marine mammal harvest was 9.2 percent lower. All other resource categories were relatively comparable in percentages.

TABLE 13. WILD RESOURCES USED BY RESIDENTS OF PORT GRAHAM AND ENGLISH BAY, LOWER COOK INLET

English	Sugestun	Scientific
FINFISH		
King (chinook) salmon	lluq'akaq	Oncorhynchus tshawytscha (Walbaum)
Sockeye (red) salmon	nikllig	Oncorhynchus nerka (Walbaum)
Sockeye (red) salmon, spawning stage	narilngaataq	
Coho (silver) salmon, in ocean or lake	qakii'aq	Oncorhynchus kisutch (Walbaum)
Pink (humpback) salmon, in ocean and stream	amartuq	Oncorhynchus gorbuscha (Walbaum)
Pink (humpback) salmon, ready to die w/white skin	aakanaq	
Chum (dog) salmon	alimaq	Oncorhynchus keta (Walbaum)
Dolly Varden	saaguayaq	Salvelinus malma (Walbaum)
Rainbow trout (Steelhead)	mayu'artaq	Salmo gairdneri (Richardson)
Halibut	sagiq	Hippoglossus stenolepis (Schmidt)
Stary flounder	patuqulluk	Pleuronectes stellatus (Pallas)
Sole	ggagtuliq	
Unidentified Pleuronectidae		
Black rockfish	tukuq	Sabastes melanops (Girard)
Unidentified Scorpaenids		
Herring, Pacific	iqalluarpak	Clupea harengus pallasi (Valenciennes)
Pacific tomcod	sakelaq	Microgadus proximus (Girard)
Pacific cod	amutaq	Gadus macrocephalus (Tilesius)
Kelp greenling	tilpuuk (Russian) culuqpau'aq (Sugestun)	Hexagrammos decagrammus (Pallas)
Lingcod	amutaq	Opiodon elongatus (Girard)
Walleye pollock (Whiting)	rrirliq	Theragra chalcogramma (Pallas)

Table 13, continued

Yellow Irish lord(bullhead)	asirnaq	Hemilepidotus jordani (Bean)
Sculpins	ciiluqpuq and kala'aq	Hemilepidotus (sp.)
Pacific lamprey	quguutnaq	Lampetra tridentata (Gairdner)
Fish eggs	qaryat	
SHELLFISH		
Dungeness crab	yual'ayak	Cancer magister Dana
"Big crab"(king?)	yual'ayakcak	Paralithodes camtschatica(Tilesius)
Butter clam	salaq	Soxidomus giganteus Deshayes
Horse clam	salaq	Tresus capax (Gould)
Red neck clam	salaq	
Razor clam	cingtaataq	Siliqua patula Dixon
Scallop	salaq	Pecten caurinus Gould
Cockle	taugtaaq	Climocardium nuttallii (Conrad)
Blue mussel	amyak	Mytilus edulis Linne'
Sea urchin	uutuk	Strongylocentrotus sp.
Sea cucumber	inarngalraaq	Family Holothuroidea
Shrimp		Family Pandalidae
Chiton		
Black kattie	urriitaq	Katharina tunicata
Gumboot (lady slipper)	urriitarpak	Cryptochiton stelleri
Octopus	amikuq	Octopus dolfleini
Snail (small)	ipuk	
"coffee snail"(large)	kauk	

Table 13, continued

MAMMALS		
Harbor seal	qaigyaq	Phoca vitulina
Sea lion	wiinaq	Eumetopias jubata
Black bear	tan'erliq	Ursus americanus
Moose	teglliq	Alces alces
Mountain Goat	pehnaiq	Oreanmos americanus
Porcupine	qangateraq	Erethizon dorsatum
Marmot	quirriq	Marmota calligata
Dall sheep	sepaa'aq	Ovis dalli
Weasel	amitatuk	Mustela erminea
Marten	qaugcicuaq	Martes americana
Mink	el'kuayaq	Mustela vison
Land otter	kep'arkaq	Lutra canadensis
Coyote	kayutaq	Canus latrans
Snowshoe hare	uka'iq	Lepus americanus
Red squirrel	elkiaq	Tamiasciurus hudsonicus
BIRDS		
Seagull Small gulls	egyaaq	Larus sp.
Glaucous-winged gull	naruyaq	Larus glaucescens
Oystercatcher	kiuksaa'aq	Haematopus bachmani
Puffin	ngaqngaaq	Fratercula corniculata
Pigeon guillemot	cuu'aq	Cepphus columba
Loons	tuullek	Gavia sp.
Comorant	agayuuq	Plalacrocorax
Common snipe	kulickiiq	Capella gallimago

Table 13, continued

Spruce grouse	egtugtuliq	Canachites canadensis
Ptarmigan	qategyuk	Lagopus sp.
Duck	saqulek	
Mallard	nillqitak	Anas platyrhynchos
Green-winged teal	nillqitakwaq	Anas carolinensis
Pintail	amutaarualek	Anas acuta
Common goldeneye	nasqurtuliq or qapugnaq	Bucephala clangula
Bufflehead	nacallngaayak	Bucephala albeola
Red-breasted merganzer	paiq	Mergus serrator
Old squaw	aarraangiiq	Clangula hyemalis
White-winged scoter	cuu'arnaq	Melanitta fusca deglandi
Black scoter "whistler"	kukumyaaq	Melanitta nigra americana
Surf scoter	tunuculek	Melanitta perspicillata
Common eider	qaanillqaacak	Somateria mollissima
Scaup, lesser	egtuk	Aythya affinis
Canada goose	temngiaq	Branta canadensis
Black brant	kahnguk	Branta nigricans
Harlequin duck	ungunguasaaq	Histrionicus histrionicus
American widgeon		Anas americana
PLANTS		
Sourdock(wild rhubarb)	quunarliq	Rumex arcticus Trantv.
Bethlehem star	ikignganaq	Monesus uniflora L. Gray
Rose hip	qelempaa	Rosa sp. L.

Table 13, continued

Yarrow	qanganaruaq	Achillea boarealis Bong.
Kelp	qahnguq	Nereocystis leutkeana
Edible seaweed	caqallgat	
Fireweed	cillaqaqutaq	Epilobium angustifolium L.
Sweet coltsfoot	nausak	Petasites hyperboreus Hydb.
Tundra rose		Potentilla fruticosa L.
Salmonberry (red) (Yellow)"Russian(berry)"	alagnaq kasaakaq	Rubus spectabilis (Pursh)
High-bush cranberry	qalakuaq	Vibernum edule (Michx.) (Raf.)
Low-bush cranberry	inaq'amciq	Vaccinium L. or Oxycoccus (Adams)
Currents	cunisiq	Ribes L.
Blueberries	atsaq	Vaccinium Ovalifolium Sm.
Nagoonberry(cloudberry)	puyurnaq	Rhubus chanaemorus L.
Crowberry (mossberry)	pakik	Empetrum nigrum L.
Trailing raspberry	malruukegtaaq	Rubus pedatus sm.
Wild celery (cow parsnip)	ugyuuteq	Heracleum lanatum (Michx.)
Mountain ash	esqunaq	Sorbus sitchensis (Roem.) or scopulina (Greene)
Alder	uqgwik	Alnus crispa (Ait.) (Pursh)
Alder "berries"	qaruskaq	
Goose tongue	weguaq	Plantago maritima L.
Beach rye-grass (roots)	ggal'utet	Elymus arenarius L.
Wild chive (onion)	luk	Allium schoenoprasum L.
Devil's club	cukilanarpak	Echinopanax horridum (Sm.) Deche. and Planch.
Nettle	uuqaayanaq	Urtica gracilis (Ait.)

Table 13, continued

Indian rice	arpaayaq	Fritillaria chamschatcensis L. (Ker-Gawl)
Chamomile	alam'aaskaaq	Matricaria matricariodes (Less.)(Porter)
Sitka spruce(tree)	napaq	Picea sitchensis (Bong.) (Carr.) L.
Lavender daisy	teptukuuyaq	Aster subspicatus Nees

Sources: English Bay and Port Graham residents; Jeff Leer, Alaska Native Language Center; Leer et al. 1980

TABLE 14. RELATIVE PERCENTAGES OF RESOURCES HARVESTED BY SELECTED ALASKA COMMUNITIES

	YEAR	% SALMON	% OTHER FISH	% LAND MAMMALS	% MARINE MAMMALS	% MARINE INVERT-EBRATES	% OTHER	SOURCE
SOUTHCENTRAL REGION								
Homer	1982	15.0	34.0	27.0	0.0	22.0	2.0	Reed 1985
Kenai	1982	40.0	26.0	17.0	0.0	13.0	4.0	" "
Ninilchik	1982	20.0	48.0	10.0	0.0	16.0	6.0	" "
Seldovia	1982	33.0	22.0	15.0	0.0	15.0	15.0	" "
Tyonek	1983-84	71.0	3.0	21.0	1.0	2.0	2.0	Fall 1984
Port Graham	1981-82	38.0	39.6	.4	15.2	4.3	2.5	Stanek 1985
English Bay	1981-82	66.5	21.3	0.3	5.9	1.9	4.0	Stanek 1985
KODIAK ISLAND								
Akhiok	1982-83	43.0	6.0	15.0	28.0	9.0	-	KANA 1983
Karluk	1982-83	67.0	10.0	11.0	10.0	2.0	-	" "
Larsen Bay	1982-83	40.0	16.0	19.0	14.0	11.0	-	" "
Old Harbor	1982-83	45.0	14.0	18.0	16.0	7.0	-	" "
Ouzinkie	1982-83	44.0	15.0	19.0	8.0	14.0	-	" "
Port Lions	1982-83	33.0	34.0	16.0	3.0	14.0	-	" "
YUKON-KUSKOKWIM								
Alakanak	1980-81	27.0	38.0	10.0	18.0	0.0	7.0	Wolfe 1984
Emmonak	1980-81	37.0	33.0	9.0	15.0	0.0	5.0	" "
Kotlik	1980-81	28.0	30.0	14.0	20.0	0.0	8.0	" "
Mountain Village	1980-81	31.0	48.0	16.0	3.0	0.0	2.0	" "
Quinhagak	1983	44.0	21.0	12.0	17.0	0.0	7.0	" "
Sheldon Pt.	1980-81	48.0	30.0	5.0	15.0	0.0	2.0	" "
Stebbins	1980-81	39.0	23.0	2.0	32.0	0.0	5.0	" "

When compared to other southcentral Alaskan communities, Port Graham and English Bay were most like Tyonek in having large mean household harvests and high percentages of salmon. Statewide, they compared closely to Kodiak Island communities in relative percentages of salmon, other fish, and marine mammal harvest levels. English Bay had a higher percentage of salmon than all other communities, except Tyonek and Karluk. The two areas differed in relative percentages of land mammals with Port Graham and English Bay having low percentages due to low numbers of moose and the absence of deer, whereas Kodiak Island has large numbers of deer.

Further comparison indicates English Bay as being fairly specialized in their harvest activities, concentrating their effort on salmon. Port Graham, on the hand, had its harvest distributed over three to four different resource groups. This is due to a greater availability of equipment and easy access to marine resources. Port Graham residents own many more boats of various sizes, allowing them greater access to marine fish, marine mammals, and distant clam beds. English Bay residents own few boats, most of which are small skiffs with limited capabilities. At English Bay, however, access to salmon streams and lakes is possible by foot and set net fishing is close to the village.

Subsistence Resource Use Areas

During the late 1800s and early 1900s, residents of the lower Kenai Peninsula communities of English Bay, Port Chatham, and Seldovia, many of whom were ancestral to present day Port Graham and English Bay

residents, utilized a geographic area extending from Resurrection Bay southwest along the Kenai Peninsula including the Chugach Islands, to the head of Kachemak Bay, including both shorelines of the bay. Occasional use occurred in Kamishak Bay and the Barren Islands. This use area decreased between 1940 and 1970 as people from Port Chatham resettled in Port Graham, English Bay, and Seldovia, attracted there by cannery work and commercial fishing. Seasonal use continued in most of the area for commercial fishing and seal and sea lion hunting. As settlements grew at Homer and along the south shore of Kachemak Bay, villagers' use of the bay west of Seldovia was drastically reduced. The use of motorized boats, however, substituted short-term hunting and shellfish gathering trips to the inner bay for longer-term camps. Just as use of most shoreline areas decreased, inland areas also received less use as communities and camps on the south side of the Peninsula and trail systems connecting them to English Bay and Port Graham were abandoned.

Hunting, fishing, and gathering areas since the turn of the century included the entire coastline and islands and much of the inland areas from Resurrection Bay to Anchor Point (see Fig. 9). Over the past 80 years, use areas have fluctuated in size, location, and emphasis of use. For example, seal and sea lion hunting areas during the 1950s and 60s extended along the entire coastline from the head of Kachemak Bay to Seward. The commercial harvest of seals and bounty payments provided incentive to hunt in most of this area. The meat from many seals was salted and dried and brought back to the villagers or sold. After the bounty system was stopped, seal hunting areas shrank to their current sizes.

Changing land ownership patterns in recent decades, such as Native allotments, ANCSA, and state land disposals continue to change use patterns (Fig. 24). Special land use designations prohibiting hunting and fishing activities have been established in some areas such as the Kenai Fjords National Park, which disallows subsistence hunting within its boundaries.

Many land selections made under the ANCSA include portions of current and historic use areas. However, their sizes are are much less than formerly utilized for hunting, fishing, and gathering activities. By comparison, the shoreline distance of currently selected lands is about one-twelfth of that formerly used by Port Graham and English Bay residents. The reasons local and regional corporations selected particular lands also was not solely or even primarily to protect subsistence uses, but for other economic reasons.

Terrestrial use areas have decreased in size and many areas are hunted less than in the past. For example, in the 1920s and 30s moose and bear were hunted by villagers along the entire north shore of Kachemak Bay. During the study period, the area was used only occasionally. The head of the bay was still used occasionally, but it too received less use than in the past. Some of this use has been displaced to other areas, while the remainder has discontinued. The entire shoreline and bay from Fox River Flats to Seldovia was utilized for hunting large and small game as well as for gathering marine bird eggs, berries, and other vegetation in the 1920s through the 50s. Settlements and competitive uses along much of the shoreline have precluded use of many key locations like Halibut Cove and Bear Cove, and

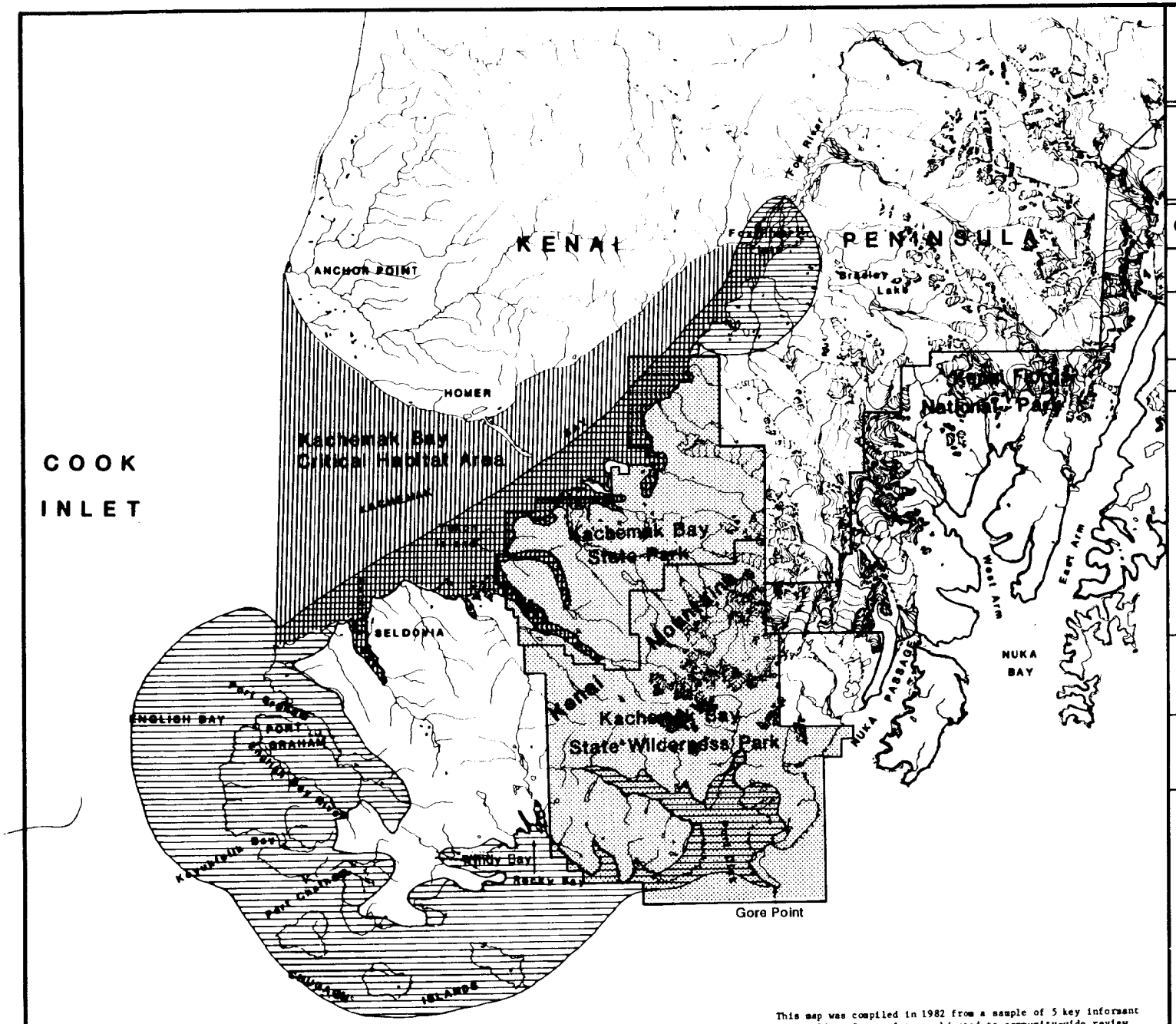

Figure 24. Resource use areas of English Bay and Port Graham residents and land status of Lower Kenai Peninsula.

This map was compiled in 1982 from a sample of 5 key informant households. It was later subjected to community-wide review and represents areas used by English Bay and Port Graham between 1972 and 1982. Use areas change through time and are not fixed entities; therefore, these maps may be a partial representation of use areas. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.

ALASKA DEPARTMENT OF FISH AND GAME

SUBSISTENCE RESOURCE HARVEST AREA MAP

QUAD NAME Seldovia

SCALE 0 5 10 15 miles

TITLE English Bay, Port Graham Harvest Area and Lower Kenai Peninsula Land Status

LEGEND

- Resource Use Areas
- State Parks
- National Park
- State Critical Habitat Area

SOURCES
English Bay, Port Graham Residents

PREPARED BY
Ronald Stanek
Dan Foster

DATE
7/3/84

DIVISION OF SUBSISTENCE

resulted in decreased effort in areas like China Poot Bay and Tutka Lagoon.

Occasionally, trips were made during the study period to Kodiak or Cordova, where relatives or friends had equipment to hunt deer. With the ease of access to the upper Kenai Peninsula, several households in recent years have begun making trips to the Kenai River or Turnagain Arm for eulachon, Clam Gulch for razor clams, and the Matanuska Valley for moose. But during the study period, it was uncommon for villagers to travel outside local use areas for resources.

From the early 1900s to the 50s when Portlock was an active village site, more intensive use was made of its immediate vicinity, Koyuktolik Bay, and Elizbeth Island. Today these areas are used most commonly for extended bear, seal, sea lion, and goat hunts which often include extended family units. The women and children gather berries, plants, and eggs near the camps.

For the past 20 to 25 years, the active use areas of the two communities included the lower peninsula coastline and islands from Gore Point to the head of Kachemak Bay. Inland use areas extend from a line between Seldovia and Port Graham southeast to Windy Bay, including most of the tip of the peninsula, and several areas near the head of Kachemak Bay. The historic use area from Gore Point east to Resurrection Bay was viewed by the village residents as a "reserve" area where people will be able to hunt or fish if present areas become overused. The areas depicted in Figure 25 were used by people from both communities, except along the English Bay and Port Graham Rivers which received use primarily by people from each community respectively.

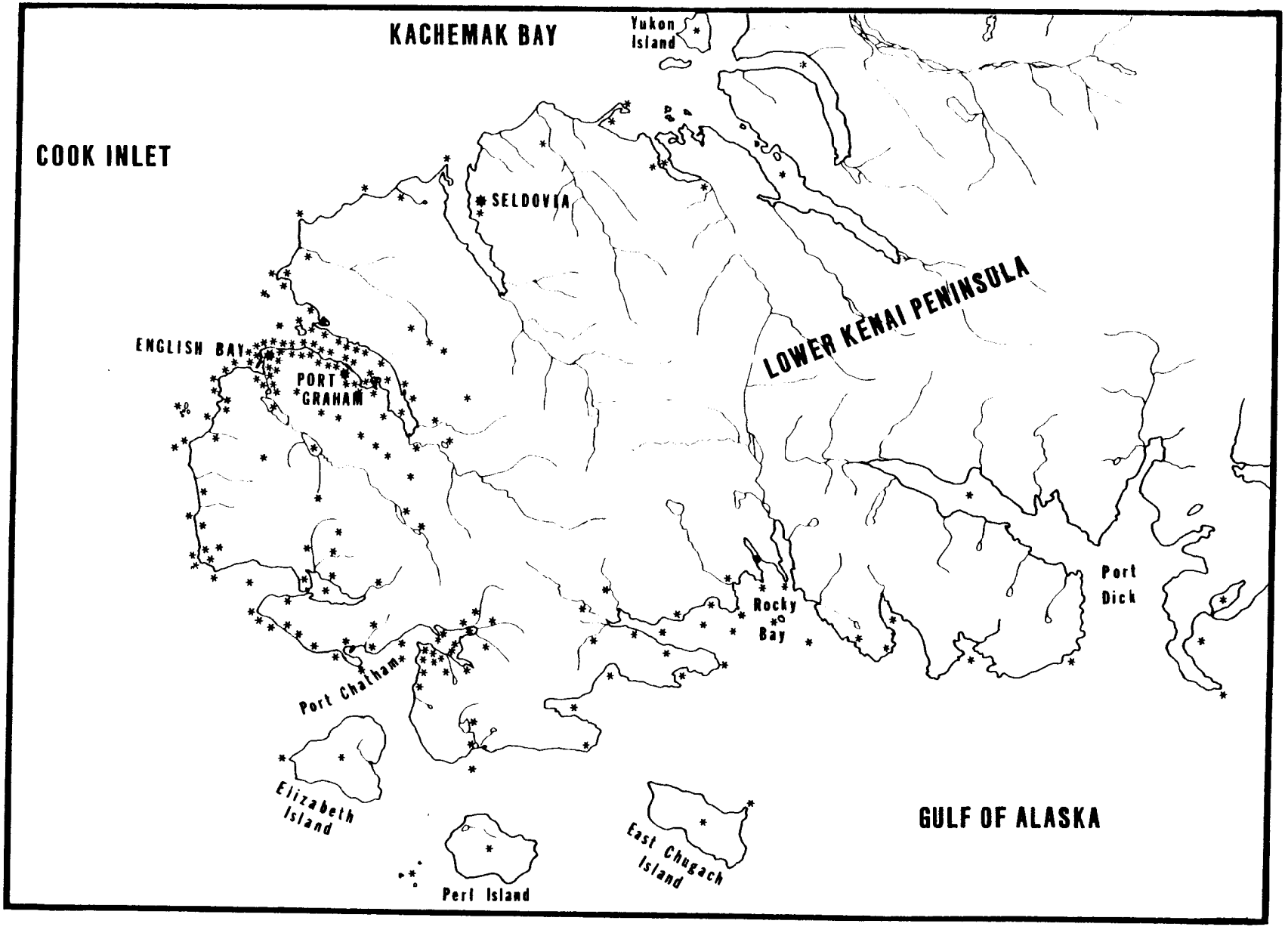

Figure 25. Placename locations on the Lower Kenai Peninsula. Source: Leer 1980.

Within the more localized hunting and fishing areas of the two communities, hunters and fishermen maintained a system of usufruct land and water use rights. In some areas such as stream drainages or fishing areas, this system extended to the village level. At the individual level, for example, fishermen from Port Graham had subsistence and commercial set netting sites that were recognized as "belonging" to each individual. Among hunters, a similar but less site-specific system applied. A bear hunter and his partners who annually hunted a general area could usually depend on other hunters not using that area. This was particularly true if the hunter had a cabin or camp in the area. Similarly, hunters from Port Graham did not use the English Bay River drainage for bear or moose hunting unless a close relative and hunting partner from English Bay hunted there also. This latter situation existed to a small degree with most resource uses. Therefore, in the generalized outer boundaries of community use areas, no difference occurred with regard to the limits of the areas used by Port Graham and English Bay residents. However, significant differences did exist with regard to the number of residents from one village or the other using certain areas.

If for no other reason than the proximity of local residents to some areas, their levels of use may be greater than nonlocals. Regarding more distant use areas, access and use levels are dependent upon individual or group equipment, financial resources, and knowledge, since temporary hunting and fishing camps are no longer maintained in distant areas. People with large boats are more able to travel to areas on the southern coast of the Kenai Peninsula, for example, than people without this equipment. This was often the case with seal and goat

hunting. These hunting activities were commonly associated with commercial fishermen utilizing large seine and drift gill net boats.

Further information on geographic use areas over time may be interpreted from use of placename maps. The distribution of Native names provides an index of the extent of environmental knowledge and traditional land use by area residents living today. Most of these names have been passed down through oral history, while others are of recent origin. A distribution of selected placenames known to many village residents is provided in Figure 25. An indication of the zones of use intensity can be derived from the concentrations of names. Those areas with the highest concentrations of names known to modern-day residents of the two communities extend from near Seldovia to Port Dick.

Documented Alutiiq placenames for the lower Kenai Peninsula name significant geographic features. These include mountains, islands, and bays, historic sites such as villages, hunting and fishing camps, and features of ecological significance like seal and sea lion haul-outs, clam beds, and bear denning areas. Shoreline, inland, and intertidal landmarks provide markers for travel and reference points for locating campsites, travelways, or harvest areas. Because of the old age of many names, their meanings have either been lost through dialectual changes or disuse. Other names, many of recent origin, have retained their meanings and remain in use today.

Salmon

Regulations

Five species of Pacific salmon found in lower Cook Inlet were utilized by the residents of the two communities. Regulations pertaining to the harvest of salmon existed under three different regulatory schemes - commercial, sport, and subsistence. Salmon were harvested for home consumption by residents in both communities under regulations governing all three uses.

For the period 1981 through 1983, commercial regulations pertaining to the areas utilized by the two communities were those covering the southern and Kamishak districts of the Cook Inlet area (ADF&G 1981, 1982, 1983). In these districts there are two types of commercial salmon fisheries: seine net and set gill net. These two fisheries were generally separated geographically. Open fishing periods for the seine fishery occurred by emergency order, and those for the set gill fishery were for two 48-hour periods each week from the first Monday in June until closed by emergency order. Occasional concurrent openings occurred where the two gear types were allowed, however this usually took place when escapement goals were met and salmon had passed the set net fishery.

Subsistence set gill net fishing regulations beginning in 1981 were amended to broaden the previous regulatory framework and more adequately meet the home use patterns of residents within the Port Graham subdistrict. A split season was implemented and occurred in two segments from May 10 to June 15 and from August 16 through September 30 (Fig. 26). A

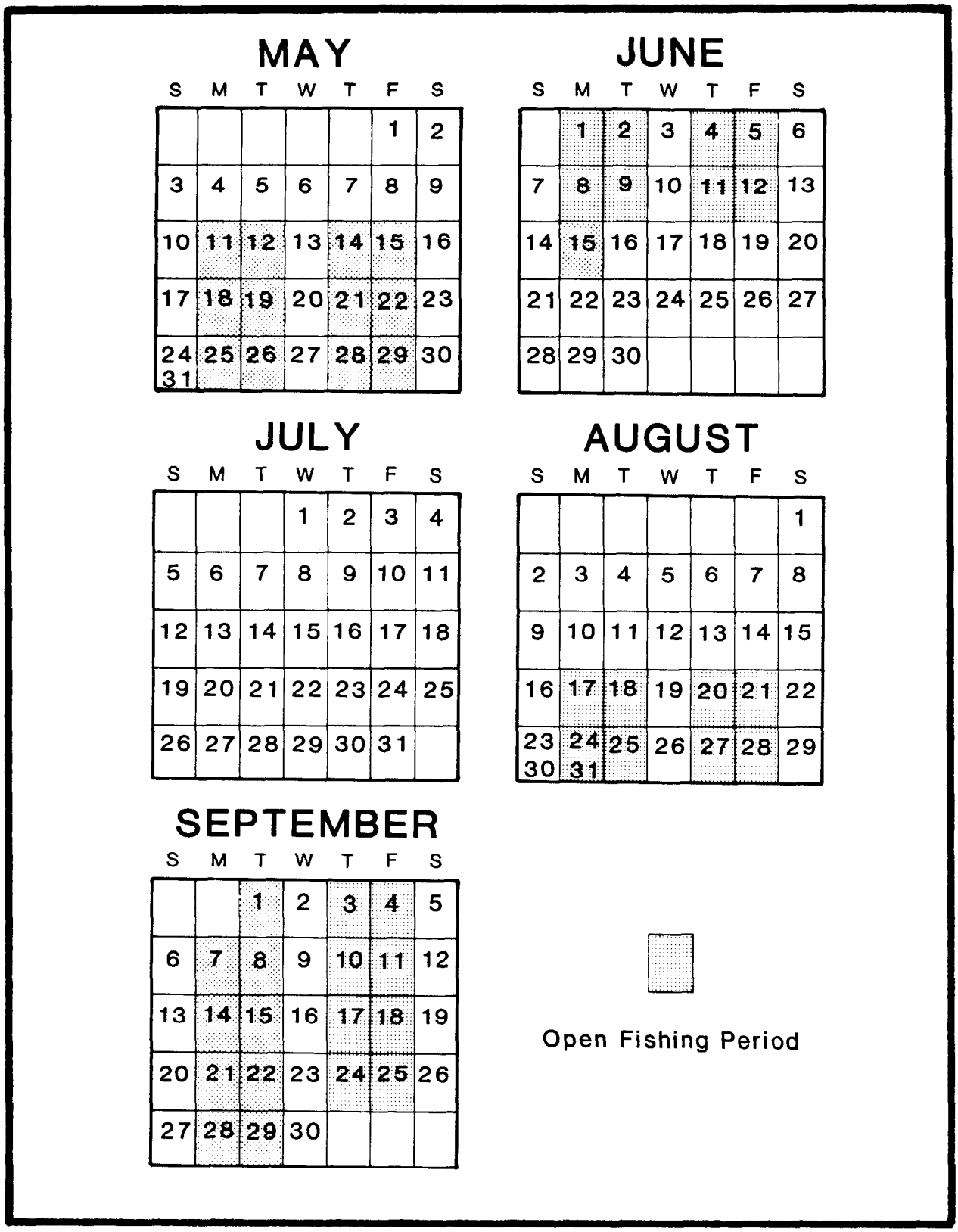

Figure 26. Open subsistence set gill net salmon fishing periods for the Port Graham subdistrict, 1981.

ten week closed period was set during mid-summer, the busiest commercial set gill net and seine boat fishing times. The geographic area open to subsistence fishing included nearly the entire subdistrict, whereas the area open to commercial set netting was about one-half the subdistrict (Fig. 27). Home use salmon were also taken in other areas (Fig. 42).

In 1983, a management option was available to open or close the commercial fishery in the vicinity of either community depending upon whether the subsistence need for salmon had been met in each village. In effect, the subdistrict was divided in two based on the fishing locations of each village. If either village needed more subsistence fish at the time of the commercial season, the village could choose to keep its area closed to commercial fishing until their subsistence needs were reached.

Sport fishing regulations (ADF&G 1981c, 1982) also applied to salmon fishing by means of hook and line in fresh and salt waters. Salt waters in the Port Graham subdistrict were open year-round to fishing with rod and reel, with a bag limit of not more than six salmon per year. Not more than two of these could be king salmon, and this species had to be recorded on a harvest record sticker. In fresh water, the Port Graham and English Bay Rivers were open for hook and line salmon seasons. The English Bay River was designated a single-hook fly-fishing only area from June 1 through July 31, from the river mouth upstream to Lower English Bay Lake. Limits were three salmon over 16 inches in possession, and ten fish total in combination with char and trout. The Port Graham River also had a ten fish total limit of salmon, trout,

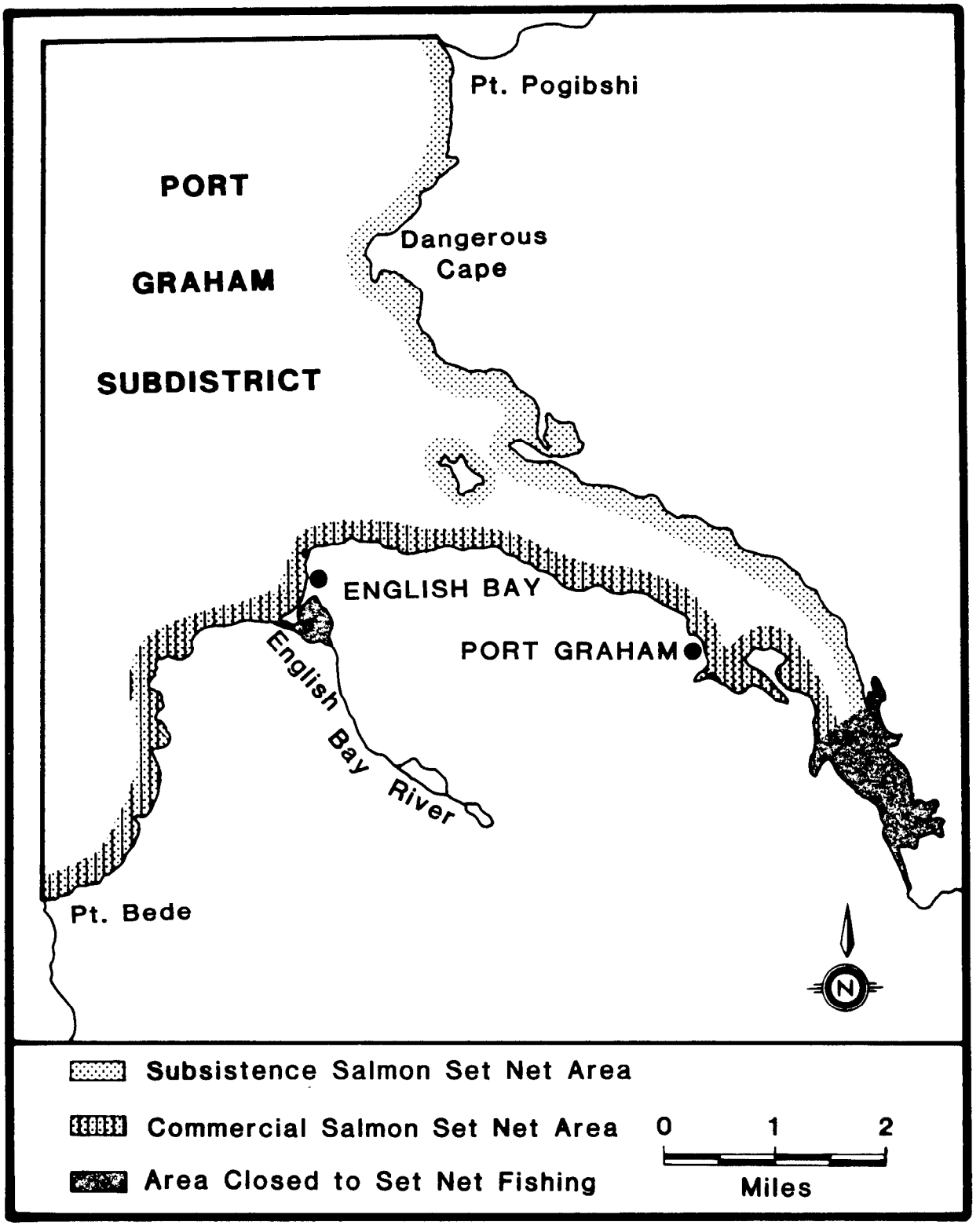

Figure 27. Commercial and subsistence salmon set net areas within the Port Graham subdistrict.

grayling, and char. Additional limits which applied were only one king salmon over 20 inches in length, two grayling, two lake trout, one rainbow, and one steelhead were allowed in possession.

Periods of Fishing Activity

The harvest of salmon for home use by Port Graham and English Bay residents occurred from May through October, and in some years extended into November. The first part of the subsistence season in May allowed fishermen to target the early run of red salmon for home use before the commercial set gill net and seine seasons began. In 1982 and 1984 salmon runs were not adequate during May and early June to meet all home use needs, so some fishermen continued subsistence fishing after the first commercial openings.

Most subsistence set net fishing was done by fishermen who fished commercially at other times during the season. Regulations prohibit fishing for commercial and subsistence uses on the same day. Consequently, the May subsistence fishing season was usually hectic, as most fishermen attempted to complete their subsistence fishing prior to the first commercial opening. Port Graham fishermen managed to harvest adequate supplies of fish during this time. This was not the case in English Bay where fishermen generally harvest larger quantities of fish for home use and therefore required more fishing time than provided in the May/June subsistence season. English Bay residents generally continued to fish red salmon for home use with rod and reel in the English Bay River after the early subsistence season closed. Some Port Graham residents who needed to, also fished in the English Bay River

sockeye fishery. In addition, commercial fishermen from both communities removed red salmon from their commercial harvests for home use.

Organization of Fishing Groups

At the beginning of the subsistence set net season people wishing to get salmon for subsistence use organized themselves into groups centered around someone who had a fishing site and fishing gear. In English Bay, most fishing groups were composed of family members from one or several households, while some groups contained friends and neighbors. Usually when a group of related households fished together the equipment was operated by the same individuals throughout the season. Daily harvests were divided among group households starting with the eldest or the largest household. In other instances, the site and equipment were used by one household after the next as each caught their required amount of fish. In other instances where one or two fishermen fished for the group, the catch was divided among all members until everyone received some fish. Whoever needed additional fish used the site and equipment to get the balance of what they needed for the year. Often nonfishing group members, usually women, prepared and preserved fish for other group members. This was common when commercial and subsistence seasons occurred concurrently.

Households served as bases of operation for gear storage, fish processing, and preservation. Usually each household had its own smokehouse or tree in which to hang fish for smoking and air-drying.

Some owners of new homes built in 1982 had built new smokehouses, while others shared old ones with other households.

Subsistence set net fishing for salmon was organized around a group of people usually related through kinship ties. However, groups of unrelated people organized into fictive kinship groups (people who act as kin but their actual relationship cannot be traced) for the purpose of producing salmon products. Several examples of these groups are cited below to exemplify the variety in group composition.

Case 1.

This case involves a group of 37 extended family members in 10 households (Fig. 28). The figure depicts household structures as they occurred during 1981 and 1982. Two young men in their twenties lived with their parents in household 1 while the other three brothers (households 2-4) and six sisters (households 5-10) had their own households. Four of the ten households fished commercially with either set nets (households 1, 9, and 10) or seine boats (households 1, 3, and 8). Each year several brothers usually fished commercially together, and at least one brother fished with the father. Throughout the study period members of these households fished together for salmon, shared the harvests, processing tasks, and salmon products.

Setting and tending nets was typically done by the young, adult male members of the unit. Several young men usually went together to set and pick fish from nets. Depending upon which household caught the fish, either the fish were brought directly to household 1 or the elder woman in household 1 was told that fish were available and she then directed their distribution among households within the unit.

Once fish were taken to a particular household, cutting and preservation were usually done by the adult members of the household while children often assisted in many of the simpler tasks such as hanging cut fish on drying racks.

Since most of the households in this unit contained adults in their 30s and 40s, they were able to do their own preservation of fish products and usually did so with just a few fish at a time. If large quantities of fish had to be processed, members from several households got together to help each other. Also, the elder woman in household 1 often went to her

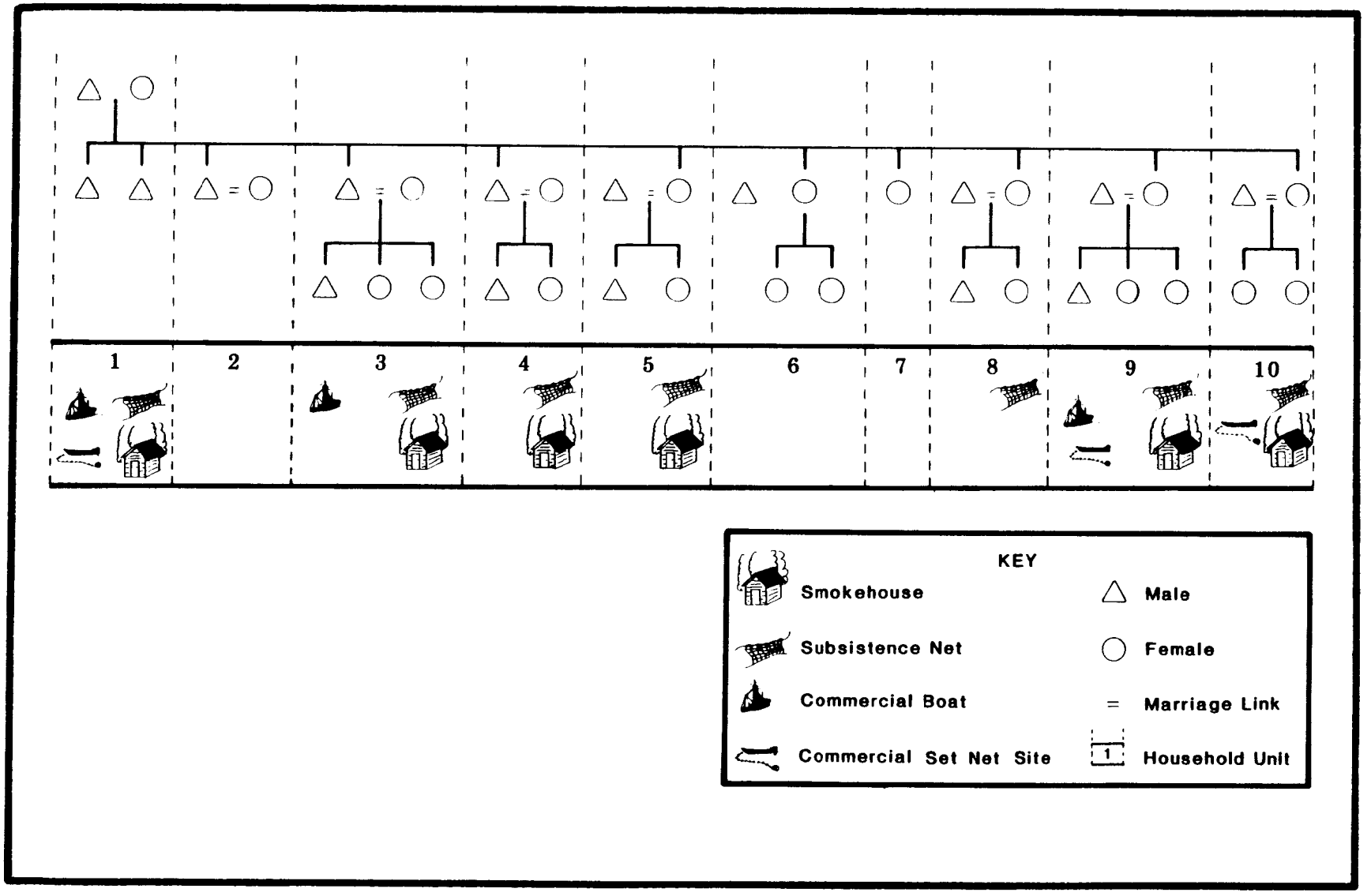

Figure 28. An example of a large extended family unit at Port Graham. The members share subsistence caught salmon, set net equipment, and smokehouses. Some households commercial fish and take fish out of their catch for home use.

children's household to help them process fish. In some years, and often during the second subsistence season in August and September, the extended unit in Figure 28 divided into two smaller functional units (Fig. 29). Households 3, 4, 8, and 10 fished and conducted their preservation activities independently.

A notable characteristic of this extended family is the changing roles played by its members, particularly by the sons, the daughters whose husbands were commercial fishermen, and the parents. The woman in household 1, who was the mother of the heads of the other nine households, always instructed her children to help each other in all kinds of situations, especially when one of the children's families had problems. It was in this spirit that each year she directed one or several of her children who fished commercially to give salmon products to those family members who were unable to harvest subsistence salmon. For example, in 1981 the son in household 2 got married. He had no smokehouse and could not afford fishing equipment. He had to build a small house and had no job. He and his wife lived temporarily in his parent's old house. His mother encouraged him to fish with his brothers and she also asked her son in household 9 to help him catch subsistence fish. During the 1981 season household 9 shared its smokehouse with the brother in household 2 and with their mother. The mother also helped her new daughter-in-law prepare fish by showing her the different methods of cutting, drying, smoking, and canning. In addition, the mother gave some of her fish to the son as did the brother-in-law in household 10.

The roles of other group members during the study period are also of interest. The two sons living at their parents' household (number 1) were very active subsistence fishermen. They not only fished for their mother and father but also for their sisters in households 6, 7, and 8. They were assisted in tending nets by their brother-in-law in household 8. Each household usually stored its own fish over winter, although households 1 and 3 stored larger quantities drawn upon by other households members.

In addition the utilization of fishing sites is of interest. The fishermen in households 1, 9, and 10 utilized their commercial set net sites for catching red salmon for subsistence use. Each fisherman used an additional different location for catching king salmon. The site traditionally fished for kings by the eldest man in household 1 was used almost continuously by his sons to catch kings. This site was one of a few very productive king sites. A few other unrelated people also fished that site, simply by asking permission of the elder man.

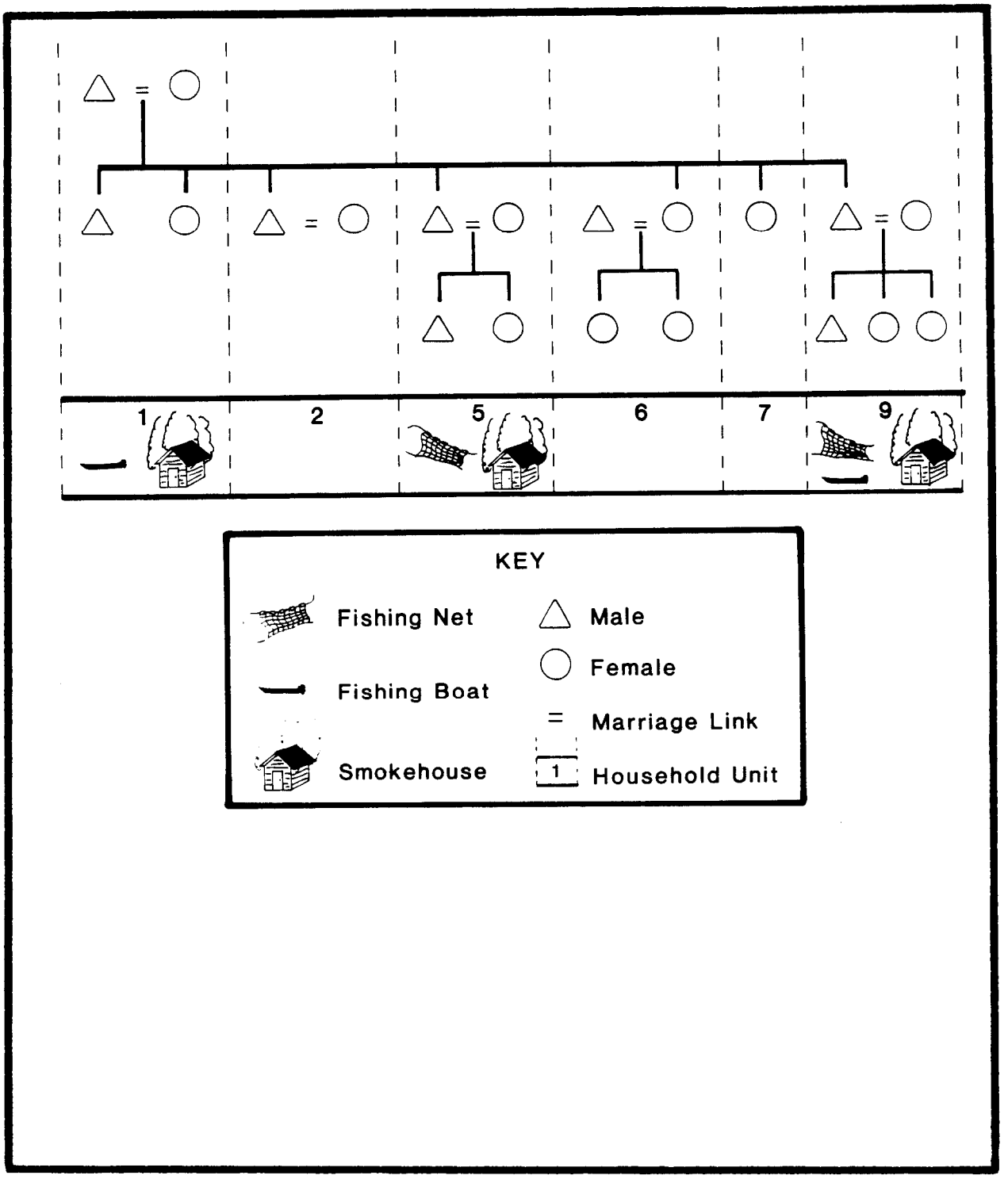

Figure 29. An example of a subunit of the larger extended family unit depicted in Figure 28 which sometimes fishes and shares salmon products seperately from other extended family members.

Case 2

This second example was composed of a group of five households (Fig. 30), three of which were related (households 3, 4, and 5) and two of which were not linked by kinship to the other members.

A distinguishing characteristic of this group was the leadership role played by the male head of household number 2. He was the lead fisherman for the group. He was also a successful big game and marine mammal hunter. He owned the equipment for fishing but no smokehouse. Because he was a successful fisherman, he was able to assist the four other small households in catching the fish they required.

Each year the fisherman in household 2, with the assistance of the two unrelated men in household 3, prepared the fishing equipment. These same two men had always worked in the cannery and did not own a boat, motor, or fishing nets. During each subsistence fishing period, two or three of the men went together to check the net. Depending on the number of fish caught each day, the catch was divided equally among the five households. Each household cut their own fish, preparing it for drying and smoking in the smokehouse of household 3. The elderly woman in household 1 usually prepared pickled fish for household 2. She also prepared meals for other group members. The widowed woman in household 4 also prepared meals and salmon products for her brother in household 3 and for members of household 2. In addition, she cared for her aging mother in household 5.

In the fall the men in households 2 and 3 went fishing for silvers with rod and reel at the head of Port Graham Bay. Again they shared the catch with other group members. They also fished with rod and reel for Dolly Varden and trout in the Port Graham River. This was often done in the fall while scouting for black bear and moose.

Case 3

This case includes eight households which did their subsistence fishing activities such as catching salmon, cleaning, cutting, and preservation as two separate units A and B (Fig. 31). Occasionally, the two units joined together to form one larger unit during social functions such as entertainment. While the members within each unit are related, the only kinship relation between the two units is that the male household head in A-3 is a "distant cousin" of the female in B-1.

Social relations between the two groups are based on the working partnerships which annually exist between unit members. For example, because the male members of households

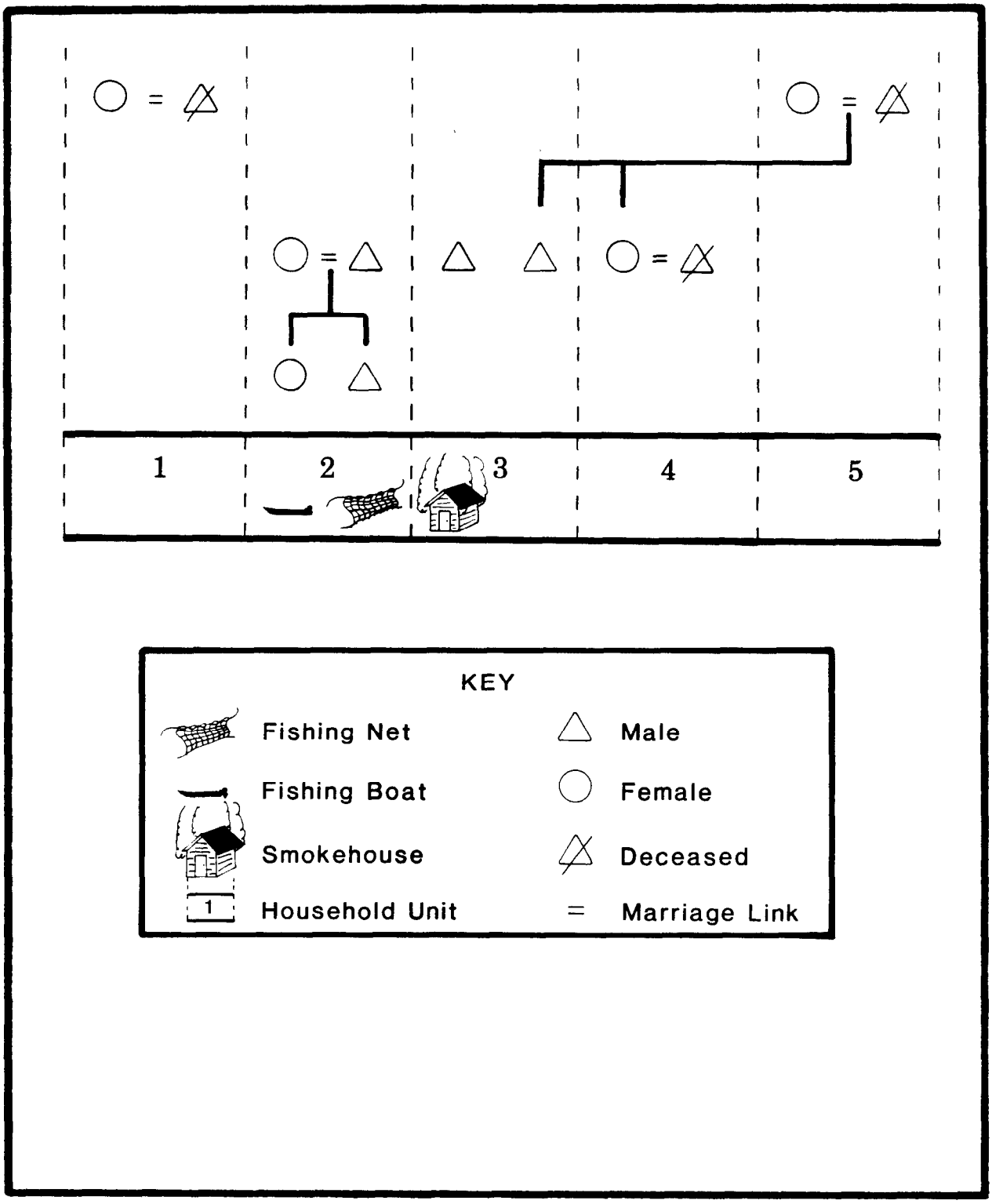

Figure 30. A small group of unrelated households which shared labor, equipment, and salmon products in 1981. The group was established in order to have the labor and equipment to accomplish fishing tasks.

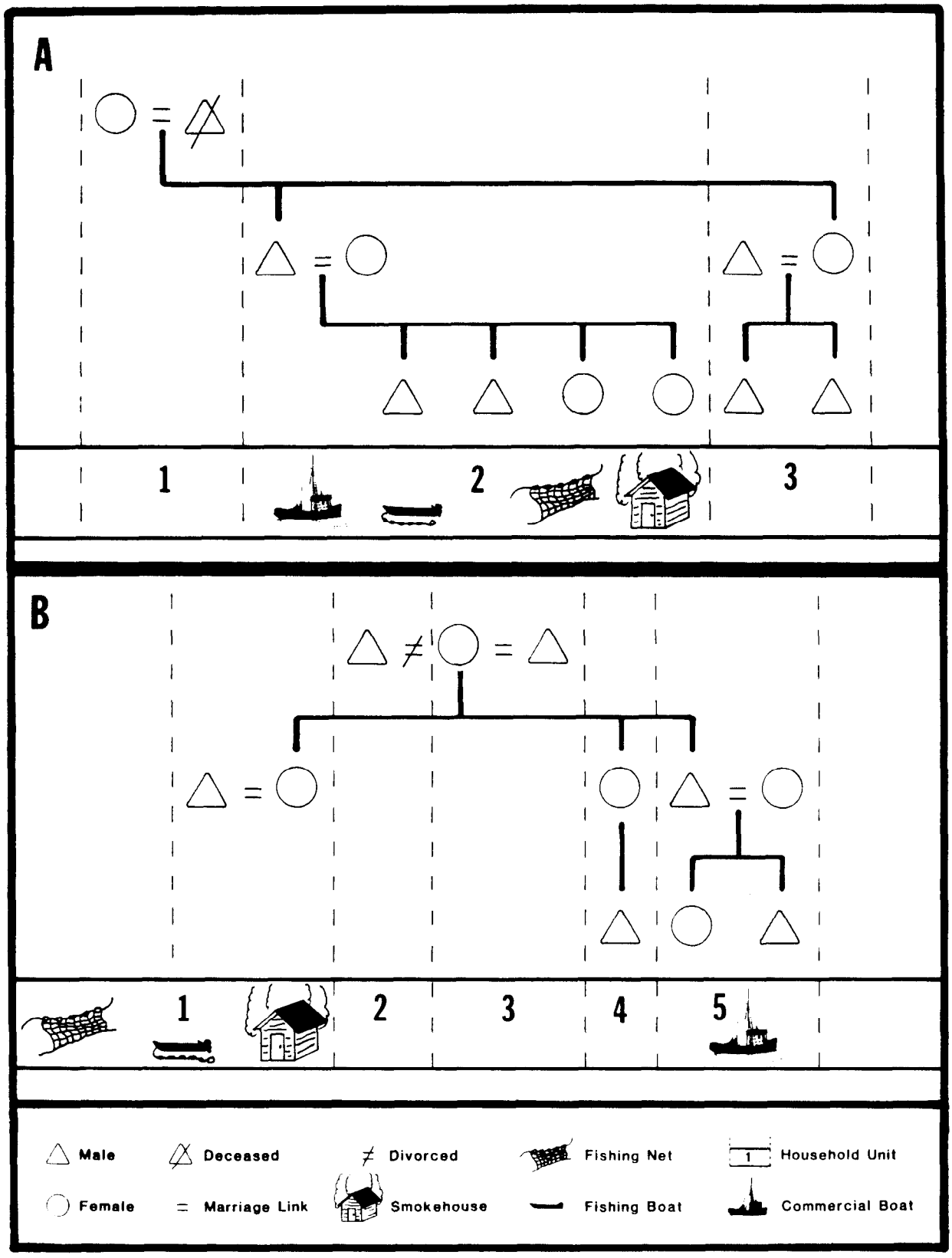

Figure 31. Two salmon fishing groups which consolidate during social and work activities.

A-2, B-2, and B-3 work together as crew members on the seine boats of households A-2 or B-5, they occasionally get together for playing cards, watching television, taking saunas, or sharing meals. During these social functions, unit members share salmon products.

As mentioned, for the harvest and processing of salmon, the two units operate independently. In unit A salmon harvesting for was done by the father, two sons, and one daughter in household A-2. In recent years, this daughter and her brothers were old enough (high school age) to do the fishing together without the help of their father. Usually a net was set and tended throughout the season. They were able to catch enough fish to meet the requirements of all three households. The catch was brought back to the cutting facility and smokehouse of household A-2, where family members gathered to process the fish. Usually the mother and her children did the processing, except in a few instances where the mother was busy at her part-time job at which time the father cut the fish.

The members of unit B operated differently from unit A in their subsistence fishing activities. The male in household 1 preferred catching all the salmon required by his unit in a short time. Usually he waited until the fish were running at peak levels and then set a net. In two or three days he would catch all the fish required. Processing then took place for one or two days. All the unit participated in cutting, brining, salting, and hanging salmon products in the smokehouse. Each household processed whatever amounts they required. The mother in household 3 took the lead in processing salmon by deciding how much was cut into various products. The two elderly males in households 2 and 3 did not actively participate in fishing or cutting because of their old age, but they were usually present during processing activities.

Fishing Methods

Subsistence nets were set along the rocky shoreline areas located from several hundred yards to 3 miles from each village. Nets were set far enough offshore so as not to go dry at low tidal periods. Nets were anchored at both ends in one of two ways. In the first method, one end was tied to a rock or other object onshore. In the second method, both ends were anchored to heavy weights in deep water. A large buoy was

attached at either end, and a series of floats, either standard commercial net floats or empty plastic bottles were tied along the top of the net. A lead-line was attached to the bottom edge of the net to keep the net as vertical as possible in the water (Fig. 32).

Generally, subsistence nets were checked and picked once in the early morning and again in the evening, or whenever during the day a fisherman got time away from other work activities. If his daily routine was flexible, nets were tended just before high, slack tide. While tending nets, a fisherman picked whatever fish were caught and cleaned out any debris such as kelp, seaweed or sticks which became entangled. If seals or sea otters had been a problem, nets were pulled and holes mended.

Fishermen usually used less than the allowable 35 fathoms of gear for subsistence salmon fishing. A smaller amount of gear was more manageable and generally caught fewer fish at one time. Too many fish were difficult to process or were more than a drying rack or smokehouse could hold. Generally, harvesting of the amount of salmon needed was extended out over the entire season.

Although no subsistence fishing sites were legally owned by individuals, certain long-time fishermen who had used some sites repeatedly during their life-time had an unwritten claim to those sites. After these people completed their subsistence fishing, they commonly let others fish the site. Commercial set netters usually used the same sites for subsistence that they fished commercially.

Even though the entire shoreline in the vicinity of both communities was open to set netting, not all sites along the shoreline could be productively fished. Much of the shoreline was too rocky, shallow,

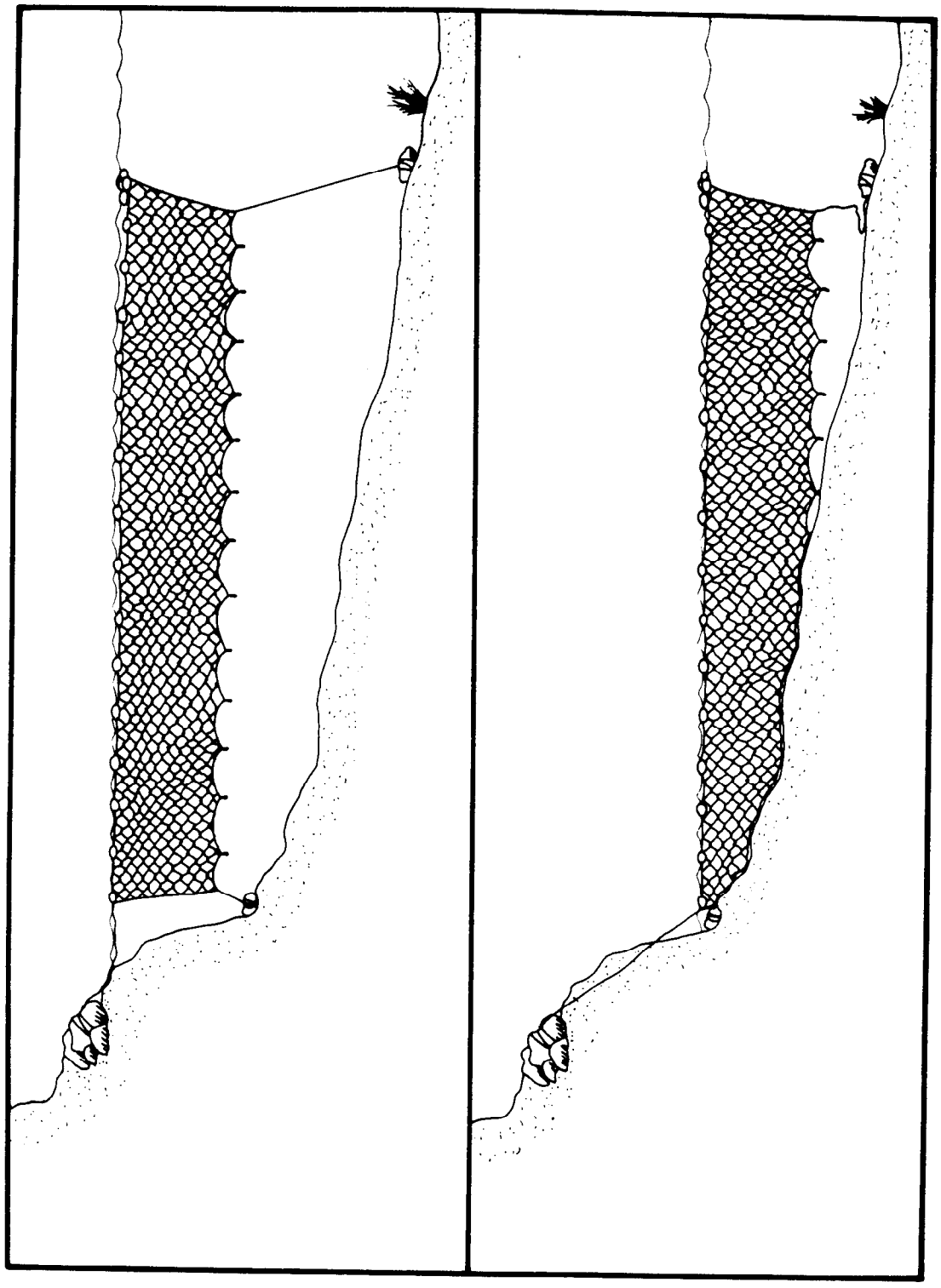

Figure 32. The tvpical method of setting a subsistence set net. It is set a'ong rocky shorelines and does not go dry at low tide.

or had rapid tidal rips. Some sites produced more fish than other sites. The best fishing sites were in high demand and were often fished by a succession of fishermen throughout the season.

Preservation and Food Preparation

After harvest, salmon were preserved in several ways for a variety of products. The most common preservation methods were air-drying and a combination of drying and smoking. If the fish was to be dried it was either fully dried into tamuuq, or half-dried into uumatak. To make either product, the head and gills were removed just in front of the collarbone, and the fish was gutted. The body was then split on each side of the backbone, which was removed, and the two fillets left attached to each other at the tail. Knife slits were made in the flesh about one inch apart across the fillet and the flesh remained attached to the skin. Each pair of fillets was then hung on drying racks (Fig. 33). Backbones were also slit between every fourth bone and hung to dry, resulting in a product called ataneq. The meat was later picked off the bones and eaten, or the bone cooked in soups.

Uumatak generally required 3-5 days to dry depending upon the weather. It was stored in boxes or plastic bags and kept fresh and free of mold by freezing in a freezer. It was often prepared baked or boiled in soups. Tamuuq, on the other hand, was dried until quite hard. It was stored in boxes in a cool dry place, and was eaten by breaking off pieces of flesh and dipping them in seal or Wesson oil.

Another favored method of preservation was smoking. Salmon were cut the same way as when making tamuuq but the fillets were placed in a brine with brown sugar and soaked for 20-30 minutes. They were then

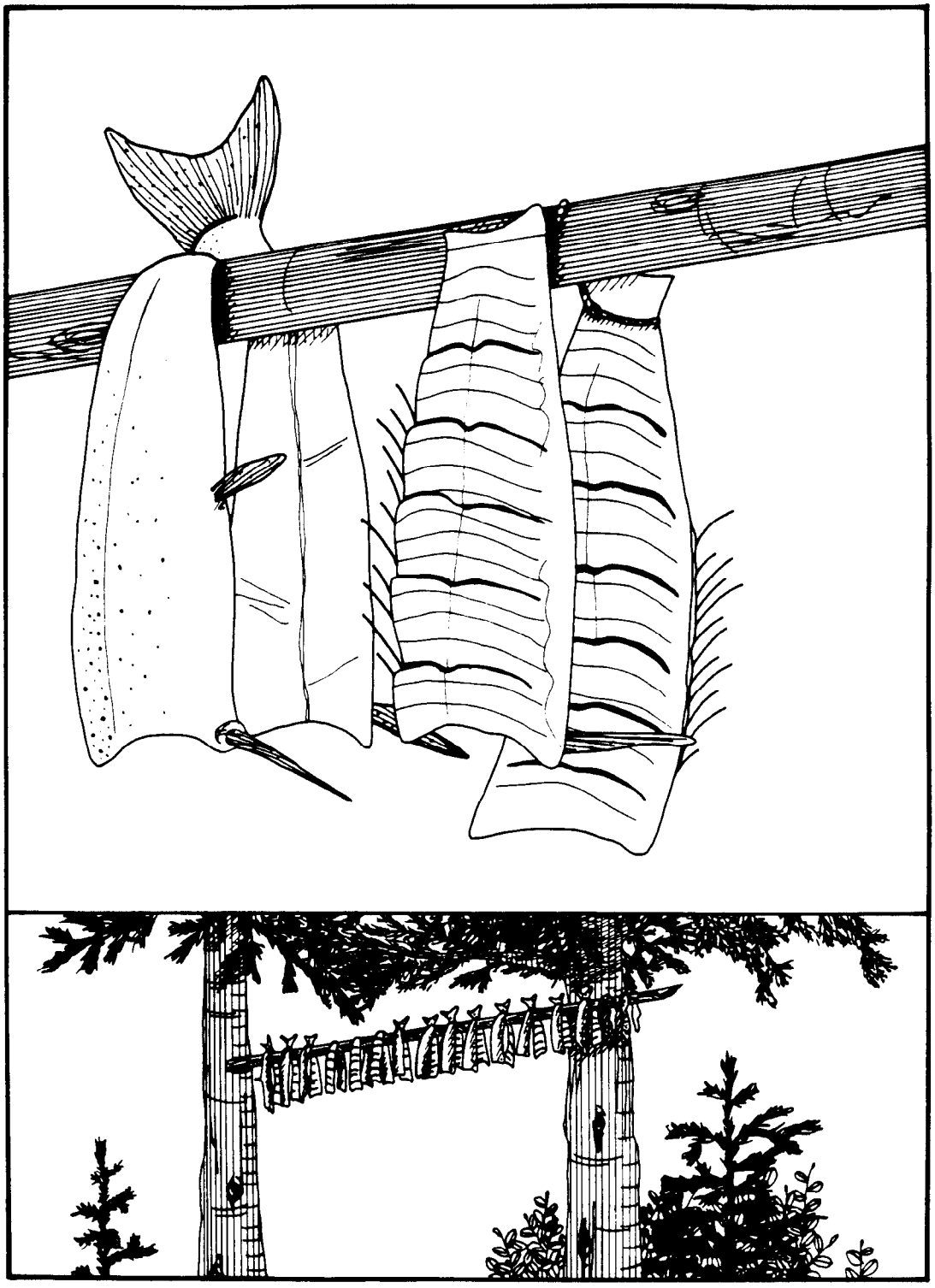

Figure 33. Two methods of cutting salmon for air drying (A). Cut salmon are usually hung in open air on poles or racks in trees (B).

removed, rinsed in fresh water, and hung overnight to drip dry. The fillets were also cut into strips from one-half to one and one-half inches wide. Two strips were tied together at one end and hung over racks in the smokehouse. Smoking was done by burning cottonwood or alder in a slow smoldering fire to produce a cold smoke. The resulting product was called palik and was eaten cold or heated. It generally required 5-10 days to cure, depending upon weather conditions, thickness of the flesh, and tastes of household members.

Salting was another method of preserving fish. Saltfish was made by cutting fillets of king or red salmon into large chunks and layering them with salt in plastic buckets or wooden kegs. Called sulunaq, it was used mostly in making fish pie, piruk. Before cooking, the salty flesh was removed from the salt brine and soaked for several hours in fresh water. The flesh was then broken into chunks, mixed with vegetables and boiled rice, and cooked in a dough crust. Sulunaq was also mixed with pickling spices and made into pickled fish.

Salmon heads were usually smoked, salted, or dried, and eaten in soups or chowders. The teeth were first cut off the fresh heads and the gills removed. Small heads of red salmon were cut about half way through from the underside to enhance drying. King salmon heads were slit several times. The tails and fins were usually used in soups or chowders. These parts were not generally removed before the fish was cut up, but they remained attached to whatever product was prepared.

In addition to the ways fish flesh was used, other parts of the fish were prepared for eating in several ways. Especially from king salmon, the hearts and stomach were cooked or fried with vegetables and mixed with a gravy and eaten over rice. Stomachs were cleaned and

soaked for a day or more and later fried or cooked in soups. Fish eggs were used in several ways. Skeins of eggs removed from fish were boiled or fried. Eggs removed from the interstitial membrane were sometimes fermented in a jar and called qayurkaq. In former times people made fermented eggs called piinaq, and also fish flesh fermented underground called cin'aq. Fish eggs were also stripped out of spawning fish in the streams and lakes. These eggs were lightly salted, mixed with soy sauce, chopped onions or goose tongue, and eaten either alone or as a side dish at meals.

Each species of salmon was preferred for making one or more particular products. King and red salmon, which were the first to arrive in the spring, were preferred for making strips and salt-fish. Some reds were made into half dried fish. Pink salmon, which were abundant in July and August, were almost always prepared as tamuuq. Red salmon which had been in the streams or lakes for some time (narilngaataq), were preferred for making dryfish because they dried quicker then fresh sea-run fish. This was important in the late summer when flies and rainy weather made drying difficult. Even male humpies which had been in the stream were highly desired by many older people. The cartilage and fatty tissue in the hump were cut out and eaten raw, with oil, or boiled in a soup. Both chum and silver salmon were preferred eaten fresh and the fillets prepared by frying. Silvers especially were often frozen whole. They were also cut into strips and smoked if weather conditions were favorable.

Harvest Quantities

Salmon harvest data for 1981, 1982, and 1983 are presented in Tables 15 and 16. Discussions of salmon harvests were presented in Stanek (1981, 1982). Of the three years only two, 1981 and 1982, are representative estimates of the total quantities harvested for home use. Harvest calendars for 1983 recorded only those salmon harvested in subsistence set nets and did not include salmon taken by hook and line or from commercial nets during June, July, and August.

Harvests of subsistence salmon in English Bay increased by 233 percent from 1981 to 1982, largely as a result of the strong runs of pink and silver salmon in July and August. In contrast, total harvests by Port Graham residents dropped by 16 percent from 1981 to 1982. This drop may have been due in part to the absence of several highly productive fishermen who were working on housing projects, or a lower number of red salmon in the 1982 run. When compared with 1981, the harvest at Port Graham in 1982 was characterized by relatively stable numbers of chinook, coho, and chum salmon. The two years differed, however, in that 1982 produced one-half as many sockeye and three times as many pinks. Mean household harvests (Table 17) were higher in English Bay than Port Graham over the three year period.

General trends in harvests (Fig. 34) are indicative of the patterns of harvest activities followed by both communities. In Port Graham, commercial set gill net and seine fishermen attempted to complete their subsistence harvests early in the season, usually by June. From July through September, a portion of the fishermen dropped out of the subsistence set net fishery or decreased their effort because of their

TABLE 15. ESTIMATED SALMON HARVESTS FOR DOMESTIC USE AT PORT GRAHAM, ALASKA 1979-1983

YEAR/MONTH	CHINOOK	SOCKEYE	COHO	PINK	CHUM	SUBTOTAL	CALENDARS	HARVEST DAYS
1979*								
Total Est.	222	777	506	1,170	494	3,249	-	-
							Returned/Issued	
1981**								
May	31	543	-	-	-	574	39/47	94
June	11	923	-	7	6	947	36/47	61
July	74	209	-	74	92	449	37/47	36
August	-	19	173	176	50	418	38/47	45
September	-	-	452	41	2	495	41/47	32
October	-	+	+	+	-	-	-	-
Totals	116	1,694	625	298	150	2,883	-	268
							Returned/Issued	
1982**								
May	32	264	-	-	3	299	36/36	46
June	34	442	1	37	31	545	37/38	107
July	28	74	4	465	68	639	38/38	63
August	4	5	209	229	76	523	34/35	73
September	-	13	294	120	15	442	28/34	59
October	-	+	+	+	-	-	-	-
Totals	98	798	508	851	193	2,448	-	-
							Issued	
1983**								
May	19	368	-	-	-	387	31	-
June	38	697	-	5	1	741	19	-
July	+	+	+	+	+	-	-	-
August	-	1	232	76	53	362	16	-
September	-	-	208	88	11	307	13	-
October	+	+	+	+	-	-	-	-
Totals	57	1,066	440	169	65	1,797	-	-

* North Pacific Rim Harvest Estimates.
** ADF&G Harvest Calendar Estimates.
\+ No Data Available; some harvest may occur by methods other than set nets.

TABLE 16. ESTIMATED SALMON HARVESTS FOR DOMESTIC USE AT ENGLISH BAY, ALASKA 1979-1983

YEAR/MONTH	CHINOOK	SOCKEYE	COHO	PINK	CHUM	SUBTOTAL	CALENDARS	HARVEST DAYS
1979*								
Total Est.	137	1,545	2,437	2,186	305	6,610	-	-
1981**								
May	1	609	-	-	-	610	25/29	76
June	10	330	-	-	-	354	22/29	61
July	10	53	1	1	5	161	22/29	27
August	3	58	99	376	14	550	23/29	92
September	-	25	214	139	-	378	20/29	61
October	-	+	+	+	-	-	-	-
Totals	24	1,075	314	621	19	2,053	-	317
1982**								
May	2	259	-	-	7	268	36/36	79
June	2	809	1	3	1	816	31/31	115
July	4	70	-	101	-	175	31/31	37
August	5	427	143	977	18	1,570	25/29	127
September	-	19	756	724	10	1,509	27/29	150
October	-	-	405†	45†	-	450†	-	-
Totals	13	1,584	1,305	1,850	36	4,788	-	508
1983**								
May	-	807	-	-	-	807	22/28	-
June	-	655	-	-	-	655	17	-
July	+	+	+	+	+	-	-	-
August	-	210	65	363	10	648	14	-
September	-	112	302	-	-	414	10	-
October	+	+	+	+	-	-	-	-
Totals	-	1,784	367	363	10	2,524	-	-

* North Pacific Rim Harvest Estimates.
** ADF&G Harvest Calendar Estimates.
† Field Observation Estimates.
\+ No Data Available; some harvest may occur by methods other than set nets.

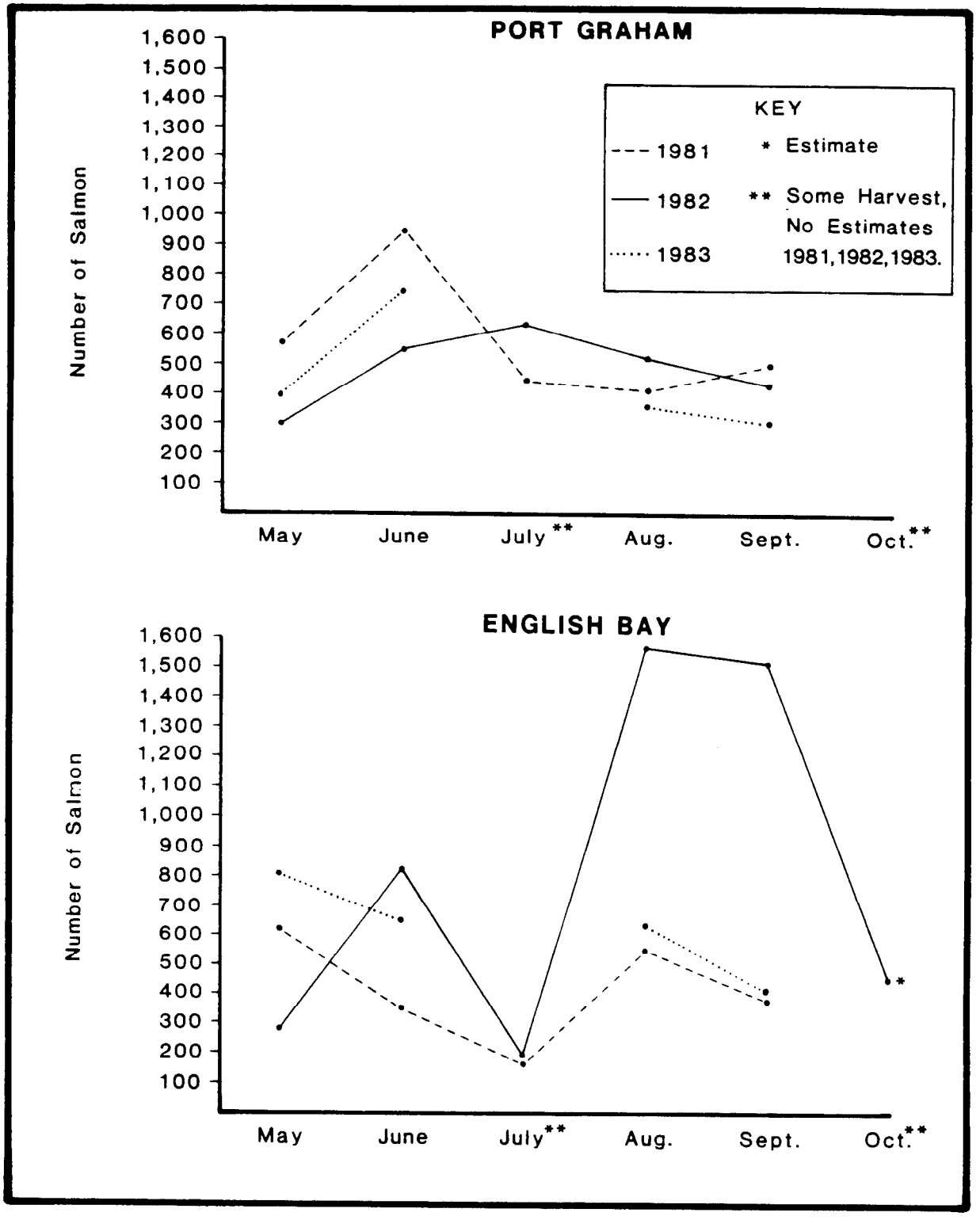

Figure 34. Monthly subsistence salmon harvests for Port Graham and English Bay, 1981-1983.

TABLE 17. MEAN SALMON HARVESTS PER HOUSEHOLD

	Port Graham			English Bay		
	1981 (n=47)	1982 (n=38)	1983 (n=37)	1981 (n=29)	1982 (n=31)	1983 (n=33)
Mean Harvest	61	64	49	71	140	62
Range	0-326	0-471	0-185	0-357	0-580	0-349

participation in the commercial fisheries. Some subsistence set gill net effort continued by a few commercial set netters, while at the same time some home use fish were taken from commercial nets and by rod and reel.

In English Bay two peaks in effort were observed. The first occurred at the beginning of the subsistence set gill net fishery, and tapered off during the height of the commercial season. The second occurred at the end of the commercial season in August and September. In part this was due to the July regulatory closure in the subsistence set net fishery. However, most fishermen were occupied with one of the two commercial fisheries.

Saltwater Fishing

This section discusses saltwater finfish fishing activities for species other than salmon. A variety of species occupied the outer Kachemak Bay area year-round, including sculpins, greenlings, lingcod, flounder, and rock fish.

Regulations

During the study period, sport fishing and subsistence fishing regulations covered the taking of fish in saltwater in Kachemak Bay, while sport fishing regulations covered the taking of rockfish and halibut in the Kachamak Bay (ADF&G 1981c:13). Under sport fish regulations, hand-held lines and reel or underwater spear were the legal means for taking saltwater fish. A valid sport fishing license was required for finfish fishing. For rockfish, which includes all species of the genus Sebastes, ten was the daily and possession limit. There was no closed season. For halibut, two was the daily bag and possession limit, and the season lasted from March 1 through October 31. No "sport caught" halibut could be possessed on any vessel which also contained fish or shellfish destined for commercial sale.

Subsistence regulations allowed the taking of halibut between March 1 and October 31 with a bag limit of two. Possessing sport and subsistence-taken halibut on the same day was prohibited. Other saltwater species were, under the General Provision 5AAC 01.005, allowed to be taken, "for subsistence purposes at any time, in any area of the state by any methods...."

Periods and Areas of Fishing Activity

Fishing for salt water species by residents of both communities took place throughout the year, but was typified by two peak periods -- one in early spring and the other in late summer and early fall. Halibut and flounder were the most actively pursued of all salt water

species; however, six other groups including sculpins, codfish, greenling, lingcod, rockfish, and herring were taken consistently. Halibut population numbers fluctuated between summer and winter months as this species moved between shallow shoreline areas and deeper waters of the outer bay. Fishing effort within the area utilized (Fig. 35) likewise fluctuated with the availability of halibut. Small numbers of people, especially from Port Graham, fished throughout the fall, winter, and spring months during good weather and smooth water conditions. As some people began catching halibut in late winter and early spring and others learned of the presence of halibut, levels of fishing effort increased.

Most bottomfish fishing took place at low, slack tide when fishing lines could be carefully controlled, and when skiffs would not drift rapidly from favored fishing sites. Herring fishing took place during a one to two week period in April or May when fish schooled along shoreline areas for spawning. Usually, three to four nets were set in locations where herring schooled and spawned.

Methods of Harvest

Fishing activity took place from small skiffs, piers, shorelines, and commercial fishing boats. Gear for all species mentioned above included hand lines and rods and reels equipped with hooks of various sizes. The method used almost exclusively for manipulating fishing gear was jigging; seldom was casting or trolling utilized. A variety of artificial lures and preserved baits were used to attract fish. Most common were halibut hooks dressed with salted herring or fish eggs.

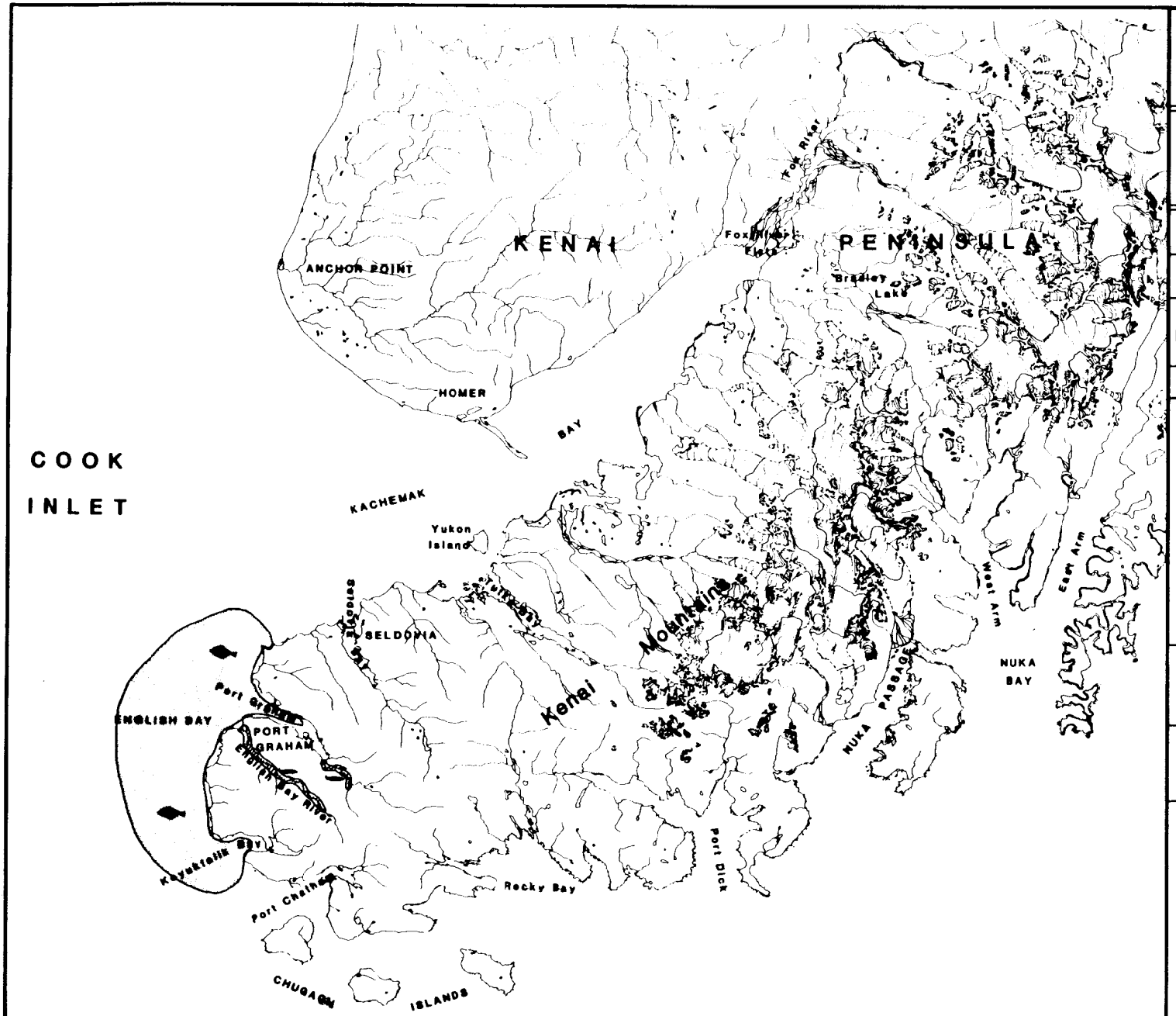

Figure 35. Freshwater and marine fishing areas utilized by Port Graham and English Bay residents 1960 to present.

This map was compiled in 1982 from a sample of 5 key informant households. It was later subjected to community-wide review and represents areas used by English Bay and Port Graham between 1972 and 1982. Use areas change through time and are not fixed entities; therefore, these maps may be a partial representation of use areas. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.

ALASKA DEPARTMENT OF FISH AND GAME

SUBSISTENCE RESOURCE HARVEST AREA MAP

QUAD NAME Seldovia

SCALE 0 5 10 15 miles

TITLE English Bay, Port Graham Harvest Areas for Freshwater Fish, and Marine Fish

LEGEND

RESOURCE	SYMBOL
Freshwater Fish	
Marine Fish	

SOURCES
English Bay, Port Graham Residents

PREPARED BY	DATE
Ronald Stanek Dan Foster	7/3/84

DIVISION OF SUBSISTENCE

Some fishermen had their own special recipes of preserved bait, and others used special lures which they found successful.

Although they were sometimes caught on small hooks and lines, herring were most commonly caught in set gill nets or seines. In 1982, a good run of herring in Port Graham Bay was fished with set gill nets.

Tomcod were caught by jigging through the ice in lagoons and stream mouths. Although they were also caught in shoreline marine waters, the largest quantities were caught during winter as the fish moved into the English Bay lagoon to spawn. Large quantities of tomcod were sometimes caught in a set gill net and then distributed throughout the community or frozen for later use.

Organization of Fishing Groups

Fishermen usually went fishing in parties of two or more people whether they fished from boats, piers, or shorelines. Most fishing parties were made up of two to five people who had established partnerships either through personal friendships or family relations. This was particularly true when small skiffs were used, as five was about the maximum number any skiff could safely hold. Although fishing parties were normally composed of not more than five people, these same people were usually members of the larger subsistence salmon groups described earlier, and upon which members could draw when looking for fishing partners.

Based soley on observational data, there appeared three types of structures in the composition of fishing groups for saltwater species. These were: (1) mixed age single family groups composed of adults and

their young children; (2) single age, single sex groups, common among middle-aged men or women; (3) mixed age, mixed sex groups usually composed of a young male accompanying older female partners.

Harvest Levels and Use

Estimated quantities of salt water finfish harvested by both communities are presented in Table 18. These estimates are based on harvest calendar reports, and vary significantly from year to year. Significant quantitative differences occurred between the two communities, and this is indicative of the varying ability of the two communities to participate in saltwater fisheries. English Bay's lower harvest levels are a result of the fewer numbers of skiffs and motors and more difficult access to fishing areas.

Table 18. REPORTED QUANTITIES OF SALTWATER FINFISH FOR PORT GRAHAM AND ENGLISH BAY MAY 1981 THROUGH APRIL 1982

	Port Graham			English Bay		
	1981	1982		1981	1982	
	May-Dec.	Jan.-Apr.	Total	May-Dec.	Jan.-Apr.	Total
Halibut	132	102	234	34	19	53
Flounder	72	10	82	8	41	49
Sculpin	9	5	14	6	56	62
Rockfish	154	106	260	48	0	48
Lingcod	18	0	18	0	0	0
Greenling	37	18	55	0	0	0
Herring	1,165	683	1,848	0	0	0

Salt water finfish were preserved in a variety of ways depending upon the size of the fish, its intended use, and the season of harvest. Generally, large halibut caught in the spring were filleted into one inch by one inch strips. Strips were cut so the flesh was left on the skin. Two strips were tied to end-to-end and hung on a rack either in the open air or in a screened drying house. Halibut strips were also lightly smoked to add flavor. Parts of the fish like the tail, head, and fins were made into soups and chowders. Dried and smoked halibut strips were packaged and, like salmon strips, stored in freezers or in boxes, and placed in cool dry places. Halibut strips were a favorite food, eaten as snacks or as part of a meal. They were usually eaten dipped in seal oil or Wesson oil to which soy sauce was added for flavoring.

Small halibut and flounder were usually cut up and eaten fresh or stored whole in a freezer. One of the most favored ways of eating fresh halibut was to fry it in butter or oil with a batter coating, or to deep fat cook it. A few people liked to eat halibut raw, sliced very thin and dipped in soy sauce. Halibut was also cut into chunks and cooked in soups and chowders.

Freshwater Fishing

This section discusses the harvest and use of freshwater finfish including rainbow trout and Dolly Varden. Historically, rainbow trout and Dolly Varden were harvested in freshwaters with the use of traps, spears, and a variety of hooks. During pre-statehood times, the federal government paid a bounty for the tails of Dolly Varden and many people

took advantage of this source of supplemental cash. Bounty systems have since been abolished.

Regulations

Sport fishing regulations (ADF&G 1981c) covered all freshwater areas of the Kenai Peninsula, and allowed for an open season from January 1 through December 31. Daily bag and possession limits included ten fish in total of salmon, trout, grayling and char as long as any king salmon harvested were over 20 inches in length. On the lower Kenai Peninsula, in addition to the above bag limits, three chum, pink, red, or coho salmon in any combination greater than 10 inches and one king salmon greater than 20 inches could be included in the daily bag. Subsistence regulations prohibited the taking of trout, char, grayling, and burbot.

The vicinity of Port Graham and English Bay River drainage was closed to salmon fishing upstream from the outlet of Lower English Bay Lake. The English Bay River from its mouth including the lagoon upstream to Lower English Bay Lake, was a fly-fishing only area from June 1 through July 31.

Harvest Activities

Species other than salmon were harvested throughout the year by both communities in locations depicted in Figure 35. Dolly Varden and rainbow trout harvests occurred primarily in the spring and fall. Dolly Varden became a target species of rod and reel fishermen in the spring

while fish were in salt water shoreline areas. When Dollies entered the streams following salmon later in the season they were again fished with rod and reel.

Dolly Varden, which inhabited the English Bay lakes, were caught by hook and line along the shorelines in the fall. This was done in association with moose and bear hunting, or during visits to cabins and other property around the lakes. Dollies were caught on hook and line with spinners or salmon eggs. Sometimes Dollies were so abundant along the shorelines that almost every cast produced a fish. Fall harvests of Dolly Varden were incidental to the harvest of salmon in the streams and lakes. Their flesh, liver, and eggs were highly valued and were usually eaten fresh. Trout were usually eaten fresh, either fried or in soups. Larger size Dolly Varden were split with the backbone removed and dried.

Shellfish and Intertidal Resource Harvests

A large variety of shellfish is available in intertidal and subtidal areas throughout Kachemak Bay. Among those shellfish most common in the vicinity of the two communities are clams, including mussels and butter clams. Other species such as crab, sea cucumber, sea urchin, octopus, chiton, and snail are also present, and because of this group's mobility, their numbers fluctuate with the seasons.

Historic Use Activities

Traditionally, shellfish were considered by residents as part of a single large category of resources called uyangtaaq which collectively

includes any bottom-dwelling species (W. Meganack pers. comm., 1982). In the past, harvesting was done with spears and by hand picking, either while walking the intertidal areas during low water or in shallow waters from a kayak built specifically for this purpose. As recently as the 1950s, spearing was done from skiffs which replaced kayaks (M. Tanape pers. comm., 1982).

Regulations

During the study period, state regulations managing the local use of shellfish in the Cook Inlet area were covered under subsistence regulations during 1981 and under personal use regulations in 1982 and 1983. Only clams remained in the subsistence regulations after 1982. Shellfish could also be taken from an individual's commercial harvest for home use.

Personal use regulations (5AAC 77.500-77.530) provided seasons and bag limits which allowed for the year-round harvest of male dungeness and tanner crabs with a bag and possession limit of 20 of each species. King crab seasons were from June 1 through March 15 with a daily bag and possession limit of six crab.

For shrimp and clams there was no closed season and no bag or possession limits in the areas used by Port Graham and English Bay residents. All other shellfish were unrestricted. The only other requirement under personal use was the possession of a sport fishing license.

Under subsistence regulations clams were the only shellfish which could be taken for subsistence purposes. Only the Port Graham

sub-district was open, and only to persons domiciled in Port Graham and English Bay.

Organization of Harvest

The harvest of shellfish included about six species of clams and mussels; several snail species; two chiton species (referred to as bidarky); octopus; and dungeness, king, and tanner crab. Crab harvests were composed primarily of dungeness (Tables 19 and 20).

Harvest strategies similar to traditional practices were followed for snails, chiton, crab, mussels, and octopus during the study period. Intertidal areas were searched at low tides and a variety of species collected by hand or with the aid of sticks, knives, or shovels. Occasionally pots were set for crab and shrimp. Usually harvesting was done daily in local intertidal areas. Individual daily household harvests were relatively small. An example of one day's harvest might include a half-gallon of snails, 2 to 3 dungeness crab, 10 to 20 chiton, and an octopus. During the 16-month study period, the total reported harvest for both communities included 726 pounds of chiton, more than 100 pounds of snails, 15 octopus, and 454 dungeness crab. In instances where large numbers of crab were caught in pots, they were shared among households, as they were preferred eaten fresh.

Clams and cockles were sometimes collected in the same manner as chiton and snails, but normally were sought on special clamming trips made during minus tidal periods. Clams were collected in five-gallon buckets, brought back to the villages, and part of the harvest distributed to those households unable to make the trip. Sea cucumbers were

TABLE 19. SHELLFISH HARVESTS FOR PORT GRAHAM, ALASKA MAY 1981 - APRIL 1982*

RESOURCE	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	Total
Butter Clams and Cockles	279	28	-	45	-	700	-	-	-	-	85	1,038	2,175
Horseneck Clams	25	-	-	-	-	-	-	-	-	-	-	18	43
Horseneck Clams (Pounds) and Mussels	5#	-	-	-	45	64&6#	-	-	-	-	-	-	109&11#
Snails (Pounds)	31	5	-	-	-	-	-	-	-	-	-	11	47#
Chiton (Pounds)	55	12	-	-	2	55	30	30	10	72	68	38	372#
Dungeness Crab	17	54	49	43	103	20	-	-	34	-	6	13	339
Tanner Crab	-	-	-	-	-	5	33	-	-	-	-	-	38
Octopus	1	1	2	-	3	3	-	-	-	3	-	-	13
Shrimp (Pounds)	75	-	75	-	-	-	-	-	-	-	-	-	150

* = Quantities in Numbers or Pounds
# = Pounds
- = No reported harvest

TABLE 20. SHELLFISH HARVESTS FOR ENGLISH BAY, ALASKA MAY 1981 - APRIL 1982*

RESOURCE	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	Total
Razor Clam	-	105	-	10	-	-	-	-	115	-	-	-	230
Butter Clam and Cockle	111	25	-	-	-	232	-	-	156	-	-	793	1,317
Chiton (Pounds)	2.5	12.5	30	30	-	17.5	10	-	102.5	-	17	-	222#
Snails and Mussels	21	6	-	-	-	-	-	-	33	-	-	-	60
Dungeness	8	22	40	22	5	-	-	-	99	-	-	-	196
Tanner and King Crab	-	-	-	4	-	-	-	-	9	-	-	-	13

* = Quantities in Numbers or Pounds
# = Pounds
- = No reported harvest

sometimes taken incidentally when they were found. The total harvest of clams for all species (mostly butter clams) was 3,700.

General locations of shellfish harvest in the vicinity of Port Graham and English Bay are depicted in Figure 36. Distant areas such as McDonald Spit and Tutka Lagoon were also used, but the majority of harvest activity took place locally.

Most shellfish were eaten fresh; they were also fried, boiled, or prepared in chowders. Large harvests of clams were frozen unless they were distributed to other community members. Snails were boiled, the meat picked out of the shells, and eaten as a snack food. Chiton was boiled and prepared in a number of dishes including salads, chowders, and pickled. Kvasnikof (1981a) provides several chiton recipes.

The harvest of intertidal species was important not only for the food produced but also as a social activity, especially for older people unable to participate in more strenuous and dangerous harvest activities. It was an opportunity to be outdoors, and it also allowed older people to teach their children and grandchildren how to use local resources. Field observations in both communities found chiton and clams occurring as food items in over half the households following suitable low tides. The harvest of these resources was often discussed by residents in social settings and was of particular interest to the older people. Most intertidal resources were highly valued food products in both communities. Searching for chiton with the aide of a lantern during nighttime low tidal periods in late fall and winter was a common practice among experienced people. Summer months found many residents searching areas abundant with chiton and other intertidal species during the long daylight periods.

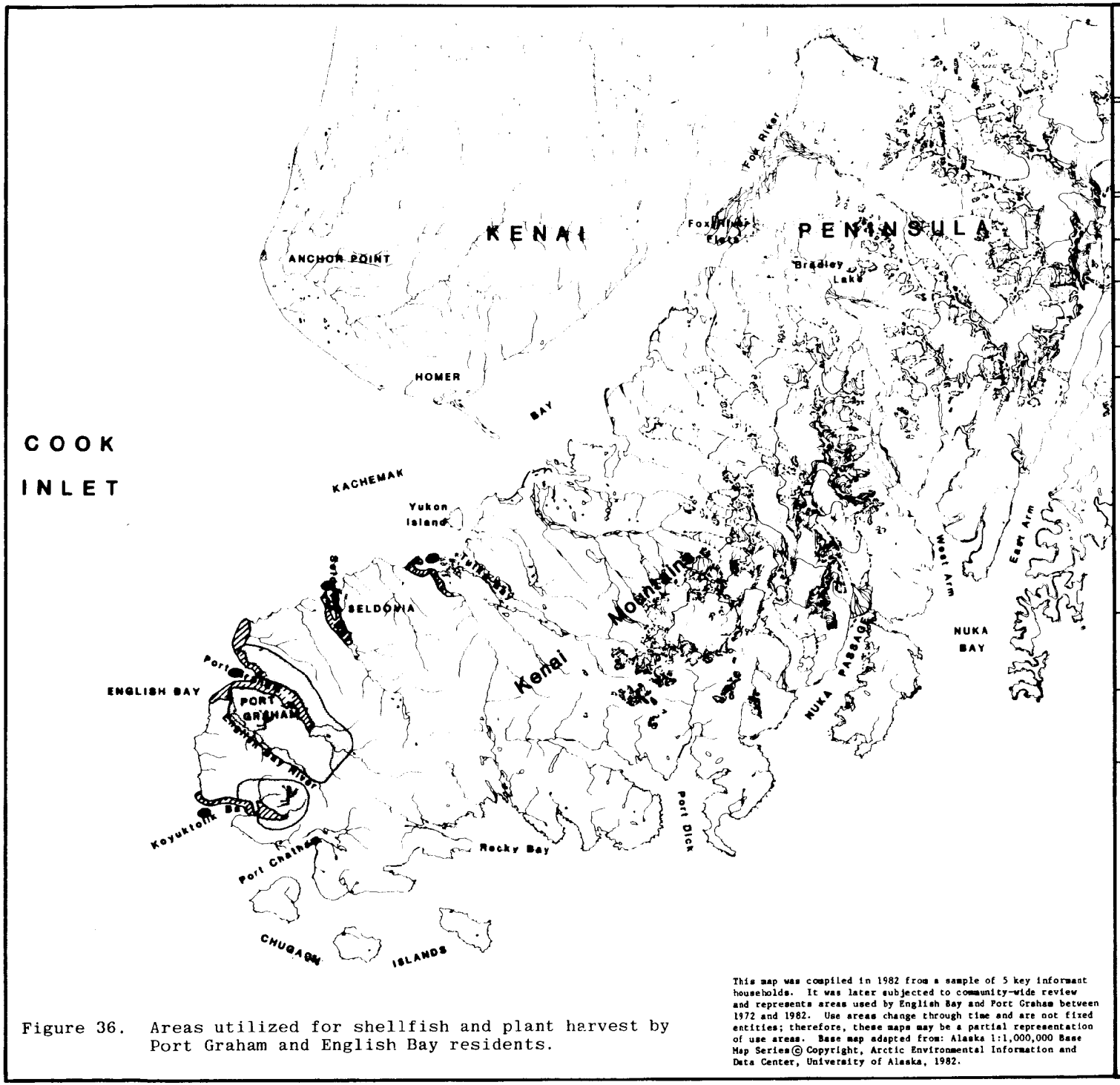

Figure 36. Areas utilized for shellfish and plant harvest by Port Graham and English Bay residents.

This map was compiled in 1982 from a sample of 5 key informant households. It was later subjected to community-wide review and represents areas used by English Bay and Port Graham between 1972 and 1982. Use areas change through time and are not fixed entities; therefore, these maps may be a partial representation of use areas. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.

ALASKA DEPARTMENT OF FISH AND GAME

SUBSISTENCE RESOURCE HARVEST AREA MAP

QUAD NAME Seldovia

SCALE 0 5 10 15 miles

TITLE English Bay, Port Graham Harvest Areas for Plants, and Shellfish

LEGEND

RESOURCE	SYMBOL
Plants	
Shellfish	

SOURCES
English Bay, Port Graham Residents

PREPARED BY	DATE
Ronald Stanek Dan Foster	7/3/84

DIVISION OF SUBSISTENCE

Most villagers observed that during the last ten years sea otters have preyed heavily on butter clams, crab, and other shellfish. Evidence of sea otter activity was visible as pock-marks and broken clam shells on beaches in Port Graham Bay. As a result of the depleted shellfish resource people travel to beaches as far away as Seldovia, Tutka Lagoon, and Kasitsna Bay.

Preservation and Use

There was very little preservation of shellfish. Freezing was used when large quantities of clams and crab were harvested, but it was the usual practice for large quantities to be distributed among relatives and friends and consumed fresh. The ready availability of most resources did not require long-term preservation and to most people fresh shellfish was a welcome change from the routine of dried finfish, especially during winter months. Although not frequently practiced, some people still smoke-dried clams and bidarkies. This was a very common practice historically, but has diminished since ice boxes and freezers have come into use.

The most common use of clams, cockles, and chiton was in chowders. They were also fried, cooked, diced, and mixed in salads, or cooked in casseroles. Rice dishes or plain rice with a gravy sauce made from chiton or clams were also quite common.

Snails, shrimp, and crab were considered as specialities, and were lightly boiled and eaten dipped in some type of sauce. Mussels, too, were eaten this way with seal oil or Wesson oil, and soy sauce or

worcestershire sauce. Shrimp were often dipped in a batter and fried in oil.

Marine Mammals

Historic Use Activities

Historically marine mammal hunting by Port Graham and English Bay hunters occurred throughout Kachemak Bay and along the Kenai Peninsula to Resurrection Bay. Hunting effort closely followed the seasonal movements of seals to feeding, resting, and pupping areas. A variety of species were hunted, including belukha and minke whales, porpoises, harbor seal, Steller sea lion, and sea otter. Middle-aged and elder male hunters described hunting activities from the 1920s to 60s, during which time a federal bounty system was in effect and seals were harvested for both commercial and subsistence use.

In the 1920s and 30s, English Bay and Port Graham hunters had traditional earthen shelters built along the shorelines and on islands all along the southern coastline of the lower Kenai Peninsula. Hunting parties spent winter months trapping furbearers and hunting seal in the Nuka Bay area. Loads of meat, oil, and hides were brought back to the villages and divided among households.

As the commercial fishing industry developed, seals and sea lions were killed for bounty because they preyed heavily on salmon. One Port Graham hunter recalled hunting seals in 1965 from a 60-foot boat in Resurrection Bay. Members of their boat shot 300 seals and sold their pelts for $30 to $41 each. The faces of seals were turned in for a

$3 bounty. They discarded most of the meat, but kept the livers and lungs because they were so highly valued by the villagers. Another elder man recalled the annual trip by his father and other hunters to Halibut Cove. Seals, sea lions, and belukha whale used to be abundant there in the spring as they came to feed on herring. Hunters stationed themselves on a point of land at the mouth of the cove. As seals drifted in on the incoming tide, hunters shot as many as possible; the tide carried dead animals into the cove. When the tide receded, dead seals could be picked up in shallow waters. Usually a large hunting camp was set up and seals were processed by cutting up and drying the meat, rendering the fat, and then hauling everything back to English Bay.

As recently as the 1950s and 60s, the Barren Islands and Kamishak Bay were hunted for seals which were used for food and commercial sale. Hunters from Port Graham and English Bay were normally in these more distant areas while they were crew members on commercial crabbing boats at which time they harvested seal for their immediate and later use.

Regulations

During the study period, Steller sea lions and harbor seals were managed by the U.S Fish and Wildlife Service under the authority of the Federal Marine Mammal Protection Act of 1976. According to the provisions of the act, only Alaska Natives could take marine mammals for subsistence purposes. No seasons, bag limits, or methods were applied to the harvest of marine mammals in Cook Inlet.

Harvest and Use Patterns

Contemporary harvests of marine mammals during the study period included two species -- Steller sea lion and harbor seal. Of all resources, harbor seal were considered the most highly valued. These sea lion and seal were taken primarily during spring and summer in association with subsistence and commercial salmon set net and seine fishing when seals preyed heavily on fish caught in nets. Fishermen frequently waited in the vicinity of their nets for seals which had been feeding on netted fish. Seal and sea lion hunting was also done by commercial seine boat fishermen when seals were in and around their nets chasing fish. Seals often got in the nets, forcing fish to sound out the bottom of the net. Large holes were sometimes ripped in the nets where the animals escaped. In addition, hunting also occurred during clamming trips, waterfowl hunts, on hunts specifically for seals, and on routine trips between communities.

When shot, seals had to be hit cleanly in the head and retrieved immediately or they sank out of reach. Gaffs and rods and reels with treble hooks were used to retrieve sinking animals.

The area hunted during the past 10 years for marine mammals was significantly smaller than the area used 20 years earlier when the Gulf of Alaska and Kamishak Bay were heavily hunted (Figs. 9 and 37). Most hunting during the study period took place in the immediate vicinity of the villages, at haul-out areas on Yukon Island and Elizabeth Island, as well as at other bays and shoreline areas throughout Kachemak Bay and around the Kenai Peninsula as far east as Port Dick.

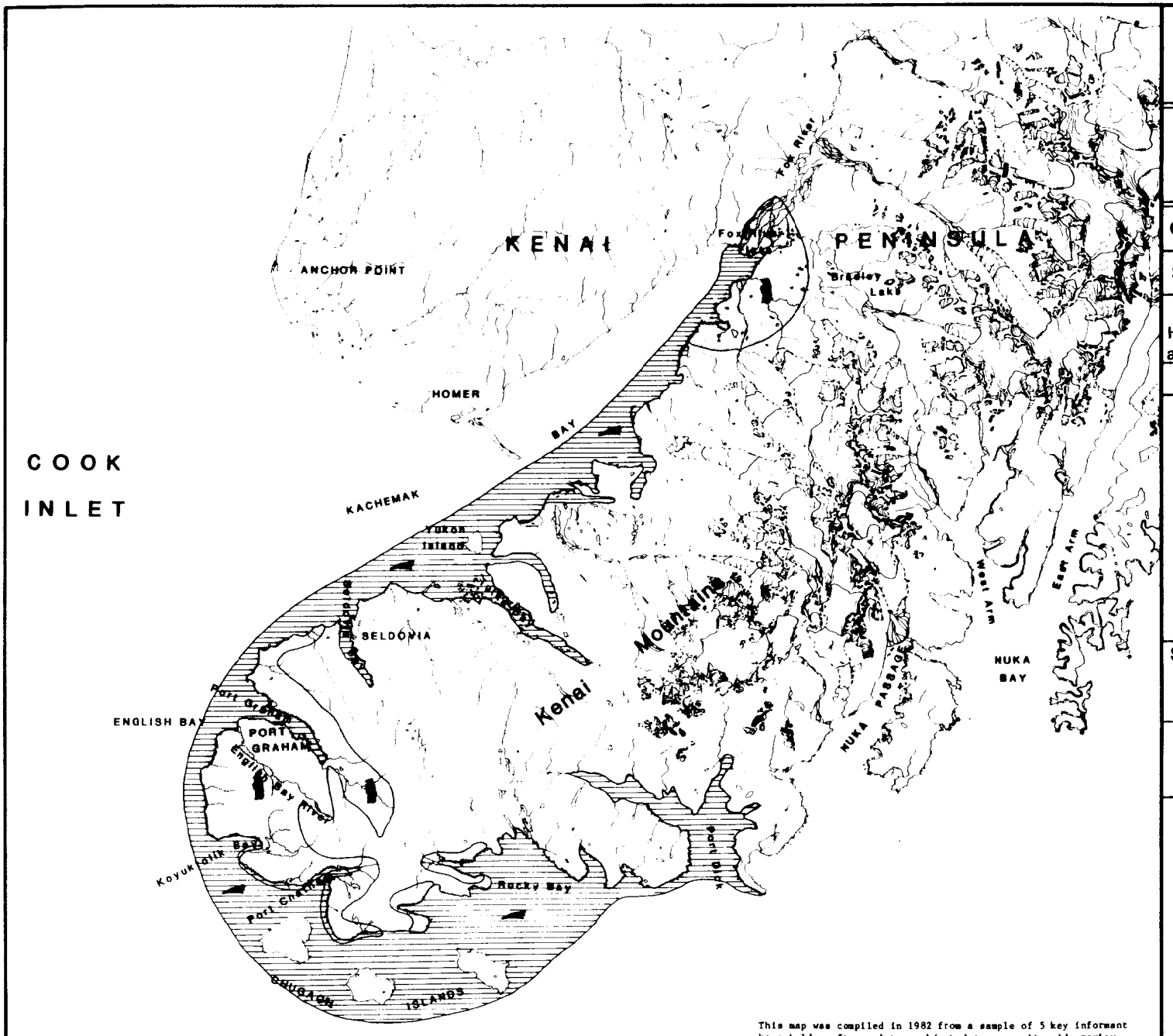

Figure 37. Areas utilized for marine mammal and black bear harvest by Port Graham and English Bay residents 1960 to present.

This map was compiled in 1982 from a sample of 5 key informant households. It was later subjected to community-wide review and represents areas used by English Bay and Port Graham between 1972 and 1982. Use areas change through time and are not fixed entities; therefore, these maps may be a partial representation of use areas. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.

ALASKA DEPARTMENT OF FISH AND GAME

SUBSISTENCE RESOURCE HARVEST AREA MAP

QUAD NAME: Seldovia

SCALE: 0 5 10 15 miles

TITLE: English Bay, Port Graham Harvest Areas for Marine Mammals, and Black Bear

LEGEND

RESOURCE	SYMBOL
Marine Mammals	
Black Bear	

SOURCES: English Bay, Port Graham Residents

PREPARED BY	DATE
Ronald Stanek Dan Foster	7/3/84

DIVISION OF SUBSISTENCE

Marine mammal harvest levels varied greatly from year to year. Approximately 30 harbor seals and 4 Steller sea lions were harvested by the two communities from May 1981 to August 1982. During the summer of 1983, 20 seals were harvested by English Bay hunters on one trip alone to Yukon Island. English Bay residents took another 25 to 30 seals and 3 sea lions throughout the rest of the 1983. Village hunters estimated that from 40 to 100 seals and 4 or 5 sea lions are harvested by both communities in most years. This variability in harvest levels was dependent largely upon the activities of the 8 to 12 hunters who actively pursued seals. In 1982 for example, during the year of new housing construction in both communities, 7 hunters were employed full-time during the peak summer and fall building periods. Seal harvests for that period were lower than would be expected if the hunters were not working.

Live weights of harbor seal in lower Cook Inlet were reported by Ken Pitcher of the Alaska Department of Fish and Game (pers. comm., 1985) to be smaller than seal in other areas, and to average about 130 pounds. The average harvested seal was estimated by village hunters to weigh 50 to 100 pounds live.

When fishermen attempted to take either seals or sea lions at their fishing nets they were indiscriminate about the size of the animal they shot. This activity was intended primarily to defend the net, though animals were retrieved whenever possible. While on hunting trips however, hunters usually tried for medium sized seals and small sea lions. Both were said to be easier to handle and to haul into a boat, and were said to taste better than older animals.

Because they were highly valued for their taste and nutritive qualities, seal meat and parts were the most widely distributed of any resource. Distribution of the meat, fat, and internal organs possibly included every household in the two communities. Examples of how two hunters distributed their kills are presented in Figures 38 and 39. In the first case from English Bay (Fig. 38), the persons receiving seal were members of 8 households with 23 people. The hunter shot a medium sized seal while he and his hunting partner (his cousin) in household 7 were on a hunting trip. The two men split the seal equally and in turn shared their portions with other relatives. Most of the fat, flippers, and lungs went to elders in households 4, 5, 6, and 8 because they always requested these parts. Elders were also knowledgeable in preparing these parts into foods, and they greatly enjoyed the taste and the custom of preparation. The two brothers of the hunter and his father were given ribs, fat, and roasts.

Figure 39 depicts another example of the distribution of seal among a kinship network in Port Graham. In this example, seal was distributed among 16 households and 45 people who lived in Port Graham, Seldovia, and English Bay. This case exemplifies the maximum observed size of a unit within which seal products were distributed. In this example, there were two hunters (households 3 and 15). Typically, when one of the hunters harvested a seal, it was distributed to three or four households in addition to his own in Figure 39. With each seal taken a sub-group of households, different from prior groups, received seal products. Seal and sea lions were butchered and utilized in the same way as described earlier. In addition, male hunters shot and field dressed the seal. They often cut it into smaller pieces for

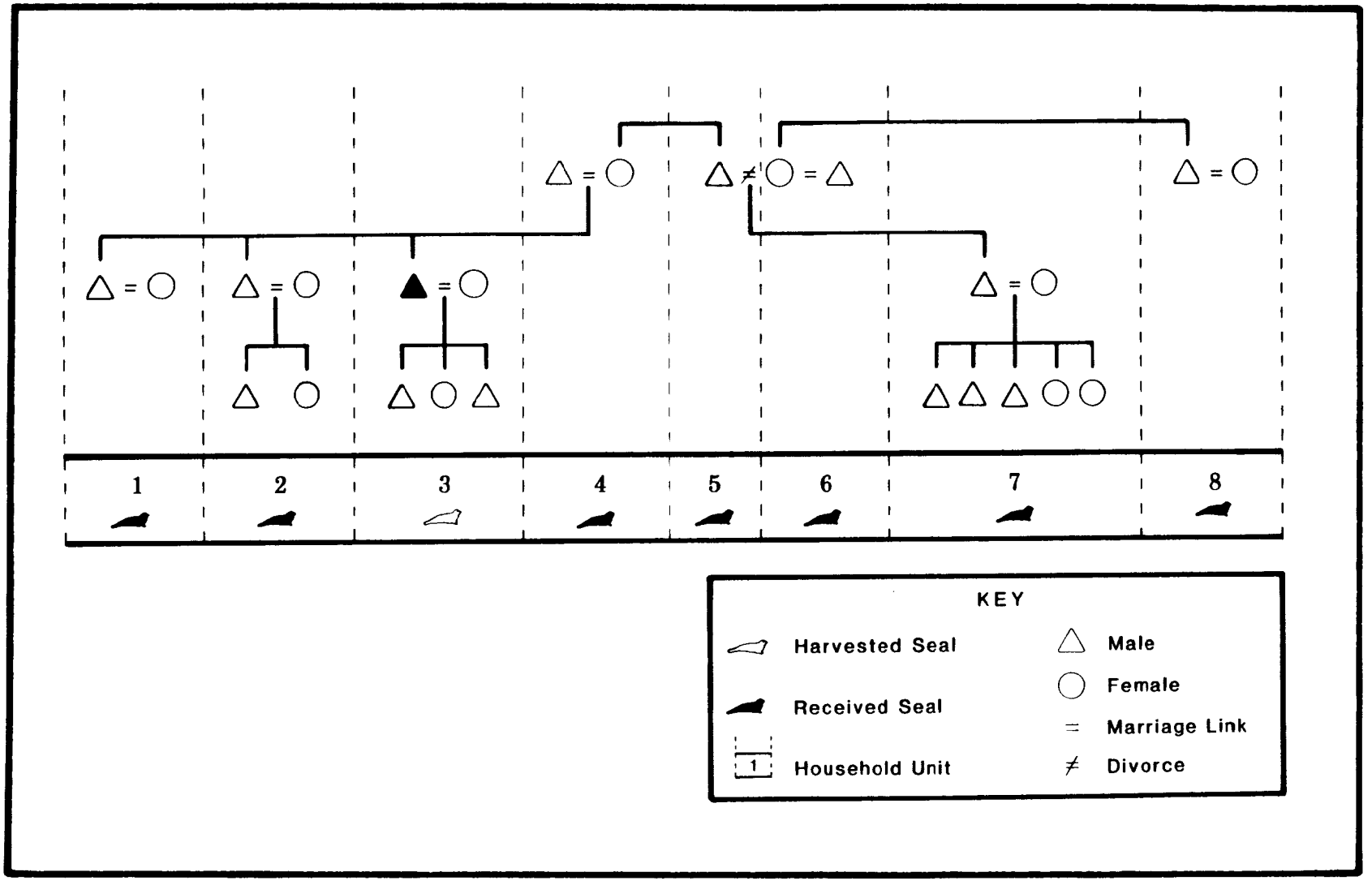

Figure 38. An example of the distribution of seal within a kinship network in English Bay.

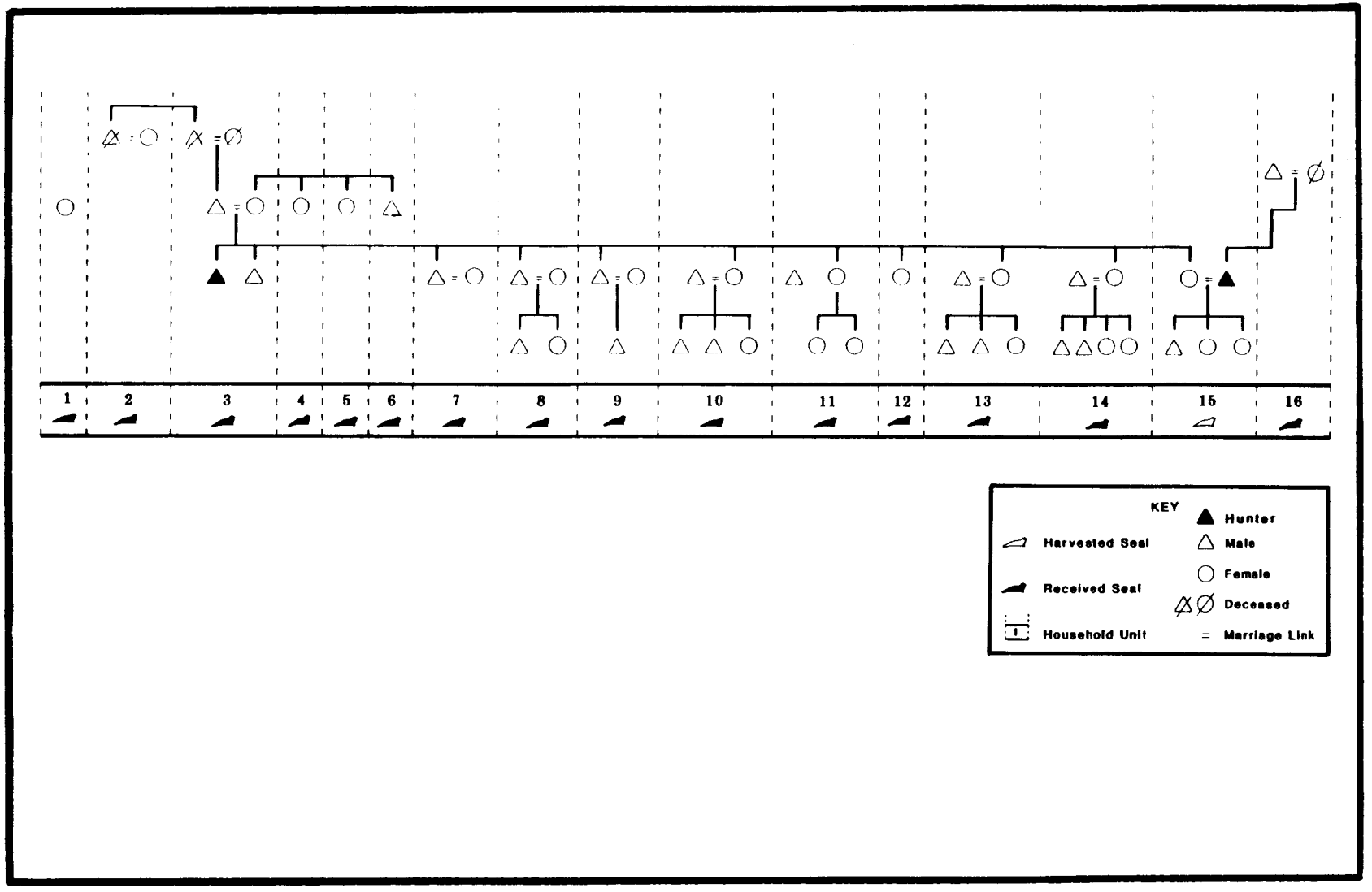

Figure 39. An example of a large, extended Port Graham family unit in which seal meat and parts were distributed. Household 16 resides in English Bay, While households 4, 5, and 6 reside in Seldovia. Household 1 has no immediate family member in the village and is provided seal by other hunters also.

seal. They often cut it into smaller pieces for distribution. Beyond this initial preparation, however, seal products were prepared by women. Sometimes the entire seal was delivered to the hunter's wife or another woman in the extended family for cutting up and distribution.

In general, the number of households receiving seal from a hunter depended upon the frequency of seal harvests and the number of people in the hunter's extended family. If a hunter had many close lineal relatives, one seal did not go very far to meet his relatives' needs. For instance, one hunter felt that the average seal was enough for his extended family of six households. In contrast, a second hunter felt that a medium-sized animal was enough for him and only two other households. The hunter in Figure 39 with so many immediate kinsman felt that he could harvest 20 seals per month and have no problem giving the meat away. Since hunting takes time, fuel, and ammunition, he usually harvested as many seals as he could while commercial fishing and minimized making special trips just for seals.

When a seal was harvested, the hunter field dressed the animal and kept the liver, heart, and other internal organs such as lungs or guts for whoever wanted them. The hunter also kept for himself whatever cuts of meat he wanted. Cutting up seals was done in much the same way as other game. Most seals were quartered and cut into sizable pieces for cooking. The hide and fat were usually removed first and then cut in pieces for distribution. Sometimes the hunter left the hide and fat attached to the meat in order to keep the fat clean.

Seal meat and fat were preserved primarily by freezing. Most people who received small portions of meat consumed them in a short time. Drying and smoking were common preservation methods in earlier

times but are used rarely today. Seal hides were not used, but were normally cut up at the time of butchering with the fat left attached. Fat was kept clean and easily divided among households in this way. Most people liked to get some fat for rendering into oil. Fat was rendered by placing it in a jar and letting it stand for several days indoors.

The fat of seals was highly valued and was used in various foods. For example, "Eskimo ice cream," akutaq was made from mashed potatoes, fermented fish eggs, and seal oil. Seal meat was usually cooked as roasts, fried, or made into stews. The internal organs were prepared into several traditional dishes. Lungs were stuffed with pieces of fat, meat, and vegetables and then baked. The liver, kidneys, and heart normally were given to the hunter's family, and were the most highly valued parts. Flippers were usually given to older people who had the time and knowledge for their preparation, a lengthy process of singing and scraping the hair and skin and then baking.

Moose

Small numbers of moose are found in the Port Graham and English Bay River valleys. Larger numbers are found 30 to 40 miles east of the villages along the north shore of Kachemak Bay and at the head of the bay in the vicinity of the Fox River Flats.

Regulations

During the study period, moose season in GMU 15C lasted from September 1 through September 20. One bull moose per hunter was the bag limit.

Historical Use Activities

Historically, villagers made annual trips to the north shore of Kachemak Bay for moose, bear, and furbearers, and to the head of the bay for moose, bear, sheep, waterfowl, and seals. Increasing human populations and changing land ownership have precluded most use of distant areas today.

Harvest and Use Patterns

During the study period, occasional moose hunting trips were made to the Fox River Flats and Bradley River areas. The timing and duration of seasons were said to make distant trips more difficult than in earlier times. Therefore, most moose hunting effort took place in the vicinity of the two villages (Fig. 40).

Although there were few moose in the vicinity of English Bay and Port Graham, one to three moose were harvested annually by each community. In the fall of 1982, one English Bay hunter shot a moose. Another moose was salvaged after it drowned swimming in rough seas after being chased by dogs out into Cook Inlet near English Bay. The drowned moose was towed ashore, cut up, and distributed to every

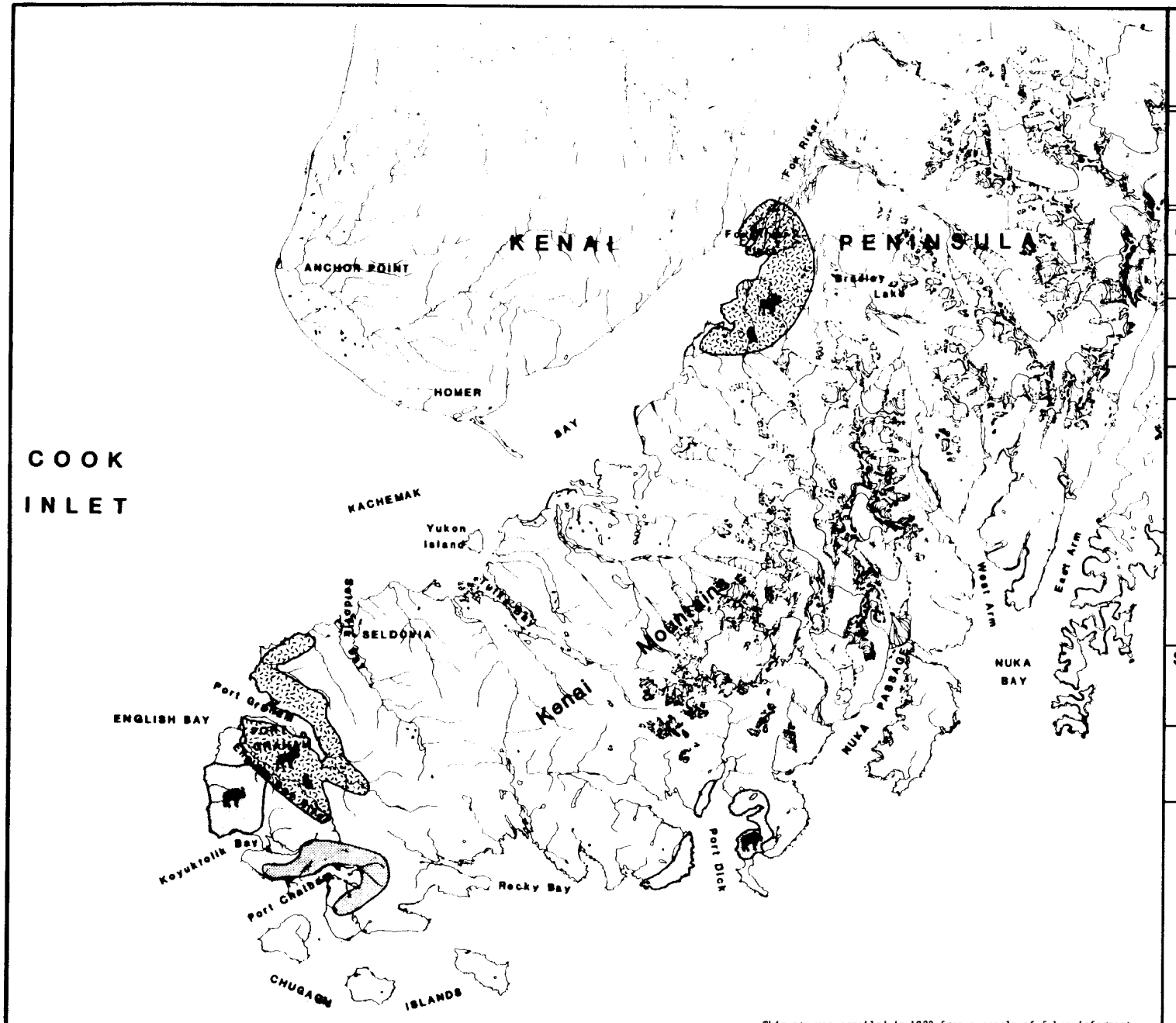

Figure 40. Contemporary hunting areas for moose, goat, and small game utilized by Port Graham and English Bay residents.

This map was compiled in 1982 from a sample of 5 key informant households. It was later subjected to community-wide review and represents areas used by English Bay and Port Graham between 1972 and 1982. Use areas change through time and are not fixed entities; therefore, these maps may be a partial representation of use areas. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.

ALASKA DEPARTMENT OF FISH AND GAME

SUBSISTENCE RESOURCE HARVEST AREA MAP

QUAD NAME Seldovia

SCALE 0 5 10 15 miles

TITLE English Bay, Port Graham Harvest Areas for Moose, Small Game, and Mountain Goat

LEGEND

RESOURCE	SYMBOL
Moose	
Small Game	
Mountain Goat	

SOURCES
English Bay, Port Graham Residents

PREPARED BY	DATE
Ronald Stanek Dan Foster	7/3/84

DIVISION OF SUBSISTENCE

household in the community. Portions went to relatives in Port Graham. In 1983, three moose were harvested by English Bay residents.

Moose hunting was done on foot usually in remote areas away from ATV trails and navigable streams. Groups of two to six hunters usually searched forest trails and clearings for signs such as tracks, antler rubbings, or droppings. Areas with known moose activity were often watched from a stand where hunters sat quietly. Calls of any kind were not used. Spotting moose was difficult in these areas as foliage was thick during the early September season.

When a moose was harvested, word went back to the village and additional people came out to assist in butchering and carrying out the meat. Moose meat was divided up among hunting partners and people who helped carry the meat back to the village. It was not distributed by hunters as widely as some other resources like bear or seal since moose were so infrequently harvested and required a great deal of effort to procure. Almost all parts of the animal were utilized including the head, heart, liver, and parts of the intestines. The hide, feet and antlers were not normally used.

Over the years several hunters who acquired allottment land in moose hunting areas established camps which they used as bases for daily hunts. Women and children usually accompanied their husbands and other relatives to the camps. Women cooked meals, kept camp in order, and watched the children. Family groups usually picked berries, caught salmon and char, and tended to camp chores. From two to six extended families spent as long as a month hunting and gathering resources in the vicinity of these camps. Occasional daily trips were made back to the

village to haul out meat or other resources and to return with other supplies.

Groups of hunters from both communities occasionally traveled to the Bradley River and Fox River Flats where camps were set up or commercial fishing boats were anchored offshore to serve as bases for daily hunting trips. Usually these distant hunting trips were several days long and included hunts for waterfowl and bear as well as moose. The extended trips were largely dependent upon the annual village economy. In years like 1981 when most fishermen earned enough money fishing, at least two trips were made by hunting parties. During the following years, earnings from commerical fishing by both villages were low and only one trip was made during a three-year period.

Black Bear

Large numbers of black bears inhabit many areas on the lower Kenai Peninsula and were abundant in the vicinity of both communities during the study period. Bears were frequently spotted on mountain slopes and along beaches. Bear concentrations during the spring occurred near denning areas on south facing slopes, and in the fall along salmon streams and on hillsides where berries were abundant.

Regulations

Bear hunting season was open year round on the lower peninsula with an annual limit of three bears per hunter.

Historical Hunting Activity

Several older hunters in both communities took great pride in telling bear hunting stories about their ancestors and themselves. In the early days when bears were hunted with spears, hunters had to be quick and agile. Meganack (pers. comm., 1982) described the spears used (see Chapter 5) and many of the rituals surrounding bear hunting. For example, hunters could not defecate in areas above timberline where bears roamed. It was thought that a bear which found a hunter's excrement would hunt him and kill him while he slept.

During the 1920s to 50s, when people walked the trails connecting Port Graham and English Bay to other coastal camps and communities like Port Chatham and Port Dick, bear hunting was more extensive and more common than today. In the early days, bears were highly valued as emergency food during the winter. Hunters took great care to locate and remember where bears had denned. In the event of food shortages, dens of hibernating bears were dug into and the bears killed.

Harvest and Use Patterns

During the study period, hunting activities focused on spring and fall when bears were feeding on fresh green vegetation and berries. Spring hunting was done mainly along shoreline areas easily accessible by skiff and on foot. Skiffs were used to travel along shorelines searching land areas where bear were feeding.

Two to three hunts were organized each spring by groups of three to six people. Usually hunts lasted several days and involved setting up

base camps. Those areas most commonly hunted included Dogfish Bay (Koyoktulik), Port Chatham, Windy Bay, and Port Dick (Fig. 37). In August and September when berries were at their peak of production, hunters again formed hunting parties and traveled to the Dogfish Bay area and to the head of Kachemak Bay. In addition to black bear, these hunts included goats, marine mammals, and waterfowl. Trips to the head of Kachemak Bay were primarily for moose, but black bears were taken when encountered. The major effort for fall black bears occurred in the vicinity of both villages, and took place in association with moose hunting or immediately after the moose season. Although bears were not normally passed up during moose hunting trips, some hunters did not like to shoot at them before they got a chance at moose since any activity or shooting may have lessened the possibility of killing or even seeing moose. Following moose season, a few hunters remained in their hunting camps and made daily outings for bears.

There were about 14 hunters who regularly hunted bears. Many other people participated on an occasional or opportunistic basis. This latter group may have taken bears if encountered during other activities or if a bear was spotted in a nearby accessible location. During the period spring 1981 to summer 1982, six bears were harvested by the two communities. In the fall of 1983, two bears were taken by Port Graham and three by English Bay. Bear hunters using the Dogfish Bay area pointed out that getting a bear in that area had become more difficult in recent years than in earlier times. The decrease in success rate was attributed to the increased numbers of nonlocal hunters using the area during both spring and fall.

Because bear products were in high demand, and bear were relatively abundant, sharing among hunters' families and friends was extensive. Some hunters tried to harvest several bears per season in order to meet their own personal needs as well as the needs of other community members. Sharing of the kill took place primarily between the hunter and his partners. Secondary distribution went to friends and relatives (Fig. 41). With the small amount of meat gotten from one bear (about 58 pounds), distribution of a single bear's meat usually did not extend to many households. Subsequent bears were distributed to people who had asked for meat or fat and did not receive some from previous bears.

Bear meat and fat are highly valued by people in both communities, and are thought to be about equal to seal in food value. The meat was usually cooked in roasts and stews, and ribs were highly favored. Bear fat was considered the very best for baking and cooking after it had been rendered into lard.

Goats

The mountainous coastal environment of the lower Kenai Peninsula is ideal habitat for mountain goat. Approximately 30 to 35 goats inhabit isolated mountains and ridges along the coast near the villages. Goats were commonly seen in the vicinity of both communities and on occasion wandered onto the airstrip and trails in English Bay during their annual movements.

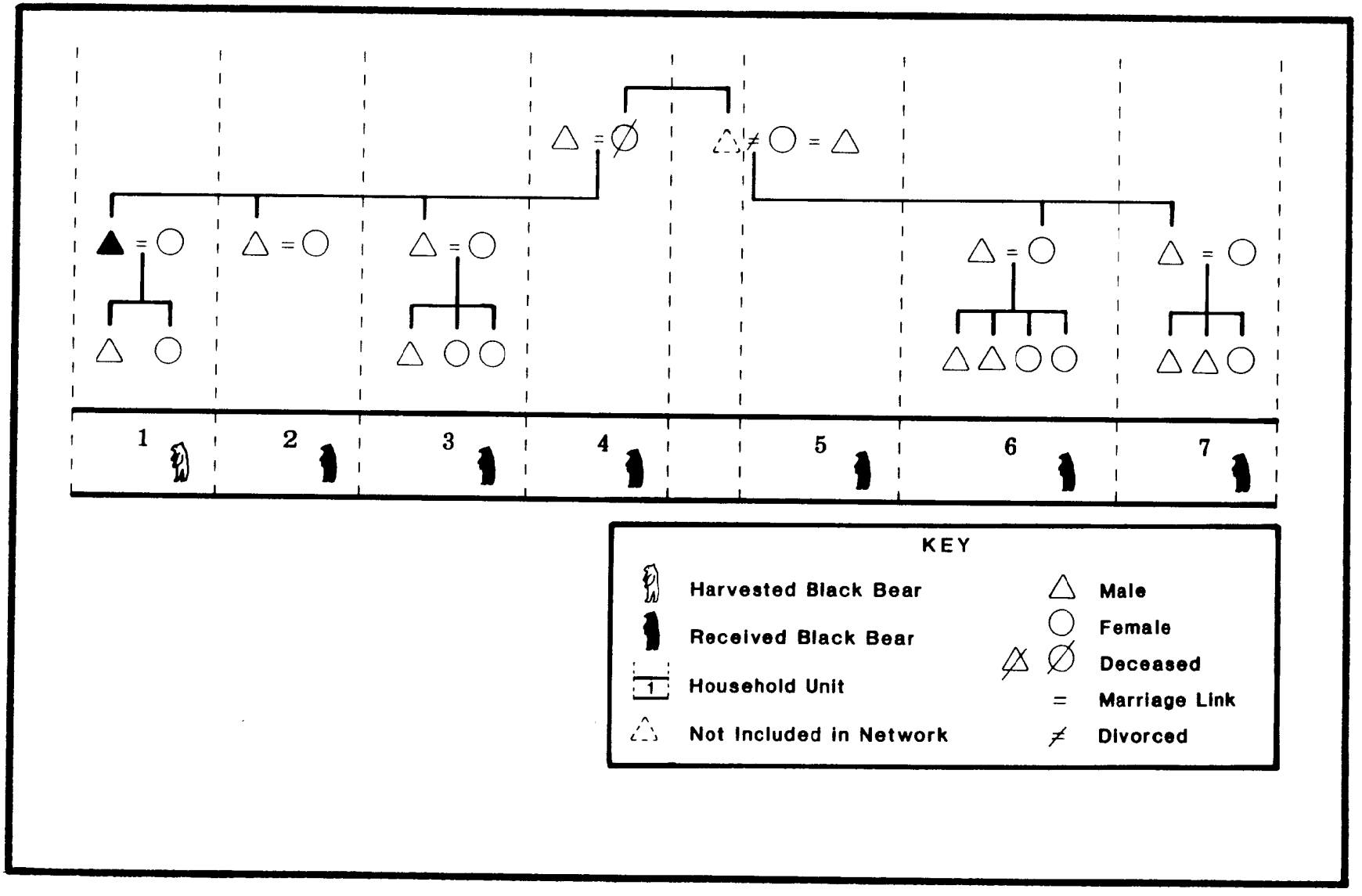

Figure 41. An example of the distribution of black bear within a kinship network in English Bay. Note that this same family unit is depicted in the seal distribution network of Figure 38, although different brothers hunt each resource.

Regulations

Goat hunting during the study period (1981 to 1983) was restricted to a drawing permit system open to the general public. Season dates were August 10 through November 30 with a bag limit of one goat per season.

Harvest and Use Patterns

An average of eight hunters annually attempted to harvest goats. In 1982, two hunters in English Bay received permits but hunted unsuccessfully during the season. Two types of hunting patterns were followed by goat hunters. Local hunters searched in the vicinity of the villages and areas accessible by small skiff, while more distant areas were used by the occasional hunter via commercial fishing vessels. The geographic areas used appear to be separated based on this use pattern (Fig. 40).

Small Game

Small numbers of a variety of small game species inhabit the lower Kenai Peninsula. None of the furbearer species are numerous, nor are hare or grouse, although ptarmigan were observed by villagers to be numerous from time to time. Marmot are locally abundant in their preferred boulder field habitat.

Older informants indicated that during their lifetimes species like mink, otter, fox, weasel, grouse, ptarmigan, hare, and porcupine were

sporadically abundant. At times they are utilized extensively by area residents as food, clothing, sources of cash, and trade.

Regulations

As discussed here, small game is divided into two groups. "Furbearers" include species like beaver, coyote, fox, mink, weasel, and otter. "Other small game" include grouse, hare, and ptarmigan. Waterfowl are discussed in the next section.

During the study period, Alaska hunting regulations allowed furbearers harvest with a gun or bow and arrow. It is more useful here to consider their respective bag and possessions limits under Alaska Trapping Regulations. Table 21 summarizes the seasons and bag and possession limits for Game Management Unit 15.

Harvest and Use Patterns

During the study period, the hunting and trapping effort for furbearers and other small game was low. Several people trapped land otter, lynx, mink, weasel, and squirrels but harvests were small.

Porcupine and marmot were taken when the opportunity arose. Marmots in particular were taken during spring and fall bear hunts and were valued for their fat. Birds such as ptarmigan and grouse were harvested incidentally while people were hunting and trapping other game, and while picking berries. Small game hunting areas appear in Figure 40; they are essentially the same areas as those used for moose and bear hunting.

TABLE 21. FURBEARER AND SMALL GAME BAG AND POSSESSION LIMITS FOR HUNTING AND TRAPPING IN GMU-15, 1982

Resource	Open Seasons		Bag Limit
Beaver	Hunting	None	
	Trapping	Feb. 1 - March 31	20 per season
Coyote	Hunting	Sept. 1 - April 30	2
	Trapping	Nov. 10 - March 31	No Limit
Red Fox	Hunting	Sept. 1 - Feb. 15	2
	Trapping	Nov. 10 - Jan. 31	No Limit
Lynx	Hunting	Sept. 1 - March 31	2
	Trapping	Nov. 10 - March 31	No Limit
Marmot	Hunting	None	
	Trapping	No Closed Season	No Limit
Marten	Hunting	None	
	Trapping	Nov. 10 - Jan. 31	No Limit
Mink and Weasel	Hunting	None	
	Trapping	Nov. 10 - Jan. 31	No Limit
Muskrat	Hunting	None	
	Trapping	Nov. 10 - June 10	No Limit
Land Otter	Hunting	None	
	Trapping	Nov. 10 - March 31	No Limit
Flying, Parka and Ground Squirrel	Hunting	None	
	Trapping	No Closed Season	No Limit
Red Squirrel	Hunting	No Closed Season	No Limit
	Trapping	No Closed Season	No Limit
Wolf	Hunting	Apr. 10 - Apr. 30	4
	Trapping	Nov. 10 - Mar. 31	No Limit
Wolverine	Hunting	Sept. 1 - Mar. 31	1
	Trapping	Nov. 10 - Mar. 31	No Limit
Grouse	Hunting	Aug. 10 - Apr. 30	15/day 30 in possession
Hare	Hunting	No Closed Season	No Limit
Ptarmigan	Hunting	Aug. 10 - Apr. 30	20/day 40 in possession

Sources: Alaska Hunting Regulations No. 22 July 1, 1981 - June 30 1982
Alaska Trapping Regulations No. 22 July 1, 1981-June 30 1982

Waterfowl and Marine Birds

Concentrations of ducks, geese and marine birds are found in the Kachemak Bay area from late September through November, and again from April through May. Colonies and nesting areas are located on islands, marshy flats, cliffs, and along lake shores and streams throughout the area.

Traditionally, waterfowl and marine birds were taken year-round. Certain species were, however, taken at specific times of the year. For example, gull were taken for meat in early spring. Some loons which stayed all winter in Kachemak Bay were taken in winter months. Ducks like buffle-head, harlequin ducks, mallards, and golden-eye usually wintered over in Kachemak Bay and were taken during winter months. Other geese and ducks were taken in spring and fall when they were in coastline areas and along rivers and in lakes. Swans were taken in spring, especially at Koyaktulik Bay, which means "swan's bay" in Alutiiq.

Regulations

Both state and federal regulations applied to the taking of waterfowl and marine birds. State hunting regulations provided for a waterfowl season in the Kachemak Bay area between September 1 and December 16. For the hunting of waterfowl, an Alaska hunting license and a federal migratory bird hunting stamp were required. Designated shooting hours were one-half hour before sunrise to sunset. Species of waterfowl were divided into seven groups: (1) sea ducks, which included

eiders, scoters, old squaw, and harlequin; (2) other ducks, which included species like mallard, pintail, teal, widgeon, goldeneye; (3) geese, which included Canada, white-fronted, and snow geese; (4) emperor geese; (5) brant; (6) snipe; and (7) cranes.

Bag and possession limits varied for each waterfowl group. In the Kachemak Bay area 8 ducks were allowed in the daily bag limit with 24 total in possession. For sea ducks, a total of 15 was allowed in the daily bag and 30 in possession. The bag and possession limits for geese had the stipulation that not more than four daily, eight in possession could be Canada or white-fronted geese. Brant had a daily bag limit of four with eight allowed in possession. Emperor geese had a daily bag limit of 6 with 12 in possession; emperors are very rare in Kachemak Bay. For snipe, the bag limit was 8 per day and 16 in possession. Two cranes were allowed per day with four in possession.

Under the Convention Between the United States and Great Britain For the Protection of Migratory Birds (1916 Article II Paragraph 3), certain marine birds and their eggs were allowed to be taken only by Natives for subsistence purposes. There were no specific bag or possession limits.

Hunting Activity

Hunting activity corresponded to the birds' migratory movements and usually did not get underway until late September. Ducks which moved into shoreline areas, small bays, streams and open lakes were hunted from September through December. Some waterfowl were taken as late as

March and April. Occasional harvest occurred while hunters were on hunting trips for seal or sea lion.

Gull hunting was usually done locally as the first birds arrived in spring and were still fat. Other seabirds were taken in the spring at concentration areas. Over-wintering loons were occasionally taken in the vicinity of both communities.

Most hunting activity occurred in the vicinity of the village or in outer Bay shoreline areas (Fig. 42). Hunts to the Fox River Flats, Tutka Lagoon, and Dogfish Bay were occasionally organized among hunters from both communities.

Egg Gathering

Each spring gulls, puffins, murres, and other marine birds nest at rookeries located on islands, river deltas, and other coastal areas in Kachemak Bay and the Lower Kenai Peninsula. Residents of both communities annually visited bird nesting areas primarily to harvest gull eggs, but also eggs of puffins and murres. Most frequently harvested were the eggs of glaucous-winged gulls.

Generally, egg gatherers followed the practice of taking only one egg from each nest. Estimated quantities of eggs harvested in both communities ranged from one to two five-gallon buckets to eight to ten buckets each season for each community.

Eggs were collected on special trips usually composed of family groups of men, women, and children. On some occasions egg gathering was done in association with bear or seal hunting, plant gathering, and social or business trips to other communities. Because they are highly

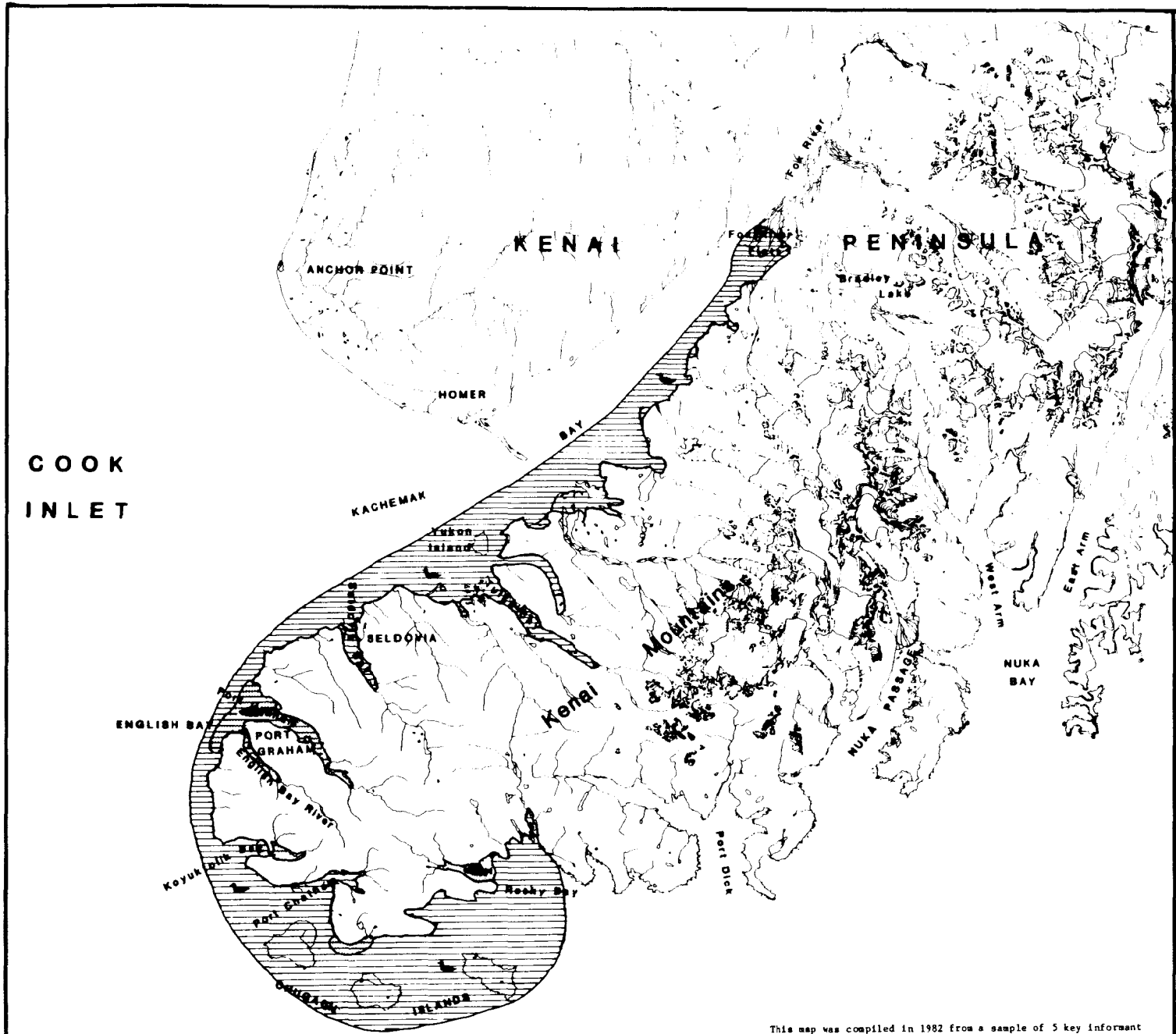

Figure 42. Contemporary subsistence salmon fishing and waterfowl hunting area of Port Graham and English Bay residents.

This map was compiled in 1982 from a sample of 5 key informant households. It was later subjected to community-wide review and represents areas used by English Bay and Port Graham between 1972 and 1982. Use areas change through time and are not fixed entities; therefore, these maps may be a partial representation of use areas. Base map adapted from: Alaska 1:1,000,000 Base Map Series © Copyright, Arctic Environmental Information and Data Center, University of Alaska, 1982.

ALASKA DEPARTMENT OF FISH AND GAME

SUBSISTENCE RESOURCE HARVEST AREA MAP

QUAD NAME Seldovia

SCALE 0 5 10 15 miles

TITLE English Bay, Port Graham Harvest Areas for Salmon, Waterfowl, and Marine Birds

LEGEND

RESOURCE	SYMBOL
Salmon	
Waterfowl Hunting and Marine Bird Egging and Hunting	

SOURCES
English Bay, Port Graham Residents

PREPARED BY	DATE
Ronald Stanek Dan Foster	7/3/84

DIVISION OF SUBSISTENCE

regarded by elders, eggs were widely distributed by gatherers to those people unable to gather eggs.

Gull eggs and bear fat were highly regarded for use in baking breads, cakes, and pastries. Eggs were also eaten fried, but were usually hard-boiled and served at family gatherings.

Plants

Abundant forests of spruce and hemlock grow in the vicinity of Port Graham and English Bay. Most of these forests are at or just past their peak maturity. Extensive stands of alder grow just above timber line at 500 to 1,000 feet. Grassy meadows and dry muskeg openings occur throughout the area. Along the Port Graham River and in locations along the English Bay River are patches of cottonwood. A variety of other woody and herbaceous plants grow in association with the above major groups. Alpine tundra vegetation appears above timberline, and this gives way in higher areas to barren lands of rocks and scattered low-growing alpine plants.

Regulations

In the vicinity of the two villages, the only regulations which applied to the harvest of plants were federal regulations pertaining to the harvest of timber resources on Native-owned lands (25CFR part 163 General Forest Regulations). The Department of the Interior through the Bureau of Indian Affairs and 53 BIA supplements 3 and 4 have the

authority for implementing forestry regulations. Under the above regulations, provisions were made for the commercial as well as personal use harvest of forest products from allotted lands.

Harvest

Most plant resources were gathered in the immediate vicinity of both communities (Fig. 36). However, several distant locations were used during specific times, mostly for berries and wood.

Food Plants

Various parts of a variety of plants were used as food. Leafy greens, stems, roots, and fruits were widely used. Plants producing greens include wild parsley, wild onion, goose-tongue, wild celery, ferns, fireweed, nettles, seaweed, and kelp. All these plants were harvested in the spring and early summer while their parts were young and tender. Their uses were as greens in soups and salads, and some were eaten as they were picked. Wild rhubarb was eaten raw or it was cooked and made into sauce and jam. Wild onions (chives), goose-tongues (plantains) were commonly used as flavorings on boiled fish and in salads. Chives were picked just before they flowered, cut in one-half inch pieces, and salted in jars. They were later used as flavoring in salmon dishes.

Eight species of berries were gathered from June through October. The most commonly harvested was salmonberry, which grows extensively in forest openings, along trails, and on the mountains just above

timberline. Other berries harvested included highbush and lowbush cranberry, crowberry, blueberry (high and lowbush), currents, nagoonberry, and trailing strawberry. Uses for berries were varied including jams and jellies for which salmon berries, blueberries, nagoonberries, and crowberries were usually used. Other uses were in breads, cakes, and biscuits for which blueberries, cranberries, and currents were preferred. Berries were also made into sauces, mixed with sugar, or eaten plain.

In June and July villagers kept close watch on the abundance of flowers and developing berries along trails and roads. In this way people were able to anticipate the productivity of each season and decide on which areas were worthwhile to search. Berries usually ripened in the first week of August. As the first berries ripened, they were quickly picked by wandering children, passersby, and birds. During seasons of high productivity, an abundance of berries were found in the immediate vicinity of each village. Several important berry producing areas in Port Graham were destroyed by airport and water system construction projects. People have since had to find new areas, and some people traveled across Port Graham Bay, or to the flats along the Port Graham River. While commercial fishing in waters away from the village, fishermen sometimes went ashore and collected large quantities of berries. Berry picking was a common activity among parties of hunters who spent several days in camp. Especially in early fall, highbush cranberries and moss berries were harvested in the vicinity of English Bay lakes and along the Port Graham River.

The quantities of berries harvested varied greatly with annual productivity and weather. In 1983 salmon berries were abundant and an

estimated 320 gallons were picked by Port Graham residents. In 1981, berry production was lower, and a low of 58 gallons was reported on harvest calendars. In 1983, blueberries in the Port Graham area were moderately productive but were heavily infested with worms. Other types of berries picked in undetermined quantities included currents, highbush and lowbush cranberries, nagoonberries, and trailing strawberries.

Medicinal Plants

Although the use of plants for medicinal purposes was not studied specifically, some information was gained while working on other subjects. Additional information was obtained through several literature sources. Medicinal uses were briefly reported by McMullen (1981), T. Kvasnikoff (1981), the North Pacific Rim (1977), and Wennekens (1984).

Plant use information gathered during this report support the conclusion by North Pacific Rim (1977:130) that the knowledge of traditional remedies from wild plants was "moderately high" among people over 30 years old. The most frequently used medicines were found to be roots or herbs used by boiling into drinks (teas). Other health remedies used in association with plants included the steam bath, good diet, rest, avoiding potential hazards, and keeping active.

Commonly used medicinal plants and their uses were reported by McMullen (1981) and by village residents during this study to include the following species. Yarrow was harvested throughout the spring, summer, and fall and was dried and stored for use during winter months.

Its primary use was for the relief of sore throats and asthma. It was historically used for treating a new-born baby's umbilical cord which persisted longer than usual.

Highbush cranberries and their stems were made into a thick syrup and taken for bad coughs and sore throats. The inner white pulpy area of the branches were used as a poultice for infected cuts. Sores on hands and feet were soaked in a mixture of boiled stems. Bethlehem Stars and sweet coltsfoot were used as sore throat treatments after they had been boiled in water and made into teas. One additional plant used for colds was tundra rose. The stems were cut and boiled and the tea was drunk. Tundra rose was also reported to be good for treating pneumonia.

Other less common remedies were the roots of nettles and devil's club which were used for the treatment of toothaches and arthritis. Elder villagers pointed out that these two plants were to be used cautiously because their potency could easily harm the patient if used incorrectly. The white fungus infested wood of rotten logs was removed and made into a packing which was applied to earaches and infections.

Firewood

Both communities gathered green and dry wood for heating homes and steam baths. Wood burning stoves for heating were replaced in the 1950s and 60s by oil stoves in most homes. Many people continued to use wood for cooking. As oil prices increased and efficient wood burning stoves came on the market, people switched back to wood burners. In some cases oil stoves were converted to burn wood. Bottled gas and electric ranges

replaced many wood burning cookers in the 1960s and 70s with the construction of BIA housing and the installation of power lines from Homer to south Kachemak Bay areas. The cost of heating with oil in most homes ran as high as $700 to $1,000 per year. For most older people, fuel costs were too high and gathering wood was difficult or impossible. Whenever possible, elders' wood was gathered by younger relatives or they paid to have wood hauled to their homes. In 1982, a HUD housing project installed both wood and oil stoves in new homes for both communities. Wood again became the primary source of heat with oil used as a backup. These homes, however, are well insulated and efficient wood-burning stoves were installed requiring less fuel per home.

During the study period, firewood was harvested in designated areas near each community and from shorelines 10 to 15 miles distant. Both green and dead wood was taken in forests, while driftwood was the major source from shorelines. In the case of driftwood, logs found washed up on beaches were pulled off with skiffs during high tides and towed to the villages. Wet driftwood was pulled up on shore and left to dry. It usually had to be cut into blocks and split for further drying. Large quantities of wood were often stockpiled in the late summer and fall. Most households estimated using five to six cords of firewood each year for heating homes. Additional amounts were used for smokehouses and banyas. Firewood was collected continuously throughout the winter months from nearby areas accessible by three-wheelers or snowmachine. The most commonly used firewood was spruce, but cottonwood and some alder were also burned. People also utilized whatever scrap lumber they could salvage from building projects. Cutting and hauling firewood

supplies became a source of work and petty cash income for many residents, especially teenage boys and young men.

Miscellaneous Uses

In addition to the above three use categories, several plants, some of which were already mentioned, were used for a variety of other purposes. Included here are the roots of spruce and beach rye-grass which were used in steam-baths for scrubbers. Roots of both species which were approximately one-sixteenth to three-sixteenths inch in diameter were gathered, cleaned of any sand and soil, and wound together into a loose mass. This was then used with or without soap as a scrubber.

The poles of alder and young spruce, one to three inches in diameter, were used in making fish racks inside and outside of smoke houses. Poles three to five inches in diameter were used for large outside drying racks, small shelters, storage sheds, fences, and gill net racks. Large spruce logs six inches to about one foot in diameter were used to build log homes, cabins, foot bridges, steam baths, and as pilings. Some people unable to afford new handles for axes and other tools, replaced broken handles with spruce poles. On many skiffs and dories, a split spruce pole was attached to the outer gunnel as a rub rail to protect the boat from damage.

Alder logs and shavings were burned in smoke houses to cure and flavor salmon. Alder branches with the green leaves still on were cut in 18-inch lengths and made into small bundles which were later used as

spankers in steam baths. Many people preferred using mountain ash branches with leaves attached for this purpose because the fine pubesence on the leaves make them softer to the touch.

In addition, poles and sticks were put to a variety of uses almost too numerous to mention, from flag poles to masts, clubs, spears, tool handles, probes, digging sticks, and structural supports of many types. Some people even made furniture out of poles and sticks.

CHAPTER 8

DISCUSSION

The results of the research presented in this report have demonstrated the long history of wild resource use in the lower Cook Inlet communities of Port Graham and English Bay. The report has also shown that despite the tremendous sociocultural and socioeconomic changes that have taken place in most Kenai Peninsula communities during the 20th century, English Bay and Port Graham have remained rural villages with subsistence-based economies and ways of life. In this regard they most closely resemble communities of the roadless areas of western Alaska such as Nondalton, Kotlik, and Mountain Village (Wolfe and Ellanna 1984) more than they resemble other Kenai Peninsula communities such as Homer and Kenai. The following discussion summarizes the features of this subsistence-based way of like as it existed in Port Graham and English Bay during the study period.

THE ORGANIZATION OF RESOURCE USE ACTIVITIES

In Port Graham and English Bay during the study, period resource harvest activities were usually organized among members of kinship related groups of households. Group organization was further structured by the ownership of equipment, facilities, the possession of knowledge, and land use rights. Typically, a work unit of salmon-producing households had a fishing site, boat and motor, nets, smokehouse, drying racks, and a cutting and processing area.

The roles of individuals within fishing groups were determined by knowledge, age, and experience. These three elements also appeared related to the possession of equipment facilities and hunting or fishing locations. Of particular interest is that the elder generation in both communities was the first to gain the economic ability to own commercial fishing sites and significant amounts of modern equipment. Their children are now becoming heirs to the parents' equipment and fishing and hunting locations, and have gained the necessary knowledge to continue these activities.

Male and female roles in resource use activities were clearly defined in almost all instances. In salmon set netting, for example, adult males set and tended the nets and performed most of the heavy work of pulling nets and caring for equipment. Exceptions to this general order of labor occurred in both communities. Women often accompanied men on large boats and when tending nets. Generally, however, women prepared salmon for preservation.

In other activities such as hunting and wood gathering, men took the lead in organizing and conducting hunts and wood gathering trips. Women were very active in berry picking and gathering other edible plants and usually took lead roles in these activities. Women also were responsible for estimating quantities of resources required by their households each year. Fishing trips for saltwater and freshwater species were frequently organized and led by women. Rod and reel fishing for halibut and silver salmon were the two fishing activities most commonly participated in by women. Further exceptions to the general roles of men and women occurred when young, unmarried men lived with their parents. In these cases the young men often assisted their

mothers in cutting and preserving fish and other resources. They also helped other extended family members in harvesting and preserving annual supplies of wild foods.

THE ANNUAL SEASONAL ROUND

The contemporary annual seasonal round of resource harvest activities of Port Graham and English Bay residents is comparable to that of Gulf Coastal people in the earliest historical times in several ways. Harvest timing is primarily dependent upon seasonal availability and accessibility of resources. The harvest of individual resources is closely tied to local weather, tidal, and day-length conditions. Harvest activities are practiced by the majority of community members at specific times of the year. Preparation for harvest activities occurs in a manner which synchronizes community activities allowing for the availability of labor, materials, and equipment necessary for resource harvest and preservation. A wide variety of wild resources are harvested locally or within a relatively close distance accessible to most people in the community.

Contemporary harvest patterns also differ from historic patterns in that commercial harvests of some resources have been incorporated into the annual round. For example, commercial salmon fishing occurs simultaneously with subsistence fishing. Most non-commercialized resources are harvested at the same time as they were historically. Exceptions include species which have been regulated by government agencies. Examples include the prohibition against the spring harvest

of ducks, geese, and marine birds, and limited hunting opportunity for mountain goat.

The use of seasonal hunting and fishing camps distant to the community no longer occurs. However temporary camps, boats, and cabins on Native allotments are used occasionally during resource harvest activities.

Modified versions of traditional hunting and fishing equipment discussed in Chapter 5 were used until the late 1950s and early 1960s. All but a few of the methods have disappeared due to the introduction of modern technology and regulatory restrictions. Some equipment associated with preservation, such as drying racks, are still in use, as is the hand line used in salt water fishing. Spears, fish traps, and wiers have been made illegal by state and federal regulatory agencies.

RESOURCE HARVEST LEVELS AND PARTICIPATION

As noted throughout Chapter 7, Tables 22 and 23, and in Appendices C and D, levels of harvest of individual resources varied significantly throughout the study period. Harvest levels for all resources reached their lowest levels during the winter months and their highest levels from spring through fall (Fig. 43).

Monthly harvest levels for the two communities differed significantly for the peak harvest months of April, May, June, and July. In June 1981, Port Graham fishermen harvested large quantities of salmon in the subsistence set net fishery because red salmon milled in the vicinity of Port Graham Bay before moving to the English Bay River system. For this reason, and because Port Graham commercial fishermen

TABLE 22. MONTHLY MEAN POUNDS OF HARVEST BY RESOURCE GROUP*. ALSO INCLUDED ARE TOTAL KNOWN HARVEST, PER CAPITA HARVEST, AND HOUSEHOLD HARVEST VALUES FOR PORT GRAHAM - MAY 1981-APRIL 1982.

SPECIES	MAY 42	JUNE 33	JULY 34	AUG 36	SEPT 32	OCT 28	NOV 21	DEC 22	JAN 22	FEB 24	MARCH 23	APRIL 18)	Total Known Harvest (lbs)	Mean Per HH (N=48)	Annual Per Capita (3.9/HH)	% of Annual Per Capita
SALMON	61.3	122.2	11.2	41.5	56.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10286.8	214.3	55.0	38.0%
FRESHWATER FISH	1.0	1.8	2.1	.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	271.7	5.7	1.5	1.0%
SALTWATER FISH	14.5	1.1	2.2	0.2	4.4	3.4	2.5	8.8	1.8	0.6	0.1	15.2	1539.3	32.1	8.2	5.7%
FLAT FISH	171.5	29.3	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.3	0.9	36.7	8913.2	185.7	47.6	32.9%
TOTAL FISH	248.3	154.4	15.5	41.7	63.8	3.4	2.5	8.8	3.2	1.9	1.0	52.0	21011.0	437.7	112.2	77.6%
CLAMS	1.2	0.2	0.0	0.3	0.0	1.3	0.0	0.0	0.1	0.0	0.9	13.0	361.1	7.5	1.9	1.3%
CRABS	0.3	0.3	1.0	0.8	1.7	0.7	1.1	0.0	1.1	0.0	0.2	0.0	211.4	4.4	1.1	0.8%
INVERTEBRATES	2.5	0.3	0.0	0.0	0.1	3.7	2.9	2.0	0.0	3.8	4.7	3.7	592.5	12.3	3.2	2.2%
TOTAL INVERTS	4.0	0.8	1.0	1.1	1.8	5.7	4.0	2.0	1.2	3.8	5.8	16.7	1165.0	24.3	6.2	4.3%
MARINE MAMMALS	3.6	84.8	11.8	1.4	4.7	14.3	4.8	0.0	2.3	0.0	0.0	0.0	4103.4	85.5	21.9	15.2%
LAND MAMMALS	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	117.0	2.4	0.6	0.4%
TOTAL MAMMALS	3.6	86.6	11.8	1.4	6.5	14.3	4.8	0.0	2.3	0.0	0.0	0.0	4220.4	87.9	22.5	15.6%
FOWL	0.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	.0	.0	.0%
WATERFOWL	0.1	1.9	0.3	2.9	0.0	3.2	0.0	0.0	0.6	0.0	0.0	0.0	284.3	5.9	1.5	1.1%
SEA BIRDS	0.0	0.4	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	42.6	0.9	0.2	0.2%
TOTAL FOWL	0.1	2.3	0.3	2.9	0.0	3.2	1.4	0.0	0.6	0.0	0.0	0.0	328.0	6.8	1.8	1.2%
BERRIES	0.0	0.1	1.6	0.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	110.5	2.3	0.6	0.4%
OTHER PLANTS	0.2	3.4	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	230.6	4.8	1.2	0.9%
TOTAL PLANTS	0.2	3.5	1.6	0.4	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.6	341.1	7.1	1.8	1.3%
MONTHLY MEAN	256.2	247.6	30.2	47.5	76.4	26.6	12.7	10.8	7.3	5.7	6.8	69.3	27065.5	563.9	144.6	100.0%

*Based on monthly pounds of harvest divided by total calendars issued for that month

TABLE 23. MONTHLY MEAN POUNDS OF HARVEST BY RESOURCE GROUP*. ALSO INCLUDED ARE TOTAL KNOWN HARVEST, PER CAPITA HARVEST, AND HOUSEHOLD HARVEST VALUES FOR ENGLISH BAY - MAY 1981-APRIL 1982.

SPECIES (n=	MAY 28	JUNE 19	JULY 21	AUG 22	SEPT 19	OCT 9	NOV 9	DEC 9	JAN 7	FEB 8	MARCH 9	APRIL 10)	Total Known Harvest (lbs)	Mean Per HH (N=29)	Annual Per Capita (4.4/HH)	% of Annual Per Capita
SALMON	90.4	79.7	228.0	81.3	95.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12437	428.8	97.5	66.5%
FRESHWATER FISH	10.7	2.7	4.3	27.2	37.8	1.3	0.0	0.0	0.0	0.0	6.7	10.8	1938	66.8	15.2	10.4%
SALTWATER FISH	1.2	0.2	0.0	0.0	0.0	0.2	0.1	0.1	3.1	9.0	2.3	1.6	170	5.9	1.3	0.9%
FLAT FISH	35.4	23.1	12.2	5.8	0.0	0.0	0.6	0.6	0.0	0.0	0.0	5.7	1881	64.9	14.7	10.1%
TOTAL FISH	137.7	105.7	244.5	114.3	133.3	1.5	0.7	0.6	3.1	9.0	9.0	18.1	16425	566.4	128.7	87.9%
CLAMS	0.5	1.6	0.0	.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	48	1.6	0.4	0.3%
CRABS	0.2	0.8	1.8	1.3	0.0	0.4	0.0	0.1	0.2	0.0	0.0	0.0	92	3.2	0.7	0.5%
OTHER INVERTEBRATES	1.7	1.3	1.7	0.7	0.0	1.5	0.8	0.0	5.1	2.3	3.0	0.0	224	7.7	1.8	1.2%
TOTAL INVERTS	2.4	3.7	3.5	2.0	0.0	1.9	0.8	0.1	5.7	2.3	3.0	0.0	364	12.6	2.9	1.9%
MARINE MAMMALS	7.1	10.5	7.1	0.0	0.0	11.1	0.0	44.4	0.0	0.0	5.6	0.0	1097	37.8	8.6	5.9%
LAND MAMMALS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	58	2.0	0.5	0.3%
TOTAL MAMMALS	7.1	10.5	7.1	0.0	0.0	11.1	0.0	44.4	0.0	0.0	5.6	5.8	1155	39.8	9.1	6.2%
FOWL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0%
WATERFOWL	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.6	0.6	0.3	0.0	23	0.8	0.2	0.1%
SEA BIRDS	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32	1.1	0.2	0.2%
TOTAL FOWL	0.0	0.0	1.5	0.0	0.0	0.0	0.5	0.7	0.6	0.6	0.3	0.0	54	1.9	0.4	0.3%
BERRIES	0.0	6.2	6.7	6.1	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	450	15.5	3.5	2.4%
PLANTS	0.2	10.5	0.0	1.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	245	8.5	1.9	1.3%
TOTAL PLANTS	0.2	16.7	6.7	7.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	695	24.0	5.4	3.7%
MONTHLY MEAN	147.4	136.6	263.3	123.8	136.8	14.5	2.0	45.8	9.4	11.9	17.9	23.9	18694	644.6	146.5	100.0%

* Based on monthly pounds of harvest divided by total calendars issued for that month)

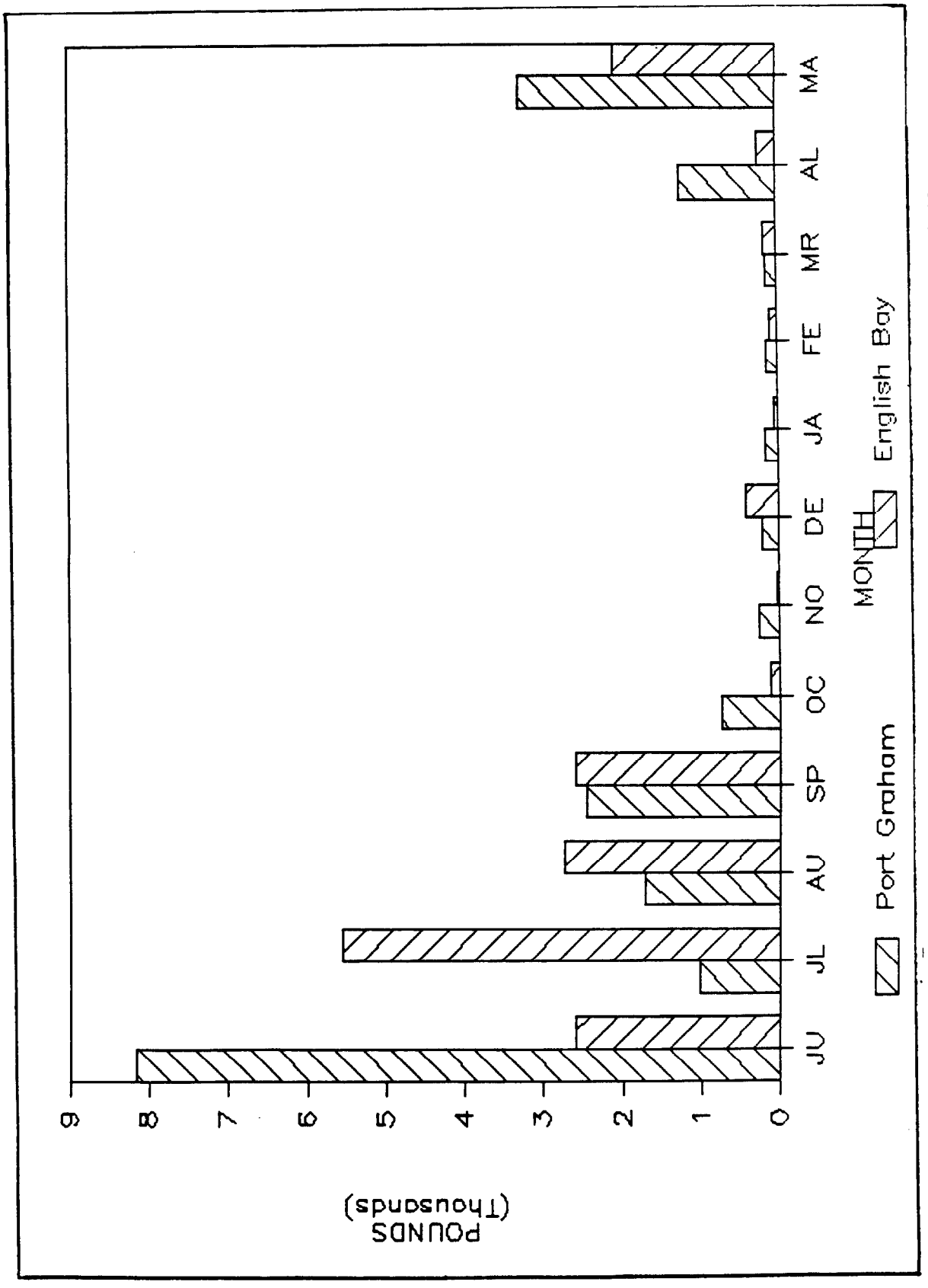

Figure 43. Comparison of Port Graham and English Bay monthly harvests, June 1981 - May 1982.

try to fill their subsistence need prior to commercial season, effort levels among Port Graham households was greater than among English Bay households. July 1981 saw a complete reversal of the June harvest pattern as English Bay households harvested salmon for home use in both the commercial and hook and line fisheries. Few English Bay households participated in the commercial seine fishery which generally requires the participants' absence from the village. English Bay fishermen and their households therefore had more time to fish for home use in July when red salmon became available in the immediate vicinity of the community.

During August and September, harvest levels for both communities were comparable. English Bay, however, harvested slightly more pink and silver salmon to fulfill home use needs. In 1982, April and May harvests were composed of halibut and salmon respectively. Port Graham residents had greater quantities of saltwater fish because of their greater degree of access to saltwater fishing in the protected bays, harbor facilities, and ready availability of skiffs.

Winter months for both communities were periods of low harvest levels. Port Graham households harvested slightly larger quantities during the winter - mostly shellfish and saltwater fish - owing to the availability of these resources in Port Graham Bay and the greater accessibility of the bay during winter than the area near English Bay.

Both salmon and other fish, primarily marine fish, made up the bulk of annual harvests with shellfish and marine mammals than the other important resource groups. Average household harvest levels for the two communities were 563 pounds edible weight for Port Graham households and

644 pounds edible weight household for English Bay. This was attributable to low numbers of job opportunities, low average income levels, and high costs of storebought goods. Strong cultural and kinship ties within each community are additional reasons for high harvest levels and strong participation in harvest activities. Participation, although high for each community, varied considerably by species. Salmon and halibut, for example, were harvested by the highest percentage (51 percent) of the households. This was due to the relative ease of access and abundance of these two resources near each community. Shellfish was harvested by the third highest percent of households (42 percent). Resources such as moose, black bears, seals, and goats were few in number, inhabited remote areas, and are quick to flee from hunters. These resources were harvested by a few households (13 percent) who were physically strong and knowledgeable in hunting techniques. Additionally, moose numbers in the vicinity of the villages were low, while goat harvests were regulated by a random permit drawing process. Although black bear numbers were relatively high on the lower Kenai Peninsula, competition in village hunting areas from non-local people has been high in recent years, and may account in part for a low village harvest. Increasing regional population numbers have forced village hunters out of many inner Kachemak Bay areas used historically. The periodic although irregular availability of cash employment opportunities in each community strongly influenced the participation levels of village residents. Many of the most able-bodied and productive resource harvesters chose to participate in cash jobs at times of peak resource availability. Local control of some cash employment opportunities usually distributed employment opportunities as

widely as possible among village residents and whenever possible scheduled jobs to coincide with periods of low resource harvest activity.

HARVEST COMPOSITION

Of the 34 different species of resources recorded on the harvest calendars, Port Graham households harvested from 1 to 21 different species (Fig. 44). Most households (38.3 percent) harvested from 1 to 4 different resources, including red salmon, halibut, shellfish, and salmon berries. One fourth of the households (25.5 percent) harvested from 5 to 9 different resources and these usually included red salmon, silver salmon, pink salmon, bidarkies, clams, salmon berries, halibut, ducks, and seal. The third largest group of households (17.1 percent) harvested 10 to 21 resources. In addition to those resources mentioned for the above groups, this group also harvested king and chum salmon, several species of saltwater fish, all plant species, and all shellfish species. Likewise, they harvested the largest quantities by weight (Fig. 45). A small percentage (9 percent) of those households given calendars reported no resources harvested. These were typically households which received a calendar in the initial stages of the project, returned only a few months of calendars, and then ceased receiving calendars. They normally were given resources by other family members and were usually elderly or single female households.

English Bay households differed significantly in their harvest composition from Port Graham by having one-third as many households (13.7 percent) harvesting from 1 to 4 resources, and nearly twice as

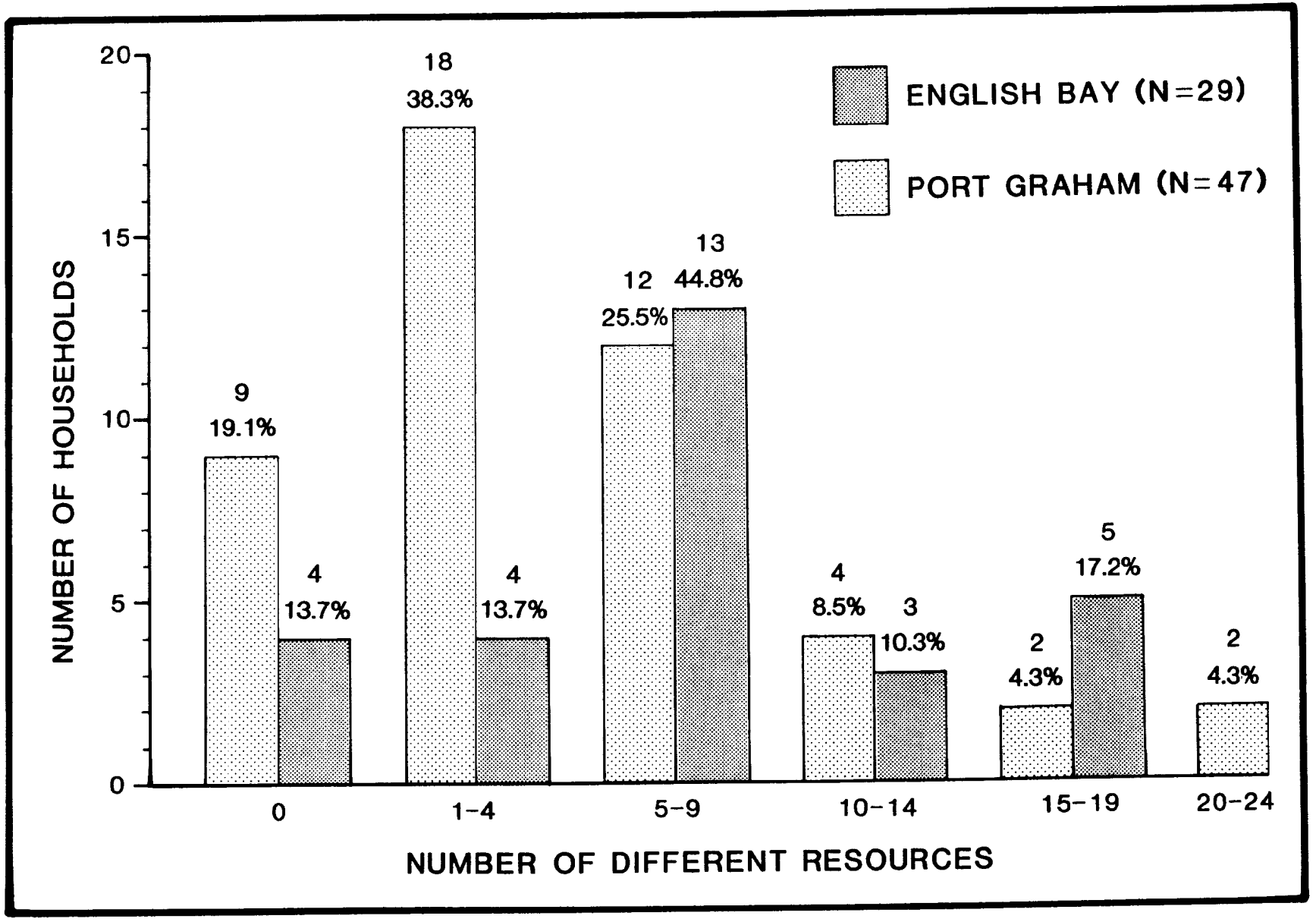

Figure 44. Number of households harvesting select quantities of different resources.

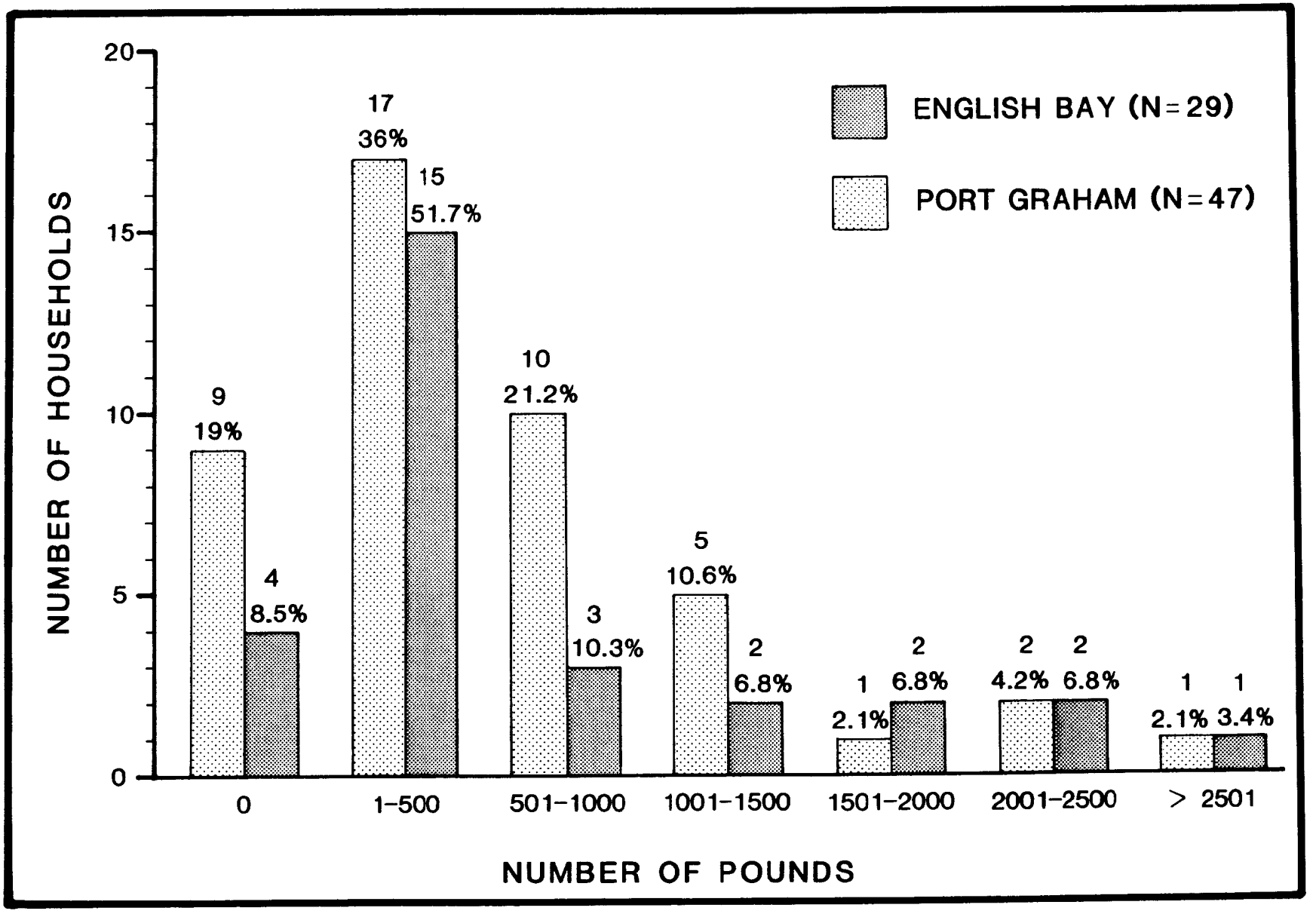

Figure 45. Number of households harvesting select quantities of pounds of resources.

many households harvesting 5 to 9 resources, and 10 to 24 resources (27.5 percent). There were fewer households reporting zero resources, but this was due to the lower number of elderly in the total population. Characteristics of English Bay households harvesting different categories of resources appear much the same as Port Graham households except red salmon was of greater importance and halibut of lesser importance in the 1 to 4 resource harvest group. As mentioned earlier, this is attributable to the ease of access to a salmon stream, the lack of equipment, and high degree of difficulty in accessing the saltwater fishery from English Bay.

Monthly harvest composition (Table 24) among resource groups and among months was highly variable and primarily a reflection of resource availability and harvest as affected by levels of participation. For example, in May Port Graham showed a high percentage of other fish harvested while August and September are much lower. Similar examples can be found among all resource groups for both communities.

Annual harvest composition differed dramatically between communities (Table 25). Salmon and marine mammals showed the greatest differences. Salmon composed 66.5 percent of the English Bay annual harvest and 38.0 percent of the Port Graham harvest, while other fish were 21.3 percent the English Bay harvest and equal (39.6 percent) to salmon in Port Graham.

Port Graham's geographic location on the inner reaches of a protected bay provide it with the advantage of greater accessibility of a wider variety of resources than English Bay. Although English Bay may have been less economically able to afford equipment for resource

TABLE 24. MONTHLY RELATIVE PERCENTAGES OF SEVEN RESOURCE GROUPS FOR PORT GRAHAM AND ENGLISH BAY

PORT GRAHAM

MEAN MONTHLY HARVESTS 1981 - 82 : Percent of Total Monthly Pounds Harvested

SPECIES	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL
SALMON	23.9%	49.4%	37.1%	87.3%	73.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OTHER FISH	73.0%	13.0%	14.2%	0.5%	9.7%	12.8%	19.7%	81.5%	43.8%	33.3%	14.7%	75.0%
INVERTEBRATES	1.6%	0.3%	3.3%	2.3%	2.4%	21.4%	31.5%	18.5%	16.6%	66.7%	85.3%	24.1%
LAND MAMMALS	0.0%	0.7%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MARINE MAMMALS	1.4%	34.2%	39.1%	2.9%	6.2%	53.7%	37.8%	0.0%	31.5%	0.0%	0.0%	0.0%
FOWL	0.0%	0.9%	1.0%	6.1%	0.0%	12.2%	11.0%	0.0%	8.2%	0.0%	0.0%	0.0%
PLANTS	0.1%	1.4%	5.3%	0.8%	5.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

ENGLISH BAY

MEAN MONTHLY HARVESTS 1981 - 82 : Percent of Total Monthly Pounds Harvested

SPECIES	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL
SALMON	61.3%	58.4%	86.6%	65.7%	69.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OTHER FISH	32.1%	19.0%	6.3%	26.7%	27.6%	10.3%	33.7%	1.4%	33.0%	75.6%	50.3%	75.7%
INVERTEBRATES	1.6%	2.7%	1.3%	1.6%	0.0%	13.1%	40.8%	0.2%	60.6%	19.3%	16.8%	0.0%
LAND MAMMALS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	24.3%
MARINE MAMMALS	4.8%	7.7%	2.7%	0.0%	0.0%	76.6%	0.0%	96.9%	0.0%	0.0%	31.3%	0.0%
FOWL	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	25.5%	1.5%	6.4%	5.0%	1.7%	0.0%
PLANTS	0.1%	12.2%	2.5%	6.1%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE 25. RELATIVE PERCENTAGES BY RESOURCE CATEGORY OF PORT GRAHAM AND ENGLISH BAY HARVESTS MAY 1981-APRIL 1982

PORT GRAHAM

Proportion of Known Annual Harvest	
SALMON	38.0%
OTHER FISH	39.6%
LAND MAMMALS	0.4%
MARINE MAMMALS	15.2%
INVERTEBRATES	4.3%
FOWL	1.2%
PLANTS	1.3%
TOTAL	100.0%

ENGLISH BAY

Proportion of Known Annual Harvest	
SALMON	66.5%
OTHER FISH	21.3%
INVERTEBRATES	1.9%
LAND MAMMALS	0.3%
MARINE MAMMALS	5.9%
FOWL	0.3%
PLANTS	3.7%
Total	100.0%

gathering, it compensated for fewer months of harvest opportunity by increasing production during late summer and fall months.

Following the termination of harvest calendars in August 1982, additional harvest data were collected on certain big game and marine mammal harvests and provide insight into the extreme variability in harvest levels which can occur from year to year. While few of these resources were documented from May 1981 to August 1982, subsequent field observations and interviews documented an increase in the take of moose, seals, sea lions, and black bears (Table 26). Further informal interviews with key hunters in both communities indicated substantial numbers of seals taken during most years with an estimated range of 40 to 100 seals.

Moose and black bear harvests also vary annually. While one moose was reported by English Bay hunters in 1982, three were taken the following September. Black bear harvest did not show any increase although these were taken in the fall of 1983.

TABLE 26. BIG GAME HARVEST ESTIMATES FOR PORT GRAHAM AND ENGLISH BAY FALL 1982 THROUGH FALL 1983

Species	Port Graham		English Bay	
	1982	1983	1982	1983
Moose	1	1	2	3
Black Bear	2	2	3	3
Seal	15	20	21	45-50
Sea Lion	0	0	2	3

CONCLUSION

Port Graham and English Bay are predominately Chugach Eskimo communities whose residents have a long history in the Gulf of Alaska. The majority of current-day residents trace their ancestry to former native villages along the southern coast of the Kenai Peninsula and Prince William Sound. Also, in 1986 English Bay achieved recognition as the site of the oldest Russian settlement on the Alaska mainland. Both communities have remained isolated from other southcentral communities as compared to the rest of the Kenai Peninsula. In contrast to the neighboring Kachemak Bay area, there has been no major settlement entry into the communities in recent decades by non-Natives.

Although the early economy of the region was based solely on subsistence hunting and fishing, trade, and barter, a mixed subsistence-based economy with a cash component evolved after the purchase of Alaska in 1867. A number of traditional subsistence activities persisted in both communities as the base of the mixed economy. Among the characteristics of this economy is a patterned annual round of subsistence activities. These resource harvest activities are closely tied to seasonal variations in weather and resource availability. Typically, resource harvests are high levels of participation among kin-based groups. These groups supply the labor and equipment for harvesting and processing resources. They also provide networks within which the non-commercial distribution and exchange of resources occurs.

Annual subsistence harvests of fish and game resources in both communities are high. These harvests are dependent upon the availability of resources and access to those resources as influenced by

a variety of environmental and economic factors. Numbers of local wild resources and economic conditions vary greatly by season and year. This availability requires a series of adaptive strategies such as simple food storage techniques, flexibility of harvest techniques, and the harvest of a wide range of resources in order to maintain a stable food supply. Augmenting these techniques is an open access land system which is governed by traditional rules of land use and occupancy. Superimposed on this system is a set of state and federal harvest regulations.

In the mixed cash-subsistence economy of English Bay and Port Graham, monetary sources over the long-term are insecure. Monetary jobs are seasonal, part-time, short-term, and have low earnings. Subsistence harvests, on the other hand, are secure and long-term. Money is essential in this system for the purchase of hunting, fishing, and gathering equipment. Cash is also used to purchase conveniences and to obtain food staples and fuel. Participation in the cash economy is usually at the household level with several family members working in wage employment and commercial fishing activities. The two activities are blended into a mutually-supportive system which is highly versatile.

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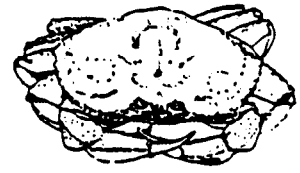
MARCH 1982

SUBSISTENCE CATCH CALENDAR



DUNGENESS CRAB

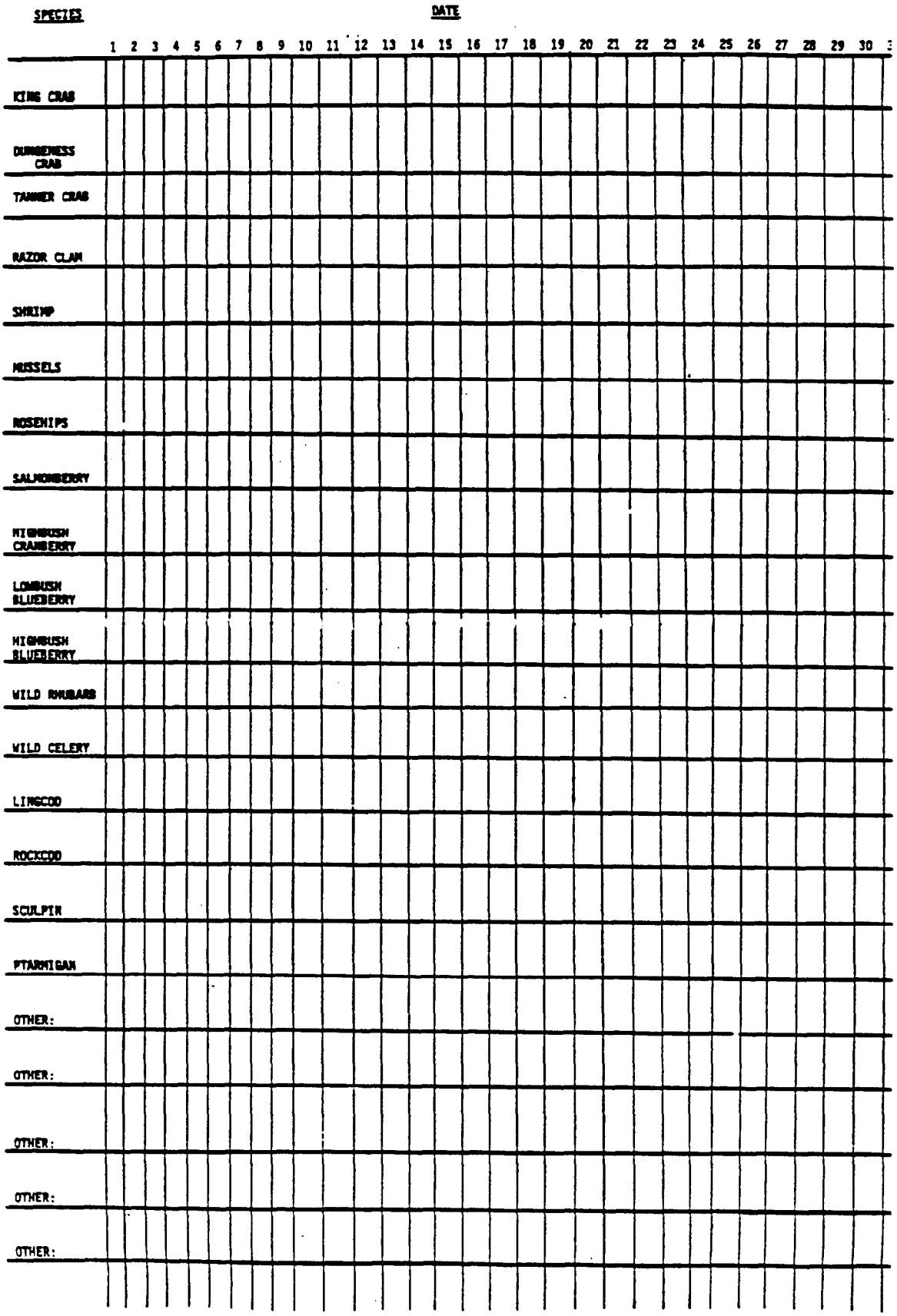
ENTER ONLY THE THINGS YOU CATCH.
DO NOT ENTER COMMERCIAL FISH THAT ARE SOLD.

ENGLISH BAY / PORT GRAHAM

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2	3	4	5	6
	HERRING	HERRING	HERRING	HERRING	HERRING	HERRING
	TOMCOD	TOMCOD	TOMCOD	TOMCOD	TOMCOD	TOMCOD
	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER
	SAMBILL	SAMBILL	SAMBILL	SAMBILL	SAMBILL	SAMBILL
	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE
	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL
	BIDARKY	BIDARKY	BIDARKY	BIDARKY	BIDARKY	BIDARKY
	SHRIMP	SHRIMP	SHRIMP	SHRIMP	SHRIMP	SHRIMP
7	8	9	10	11	12	13
HERRING	HERRING	HERRING	HERRING	HERRING	HERRING	HERRING
TOMCOD	TOMCOD	TOMCOD	TOMCOD	TOMCOD	TOMCOD	TOMCOD
FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER
SAMBILL	SAMBILL	SAMBILL	SAMBILL	SAMBILL	SAMBILL	SAMBILL
SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE
HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL
BIDARKY	BIDARKY	BIDARKY	BIDARKY	BIDARKY	BIDARKY	BIDARKY
SHRIMP	SHRIMP	SHRIMP	SHRIMP	SHRIMP	SHRIMP	SHRIMP
14	15	16	17	18	19	20
HERRING	HERRING	HERRING	HERRING	HERRING	HERRING	HERRING
TOMCOD	TOMCOD	TOMCOD	TOMCOD	TOMCOD	TOMCOD	TOMCOD
FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER
SAMBILL	SAMBILL	SAMBILL	SAMBILL	SAMBILL	SAMBILL	SAMBILL
SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE
HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL
BIDARKY	BIDARKY	BIDARKY	BIDARKY	BIDARKY	BIDARKY	BIDARKY
SHRIMP	SHRIMP	SHRIMP	SHRIMP	SHRIMP	SHRIMP	SHRIMP
21	22	23	24	25	26	27
HERRING	HERRING	HERRING	HERRING	HERRING	HERRING	HERRING
TOMCOD	TOMCOD	TOMCOD	TOMCOD	TOMCOD	TOMCOD	TOMCOD
FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER
SAMBILL	SAMBILL	SAMBILL	SAMBILL	SAMBILL	SAMBILL	SAMBILL
SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE
HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL
BIDARKY	BIDARKY	BIDARKY	BIDARKY	BIDARKY	BIDARKY	BIDARKY
SHRIMP	SHRIMP	SHRIMP	SHRIMP	SHRIMP	SHRIMP	SHRIMP
28	29	30	31			
HERRING	HERRING	HERRING	HERRING			
TOMCOD	TOMCOD	TOMCOD	TOMCOD			
FLOUNDER	FLOUNDER	FLOUNDER	FLOUNDER			
SAMBILL	SAMBILL	SAMBILL	SAMBILL			
SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE	SPRUCE GROUSE			
HARBOR SEAL	HARBOR SEAL	HARBOR SEAL	HARBOR SEAL			
BIDARKY	BIDARKY	BIDARKY	BIDARKY			
SHRIMP	SHRIMP	SHRIMP	SHRIMP			

Continued NP

PLEASE ENTER NUMBER OR AMOUNT OF ADDITIONAL PLANTS AND ANIMALS COLLECTED.



APPENDIX B

English Bay/Port Graham Survey Weight Conversions

Species	Units	Conver	Salmon	Flat Fish	SaltWater Fish	Fr. Water Fish	Invert	Land Mammals	Marine Mammals	Water Fowl	Fowl	Birds	Berries	Plants	Total Harvest
King Salmon	#	18.0	x												x
Red Salmon	#	4.0	x												x
Silver Salmon	#	6.0	x												x
Pink Salmon	#	2.0	x												x
Chum Salmon	#	6.0	x												x
Herring	#	0.4			x										x
Halibut	#	32.0		x											x
Cod	#	2.5			x										x
Flounder	#	5.0		x											x
Dolly Varden	#	1.5				x									x
Rainbow Trout	#	1.5				x									x
Sculpin	#	0.5			x										x
Black Bass	#	1.5			x										x
Greenling	#	1.0			x										x
Tomcod	#	0.5			x										x
Dungeness/Tanner Crab	#	0.7					x								x
Butter Clams, Cockles	#	0.23					x								x
Shellfish (other)	Qts.	1.5					x								x
Octopus	#	2.5					x								x
Fish Eggs	Qts.	2.0													x
Moose	#	500.0						x							x
Black Bear	#	58.0						x							x
Goat	#	72.5						x							x
Seal	#	50.0							x						x
Sea Lion	#	200.0							x						x
Ducks	#	1.5								x		x			x
Geese	#	3.0								x		x			x
Seabirds	#	1.5										x			x
Grouse	#	0.5									x	x			x
Ptarmigan	#	0.5									x	x			x
Celery	Qts.	0.5												x	x
Plantain	Qts.	0.5												X	x
Salmonberry	Qts.	1.0											x	X	x
Blue Berry	Qts.	1.0											x	X	x
Highbush Cranberry	Qts.	1.0											x	X	x
Currant	Qts.	1.0											x	X	x
Rhubarb	Qts.	1.0												X	x

APPENDIX C

MONTHLY CALENDAR RETURNS INDICATING MONTHS OF CALENDARS RETURNED, RESOURCES HARVESTED, AND PERCENTAGE OF RETURNS BY RESOURCE CATEGORY AND TOTAL NUMBER OF DIFFERENT RESOURCES FOR PORT GRAHAM

PORT GRAHAM RESOURCE USE DATA

HHID	# CAL	m (81)	j	j	a	s	o	n	d	j (82)	f	m	a	KING	RED	SIL	PINK	CHUM	HAL	FLOUN	HERR	COD	SCUL	BASS	GRNL	TOMCD	RBT	DOLLY	FSHEGG	CRAB	CLAMS	SHELLF	OCT	MOOSE	BEAR	GOAT	SEAL	SEA LION	DUCK	GEESE	GRSE	PTARM	SEA BIRD	SLBERR	BLBERR	HIGHB	CURR	CELER	PLANT	RHUB	Total Res.	% (n/34)
1	12	x	x	x	x	x	x	x	x	x	x	x	x	1	1	1	1	1	1												1	1	1						1												10	29.4%
2	11	x	x	x	x	x	x	x	x	x	x	x		1	1	1		1			1										1	1																1				8	23.5%
4	8	x	x	x	x	x	x				x	x			1	1															1						1															4	11.8%
5	8	x	x	x	x	x	x	x	x					1	1	1	1	1	1	1	1	1							1	1	1	1	1									1					1				1	1		18	52.9%
6	8	x	x	x	x					x	x	x	x	1	1		1	1	1									1														1										7	20.6%
7	4	x								x	x	x																					1																					1	2.9%
8	12	x	x	x	x	x	x	x	x	x	x	x	x		1	1	1	1	1	1	1	1	1	1	1	1		1		1	1	1	1												1	1	1		1			21	61.8%
9	11	x	x	x	x	x	x	x	x	x	x	x		1	1	1	1	1	1	1		1	1	1	1	1		1		1	1	1	1						1		1										19	55.9%
10	12	x	x	x	x	x	x	x	x	x	x	x	x	1	1	1			1		1											1	1	1																				8	23.5%
11	12	x	x	x	x	x	x	x	x	x	x	x	x		1	1	1			1	1	1	1	1		1	1	1	1	1	1	1					1		1	1				1	1						20	58.8%
12	1	x																																																	0	0.0%
13	1	x																																																	0	0.0%
14	6	x	x			x	x	x	x					1	1													1																								3	8.8%
15	12	x	x	x	x	x	x	x	x	x	x	x	x	1	1				1							1		1			1	1	1		1					1													10	29.4%
16	12	x	x	x	x	x	x	x	x	x	x	x	x	1	1	1	1		1	1							1						1		1								1													10	29.4%
17	1	x																																																	0	0.0%
18	7	x		x	x		x			x	x	x			1													1																								2	5.9%
19	12	x	x	x	x	x	x	x	x	x	x	x	x		1																		1																				2	5.9%
20	9	x	x	x	x	x				x	x	x	x			1				1		1				1		1		1															1								7	20.6%
21	1	x												1																																					1	2.9%
22	11	x	x	x	x	x	x	x		x	x	x	x			1	1	1														1	1	1																			6	17.6%
23	10	x	x	x	x	x	x			x	x	x	x		1	1	1		1	1	1							1		1	1																						9	26.5%
24	6	x	x	x	x	x	x							1	1				1																											1								4	11.8%
25	12	x	x	x	x	x	x	x	x	x	x	x	x		1	1	1		1							1		1		1		1																						8	23.5%
26	10	x			x	x	x	x	x	x	x	x	x						1	1						1	1																												4	11.8%
27	5	x	x	x	x	x											1		1																											1		1						4	11.8%
28	6	x	x	x	x	x	x																																											0	0.0%
29	12	x	x	x	x	x	x	x	x	x	x	x	x	1	1				1									1																								4	11.8%
30	10	x	x	x	x	x	x			x	x	x	x	1	1	1																														1								4	11.8%
31	2	x	x															1					1																													2	5.9%
32	5	x	x	x	x	x										1	1		1		1												1																					5	14.7%
33	4	x	x	x	x									1	1			1	1																												1							5	14.7%
34	12	x	x	x	x	x	x	x	x	x	x	x	x		1																		1	1						1		1					1	1						7	20.6%
35	8	x	x	x	x	x	x	x	x					1	1				1				1											1			1		1	1	1	1								1		1		12	35.3%
36	4	x	x	x	x													1																		1															3	8.8%
37	8	x	x	x	x	x	x	x	x										1				1																					1			1						1		5	14.7%
38	1	x																		1																															1	2.9%
39	9	x	x	x	x	x				x	x	x	x						1																															1	1	3	8.8%
41	8	x	x	x	x	x	x	x	x									1	1	1												1						1			1		1			1								8	23.5%
42	1	x																																																	0	0.0%
43	6	x	x	x	x	x	x							1	1													1																								3	8.8%
44	1	x																																																	0	0.0%
45	6		x			x	x	x	x		x																																										0	0.0%
46	2				x	x										1																															1					2	5.9%
47	1				x																																															0	0.0%
48	10			x	x	x	x	x	x	x	x	x	x			1																																			1	2.9%
51	1				x																																															0	0.0%
Tot	# of Harvesters													13	24	18	14	8	24	8	6	6	5	5	3	8	1	13	2	9	13	16	5		2		6	1	8	5	1		2	9	4	3	2	2	4	1	34	
47	% of Households													27.7%	51.1%	38.3%	29.8%	17.0%	51.1%	17.0%	12.8%	12.8%	10.6%	10.6%	6.4%	17.0%	2.1%	27.7%	4.3%	19.1%	27.7%	34.0%	10.6%	0.0%	4.3%	0.0%	12.8%	2.1%	17.0%	10.6%	2.1%	0.0%	4.3%	19.1%	8.5%	6.4%	4.3%	4.3%	8.5%	2.1%		

APPENDIX D

MONTHLY CALENDAR RETURNS INDICATING MONTHS OF CALENDARS RETURNED, RESOURCES HARVESTED, AND PERCENTAGE OF RETURNS BY RESOURCE CATEGORY AND TOTAL NUMBER OF DIFFERENT RESOURCES FOR ENGLISH BAY

ENGLISH BAY RESOURCE USE DATA

HHID	# CAL	B1 m	j	j	a	s	o	n	d	B2 j	f	m	a	KING	RED	SIL	PINK	CHUM	HAL	FLOUN	HERR	COD	SCUL	BASS	GRNL	TOMCD	RBT	DOLLY	FSHEGG	CRAB	CLAMS	SHELLF	OCT	MOOSE	BEAR	GOAT	SEA LION	DUCK	GEESE	GRSE	PTARM	SEA BIRD	SLBERR	BLBERR	HIGHB	CURR	CELER	PLANT	RHUB	Total Res.	% (n/30)
50	1												x																																					0	0.0%
53	5	x	x	x	x	x								1	1	1	1	1	1							1		1				1											1	1				1	11	36.7%
54	5	x	x	x	x	x									1	1			1							1		1	1			1											1		1					6	20.0%
55	4	x	x	x	x										1	1	1														1											1		1					7	23.3%
56	12	x	x	x	x	x	x	x	x	x	x	x	x		1		1				1							1	1																					12	40.0%
57	12	x	x	x	x	x	x	x	x	x	x	x	x		1	1	1									1	1	1	1	1	1	1													1	1					9	30.0%
58	4	x			x	x	x								1	1	1											1	1			1				1								1	1					16	53.3%
60	5	x	x	x	x	x								1	1	1	1		1			1	1			1		1	1	1	1	1											1	1	1					17	56.7%
61	12	x	x	x	x	x	x	x	x	x	x	x	x	1	1	1	1		1	1				1		1		1		1		1		1		1	1	1					1	1						6	20.0%
62	10	x	x	x	x	x	x	x	x			x	x		1	1	1									1		1				1																		16	53.3%
63	5	x	x	x	x	x	x							1	1	1	1											1	1	1	1	1	1				1						1	1	1	1			1	15	50.0%
64	9	x	x	x	x	x	x			x	x	x	x	1	1	1	1	1	1	1			1					1	1	1	1	1					1							1				1			6	20.0%
67	2	x			x										1	1	1											1	1			1																		0	0.0%
68	9	x				x	x	x	x	x	x	x	x																																				6	20.0%
69	8	x	x	x	x	x	x	x	x					1	1		1											1		1	1																			9	30.0%
70	3	x	x	x	x									1	1				1		1							1	1	1	1																1			8	26.7%
71	6	x			x	x					x	x	x	1	1	1	1		1							1		1			1																			2	6.7%
72	5	x						x	x	x	x															1						1																		10	33.3%
73	4	x		x	x	x									1	1	1	1	1									1	1	1	1	1																			0	0.0%
74	1	x																																																2	6.7%
75	1	x													1																	1																			7	23.3%
76	3	x	x	x											1	1	1															1																			2	6.7%
82	8	x	x	x	x	x	x	x	x						1													1																							16	53.3%
83	5	x	x	x	x	x								1	1	1	1	1	1									1	1	1	1						1						1	1	1	1			1	6	20.0%
84	4	x	x	x	x	x								1	1		1		1	1								1																								1	3.3%
85	5	x	x	x	x	x	x																									1																			8	26.7%
86	4	x	x	x	x	x									1	1			1									1	1																1							0	0.0%
87	8	x	x	x	x	x	x	x	x	x																																									7	23.3%
88	10	x			x	x	x	x	x	x	x	x	x			1	1	1								1			1			1																				
101		# of Harvesters												10	22	17	18	5	12	4	2	1	1	1		8	1	19	13	9	5	18	1		1		5	1	1			2	12	10	8	3	1	3		30	
29		% of Households												34.5%	75.9%	58.6%	62.1%	17.2%	41.4%	13.8%	6.9%	3.4%	3.4%	3.4%	0.0%	27.6%	3.4%	65.5%	44.8%	31.0%	17.2%	62.1%	3.4%	0.0%	3.4%	0.0%	17.2%	3.4%	3.4%	0.0%	0.0%	0.0%	6.9%	41.4%	34.5%	27.6%	0.0%	10.3%	3.4%	10.3%		