RESOURCE USE PATTERNS IN CHENEGA, WESTERN PRINCE WILLIAM SOUND: CHENEGA IN THE 1960S AND CHENEGA BAY 1984-1986

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ABSTRACT

In 1984, the village of Chenega Bay was resettled after a 20 year absence from western Prince William Sound. The Division of Subsistence, Alaska Department of Fish and Game, undertook a study between 1985 and 1986 to locate and summarize available information on traditional uses of wild renewable resources by Chenega residents prior to 1964, and to identify and describe the harvest and use of wild resources in the re-established village of Chenega Bay.

A literature review and three household surveys were conducted. Former residents of the 1960s village were surveyed, and annual harvest surveys of Chenega Bay residents were conducted in spring 1985 and 1986. Maps of previous and currently utilized resource harvest areas were also developed through interviews with village residents.

In the early 1960s, commercial fishing, cannery work, and trapping were the predominant components of the village cash ecomony. All households were engaged in the harvest and use of resources in the 1960s. Based on estimates of an average annual household, seal, sea lion, chum salmon, and silver salmon contributed the highest number of pounds to the overall household harvest. Marine mammals accounted for 67 percent of the reported annual harvest, and salmon accounted for 18 percent. The mean estimated household harvest for Chenega in the early 1960s was 7,311 pounds edible weight. The per capita harvest was 1,422 pounds.

In 1986, Chenega Bay on Evans Island was the smallest community in Prince William Sound, with a population of 60 people. Accessible only by air or water, the village is 55 air miles east of Seward, and 84 air miles southwest of Cordova. Seventy-seven percent of the population was Alaska Native.

Thirteen of the 16 households surveyed in 1986 had members who resided in the former village. The median age for the village was 23 years. Eighteen children were enrolled in the school.

Employment in Chenega Bay was primarily in commercial fishing in 1985, but predominantly construction in 1986. Commercial fishing and government services also contributed to the cash economy. In 1985-86, 25 people were employed, for an average of 4.9 months per person.

All surveyed Chenega Bay households harvested resources in 1985-86. The number of resources harvested by each household ranged between 5 and 28, with a mean of 14 resources. Eighty percent of the households harvested salmon and sixty percent took marine mammals. In 1985-86, Chenega Bay households harvested an average of 1,286 pounds of wild resources, and reported using an average of 866 pounds of wild resources. The per capita harvest was 361 pounds, and per capita use was 243 pounds. The 1985-86 per capita harvest reflected an increase of 73.6 percent over 1984-85 levels. Deer, marine mammals, salmon, and halibut were the major resources harvested by weight. Marine mammals constituted 39 percent of the village harvest (7,996 lbs), salmon, 21 percent (4,286 lbs), and game, 20 percent (4,167 lbs).

Sixty-one percent of the salmon was taken from commercial catches, 29.5 percent from non-commercial nets or methods, and 9.4 percent by rod and reel. Silver salmon contributed the most salmon to the household harvests by weight, followed by king and chum salmon. Salmon harvests rose 18 percent from 1984 to 1985.

Areas used for harvesting resources expanded from 1984-85 to 1985-86. Similar to patterns in the early 1960s, Chenega Bay residents primarily used western Prince William Sound, and particularly islands and bays closest to the new village.

The presence of a former Chenega resident in the household and participation in commercial fisheries by at least one household member were attributes associated with higher harvest levels. However, use levels were very similar, indicating widespread sharing and distribution of harvested resources.

Six households at Armin F. Koernig Hatchery, Port Ashton, and on Latouche Island were also interviewed in 1985. Overall, the six households had a per capita harvest of 250.2 pounds of resources. Salmon and halibut dominated the harvest.

In 1985-86 commmercial fishing and cannery work did not play as significant a role in the Chenega Bay's economy as they did in the economy of the earlier village. The new village enjoys services not available earlier, including electricity, water and sewer systems, and telephones.

Per capita harvests in 1986 at Chenega Bay were 42 percent of the 1960s estimate, excluding marine mammals. Regulations have affected, and probably curtailed salmon, big game, and bird egg harvests in 1984-86. The availability of resources is also a factor influencing harvest levels. Halibut are available in greater abundance in Sawmill Bay than near Chenega Island. Crab and shrimp are being brought into the village through trade with commercial fishermen. Sea otter predation has reduced the availability of many intertidal resources.

Changes in technology used for harvesting and preserving resources have enhanced deer hunting and allowed larger harvests at one time because of ease of handling. Other factors influencing resource harvest levels in 1984-86 compared with the early 1960s included the marketability of furbearers, the accessability of imported foods, familiarity with area, and transmission of knowledge.

Chenega of the early 1960s was heavily dependent on natural resources for food and as a source of income. In Chenega Bay in 1984-86, natural resources still figured prominently in the local economy. The research found relatively high levels of harvest, use, and participation in harvesting activities. The village residents have adapted and responded to their new environment through the re-application of traditional hunting and fishing practices.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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CHAPTER 1

INTRODUCTION

Prince William Sound, on the northern Gulf of Alaska, is a varied marine environment hosting diverse human settlements and activities. It is protected from the rough open waters of the Gulf of Alaska by a series of barrier islands. Over five million acres of land around the sound are managed by the U.S. Forest Service as part of the Chugach National Forest. The majority of this acreage is undeveloped wilderness, with a coastline of bays, lagoons, fjords, islands, and tidewater glaciers. Interspersed within this wilderness are five communities of varying sizes and economic composition. All five communities, Valdez (1984 population 3,687), Cordova (1984 population 2,108), Whittier (268 in 1984), Tatitlek (68 in 1984), and Chenega Bay (60 in 1985) lie within the unorganized borough.

Under current trends and plans, Prince William Sound will be the site of increasing tourism and recreational activity. Western Prince William Sound in particular has experienced considerable growth in use over the last 20 years. In the 1970s, Valdez became the terminus of the Trans-Alaska Pipeline in addition to being the state's major year round deep water port. Shipping activity in the Valdez arm has increased tremendously. Whittier serves as a gateway to Prince William Sound for many recreational users coming from Anchorage, providing access to the state ferry system and a harbor with a 525 boat capacity.

After a 20 year absence from Prince William Sound, the people of Chenega Bay have re-established a settlement on Evans Island in the southwestern portion of the sound. In order for state and federal agencies to develop

appropriate management and planning tools for western Prince William Sound, information is needed about past and current uses of the western sound and its many resources by residents there. In order to meet the need, the purpose of this report is to describe patterns of fish and game harvest and use in the village of Chenega in the early 1960s, and in the recently established community of Chenega Bay between 1984 and 1986.

BACKGROUND

Until the March 27, 1964 earthquake, Chenega was a fishing village on the southern end of Chenega Island, on Knight Island Passage in western Prince William Sound (Fig. 1). Founded before the Russians arrived in the late 1700s, Chenega was the longest occupied village in Prince William Sound at the time of the earthquake. Minutes after the earthquake, a tidal wave destroyed all the buildings in the village except one house and the school. Twenty-three of the 68 residents lost their lives (North Pacific Rim 1980:37; Plafker et al. 1969:15). The village site was abandoned immediately after the earthquake; survivors were taken initially to Cordova and later resettled in Tatitlek by the Bureau of Indian Affairs.

Plans to re-establish the village were launched in the 1970s. Provisions in the Alaska Native Claims Settlement Act allowed the village to acquire land. Those enrolled to Chenega Village Corporation chose a new site at Crab Bay on Evans Island, which was named Chenega Bay in March 1977 (North Pacific Rim 1980:36). The Chenega Corporation and the Chenega IRA Council worked together to obtain funding for a road, a water and sewer system, electric generators, a boat and float plane dock, and a school. In 1984, with the

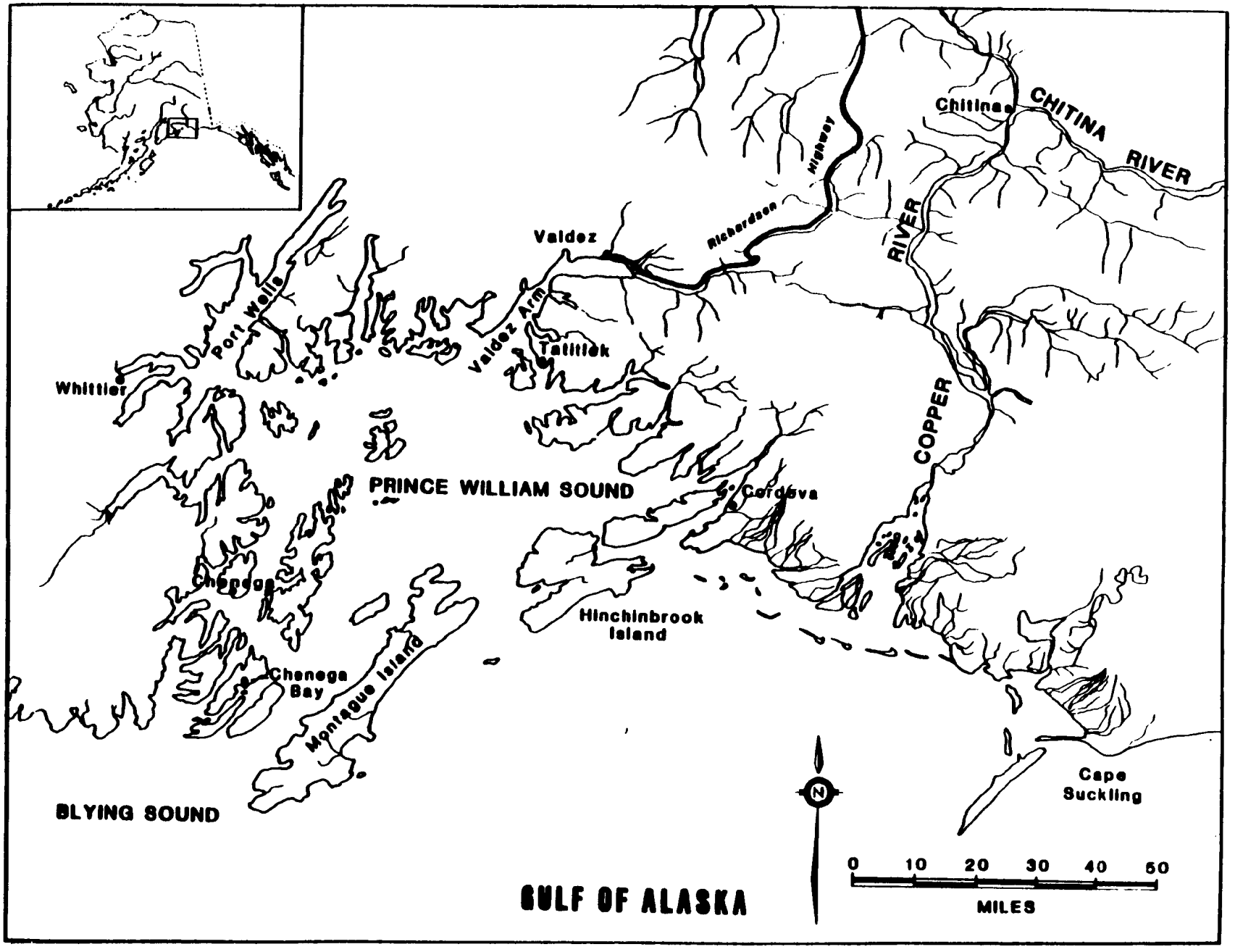


Fig. 1. Prince William Sound.

construction of 21 Housing and Urban Development (HUD) houses, the dream of a new village was realized.

Although the largest part of the resettlement occurred between August and October of 1984, relocation of people began in 1983 when two families moved to the Crab Bay site. In the spring of 1984, an additional three families took up residence. The remaining households waited until the HUD houses were completed before moving. By March 1985, 20 of the 21 HUD houses were occupied, 17 by former Chenega residents, and three by school teachers and their families. During the summer of 1985, two housing units for school teachers were built. By the spring of 1986, there were 23 housing units in Chenega, of which 16 were occupied full-time, 3 intermittently, and 4 were vacant. In addition, one person lived aboard a boat at the Chenega Bay dock.

One concern voiced by the Chenega IRA Council President prior to the re-establishment of the village was the appropriateness of non-commercial fishing and hunting regulations for the area. A comparison of previous and current non-commercial fishing and game regulations for some major species (see Appendix A) shows some regulations changed in the intervening 20 years between the earthquake and the resettlement. Annual salmon bag limits were reduced. Goat hunting had seen some additional restriction in the form of a permit requirement and reduced bag limit. Moreover, Chenega Village in 1960 was considerably more isolated than Chenega Bay in the 1980s. In the past, regulations had little applicability and similarly little enforcement, thus they were of minimal concern to village residents. In the 1980s, Prince William Sound is the site of much more activity, and enforcement of regulations is a reality. These concerns prompted interest in research in the area to determine what the characteristics of earlier hunting and fishing activities were, and to develop a framework for resource management in western

Prince William Sound which appropriately accommodates traditional subsistence uses of the Chenega people.

PURPOSES AND OBJECTIVES

In 1982 a member of the Chenega Bay Council contacted the Division of Subsistence regarding the re-settlement and concerns about fishing and hunting regulations. The council and the division identified two broad kinds of data needed to address the issues: documentation of Chenega residents' historical resource use and harvest activities, and a description of contemporary use of natural resources in Chenega Bay. Researchers developed a project to collect this information.

The study had two purposes. The first purpose was to locate and summarize available information on the traditional uses of wild renewable resources by Chenega residents prior to 1964. Secondly, the study was to identify and describe the role of resources in the economy of the recently resettled village of Chenega Bay.

Specific objectives of the study included the following:

1) Collect historical information about wild renewable resource uses and the community of Chenega including:
    a) an inventory of fish, game, and other resources;
    b) methods and means of natural resource harvests;
    c) seasonal rounds;
    d) an estimate of quantities of individual resources harvested;
    e) a summary of fishing and hunting regulations affecting Chenega residents in 1963-64;

f) maps of historic sites and descriptions of their significance in the harvesting of resources; and

g) demographic information.

2) Collect contemporary information about wild renewable resource uses and the community of Chenega Bay, including:

a) an inventory of resources harvested and used, especially marine mammals and big game;

b) methods and means of harvest;

c) seasonal rounds;

d) approximate harvest quantities;

e) a summary of fishing and hunting regulations which applied to Chenega Bay residents in 1984-86;

f) maps of areas currently used by residents for hunting, fishing, and gathering;

g) maps of areas which may be used in the future;

h) demographic information and kinship data, particularly the relations of Chenega Bay residents to the previous Chenega inhabitants, and the communities of Tatitlek and Eyak/Cordova; community size; number of households; place of birth of current residents; and places of previous residency of current residents;

i) community characteristics, particularly presence of schools and other facilities; list of wage employment opportunities, by source of employment; services available;

j) the extent of participation in commercial fishing by households in Chenega Bay, including the number and type of limited entry permits held by residents; and

k) resource harvesting groups.

3) A written report, summarizing the findings of the project.

4) Finalized field notes, meeting Division of Subsistence standards for confidentiality (Wolfe 1984), and which provide detailed information on the above outlined purposes and objectives.

LIMITATIONS

The initial research design called for a comparison of resource harvest and use in 1984-85 by the new village residents with estimates of harvest levels in the 1960s prior to the earthquake. Since most Chenega Bay households had not resided in the new village for a full year at the time of the study in spring 1985, including a full summer, data on initial harvest levels subsequent to resettlement were incomplete. A second year's data were collected for 1985-1986. Three households had moved into the village during 1985. Thus, some households surveyed in the second year still were not reporting a full annual round of harvest information.

CHAPTER 2

METHODOLOGY

The Chenega Project included four major components, some of which were extended over two years: a literature review, interviews with former Chenega residents of the 1960s, a household survey of residents of Chenega Bay, and the development of use area maps for three time periods: historic (based on archaeological and ethnographic evidence), 1960s, and 1980s.

The researchers contacted the village council president several times in the planning stages of the project. In late March 1985, the entire village council reviewed the survey instruments and granted the researchers permission to administer surveys in the village. A village resident recommended by the council was hired by Division of Subsistence as a liaison and key respondent in 1985.

Research personnel in the Chenega project were a Subsistence Resource Specialist II and a Fish and Game Technician III. The Resource Specialist was responsible for research design, training and supervision of field data collection, data analysis, and preparation of the final report. The technician had primary responsibility for data collection, and assisted in data tabulation and summary as well.

LITERATURE REVIEW

Researchers reviewed existing historical, archaeological, and ethnographic literature; a summary of available historical information appears in Chapter 3. Information from contemporary research provided information on the range of species used and harvested, and was used in drafting

questionnaire forms and interview guides.

INTERVIEWS WITH FORMER RESIDENTS

The researchers developed a list of Chenega residents in the 1960-1964 time period from a newspaper article listing earthquake survivors (Cordova Times 1964) and by referral from the village council. Eight households of survivors, located in Tatitlek, Cordova, Valdez, and Anchorage received letters explaining the project, co-signed by a researcher and the President of Chenega Bay IRA Council. The researcher contacted those residing in Chenega Bay personally. Eighteen interviews were conducted, representing 14 households of approximately 23 that existed in the 1960s. Not all interviewed households resided in the village at the time of the earthquake. The technician used an historic use questionnaire (Appendix B) to guide the interview and record data.

HOUSEHOLD SURVEYS

1985

With the assistance of village officials, the researchers compiled a list of all occupied households in the village of Chenega Bay. Using a questionnaire (Appendix C), a researcher surveyed 16 of the 20 households (80 percent). Occupants of the remaining four were out of the village during the survey period. While 16 of the households were represented in the demographic data, resource harvest and use tabulation includes data from only 15 households. One household had moved into the village two months prior to the

survey, and had not harvested or used wild resources during that time.

In addition to the households in Chenega Bay, researchers contacted an additional six households residing in western Prince William Sound. These included five households on Evans Island at the Armin F. Koernig Hatchery, formerly the Port San Juan Hatchery, and one household on Latouche Island, all of whom resided year round in the area. A summary of the use patterns for these households appears in Chapter 4.

1986

For the follow-up survey on contemporary uses, again a current listing of occupied households was developed. A revised questionnaire (Appendix D) was administered to 16 of the 17 Chenega Bay households (94 percent). One household reported only part of the household's harvest information, thus harvest levels for some species are only given for 15 households.

MAPPING COMPONENT

The design called for three maps to be compiled. The first was a composite map depicting historic sites in Prince William Sound related to natural resource harvesting. Secondly, a map of areas used by residents of Chenega in the early 1960s was to be developed. The third map was to be of areas used by Chenega Bay residents in 1984, 1985, and 1986.

The technician developed an historic site map by researching Alaska Heritage Resource Survey and Bureau of Land Management site descriptions on file at Chugach National Forest headquarters in Anchorage. Sites which were linked with harvesting or preserving activities, or which documented use of

resources, were catalogued by the technician on a summary sheet for each site (Appendix E). The location of each site was noted on an acetate overlay, using USGS quadrangles (Scale 1:250,000) as base maps.

Areas used in the 1960s by Chenega residents were composited on another acetate overlay, using the same scale base maps. The technician conducted interviews following a mapping schedule (Appendix F). While mapping interviews were conducted with individuals, one set of overlays was used for all the interviews, so that the overlays represent the collective areas used. Thirteen of the sixteen households participating in the historic use interviews provided use area information on the maps.

Contemporary use areas were recorded in the same manner as the 1960s mapped data. Eight households contributed information to the map of areas used for resource harvesting in 1985. In 1986, four households reviewed and contributed information. Two of these had mapped in 1985 as well. Everyone added new areas that had been used. The consensus in 1985 was that a wider area would be used by village residents in the coming years as people become familiar with the vicinity and acquire the equipment necessary to fish and hunt in the area. This was realized in part in 1986.

CHAPTER 3

FINDINGS

HISTORIC BACKGROUND

Long before the Russians and other Europeans ventured into the area, the Tanimiut, or Chenega people, claimed the western Prince William Sound below Port Wells as their territory. They were speakers of the Alutiiq (Sugpiaq) language, which is closely related to Central Yupik Eskimo. The Chenega people were part of a group referred to in the literature as "Chugach Eskimo," or "Pacific Eskimo." The principal village of the Tanimiut was Chenega, or Ingimatia, which means "under the mountain" (de Laguna 1956:28,30). The old Chenega village site has not been dated because the village was occupied when major archaeological work was undertaken in the 1930s in Prince William Sound. Before occupation of the site on the southern tip of Chenega Island, the people lived on the southern end of Knight Island, north of Little Bay. The site was called Uksillenquasaaq which means "small wintering place" (Kompkoff n.d.:1).

European contact began in the 1700s. Vitus Bering visited Chugach territory in 1741, stopping at Kayak and Wingham Islands in the Gulf of Alaska. Captain James Cook was the first European explorer of Prince William Sound in 1778 (de Laguna 1956:10). The Russians followed, bringing with them Russian Orthodoxy and the fur trade. By 1803, Chugach throughout Prince William Sound were hunting sea otter for the Russians (Hassen 1978:137). By the late 1800s, furbearer populations were severely depleted.

Although commercial salmon fishing was a growing industry at the mouth of the Copper River by the 1880s, it was not until World War I that the industry

expanded to Prince William Sound, and a cannery was opened at Port Nellie Juan. The cannery had a profound effect on the Chenega people. Every summer, residents of the village moved to a site known as Shipyard, two miles north of Port Nellie Juan. The people commercial fished until the season closed (Kompkoff n.d.:15).

Historic accounts and archaeological evidence indicate that for at least the last two centuries, villagers have relied heavily on sea mammals, fish, and other marine resources. Hunting for goat, bear, moose, and more recently deer, was also common. Villagers also harvested a variety of waterfowl for various purposes in earlier years (Birket-Smith 1953; de Laguna 1956).

Until the 1964 earthquake, Chenega had perhaps one of the most stable populations of Prince William Sound villages. Census figures for Chenega showed a population of 80 people in 1880, 71 in 1890, and 91 inhabitants in 1950 (Table 1). There were between 68 and 76 residents at the time of the earthquake. Twenty-three people were lost in resulting tsunamis. Survivors were relocated to Tatitlek and Cordova (GDM 1983:7; North Pacific Rim 1980:37).

CHENEGA IN THE EARLY 1960S

Demography

As described in the methology section, interviews were conducted with persons resident in Chenega Bay prior to the 1964 earthquake. At least one household, and a few members of other households interviewed were not living in Chenega at the time of the village's destruction. As high school education was not provided in the village at that time, families moved to Cordova to see

TABLE 1. POPULATION OF PRINCE WILLIAM SOUND 1880-1985

	1880	1890	1900	1910	1920	1929	1939	1950	1960	1970	1980	1985
Chenega	80	71	140	--	--	90	95	91	--	0	0	60[a]
Cordova	--	--	--	1,152	955	980	938	1,165	1,128	1,164	1,879	2,108[b]
Ellamar	--	--	--	98	106	--	46	23	--	--	--	5[a]
Eyak	--	--	22	--	320	366	365	--	--	--	47	--
Katalla	--	--	--	--	84	44	23	--	--	--	--	--
Kaniklik	--	73	52	32[c]	8[d]	0	0	0	0	0	0	0
Latouche	--	--	--	--	505	339	40	--	--	--	--	3[a]
Nuchek	145	144	--	30[c]	11[d]	0	0	0	0	0	0	0
Tatitlek	90	149	--	156	187	70	75	89	96	111	68	--
Valdez	--	315	--	810	466	442	529	554	555	1,005	3,079	3,687[b]
Whittier	0	0	0	0	0	--	--	627	809	130	198	268[b]

Sources: The North Pacific Rim 1980; Hassen 1978; Alaska Department of Fish & Game 1985.

a researcher's observation. Chenega Bay for 1986, all others 1985.
b Alaska Department of Labor, 1984 population
c actually for 1909
d actually for 1916
--: no information available

their children through high school, or else sent them to boarding schools. The eighteen people interviewed represented 14 of approximately 23 households residing in Chenega Bay in the early 1960s. The 14 households contained 72 members. Of the 72, 42 (60 percent) were male. Age information was not collected on the 1960s survey. Household sizes ranged from 2 to 15 (Fig. 2). The average household size was 5.1 members.

Employment

Commercial fishing was the mainstay of the cash sector of Chenega's economy in the 1960s. All 14 households represented by the historic survey respondents reported involvement in the salmon seine fishery. All households also reported deriving at least some income from sale of trapped furbearers and from a bounty on seals. Two canneries on Evans Island provided employment for at least one member of half the households during the summer, typically women. The canneries also employed members of two households as winter caretakers. Commercial salmon fishing with set and gill nets, and commercial harvesting of razor clams were other sources of employment.

According to the respondents, much of the cash economy operated on a credit basis. Groceries and fuel were charged at the cannery stores, and later subtracted from the commercial salmon harvests. Cash was not often exchanged except when village residents travelled to Cordova to sell furs and pick up supplies.

Resources Used and Harvested

Chenega residents reported harvesting a total of 57 different resources

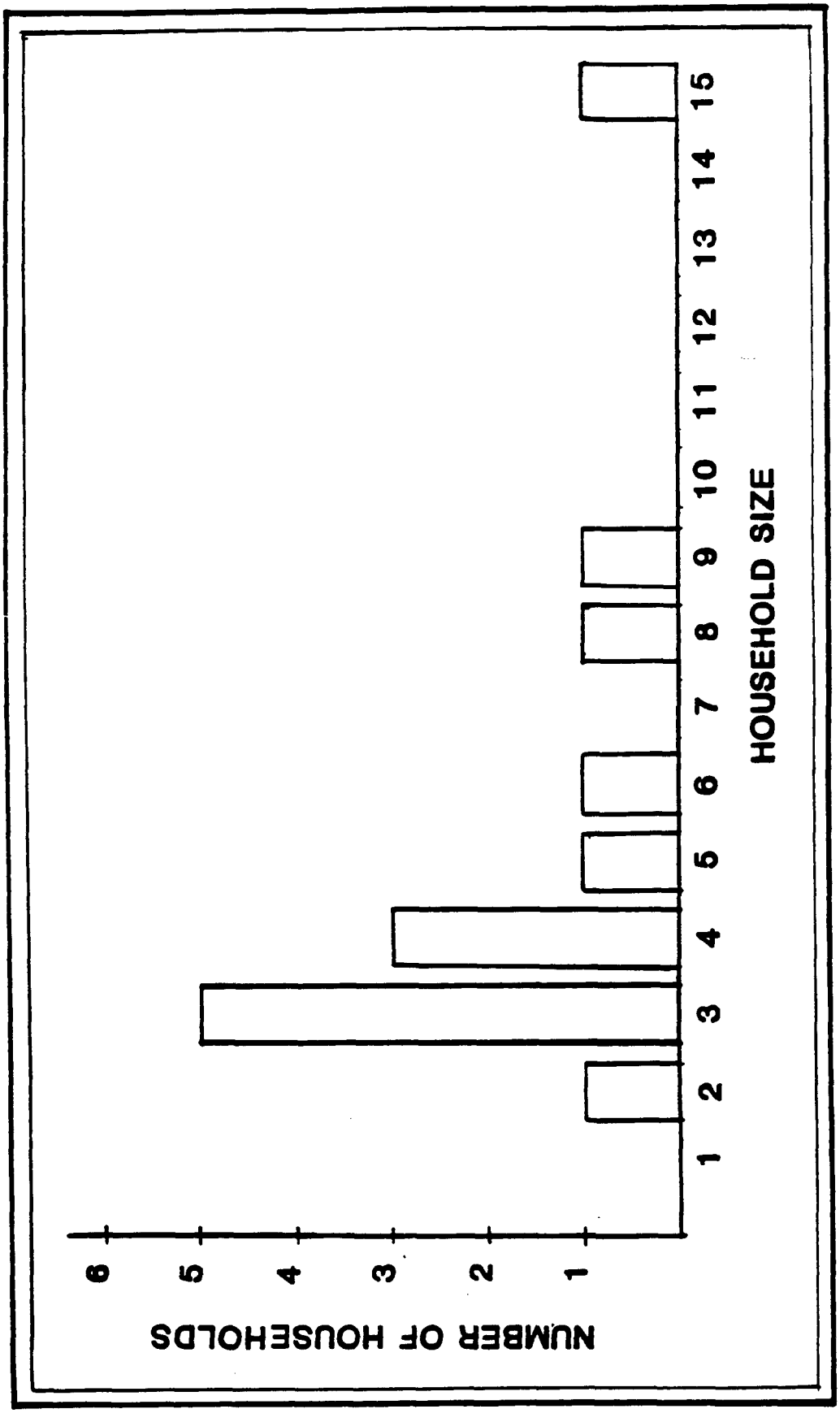


Figure 2. Household Size, Chenega in the Early 1960s.

during the 1960s. A partial listing is provided in Figure 3. Appendix G gives a full listing of the resources used, and the scientific names.

Seasonal Round

The season of harvest for major resources used by Chenega residents in the 1960s is shown in Figure 3. According to key respondents, fishing and hunting followed a regular cycle. As the snows melted in early April, black bear were hunted. Migratory birds such as crane, geese and ducks also arrived with spring and were harvested. Herring were caught throughout February and March. By April, herring roe on seaweed and lingcod roe off rocks were also gathered.

In May, gathering activities increased. Razor clams, sea urchins, seaweed, and bird eggs were all harvested. At that time, king and red salmon began returning to the sound. June, July and August were spent salmon fishing. July and August were peak months for pink and chum salmon, and the taking of salmon roe. Dolly Varden and trout were harvested in streams. Cockles and mussels were taken throughout the summer. By July, blueberries and salmonberries were ripe for harvesting.

Fall activities centered on silver salmon, black bear, deer, goat, moose, small game, and most varieties of waterfowl. Hunting continued well into winter on several of these resources. Trapping also occurred.

Throughout the year, bottomfish such as halibut and various cods and rockfish were taken. Intertidal resources, including sea cucumbers, chitons, and several kinds of clams were also gathered. Sea lion were taken throughout the winter and spring, while seal were hunted all year.

Unlike the interior where resources are only available seasonally, the

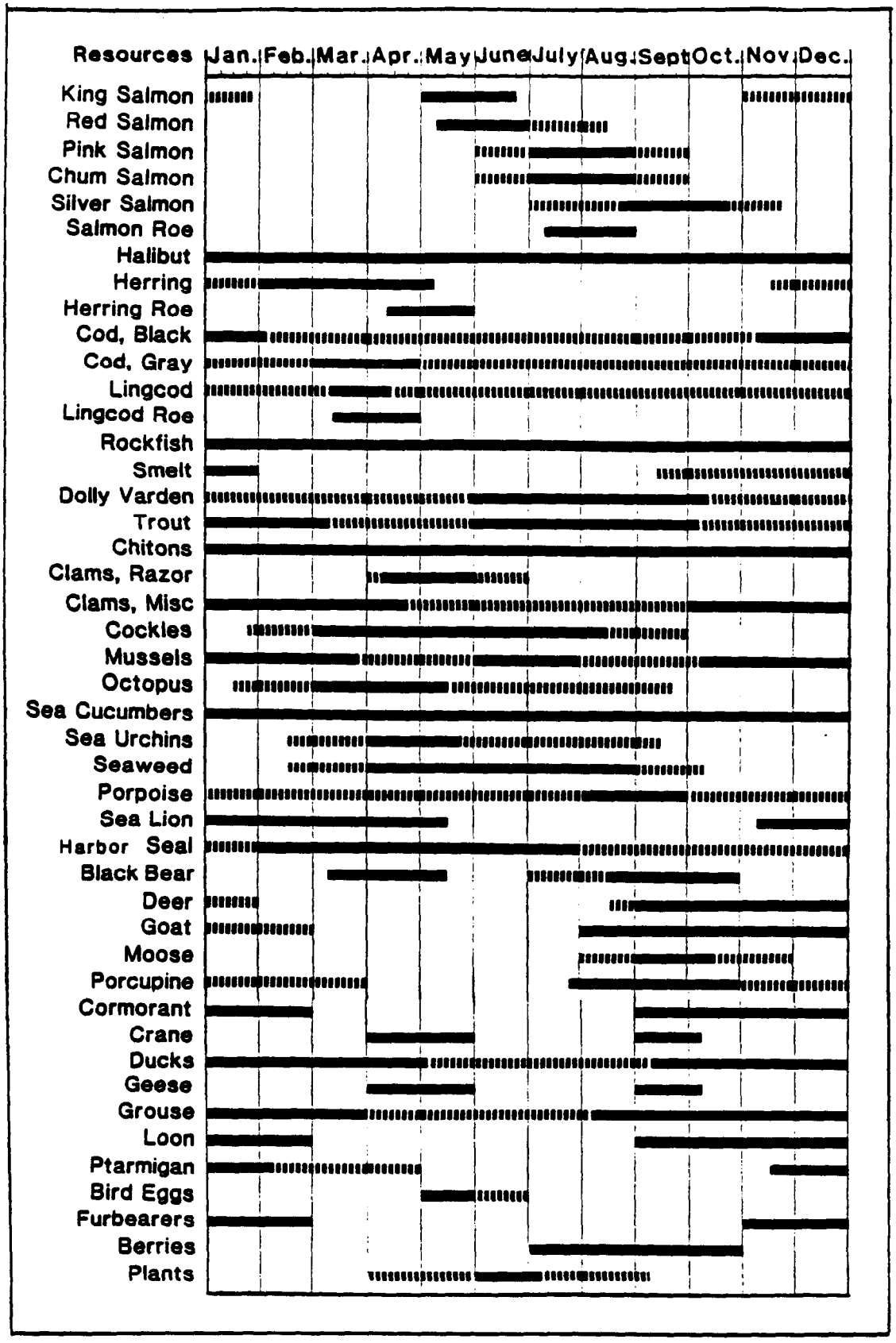


Figure 3. Seasonal Round of Harvest Activities, Chenega in the Early 1960s. (Solid line show usual harvest season. Broken line indicates occasional effort.)

rich marine environment of the sound, complemented by productive land habitat, offered Chenega residents a variety of resources throughout the year. The weather, however, played a significant role in the timing of activities. Severe winter storms could make open water travel dangerous if not impossible, so residents could not access certain areas for fishing and hunting.

Participation in Harvest and Use of Resources

One hundred percent of the households were involved in harvesting and using resources in the early 1960s (Table 2). All households reported harvesting silver salmon, seal and berries. All but one household (93 percent) harvested pink and chum salmon, herring roe, deer, sea lion, ducks, bird eggs, mink, and land otter. Thus all households were involved in fishing, marine mammal hunting, and gathering activities, and all but one in game and bird hunting (deer and ducks). Use levels reflected the high participation rates. However, survey data were not as complete regarding use, so actual levels may be under-reported in the table.

Estimated Quantities Harvested

Table 3 shows the number of wild resources harvested and used by respondents to the historic survey. These quantities reflect what respondents recalled as a typical annual household harvest and use in the early 1960s. Responses were given in approximated figures, representing broad estimates of harvest and use levels of 20 years ago. Some respondents preferred not to comment on quantities. It is unlikely that what former residents remember as a typical harvest occurred for all species in the same year.

TABLE 2. HOUSEHOLD PARTICIPATION IN RESOURCE HARVEST AND USE, CHENEGA IN THE 1960S (n=14)

Species[a]	Number of Households Harvesting	Percent of Households Harvesting	Number of Households Using	Percent of Households Using
King Salmon	7	50.0	8	57.1
Red Salmon	12	85.7	12	85.7
Pink Salmon	13	92.9	12	85.7
Chum Salmon	13	92.9	13	92.9
Silver Salmon	14	100.0	13	92.9
Halibut	10	71.4	12	85.7
Herring	8	57.1	7	50.0
Gray Cod	6	42.9	5	35.7
Black Cod	3	21.4	4	28.6
Red Snapper	11	78.6	10	71.4
Herring Roe	13	92.9	12	85.7
Smelt/Eulachon	1	7.1	1	7.1
Lingcod	4	28.6	4	28.6
Cod Roe	4	28.6	3	21.4
Dolly Varden	3	21.4	2	14.3
Cutthroat Trout	4	28.6	4	28.6
Razor Clams	7	50.0	9	64.3
Other Clams	14	100.0	12	85.7
Cockles	11	78.6	10	71.4
Mussels	6	42.9	5	35.7
Octopus	8	57.1	8	57.1
Chitons	11	78.6	10	71.4
Sea Urchins	4	28.6	4	28.6
Sea Cucumbers	9	64.3	8	57.1
Sea Snails	1	7.1	1	7.1
Seaweed	3	21.4	3	21.4
King Crab	1	7.1	3	21.4
Dungeness Crab	1	7.1	1	7.1
Shrimp	1	7.1	4	28.6
Harbor Seal	14	100.0	13	92.9
Sea Lion	13	92.9	13	92.9
Porpoise	9	64.3	8	57.1
Deer	13	92.9	12	85.7
Moose	4	28.6	3	21.4
Black Bear	13	92.9	11	78.6
Goat	11	78.6	10	71.4
Porcupine	8	57.1	7	50.0

TABLE 2. (Continued) HOUSEHOLD PARTICIPATION IN RESOURCE HARVEST AND USE, CHENEGA IN THE 1960S (n=14)

Species[a]	Number of Households Harvesting	Percent of Households Harvesting	Number of Households Using	Percent of Households Using
Geese	3	21.4	1	7.1
Ducks	13	92.9	12	85.7
Crane	1	7.1	1	7.1
Ptarmigan	4	28.6	4	28.6
Grouse	9	64.3	8	57.1
Cormorant	4	28.6	0	0
Loon	1	7.1	0	0
Gulls	1	7.1	1	7.1
Eggs	13	92.9	11	78.6
Salmonberry	14	100.0	13	92.9
Blueberry	14	100.0	13	92.9
Cranberry	8	57.1	6	42.9
Other plants and berries	13	92.9	11	78.6
Mink	13	92.9	13	92.9
Weasel	8	57.1	8	57.1
Land Otter	13	92.9	13	92.9
Wolverine	4	28.6	4	28.6
Lynx	1	7.1	1	7.1
Marten	7	50.0	7	50.0
Coyote	1	7.1	1	7.1

[a]See Appendix G for complete list of species and scientific names.

TABLE 3. ESTIMATED ANNUAL LEVELS OF HOUSEHOLD RESOURCE HARVEST AND USE: CHENEGA 1960S (n=14).

Resource[a]	Total Number Harvested	Total lbs Harvested	Household Harvest	Per Capita Harvest	Total Number Used	Total lbs Used	Household Use	Per Capita Used
King Salmon	35	742	53.0	10.3	30	638	45.6	8.9
Red Salmon	389	1,789	127.8	24.8	426	1,960	140.0	27.2
Pink Salmon	1,858	4,830	345.0	67.1	1,853	4,817	344.1	66.9
Chum Salmon	815	5,461	390.1	75.8	815	5,461	390.1	75.8
Silver Salmon	693	5,405	386.1	75.1	669	5,218	372.7	72.5
Halibut	NA[b]	1,864	133.1	25.9	NA[b]	1,289	92.1	17.9
Herring	582g[c]	221	15.8	3.1	59g[c]	190	13.6	2.6
Gray Cod	71	284	20.3	3.9	34	134	9.6	1.9
Black Cod	3	9	.6	.1	4	12	.9	.2
Red Snapper	39	155	11.1	2.2	37	149	10.6	2.1
Dolly Varden	30	27	1.9	.4	24	22	1.6	.3
Cutthroat Trout	50	70	5.0	1.0	50	70	5.0	1.0
Herring Roe	121g	846	60.4	11.8	88g	619	44.2	8.6
Smelt/Eulachon	5g	16	1.1	.2	5g	16	1.1	.2
Lingcod	11	44	3.1	.6[d]	11	44	3.1	.6[d]
Cod Roe	NA	3	.2	--[d]	NA	2	.1	--[d]
Razor Clams	44g	70	5.0	1.0	61g	98	7.0	1.4
Other Clams	1,222g	1,222	87.3	17.0	950g	950	67.9	13.2
Cockles	139g	139	9.9	1.9	81g	81	5.8	1.1
Mussels	15g	15	1.1	.2	8g	8	.6	.1
Chitons	43g	170	12.1	2.4	33g	130	9.3	1.8
Sea Urchins	10g	10	.7	.1	7g	7	.5	.1
Sea Cucumbers	4g	4	.3	.1	12g	12	.9	.2
Sea Snails	2g	2	.1	--	2g	2	.1	--
Octopus	26	102	7.3	1.4	23g	90	6.4	1.3
Seaweed	23g	90	6.4	1.3	10g	41	2.9	.6
King Crab	1	2	.1	--	4	9	.6	.1
Dungeness Crab	5	4	.3	.1	5	4	.3	.1
Shrimp	NI[e]	NI[e]	NI[e]	NI[e]	NA	30	2.1	.4
Harbor Seal	1,602	60,556	4,325.4	841.1	787	29,747	2,124.8	413.2
Sea Lion	33	6,688	477.7	92.9	50	4,908	350.6	68.2
Porpoise	13	780	55.7	10.8	10	600	42.9	8.3

TABLE 3. (Continued) ESTIMATED ANNUAL LEVELS OF HOUSEHOLD RESOURCE HARVEST AND USE: CHENEGA 1960S (n=14).

Resource[a]	Total Number Harvested	Total lbs Harvested	Household Harvest	Per Capita Harvest	Total Number Used	Total lbs Used	Household Use	Per Capita Used
Deer	61	2,420	172.9	33.6	42	1,680	120.0	23.3
Goat	23	1,575	112.5	21.9	17	1,158	82.7	16.1
Moose	4	2,000	142.9	27.8	2	1,125	80.4	15.6
Black Bear	37	2,117	151.2	29.4	25	1,446	103.3	20.1
Porcupine	32	144	10.3	2.0	26	117	8.4	1.6
Geese	30	150	10.7	11.7	24	120	8.6	1.7
Ducks	265	398	28.4	5.5	247[e]	371[e]	26.5[e]	5.2[e]
Crane	3	30	2.1	.4	NI[e]	NI[e]	NI[e]	NI[e]
Ptarmigan	11	6	.4	.1	11	6	.4	.1
Grouse	148[e]	73[e]	5.2[e]	1.0[e]	132	66	4.7	.9
Cormorant	NI	NI	NI	NI	0	0	0	0
Loon	NI	NI	NI	NI	0	0	0	0
Gulls	NI	NI	NI	NI	NI	NI	NI	NI
Eggs	1,061	53	3.8	.7	401	21	1.5	.3
Salmonberry	1,432g	358	25.6	5.0	1,232g	308	22.0	4.3
Blueberry	2,768g	692	49.4	9.6	2,408g	602	43.0	8.4
Cranberry	352g	88	6.3	1.2	240g	60	4.3	.8
Other plants and berries	NA[b]	260	18.6	3.6	NA[b]	200	14.3	2.8
Mink	349	NA[b]	NA[b]	NA[b]	NA	NA[b]	NA[b]	NA[b]
Weasel	113	NA	NA	NA	NA	NA	NA	NA
Land Otter	266	NA	NA	NA	NA	NA	NA	NA
Wolverine	6	NA	NA	NA	NA	NA	NA	NA
Lynx	2	NA	NA	NA	NA	NA	NA	NA
Marten	53	NA	NA	NA	NA	NA	NA	NA
Coyote	6	NA	NA	NA	NA	NA	NA	NA
Total[f]		101,980	7,284.3	1,416.4		64,032	4,616.6	897.7

[a] See Appendix G for complete list of species and scientific names.
[b] NA: Not Applicable
[c] g: gallons
[d] --: less than .1 pound
[e] NI: No Information
[f] Total reflects weights prior to rounding

According to these estimates, seal, chum salmon, and silver salmon were the species that contributed the highest number of pounds to the overall household harvest and use. Marine mammals accounted for 63 percent of the total reported annual harvest, and 50 percent of the total household use (Fig. 4). Salmon (all species combined) followed at 18 percent of the harvest and 27 percent of the resources used, then game (both big and small game species), at 8 percent of the harvest and 10 percent of the use. Although marine mammals undoubtedly played a considerable role in household diet in the 1960s, the high reported harvest weights for seal are likely due to the bounty on seal at that time. The 14 households reported a harvest of 1,602 seals, or 60,556 pounds, as a typical harvest at that time. It is likely that only portions of the 60,556 pounds of seal harvested were retained for human consumption. Respondents estimated their households used about 787 seals (29,747 lbs), or about 56 per household (Table 3). The questionnaire did not ask what portions of the seal were used, so it is likely this still overestimates the historic consumption of seal, as the higher the number of seal harvested, the more selective people were about the parts that were eaten. Weights used to convert the number of a given species into edible weight are provided and explained in Appendix H. Where respondents gave specific weights of resources, these estimates were used instead of the standard conversion factors shown in Appendix H.

Five species of salmon contributed over 18,225 pounds to the village harvest. After seal, salmon was the largest resource category used. Silver, chum, and pink were the most used species. Respondents reported using slightly more red salmon than they harvested, because, unlike all other resources mentioned, people frequently recalled being given a few reds in addition to what their household had harvested. They received red salmon from

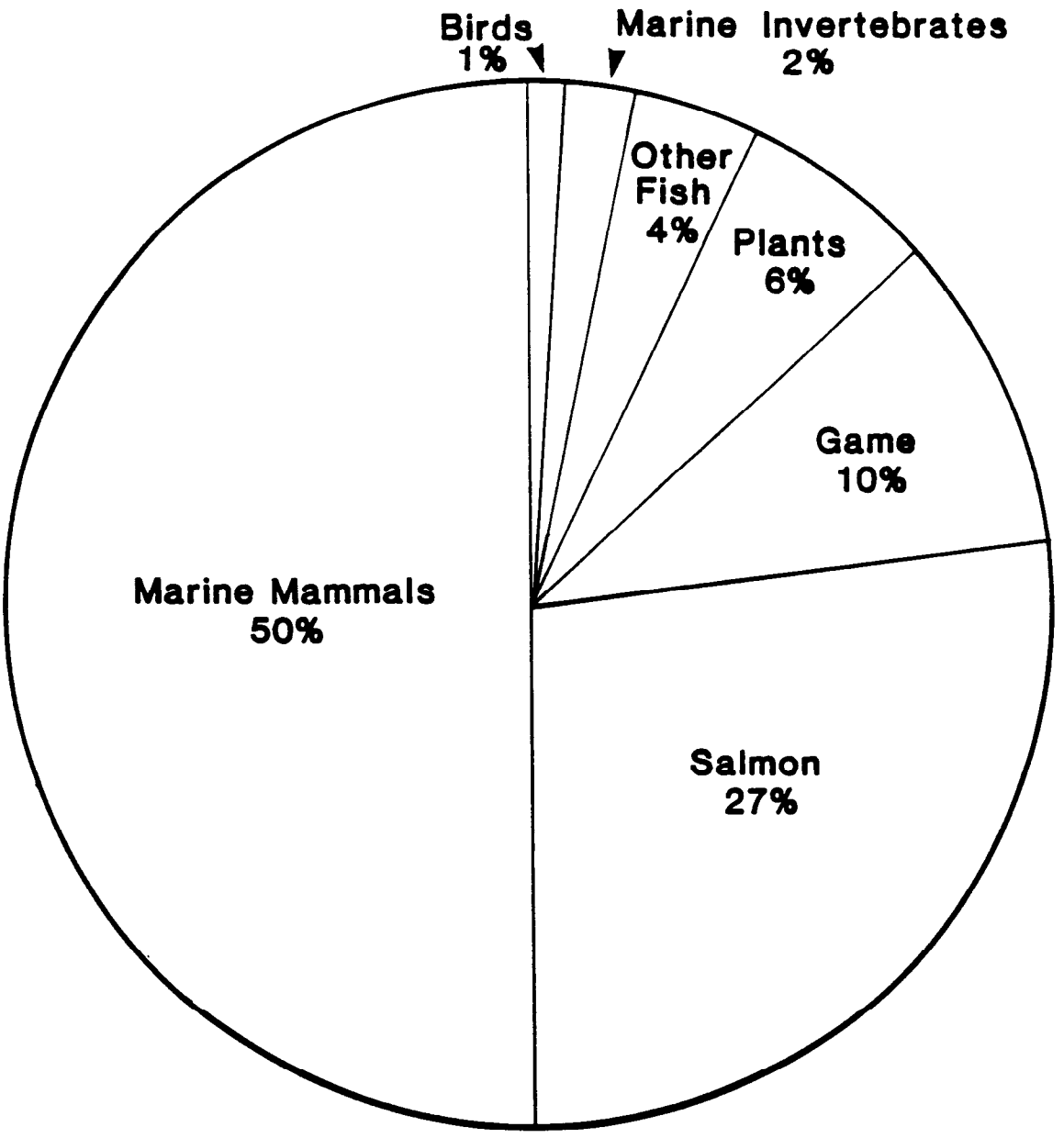


Figure 4. Resources Used by Resource Category, Chenega 1960s.

fishermen from other Prince William Sound communities where red salmon was more locally abundant.

Four big game species (deer, goat, moose, and black bear) contributed about 8,128 pounds to the total village harvest. All but one of the interviewed households reported harvesting deer and black bear, and three fourths of the respondents mentioned harvesting goat.

Overall, the mean estimated household harvest for Chenega in the early 1960s was 7,311 pounds. The mean number of reported pounds used by households was 4,780. Per capita, harvest quantities and use quantities were 1,422 and 929 pounds, respectively. The lower number of pounds used reflects seal that were harvested and not used for personal consumption, and other species of which people remembered sharing portions of their harvest. Sharing occurred not only within the village, but with relatives in Tatitlek and Cordova as well.

Harvesting and Preservation Activities

Hunting and fishing by Chenega residents in the late 1950s and early 1960s was the primary source of food and occurred throughout the year. Harvesting generally occurred during planned trips, although opportunistic harvests were also common. Harvested resources were typically distributed throughout the village. Freezers were non-existent, and refrigerators were owned by few households. Smoking, drying, salting, pickling, and fermenting were the predominant methods of preservation.

Salmon

Salmon was a staple of most Chenega households. According to former Chenega residents, the whole village left in the summer to go to salmon camps. The advent of outboard motors is clearly remembered by some, who recall rowing their families to salmon camps in open skiffs. Common salmon camp sites included the whole south side of Chenega Island, Paddy Bay, Montgomery Creek on Latouche Island, Evans Bay, Whale Bay, and Jackpot Bay (see Fig. 5). All areas used for salmon harvesting are shown in Figure 6. Often, more than one camp location was used in order to obtain a desired salmon species. Many families were gone several weeks to catch, clean, and process salmon. Camps closer to the village, such as those on the south side of Chenega Island could be reached on day trips. Fish from these close camps were brought back to the village for processing. Salmon were brought home for use in one of two ways: they were either taken out of a commercial catch early in the season or harvested from nearby streams with nets, hook and line, or by hand, and with beach seines at the mouths of creeks. Sometimes salmon were so abundant they could be picked by hand out of the water. King salmon were used to a very limited extent during the 1960s, primarily because of their scarcity in the western sound. Seven households harvested them prior to the earthquake, taking from two to seven kings each. With one exception, the kings brought home were out of commercial catches. Kings caught commercially were often salted down in buckets on the boat. One respondent remembered getting king salmon near the village during the winter. Kings were eaten fresh, salted, dried, or pickled.

All but two of the families harvested and used red salmon. Annual household harvests were typically around 20 red salmon. Some were taken out

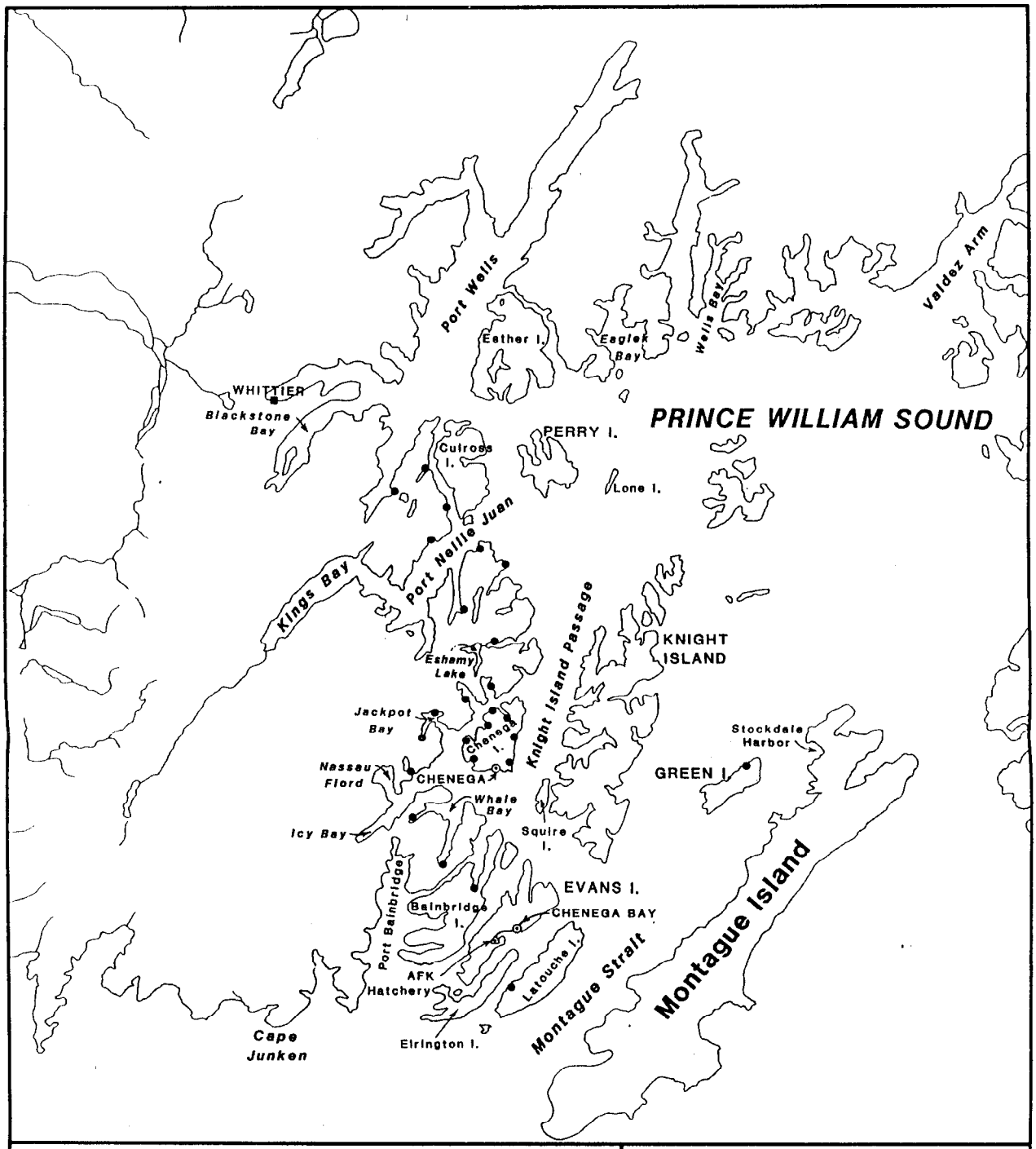
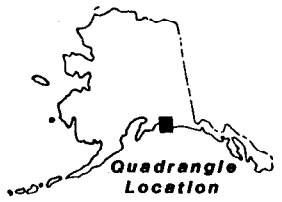


FIG. 5.
SEASONAL FISH CAMPS, CHENEGA
IN THE EARLY 1960s

• FISH CAMPS

SOURCE: This map depicts fish camps used for resource harvesting during the early 1960s by Chenega residents, as reported by 10 former residents contacted in 1985 and 1986. Because not all former residents were interviewed, and because respondents were reporting on activities that took place 20 years ago, some areas may have been omitted.



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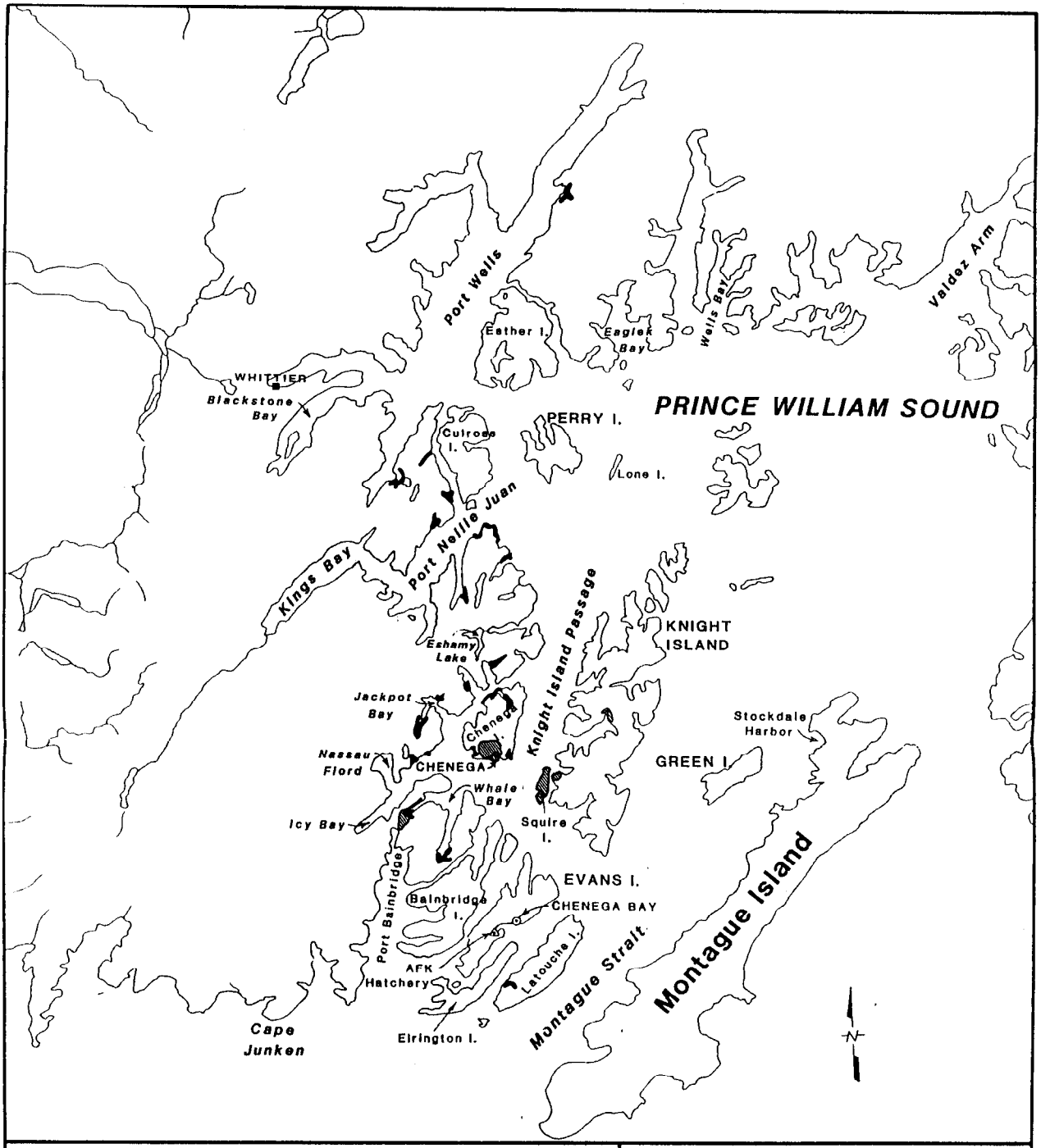
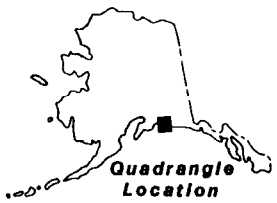


FIGURE 6. SALMON AND VEGETATION USE AREAS, CHENEGA IN THE EARLY 1960s

SALMON

VEGETATION

SOURCE: This map depicts areas used for resource harvesting during the early 1960s by Chenega residents, as reported by 13 former residents contacted in 1985 and 1986. Because not all former residents were interviewed, and because respondents were reporting on activities that took place 20 years ago, some areas may have been omitted.



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DEPT. OF FISH AND GAME
Subsistence Division

of commercial catches in late May, while in June and July reds were taken from creeks or creek mouths. Less common than pinks or chums, there were only a few places where reds were taken, such as Eshamy Lake, Paddy Bay, and Jackpot Bay. Harvest methods included seining, gillnetting, dipnetting, and use of hook and line. They were preserved by drying, smoking, and salting.

Pink salmon were harvested in the largest numbers of all the salmon species. Household harvests varied from 50 to 300 pink salmon, with a mean harvest of 133 fish. Chum salmon were harvested in smaller numbers than pinks, but represented a higher number of pounds because of the larger size of the fish. Typical harvests varied in magnitude from 20 to 100 chum salmon, with a mean of 58 fish harvested per household. Some pink and chum salmon were brought home from commercial seining, but the majority of the harvest was from the creeks. Some pinks and chum were taken with beach seines before entering the creeks. However, creek salmon were preferred by many for smoking, as they dried earlier and tasted better than ocean bright fish. Raw pink salmon noses and humps (a Chugach delicacy) could only be obtained from creek humpies. Chum salmon were primarily dried, while pinks were smoked, salted, and dried.

Silver salmon contributed over 5,400 pounds to the village salmon harvest, second only to chum salmon. All 14 of the households reported harvesting silver salmon in a typical year. Household harvests were commonly between 10 and 50 fish, with a mean of 50 silver salmon harvested per household. Some silver salmon were brought home from commercial drift net catches, but most were obtained from the creeks in the months of September and October on Chenega and Latouche islands and Whale Bay. Subsistence gillnets, small beach seines and rod and reel were used. Preservation methods varied from house to house, with all of the methods mentioned for other species used.

Salmon roe was consumed. Pink and chum salmon roe were eaten raw, boiled, or fermented. Berries and seal oil were often added to the fermented eggs before eating.

Herring

Herring was a popular delicacy for many Chenega households, but others did not use herring at all during the 1960s. Of the eight households that reported harvesting and using herring, three indicated that a typical harvest was at least 70 pounds. The total village harvest of 254 pounds represents a household mean of 18 pounds of herring. Most commonly fried, herring were also smoked, pickled, and salted. Some residents used the salted herring exclusively for bait, trapping, or bottomfishing. Herring were generally taken in the winter or spring. Several Chenega households reported jigging for herring, while a few households used commercial seines or gillnets. One family dipnetted herring, and one harvested spawning herring by hand. Herring were seasonally available in front of the village. Some herring were harvested near Tatitlek.

Herring roe on kelp was collected in the spring after herring had spawned. "Popweeds" (Fucus sp.) were the most common substrate near Chenega. Some herring spawn-on-kelp was generally available within walking distance of the village and collected in plastic laundry baskets or in five gallon buckets. A few households took skiffs or commercial boats to a nearby area. Spawn was either eaten that day or salted and preserved for later use. The herring spawn-on-kelp was typically par-boiled, then dipped in seal oil and eaten.

Miscellaneous Finfish and Bottomfish

Bottomfish such as halibut, red snapper, and cod were generally taken by handline from skiffs in front of the old village during the 1960s. Herring was often used as bait. Figure 7 shows the areas used in the 1960s for all non-salmon finfish. No Chenega residents fished halibut commercially in the early 1960s.

Halibut was the most commonly harvested bottom fish. Ten of the 14 households fished for halibut, contributing an estimated 1,864 pounds to the village annually, an average of 133 pounds per household. Halibut were cleaned and cut up on the beach in front of the village. Anyone interested came and got a piece of fish for dinner. Fishing occurred primarily in the late spring through early fall, with a particular emphasis on fishing in spring during the six week Lent season preceding Easter.

Red snapper (actually a rockfish) was the second most commonly caught species of bottomfish. Snapper were caught year round, but especially in the fall and winter, often while halibut fishing. Eleven of the 14 households reported harvesting red rockfish, for an average annual harvest of about 11 pounds.

Only a few individuals fished for gray and black cod. Gray cod were harvested year round, while black cod were taken mainly in the winter. The estimated annual harvest of each was 284 pounds and 9 pounds, respectively. Availability varied from year to year. Gray cod were taken in front of the village opportunistically while habibut fishing. Boiled gray cod stomach and livers were a delicacy.

Lingcod were also only harvested by a few people on an occasional basis throughout the year. Lingcod were reportedly available closer to the village

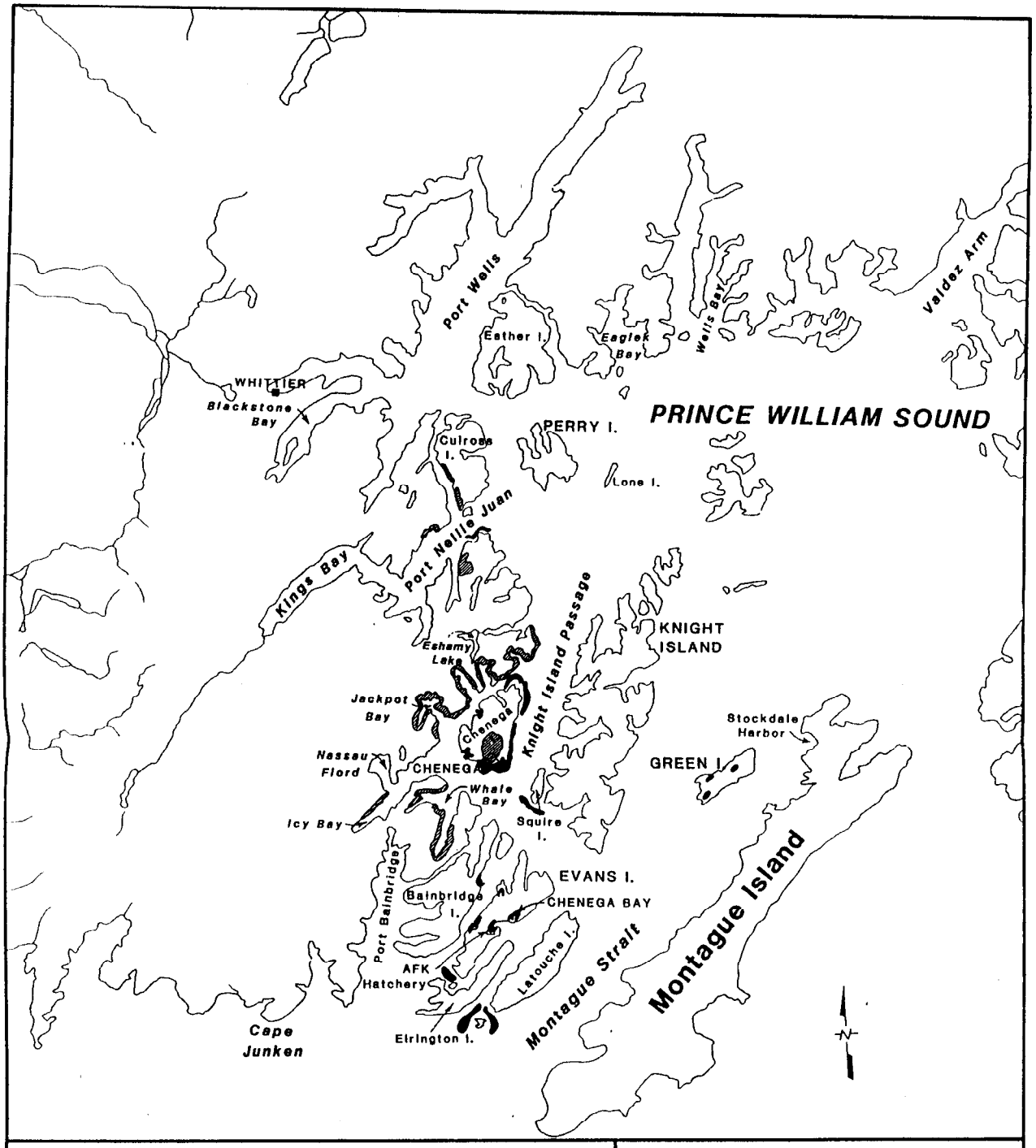

FIGURE 7.
NON-SALMON FINFISH AND SMALL GAME USE AREAS, CHENEGA IN THE EARLY 1960s

NON-SALMON FINFISH

SMALL GAME

SOURCE: This map depicts areas used for resource harvesting during the early 1960s by Chenega residents, as reported by 13 former residents contacted in 1985 and 1986. Because not all former residents were interviewed, and because respondents were reporting on activities that took place 20 years ago, some areas may have been omitted.

SCALE

0 10 20 30 Miles

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STATE OF ALASKA
DEPT. OF FISH AND GAME
Subsistence Division

than halibut. While the fish itself was not commonly harvested, villagers considered lingcod eggs a delicacy and collected lingcod spawn in intertidal areas during spring minus tides. Described as "orange loaves of bread", they were about 12 to 14 inches in length. Lingcod spawn were eaten raw or boiled, served sometimes with seal oil.

Only a couple individuals recalled using hook and line to harvest cutthroat trout and Dolly Varden. One respondent fished through the lake ice on Chenega Island, while another respondent remembered fishing through ice on Green Island for these species. Some were taken during the summer while at fish camp. When caught, the fish were fried up fresh.

A few smelt were taken in the Valdez area with a dipnet, or were harvested near Cordova while visiting relatives. Neither eulachon nor smelt were available near Chenega Island.

Clams

A winter-time staple, clams were harvested in quantities of up to 300 pounds per household per year during the 1960s. Butter clams made up the majority of the harvest, but littlenecks and cockles were also popular. The mean household harvest for all clams was about 102 pounds, including cockles. Areas used for clam and other marine invertebrates are shown in Figure 8.

In the early 1960s a few Chenega households participated in a commercial razor clam fishery in eastern Prince William Sound, but seldom took clams home. Only one respondent reported digging razor clams non-commercially for home use.

Butter clams were available near the village in areas accessible by foot or skiff. The clam population was healthy, and villagers harvested butter

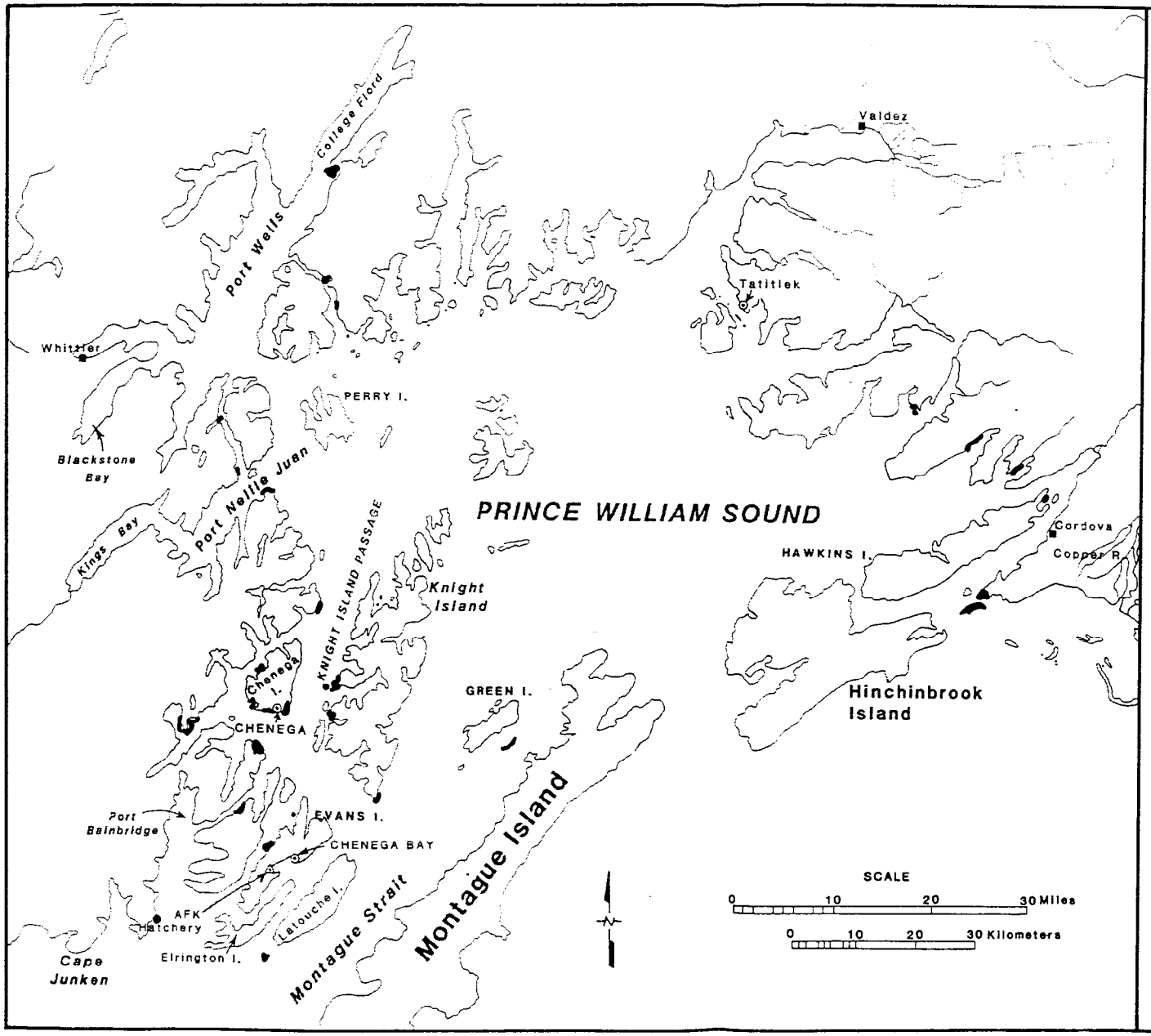


FIGURE 8.
MARINE INVERTEBRATE USE AREAS,
CHENEGA IN THE EARLY 1960s

3 MARINE INVERTEBRATE

SOURCE: This map depicts areas used for resource harvesting during the early 1960s by Chenega residents, as reported by 13 former residents contacted in 1985 and 1986. Because not all former residents were interviewed, and because respondents were reporting on activities that took place 20 years ago, some areas may have been omitted.

STATE OF ALASKA
DEPT. OF FISH AND GAME
Subsistence Division

clams by the bucket-full from Chenega Island, Knight and Squire islands, Culross Passage and Esther Passage. Although a few households dug clams year round, most harvesters concentrated on the winter and spring months. Some followed the "R" month rule, harvesting clams only during months with an "R", (September through April), when paralytic shellfish poison (PSP) is supposedly least likely to occur in intertidal shellfish.

According to survey respondents, cockles were only available in limited areas. Hunters harvested them opportunistically in conjunction with other activities, such as seal hunting and commercial salmon fishing in Coghill. Spring and summer were the most common harvest times.

Other Intertidal Resources

Other invertebrate or intertidal species utilized in the 1960s included chitons (gumboots), sea urchins, sea cucumbers, sea snails, octopi, mussels, and seaweeds. Chenega residents obtained most of these near the village; however, Green and Danger islands were used as well as other locations.

Of the intertidal species, chitons were gathered and eaten in the largest quantity. People harvested chitons year round near Chenega, at Dangerous Pass, and at Danger Island. Two species were harvested: the large red and the small black chitons. The black chitons were more abundant, while fewer red chitons were harvested because they were less common. Only the large foot was eaten of the red chiton. Black chitons were boiled or cooked in the fire for just a few minutes. The red variety was boiled or fried.

Only a few respondents reported eating sea urchins. The "green" species was harvested during a minus tide. In the spring, sea urchins were harvested for the roe. Sea cucumbers and octopi were taken during low tides, generally

in the spring. Sea cucumbers were also taken during higher tides with a hook, long stick or gaff from a skiff. Only the internal muscle strips of the sea cucumber were eaten (about 5-10 percent of the total weight), and these were commonly fried. Fishermen sometimes caught octopus when jigging for halibut. Harvest of these species was occasional, with only a few of each species taken annually by village residents.

A couple households used sea snails, and then rarely. Snails were caught by commercial fishermen in deepwater pots or on long-line gear and given to villagers. Snails were ground up and used in chowder.

Seaweed was gathered by a few, primarily older, residents and shared within the community. Taken on a minus tide largely off of Danger Island, seaweed was not collected in large quantities. Prince of Wales and Bainbridge passes were also used. Picked during the spring and summer, seaweed was then dried and used in soups or as a snack. Some consumed it raw.

Deer

After being transplanted to Prince William Sound in 1916, deer spread rapidly throughout the sound and had become a mainstay of Chenega households' diet well before the 1964 earthquake. Thirteen of the 14 surveyed households hunted deer successfully in the 1960s. The estimated total village harvest of 2,280 pounds represents a household average harvest of about 163 pounds, or a little more than four deer per household.

Deer were hunted extensively in the fall, and more occasionally in the winter. After the first snowfall and before holidays were key times for harvesting.

Deer hunting, as other hunting, was predominately a male activity. Men

went out in skiffs, and less commonly, commercial fishing boats for one or more days. A hunter might go out alone or in a group. Hunters made several deer hunting trips each year. Freezers were unknown in the village, so harvests were small and frequent to prevent spoilage. A few households took more, and salted or canned the deer meat.

Hunting areas were dispersed, and included the area around Chenega Island, the west side of Knight Island, Green, Latouche, and Evans islands, and Bainbridge Passage, among other locations (See Figure 9). Hunters generally chose a known deer area, especially one where deer had been recently sighted.

Bear

No Chenega residents reported taking or using brown bear at any time. Black bear, however, were taken and used extensively during the 1960s. The meat, stomach, and fat ("white bear oil") was used. Like deer hunting, almost all households were involved in harvesting bears. The estimated annual village harvest of 41 bears represented about 2,378 pounds of meat or about 170 pounds of bear meat per household.

Bear hunting was often combined with other harvest activities such as salmon fishing, trapping, and bottomfishing. They were also harvested opportunistically. A bear hunt consisted of one or more men going out in a commercial fishing boat for one or several days. The hunters usually returned home at night instead of camping out. Often, the undertaking was a one day trip to a pre-selected site. Some bears were harvested in the spring, often when still in their dens or when just emerging. Although the meat was considered more desirable in the spring, most bear were taken in the fall. In

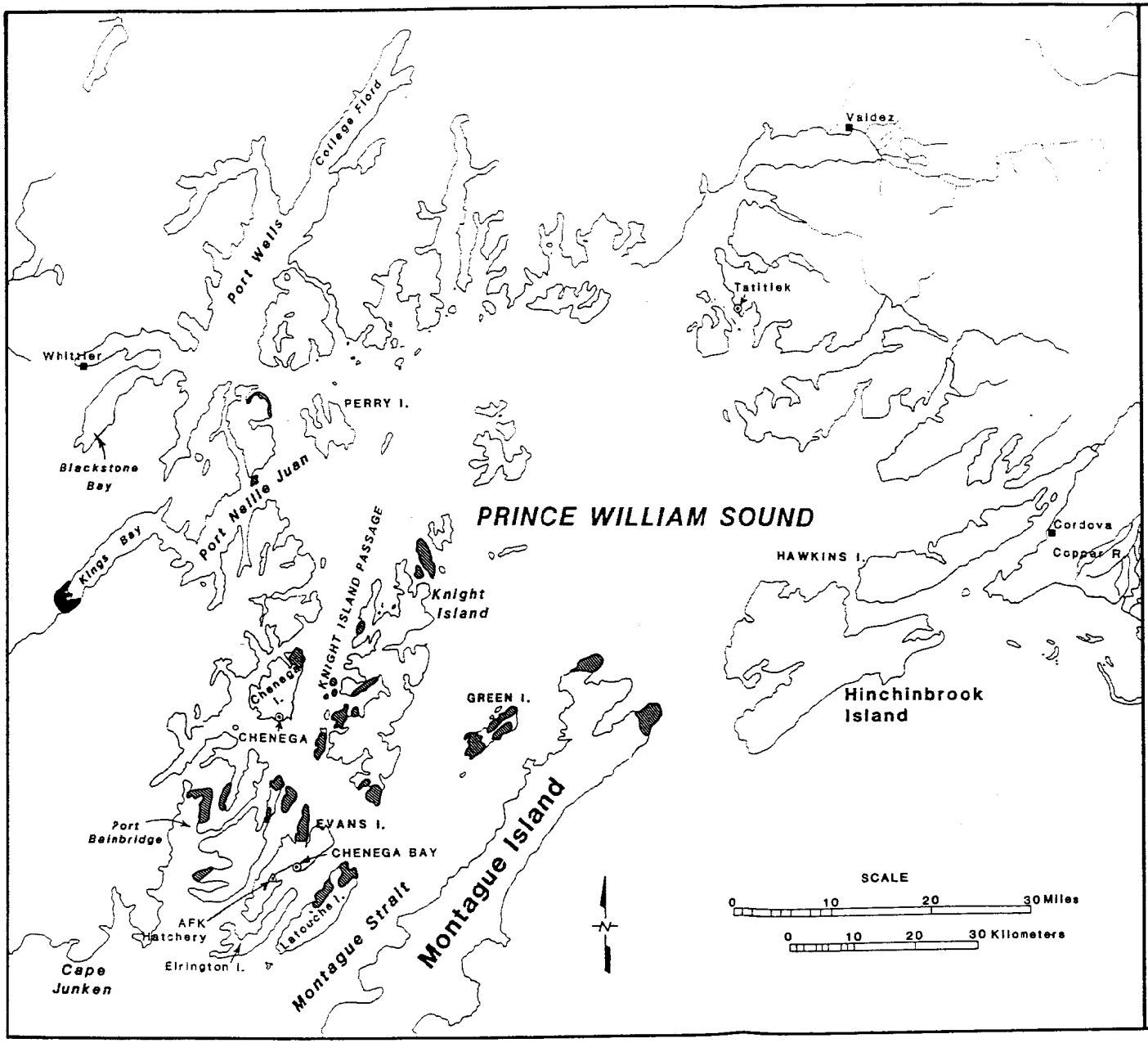


FIGURE 9.
DEER AND MOOSE USE AREAS,
CHENEGA IN THE EARLY 1960s

DEER

MOOSE

SOURCE: This map depicts areas used for resource harvesting during the early 1960s by Chenega residents, as reported by 13 former residents contacted in 1985 and 1986. Because not all former residents were interviewed, and because respondents were reporting on activities that took place 20 years ago, some areas may have been omitted.

STATE OF ALASKA
DEPT. OF FISH AND GAME
Subsistence Division

the fall, bears could be found relatively easily along salmon creeks. Fall also offered more time for hunting. One respondent indicated that the fishy fall meat had to be cooked longer in order to have a palatable taste. Black bear meat was most commonly eaten fresh. However, a few households reported salting and canning bear.

Bear hunting areas were extensive because bear were hunted in conjunction with other activities (Figure 10). The bear population on Chenega Island itself was reported to be healthy during the 1960s by respondents.

Goat

Three quarters of the households indicated that at least one person in the household successfully hunted goats during the 1960s. Goats were more difficult to obtain than bears or deer. Respondents estimated a village harvest of about 21 goats, contributing 1,470 pounds to the annual village harvest, or an average 105 pounds per household. Goat hunting involved more planning than either deer or bear hunting, and often involved hunting parties. Two or more men went to a pre-selected spot where goat had been sighted, usually taking a commercial boat. A goat hunt often involved camping for two or more days, and sometimes up to a week, until one or more goats were taken.

Goats were sometimes spotted on a cliff from the boat, and under optimal circumstances, they could be shot from the boat. They then fell from the cliff into the water. More often, however, hunters climbed up to the goats' grazing area. Goats were therefore considered the most difficult big game to get.

Hunters considered fall and winter months prime goat hunting time. While winter hunts often involved less climbing, since snow brought the goats down closer to the water, fall meat was preferred. The goats were fat and the meat

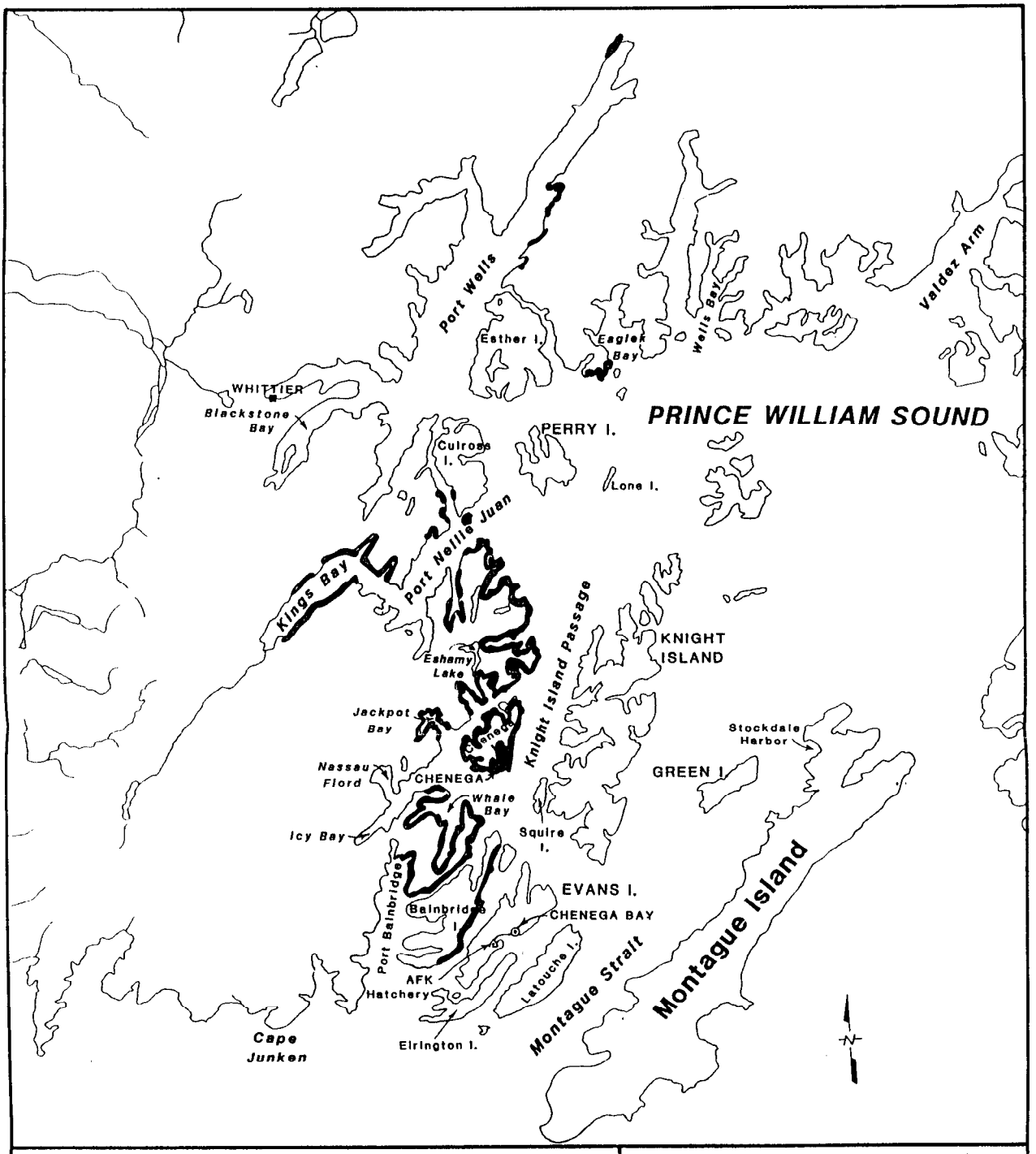
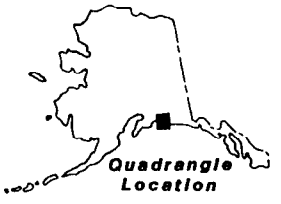


FIGURE 10. BEAR USE AREAS, CHENEGA IN THE EARLY 1960s

BEAR

SOURCE: This map depicts areas used for resource harvesting during the early 1960s by Chenega residents, as reported by 13 former residents contacted in 1985 and 1986. Because not all former residents were interviewed, and because respondents were reporting on activities that took place 20 years ago, some areas may have been omitted.



SCALE

0 10 20 30 Miles

0 10 20 30 Kilometers

STATE OF ALASKA
DEPT. OF FISH AND GAME
Subsistence Division

at its best in fall. Goat hunting areas as shown in Figure 11 included Cape Puget, Icy Bay, Port Wells, Cape Junken, Prince of Wales Pass, Knight Island, and Port Bainbridge, among other areas.

Moose

Moose were hunted by only a few individuals in old Chenega, and not all were successful. Four hunters reported harvesting moose during a typical year in the early 1960s. At 500 pounds per moose, that represents 2,000 pounds of meat per year, or a mean of 143 pounds per household in the village. This may be a higher harvest than actually occurred in a given year, but indicates that four households hunted moose actively. Moose were hunted in the fall. The closest moose population to Chenega occurred on the mainland at Kings Bay. One Chenega resident who was a caretaker at Nellie Juan part of the year hunted moose more frequently than the other residents. A few respondents reported hunting moose in Kings Bay in conjunction with commercial fishing in the area, and one mentioned hunting moose and goat concurrently.

Small Game

Of the available species of small game, porcupine and grouse were the most regularly hunted, contributing 144 and 73 pounds to the village harvest respectively. Beaver and lynx were not eaten; ptarmigan were infrequently hunted and eaten.

Porcupine were taken incidentally while bear hunting, salmon fishing, or trapping away from the village. Porcupine were hunted on the mainland, as there was not a resident population on Chenega Island. Three households

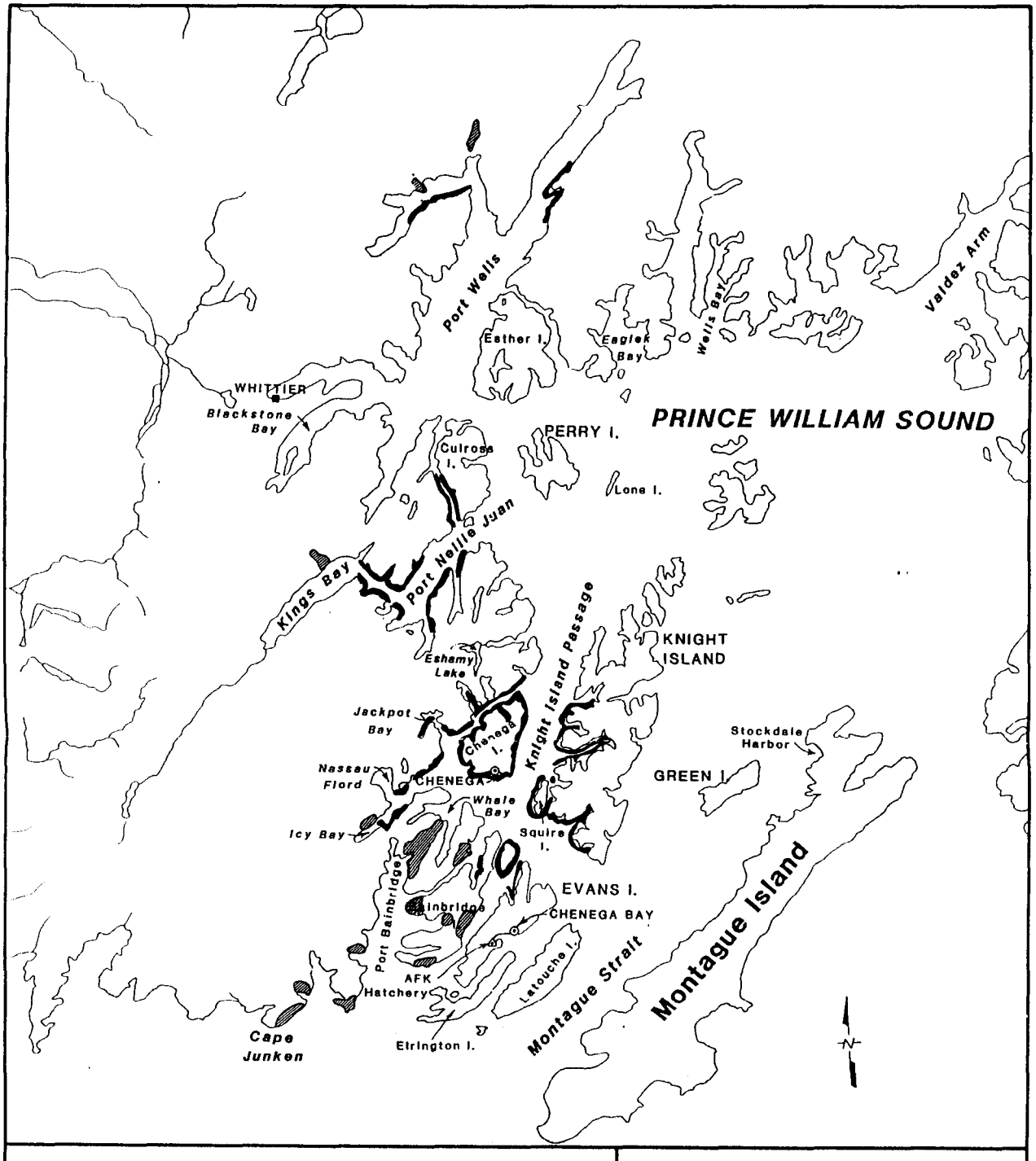


FIGURE 11. GOAT AND WATERFOWL USE AREAS, CHENEGA IN THE EARLY 1960s

GOAT

WATERFOWL

SCALE

0 10 20 30 Miles

0 10 20 30 Kilometers

SOURCE: This map depicts areas used for resource harvesting during the early 1960s by Chenega residents, as reported by 13 former residents contacted in 1985 and 1986. Because not all former residents were interviewed, and because respondents were reporting on activities that took place 20 years ago, some areas may have been omitted.

STATE OF ALASKA
DEPT. OF FISH AND GAME
Subsistence Division

remembered using dogs to tree the porcupine, where it was shot. Porcupine were also clubbed. One hunter probed porcupine dens with poles, taking the porcupine when it appeared. August and September were the common months of harvest, although at least one household hunted in the winter as well.

Grouse hunting was a young man's pursuit. Many hunted on foot near the village. A few took grouse while trapping. A hunter might go alone or with one or two others. Rifles (.22 caliber) were commonly used, as were sling shots and bows and arrows. A few just threw rocks. In addition to the area around the village, Shipyard was also a popular grouse hunting area.

Ptarmigan were available only at higher altitudes. This seemed to discourage all but a few from hunting them. Some were taken in Icy Bay while seal hunting. Winter was the common season of harvest.

Marine Mammals

Seals and sea lions, and to a lesser extent porpoises, were important resources for Chenega residents. All 14 of the interviewed households were involved in seal hunting in the early 1960s, and 13 of the 14 respondents hunted sea lions. The households interviewed reported a total harvest of more than 1,600 seals, representing over 60,000 pounds of potentially useable meat. It is improbable that all the meat was salvaged and consumed, however, since harbor seals were not only eaten, but also sold for income when the $3.00 per seal snout bounty was available. The bounty increased hunting pressure and harvest of seals. Besides the snout which was turned in for the bounty, hides were usually taken and often sold for an average price of $15 per hide. Village residents preferred younger "yearling" seals of either sex for eating. In the spring, seal pups were brought home to eat.

Seal hunting trips lasted from one day to one and a half months. Men often hunted in pairs. Long trips to seasonal camps in Icy Bay and Port Wells were especially common in the spring after ice break-up while the bounty was still offered. The best hunting time was considered to be June and July.

Even though commercial fishing boats were occasionally used for transport to the seal hunting grounds, hunters most commonly used skiffs for the actual hunting. Skiffs allowed hunters to go into shallow water, preferred for seal hunting because seals often sank after shooting and could be retrieved in shallow water with a grappling hook.

Many parts of the seal were used. Meat, especially the choice liver and breast portions, was eaten. Some Chenega residents used seal meat for trapbait. A few of the women cleaned and used the seal stomach for food storage. They rendered fat into seal oil, which had many uses. Village residents used seal oil on berries, herring eggs, fermented salmon roe, smoked salmon, and other foods. Seal oil was also a preservative for some meats and berries.

In contrast to seals, which had some commercial value, sea lions were only taken for food. Respondents reported an annual kill of approximately 36 sea lions. It is uncertain which parts were typically used. Several hunters mentioned salvaging certain preferred portions, such as the flippers, livers, kidneys, and breast meat. If the entire sea lions were consumed, the 3,600 pounds of sea lion harvested represent a household average of 257 pounds.

Winter and spring were the most common harvest times, but hunters harvested seal lions throughout the year. The harvest sometimes occurred opportunistically in conjunction with seal hunts. Sea lions were avoided when they were feeding on herring. Hunters believed the sea lions with herring in their stomachs would sink when shot. More commonly, sea lions were harvested

when they were spotted near Chenega, or when seals were not available. For the most part, seal meat was preferred over sea lion.

Porpoise skin was a popular food, which respondents described as tasting like whale blubber. Porpoise meat was eaten as well. Nine households of the 14 interviewed (64 percent) reported occasionally harvesting dall porpoises. The total village harvest was at the highest 13 porpoises per year. It is more likely that between 1 and 4 porpoise were taken in a typical year. Although liked, porpoises were eaten much less regularly than seal, salmon, or deer. One partial explanation is that porpoise meat was never preserved, and therefore only eaten fresh. They also reportedly sank quickly when shot. Any harvested porpoise meat was shared throughout the village. The skin was sliced and eaten raw, including the dorsal fin. Porpoises were dressed carefully to keep the tendons intact. Tendons were used for sewing, especially in bear-gut raincoats.

Porpoises were generally encountered while travelling by boat throughout the sound. They were shot off the bow of the boat, and if possible, only when they had filled their lungs with air. This would prevent them from sinking. They were often hunted in fall.

Areas used for marine mammal harvesting are shown in Figure 12. Hunters travelled extensively in conjunction with marine mammal hunting, especially for seals.

Waterfowl and Bird Eggs

Of the waterfowl species available, Chenega residents hunted ducks most commonly. Thirteen households (93 percent) harvested ducks during the 1960s. Ducks contributed about 28 pounds to the mean household harvest, or 398 pounds

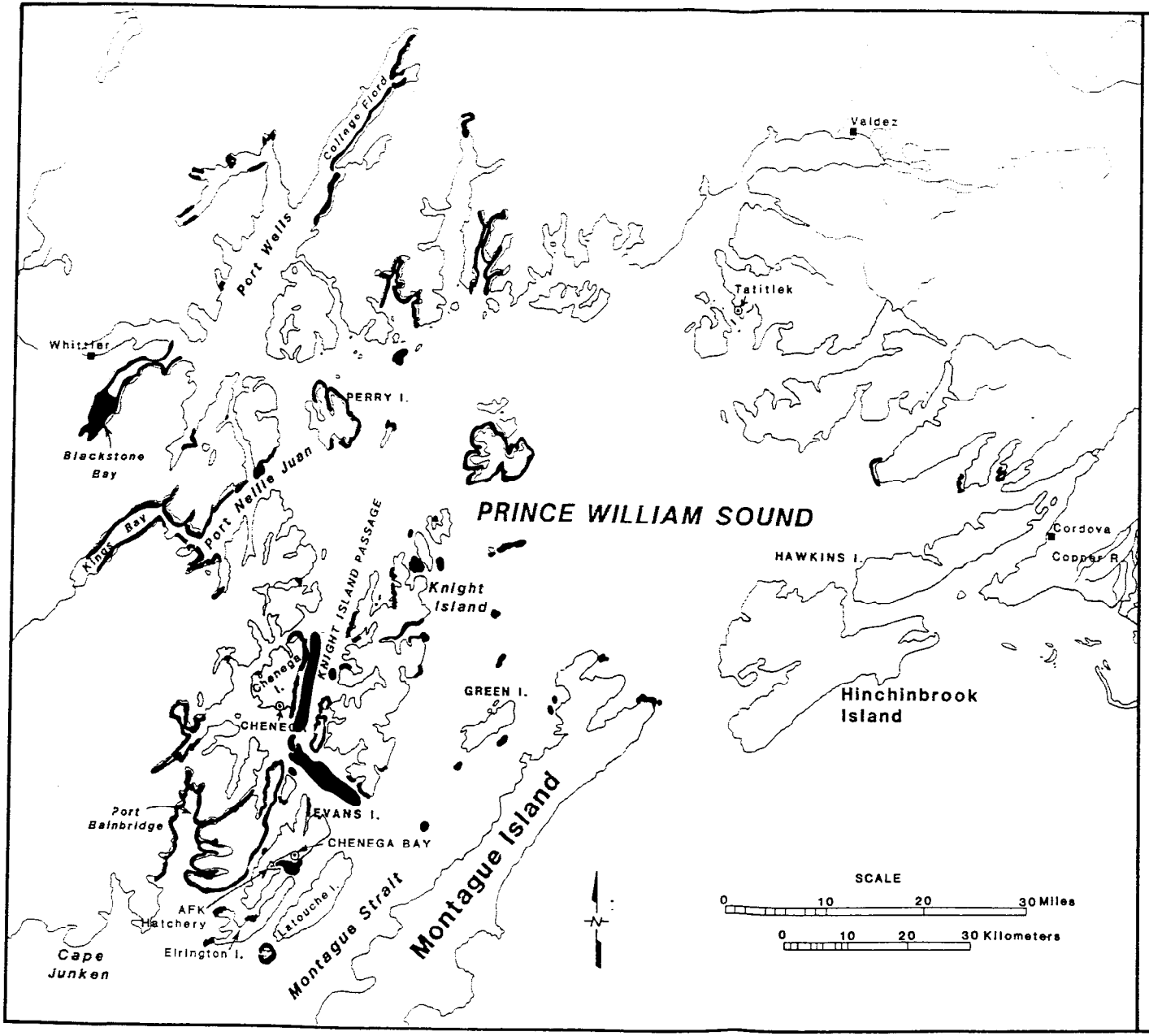
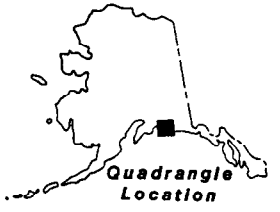


FIGURE 12.
MARINE MAMMAL USE AREAS,
CHENEGA IN THE EARLY 1960s

A MARINE MAMMAL

SOURCE: This map depicts areas used for resource harvesting during the early 1960s by Chenega residents, as reported by 13 former residents contacted in 1985 and 1986. Because not all former residents were interviewed, and because respondents were reporting on activities that took place 20 years ago, some areas may have been omitted.



STATE OF ALASKA
DEPT. OF FISH AND GAME
Subsistence Division

to the total village harvest. As with virtually all game, ducks, as well as other waterfowl were hunted by the men of the village. Ducks were hunted out of skiffs using shot guns. Duck hunting could be a day venture alone, or an overnight trip with the family combining egg gathering as well in the spring. Fall and winter hunts were common. Ducks were often dressed on the beach, and singed in a beach fire to help remove the feathers. One household reported aging carcasses for a day. Geese were rarely hunted due to the general lack of availability. Only one respondent recalled sandhill crane hunting in the spring and fall near Chenega. Only one or two were taken, and the harvests did not occur every year. Cormorants and loons were occasionally harvested, primarily during the winter months.

Several species of bird eggs were gathered. Sea gull and arctic tern eggs were most commonly gathered. Duck and goose eggs were collected, but harder to find and in some cases not taken because residents wanted more geese around. The eggs from "black ducks" or black oystercatchers were also taken, but were harder to find and less numerous. A value of conservation was commonly practiced in egg gathering, and one or two eggs were always left in each nest. Thirteen of the 14 households reported harvesting bird eggs in the 1960s. Eggs comprised approximately four pounds of the mean annual household harvest.

May and June were the key egg gathering months. Egg gathering was often a family affair consisting of one day trips, but men also looked for eggs while seal-hunting. Nesting colonies were easily spotted by the gulls and terns flying overhead, often on small islands or reefs. Gatherers landed skiffs at high tide and collected the eggs from the colonies, in sometimes precipitous conditions.

Furbearers

Prior to the earthquake, trapping was an important source of winter income in Chenega, and most men in the village were involved. Thirteen households reported catching mink and land otter, which were fairly abundant and the most valuable of the available furbearers. Marten and weasel were less common and less valuable. Lynx were not marketable and consequently not trapped. Wolverine were rare and difficult to trap, but occasionally caught and sold.

Each hunter or family had unique trapping areas. In order to trap in another's area, permission was required. Territorial disputes were reported to be virtually non-existent. As shown in Figure 13, Chenega Island, the west side of Knight Island, Dangerous Pass, Jackpot Bay, and Bainbridge Passage were a few of the areas trapped by Chenega residents.

Trappers used deadfalls and snares. Mink and marten were commonly taken in deadfalls. Beginning with the 1963-64 trapping season, pits and deadfalls were outlawed, requiring a change in method. The advent of metal traps made the setting of traps easier and quicker. Although trappers considered deadfalls more humane to animals and more efficient, deadfalls also required time to erect. Not all furbearers were obtained with deadfalls and traps. Land otters and wolverines were shot, and one household reported hunting furbearers with dogs.

Trapping took place from November to February every year. Many men went out alone, while others mentioned trapping with fathers, uncles, brothers, cousins, or friends. One-day trips, weather permitting, were common. Using skiffs, trappers could run 30-40 traps per day. An area was trapped for one month, and checked weekly or every two or three days. Traps were set along

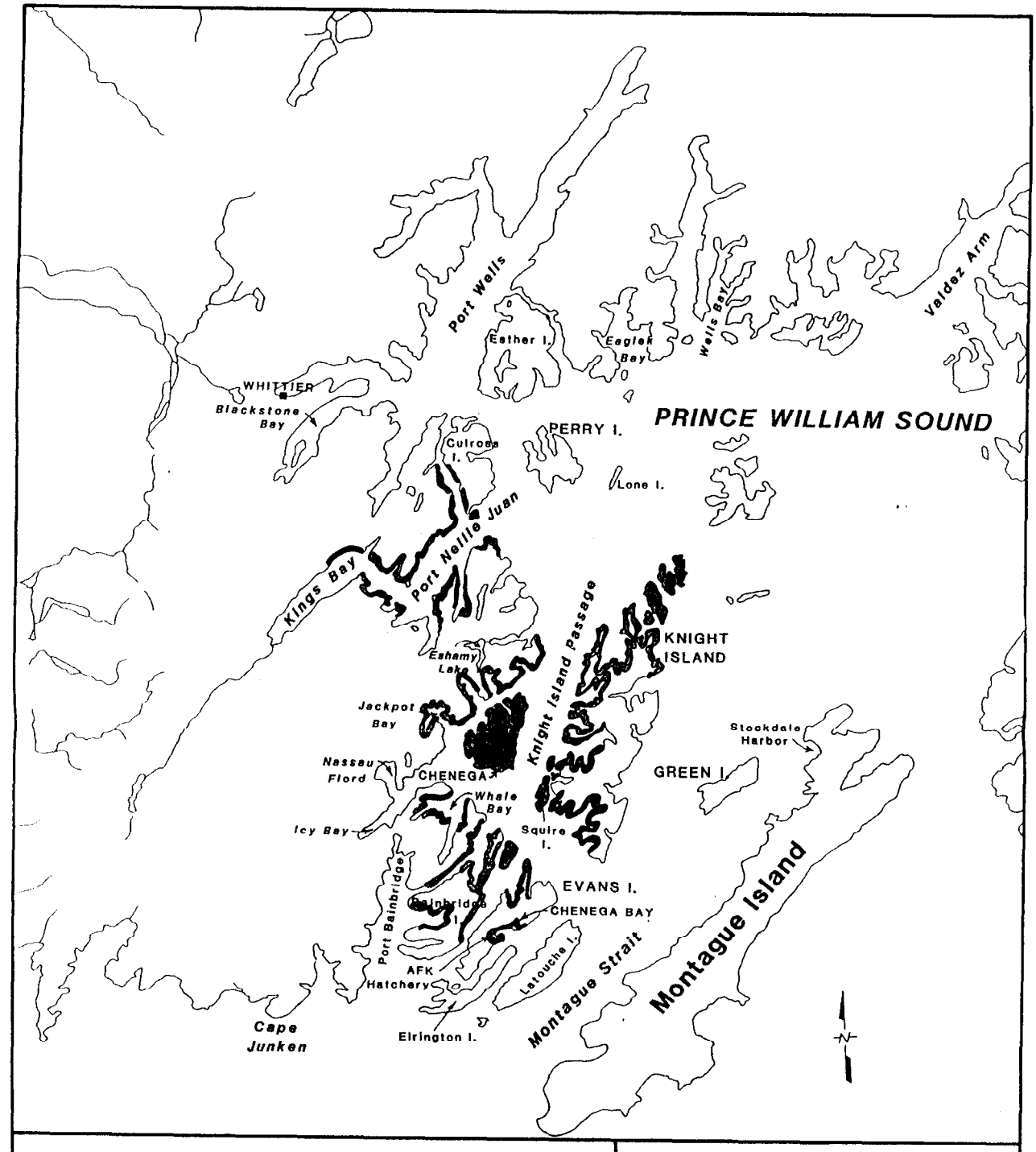
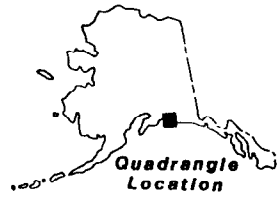


FIGURE 13. FURBEARER USE AREAS, CHENEGA IN THE EARLY 1960s

FURBEARER

SOURCE: This map depicts areas used for resource harvesting during the early 1960s by Chenega residents, as reported by 13 former residents contacted in 1985 and 1986. Because not all former residents were interviewed, and because respondents were reporting on activities that took place 20 years ago, some areas may have been omitted.



SCALE

0 10 20 30 Miles

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STATE OF ALASKA
DEPT. OF FISH AND GAME
Subsistence Division

game trails near the beach. Trappers commonly used seal meat and birds for bait. A few residents recalled that historically, trapping was conducted on extended trips of two weeks or more. Five households remembered paddling bidarkas to trapping sites. By the 1960s, the bidarka was not in common use. No respondents reported using furbearer pelts at home. All furs were sold or bartered.

Plants

Several species of berries and plants were gathered by Chenega residents in the 1960s. Berry picking was a late summer and early fall activity that involved women and children for the most part. Occasionally, fathers went along, too. Some men picked berries while hunting, but rarely in substantial quantities. Salmonberries and blueberries were harvested in large amounts, often by the gallon. Fewer people picked currants. Lowbush cranberries were also harvested. One particular sub-species of blueberry with light-colored leaves was highly prized by berry pickers. Highbush cranberries were less accessible, growing at higher elevations, but were also picked. Only one or two households used crowberries and nagoonberries.

Most respondents picked berries within walking distance of the village, but berries were also harvested at other locations in conjunction with hunting and fishing. Women reported making jams and jellies. They also canned berries whole.

Other vegetation used included Indian rice, wild celery, fiddleheads, and salmonberry shoots. The harvesting season varied between species, but most plants were picked in the spring and summer.

Areas Used

Commonly used areas for harvest of individual species have been noted under the species' subsections. Chenega residents of the 1960s stayed for the most part in the western sound, and harvested multiple species in the immediate Chenega Island area. To the west, Dangerous Passage, and Ewan, Paddy, and Jackpot bays were frequented for different species. Similarly, Bainbridge Island and Passage, Knight Island Passage, and Knight Island were commonly used areas for a variety of activities.

Deer and marine mammals were the primary species for which hunters traveled long distances. These species extended the community's harvest areas out to Perry Island, Blackstone Bay, and Eaglek and Wells bays. The same resources, with the addition of clams, attracted one or two residents to the eastern sound, around the northeast end of Montague Island.

Of the 197 historic sites which were cataloged in the Prince William Sound as having some relationship to Chenega and western sound residents (USFS File Data), 41 sites were included in areas used for resource harvesting by Chenegans in the 1960s as reported by the 18 respondents. Of the 41 locations, 22 were the staging area for the same activities as recorded in the historic site research. Some of these 41 historic sites have been dated as early as pre-contact, while others are late 19th century settlements and fishing and hunting camps. The recurring use by Chenega residents of these historic sites reflects a continuity of contemporary subsistence activities with the activities of previous generations.

CHENEGA BAY 1984-1986

During the study period 1984-86, newly established Chenega Bay was the smallest of the five communities in Prince William Sound with a population of 60 people. Valdez was the largest community (pop 3,687) followed by Cordova (pop 2,108) and Whittier (pop 268). Tatitlek was closest to Chenega Bay in size (pop 68), employment opportunities, and ethnic composition. There were also many kinship ties between the two villages.

The Chenega Bay village site on Evans Island, like its predecessor on Chenega Island, is accessible only by boat or airplane. Table 4 shows the village's distance in air and water miles from other Prince William Sound and Southcentral Alaska communities. When weather allows, mail is delivered two times a week by float plane. Evans Island is no longer on the Alaska Marine Highway route. Travel to the village is by private vessel or chartered aircraft.

TABLE 4. TRAVEL DISTANCES BETWEEN CHENEGA BAY AND OTHER COMMUNITIES

CHENEGA BAY TO	AIR MILES	MILES BY WATER
Anchorage	104	--
Cordova	84	96
Armin F. Koernig Hatchery	2	2
Seward	55	72
Tatitlek	72	90
Valdez	96	112
Whittier	56	80

Source: GDM and Associates 1983:18.

Chenega Bay residents offered many reasons for relocating to the new village (Table 5). Almost all respondents, except for the teachers, wanted to return to or adopt a village lifestyle. For most, this meant a quieter,

simpler way of life. Also mentioned frequently were economic considerations, such as lower rent, taxes, and municipal fees. The HUD houses provided residents a fairly economical way to own their own houses in comparison to Cordova and Anchorage where rentals and real estate prices were steeply priced.

TABLE 5. REASONS FOR MOVING TO CHENEGA BAY, 1985 HOUSEHOLD SURVEY

Reason	Number of Responses [a]
Return to village life	8
Like rural lifestyle	6
Economic reasons	5
Job-related	3

[a] Answers were not mutally exclusive. Some households gave more than one reason.

In the following section, unless otherwise noted, the information presented is from the 1986 household survey. In a few instances, 1985 survey data are included for comparison.

Demography

In March, April, and May of 1985, researchers identified 16 occupied homes, with a total population of 57 people. In 1986, there were also 16 households and one person living on a boat. The population estimated by the researchers, which includes all the households in the village, was 60 people in 1986, a mean household size of 3.5. Household sizes ranged from one to six (Fig. 14). Of the 57 surveyed residents, 44 (77 percent) were Alaska Natives. The remaining 13 were non-Native, primarily school teachers and their families. Three Native households had non-Native spouses who had married into

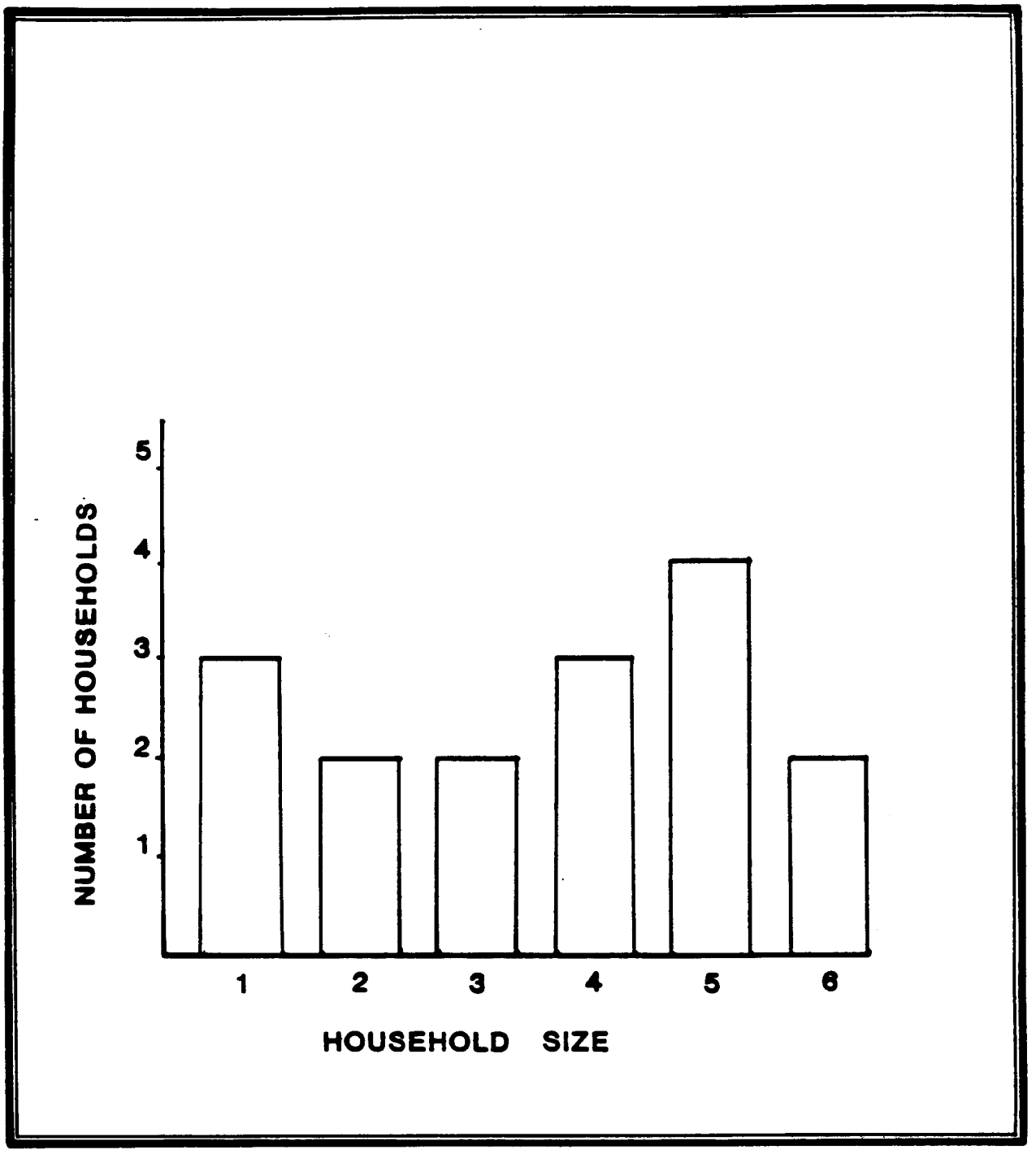


Figure 14. Household Size, Chenega Bay 1985 (n=16).

the community. Seventy percent of the Chenega Bay residents were born in the Prince William Sound area, or their parents were living in the area at the time of their birth.

Of the 16 households interviewed in 1985, either the head of household or spouse in nine households was from Chenega originally. In an additional four households, either the household head or spouse had relatives from the old Chenega Village. The remaining three households were non-Native school teachers. All 13 Alaska Native households had relatives in Cordova. Twelve of the 13 had relatives in Tatitlek.

In keeping with Alaskan communities statewide, Chenega Bay had a higher percentage of males (54 percent) than females, and was also fairly young. Over one third (39 percent) of the population was 15 years of age or younger. Five percent were over 60 years old. The median age was 22 while the mean age was slightly higher at 26.1 years. The fairly young population also reflects those who were willing and able to relocate to the new village. Several households, typically with older members, elected to stay in Anchorage, Tatitlek, and Cordova. Jobs, accessible medical care, and two decades of residency were some of the ties that kept former Chenega residents from returning to the new village in western Prince William Sound.

Local Government

The Chenega Bay IRA Council is the local decision-making body. The council of six people meets on an as-needed basis to handle community affairs. Two committees, a Health Committee and a Native Education Committee, are active in guiding some programs in the community, working under the direction of the council. The Health Committee coordinates with the North Pacific Rim

(the regional Native non-profit corporation), the locally employed health aide, community health representative, and the Village Public Safety Officer (Lue Rae Erickson pers. comm.). The Native Education committee administrates Johnson-O'Malley (JOM) funds which are channeled to the village through the North Pacific Rim. The committee is considering a bi-lingual education program in the community (Joani Cleary, pers. comm.). The language spoken by most community residents is English. There are still a few Alutiiq speakers.

Services

At the time of the survey, Chenega Bay school had an enrollment of 18 children in grades K through 12. Three full-time teachers, one part-time aid, and a maintenance person were employed. The village had a water treatment plant, and all homes had water and sewage systems. Power throughout the village was supplied by a 100 kilowatt power plant. A 65 kilowatt back-up generator was also in place. One full-time village public safety officer (VPSO), a full-time health aide, and a part-time community health representative were employed. There was also a part-time assistant health aide position. While only one village phone existed at the time of the 1985 survey, private lines were installed in many of the homes by the time of the 1986 research.

Employment

Three commercial fishery limited entry permits were held by three village residents: one salmon seine permit and two salmon drift-gillnet permits. Two additional gillnet permits had been sold between the 1985 and 1986 salmon

seasons. All of the permits were for Area E (Prince William Sound and Copper River). An additional two people indicated that they were employed as crew members on commercial boats, down from 14 in 1985. The loss of permits, combined with construction work available in the village, contributed to this change. Twenty-five of the 57 residents responding to the survey in spring 1986 reported being employed at least seasonally over the last 12 months, with half of the households reporting two people working. A community center was constructed in the summer of 1985. Eight people in the community worked on the project, for periods of time varying from nine days to six months. In light of the lessening availability of state funds for capital projects, village construction projects cannot be expected in the future.

With employment primarily dependent on local construction and commercial fishing, most work was seasonal. Averaged across the employed population, 25 employed people worked 4.9 months per person per year in 1985-86, compared with an average of 6.4 months in the previous year (1984-85).

Transportation

The modes of transportation owned by individuals can be determinants of harvesting options. They are also indicators of available and affordable technology. During the study period, there were no aircraft owned or operated by people in the village. Three households owned commercial fishing boats and eight households owned skiffs. There were three off-road vehicles in the village. Five households did not own any boat. However, all but one household had access to a skiff for use, with the remaining household using a relative's airboat for hunting.

Resources Used and Harvested, 1985-86

The varieties of fish, wildlife, marine invertebrates, and vegetation harvested by contemporary residents of Chenega Bay in 1985-86 were almost identical to the species listed by Chenega residents in the 1960s as reconstructed from key respondent interviews (Tables 2 and 3). There were some minor differences. Several resources were used in the 1960s, but not in the 1980s. These resources included sea urchins, sea cucumbers, seaweed, ptarmigan, cranes, cormorants, loons, gulls, snails and several kinds of furbearers. Sea urchins and sea cucumbers were not as abundant as in earlier years, most likey a result of sea otter predation. Ptarmigan and crane are not readily available in the Evans Island vicinity. Villagers were under the impression that there were no legal seasons on cormorants, loons and seagulls, so have not hunted them. Porpoise are valued differently by many of the residents. The tendons are no longer used for sewing, and people enjoy watching them to the extent that few hunt them. The current market for most furbearers has not paid enough to encourage the widespread participation in trapping seen in the 1960s.

Seasonal Round, 1984-86

The seasonal round of hunting, fishing and gathering activities during 1984-86 was very similar to that of the 1960s (Figure 15). Black bear hunting and herring fishing heralded the onset of spring harvesting activities in March and April. The salmon harvest began in May when king salmon were harvested. Red salmon came in shortly after the kings. May also marked an increase in the same gathering activities as in earlier years: razor clams,

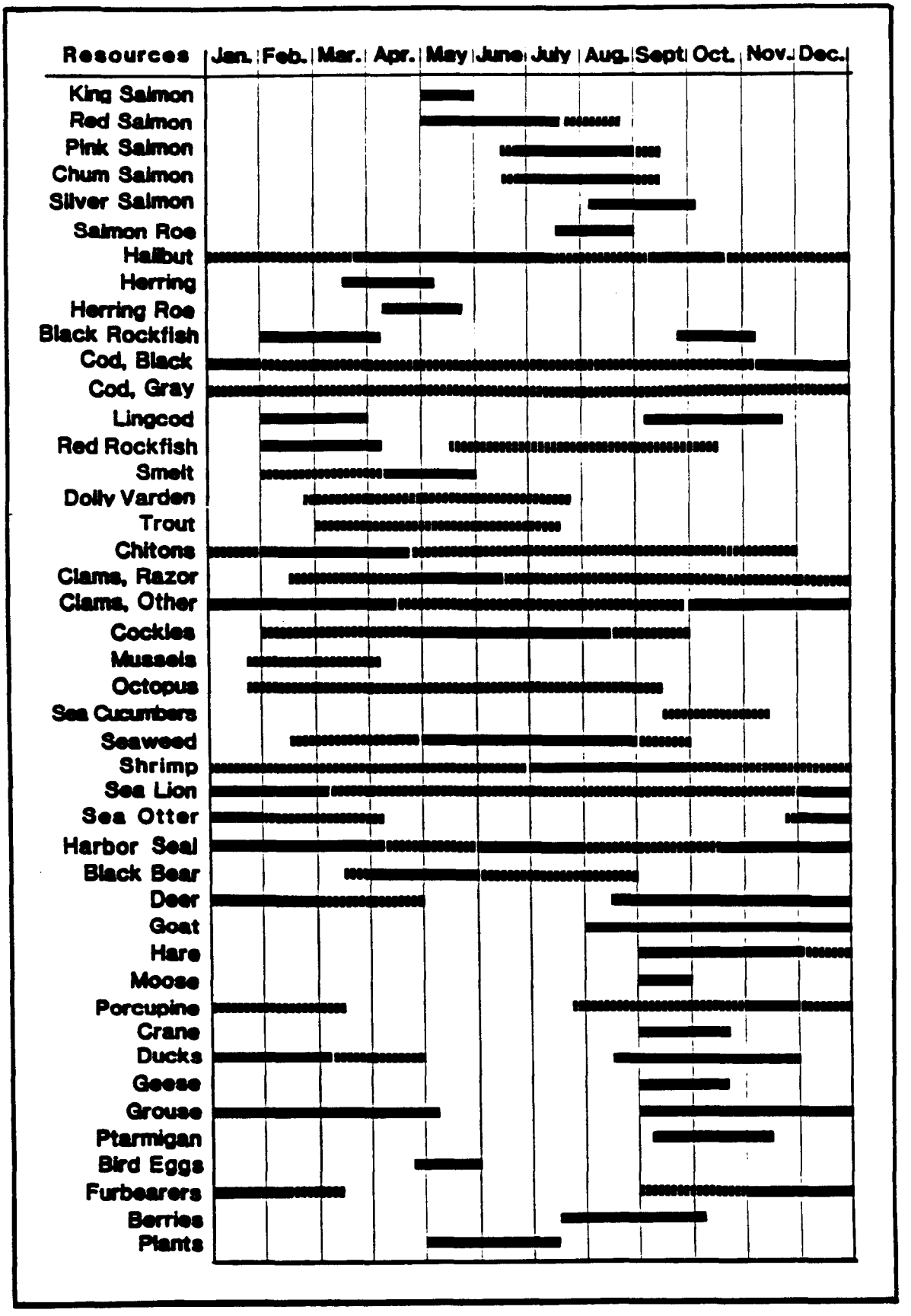


Figure 15. Seasonal Round of Harvest Activities, Chenega Bay 1984-1986. (Solid line shows usual harvest season. Broken line indicates occasional effort.)

cockles, seaweed, plants, and bird eggs. Salmon fishing dominated the summer months. Seal were taken in conjunction with commercial fishing, suggesting an opportunistic approach to seal hunting, at least during the summer.

August, September, and October mirrored the patterns of the 1960s, with silver salmon, large game (goat, moose, deer), small game, and waterfowl harvests. Shrimp were taken in late summer and early fall by some Chenega Bay residents, an activity rarely conducted in the 1960s.

Hunting for goat, deer, small game, and marine mammals continued throughout the winter. Sea otter were taken primarily in December or January, when the hides were believed to be at their prime.

Bottomfish, intertidal resources, and marine mammals were taken throughout the year, much as they had been in the previous village. Overall, the current seasonal round of activities was almost identical to that in the 1960s. A few species were added, and a few deleted. Seasons of harvest effort appeared to be a little shorter for some resources in the 1980s. However, this may have been related to the settling in and familiarizing process; seasons may extend as new use areas are explored and as various species are located.

Participation in Harvest and Use of Resources, 1984-1986

Because one household did not provide complete harvest information, except where noted, participation in harvest and use activities is for 15 households. All 16 households attempted to harvest resources in 1985-86. One hundred percent of the households were successful at harvesting some resource, harvesting from 5 to 28 resources for a mean of 14 resources harvested per household (n=15). The number of resources used by each household was higher

than the number harvested, a household average of 18 resources used. Clams, halibut, berries, and deer were harvested by the highest number of households, with at least two thirds of the respondents participating. Twelve of the 15 reporting households (80 percent) harvested at least one species of salmon. Four households harvested all five kinds of salmon available in Prince William Sound. All 15 used salmon. Use data includes resources harvested, received, and purchased non-commercially in the village, but does not reflect those resources given to other households.

Fourteen households attempted harvest of fish other than salmon. Thirteen were successful. Halibut and red rockfish (commonly referred to as red snapper) were the most widely harvested, by eleven households (73 percent) and 7 households (47 percent) respectively (see Table 6). All 15 households used fish other than salmon.

Participation in the harvesting of marine invertebrates was more widespread than involvement in taking salmon, although quantitatively invertebrates contributed less to the harvest. Fourteen households attempted to harvest these resources, and all reported taking from one to six kinds of resources in this category. Clams other than razor clams, such as butter and littleneck clams were harvested by 14 of 15 households.

Ten (63 percent) of the 16 households attempted to harvest marine mammals. Nine households (56 percent) were successful. Seven (44 percent) took harbor seal. Seventy five percent of the Chenega Bay households surveyed used marine mammals.

Thirteen of the 16 households attempted to harvest at least one big game resource. Eleven (69 percent) took deer, six (38 percent) harvested black bear and one household each moose and goat. All 16 households used big game.

TABLE 6. HOUSEHOLD PARTICIPATION IN RESOURCE HARVEST, USE, AND SHARING, CHENEGA BAY 1985-86 (n=15)

Resource[a]	Using #	Using (%)	Attempted Harvest #	Attempted Harvest (%)	Harvested #	Harvested (%)	Gave Away #	Gave Away (%)	Received #	Received (%)
King Salmon	10	(66.7)	6	(40.0)	6	(40.0)	4	(26.7)	4	(26.7)
Red Salmmon	12	(80.0)	8	(53.3)	8	(53.3)	5	(33.3)	6	(40.0)
Pink Salmon	13	(86.7)	10	(66.7)	9	(60.0)	7	(46.7)	5	(33.3)
Chum Salmon	11	(73.3)	9	(60.0)	9	(60.0)	5	(33.3)	3	(20.0)
Silver Salmon	11	(73.3)	9	(60.0)	8	(53.3)	5	(33.3)	6	(40.0)
Halibut	15	(100.0)	13	(86.7)	11	(73.3)	10	(66.7)	12	(80.0)
Herring	8	(53.3)	4	(26.7)	3	(18.8)	3	(20.0)	5	(33.3)
Gray Cod	5	(33.3)	5	(33.3)	5	(33.3)	2	(13.3)	1	(6.7)
Black Cod	2	(13.3)	4	(26.7)	4	(26.7)	3	(20.0)	0	(0)
Red Rockfish	7	(46.7)	9	(60.0)	7	(46.7)	4	(26.7)	1	(6.7)
Black Rockfish	2	(13.3)	3	(20.0)	2	(13.3)	0	(0)	0	(0)
Herring Roe	8	(53.3)	2	(13.3)	2	(13.3)	1	(6.7)	7	(46.7)
Smelt/Eulachon	6	(40.0)	5	(33.3)	5	(33.3)	2	(13.3)	3	(20.0)
Shark	1	(6.7)	1	(6.7)	1	(6.7)	0	(0)	0	(0)
Eel	1	(6.7)	1	(6.7)	1	(6.7)	0	(0)	0	(0)
Dolly Varden	3	(20.0)	2	(13.3)	2	(13.3)	1	(6.7)	1	(6.7)
Trout	1	(6.7)	1	(6.7)	1	(6.7)	1	(6.7)	0	(0)
Razor Clams	4	(26.7)	5	(33.3)	4	(26.7)	0	(0)	0	(0)
Other Clams	14	(93.3)	14	(93.3)	14	(93.3)	1	(6.7)	0	(0)
Cockles	5	(33.3)	6	(40.0)	5	(33.3)	0	(0	0	(0)
Mussels	2	(13.3)	2	(13.3)	2	(13.3)	0	(0)	0	(0)
Octopus	8	(53.3)	6	(40.0)	6	(40.0)	1	(6.7)	4	(26.7)
Chitons	8	(53.3)	7	(46.7)	6	(40.0)	1	(6.7)	2	(13.3)
Sea Cucumbers	1	(6.7)	1	(6.7)	0	(0)	0	(0)	0	(0)
Sea Urchins	1	(6.7)	1	(6.7)	0	(0)	0	(0)	0	(0)
Dungeness Crab	0	(0)	2	(13.3)	1	(6.7)	1	(6.7)	0	(0)
King Crab	14	(93.3)	2	(13.3)	1	(6.7)	3	(20.0)	13	(86.7)
Tanner Crab	5	(33.3)	1	(6.7)	0	(0)	0	(0)	5	(33.3)
Shrimp	15	(100.0)	5	(33.3)	4	(26.7)	5	(33.3)	10	(66.7)
Sea Lion[b]	12	(80.0)	7	(43.8)	7	(43.8)	6	(37.5)	7	(43.8)
Sea Otter[b]	5	(31.3)	4	(25.0)	5	(31.3)	1	(6.3)	0	(0)
Harbor Seal[b]	12	(80.0)	9	(56.3)	7	(43.8)	6	(37.5)	7	(43.8)
Deer[b]	16	(100.0)	13	(81.3)	11	(68.8)	8	(50.0)	10	(62.5)
Moose[b]	7	(43.8)	1	(6.3)	1	(6.3)	1	(6.3)	6	(37.5)
Black Bear[b]	10	(62.5)	6	(37.5)	6	(37.5)	4	(25.0)	7	(43.8)
Goat	5	(33.3)	2	(13.3)	1	(6.7)	1	(6.7)	4	(26.7)
Porcupine	5	(33.3)	5	(33.3)	4	(26.7)	2	(13.3)	2	(13.3)
Geese	2	(13.3)	2	(13.3)	1	(6.7)	0	(0)	1	(6.7)
Duck[b]	9	(56.3)	11	(68.8)	10	(62.5)	4	(25.0)	3	(18.8)
Grouse[b]	7	(43.8)	8	(50.0)	7	(43.8)	2	(12.5)	1	(6.3)
Bird Eggs	1	(6.7)	1	(6.7)	1	(6.7)	1	(6.7)	0	(0)

TABLE 6. (Continued) HOUSEHOLD PARTICIPATION IN RESOURCE HARVEST, USE, AND SHARING, CHENEGA BAY 1985-86 (n=15)

Resource[a]	Using #	Using (%)	Attempted Harvest #	Attempted Harvest (%)	Harvested #	Harvested (%)	Gave Away #	Gave Away (%)	Received #	Received (%)
Land Otter[b]	3	(18.8)	3	(18.8)	3	(18.8)	0	(0)	0	(0)
Mink[b]	4	(26.7)	3	(18.8)	3	(18.8)	0	(0)	1	(6.3)
Weasel[b]	1	(6.3)	1	(6.3)	1	(6.3)	0	(0)	0	(0)
Berries	15	(100.0)	11	(73.3)	11	(73.3)	1	(6.7)	10	(66.7)
Plants	4	(26.7)	5	(33.3)	4	(26.7)	1	(6.7)	0	(0)
Wood	13	(86.7)	11	(73.3)	11	(73.3)	4	(26.7)	3	(20.0)

[a] See Appendix G for a complete list of species and scientific names.
[b] n=16

Birds (waterfowl and grouse) were as widely sought after as game. Thirteen households attempted to harvest them. Twelve (80 percent) were successful in taking at least one species and reported using birds.

The take of small game and furbearers was less prevalent. Six of sixteen households (38 percent) attempted taking porcupine or furbearers. All six were successful, with four taking porcupine and three taking furbearers. Five households used porcupine meat or furbearer pelts non-commercially.

Fourteen of the fifteen (93 percent) reporting households attempted harvesting berries, plants or wood and all were successful. Eleven households (73 percent) picked berries, and the same number cut firewood.

Estimated Quantities Harvested, 1985-86

Table 7 shows the total harvest and use of each species for the entire community as well as the averaged per capita harvested of each resource for 1985-86. Harvest data from the 1984-85 survey are shown in Appendix I.

In 1985-86, Chenega Bay households harvested 1,286 pounds of wild resources per household, and reported using 866 pounds of wild resources. The per capita harvest was 361 pounds, and per capita use was 243 pounds. The lower use levels reflect sharing of resources with residents of other communities. These figures represent an increase in per capita harvests over 1984-85 levels of 16.9 percent.

In 1985-86, marine mammals, salmon, deer, and halibut were the major resources harvested by weight. All five species of salmon collectively contributed 4,286 pounds to the village harvest or 286 pounds per household (n=15). Marine mammals, particularly seal and sea lion, accounted for 7,996 pounds, an average of 500 pounds per household (n=16). Households harvested

TABLE 7. HOUSEHOLD AND PER CAPITA LEVELS OF RESOURCE HARVEST AND USE, CHENEGA BAY 1985-86 (n=15)

Resource[a]	Total Number Harvested	Total Pounds Harvested	Household Harvest	Per Capita Harvest[b]	Total Number Used	Total Pounds Used	Household Use	Per Capita Used[b]
King Salmon	43.0	838.5	55.9	15.5	34.5	672.8	44.9	12.5
Red Salmon	172.0	705.2	47.0	13.1	167.5	686.8	45.8	12.7
Pink Salmon	286.0	686.4	45.8	12.7	321.5	771.6	51.4	14.3
Chum Salmon	116.0	742.4	49.5	13.7	93.0	595.2	39.7	11.0
Silver Salmon	185.0	1,313.5	87.6	24.3	162.5	1,153.8	76.9	21.4
Halibut	NA[c]	2,335.0	155.7	43.2	NA[c]	1,459.0	97.3	27.0
Herring	70.0g[d]	224.0	14.9	4.1	47.4g[d]	151.5	10.1	2.8
Gray Cod	29.0	116.0	7.7	2.1	10.0	40.0	2.7	.7
Black Cod	10.0	31.0	2.1	0.6	5.0	15.5	1.0	.3
Red Rockfish	59.0	236.0	15.7	4.4	51.0	204.0	13.6	3.8
Black Rockfish	4.0	16.0	1.1	.3	4.0	16.0	1.1	.3
Herring Roe	15.0g	105.0	7.0	1.9	21.4g	149.8	10.0	2.8
Smelt/Eulachon	18.0g	57.6	3.8	1.1	16.3g	52.0	3.5	1.0
Shark	NA	4.0	.3	.1[e]	NA	4.0	.3	.1[e]
Eel	1.0	2.0	.1	--[e]	1.0	2.0	.1	--[e]
Dolly Varden	72.0	64.8	4.3	1.2	57.0	51.3	3.4	1.0
Trout	100.0	140.0	9.3	2.6	60.0	84.0	5.6	1.6
Razor Clams	16.0g	25.6	1.7	.5	16.0g	25.6	1.7	.5
Other Clams	53.0g	50.0	3.3	.9	51.0g	47.5	3.2	.8
Cockles	3.9g	3.9	.3	.1	3.9g	3.9	.3	.1
Mussels	5.5g	5.5	.4	.1	5.5g	5.5	.4	.1
Octopus	13.3	53.0	3.5	1.0	16.5	66.0	4.4	1.2
Chiton	6.4g	25.4	1.7	.5	11.9g	47.4	3.2	.9
Dungeness Crab	4.0	2.8	.2	.1	0	0	0	0
King Crab	18.0	41.4	2.8	.8	108.0	248.4	16.6	4.6
Tanner Crab	0	0	0	0	51.0	81.6	5.4	1.5
Shrimp	NA	55.5	3.7	1.0	NA	485.2	32.3	9.0

TABLE 7. (Continued) HOUSEHOLD AND PER CAPITA LEVELS OF RESOURCE HARVEST AND USE, CHENEGA BAY 1985-86 (n=15)

Resource[a]	Total Number Harvested	Total Pounds Harvested	Household Harvest	Per Capita Harvest[b]	Total Number Used	Total Pounds Used	Household Use	Per Capita Used[b]
Sea Lion[f]	25.0	2,500.0	166.7	46.3	NA[c]	965.0	64.3	17.9
Sea Otter[f]	15.0	15.0	.9	.3	NA	1.5	.1	--[e]
Harbor Seal[f]	145.0	5,481.0	342.6	96.2	NA	1,594.6	99.7	28.0
Deer[f]	73.0	2,920.0	182.5	51.2	NA	2,857.0	178.6	50.1
Moose[f]	1.0	500.0	31.3	8.8	NA	316.0	19.8	5.5
Black Bear[f]	10.0	580.0	36.3	10.2	NA	338.0	21.1	5.9
Goat	2.0	140.0	9.3	2.6	NA	119.0	7.9	2.2
Porcupine	6.0	27.0	1.8	.5	6.0	27.0	1.8	.5
Geese[d]	6.0	30.0	2.0	.6	8.0	40.0	2.7	.7
Ducks[d]	142.0	213.0	13.3	3.7	115.0	172.5	10.8	3.0
Grouse[d]	40.0	20.0	1.3	.4	34.0	17.0	1.1	.3
Bird Eggs	30.0	1.5	.1	--[e]	15.0	.8	.1	--[e]
Land Otter[f]	29.0	NA[c]	NA[c]	NA[c]	29.0	NA[c]	NA[c]	NA[c]
Mink[f]	17.0	NA	NA	NA	18.0	NA	NA	NA
Weasel[f]	1.0	NA	NA	NA	1.0	NA	NA	NA
Berries	58.5g	234.0	15.6	4.3	69.1g	276.4	18.4	5.1
Plants	NA	34.0	2.3	.6	NA	18.0	1.2	.3
Wood	153.0c[g]	NA	NA	NA	135.0c[g]	NA	NA	NA
Total[f]		20,576.0	1,286.0	361.0		13,863.0	866.4	243.2

[a] See Appendix G for complete list of species and scientific names.
[b] Per capita where household n=15 reflects 54 individuals, and 57 individuals where n=16.
[c] NA: Not applicable, either only pounds were recorded or resource was used, but not consumed.
[d] g: gallons.
[e] --: less than .1 pound.
[f] n=16 households.
[g] c: cords.

2,920 pounds of deer (183 lbs per household), and 2,335 pounds of halibut (156 lbs per household).

Figure 16 illustrates the harvest composition by major resource category. By weight, marine mammals accounted for the largest portion of the village harvest (39 percent), followed by salmon (21 percent), and game (20 percent). All other fish combined made up 16 percent of the harvest. Birds (including waterfowl and grouse), marine invertebrates, and plants each contributed just over one percent of the harvest.

Sharing of resources between households was common in 1985-86. Similar to the 1960s harvest and use reports, households reported receiving salmon in addition to what members of their household had harvested (see Table 6). Households harvesting marine mammals and big game commonly reported giving away a portion of their harvest. Seal meat was also sold or bartered to commercial crab fishermen to be used for bait. Six of the seven households harvesting seal and sea lion gave away portions, and seven households reported receiving seal or sea lion portions. Sharing of halibut was even more common. Ten households (67 percent) gave away portions of halibut and twelve households reported receiving halibut. Deer was also distributed throughout the village, with seven (63.6 percent) of the harvesting households giving away some of their harvest, and ten (63 percent) of the surveyed households indicating that they had been given portions of deer. Shellfish, king crab, and shrimp were also widely shared among households, but were resources which only a few in the village reported harvesting. It was not uncommon for commercial crab boats to dock at Chenega Bay, and either give, trade, or sell some of their fresh catch to local residents.

Two household attributes were associated with differing harvest levels between households. These were the presence of a former Old Chenega resident

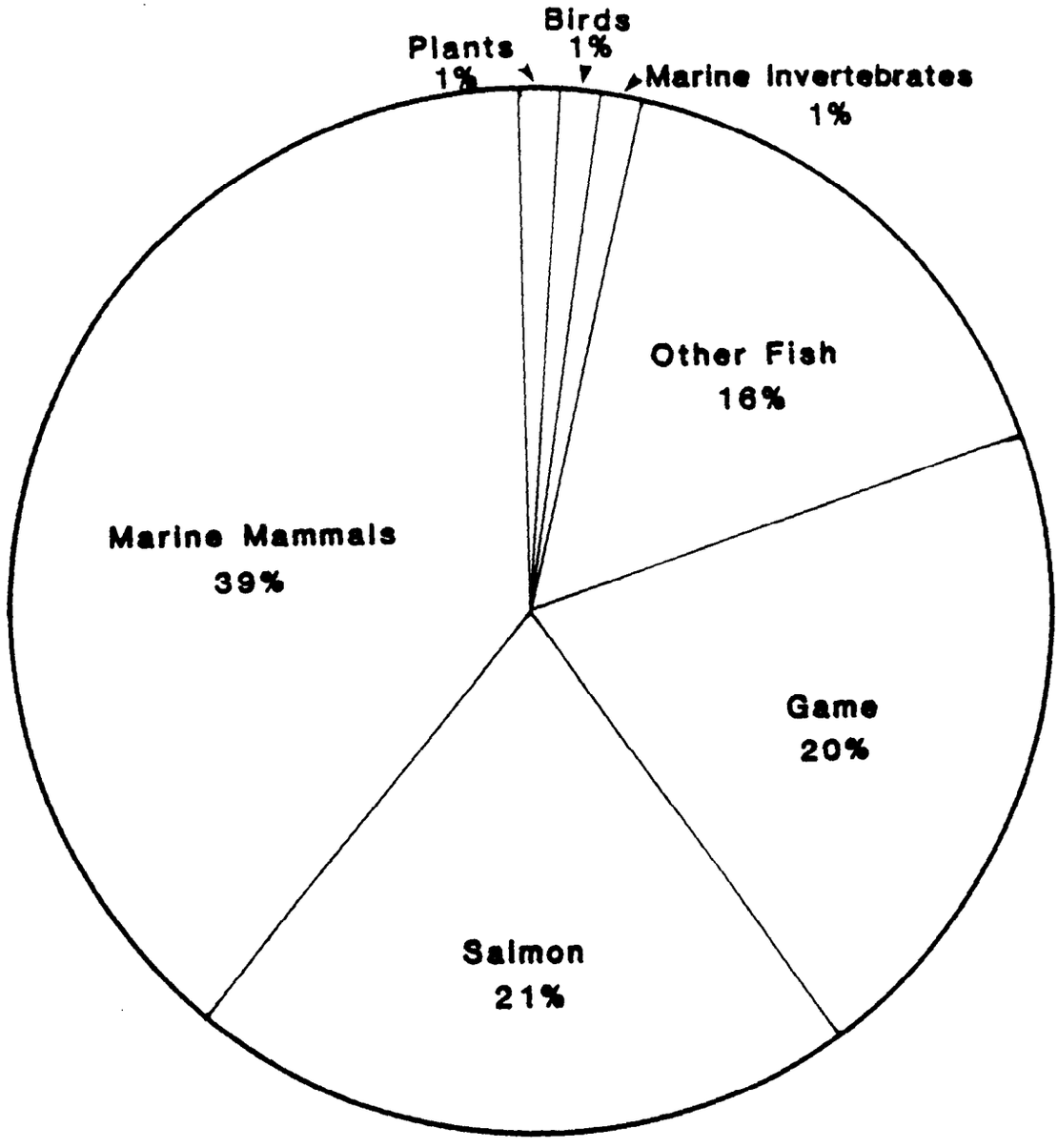


Figure 16. Harvest Composition by Resource Category, Chenega Bay 1985-86.

in the household, and participation in commercial fisheries by at least one household member. The seven households without a former Chenega resident had a per capita harvest of 187 pounds, compared with 487 pounds for the nine households with an Old Chenega resident. Per capita use figures were much less disparate, 182 and 287 pounds respectively. Ten households with no involvement with commercial fisheries had a per capita harvest of 249 pounds, compared with 569 pounds per capita in the five households that participated in commercial fisheries. Per capita use figures were close, however, at 240 pounds and 265 pounds respectively. The similar use figures underscore the sharing of resources by active harvesters with others. The fact that both groups have lower use levels suggests that resources are being shared with those residing outside of the village. Most families have relatives in Cordova, Tatitlek, and Anchorage. Ownership or access to a motorized boat did not affect harvest or use levels significantly on a per capita basis.

Harvesting and Preservation Activities, 1984-86

In 1985, the community of Chenega Bay was still in a "gearing up" phase. As families have settled into their homes, acquired equipment, and re-oriented themselves to the area, the amount of natural resources harvested by village residents has increased as they expected. They also expected the hunting and fishing patterns to undergo changes in comparison to those of the 1960s. The two main factors they mentioned were the presence of freezers and more restrictive regulations and enforcement. The advent of affordable and accessible power enabling people to have freezers may not only affect how resources are preserved, but also harvesting strategies. Some respondents anticipated "stocking up" on wild meat in the fall for use the remainder of

the year. Specific information on harvesting and preservation techniques are covered below in the individual species accounts.

Salmon

As stated above, salmon comprised 21 percent by weight of the total community subsistence harvest in 1985-86, or 4,286 pounds (Table 8). The majority of salmon, 61.1 percent by weight, brought into the community for family use, came out of commercial catches. In addition, 29.5 percent came from non-commercial nets or methods, and 9.4 percent from rod and reel. Since subsistence fishing was only provided for in regulation during commercial seasons with commercially allowable gear types, and in the same locations as commercial fisheries, it is not surprising that many households brought salmon home from their commercial catches. During the study period, legal gear for the subsistence fishery were seines and gillnets.

Silver salmon contributed 88 pounds to the average household harvest of 286 pounds of salmon, the highest for the salmon species (Table 7). Nine (60 percent) of all households fished for silvers. King salmon accounted for 56 pounds per household, or approximately 3 fish. While only six households (40 percent) reported harvesting king salmon, ten (66.7 percent) used that species. Chum salmon was third in terms of pounds harvested, with nine households (60 percent) reporting harvests, which averaged 50 pounds per household. Use of king salmon in 1985 was higher than respondents reported for the 1960s because of an increase in participation by Chenega Bay residents in the Copper and Bering rivers gillnet fisheries.

Overall, commercially-taken salmon accounted for 61 percent of the salmon harvest. Of the king harvest, 95 percent came from commercial fisheries.

TABLE 8. CHENEGA BAY SALMON HARVEST FOR HOME USE BY SPECIES AND GEAR TYPE, 1985

	COMMERCIAL GEAR[a]		ROD AND REEL		SUBSISTENCE[b]		TOTAL			
	House-holds	Harvest (Lbs)	House-holds	Harvest (lbs)	House-holds	Harvest (lbs)	House-Holds	Harvest Fish	Lbs	Per Cent
King Salmon	5	799.5	0	--	1	39.0	6	43	838.5	19.6
Red Salmon	5	487.9	1	45.1	2	172.2	8	172	705.2	16.5
Pink Salmon	3	189.6	4	124.8	6	372.0	9	286	686.4	16.0
Chum Salmon	5	416.0	0	--	5	326.4	9	116	742.4	17.3
Silver Salmon	5	724.2	4	234.3	1	355.0	8	185	1,313.5	30.6
Total Harvest		2,617.2		404.2		1,264.6	12		4,286.0	100.0
Percent		(61.1)		(9.4)		(29.5)			(100.0)	

[a] Only fish removed for home use or given away are included.
[b] Households used gillnets, or harvested directly from creeks.

King and red salmon were salted in buckets on the fishing boat, or brought back to the village to be frozen or canned. The majority of red salmon (69 percent), silver (55 percent) and chum salmon (56 percent) also were taken from commercial catches. Some of the silver salmon harvest was conducted in conjunction with deer hunting in the fall. Only pink salmon were primarily harvested by subsistence and rod and reel methods. Subsistence methods included gillnets at creek mouths and harvest by hand with gaffs in creeks.

From 1984 to 1985, the salmon harvest by village residents rose 18 percent. Among the individual species (see Figure 17), king salmon was the only one to show a decline, of seven percent. This is accounted for by the distance Chenega Bay residents are from the major king run in the Copper River. In 1984, some families had fished commercially on the Copper River Flats and then moved to the village. Additionally, some fishermen had sold their commercial permits between the 1985 and 1986 seasons, further decreasing their involvement in the commercial fishery.

Salmon harvests in 1985 were only 23.5 percent of the reported 1960s "typical" harvest. Also, the distribution of harvest among salmon species (Table 9) suggests some shifting in harvest patterns. On the basis of pounds harvested, silver salmon dominated the 1985 harvest. In terms of overall harvest composition, however, silver salmon constituted approximately the same percentage of the harvest as in the 1960s. The proportion of harvest related to red salmon increased about 6.7 percent, and the proportion related to kings increased 15.5 percent. Pink and chum salmon decreased.

The king, silver, and red salmon increases are attributable in part to subsistence fishing regulations and commercial fishing. Subsistence regulations in 1985 prohibited commercial fishermen from participating in a subsistence fishery. This necessitated keeping some commercial harvest for

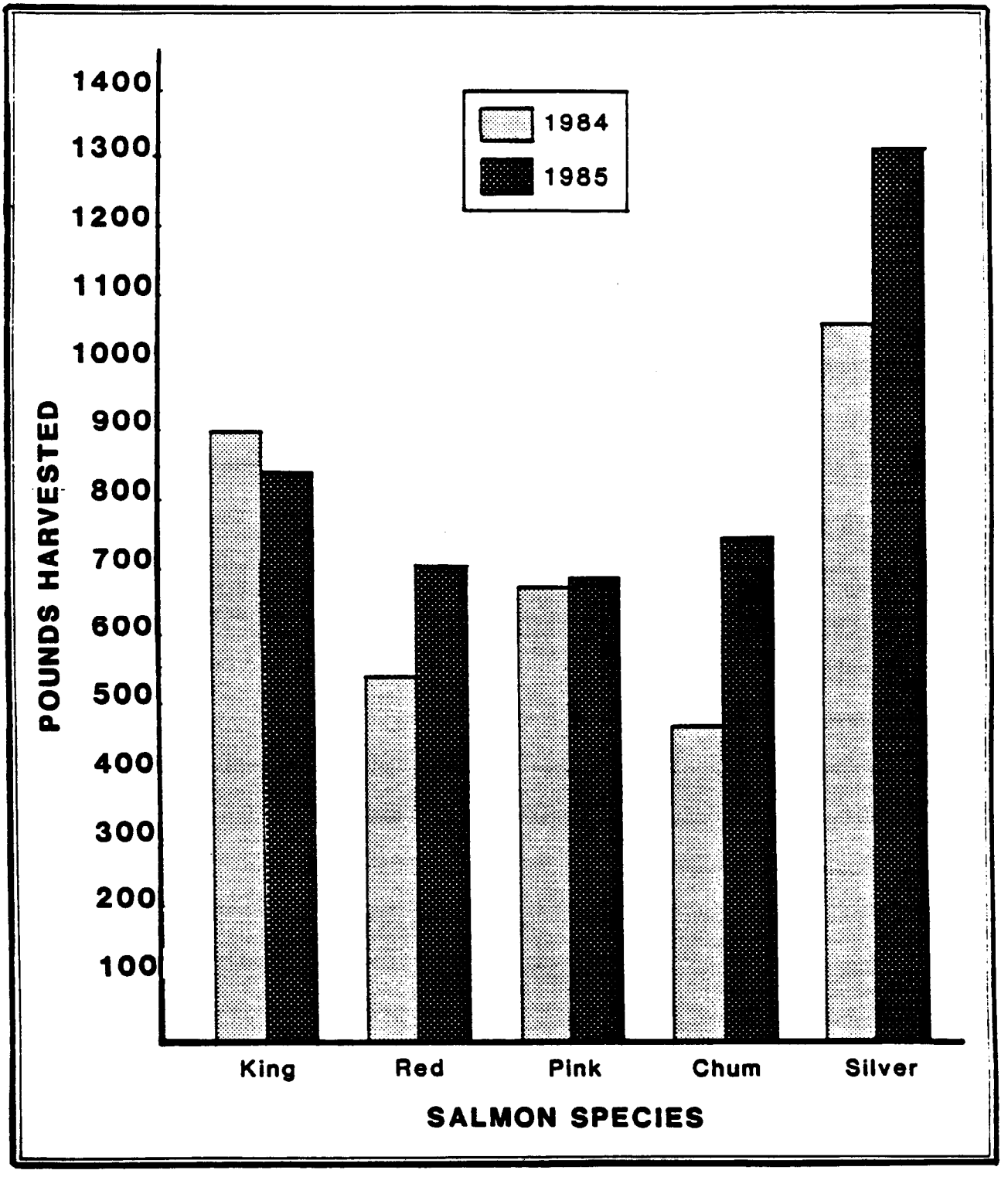


Figure 17. Chenega Bay Salmon Harvests, 1984 and 1985 (n=15).

TABLE 9. SALMON HARVESTS BY SPECIES, CHENEGA 1960S AND CHENEGA BAY 1985

Species	1960s Pounds Harvested	1960s Percent	1985 Pounds Harvested	1985 Percent	Change in Percent Composition
King	742.0	4.1	838.5	19.6	+15.5
Red	1,789.4	9.8	705.2	16.5	+6.7
Pink	4,829.5	26.5	686.4	16.0	-10.5
Chum	5,460.5	30.0	742.4	17.3	-12.7
Silver	5,405.4	29.7	1,313.5	30.7	+1.0
TOTAL	18,226.8	100.0	4,286.0	100.0	

home use. Further, these subsistence regulations required commercial gear types in commercially open areas. Near Chenega Bay, this meant purse seines. Therefore, the cost of gear and boats to fish legally under subsistence regulations has been prohibitive for those who are not commercial fishermen. The marked change in king salmon harvest may also be due in part to increased exposure and availability of king salmon in the 1980s. The Copper River king salmon runs have been much stronger in recent years and more commercial fishermen have been targetting the kings. The dominance of silver salmon harvest in relation to other species has been encouraged by the participation of Chenegans in the Copper River gillnet fishery, the availability of silvers locally in western Prince William Sound, and also the run timing. Silvers come in as other fisheries are winding down. Thus, commercial fishermen who have been involved in pink and chum fisheries are able to fish for silvers for home use.

One expected change from the 1960s observed in salmon harvesting was the absence of summer fish camps removed from the village. Respondents indicated that salmon caught non-commercially in 1985 were harvested primarily on Evans Island and to a lesser extent on Green Island (see Figure 18). These were accessed from the village on day trips.

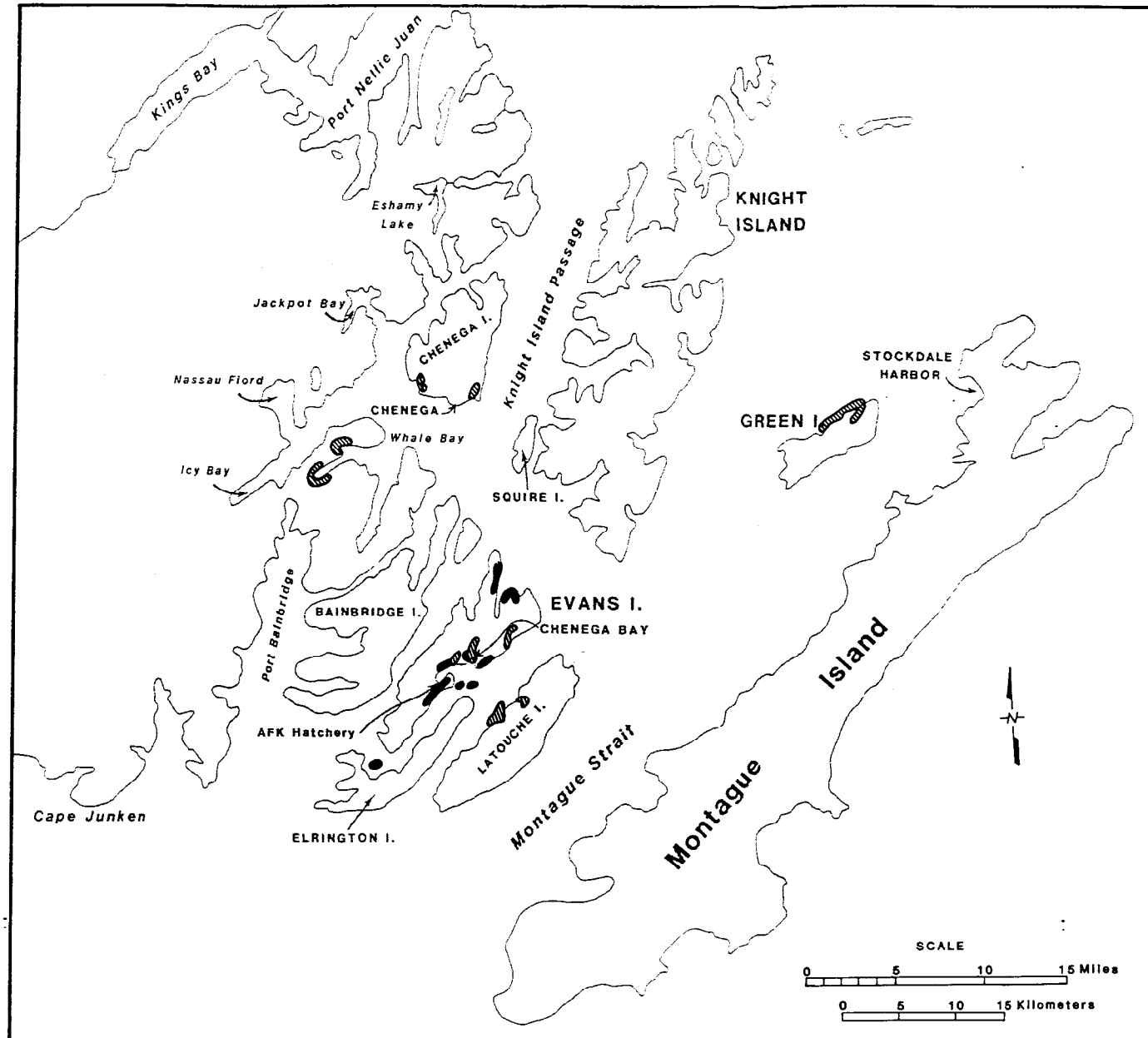
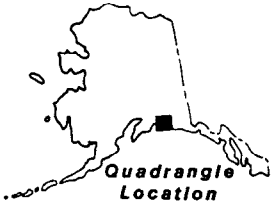


FIGURE 18.
SALMON AND FURBEARER
USE AREAS, CHENEGA BAY
1984-1986

SALMON

FURBEARERS

SOURCE: This map depicts areas used for resource harvesting from 1984-1986 by 10 households contacted during 1985 and 1986. Because not all residents were interviewed, not all areas are reflected. In addition, use areas are extending as residents acquire the necessary equipment and become more familiar with the area. The map represents the minimal limits of land and water use by Chenega Bay residents.



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Herring and Herring Roe

Three households reported harvesting herring, and eight households (53 percent) mentioned using them. While herring were used by some households for food, more people used them as bait for halibut fishing and trapping. Bait herring were frozen whole. Herring for human consumption were fresh fried or pickled. Some herring were taken near Tatitlek.

Herring roe on kelp continued to be harvested in intertidal areas. Some residents were still looking for good sites to harvest the spawn-on-kelp near the village. In both 1984 and 1985, only two households harvested it, although eight households (nine households in 1984) reported consuming herring spawn-on-kelp. Herring roe-on-kelp were also taken near Tatitlek, or from Stockdale Harbor on Montague Island.

Miscellaneous Finfish and Bottomfish

Two households used rod and reels to fish for freshwater fish in 1985-86. One fished for cutthroat and steelhead and both fished Dolly Varden. Dolly Varden are eaten fresh and smoked. In 1985-86, smelt had been harvested in the Cordova area before people relocated. Five households reported harvesting smelt or eulachon in 1985-86, typically with gillnets in the Cordova harbor. Aside from anadromous salmon, freshwater fishing is limited among village residents.

Most halibut were harvested near the village with handlines. Eleven households (73 percent) harvested 2,335 pounds of halibut in 1985-86 for an average of 156 pounds per household in the village. This was an increase of 1,365 pounds, or 140 percent over the 1984-85 harvest, and a 25 percent

increase over the 1960s reported take. Halibut was widely shared, as all 15 households responding to the question reported using it. April through June were fished more frequently than other months.

Red rockfish, another bottomfish, were also taken with handlines. Seven households harvested red rockfish in both survey years. Lingcod were harvested in the late winter (February and March), and were caught on hand lines and in pots, incidental to halibut and snapper fishing. Only two households reported harvesting lingcod in 1984-85, and none in 1985-86. Gray and black cod were harvested in 1985-86, by five and four households respectively. The gray and black cod were caught in the same manner as the lingcod. Skate was taken incidental to halibut fishing.

Most bottomfishing occurred in the vicinity of Evans Island. Latouche Island and Lone Passage were also fished (Figure 19).

Intertidal Resources

Several intertidal resources were gathered in 1985-86 by Chenega Bay households. A variety of clams, including butter and littleneck clams (tabulated under "other clams") were widely and actively harvested. Reportedly, successful clam digging required more effort than in the 1960s because of heavy sea otter predation on clams. Sites near the village with clam concentrations were still being explored at the time of the study. The same interest, but lack of availability, applied to cockles as well. Several households harvested chitons and octopus. They were obtained and cared for in the same manner as in the 1960s. Smaller amounts of razor clams and mussels were gathered. As shown in Figure 20, most invertebrates were harvested in the intertidal area off Evans Island during minus tides.

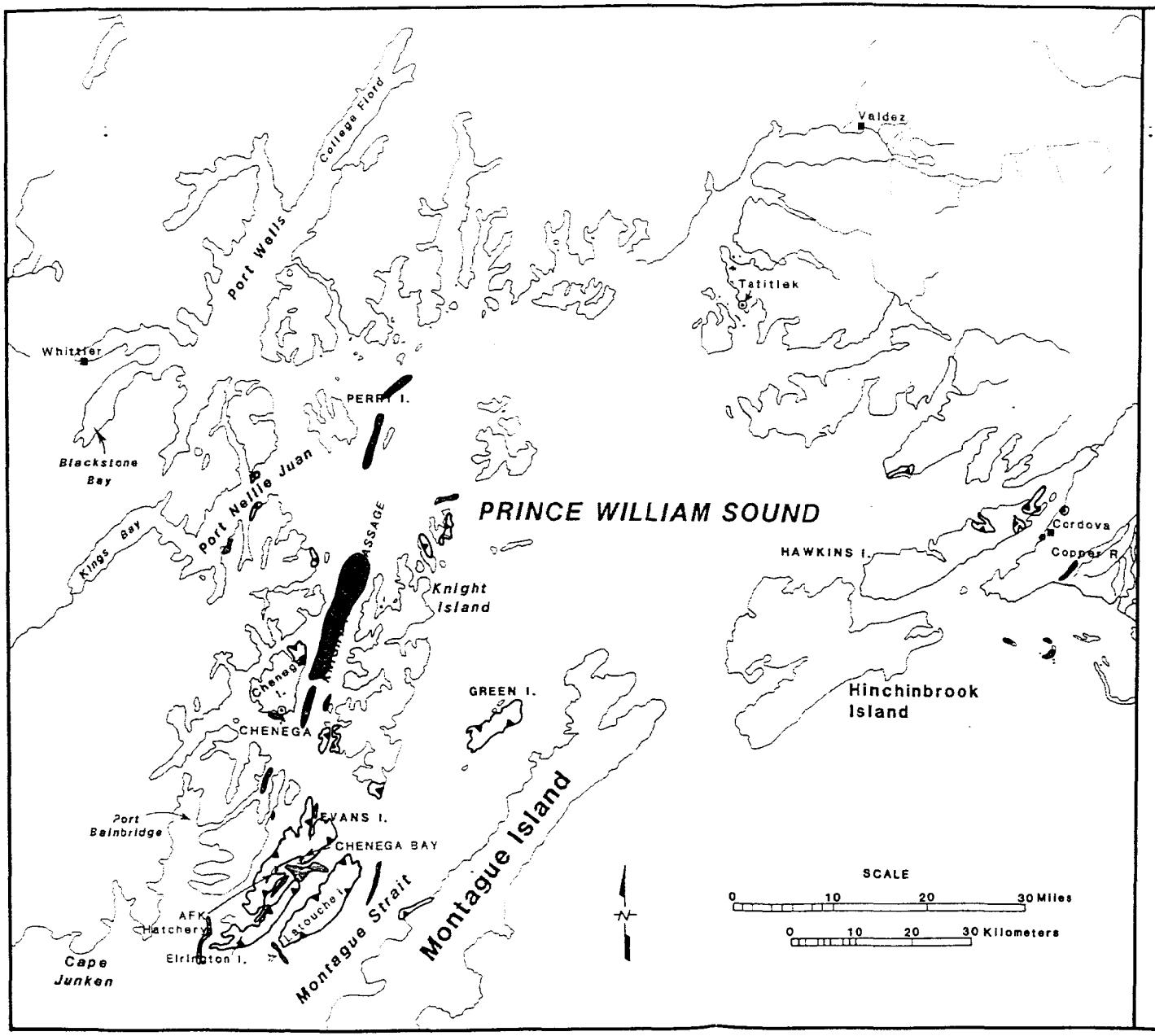
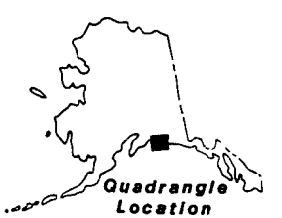


FIGURE 19.
NON-SALMON FINFISH AND DEER USE AREAS, CHENEGA BAY 1984-1986

NON-SALMON FINFISH

DEER

SOURCE: This map depicts areas used for resource harvesting from 1984-1986 by 10 households contacted during 1985 and 1986. Because not all residents were interviewed, not all areas are reflected. In addition, use areas are extending as residents acquire the necessary equipment and become more familiar with the area. The map represents the minimal limits of land and water use by Chenega Bay residents.



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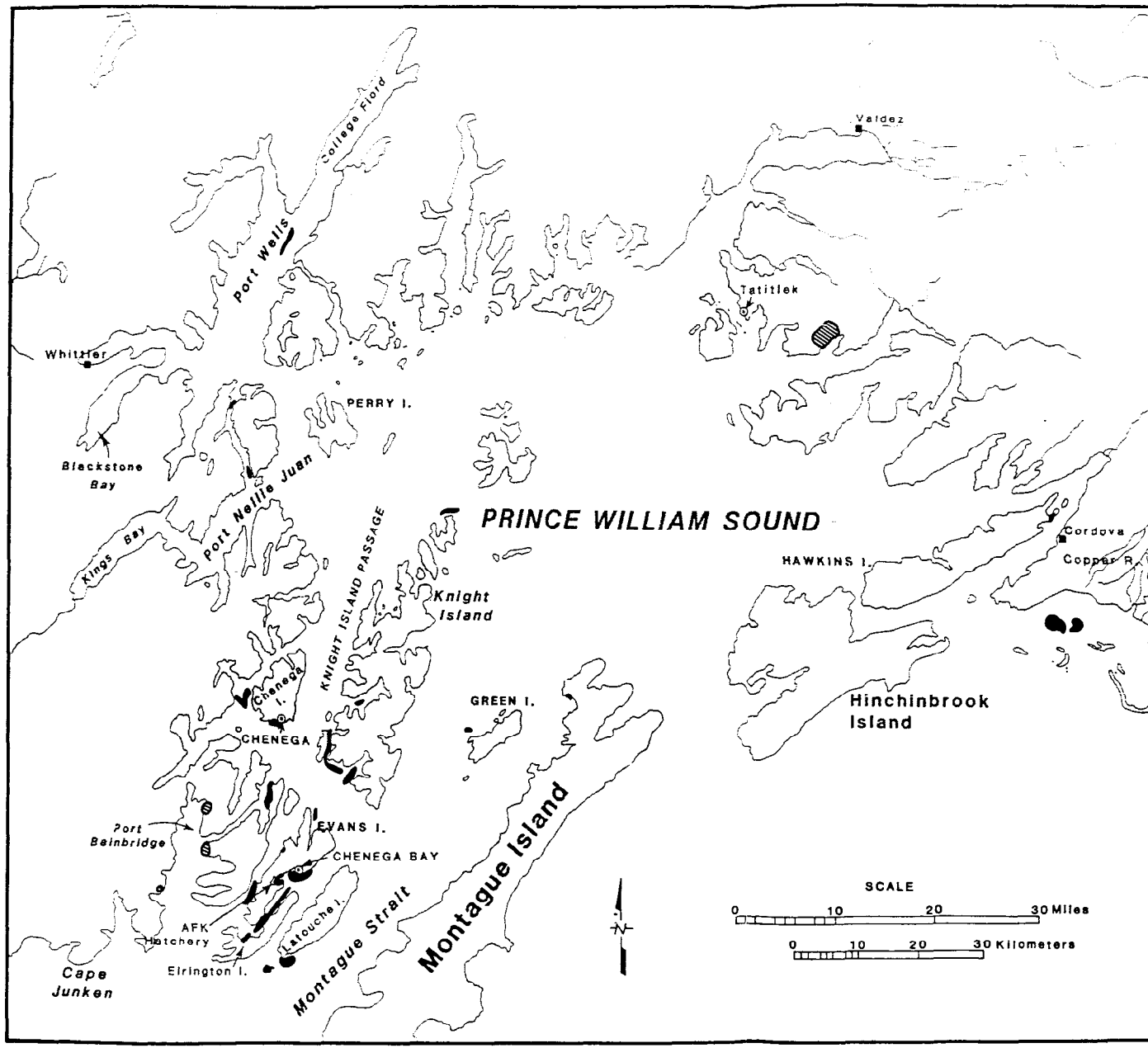


FIGURE 20.
MARINE INVERTEBRATE AND GOAT USE AREAS, CHENEGA BAY 1984-1986

MARINE INVERTEBRATE

GOAT

SOURCE: This map depicts areas used for resource harvesting from 1984-1986 by 10 households contacted during 1985 and 1986. Because not all residents were interviewed, not all areas are reflected. In addition, use areas are extending as residents acquire the necessary equipment and become more familiar with the area. The map represents the minimal limits of land and water use by Chenega Bay residents.

STATE OF ALASKA
DEPT. OF FISH AND GAME
Subsistence Division

Sea urchins and sea cucumbers were not taken during the two study years. Also prey for sea otter, these populations were reportedly depleted. Snails were also absent from the list of harvested species. Typically an incidental catch in crab pots, current mesh on the pots is large enough to allow the snails to fall out when the crab pot is pulled. If there were interest in snails, commercially or for local consumption, the bottom of the crab pots would be lined with herring net.

Deer

Deer was one of the major species harvested in substantial quantities in 1984 and 1985, comprising 14 percent by weight of the community's total harvest in 1985-86 and 22 percent in 1984-85. Deer were hunted, harvested, and preserved in much the same manner as occurred in old Chenega in the 1960s. Eleven households (69 percent) harvested deer in 1985, bringing 2,920 pounds of deer meat into the village, a mean of 183 pounds per household. A few hunters indicated a preference for does, as the meat was better tasting than bucks. Residents reported that deer was shared extensively in the community. All sixteen households had used deer meat during the year. Many households froze deer meat. In addition, the historic preservation methods of salting and canning were also used.

Deer were hunted extensively on Evans, Latouche, and Elrington islands. Chenega Bay hunters also hunted on and along the shores of Knight, Chenega, and Green islands (see Figure 19). Deer hunting sometimes occurred in conjunction with seal or sea lion hunting.

Bear

Ten black bears were harvested by six Chenega Bay households during the period covered by the recent survey, up from a single bear the preceding year. Several hunters mentioned that spring hunts are preferred for denning or emerging bears since the taste of spring meat is favored over fall meat. As the survey was conducted in March and April, some bear hunting was still occurring in 1985-86. A couple of the harvested bears were nuisance bears, taken right in the village during the summer. Most hunting occurred on Evans and Knight islands with some effort on Bainbridge Island (Figure 21).

Goat

One Chenega Bay household successfully hunted goat. One other household hunted goat unsuccessfully. Regulatory restrictions were mentioned as constraints in 1984-85, as goat were on drawing permit. The following year the hunt was put on registration, which still required obtaining a permit. Several respondents expressed an interest in goat hunting during the first survey, but only two households hunted in 1985-86. Goat hunters used the Port Bainbridge area (Figure 20).

Moose

Three households hunted moose during September 1984, of which two were successful. One hunted on the Copper River delta using a road vehicle and then hunting by foot. The other successful hunter harvested a moose at Icy

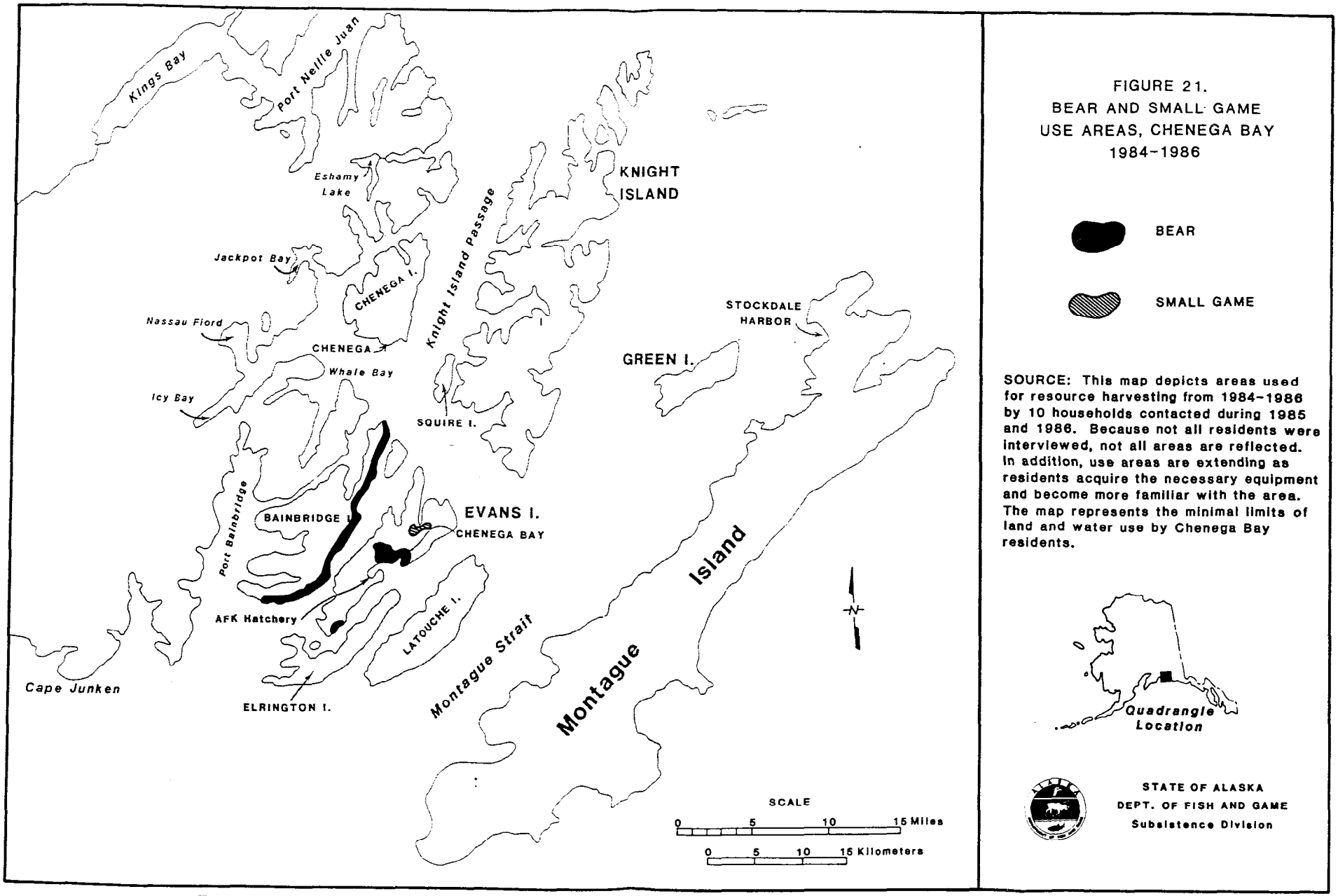


FIGURE 21.
BEAR AND SMALL GAME
USE AREAS, CHENEGA BAY
1984-1986

BEAR

SMALL GAME

SOURCE: This map depicts areas used for resource harvesting from 1984-1986 by 10 households contacted during 1985 and 1986. Because not all residents were interviewed, not all areas are reflected. In addition, use areas are extending as residents acquire the necessary equipment and become more familiar with the area. The map represents the minimal limits of land and water use by Chenega Bay residents.

STATE OF ALASKA
DEPT. OF FISH AND GAME
Subsistence Division

Bay (GMU 5B), prior to moving to Chenega Bay. Several hunters hoped to hunt the Kings Bay area in the future. In 1985, one hunter was successful in taking a moose on the Copper River Delta.

Small Game

Grouse were the most commonly harvested small game by Chenega Bay residents aside from waterfowl. In 1985-86, eight hunters harvested 40 grouse. Grouse are relatively easy prey and locally abundant. They were hunted in the fall and winter on Evans Island (Figure 21). Porcupine and hare are also present on the island, but were not widely harvested. Four households harvested a total of six porcupines during the study year. In 1984-85, one person harvested beaver for meat and pelts, but in 1985-86 no beavers were taken.

Marine Mammals

Sea otters were one of few resources harvested in 1985-86 but not taken in the 1960s. In 1985-86 five households hunted sea otter, harvesting 15 otters, strictly for fur. One household brought back 15 pounds of meat to try. Most Chenega Bay residents were uncertain as to what legally could be done with the pelts, so the harvest was fairly small. December and January were cited as the months when the fur is in prime condition.

In 1985-86 seal hunting was still a widespread activity, although harvest levels were down from 1960s levels. This decline is most likely attributable to the absence of the former bounty on seals. In 1985-86, seven households (44 percent) reported harvesting 145 seals or 343 pounds per household, down

from 12 households and 186 seals in 1984-85, and 14 households and 1,602 seals in the 1960s. In previous years, so many seals were taken that only portions of some were consumed. The most recent surveys indicated that hunters are currently more selective in their seal harvests. Additionally, seal harvesting is more opportunistic. Overall, there is probably less meat discarded. Hunters went in skiffs on one-day trips near Chenega Bay around Evans Island. Most hunters salvaged both the skins and meat. Several households traded or sold the seal skins. In 1985-86, the average price paid was $30 per seal hide. If all the hides taken in 1985 were sold, the average income for seal harvesting households was $621 for the year. Most seal skins are sold to a registered fur buyer in Cordova. Seal meat in excess of what the village could consume was used for halibut and crab bait. Some seal carcasses were traded or sold to commercial crab fishermen. Seals were shot from the boat, preferably in the head and in shallow water. The seals could be grappled with a hook on a weighted line in shallow water if they sank. Seal were often skinned out on the boat. One hunter reported hunting them in deep water in the winter, because their higher percentage of body fat kept them afloat after they were shot. Respondents indicated that seals were fatter and better tasting in the winter. Seal meat was shared liberally. Twelve of the 16 Chenega Bay households consumed seal meat. The backstrap, kidney, and liver of the seal were preferred portions. The stomach was also used by some households. Seal intestines were only salvaged when requested by the few village residents who continue to clean, braid, and cook the intestines in the traditional ways. Seal oil was also rendered and in common use.

Sea lions, considered by most respondents to be second to seal in quality and flavor, were harvested and used in more limited quantities than seal. Twenty five sea lions were harvested by seven Chenega Bay households during

1985-86. Sea lion was eaten by 12 of the 16 households in Chenega Bay. The diminished seal harvest has resulted in a small increase proportionately in the sea lion harvest. Sea lions are considered easier to hunt than seals. Sea lions were harvested at a haul-out on Elrington Island and on the north end of Evans Island. Sea lion meat is preferred in the winter months (December through February), although sea lions were hunted throughout the year. Sea lions were harvested strictly for the meat; the hide and fat were not used. Younger animals were preferred to the older ones. The meat was hung for one or two days, except the flippers, which were eaten immediately. Flippers were not skinned before being eaten. Sea lion meat was fried, boiled, baked, or cooked over an open fire.

In addition to hunting around Evans Island for marine mammals, hunters used the waters around Latouche, Knight, Bainbridge, Flemming, and Squire islands extensively, as shown in Figure 22. A few respondents went further, to Icy Bay, Nassau Fiord, Kings Bay, and Blackstone Bay.

Waterfowl and Bird Eggs

Among waterfowl that was hunted, ducks were the most popular birds. Ten households (63 percent) reported harvesting a total of 142 ducks for a mean household harvest of 13 pounds. Duck harvests ranged up to 30 birds per household. Day trips were made in the fall and winter months to places nearby, including Sawmill Bay, Latouche, Squire, and Knight islands (Figure 23). In 1984, one household also harvested sandhill cranes incidental to duck hunting. In the same year, one household hunted ducks near Cordova.

In 1985-86, bird eggs were harvested in a much smaller quantity than at the old village. One household reported harvesting bird eggs in 1985-86,

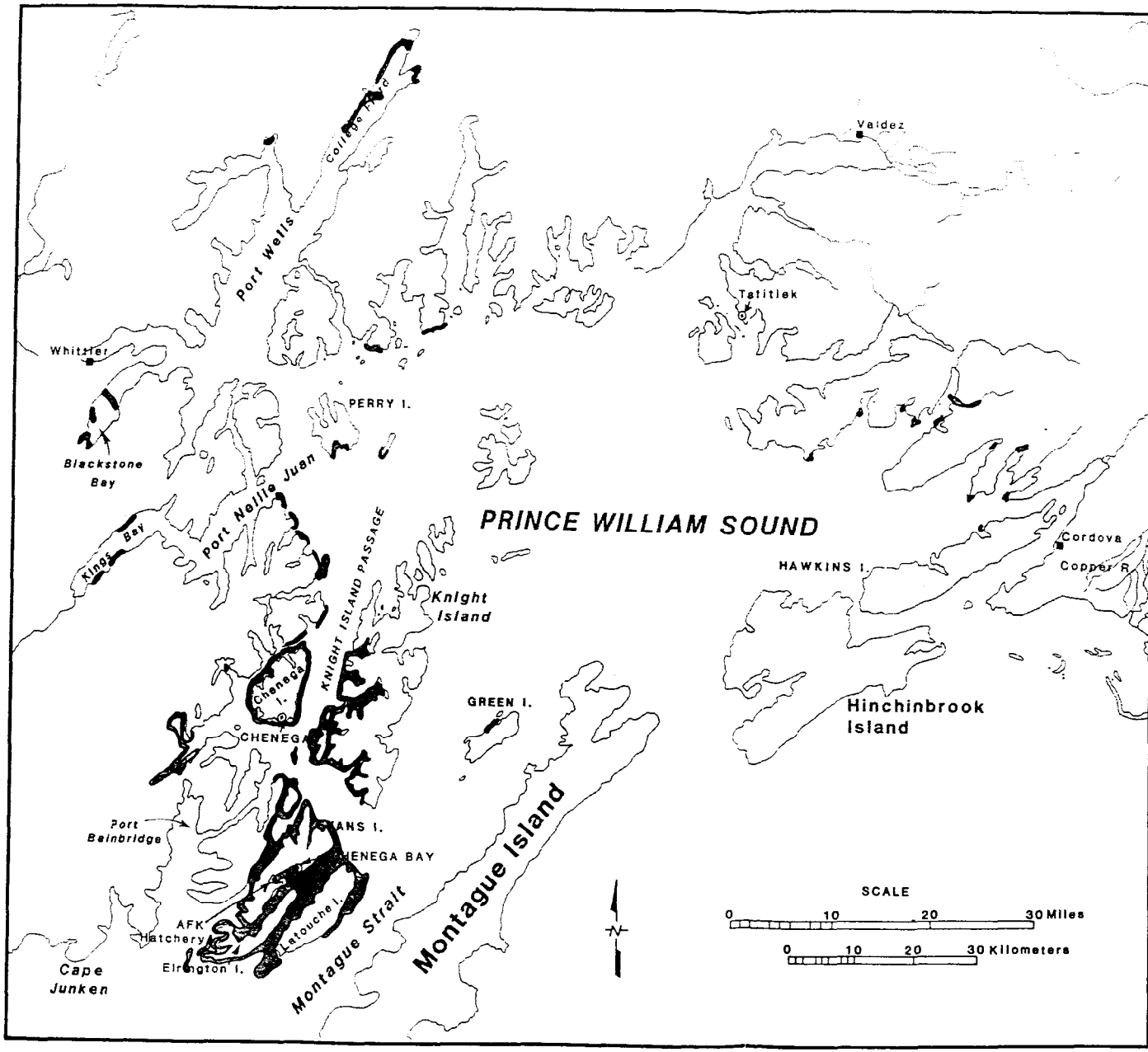
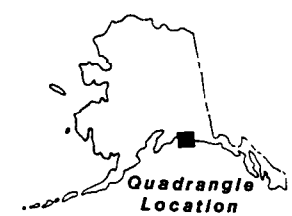


FIGURE 22.
MARINE MAMMAL USE AREAS,
CHENEGA BAY, 1984-1986

MARINE MAMMAL

SOURCE: This map depicts areas used for resource harvesting from 1984-1986 by 10 households contacted during 1985 and 1986. Because not all residents were interviewed, not all areas are reflected. In addition, use areas are extending as residents acquire the necessary equipment and become more familiar with the area. The map represents the minimal limits of land and water use by Chenega Bay residents.



STATE OF ALASKA
DEPT. OF FISH AND GAME
Subsistence Division

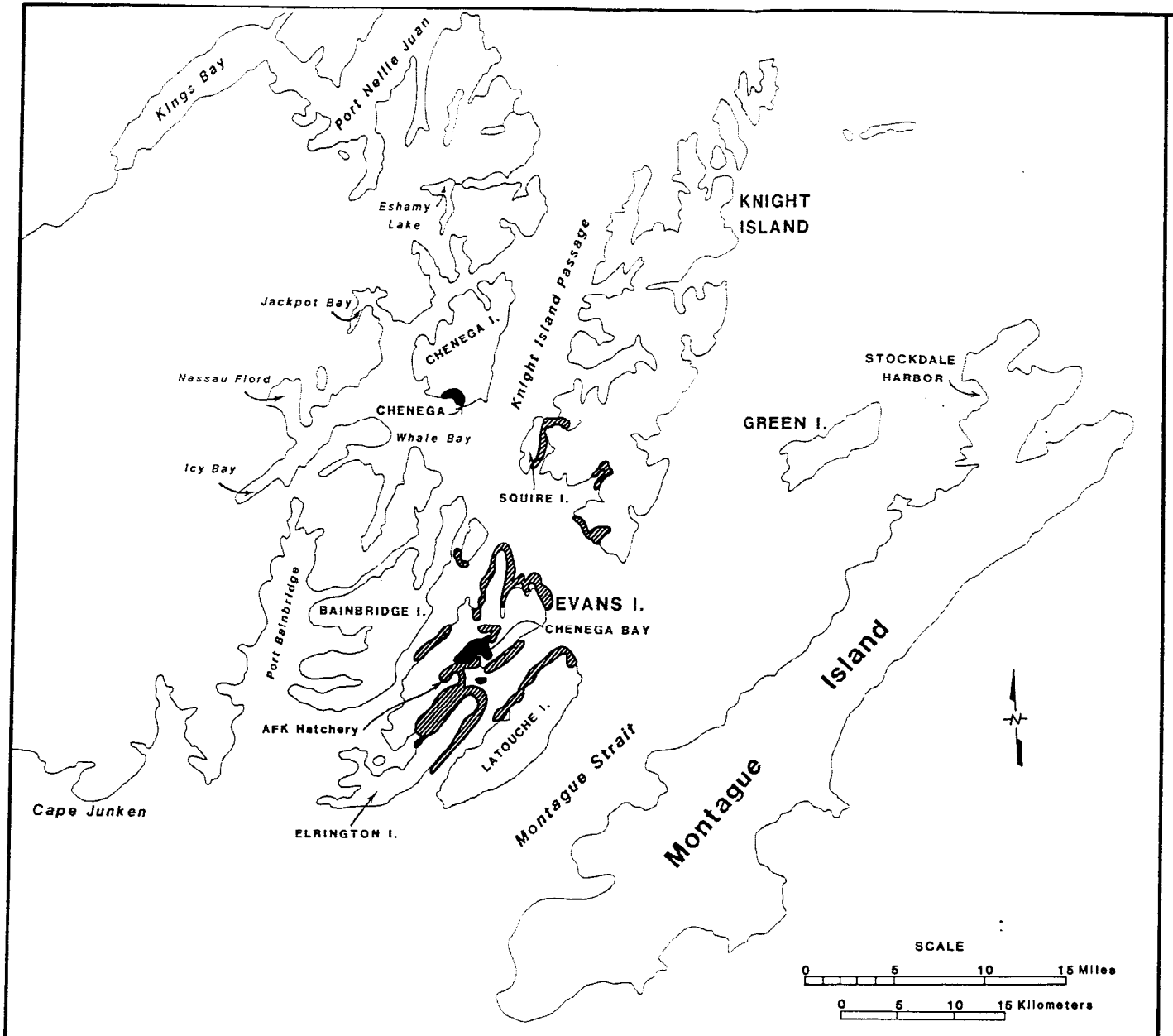
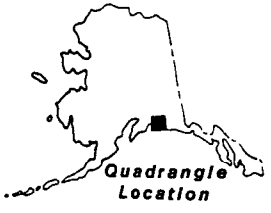


FIGURE 23.
WATERFOWL AND VEGETATION USE AREAS, CHENEGA BAY 1984-1986

WATERFOWL

VEGETATION

SOURCE: This map depicts areas used for resource harvesting from 1984-1986 by 10 households contacted during 1985 and 1986. Because not all residents were interviewed, not all areas are reflected. In addition, use areas are extending as residents acquire the necessary equipment and become more familiar with the area. The map represents the minimal limits of land and water use by Chenega Bay residents.



STATE OF ALASKA
DEPT. OF FISH AND GAME
Subsistence Division

while three reported harvests in 1984-85. Seagull eggs made up the majority of the harvest, although arctic tern and puffin eggs were also taken opportunistically.

Furbearers

Few respondents trapped furbearers during either the 1984-85 or the 1985-86 seasons. Two households trapped in 1984-85, and three in 1985-86. Because prices for furs were low, furbearer harvests did not compensate for the work and capital investment required to trap (Table 10). Several other households indicated that they hoped to trap when prices improved and they were more familiar with the area. A few were planning to build deadfalls. A skiff was used to trap along the surrounding island shorelines. In 1985-86, mink, land otter, and weasel were sought. A total of 29 land otters, 17 mink, and one weasel were taken. As there was virtually no market for land otter or weasel in 1986, mink was the primary income producer. The total harvest averaged across the three trapping households produced an average income of $113. Trapping activities were reported primarily on Evans Island (Figure 18).

Plants

A variety of berries and plants were harvested in 1985-86. Blueberries were most commonly picked, available in abundance in good years in the Chenega Bay area. Salmonberries were also harvested, as well as currants, cranberries, mossberries, and watermelonberries. Seaweed, fiddleheads, wild celery, and watermelonberry stalks were the plants that respondents gathered.

TABLE 10. PARTICIPATION, HARVEST LEVELS, AND ESTIMATED INCOME FROM FURBEARERS AND SEAL, CHENEGA 1962-63 and 1985-86.

	1962-63					1985-86			
Resource	Average Price 1963 $[a]	Average Price 1984 $[b]	Number of Households Harvesting[c]	Number Harvested	Average Income per Harvesting Household$[b]	Average Price 1986 $[a]	Number of Households Harvesting	Number Harvested	Average Income per Harvesting Household$
Land Otter	32.50	110.17	13	266	2,254.35	d	3	29	0
Marten	12.50	42.37	7	53	320.82	60.00	0	0	0
Mink	25.00	84.75	13	349	2,275.19	20.00	3	17	113.33
Weasel	1.00	3.39	8	113	47.86	1.00	1	1	1.00
Seal	15.00[e]	50.85	14	1,602	5,818.69	30.00	7	145	621.43

[a] Larry Kritchen, personal comm.
[b] Adjusted for inflation using figures from US Bureau of Census, 1985.
[c] Based on early 1960s harvest estimates.
[d] No market for land otter during the year.
[e] Price for pelt only. Does not include bounty.

The total village harvest of 268 pounds of berries and plants computed to an average harvest of 18 pounds per household.

Areas Used

With 11 Chenega Bay households in residence for at least a year and a half, areas used for hunting, fishing, and gathering expanded considerably between 1985 and 1986. Contemporary use area maps were developed through mapping interviews with residents during 1985 and 1986. Similar to the 1960s maps, in 1985-86 Chenega Bay residents primarily used the western Prince William Sound, and particularly the islands and bays closest to the recently established village. Where the 1960s maps showed a fairly thorough use of the Chenega Island area, in 1984-86 Chenega Bay residents concentrated their use on Evans, Elrington, and Latouche islands and the waterways surrounding them. Deer, marine mammals, and waterfowl were the species that drew a few hunters over to islands in eastern Prince William Sound, and to the Copper River Highway.

Areas used by Chenega Bay residents coincided with 27 of the historic sites catalogued for this project. Down from the percentage of historic areas used in the 1960s, a change in areas used is reflected. Of the 27 sites, nine were frequented for the same resources as noted in the historical record. Seven of the historic sites that were in areas used by Chenega Bay residents were locales not reported in use in the 1960s by Chenega respondents.

CHAPTER 4

SAN JUAN BAY

The Armin F. Koernig Hatchery (AFKH), formerly Port San Juan Hatchery, is located at the southwest end of Sawmill Bay on Evans Island, approximately one and a half miles from Chenega Bay. The hatchery is operated by the Prince William Sound Aquaculture Corporation (PWSAC). Formerly the site of a cannery operated by the San Juan Fishing and Packing Company, the hatchery began operation in 1975 (Prince William Sound Regional Planning Team 1985:36-37).

SAMPLE

At the time of the survey, four households were living at the hatchery. One household resided nearby at Port Ashton (also in Sawmill Bay), and worked seasonally at AFKH. A sixth household was included in this data summary, although they neither lived on Sawmill Bay, nor worked at AFKH. They lived across Latouche Passage from Chenega Bay Village, on Latouche Island. They are included here because they shared some similarities with the Port Ashton household, and are year-round residents of western Prince William Sound who are actively involved in harvesting natural resources. Although resource use patterns are somewhat different between the four hatchery households and the Port Ashton and Latouche residents, the data summary combines all six for purposes of confidentiality.

DEMOGRAPHY

A total of 17 people lived in the six surveyed households, for an average of 2.8 people per household, slightly lower than Chenega Bay. The mean age was 28.2, while the median and mode were 30 years. All but four of the sample population were adults between the ages of 25 and 50. Fifteen of the seventeen were born outside of Alaska. The average length of residency was 4.5 years; however, if the non-hatchery households were excluded, the mean length of residency was 2 years as of spring 1985.

EMPLOYMENT

The AFKH staff fluctuates in size throughout the calendar year. There are four full-time year round employees. In the months of January and February, they are the only staff. From March to June an additional two or three crew members are added. In the summer months the staff increases in size, peaking during egg take and salmon harvest from mid-July to mid-September. At that time there are a total of 23 hatchery employees. PWSAC provides seasonal employees with room and board, operating a dormitory and hiring a cook during peak activity times. The majority of the hatchery's seasonal and permanent employees are hired from outside the state. The seasonals, therefore, usually have not established Alaskan residency, making them ineligible for resident hunting licenses and tags. As a rule, seasonal workers at AFK Hatchery do not hunt. Permanent employees are provided housing only, and must obtain their own food and pay all air freight and shipping charges (Rand Little, pers. comm., 1986).

Of the five households working at the hatchery in the spring of 1985, four were permanent employees, and the remaining household was a seasonal employee residing year round on Sawmill Bay. One of the households had a seasonal worker living with them.

RESOURCES USED AND HARVESTED

The six surveyed households attempted to harvest a total of 25 resources or resource categories. Twenty-four different resources were harvested, with each household on the average taking 11.5 species. The number used per household was higher, 15.5, reflecting sharing among harvesters. A few species, such as king salmon, herring, and king crab were not harvested by any of the surveyed households but given to them. Overall, the six households had a per capita harvest of 250.2 pounds of resources. The resource use level was slightly higher at 266.5 pounds per capita.

Among the various resources, harvest of only red rockfish, deer, and berries was attempted by all six households (Table 11). Of these, only berries were successfully harvested by all the households. However, all respondents reported using pink salmon, chum salmon, halibut, and berries.

Salmon and halibut appeared to be dietary mainstays (Table 12). Combined, the five salmon species comprised 840.2 pounds (or 19.8 percent) of the total harvest, or 140 pounds per household. Households used a total of 1,027 pounds of salmon (171 pounds per household). Halibut comprised 29.7 percent of the harvest. Halibut harvest and use for the sample were 1,265 pounds and 1,010 pounds respectively. Black rockfish, lingcod, and deer were other major contributors to the overall harvest, all in excess of 350 pounds and comprising a mean of 60 pounds or better of each household's harvest.

TABLE 11. HOUSEHOLD PARTICIPATION IN RESOURCE USE, HARVEST, AND SHARING, SAN JUAN BAY, 1984-85 (n=6)

Resource	Using # (%)	Attempted Harvest # (%)	Harvested # (%)	Gave Away # (%)	Received # (%)
King Salmon	2 (33.3)	0 (0)	0 (0)	2 (33.3)	2 (33.3)
Red Salmon	5 (83.3)	4 (66.7)	3 (50.0)	4 (66.7)	4 (66.7)
Pink Salmon	6 (100.0)	5 (83.3)	5 (83.3)	4 (66.7)	2 (33.3)
Chum Salmon	6 (100.0)	5 (83.3)	5 (83.3)	4 (66.7)	1 (16.7)
Silver Salmon	5 (83.3)	3 (50.0)	3 (50.0)	3 (50.0)	3 (50.0)
Halibut	6 (100.0)	5 (83.3)	5 (83.3)	5 (83.3)	3 (50.0)
Herring	1 (16.7)	0 (0)	0 (0)	1 (16.7)	1 (16.7)
Lingcod	5 (83.3)	5 (83.3)	5 (83.3)	3 (50.0)	1 (16.7)
Red Rockfish	5 (83.3)	6 (100.0)	5 (83.3)	2 (33.3)	1 (16.7)
Black Rockfish	4 (66.7)	4 (66.7)	4 (66.7)	3 (50.0)	1 (16.7)
Dolly Varden	1 (16.7)	1 (16.7)	1 (16.7)	0 (0)	0 (0)
Trout	2 (33.3)	3 (50.0)	2 (33.3)	2 (33.3)	0 (0)
Razor Clams	2 (33.3)	1 (16.7)	1 (16.7)	1 (16.7)	1 (16.7)
Other Clams	5 (83.3)	2 (33.3)	2 (33.3)	3 (50.0)	3 (50.0)
Cockles	2 (33.3)	2 (33.3)	2 (33.3)	0 (0)	0 (0)
King Crab	1 (16.7)	0 (0)	0 (0)	0 (0)	1 (16.7)
Mussels	1 (16.7)	1 (16.7)	1 (16.7)	0 (0)	0 (0)
Octopus	1 (16.7)	1 (16.7)	0 (0)	0 (0)	1 (16.7)
Shrimp	5 (83.3)	3 (50.0)	3 (50.0)	5 (83.3)	5 (83.3)
Black Bear	3 (50.0)	2 (33.3)	2 (33.3)	1 (16.7)	1 (16.7)
Deer	5 (83.3)	6 (100.0)	5 (83.3)	3 (50.0)	4 (66.7)
Ducks	3 (50.0)	3 (50.0)	3 (50.0)	2 (33.3)	1 (16.7)
Grouse	2 (33.3)	4 (66.7)	3 (50.0)	1 (16.7)	1 (16.7)
Seal	4 (66.7)	1 (16.7)	1 (16.7)	2 (33.3)	4 (66.7)
Sea Lion	2 (33.3)	0 (0)	0 (0)	0 (0)	2 (33.3)
Mink	1 (16.7)	1 (16.7)	1 (16.7)	0 (0)	0 (0)
Land Otter	1 (16.7)	1 (16.7)	1 (16.7)	0 (0)	0 (0)
Berries	6 (100.0)	6 (100.0)	6 (100.0)	2 (33.3)	0 (0)
Plants	0 (0)	2 (33.3)	2 (33.3)	0 (0)	0 (0)

TABLE 12. HOUSEHOLD AND PER CAPITA HARVEST AND USE, SAN JUAN BAY 1984-85 (n=6)

Resource[a]	Total Number Harvested	Total Lbs Harvested[b]	House-hold Harvest	Per Capita Harvest[b]	Total Number Used	Total Lbs Used	House-hold Use	Per Capita Use[b]
King Salmon	0	0	0	0	2	41.8	7.0	2.5
Red Salmon	6	27.6	4.6	1.6	16	73.6	12.3	4.3
Pink Salmon	125	325.0	54.2	19.1	176	457.6	76.3	26.9
Chum Salmon	46	308.2	51.4	18.1	34	227.8	38.0	13.4
Silver Salmon	23	179.4	29.9	10.6	29	226.2	37.7	13.3
Halibut	NA[c]	1,265.0	210.8	74.4	NA[c]	1,010.0	168.3	59.4
Herring	0	0	0	0	NA	30.0	5.0	1.8
Lingcod	NA	427.0	71.2	25.1	NA	397.0	66.2	23.4
Red Rockfish	27	108.0	18.0	6.4	25	100.0	16.7	5.9
Black Rockfish	NA	540.0	90.0	31.8	NA	520.0	86.7	30.6
Dolly Varden	1	.9	.2	.1	1	.9	.2	.1
Trout	42	58.8	9.8	3.5	42	58.8	9.8	3.5
Razor Clams	NA	20.0	3.3	1.2	NA	25.0	4.2	1.5
Other Clams	NA	27.0	4.5	1.6	NA	67.5	11.3	4.0
Cockles	16	2.1	.4	.1	16	2.1	.4	.1
King Crab	0	0	0	0	NA	2.0	.3	.1
Mussels	NA	10.0	1.7	.6	NA	10.0	1.7	.6
Octopus	0	0	0	0	5	20.0	3.3	1.2
Shrimp	NA	66.0	11.0	3.9	NA	141.0	23.5	8.3
Black Bear	4	232.0	38.7	13.6	NA	194.0	32.3	11.4
Deer	9	360.0	60.0	21.2	15	610.0	101.7	35.9
Ducks	66	99.0	16.5	5.8	64	99.0	16.5	5.8
Grouse	27	13.5	2.3	.8	24	13.0	2.2	.8

TABLE 12. (Continued) HOUSEHOLD AND PER CAPITA HARVEST AND USE, SAN JUAN BAY 1984-85 (n=6)

Resource[a]	Total Number Harvested	Total Lbs Harvested	House-hold Harvest	Per Capita Harvest[b]	Total Number Used	Total Lbs Used	House-hold Use	Per Capita Use[b]
Seal	2	75.6	12.6	4.4	NA[c]	94.6	15.8	5.6
Sea Lion	0	0	0	0	NA	11.0	1.8	.6
Mink	2	NA[c]	NA[c]	NA[c]	2	NA[c]	NA[c]	NA[c]
Land Otter	2	NA	NA	NA	2	NA	NA	NA
Berries	NA[c]	98.5	16.4	5.8	NA	98.5	16.4	5.8
Plants	NA	9.5	1.6	.6	0	9.5	1.6	.6
		4,253.1	708.9	250.2		4,530.9	755.2	266.5

[a] See Appendix G for complete list of species and scientific names.
[b] Per capita is based on 17 individuals.
[c] NA: not applicable; either only pounds were recorded or resource was used, but not consumed.

Almost all the salmon taken by the AFKH personnel were from returning hatchery fish. The two households not employed full-time by the hatchery used methods including rod and reel and gillnetting. They also participated as crew members in some commercial fisheries.

The year-round hatchery staff had a limited amount of free time for hunting and fishing. All the households made the effort to get one or two deer a year, but could not take more time off. According to the AFKH manager, the slowest season is June and early July and the crew took time to fish for halibut. The other two households had more time, and harvested more, especially game resources, than the AFKH residents. Unlike the hatchery employees, they did not have year-round employment or subsidized housing. Their reasons for moving to the area were also different in that they came to get away from the city, or to return to the place of their upbringing, rather than for a job.

Overall, resource harvest and use levels of the San Juan Bay households were slightly lower than Chenega Bay. The substantial level of harvest reflects both household food needs and the ready availability of resources on western Prince William Sound.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

The survey of household harvests in 1985-86 revealed that the contemporary community of Chenega Bay is harvesting and using wild resources in substantial quantities. The per capita resource harvests by Chenega Bay residents in 1985-86 (361 lbs) were higher than harvests of other communities in Cook Inlet, Prince William Sound, and the Copper River Basin for which information is available (Table 13). The per capita harvest of 361 pounds was comparable to Yakutat (369 lbs), and higher than some Kodiak communities and villages in southwest Alaska.

The discussion of this chapter first highlights the changes in the economy and resource harvesting of the Chenega between the 1960s and 1984-86. Secondly, some factors which probably influence observed harvest patterns are described and discussed.

COMPARISONS BETWEEN THE EARLY 1960S and 1984-86

Employment

Commercial fisheries played a much smaller role in Chenega Bay's economy in 1986 than they did in Chenega in the 1950s and 1960s. One reason for this is that the number of Chenega Bay holders of limited entry permits has been decreasing over time. Whereas in the 1960s, every household in Chenega fished commercially, in 1985-86 only three households had permits. Table 14 shows the decrease in ownership of Prince William Sound permits for local rural Alaska residents. Between 1975 and 1985, 49 seine permits, 62 driftnet, and

TABLE 13. WILD RESOURCE HARVESTS FOR SELECTED ALASKAN COMMUNITIES.

Community	1984 Population	Per Capita Harvest	Year of Study	Source
Cook Inlet				
English Bay	172	147	1981-82	Stanek 1985
Homer	3,373	104	1982	Reed 1985
Kenai	6,072	37	1982	Reed 1985
Ninilchik	427	76	1982	Reed 1985
Port Graham	174	145	1981-82	Stanek 1985
Seldovia	435	52	1982	Reed 1985
Tyonek	302	272	1983	Fall et al. 1984
Kodiak				
Akhiok	107	518	1982-83	KANA 1983
Karluk	90	835	1982-83	KANA 1983
Kodiak City	6,069	143	1982-83	KANA 1983
Larsen Bay	214	400	1982-83	KANA 1983
Old Harbor	405	464	1982-83	KANA 1983
Ouzinkie	240	358	1982-83	KANA 1983
Port Lions	301	262	1982-83	KANA 1983
Prince William Sound				
Chenega Bay	60[a]	361	1985-86	This study
Cordova	2,108	151	1985	Stratton 1986
Southcentral-Interior				
Copper Center	439[b]	113	1983	Stratton & Georgette 1984
Glennallen	861[b]	71	1983	Stratton & Georgette 1984
Talkeetna	441	55	1986	Fall & Foster 1987
Southeast				
Angoon	470	216	1984	ADF&G 1986
Klawock	532	223	1984	Ellanna & Sherrod 1986
Tenakee Springs	156	250	1984	Kookesh & Leghorn 1986
Yakutat	453	369	1984	Mills & Firman 1986
Southwest				
Chignik Bay	141	194	1984	ADF&G 1986
Chignik Lagoon	46	229	1984	ADF&G 1986
Chignik Lake	153	283	1984	ADF&G 1986
Dillingham	2,004	242	1984	Fall et al 1986
Ivanof Bay	38	445	1984	ADF&G 1986
Naknek	405	188	1984	Morris 1985
Perryville	107	391	1984	ADF&G 1986

[a] 1986 researcher observation.
[b] 1983 Study area estimate.

TABLE 14. OWNERSHIP OF PRINCE WILLIAM SOUND SALMON LIMITED ENTRY PERMITS BY ALASKAN RURAL LOCAL (ARL) RESIDENTS

		1975		1985	
Fishery	Total Permits	ARL[a] Permits	Percent	ARL Permits	Percent
Seine	261	167	64.0	118	45.2
Driftnet	534	337	63.1	275	51.5
Set net	30	17	56.7	14	46.7

[a]ARL includes all Prince William Sound residents except Valdez.

Source: Dinneford and Hart 1986:24-25.

three setnet permits have left rural areas of Prince William Sound. Given the current trend of commercial fisheries limited entry permits leaving villages throughout the state and the Prince William Sound, it is not surprising that commercial fisheries involvement among Chenega residents declined from the 1960s to the 1980s. A major reason for this decline in local permits is increased capitalization in the Prince William Sound fisheries. Since limited entry permits were issued, salmon fishing in Prince William Sound has become progressively more competitive and capitalized. Bigger, newer boats equipped with increasingly sophisticated electronic fish-finding instruments have been entering the fishery. Villagers unable to make the investments to remain competitive, and some because of advancing age and a desire to retire, have been selling their permits. Many of these sales are to non-village residents. The younger generation cannot compete in these conditions and few have the money to purchase a permit.

Cannery work in the 1980s is also not as accessible to village residents as it was in the 1960s. In the 1960s about 50 percent of the households were involved in cannery work. In the 1980s, only 27 percent were involved. There are no longer canneries operating in western Prince William Sound as there were in the 1960s. All have closed down. One floating processor anchors near Evans Island during seine season. This is where two village residents reporting fish processing work in 1985 were employed. One worked briefly in Seward and then travelled to Cordova to work in canneries. For the village's first two years of existence, construction projects in Chenega Bay have provided temporary local employment to households. Federal monies channeled through the regional Native non-profit corporation also have provided employment for a few. The state employs the VPSO, and utilities also generate part time employment in the village. These types of jobs in construction and government funded public services replaced commercial fishing and cannery wage employment as the primary sources of monetary income during the study period.

Community Infrastructure

Compared with Chenega in the 1960s, electricity, telephone, and improved mail service in the new Chenega created conditions that affect hunting and fishing. Electricity and freezers allow for improved preservation and storage of wild resources and store-bought groceries. The telephone facilitates mail ordering of groceries from Cordova and Anchorage, while improved transportation has made it possible for the mail plane to deliver fresh and frozen meat, produce, and other perishables that in earlier days were not available. The costs of importing goods are relatively high compared with household income levels, however. Thus, while households import a portion of

their community's food supply, a large portion is obtained directly from wild resources.

Resources Used and Harvested

Figure 24 compares the 1984-85 and 1985-86 harvest levels with estimated harvest levels in the 1960s. Harvest levels are given both with and without marine mammals because of the ambiguities surrounding the amount of usable product from marine mammals harvested for bounties in the 1960s. Total per capita harvests in 1986 were about 25 percent of the 1960s harvest if marine mammal harvests are included. The harvest figures without marine mammals, while undoubtedly a more conservative estimate of community harvest levels, give a better basis for comparison of the wild food supplies between the two periods. Overall, if marine mammals are excluded, the per capita harvest in 1985-86 was approximately 42 percent of the estimated per capita harvest in the 1960s (218 lbs to 520 lbs). However, it is probable that the 1960s estimated harvests are somewhat inflated because in that survey, people were asked to report an "average" yearly harvest for each species. This type of questioning creates ambiguities in responses, so that the harvest estimate may not reflect normal fluctuations of particular resources from year to year, nor take into account the households without hunters and fishers in the village who relied on others to provision them with wild foods. If these were figured in, the estimated 1960s "average" harvest probably would be lowered, and the differences between the 1960s and 1985-86 harvests lessened.

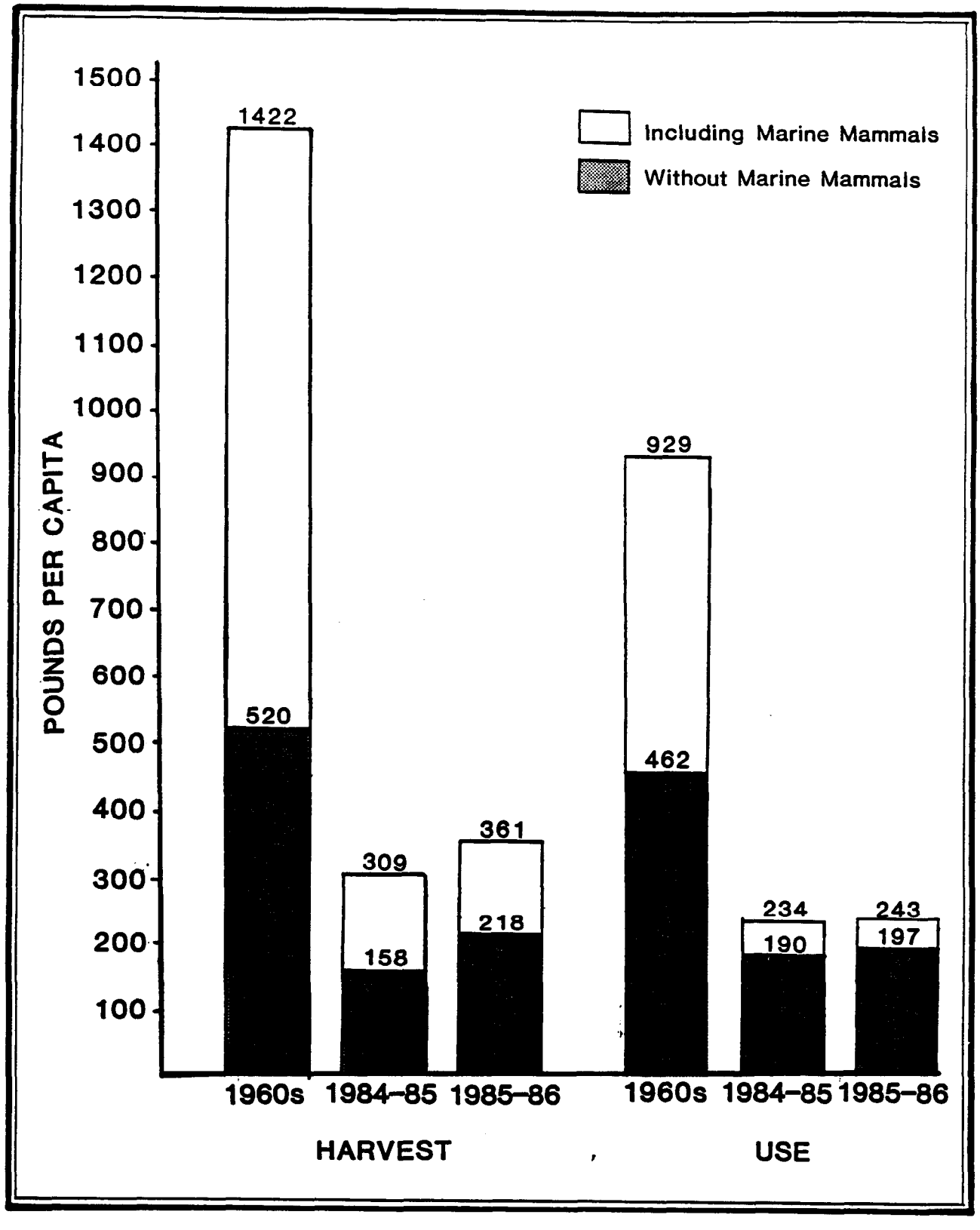


Figure 24. Per Capita Harvest and Use of Resources, Chenega 1960s, 1984-85 and 1985-86.

FACTORS INFLUENCING HARVEST LEVELS

There were several factors influencing the harvest levels in general which may help explain the differences in resource harvests between Chenega Bay in the 1980s and Chenega in the early 1960s. Some of these factors included regulations and enforcement, local availability of wild resources, technology used in harvesting and preservation, imported foods, familiarity with the area, and transmission of knowledge.

Regulations and Enforcement

As mentioned earlier, the Chenega Bay residents in 1985-86 reported regulatory constraints on their harvest activities. In comparison with the early 1960s, these perceived constraints were partly a consequence of regulatory changes since the 1960s, but, perhaps more importantly, were also a result of increased awareness of state and federal regulatory systems and the possibility of enforcement. Specific areas of concern mentioned by residents were salmon, deer, goat, and bird eggs.

Salmon regulations had a number of problems, according to respondents. Village residents did not consider the legal bag limits appropriate. During the study period in 1984-86, regulations allowed an annual bag limit of 15 salmon for a household of one, 30 fish for a household of two, and 10 fish for each additional household member. These levels were considered arbitrary and too restrictive for many household needs. Seasons also were not realistic according to respondents in that they did not coincide with the availability of local salmon stocks. The 1984-86 regulations allowed subsistence fishing only during commercial fishing openings. Commercial openings do not coincide

with some of the early and late runs that villagers would otherwise fish. Areas open to subsistence fishing also were restricted to those open to commercial fishing. These area restrictions required fishermen to fish in the same localities as commercial fishermen, and placed subsistence fishermen in direct competition with a highly capitalized commercial fishing fleet. They also did not allow any legal harvest of salmon from local streams near the village. The open areas closest to Chenega Bay included the area just outside Sawmill Bay, which is a commercial seining area by regulation. The nearest legal gillnet fishing area is at Eshamy, approximately 50 miles by boat from the village. Villagers also indicated that the two legal gear types allowed for subsistence fishing--the seine and drift net--are not always economical or practical for subsistence fishing by Chenega Bay residents. More appropriate gear would be beach seines in addition to driftnets.

Game regulations of deer and goat harvests have not changed significantly between the early 1960s and the 1980s. However, villagers' awareness of the regulations and the possibility of enforcement have increased substantially. Twenty years ago, as in 1986, limits for deer and goat were based on an individualized bag. The individualized bag does not coincide with the method of harvest at Chenega Bay, in which a limited number of hunters provide meat for the entire village. For goats, the permit system created a problem for Chenega Bay hunters. Registration permits for goat hunting were only available in Cordova and Soldotna from Alaska Department of Fish and Game offices. Airfare one way to Cordova is in excess of $300, and Cordova is in the eastern sound, while goat hunting occurs in western Prince William Sound near the village. Permitting was less of a problem for hunters with respect to deer and moose because a resident license vendor issued harvest tickets locally.

Bird egg and waterfowl harvests have been affected by regulation. For several years, spring waterfowl hunting and most egg gathering was understood by villagers to be illegal. Although a District Court decision in January 1986 ruled that those regulations are inapplicable to subsistence harvests, the longstanding perception of regulations dampened harvest of birds and eggs in the two recent study years. Only one household gathered eggs and none hunted ducks.

The passing of the Marine Mammal Protection Act in 1972 has affected use and harvest of marine mammals. There is no longer a bounty on seals, and the legality of marketing marine mammal skins and pelts is unclear to Chenega Bay residents. Given that 1963-64 was the peak year of the harbor seal harvest for bounty (ADF&G 1976:809), the take has certainly declined since then.

Availability of Resources

Second only to regulations, the availability of resources was a determinant in harvest levels. The status of certain populations influenced harvest levels, the degree of exchange of some resources, and the relative contribution of resources in the total community harvest.

Resources more widely used in the 1980s than in the 1960s included halibut, crab, and shrimp. In the 1980s, halibut was more extensively harvested. It was thought that pink salmon released and returning to AFK hatchery brought feeding halibut into Sawmill Bay. Crab and shrimp have become more available to village residents through exchange and sale from commercial fishermen who dock at Chenega Bay. The old village did not have a dock. The convenient dock, and available services including water, showers, and a store with basic provisions have brought fishermen to the village.

Sea otter predation and earthquake-induced changes have affected the availability of clams and other intertidal resources such as sea urchins and sea cucumbers. The unrestricted growth of the sea otter population has reduced the intertidal resources available for human consumption. The earthquake caused uplift in some areas, elevating some clam beds above tidewaters, while other areas subsided, submerging clam beds below the intertidal levels.

The decline in harvest of herring spawn on fucus (called "popweed") is directly a function of lack of local availability. To date, villagers have not yet located an area close to the village where herring spawn.

The decline in bear harvests may be more related to the increased deer populations in western Prince William Sound than to decreases in bear populations. Deer were transplanted in the eastern sound first in 1919. They have been spreading west and onto the islands of Prince William Sound. The increased ease of access to deer meat, combined with a preference for venison, may be lessening the demand for bear meat.

Technology

Changes in technology also have affected harvesting patterns, especially changes in commercial fishing gear and the use of freezers in the village. Since the early 1960s, commercial fishing boats have increased in size, comfort, and the kinds of electronic equipment installed for navigational and fish-locating purposes. In 1984-86, village residents owned six commercial fishing boats, varying in size and style from open skiffs with outboard motors to a fully equipped seine boat. Few of the boats were used for subsistence fishing or hunting, but they were used to transport fish retained from

commercial harvests to the village for use by families. The larger boats are better equipped for holding fish, and are able to travel longer distances more easily than the smaller boats of the 1960s. At least one commercial boat was used for goat and deer hunting in the 1985-86. The larger boat allowed several hunters to go and provided better protection in bad weather.

Survey respondents in 1985 indicated that freezers influenced the quantity of meat or fish harvested at one time because of increased ease in preservation and quality of the frozen product. Respondents reported larger harvests in some instances, such as deer and halibut. A few people had been concerned that freezers would promote more nuclear family harvest and use patterns. The increased ease with which resources could be preserved was feared by some to lead to less community-wide sharing. However, this study shows that sharing throughout the community was commonly practiced in 1985-86. At least two factors promoted this food distribution. First, there was harvest specialization between village households. There are a few very skilled seal hunters and a few knowledgeable goat hunters who harvested most of these resources. Those that have the knowledge and equipment often provide for those who do not. Secondly, it is a shared value that when there is an abundant harvest, all should share in the bounty. Some resources are still preferred fresh, and this promotes distribution of newly killed foods. Other resources are shared also in frozen form as need arises.

Marketability of Resources

As mentioned under the species account for seals, there is no longer a bounty on harbor seals. The lack of bounty has discouraged several hunters from taking the high numbers of seals reported in the 1960s. A few hunters

still take seals to market the hides, but at approximately $30 a hide, it is not a particularly lucrative undertaking.

Declines in fur harvests between 1960 and 1984-86 are also related to the market value of furs. As shown earlier, there was virtually no market for land otter and weasel in 1985. Mink prices, like seal hide prices, provided a modest return for time, equipment, and gas, but compared with 1960s prices, when equated in 1984 dollars, they are worth less than one fourth of their value in the 1960s.

Imported Foods

In spite of Chenega Bay's fairly remote location, mail plane service twice weekly can deliver grocery orders phoned or mailed into Anchorage or Cordova. In 1986, there were a few households that did not harvest substantial quantities because their families preferred imported foods, particularly imported meats. However, the high cost of shipping compared with low household income levels meant that most meats and food consumed in the community derived from local stocks.

Familiarity with the Area

Many of the new residents reported they were still relatively unfamiliar with the Chenega Bay area based on summertime commercial fishing activities in the western sound. Increasing familiarity with the area by residents undoubtedly will affect harvesting patterns in the coming years. It can be hypothesized that quantities of resources harvested may increase, as better knowledge of the area often leads to a higher success rate in harvesting.

Based on the expansion of use areas between 1985 and 1986, it is possible that use areas will continue to expand in the coming years as hunters and fishers acquainted with what is available in the immediate vicinity begin to explore areas further from home. To date, only a few of the former hunting and fishing grounds had been used in the resettlement years. Harvesters were still focusing effort in the immediate area around Chenega Bay.

Transmission of Knowledge

Another question explored in the 1986 research was what, if any, effect the 20-year absence from western Prince William Sound had had on the transmission of specialized hunting and fishing knowledge from one generation to the next. Had information been "lost" about areas to hunt and fish, strategies, and technology? A few of the particularly knowledgeable hunters and fishers of 1960s Chenega were among the 1985 and 1986 Chenega Bay residents, but others elected to remain in Anchorage, Cordova, and Tatitlek. This study's survey revealed that five of the knowledgeable harvesters who hunted from old Chenega in the 1960s and who resettled, were active hunters and fishers in new Chenega Bay during the study period, 1985-86. They often took their own sons and other young men of the village hunting and fishing with them. The skilled hunters were very much interested in passing the knowledge on to the next generation. Not all of the younger generation have so far displayed an interest in learning hunting and fishing skills. For example, the fur buyer in Cordova reports that only a few of the younger men currently know how to properly skin out a seal to retain its highest market price. One reason for this apparent lack of interest by some is that while families were living away from the Chenega area in the years before

resettlement, in many instances, the children were more involved in organized sports or other recreational pursuits available in the communities where they resided than in their families' hunting and fishing activities.

CONCLUSIONS

The Chenega of the early 1960s was a village heavily dependent on the natural resources in Prince William Sound for food and as a source of income. Marine mammals, salmon, deer, and black bear were the mainstay of villagers' diets. Commercial fishing, trapping, and bounty-hunting for seal were the prevalent sources of cash income.

In Chenega Bay in 1984-86, natural resources still figured prominently in the local community economy. Marine mammals, salmon, and deer were harvested in substantial quantities for food by Chenega Bay residents. Although direct comparisons are difficult, it appears that food harvests in 1984-86 were somewhat smaller than in the 1960s.

Construction and commercial fishing were the major sources of employment in 1984-86. In addition, government-funded positions, either directly or through grant monies, employed a number of people.

The research found relatively high levels of harvest, high levels of use, high levels of participation, expanding harvest areas, and enculturation of young men by former Chenega residents. The study suggests that wild resource harvests have played a major role in the, so far, successful re-establishment of the village.

Although the 1986 research has answered some questions, there remain many questions for future research. What effect will the decreasing number of commercial limited entry permits have on the village economy and on the

harvesting of resources? In years of declining oil revenues, will the absence of state capital projects create a shortage of cash income which may threaten the livelihood of villagers? Will harvest areas continue to expand? As hunters travel further from the village, will harvest patterns and modes of transportation change? Will increasing familiarity with the area lead to use of fishing or hunting camps?

Substantial resource harvests of the 1980s appeared to be lower than early 1960s because of several possible factors, including regulation restrictions, value changes, unfamiliarity with the area, lack of equipment, removal of the bounty on marine mammals, and the loss of limited entry permits. Still, harvests appear to be growing in Chenega Bay. It could be predicted that harvests will continue to grow as familiarity with the area increases, regulations improve, certain economic alternatives become scarce, and wild resources become more accessible. It is possible that harvests could approach 1960s levels. Like the 1960s, the current economy of Chenega Bay is a mixed one; people need cash to support harvest activities as well as to purchase other necessities such as clothes and fuel. In the 1960s economy, major cash sources were seal bounties, commercial fishing, and processing. In the 1980s, major cash resources include government services, construction, and commercial fishing. In a time of declining state and federal budgets, the future of two of these sources, government and construction, is questionable. The loss of limited entry permits is another threat to the viability of commercial fishing in the village.

Overall, Chenega Bay in this initial resettlement stage appears to be successfully overcoming innumerable financial and logistical obstacles. The community's social organization has been re-established, evidenced by the successful formation of hunting and fishing groups and the widespread

distribution of wild resources within the community. No homes went without halibut, deer, or seal the year of the study. Particularly in the subsistence realm, the village residents are adapting and responding well to their new environment through the reapplication of traditional fishing and hunting practices. Though future cash resources are still uncertain, subsistence offers one economic safety net for the community's future economic and social wellbeing. The newly relocated population, growing number of children in the local school, and increasing harvest levels of wild resources all attest to a community which is becoming successfully re-established in its traditional territory.

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APPENDIX A

FISH AND GAME REGULATORY SUMMARY FOR WESTERN PRINCE WILLIAM SOUND

Resource	Year	Area	Regulations
Deer	1963	Prince William Sound	Season: August 15 to December 31 Annual bag limit: 4 deer Restrictions: Only antlerless deer from 9/15 to 12/31.
	1984	GMU 6	Season: August 1 to December 31 Annual bag limit: 5 deer Restrictions: Only antlerless deer from 9/15 to 12/31
Goat	1963	Prince William Sound	Season: August 1 to December 31 Annual bag limit: 2 goats
	1984	GMU 6D	Season: August 1 to January 31 Annual bag limit: 1 goat Restrictions: Registration permit required.
		6D, Cape Fairfield to Tiger Glacier	Season: August 10 to September 30 Annual Bag Limit: 1 goat Restrictions: 1 goat by drawing permit only.
Moose	1963	Prince William Sound	Season: By field announcement Annual bag limit: 1 bull
	1984	GMU 6D	Season: September 1 to 30. Annual Bag Limit: 1 bull.

Resource	Year	Area	Regulations
Salmon	1963	Lower Copper River	Permit required Annual bag limit: 10 kings, 25 reds, 25 silvers per permit
		Prince William Sound	Permit required Annual bag limit:100 salmon per permit Season and area designated on permit
	1984	Lower Copper River, Prince William Sound	One permit per household Annual bag limit: 15 salmon for household of 1 30 salmon for household of 2 10 salmon for each additional member of household. Restrictions: No more than 10 kings per permit. Season: During commercial fishing periods. Areas: in areas open to commercial fishing Gear: With gear type specified for commercial fishery without location.
Shellfish	1963	Lower Copper River, Prince William Sound	Crabpot floats shall be marked with initials of owner.
	1984	Lower Copper River Prince William Sound	King Crab: 6 per day and in possession, males only. Dungeness Crab: 20 per day and in posession, 6½" or more in shoulder width. Tanner Crab: 20 per day and in possession, males only. Shrimp: Not more than 10 pots per person.

APPENDIX B

HH# _____

Date(s) _____

Interviewer _____

Place _____

HISTORIC RESOURCE USE QUESTIONNAIRE
CHENEGA VILLAGE: PRE-EARTHQUAKE

1. Did you or members of your household hunt, fish or gather when you lived in Chenega before? yes_____ no_____

2. How old were you at the time of the 1964 earthquake? _____

3. Who was living in the same household with you at that time?

member	m/f	relation to respondent	birthplace

2. What species were you or members of your household harvesting and/or using when living in Chenega? Did you use these resources after you left? If you (or members of your household) harvested this resource, could you estimate how much was harvested and/or used in one calendar year in the early 1960s?

Species	Harvested resource: est. amount	Used resource: est. amount	Months Harvested	Harvested after relocating: yes/no	Used after relocating: yes/no
King Salmon					
Red Salmon					
Pink Salmon					
Dog Salmon					
Silver Salmon					
Halibut					
Cod-gray					
Cod-black					
Red Rockfish					
Black rkfish					
Sturgeon					
Dolly Varden					
Cutthroat Trout					
Whitefish					
Herring					
Herring Roe					
Smelt					
Eulachon					
Other:					
Other:					
King Crab					
Dungeness					
Tanner					
Shrimp					
Razor Clams					

PAGE THREE

Species	Harvested resource: est. amount	Used resource: est. amount	Months Harvested	Harvested after relocating: yes/no	Used after relocating: yes/no
Other clams					
Cockles					
Mussels					
Chitons					
Sea Urchins					
Limpets					
Sea Cukes					
Sea Snails					
Octopus					
Other:					
Deer					
Goat					
Moose					
Bear-brown					
Bear-black					
Other					
Porcupine					
Beaver (meat)					
Lynx (meat)					
Rabbit (hare)					
Ptarmigan					
Grouse					
Other:					
Other:					
Seal					

PAGE FOUR

Species	Harvested resource: est. amount	Used resource: est. amount	Months Harvested	Harvested after relocating: yes/no	Used after relocating: yes/no
Sea Lion					
Porpoise					
Geese					
Ducks					
Crane					
Heron					
Shag (Cormorant)					
Loons					
Gulls					
Eggs					
Other:					
Salmon-berries					
Blueberries					
Cranberries					
Other:					
Other:					
Other:					
Marten					
Mink					
Weasel					
Land Otter					
Beaver(fur)					
Muskrat					
Wolverine					
Wolves					

Species	Harvested resource: est. amount	Used resource: est. amount	Months Harvested	Harvested after relocating: yes/no	Used after relocating: yes/no
Coyote					
Lynx					
Other					
Other					

3. Did you move to (place of interview) after the earthquake? Yes _____ No _____

   If no, where did you move? _____

   Why did you decide to relocate to that/those location(s)? _____

   _____

   _____

5. Were you or members of your household involved in any commercial fisheries while living in Chenega Bay? yes _____ no _____

   Which ones? _____

   Did that affect your harvest of salmon for your own use? yes _____ no _____

   How? _____

   _____

   _____

6. Did you ever use/visit the Crab Bay area when you were living at Chenega? yes _____ no _____

   For what purpose? _____

   _____

   _____

7. What was involved in _____ in those days? (attach additional pages)

   a. seal hunting
   b. deer hunting
   c. goat hunting
   d. trapping
   e. other:

7. Harvesting activity: _____

Transportation: _____

Approximate location: _____

What was involved: _____

_____

_____

_____

_____

_____

Harvesting activity: _____

Transportation: _____

Approximate location: _____

What was involved: _____

_____

_____

_____

_____

_____

Harvesting activity: _____

Transportation: _____

Approximate location: _____

What was involved: _____

_____

_____

_____

_____

_____

8. How did you learn to fish and hunt? _____

9. What kind of wage employment were people involved in during that period? If employed outside of the village, where did they work?

10. What contact did you have with people from Tatitlek? (hunting &/or fishing together, sharing resources; how often)

Eyak/Cordova? _____

Other? _____

11. What changes do you see in use of fish, seals, and wildlife, over the last twenty or so years? (since the earthquake)

Additional information or comments:

APPENDIX C

Household # _____

Date(s) _____

_____ _____

Interviewer _____

A HOUSEHOLD RESOURCE USE QUESTIONNAIRE
CHENEGA BAY 1984-1985

1. When did you (the head of household) move to Chenega Bay? date: _____

2. Did you live in Chenega Bay seasonally before moving there permanently?
yes _____ no_____

If yes, when? _____

3. Household summary:

member (id #)	male/ female	rel. to head of household	age	birthplace	birthplace of parents	other residency, place and dates

4. Has your household used wild fish, game, or plants in the past 12 months—April 1984 through March 1985? yes _____ no_____

5. Has anyone in your household harvested fish, game, or other natural resources (including berries and vegetation) in the last year -- April 1984 through March 1985? yes ____ no_____

PAGE TWO

6. Resource Harvest and Use, April 1984 through March 1985, all places of residency.

Species		Attempt to harvest: yes/no	Used resource est. amount	Months harvested	HARVEST IN NUMBERS OF FISH, BY GEAR TYPE						Rec'd from others: yes/no	Shared harv. w/ others: yes/no
					Comm. Gillnet	Comm. Seine	Comm. Set net	Sub-sistence Seine	Rod & Reel	Other		
King salmon	CB											
	Other											
Red salmon	CB											
	Other											
Pink salmon	CB											
	Other											
Dog Salmon	CB											
	Other											
Silver Salmon	CB											
	Other											
Herring	CB											
	Other											
					Commercial		Bait	Sub-sistence	Sport	Other		
Halibut	CB		lbs		lbs		lbs	lbs	lbs	lbs		
	Other		lbs		lbs		lbs	lbs	lbs	lbs		
King Crab	CB											
	Other											
Dungeness	CB											
	Other											
Tanner	CB											
	Other											
Shrimp	CB		lbs		lbs		lbs	lbs	lbs	lbs		
	Other		lbs		lbs		lbs	lbs	lbs	lbs		
Razor Clams	CB											
	Other											
Other Clams	CB											
	Other											

PAGE THREE

Species		Attempted to harvest: yes/no	Used resource: est. amount	Months Harvested	Amount Harvested	Received from others: yes/no	Shared harvest w/ others: yes/no
Cod-gray	CB						
	Other						
Cod-black	CB						
	Other						
Red Rockfish	CB						
	Other						
Black Rockfish	CB						
	Other						
Sturgeon	CB						
	Other						
Dolly Varden	CB						
	Other						
Cutthroat Trout	CB						
	Other						
Whitefish	CB						
	Other						
Herring	CB						
	Other						
Herring roe	CB						
	Other						
Smelt	CB						
	Other						
Eulachon	CB						
	Other						
Other:	CB						
	Other						
Other:	CB						
	Other						

PAGE FOUR

Species		Attempted to harvest yes/no	Used resource: est. amount	Months Harvested	Amount Harvested	Received from others: yes/no	Shared harvest w/ others: yes/no
Cockles	CB						
	Other						
Mussels	CB						
	Other						
Chitons	CB						
	Other						
Sea Urchins	CB						
	Other						
Limpets	CB						
	Other						
Sea Cukes	CB						
	Other						
Sea Snails	CB						
	Other						
Octopus	CB						
	Other						
Other	CB						
	Other						
Deer	CB						
	Other						
Goat	CB						
	Other						
Moose	CB						
	Other						

PAGE FIVE

Species		Attempted to harvest: yes/no	Used resource: est. amount	Months Harvested	Amount Harvested	Received from others: yes/no	Shared harvest w/ others: yes/no
Bear-Brown	CB						
	Other						
Bear-Black	CB						
	Other						
Other	CB						
	Other						
Porcupine	CB						
	Other						
Beaver (meat)	CB						
	Other						
Lynx (meat)	CB						
	Other						
Rabbit (hare)	CB						
	Other						
Ptarmigan	CB						
	Other						
Grouse	CB						
	Other						
Seal	CB						
	Other						
Sea Lion	CB						
	Other						
Porpoise	CB						
	Other						

PAGE SIX

Species		Attempted to harvest: yes/no	Used resource: est. amount	Months Harvested	Amount Harvested	Received from others: yes/no	Shared harvest w/ others: yes/no
Geese	CB						
	Other						
Ducks	CB						
	Other						
Cranes	CB						
	Other						
Heron	CB						
	Other						
Shag (Cormorant)	CB						
	Other						
Loons	CB						
	Other						
Gulls	CB						
	Other						
Eggs	CB						
	Other						
Other	CB						
	Other						
Salmon-berries	CB						
	Other						
Blueberries	CB						
	Other						
Cranberries	CB						
	Other						

PAGE SEVEN

Species		Attempted to harvest: yes/no	Used resource: est. amount	Months Harvested	Amount Harvested	Received from others: yes/no	Shared harvest w/ others: yes/no
Other	CB						
	Other						
Other	CB						
	Other						
Marten	CB						
	Other						
Mink	CB						
	Other						
Weasel	CB						
	Other						
Land Otter	CB						
	Other						
Beaver(fur)	CB						
	Other						
Muskrat	CB						
	Other						
Wolverine	CB						
	Other						
Wolf	CB						
	Other						
Coyote	CB						
	Other						
Lynx (fur)	CB						
	Other						
Other	CB						
	Other						

7. Does anyone in your household hold a limited entry permit? Yes ____ No ____
If yes, what permits?

Type of permit	# of permits	hh id # of permit holder(s)
Herring gillnet		
Herring seine		
Salmon gillnet		
Salmon seine		
Other		

8. Do you or other members of your household participate in any other commercial fisheries? yes _____ no _____

Which one(s)? _____

9. How many people in your household were crew members in 1984? _____

Crew member (hh ID #)	Relationship to skipper	Residency of skipper	Kind of Fishery or fisheries

10. What kinds of transportation do you own?

_____ (1) commercial fishing boat
Describe: _____
_____ (2) skiff/dory
_____ (3) canoe/raft
_____ (4) ORV
_____ (5) Airplane
_____ (6) Other: _____

11. Harvesting activities (complete on additional sheet).

a. subsistence salmon
b. deer
c. marine mammals
d. goat
e. berries
f. trapping
g. other

12. HARVESTING ACTIVITIES. Fill out section for each major resource harvested.

Resource: _____

Transportation used: _____

Roughly where do you go? _____

Who do you go with? _____

_____

How long are you gone? _____ days (or) _____ hours

How do you preserve or take care of your harvest? _____

_____

_____

Further information: _____

_____

_____

(please note additional hunting information on back of page or in field notes).

Resource: _____

Tranportation used: _____

Roughly where do you go? _____

Who do you go with: _____

_____

How long are you gone? _____ days (or) _____ hours

How do you preserve or take care of your harvest? _____

_____

_____

Further information: _____

_____

_____

_____

13. If you trap, how did you learn to trap? _____

_____

_____

_____

14. Employment. List those in the household engaged in wage employment, during 1984-1985.

ID#	Kind of employment	Months worked during 1984	Hours Per week

15. Why did you move to Chenega Bay? _____

_____

16. If not included above, how is this household related to previous Chenega residents? Tatitlek residents? Eyak/Cordova residents?

_____

_____

_____

_____

APPENDIX D

CHENEGA BAY HOUSEHOLD RESOURCE USE QUESTIONNAIRE
1985-1986

Interviewer_____ Household ID_____

Date _____

1. When did you (head of household) move to Chenega Bay? date:_____

2. Commercial Fishing Did members of your household participate in commercial fishing during 1985?

yes _____ no_____

If yes, please complete the following table.

RESOURCE	FISHED YES	FISHED NO	LOCATION	INVOLVE-MENT	GEAR TYPE	# REMOVED FOR HOME USE	# GIVEN AWAY
King Salmon							
Red Salmon							
Chum Salmon							
Pink Salmon							
Silver Salmon							
King Crab					XXXXXXX		
Dungeness Crab					XXXXXXX		
Tanner Crab					XXXXXXX		
Black Cod					XXXXXXX		
Ground Fish Specify:							
Herring Bait/Food					XXXXXXX	gal	gal
Herring Sac/Roe					XXXXXXX	gal	gal
Wild Roe on Kelp					XXXXXXX	gal	gal
Pound Roe on Kelp					XXXXXXX	gal	gal
Halibut					XXXXXXX	lbs	lbs
Shrimp					XXXXXXX	lbs	lbs
Razor Clams						gal	gal

3. NON-COMMERCIAL FISHING

Did your household have a Copper Flats/PWS Subsistence salmon fishing permit in 1985? yes_____ no_____

Did anyone in your household use or try to harvest any type of fish or marine invertebrate in 1985? yes_____ no_____

If yes, please fill out the following tables:

A. SALMON AND HALIBUT

RESOURCE	TRIED TO HARVEST			# HRVSTED BY GEAR TYPE				# RCVD	# GAVE AWAY	# USED
	yes	no	inci	SUBS SEINE	SUBS GLNT	SUBS STNET	ROD & REEL			
King Salmon										
Red Salmon										
Chum Salmon										
Pink Salmon										
Silver Salmon										
Halibut				XXXX	XXXX	XXXX	lbs	lbs	lbs	lbs

B. Fresh Water Fish

RESOURCE	TRIED TO HARVEST			NUMBER HARVESTED	# RECEIVED	# GAVE AWAY	# USED
	yes	no	inci				
Dolly Varden							
Trout							
Whitefish							
Other Specify							

C. Marine Fish

RESOURCE	TRIED TO HARVEST			NUMBER HARVESTED	# RECEIVED	# GAVE AWAY	# USED
	yes	no	inci.				
Gray Cod							
Black Cod							
Ling Cod							
Herring				gal			
Herring Roe				gal			
Hooligan/Smelt				gal			
Black Rockfish (Sea Bass)							
Red Rockfish (Red Snapper)							
Flounder							
Sole							
Sturgeon							
Shark							
Skate							
Other Specify							

D. Intertidal Resources

RESOURCE	TRIED TO HARVEST			AMOUNT HARVESTED	# RECEIVED	# GAVE AWAY	# USED
	yes	no	inci				
Butter Clam				gal	g	g	g
Razor Clam				gal	g	g	g
Other Clams				gal	g	g	g
Cockles				gal	g	g	g
Mussels				gal	g	g	g
Octopus				#	#	#	#
Sea Cucumbers				#	#	#	#
Sea Urchins				#	#	#	#
Gumboots				gal	g	g	g
Other Specify							

E. Crab and Shrimp

RESOURCE	TRIED TO HARVEST			NUMBER HARVESTED	# RECEIVED	# GAVE AWAY	# USED
	yes	no	inci				
Dungeness Crab							
King Crab							
Tanner Crab							
Shrimp				lbs	lbs	lbs	lbs

If someone in your household fished for crab non-commercially in 1985, how many subsistence crab pots did they fish?_____

4. MARINE MAMMALS

Did your household use or try to harvest marine mammals between April 1985 and March 1986?

yes _____ no _____

If yes, please fill in the following table:

RESOURCE	TRIED TO HARVEST			NUMBER HARVESTED	# RECEVD	# GAVE AWAY	AMOUNT AND PORTIONS USED
	yes	no	inci				
Sea Lion							
Sea Otter							
Seal							
Porpoise							
Other Specify							

5. SMALL GAME

Did your household use or try or harvest any small game between April 1985 and March 1986?

yes _____ no _____

If yes, please complete the information below:

RESOURCE	TRIED TO HARVEST		NUMBER HARVESTED	LBS RECEVD	# GAVE AWAY	# USED FOR FUR	# USED FOR FOOD
	yes	no					
Hare							
Porcupine							
Grouse						XXXX	XXXX
Ptarmigan						XXXX	XXXX
Other Specify							

7. BIG GAME

Did your household use or try to harvest any big game species between April 1985 and March 1986?

yes _____ no _____

If yes, please complete the information below:

RESOURCE	TRIED TO HARVEST		NUMBER HARVESTED	LBS RECEVD	# GAVE AWAY	# USED FOR HIDE	# USED FOR FOOD
	yes	no					
Deer							XXXX
Moose							XXXX
Brown Bear							
Black Bear							
Goat							XXXX
Other Specify							

RESOURCE	TRANSPORTATION USED - PLEASE CHECK ALL THAT APPLY						
	ROAD HUNTING	FOOT/ AUTO	SKIFF/ CANOE	COMM FISH BOAT	AIRBOAT	AIRPLANE	ATV
Deer							
Moose							
Brown Bear							
Black Bear							
Goat							
Other Specify							

7. FURBEARERS

Did your household use or try to harvest any furbearers between April 1985 and March 1986?

yes _____ no _____

If yes, please complete the information below:

RESOURCE	TRIED TO HARVEST		NUMBER HARVESTED	# RECEVD	# GAVE AWAY	# FURS SOLD	# USED FOR FUR	# USED FOR FOOD
	yes	no						
Beaver								
Land Otter								XXXX
Lynx								
Marten								XXXX
Mink								XXXX
Muskrat								
Weasel								XXXX
Wolf								XXXX
Wolverine								XXXX
Coyote								XXXX
Other Specify								

8. WATERFOWL AND EGGS

Did your household use or try to harvest waterfowl or bird eggs between April 1985 and March 1986?

yes _____ no _____

If yes, please fill in the following table:

RESOURCE	TRIED TO HARVEST		# HARVESTED	# RECEIVED	# GAVE AWAY	# USED
	yes	no				
Geese						
Sandhill Crane						
Ducks						
Bird Eggs						
Other Specify						

9. PLANTS AND BERRIES

Did your household use or try to harvest wild plants or berries in 1985?

yes _____ no _____

If yes, please fill in the following table:

RESOURCE	TRIED TO HARVEST		AMOUNT HARVESTED	AMOUNT RECEIVED	AMOUNT GAVE AWAY	AMOUNT USED
	yes	no				
Berries			gal			
Plants			lbs			
Wood			cord			

Please list berry and plant species harvested:

_____ _____ _____

_____ _____ _____

_____ _____ _____

10. EQUIPMENT

Did you own or use any of the following equipment in 1985 for hunting and fishing? yes_____ no_____

TYPE OF EQUIPMENT	DID YOU USE FOR HUNTING/FISHING IN 1985?		NUMBER OWNED
	yes	no	
Airplane			
Comm Fishing Boat			
Other Motorized Boat			
Non-Motorized Boat			
3-Wheeler or ATV			
Snow Machine			
Highway Vehicle			
Airboat			

For each commercial fishing boat owned, indicate length and type:
Commercial Fishing Boat #1: _____

Commercial Fishing Boat #2 _____

11. HOUSEHOLD INFORMATION

Please fill in one line of the table below for each household member living with you between April 1985 and March 1986.

*NOTE: If household participated in 1985 survey, fill in information from other survey. Ask only if there have been any changes.

ID#	SEX		RELATION-SHIP TO HH HEAD	YEAR OF BIRTH	RESIDENCE OF MOTHER WHEN YOU WR BORN	ETHNICITY
	M	F				
1			HEAD OF HOUSEHOLD			
2						
3						
4						
5						
6						
7						
8						

12. EMPLOYMENT

Please fill in one line of the table below for each job held by a household member during 1985.

ID # FROM TABLE ABOVE	JOB TITLE	# WKS WORKED PER YEAR IN 85	# HRS WORKED PER WEEK	LOCATION OF JOB

APPENDIX E

BLM# _____

Site Name _____

Location _____

Associated with which village/tribe: _____

Source _____

_____

Second Source: _____

_____

Evidence: Archaelogical None Observed

Other: _____

Mapped: YES NO

Resources used or harvested at or near site:

Game	Marine Mammals	
Goat	Seal	Salmon
Bear	Sea Otter	Other fish
Waterfowl	Porpoise	Invertebrates
Small Game	Whale	Vegetation:
Furbearers	_____	Bark
_____	_____	Berries
_____	_____	Roots
_____	_____	_____

Comments: _____

_____

_____

_____

APPENDIX F

MAPPING SCHEDULE
1985

Resource categories:

Moose	Waterfowl	Marine mammals
Deer	Small game	Salmon
Goat	Furbearers	Other finfish
Bear (both)	Vegetation	Crab and shrimp
		Other marine invertebrates (includes seaweed, etc.)

A. Historic Use Areas: while living in Chenega, prior to the earthquake

For each of the resource categories, would you please draw on the map areas that you were using in the early 1960s.

B. Contemporary Use Areas: 1982 to 1985

For each of the resource categories, would you please draw on the map areas that you are currently using or have used since moving to Chenega Bay? Include ONLY areas currently used.

C. Future Use Areas

Please show with a dotted line additional areas you expect to use in the future. Why are these not in use now? (note response in field notes).

CHENEGA BAY
MAPPING SCHEDULE
1986

Resource categories:

Moose	Waterfowl	Marine mammals
Deer	Small game	Salmon
Goat	Furbearers	Other finfish
Bear (both)	Vegetation	Crab and shrimp
		Other marine invertebrates (includes seaweed, etc.)

Contemporary Use Areas: 1982 to 1986

Are the areas that you have used for hunting, fishing and gathering since you moved to Chenega Bay shown on this map? If not, could you please add the areas that you use?

Include ONLY areas currently used.

APPENDIX G

List of Species

Finfish		Scientific Name
Salmon:	King	Onchorynchus tshawytscha
	Red	O. nerka
	Pink	O. gorbuscha
	Dog	O. keta
	Silver	O. kisutch
Halibut		Hippoglossus stenolepsis
Red Snapper (Yelloweye Rockfish)		Sebastes ruberrimus
Black Rockfish		Sebastes melanops
Gray Cod		Gadus macrocephalus
Black Cod		Anoplopoma fimbria
Ling Cod		Ophiodon elongatus
Trout (Cutthroat)		Salmo clarkii
Dolly Varden		Salvelinus maslma
Herring		Clupea pallasii
Herring Roe		Clupea pallasii
Eulachon/Hooligan (Smelt: Osmeridae)		Thaleichthys pacificus
Invertebrates		
Shrimp		Pandalus platyceros
Razor Clams		Siliqua patula
Butter Clams		Saxidomus giganteus
Littlenecks (Native and Manilla)		Protothaca staminea or Tapes japonica
Cockles		Clinocardium nuttalii
Mussels (Bay)		Mytilus edulis
Chitons: Red (large)		Cryptochiton stelleri
Little Black		Katharina tunicata
Green Sea Urchin (small one)		Strongylocentrotus droebchiensis
Sea Cucumber		Parastochopus californicus
Octopus		Octopus dolfleini
Seaweed (black when dried) - Lamanaria		Porphyran laciniata
Wildfowl		
Birds:	Grouse (Spruce)	Canachites canadensis
	Ptarmigan	Lagopus sp.
	Eagle	Haliacetus leucocephalus
	Geese	Branta canadensis (Dusky)
	Sandhill Crane	Grus canadensis
	Mallards	Anas platyrhynchos
	American Widgeon	Mareca americana

Goldeneye	Bucephala clanqula
Bufflehead	B. albeola
Eider	Somateria mollissma
Oldsquaw	Clangula hyemalis
Scoter (prob. mixed species)	Oidemia nigra & Melanitta sp.
Doublecrested Comorant ("King")	Phalacrocorax auritas
Pelagic Comorant	P. pelagicus
Loon	Gavia. sp.
Glacouswinged Gull	Larus hyperboreus
Mew Gull	Larus canus
Arctic Tern (Scissortail)	Sterna paradisea
Oystercatcher	Haematopus bachmani
Game	
Black Bear	Ursus americanus
Sitka Black Tailed Deer	Odocoileus hemionus sitkensis
Mountain Goat	Oreamnos americanus
Moose	Alces alces
Porcupine	Erethizon dorsatum
Snowshoe Hare	Lepus americanus
Marten	Martes americana
Mink	Mustela vison
Weasel	Mustela erminea and rixosa
Land Otter	Lutra canadensis
Wolverine	Gulo gulo
Marine Mammals	
Sea Otter	Enhydra lutris
Seal	Phoca vitulina richardsi
Sea Lion	Eumetopias jubatus
Porpoise, Dall	Phocoenoides dalli
Plants	
Salmonberry, Rosacrae (Rose) family	Rubus spectabilis
Nagoonberry, Rose	R. arcticus
Oregon Crab Apple, Rose	Malus fusca
Blueberry (Dark Leafed or Early Blue.) Ericacaie (Heath)	Vaccinium ovalifolium
Lightleafed Blueberry (Alaska Blue)	V. alaskensis
Lowbush Cranberry, Heath	V. vitusidaea
Highbush Cranberry, Caprofoliaceae (Honeysuckle)	Viburnum edule
Crowberry, Empetraceae	Empetrum nigrum
Currant, Saxifragaceae (Saxifrage)	Ribes sp.
Indian Rice, Chocolate Lilly, Liliaceae	Fritillaria camschatcensis
Wild Celery or Cowparsnip	Heracleum lanatum

APPENDIX H

CONVERSION FACTORS FOR WILD NATURAL RESOURCES

Quantities of resources harvested and used were recorded at the time of the survey predominately in numbers of fish and game. Exceptions to this were plants and berries, which were usually reported in quarts or gallons. A number of sources were consulted to establish conversion factors, so that resource harvests could be tabulated in pounds.

In all cases, the conversion weights are expressed in pounds, and are intended to reflect usable, edible weight. Skins and hides of furbearers, big game animals, and marine mammals were not included in the usable weight. Resources used for bait to harvest other consumable fish for home use were considered usable. Starfish and seaweed harvested strictly for use as garden fertilizer were excluded.

Two sets of conversion weights are provided for salmon: one used for the 1984-85 survey, and a second for the subsequent year. The 1984-85 conversions were applied to the 1960s data also.

	1984		1985	
Species	Live Weight	Edible Weight	Live Weight	Edible Weight
King Salmon	29.9	20.9	27.0	19.5
Red Salmon	6.5	4.6	5.9	4.1
Pink Salmon	3.6	2.6	3.4	2.4
Chum Salmon	9.5	6.7	9.1	6.4
Silver Salmon	11.2	7.8	10.2	7.1

Conversion weights for all five species of salmon found in Prince William Sound and Copper River flats were determined in the same way. Live weights for each species were obtained for the commercial salmon fishery in Prince

William Sound (Randall et al. 1985:107, 1986:114-116). For king, red and silver salmon, weights were taken from the Copper River-Bering River district. Weights from Prince William Sound district were used for pink and chum salmon. Then, a 70 percent usable weight factor, based on fish processor estimates was applied. For the remaining species, the best available source was contacted, or a figure from a similar area was used. For crab, a usable weight of 29 percent of actual live weight was applied.

Species	Edible Weight in Pounds	Source
Marine Fish:		
Herring	.4 16 lbs/5 gal. bucket	Stratton & Georgette 1984
Cod, Black	3.1	Bracken 1986
Cod, Gray and lingcod	4.0	Mills 1985
Rockfish, Black & Red	4.0	Researcher Estimate
Freshwater Fish:		
Dolly Varden	.9	Williams 1983
Steelhead	4.2	Williams 1983
Trout	1.4	Behnke 1982
Whitefish	.9	Williams 1983
Smelt/Eulachon	.25 3.2 lbs/gallon	Stratton & Georgette 1984
Intertidal Resources:		
Dungeness Crab	.7	Major 1983
King Crab	2.3	Major 1983
Clams, Razor	.13 1.6 lbs/gal	Nelson 1983 Foster 1986
Clams(all other species), Sea Cucumbers, Sea Urchins, Mussels, Sea Snails, Sea Urchins, Cockles	1 lb/gallon	KANA 1983
Chitons(Gumboots)	4.0 lbs/gallon	Mills 1985
Octopus	4.0	KANA 1983
Herring Roe-on-Kelp	7.0 lbs/gallon	Brady 1985
Seaweed	4 lbs/gallon	Mills 1985
Game:		
Black Bear	58	Miller 1983
Deer	40	Griese 1985
Goat	70	Griese 1985
Moose	500	ADF&G 1976

Species	Edible Weight in Pounds	Source
Small Game:		
Porcupine	4.5	Whitman 1983
Beaver	8.75	Whitman 1983
Hare	1.5	Stratton & Georgette 1984
Ptarmigan, Grouse	.5	Stratton & Georgette 1984
Marine Mammals:		
Dall Porpoise	60.0	Pitcher 1987
Seal	37.8	Pitcher & Calkins 1979
Seal Liver	4.0	Researcher Estimate
Sea Lion	100.0	Researcher Estimate
Waterfowl:		
Geese	5.0	Stratton & Georgette 1984
Ducks	1.5	Behnke 1982
Cranes	10.0	Wolfe 1981
Heron	8.0	Researcher Estimate
Eggs	.05	KANA 1983
	1 lb/gallon	
Berries & Plants	**4.0 lbs/gallon**	**Stratton & Georgette 1984**

APPENDIX I

TABLE 1. HOUSEHOLD PARTICIPATION IN RESOURCE HARVEST, USE AND SHARING, CHENEGA BAY 1984-85 (n=15)

Resource	Using #	(%)	Attempted Harvest #	(%)	Harvested #	(%)	Gave Away #	(%)	Received #	(%)
King Salmon	11	(73.3)	4	(26.7)	4	(26.7)	7	(46.7)	8	(53.3)
Red Salmmon	12	(80.0)	5	(33.3)	5	(33.3)	8	(53.3)	9	(60.0)
Pink Salmon	13	(86.7)	11	(73.3)	11	(73.3)	8	(53.3)	4	(26.7)
Chum Salmon	11	(73.3)	8	(53.3)	7	(46.7)	6	(40.0)	5	(33.3)
Silver Salmon	12	(80.0)	8	(53.3)	7	(46.7)	8	(53.3)	7	(46.7)
Halibut	13	(86.7)	12	(80.0)	7	(46.7)	10	(66.7)	13	(86.7)
Herring	10	(66.7)	2	(13.3)	2	(13.3)	3	(20.0)	9	(60.0)
Gray Cod	0	(0)	1	(6.7)	1	(6.7)	1	(6.7)	0	(0)
Red Rockfish	7	(46.7)	8	(53.3)	7	(46.7)	7	(46.7)	3	(20.0)
Black Rockfish	3	(20.0)	5	(33.3)	3	(20.0)	0	(0)	0	(0)
Herring Roe	9	(60.0)	1	(6.7)	2	(13.3)	0	(0)	8	(53.3)
Smelt/Eulachon	6	(40.0)	3	(20.0)	2	(13.3)	2	(13.3)	6	(40.0)
Lingcod	2	(13.3)	4	(26.7)	2	(13.3)	2	(13.3)	0	(0)
Shark	0	(0)	1	(6.7)	1	(6.7)	0	(0)	0	(0)
Dolly Varden	2	(13.3)	2	(13.3)	2	(13.3)	1	(6.7)	0	(0)
Whitefish	1	(6.7)	0	(0)	0	(0)	0	(0)	1	(6.7)
King Crab	1	(6.7)	0	(0)	0	(0)	0	(0)	1	(6.7)
Shrimp	9	(60.0)	3	(20.0)	3	(20.0)	6	(40.0)	10	(66.7)
Razor Clams	5	(33.3)	2	(13.3)	2	(13.3)	1	(6.7)	3	(20.0)
Other Clams	6	(40.0)	8	(53.3)	6	(40.0)	3	(20.0)	2	(13.3)
Seaweed	1	(6.7)	1	(6.7)	1	(6.7)	1	(6.7)	1	(6.7)
Cockles	2	(13.3)	3	(20.0)	2	(13.3)	1	(6.7)	1	(6.7)
Mussels	2	(13.3)	1	(6.7)	1	(6.7)	0	(0)	1	(6.7)
Chitons	4	(26.7)	4	(26.7)	4	(26.7)	2	(13.3)	2	(13.3)
Sea Cucumbers	1	(6.7)	1	(6.7)	1	(6.7)	0	(0)	0	(0)
Sea Snail	1	(6.7)	1	(6.7)	1	(6.7)	0	(0)	0	(0)
Octopus	6	(40.0)	2	(13.3)	1	(6.7)	1	(6.7)	6	(40.0)
Deer	13	(86.7)	10	(66.7)	10	(66.7)	10	(66.7)	12	(80.0)
Goat	2	(13.3)	6	(40.0)	1	(6.7)	1	(6.7)	1	(6.7)
Moose	6	(40.0)	3	(20.0)	2	(13.3)	3	(20.0)	6	(40.0)
Black Bear	7	(46.7)	5	(33.3)	1	(6.7)	1	(6.7)	7	(46.7)
Porcupine	1	(6.7)	1	(6.7)	1	(6.7)	1	(6.7)	1	(6.7)
Beaver	1	(6.7)	1	(6.7)	0	(0)	1	(6.7)	1	(6.7)
Hare	1	(6.7)	1	(6.7)	1	(6.7)	1	(6.7)	0	(0)
Ptarmigan	1	(6.7)	1	(6.7)	1	(6.7)	1	(6.7)	0	(0)
Grouse	7	(46.7)	6	(40.0)	6	(40.0)	2	(13.3)	1	(6.7)
Seal	14	(93.3)	12	(80.0)	12	(80.0)	12	(80.0)	13	(86.7)
Sea Otter	3	(20.0)	3	(20.0)	3	(20.0)	0	(0)	0	(0)
Sea Lion	14	(93.3)	9	(60.0)	7	(46.7)	8	(53.3)	13	(86.7)

TABLE 1. (Continued) HOUSEHOLD PARTICIPATION IN RESOURCE HARVEST, USE AND SHARING, CHENEGA BAY 1984-85 (n=15)

Resource	Using # (%)	Attempted Harvest # (%)	Harvested # (%)	Gave Away # (%)	Received # (%)
Geese	2 (13.3)	2 (13.3)	2 (13.3)	1 (6.7)	0 (0)
Ducks	9 (60.0)	9 (60.0)	8 (53.3)	5 (33.3)	2 (13.3)
Crane	1 (6.7)	1 (6.7)	1 (6.7)	0 (0)	0 (0)
Heron	1 (6.7)	1 (6.7)	1 (6.7)	0 (0)	0 (0)
Bird Eggs	3 (20.0)	3 (20.0)	3 (20.0)	3 (20.0)	2 (13.3)
Berries	13 (86.7)	13 (86.7)	11 (73.3)	6 (40.0)	8 (53.3)
Marten	0 (0)	1 (6.7)	1 (6.7)	0 (0)	0 (0)
Mink	1 (6.7)	2 (13.3)	2 (13.3)	0 (0)	0 (0)
Land Otter	2 (13.3)	2 (13.3)	2 (13.3)	0 (0)	1 (6.7)

TABLE 2. HOUSEHOLD AND PER CAPITA LEVELS OF RESOURCE HARVEST AND USE, CHENEGA BAY 1984-85 (n=15)

Resource[a]	Total Number Harvested	Total lbs Harvested	Household Harvest	Per Capita Harvest[b]	Total Number Used	Total lbs Used	Household Use	Per Capita Used[b]
King Salmon	43.0	898.7	59.9	15.8	46.0	961.4	64.1	16.9
Red Salmon	116.0	533.6	35.6	9.4	177.0	814.2	54.3	14.3
Pink Salmon	258.0	670.8	44.7	11.8	432.0	1,123.2	74.9	19.7
Chum Salmon	70.0	469.0	31.3	8.2	132.0	884.4	59.0	15.5
Silver Salmon	135.0	1,053.0	70.2	18.5	150.0	1,170.0	78.0	20.5
Halibut	NA[c]	970.0	64.7	17.0	NA[c]	1,210.0	80.7	21.2
Herring	NA	96.0	6.4	1.7	NA	196.4	13.1	3.4
Gray Cod	2.0	8.0	.5	.1	0	0	0	0
Red Rockfish	47.0	188.0	12.5	3.3	25.0	100.0	6.7	1.8
Black Rockfish	6.0	24.0	1.6	.4	6.0	24.0	1.6	.4
Herring Roe	NA	16.0	1.1	.3	NA	96.0	6.4	1.7
Smelt/Eulachon	NA	39.4	2.6	.7	NA	63.0	4.2	1.1
Lingcod	NA	95.0	6.3	1.7	NA	75.0	5.0	1.3
Shark	1.0	0	0	0	0	0	0	0
Dolly Varden	44.0	39.6	2.6	.7	NA	27.9	1.9	.5
Whitefish	0	0	0	0	NA	10.0	.7	.2
King Crab	0	0	0	0	1.0	2.3	.2	--[e]
Shrimp	NA	78.0	5.2	1.4	NA	173.0	11.5	3.0
Razor Clams	NA	28.6	1.9	.5	NA	38.1	2.5	.7
Other Clams	83.4g[d]	83.4	5.6	1.5	78.4g[d]	78.4	5.2	1.4
Seaweed	NA	18.0	1.2	.3	NA	18.0	1.2	.3
Cockles	15.0g	15.0	1.0	.3[e]	NA	15.0	1.0	.3
Mussels	.9g	.9	.1	--[e]	NA	2.9	.2	.1
Chitons	NA	15.0	1.0[e]	.3	NA	15.0	1.0[e]	.3
Sea Cucumbers	NA	.1	--[e]	--	NA	.1	--[e]	--
Sea Snails	NA	2.0	.1	--	NA	2.0	.1	--
Octopus	15.0	60.0	4.0	1.1	24.0	96.0	5.1	1.4
Deer	64.0	2,560.0	170.7	44.9	62.2	2,488.0	165.9	43.6
Goat	2.0	140.0	9.3	2.5	2.0	140.0	10.5	2.8

TABLE 2. (Continued) HOUSEHOLD AND PER CAPITA LEVELS OF RESOURCE HARVEST AND USE, CHENEGA BAY 1984-85 (n=15)

Resource[a]	Total Number Harvested	Total lbs Harvested	Household Harvest	Per Capita Harvest[b]	Total Number Used	Total lbs Used	Household Use	Per Capita Used[b]
Moose	1.0	375.0	25.0	6.6	NA[c]	425.0	28.3	7.5
Black Bear	1.0	58.0	3.9	1.0	1.7	98.6	6.4	1.7
Porcupine	3.0	13.5	.9	.2	2.0	9.0	.6	.2
Beaver	0	0	0	0	2.0	17.5	1.2	.3
Hare	6.0	9.0	.6	--[e]	6.0	9.0	.6	.2
Ptarmigan	18.0	9.0	.6	.2	18.0	9.0	.6	.2
Grouse	46.0	23.0	1.5	.4	44.0	22.0	1.5	.4
Seal	186.0	7,030.8	468.7	123.3	NA	1,362.8	90.9	23.9
Sea Otter	14.0	0	0	0	14.0	0	0	0
Sea Lion	15.0	1,575.0	105.0	27.6	11.3	1,131.3	75.4	19.8
Geese	4.0	20.0	1.3	.4	4.0	20.0	1.3	.4
Ducks	95.0	142.5	9.5	2.5	95.0	142.5	9.5	2.5
Crane	3.0	30.0	2.0	.5	3.0	30.0	2.0	.5
Heron	1.0	8.0	.5	.1	1.0	8.0	.5	.1
Bird Eggs	82.0	4.1	.3	.1	62.0	3.1	.2	.1
Berries	50.7g	202.6	13.5	3.6	51.3g	205.0	13.7	3.6
Marten	2.0	NA[c]	NA[c]	NA[c]	0	NA[c]	NA[c]	NA[c]
Mink	11.0	NA	NA	NA	1.0	NA	NA	NA
Land Otter	24.0	NA	NA	NA	11.0	NA	NA	NA
Total[f]		17,602.6	1,173.5	308.8		13,317.1	887.8	233.6

[a] See Appendix G for complete list of species and scientific names.
[b] Per capita reflects 57 individuals.
[c] NA: not applicable; resource recorded in pounds only or not consumed.
[d] g: gallons.
[e] --: less than .1 pound.
[f] Total reflects weights prior to rounding.