# RESOURCE HARVEST AND USE IN TATITLEK, ALASKA

by

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ABSTRACT

Tatitlek is a Chugach village on northeastern Prince William Sound, Alaska, with an estimated population of 108 in 1989. The oldest remaining Alaska Native village in the region, Tatitlek's residents have a long history and tradition of subsistence uses in Prince William Sound. Research conducted between 1987 and 1990 included household surveys, mapping interviews, and in-depth interviews with knowledgeable elders, hunters, and fishers.

Cash employment in the village during the study years was seasonal and largely in commercial fishing. Employed adults worked an average of 6.9 months a year. The mean income per tax return for Tatitlek residents was $11,111 in 1985, the lowest in the Prince William Sound region.

Tatitlek households harvested an average of 13.7 kinds of resources and used 22.6 kinds during 1988-89. All households used, harvested and received subsistence resources during the study years. The per capita harvest was 351.7 pounds edible weight in 1987-88 and 643.5 pounds in 1988-89. Salmon comprised almost 41 percent of the harvest, marine mammals 20 percent, and other finfish and game contributed 14 percent each.

Some changes in harvest patterns occurred between study years. In the first year, 63 percent of the salmon harvest was retained from commercial catches. In the second year, 78 percent was taken under subsistence regulations. Variations in harvest levels between years was attributable to liberalization of subsistence hunting and fishing regulations, fluctuations in resource availability, and sampling factors. Comparisons of household harvesting patterns between the two years showed stability and consistency.

Tatitlek per capita resource harvests were the highest in the Prince William Sound area, and one of the highest in the southcentral region. The

diversity of resources harvested, traditional methods of harvest and preservation, and widespread distribution of resources demonstrated a continuity with subsistence patterns of past generations of Alaska Native people in Prince William Sound and a continued reliance on wild resources.

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Several Alaska Department of Fish and Game staff contributed to the project. Frances Inoue and Carol Barnhill provided most of the maps in the report. Louis Brown, Sandra Skaggs and Charles Utermohle were instrumental in turning raw data into tables and responded graciously to the myriad requests for more statistics. Jody Seitz researched the regulatory summaries. Evelyn Biggs compiled historic site descriptions. Wayne Donaldson assisted in identifying species of marine invertebrates. James Fall contributed substantially to the analysis and discussion. Jeff Leer assisted with the Alutiiq spellings.

This paper represents the time and expertise of many elders in the village. Their generosity in sharing their knowledge with the researcher is deeply appreciated. Thanks also go to Thelma Geffe and Martha Vlasoff, who assisted in conducting household surveys. Finally, the researcher is indebted to Roselene Vlasoff, Anne Jackson and Doris Kompkoff for their generous hospitality, moral support, and help with logistics.

# CHAPTER ONE

# INTRODUCTION

This report describes the contemporary resource harvest and use patterns of the residents of Tatitlek, a village of 108 people (1989 population) in northeastern Prince William Sound in Alaska (Figure 1). The Division of Subsistence, Alaska Department of Fish and Game, undertook the study at the request of the Tatitlek Village Council in November, 1987. The North Pacific Rim, the regional Native non-profit corporation, through a grant from Bureau of Indian Affairs, and the United States Forest Service (USFS) assisted with funding for portions of the project.

There were several reasons for beginning the project. Resource and land use planning efforts have been undertaken by a number of agencies. The Chugach National Forest has been developing area plans for the Prince William Sound. The Prince William Sound Aquaculture Corporation is revising its 20 year comprehensive salmon enhancement plan. Also, the state of Alaska and private non-profit hatcheries have been engaged in fisheries enhancement efforts in areas overlapping with Tatitlek subsistence use and harvest locations. Logging activity in the Prince William Sound area has begun, and recreational use of the sound has been steadily increasing. More recently, the *Exxon Valdez* Oil Spill has underscored the need for information about the kinds, quantities, and locations of Tatitlek subsistence harvests.

Previous research at Tatitlek includes a household survey in 1980 (The North Pacific Rim 1981), a review of historic site information relating to resource harvest areas (cf. Stratton and Chisum 1985), limited harvest information collected in 1984 by the Division of Subsistence, and ethnographic

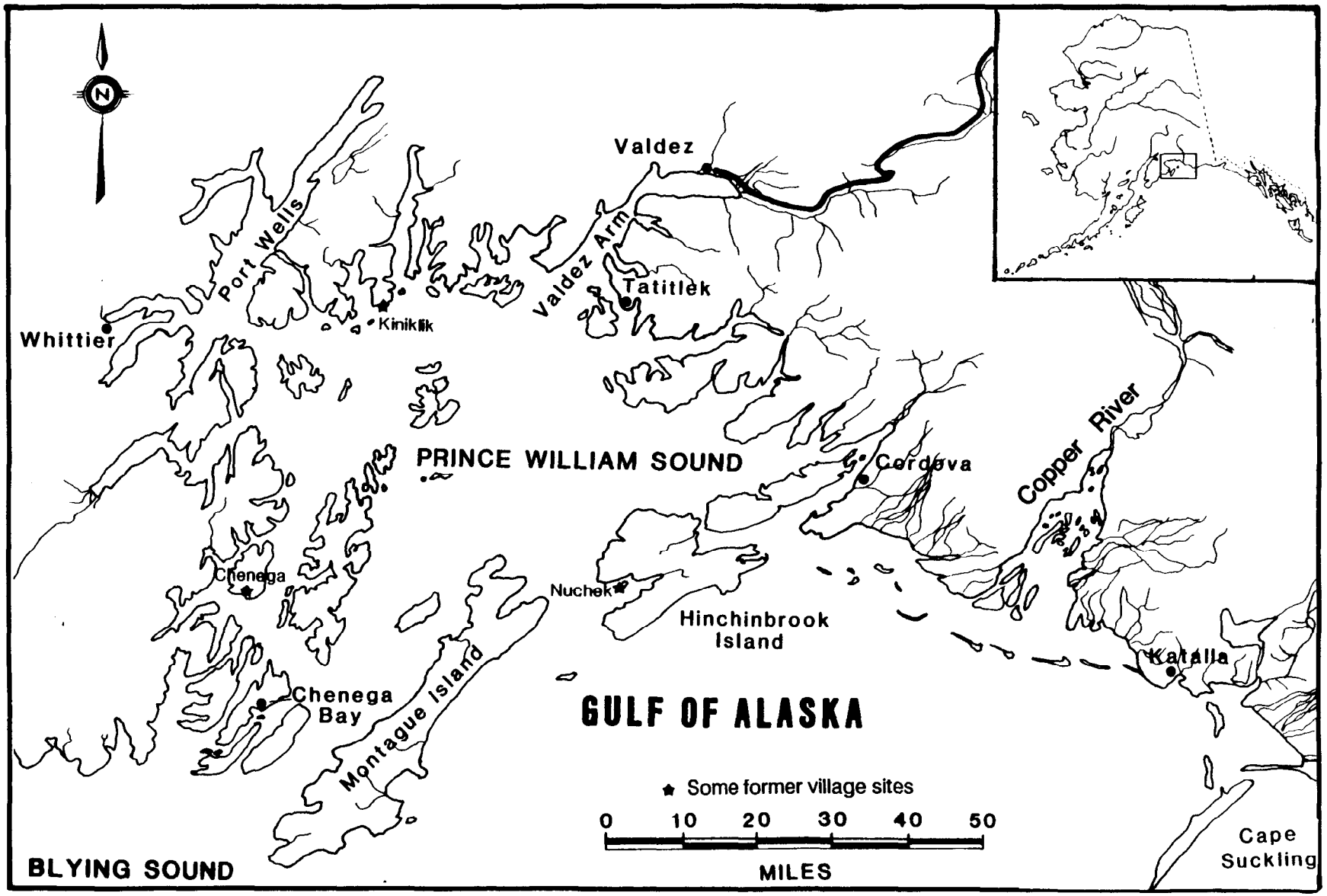



Figure 1. Communities of Prince William Sound, Northern Gulf of Alaska.

work done by de Laguna and Birket Smith in the 1930s (Birket-Smith 1953; de Laguna 1956).

## PURPOSES

Three purposes guided the study. These were:

1) to record on maps areas used by Tatitlek residents for subsistence harvest of resources, for use by the village, The North Pacific Rim, and various government and non-profit agencies in land and resource planning;

2) to collect information about harvests of fish, game, and plants in recent years, including varieties of resources harvested, harvest seasons, quantities of harvest, participation in harvesting and use of resources, and sharing of resources; and

3) to document historic resource uses by Tatitlek residents, such as methods of harvest and preservation, as recorded in available literature, and learned from residents.

## METHODOLOGY

A review of existing information was conducted for the study. Three data collection methods were employed to collect new information: mapping interviews, household surveys, and key respondent interviews, described below. In addition to the researcher, village technicians were hired to assist in introducing the researcher and project to residents, and to conduct household surveys.

Mapping Interviews

Twelve types of resources or resource categories were mapped: black bear, crab/shrimp, deer, firewood, furbearers, goat, intertidal resources, salmon, other marine fish, marine mammals, vegetation, and waterfowl. For each category, mapped information was collected for all areas ever used by the household to harvest the resource while living in Tatitlek, the areas the household members considered most reliable for harvesting each resource, and the areas the respondents used in 1987 (the most recent calendar year at the time of the mapping interviews) to harvest or attempt to harvest the resource. The goal was to talk with every household that had an active harvester, or a knowledgeble former harvester. The mapping component of the study was underwritten by funds from the United States Forest Service.

Separate acetate overlays were used for each household interview, so that household use area maps were collected. Standard 1:250,000 United States Geological Survey topographical quadrangle maps on acetate were used as base maps under clear acetate. Nineteen of the 31 households residing in Tatitlek in the spring of 1988 participated in mapping interviews in April and May 1988. The mapping component was conducted within very tight time constraints, and not all households could be reached during the three week period that mapping interviews were conducted. So it is possible that some areas of harvest were not included on the maps. Subsistence use areas also change with time, corresponding to resource availability and technology, among other factors, so that the maps generated in 1988 probably are incomplete representations of all the areas used by Tatitlek residents. Composite maps of all the household use areas for each resource and category of use were generated, and reviewed by two members of Tatitlek Village Council for

accuracy. These composites were provided to USFS for entry into their GIS system, and copies at the 1:250,000 scale made for Alaska Department of Fish and Game and The North Pacific Rim.

A composite map depicting all the subsistence harvesting areas used by Tatitlek residents is included in this report. Maps of areas used for harvesting resource categories at a more specific level can be viewed at the Alaska Department of Fish and Game, Division of Subsistence Anchorage office, or obtained by writing the Tatitlek Village IRA Council. The Village Council reviewed the maps, but requested that they not be included in the report's general distribution. The council expresssed concern over distributing the information widely, given the increased attention the village and area has received since the *Exxon Valdez* Oil Spill, and the growing number of recreational and commerical users in Prince William Sound.

## Household Surveys

A standardized questionnaire was administered to village households in April of 1988 and 1989 (Appendices A and B). A village resident was hired both years to assist the researcher with interviews, and to conduct some surveys on their own. The surveys covered resources harvested during April 1987 through March 1988, and April 1988 through March 1989. The first survey instrument was reviewed by the Village Council. The second one, because of the *Exxon Valdez* Oil Spill (EVOS), was not reviewed at a formal council meeting, but was approved by council members, and introduced to the community at a meeting.

The estimated number of resident households and participating households are shown in Table 1, with 19 households (61.3 percent) participating in 1987-

88, and 22 (75.9 percent) cooperating in 1988-89. Cooperation was not as widespread in 1988 as it was in 1989, as many residents still had concerns about the Department of Fish and Game's purpose for gathering the information. For the second year, a better understanding of the Division's research combined with the perceived value of the information in light of the oil spill increased cooperation. One household interviewed in the second year provided only limited information about their household and its resource uses, so that most tables in this report reflect uses based on 21 households' responses to the survey.

TABLE 1. SUMMARY OF TATITLEK SURVEY SAMPLE AND PARTICIPATION

| | 1988 | 1989 |
|---|---|---|
| Resident Households | 31 | 29 |
| Participating Households | 19 | 22 |
| Percentage of Participation | 61.3 | 75.9 |
| Unavailable for Interview | 1 | 6 |
| Non-participating | 9 | 1 |
| Unable to participate (ill, elderly) | 2 | 0 |

Because the second survey was conducted after the EVOS, the researcher was concerned that answers may have been biased, to reflect higher harvests than may actually have occurred the year before the spill. Therefore, surveys from both years were carefully reviewed, and with some minor adjustments regarding marine mammal use, were found to be comparable. Differences in harvest levels were attributable to increased opportunity (regulatory changes), illness of active harvesters during the first year, and the involvement in the second year of several active resource harvesting households that had previously had reservations about participating in the survey.

Survey data were coded for computer entry and tabulated and analyzed using the Statistical Package for the Social Sciences (SPSS). Harvest tables

reflect estimated harvests for the entire community, based on the sampled households, and are given at the 95 percent confidence level.

Key Respondent Interviews

Key respondent interviews were conducted by the researcher with 16 individuals residing in 13 households between 1988 and 1990. Questions focused on historic and contemporary methods of harvest and preservation.

## LIMITATIONS

Annual recall surveys by definition rely on memory, and are therefore estimates of harvest. Participants in the survey were cooperative and judged to be conscientious in their efforts to be accurate. Some households that might have completed a survey the second year were unavailable because of employment on the oil spill clean-up. While harvest levels have been extrapolated to project harvests for all village households, because there were active harvesters among those not interviewed, survey estimates of harvest quantities may be lower than in reality. Although two years of harvest estimates are presented here, changing regulations, the varying abundance of resource populations, and weather all influence harvest levels of individual resources from year to year.

# CHAPTER 2

# OVERVIEW OF REGION AND COMMUNITY

## NATURAL ENVIRONMENT

Tatitlek lies on the coast on northeastern Prince William Sound, in southcentral Alaska (Figure 1). Prince William Sound is known for its rich marine environment, thick stands of hemlock-Sitka spruce, and mineral deposits. Much of Prince William Sound is surrounded by the Chugach National Forest, originally established in 1907. The forest contains an area of nearly 6,000,000 acres bordered by the Chugach and Kenai mountains on the perimeter, with hundreds of miles of scenic coastline, including dozens of glaciers. The village of Tatitlek is surrounded by trees and tundra. Three miles northwest of the village is Ellamar, formerly a copper mining area (Figure 2). Further northwest, across Valdez Arm, is Columbia Glacier, the largest tidewater glacier in Prince William Sound. Bligh Island lies across Tatitlek Narrows southwest of the village. Bligh Reef, the site of the 1989 *Exxon Valdez* Oil Spill, is five miles from the village.

### Marine Resources

Prince William Sound hosts many marine resources, several of which are in sufficient abundance to be commercially exploited. Commercially harvested resources include five species of salmon, herring, halibut, black cod, Pacific cod, shrimp, and numerous species of crab, including Tanner, Dungeness and several varieties of king crab.

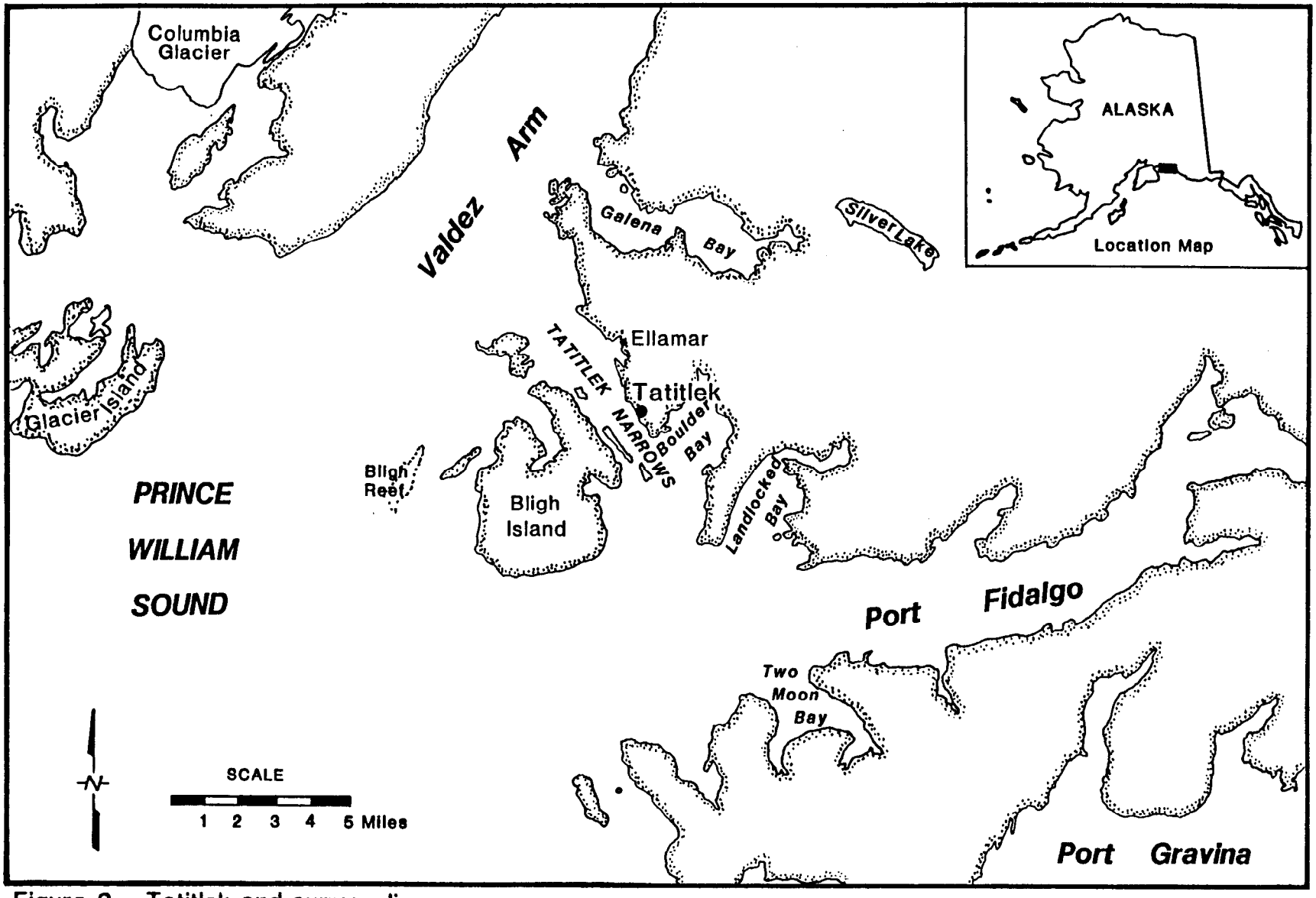



Figure 2. Tatitlek and surrounding area.

Other resources present include bottomfish such as lingcod, rockfish, flounder, and sole. Marine mammals populate the waters of Prince William Sound. Sea otters have been in particular abundance through the 1980s, having repopulated the area after being hunted out in the ninteenth century. Harbor seal, sea lion, Dall and harbor porpoise, and several other species of whale also inhabit the sound. The intertidal zone hosts myriad resources that are used by residents of Prince William Sound, including chitons ("gumboots"), cockles, mussels, octopus, several types of clams, and seaweed.

## Wildfowl

Resident upland game birds are grouse and ptarmigan. Waterfowl present and often harvested include several varieties of migratory birds: geese, sandhill cranes, and numerous species of ducks. Canada geese, and most of the puddle and diving ducks, including pintails, wigeons, goldeneyes, buffleheads, and one of the sea ducks, mergansers, breed in the area during the summer. Several sea ducks, eiders, harlequins, scoters, and old squaws, over winter in Prince William Sound. Mallards and harlequins have resident populations throughout the year. A few migratory birds only pass through the area briefly, such as sandhill cranes, scaups, and shovelers.

## Terrestrial Resources

Sitka black-tailed deer, black bear, brown bear, and mountain goat are the predominant big game species in the Prince William Sound. Deer are not indigenous to the area; the first deer were introduced to the sound in 1916. They thrived on the islands and have expanded their territory from

Hinchinbrook and Montague to include every habitable island in the sound. East of Cordova, on the Copper River Delta, are moose. The Copper River Delta moose are the product of moose transplants between 1949 and 1959. A much smaller number of indigenous moose occur in western Prince William Sound. The most populous furbearers in the region are mink, land otter, and marten.

## PREHISTORY AND HISTORICAL ETHNOGRAPHY

Alaska Natives have been in residence in Prince William Sound since well before European contact was recorded in 1778. Ethnographic literature commonly refers to the residents of Prince William Sound as Chugach Eskimos. Contemporary residents prefer to be called Aleuts, a term in use since early contacts by European explorers. To maintain continuity with existing literature, the background sections will refer to Chugach Eskimos, while contemporary residents will be referred to as Tatitlek residents. The language used by village elders, and understood by many younger residents, is Chugach Alutiiq, a member of the Eskimo family of languages, also called Suqpiaq and Pacific Yup'ik (Leer 1978:3).

### Prehistory

Radiocarbon dates of archaeological findings at Palugvik on Hawkins Island place the Chugach Eskimo there around 200 A.D. Changes in the level of the land, submerging previous coastlines, destroyed many earlier sites. A subset of the Pacific Eskimo tradition, the territory of the Chugach Eskimo extends from the Alaska Peninsula east to Prince William Sound, including Kodiak Island and Kachemak Bay (Clark 1984:136,137,144). Oral history

documents eight geographical groups of Chugach people in Prince William Sound, each named after their principal village or a locality within their territory. Archaeological evidence and oral history confirm that village sites were chosen on the shore line, allowing the residents to view approaching visitors or enemies, as well as providing ready access to the sound for harvesting, travel, or escape (Birket-Smith 1953:20-22; de Laguna 1956:11,12,31).

Historical Period

The Chugach Eskimos were involved in some trade with Europeans in the latter half of the eighteenth century. Captain Cook was the first European to record entering Prince William Sound and encountering the Chugach people, in 1778. Subsequently, many explorers from Spain and Russia traded in the area. The subsistence economy was not affected until the very end of the eighteenth century, when Russians entered Prince William Sound in pursuit of sea otter furs (see Table 2). The Russian station at Nuchek on Hinchinbrook Island became a focal point for sea otter trade, and many Chugach people congregated in the area. They became indebted to the Russians for trade goods, and in turn were required to hunt sea otters to pay their debts. This fur trade pattern continued into the American territorial period up until the early 1900s (Hassen 1978:183-189).

Commercial fishing and mineral excavation developed as the fur trade declined. Commercial salmon fishing extended from the Copper River to the Prince William Sound in 1893. The Ellamar copper mine opened in 1902. Prior to the mine opening, Ellamar was a village site named Palutaq (de Laguna 1956:25). The fur trade's dominance in local work and trade gave way to employment as day laborers and fishermen for canneries, salteries, and

TABLE 2. SIGNIFICANT HISTORICAL EVENTS IN PRINCE WILLIAM SOUND

| Year | Event |
|---|---|
| 1741 | Bering comes to Kayak Island, locates Chugach camp site |
| 1778 | Capt. Cook visits Prince William Sound, including Kayak Island, Nuchek, Snug Corner Cove, and Montague Island |
| 1779 | Spaniards visit Prince William Sound, visiting Kayak Island and Nuchek |
| 1783 | Russians, under Zaikov, travel northwest to Kayak Island |
| 1785,1788 | Shelikhov visits Prince William Sound, including Montague Island village, Middleton Island settlement, Kayak Island, and Nuchek |
| 1792 | Baranof visits Prince William Sound, takes Chugach hostages |
| 1794 | 20 Russians visit Tatitliatzk village (in vicinity of present village site) |
| 1795 | Russian priest reports baptizing 700 Chugach at Nuchek |
| 1893 | Commercial salmon fishing expands from the Copper River to include Prince William Sound |
| 1894 | Oil discovered at Katalla |
| 1896 | Coal discovered at Bering River |
| 1897 | Copper discovered in Prince William Sound |
| 1902 | Ellamar copper mine opens |
| 1922 | Influenza epidemic; half Tatitlek's population dies |
| 1964 | March 27 earthquake destroys Chenega; most survivors resettle at Tatitlek |
| 1989 | March 24 *Exxon Valdez* Oil Spill |

Sources: Bancroft 1970 (1886); Hassen 1978; Hough 1979; Shelikov 1981 (1812); Stratton 1989:27-28; Valaam Monastery 1978(1894):45.

providing supplies to the miners. Work associated with the Ellamar mine prompted the relocation of much of the Native population at Nuchek to Tatitlek, an already existing village, between 1900 and 1910 (See Table 3). By 1930, mining activity had ceased, and commercial fishing was the primary cash employment activity. May, June, and July were the key months for commercial fishermen.

Because of the movement of peoples around the sound, residents of Tatitlek today may be descendants of three or four of the traditional geographic groups: the *Tatitlarmiut*, of the area currently used by Tatitlek residents (Fig. 3); the *Atyarmiut*, who occupied the mainland between Gravina Point and Porcupine Point at the entrance to Port Fidalgo; the *Kangirtlurmiut*, the Kiniklik people, whose territory extended from Columbia Glacier west to Port Wells; and the *Nutyirmiut*, of Hinchinbrook Island, whose principal village was Nuchek (Birket-Smith 1953:20-22; de Laguna 1956:11,12,31). There are also descendants of the *Tyanirmiut*, the Chenega people, who were relocated to Tatitlek after tsunamis caused by the 1964 earthquake destroyed the village of Chenega.

## SOCIOECONOMIC PROFILE

### Community Description

Tatitlek, a community of 108 people in 1989, is the oldest remaining village in Prince William Sound. A coastal village, Tatitlek lies 40 miles northwest of Cordova and 22 miles south of Valdez (see Fig. 1). Access to the village is limited to boat, the regularly scheduled mail plane, the state ferry, or chartered flights when the weather allows. Tatitlek is governed by

TABLE 3. POPULATION OF PRINCE WILLIAM SOUND, 1818-1990

| Community | 1818 | 1834 | 1880 | 1890 | 1900 | 1910 | 1920 | 1929 | 1939 | 1950 | 1960 | 1970 | 1980 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chenega | -- | -- | 80 | 71 | 67 | -- | -- | 90 | 95 | 91 | -- | 0 | 0 | 94 |
| Cordova | -- | -- | -- | -- | -- | 1,152 | 955 | 980 | 938 | 1,165 | 1,128 | 1,164 | 2,241[a] | 2,282[a] |
| Ellamar | -- | -- | -- | -- | -- | 98 | 106 | -- | 46 | 23 | -- | -- | -- | 5[b] |
| Eyak | 117 | 150 | 117 | -- | 22 | -- | 320 | 366 | 365 | -- | -- | -- | 47[c] | 172[c] |
| Katalla | -- | -- | -- | -- | -- | -- | 84 | 44 | 23 | -- | -- | -- | -- | -- |
| Kaniklik | -- | -- | 54 | 73 | 52 | 32[d] | 8[e] | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Latouche | -- | -- | -- | -- | -- | -- | 505 | 339 | 40 | -- | -- | -- | -- | 3[b] |
| Nuchek | -- | -- | 145 | 120 | 65 | 30[d] | 11[e] | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tatitlek | -- | -- | 90 | 89 | 68 | 156 | 187 | 70 | 75 | 89 | 96 | 111 | 68 | 119 |
| Valdez | -- | -- | -- | 315 | -- | 810 | 466 | 442 | 529 | 554 | 555 | 1,005 | 3,079 | 4,068 |
| Whittier | -- | -- | 0 | 0 | 0 | 0 | 0 | -- | -- | 627 | 809 | 130 | 198 | 243 |
| Totals | -- | -- | 486 | 668 | 274 | 2,278 | 2,642 | 2,331 | 2,111 | 2,549 | 2,588 | 2,410 | 5,633 | 6,986 |

Sources: Alaska Department of Fish and Game 1985; Alaska Department of Labor 1987; Birket-Smith and de Laguna 1938:24; de Laguna 1956:256; Hassen 1978:198; United States 1990 Census.

[a] includes entire Cordova census subarea
[b] researcher estimate
[c] included in Cordova total also
[d] 1909 population
[e] 1916 population
-- no information available

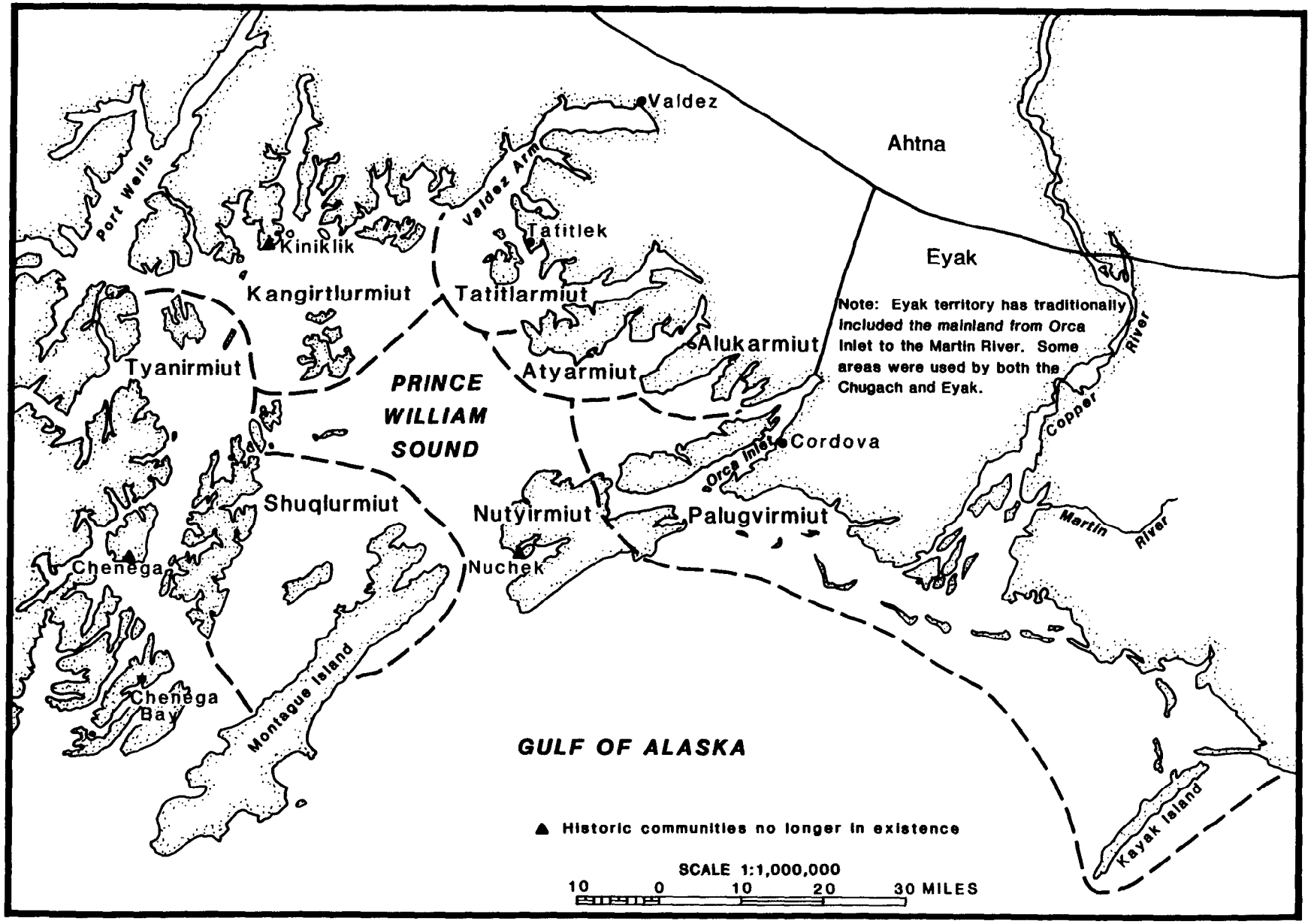



Figure 3. Traditional geographic groups of the Chugach Eskimo. After Birket-Smith 1953:20-22, Krause 1982.

an Indian Reorganization Act (IRA) Council, a tribal organization which provides many services for the community, including operation and maintenance of the water, sewer, solid waste and electrical systems. The council acts on behalf of the village in coordinating services and programs offered through state, federal, and private agencies. In addition to a full service school for grades kindergarten through 12, there is a health clinic, a post office, a museum and cultural center, and community center. An itinerant doctor and dentist make annual visits to the village. There are two churches in Tatitlek, the long-standing Russian Orthodox church, and a more recent chapel, converted out of a private residence, holding independent Protestant services. Private telephone lines have been available to residents since 1984. In addition to some older homes that have been privately built, there have been two major housing projects in Tatitlek, one by the Bureau of Indian Affairs after the 1964 earthquake, and 18 HUD homes built in 1982. Conspicuously absent from the village is a grocery store. The village banned the importation and sale of alcohol in 1983.

## Demography

Table 4 presents a demographic profile of Tatitlek derived from this study's household surveys. The annual surveys were conducted in April 1988 and 1989, and reflect household composition and characteristics at the time of the survey. In 1989, the average household size was 3.7, with an estimated population of 108 people. In 1988, the estimated population of 124 had an average household size of 4.0. Females outnumbered males in Tatitlek both years. Ages in 1989 ranged from newborn babies to 89 years old, with 42.9 percent of the population under 20 years of age, and 13 percent 60 years or

TABLE 4. DEMOGRAPHIC CHARACTERISTICS OF SAMPLED HOUSEHOLDS, TATITLEK, APRIL 1988 AND APRIL 1989.

| Characteristic | 1988 | 1989 |
|---|---|---|
| Sampled Households | 19 | 22 |
| Number of Households in the Community | 31 | 29 |
| Percent of Households Sampled | 61.3% | 75.9% |
| | | |
| Average household size | 4.0 | 3.7 |
| Range of household size | 2-7 | 1-8 |
| | | |
| Total Sample Population | 76 | 82 |
| Estimated Community Population | 124 | 108 |
| | | |
| Average Age in years, Sample Population | 23.3 | 28.2 |
| Range | .5-66 | .5-89 |
| Median | 23 | 26 |
| | | |
| Average Length of Residency in years | | |
| Household Head and Spouse | 21.9 | 15.5 |
| Range | 2-50 | .5-73 |
| | | |
| Number and Percent Male | 35 (46.1%) | 33(40.2%) |
| Number and Percent Female | 41 (53.9%) | 45(54.9%) |
| Population unknown | 0 | 4 (4.8%) |
| | | |
| Number and Percent Alaska Native | | |
| Household Head or Spouse | 16 (84.2%) | 20(90.9%) |
| Sample Population | 64 (84.2%) | 70(85.4%) |
| | | |
| Residence of Parents When Born | | |
| Tatitlek | 39 (51.3%) | 41(50.0%) |
| Chenega | 6 (7.9%) | 6 (7.3%) |
| Cordova | 3 (3.9%) | 7 (8.5%) |
| Other Prince William Sound | 1 (1.3%) | 2 (2.4%) |
| Other Alaska | 19 (25.0%) | 20(24.4%) |
| Outside Alaska | 8 (10.5%) | 6 (7.3%) |
| Total | 76 (99.9%) | 82(99.9%) |

Source: Division of Subsistence, Alaska Department of Fish and Game, Household Surveys 1988 and 1989.

older (Fig. 4, Table 5). In 1988 the range was narrower, largely because two households of older adults participated in the 1989 study that were not available to answer questions in 1988. The median age in 1989 was 26 while the mean was 28.2, higher than the previous year due to the difference in sample composition. The percent of the population that was Native was fairly constant, at 84.2 percent in 1988 and 85.4 percent in 1989. In both years, at least half the population was originally from Tatitlek, with an additional 13 to 18 percent from other Prince William Sound communities. Other Prince William Sound communities included Chenega, Cordova, and previous settlements such as Nuchek and Ellamar. Tatitlek residents who originated from outside the Prince William Sound region include Alaska Natives and a few non-Natives who married into the community. School teachers and their families accounted for those from outside Alaska.

Employment and Local Economy

During the study period, monetary employment for Tatitlek residents was largely seasonal and dominated by commercial fishing. As shown in Table 6, 71.4 percent of the adults in Tatitlek held some cash employment between April 1987 and March 1988, and 56 percent between April 1988 and March 1989. The decrease in employed adults may reflect the inclusion of elderly households in the second study year that were not available the first year. Employed adults held an average of 1.5 jobs per person the first year, and 1.3 jobs per person in the second study year. The mean length of time employed was 8 months in 1987-88 and 6.9 months per person in 1988-89, underscoring the seasonality of cash employment opportunities for village residents. As shown in Figures 5a and 5b, almost half of the jobs held by Tatitlek residents were in the

**Figure 4. Population Profile, Tatitlek, April 1989**

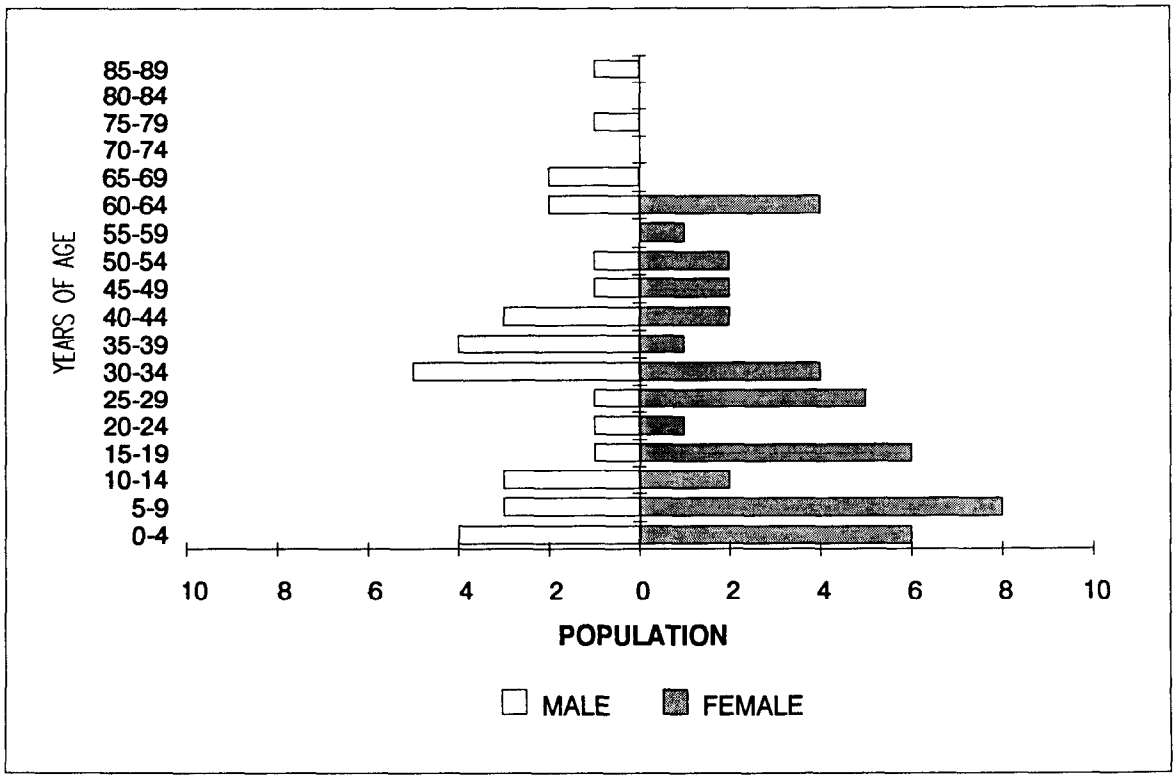



**TABLE 5. POPULATION PROFILE, TATITLEK, APRIL 1989**

| AGE | MALE | | | FEMALE | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|
| | NUMBER# | PERCENT | CUM. PERCENT | NUMBER# | PERCENT | CUM. PERCENT | NUMBER# | PERCENT | CUM. PERCENT |
| 0-4 | 4 | 12.1% | 12.1% | 6 | 13.6% | 13.6% | 10 | 13.0% | 13.0% |
| 5-9 | 3 | 9.1% | 21.2% | 8 | 18.2% | 31.8% | 11 | 14.3% | 27.3% |
| 10-14 | 3 | 9.1% | 30.3% | 2 | 4.5% | 36.4% | 5 | 6.5% | 33.8% |
| 15-19 | 1 | 3.0% | 33.3% | 6 | 13.6% | 50.0% | 7 | 9.1% | 42.9% |
| 20-24 | 1 | 3.0% | 36.4% | 1 | 2.3% | 52.3% | 2 | 2.6% | 45.5% |
| 25-29 | 1 | 3.0% | 39.4% | 5 | 11.4% | 63.6% | 6 | 7.8% | 53.2% |
| 30-34 | 5 | 15.2% | 54.5% | 4 | 9.1% | 72.7% | 9 | 11.7% | 64.9% |
| 35-39 | 4 | 12.1% | 66.7% | 1 | 2.3% | 75.0% | 5 | 6.5% | 71.4% |
| 40-44 | 3 | 9.1% | 75.8% | 2 | 4.5% | 79.5% | 5 | 6.5% | 77.9% |
| 45-49 | 1 | 3.0% | 78.8% | 2 | 4.5% | 84.1% | 3 | 3.9% | 81.8% |
| 50-54 | 1 | 3.0% | 81.8% | 2 | 4.5% | 88.6% | 3 | 3.9% | 85.7% |
| 55-59 | 0 | 0.0% | 81.8% | 1 | 2.3% | 90.9% | 1 | 1.3% | 87.0% |
| 60-64 | 2 | 6.1% | 87.9% | 4 | 9.1% | 100.0% | 6 | 7.8% | 94.8% |
| 65-69 | 2 | 6.1% | 93.9% | | 0.0% | 100.0% | 2 | 2.6% | 97.4% |
| 70-74 | 0 | 0.0% | 93.9% | | 0.0% | 100.0% | 0 | 0.0% | 97.4% |
| 75-79 | 1 | 3.0% | 97.0% | | 0.0% | 100.0% | 1 | 1.3% | 98.7% |
| 80-84 | 0 | 0.0% | 97.0% | | 0.0% | 100.0% | 0 | 0.0% | 98.7% |
| 85-89 | 1 | 3.0% | 100.0% | | 0.0% | 100.0% | 1 | 1.3% | 100.0% |
| UNKNOWN | | 0.0% | 100.0% | | 0.0% | 100.0% | 0 | 0.0% | 100.0% |
| TOTAL | 33 | 100.0% | | 44 | 100.0% | | 77 | 100.0% | |

# Number of individuals is based upon sampled households.

Source: Division of Subsistence, Alaska Department of Fish & Game, Household Survey, 1989.

TABLE 6. EMPLOYMENT CHARACTERISTICS OF TATITLEK, 1987-1989

| Characteristics | April 1987/ March 1988 | April 1988/ March 1989 |
|---|---|---|
| Number of Adults Employed | 30 | 28 |
| Number of Adults In Sample | 42 | 50 |
| Percent of Sampled Adults Employed | 71.4 | 56.0 |
| | | |
| Number of Jobs Held | 44 | 37 |
| Average Number of Jobs Held Per Employed Adult | 1.5 | 1.3 |
| Range | 1-4 | 1-3 |
| Average Number of Jobs per Household | 2.3 | 2.1 |
| Range | 1-4 | 1-7 |
| Average Number Employed Adults per Household | 1.6 | 1.5 |
| Range | 1-3 | 1-4 |
| Average Number Months Adults Employed | 8.0 | 6.9 |
| Range | 3-12 | 3-12 |
| Percent of Adults Employed Year Round | 35.7 | 21.4 |
| Average No. of Months Household Heads Employed | 8.8 | 7.5 |
| Range | 3-12 | 3-12 |

Source: Division of Subsistence, Alaska Department of Fish and Game Household Surveys 1988 and 1989.

**Figure 5a. Jobs by Occupational Type, Tatitlek 1988**

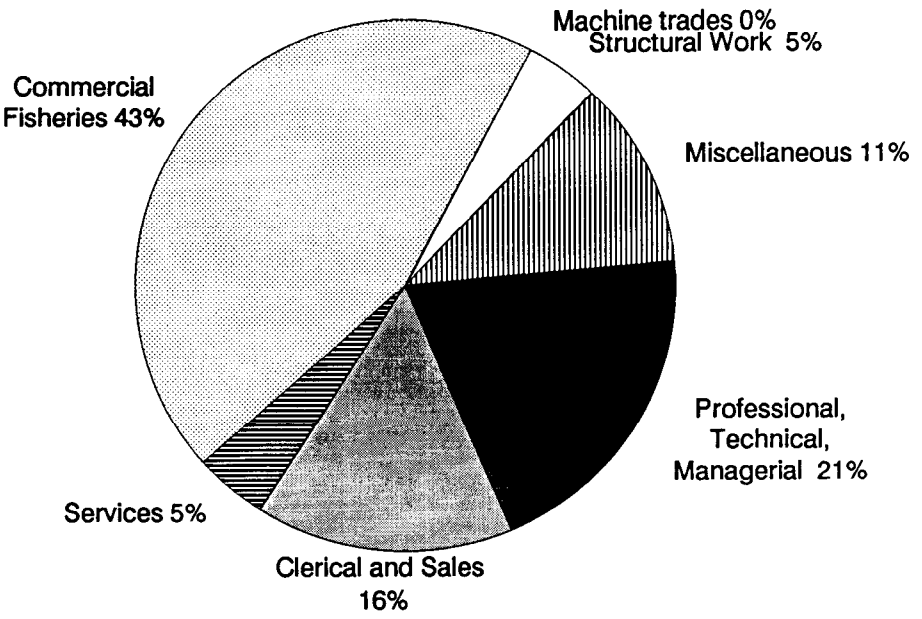
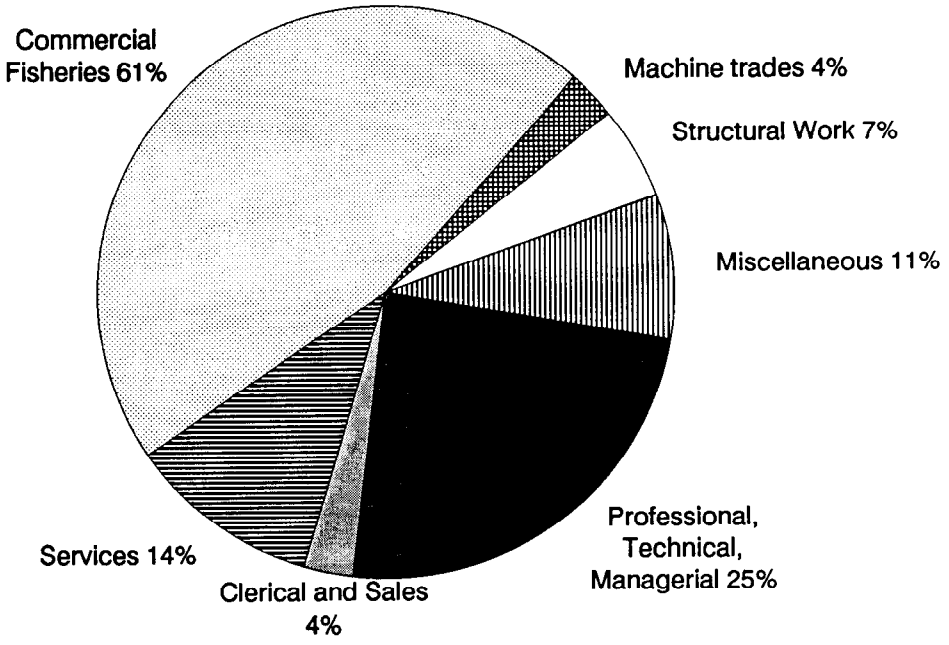



**Figure 5b. Jobs by Occupational Type, Tatitlek 1989**



commercial fishing industry (43 percent in 1987-88, 61 percent in 1988-89), exclusively catching fish for sale. No one was employed in the fish processing aspect of the industry. In Figure 6, which depicts the percentage of employed people by employment type, the school district and local government are highlighted as two other significant employment sources during the study years.

Commercial fishing has been the primary cash producing activity for village residents throughout most of this century. By 1989, seven limited entry permits were held by Tatitlek residents: five salmon gillnet and two salmon purse seine permits. Three residents were participating in other commercial fishing activities such as halibut and crab fishing. Thirteen people worked as crew members on commercial fishing vessels. Table 7 shows that in both study years over 70 percent of Tatitlek households had people involved in commercial fishing, and 60 percent of employed individuals worked in some type of commercial fishery. The category of "professional, technical and managerial" represents school teachers and also village administration positions, and accounted for 24.3 percent of the jobs in 1988-89.

Local residents' employment by the school district is somewhat smaller than indicated. The school annually employs three teachers, all of whom are brought into the village. In addition, from 5 to 12 local people work on a part time basis, including gym coordinators who worked as few as three hours per week, maintenance and janitorial employees who worked 20 to 30 hours per week, and the teacher's aide/office secretary who worked 30 hours a week. While Table 8 shows 50 percent of Tatitlek's workforce employed by the school district, the majority of these jobs were seasonal and part time (less than 10 hours per week). The North Pacific Rim, the regional Native non-profit

Figure 6. Percentage of People Employed by Employer Type, Tatitlek 1987-88 and 1988-89

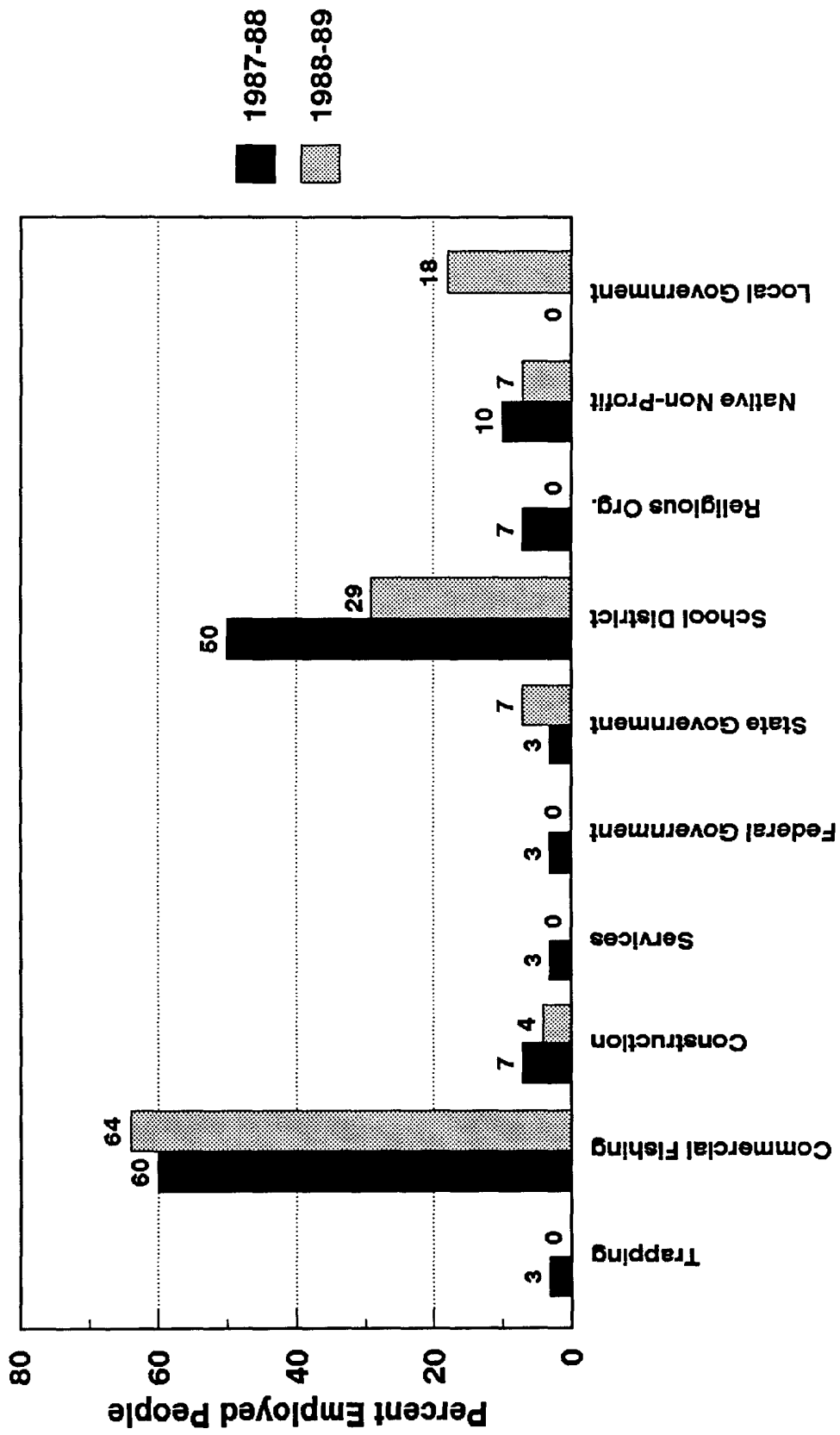


TABLE 7. EMPLOYMENT BY OCCUPATIONAL TYPE IN TATITLEK, 1987-88 and 1988-89

| | 1987-88 Percentages Of | | | 1988/89 Percentages Of | | |
|---|---|---|---|---|---|---|
| | Jobs (N = 44) | Households (N = 19) | People (N = 30) | Jobs (N = 37) | Households (N = 18) | People (N = 28) |
| Professional, Technical and Managerial | 20.5 | 36.8 | 30.0 | 24.3 | 27.8 | 25.0 |
| Clerical and Sales | 15.9 | 31.6 | 20.0 | 2.7 | 5.6 | 3.6 |
| Service | 4.5 | 10.5 | 6.7 | 10.8 | 22.2 | 14.3 |
| Agriculture, Fisheries and Forestry | 43.2 | 73.7 | 60.0 | 45.9 | 77.8 | 60.7 |
| Machine Trades | 0.0 | 0.0 | 0.0 | 2.7 | 5.6 | 3.6 |
| Structural Work | 4.5 | 10.5 | 6.7 | 5.4 | 11.1 | 7.1 |
| Miscellaneous | 11.4 | 26.3 | 16.7 | 8.1 | 16.7 | 10.7 |

Source: Division of Subsistence, Alaska Department of Fish and Game Household Surveys 1988 and 1989.

TABLE 8. EMPLOYMENT BY EMPLOYER TYPE IN TATITLEK, 1987-88 and 1988-89

| | 1987/88 Percentages Of | | | 1988/89 Percentages Of | | |
|---|---|---|---|---|---|---|
| | Employers (N = 44) | Households (N = 19) | People (N = 30) | Employers (N = 37) | Households (N = 18) | People (N = 28) |
| Agriculture, Forestry, Hunting and Trapping | 2.3 | 5.3 | 3.3 | 0.0 | 0.0 | 0.0 |
| Commercial Fishing | 40.9 | 73.7 | 60.0 | 48.6 | 83.3 | 64.3 |
| Construction | 4.5 | 10.5 | 6.7 | 2.7 | 5.6 | 3.6 |
| Services | 2.3 | 5.3 | 3.3 | 0.0 | 0.0 | 0.0 |
| Federal Government | 2.3 | 5.3 | 3.3 | 0.0 | 0.0 | 0.0 |
| State Government | 2.3 | 5.3 | 3.3 | 5.4 | 11.1 | 7.1 |
| School District | 34.1 | 63.2 | 50.0 | 24.3 | 33.3 | 28.6 |
| Religious Organizations | 4.5 | 5.3 | 6.7 | 0.0 | 0.0 | 0.0 |
| Native Non-Profit | 6.8 | 15.8 | 10.0 | 5.4 | 11.1 | 7.1 |
| Local Government | 0.0 | 0.0 | 0.0 | 13.5 | 27.8 | 17.9 |

Source: Division of Subsistence, Alaska Department of Fish and Game Household Surveys 1988 and 1989.

service corporation, was the third largest employer, employing two to three people annually in health related positions.

Prior to the *Exxon Valdez* Oil Spill, employment for village residents was dependent on commercial fishing or services underwritten by federal, state, or local governments. During the study years, the school district was funded through the state government, and water, electric, and refuse services were provided through the village government which charged for the services.

## Cost of Living

Households estimated their monthly costs for certain expenditures. Table 9 shows the mean monthly household expenditures for each 12 month survey period. The small variation (6 percent change) between the two years is likely related to the larger sample size, rather than suggesting any significant changes in costs.

Transportation fuel costs were for non-commercial fishing uses. Housing in the village consisted of several types. Two modular homes provided housing for the school teachers' families. The teachers paid rent, which included all utilities. Older homes in the village were either built by BIA after the 1964 earthquake or by individuals. Approximately 17 homes were built by BIA. During the study period, 16 of these homes were still standing. Six were used for residences, three served as community buildings, and six were unoccupied. In 1982-83, 18 HUD homes were constructed. All were occupied during the study period, and residents made monthly house payments ranging from $100 to $300, which did not cover any utilities.

TABLE 9. MEAN MONTHLY HOUSEHOLD EXPENSES, TATITLEK 1987-89

| Expense | April 1987 - March 1988 | April 1988 - March 1989 | Range | Percent Change |
|---|---|---|---|---|
| Heating Fuel | $ 51.21 | $ 83.09 | 0-442 | +62.2 |
| Transportation Fuel | 43.21 | 63.36 | 0-500 | +46.6 |
| Housing | 110.79 | 107.45 | 0-500 | -3.0 |
| Food | 614.05 | 534.59 | 250-1,200 | -12.9 |
| Water | 11.21 | 10.23 | 0-13 | -8.7 |
| Electricity | 135.58 | 108.14 | 0-240 | -20.2 |
| Telephone | 82.63 | 82.23 | 0-300 | -.5 |
| Propane | 16.26 | 12.32 | 0-70 | -24.2 |
| Monthly Average | 1,064.95 | 1,001.41 | 250-1,851 | -6.0 |
| Annual Average | $12,779.40 | $12,016.92 | $3,000-22,212 | -6.0 |

Source: Division of Subsistence, Alaska Department of Fish and Game Household Surveys 1988 and 1989.

Purchased food and household supplies came into the village primarily by mail or by boat. As stated above, there was no grocery store in Tatitlek during the years of the study. Residents mail-ordered groceries from Anchorage and Cordova which came in on the mail plane. Produce and other perishable items were phone-ordered primarily from Cordova and Valdez and sent in by plane. Occasionally, residents shopped in Anchorage, Valdez, or Cordova, and transported goods, including fuel, via commercial fishing boats from Valdez or Cordova to the village.

Because variation in the overall costs between the two years was minimal, 6 percent, the percentages for the two years' household expenses were averaged in Figure 7. Figure 7 shows the distribution of household expenditures. Figure 8 compares the mean household outlays for the categories for the two study years. Food accounted for over half the average household budget. Electricity and housing costs were the next highest expenditures. The relatively low heating costs reflect extensive use of wood for fuel.

Table 10 compares Tatitlek's two-year average of monthly expenses with those reported by Cordova residents for 1988. Tatitlek households reported spending less than Cordova respondents on several expenses, including heating fuel, transportation fuel, housing, water, and propane. The predominance of wood heat in Tatitlek accounts for their reduced heat expense. Tatitlek residents' primary transportation was boats. The combination of HUD housing, older homes that have been paid for long ago, and land owned by the village which is not taxed kept housing costs down. Household food expenses were 29 percent higher in the village compared with Cordova. Considering that the majority of Tatitlek household's protein comes from subsistence harvests, this reflects the high cost of supplemental foods and household items shipped into the village.

**Figure 7. Mean Monthly Expenses, Two Year Average,Tatitlek**

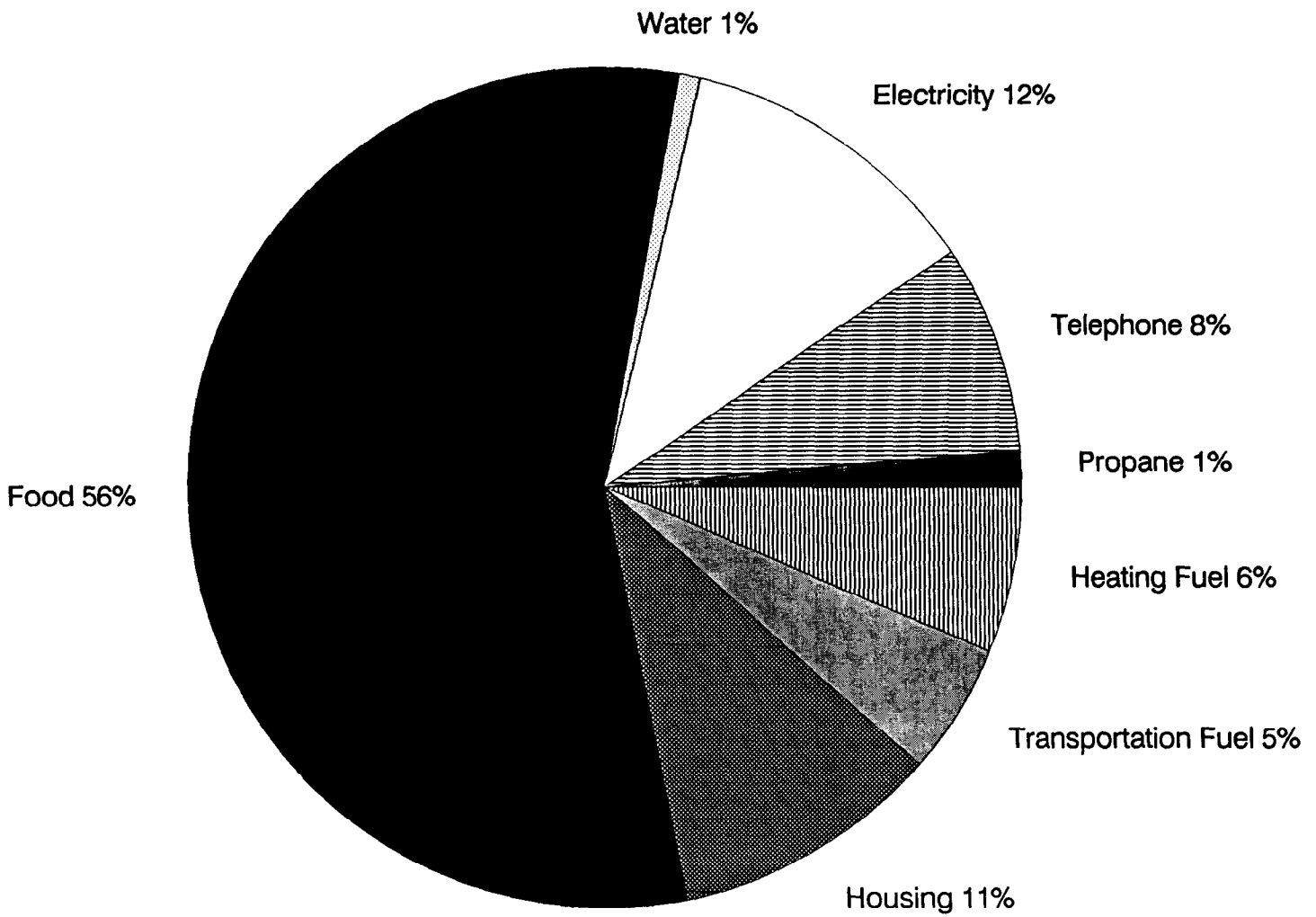


Figure 8. Mean Monthly Household Expenses, Tatitlek 1987-88 and 1988-89

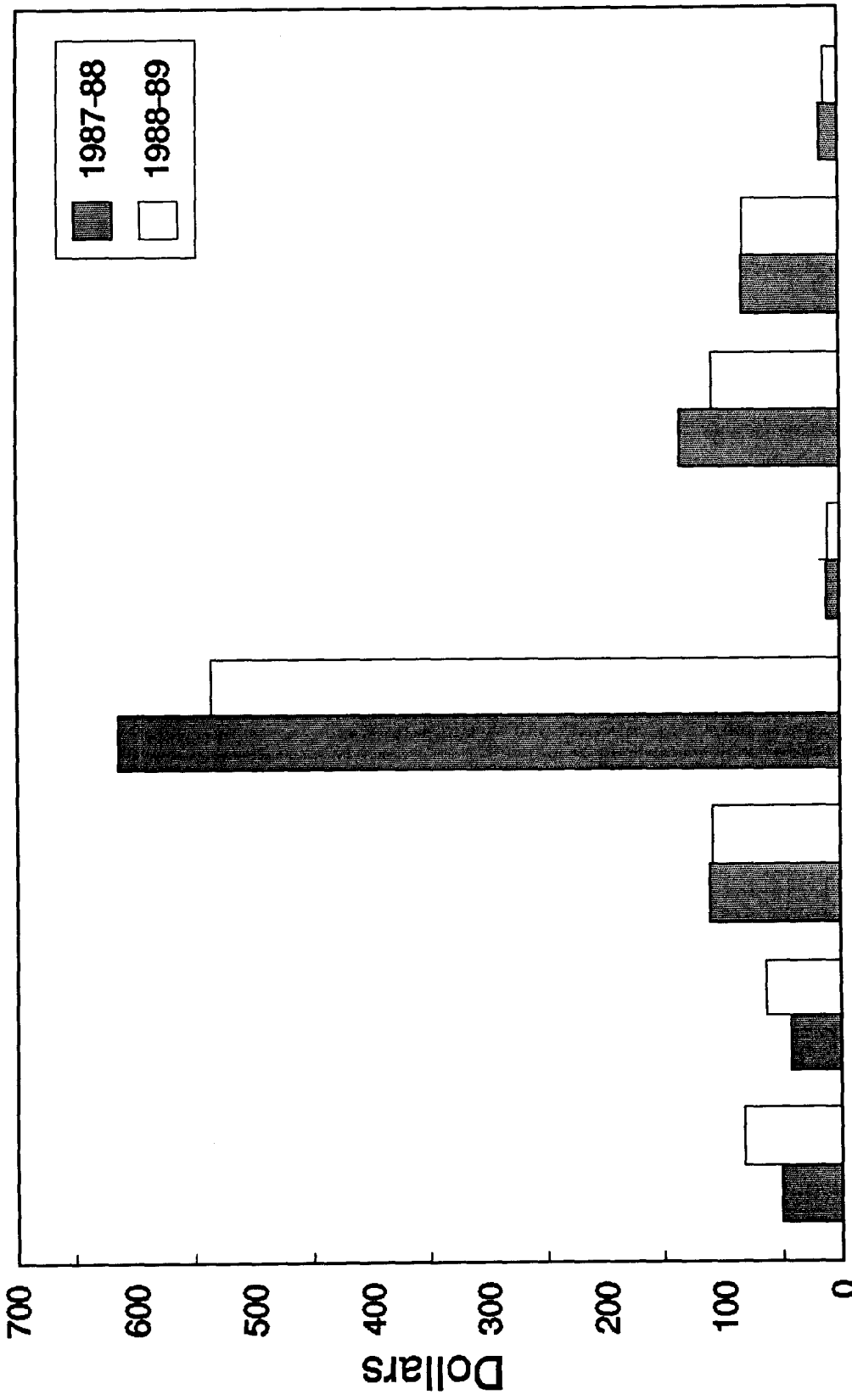


TABLE 10. TATITLEK AND CORDOVA MONTHLY HOUSEHOLD EXPENSES

| Expense | 2 Year Average | TatitlekCordova 1988 |
|---|---|---|
| Heating Fuel | $ 67.15 | $ 90.00 |
| Transportation Fuel | 53.28 | 70.52 |
| Housing | 109.12 | 415.76 |
| Food | 574.32 | 445.71 |
| Water | 10.72 | 17.58 |
| Electricity | 121.86 | 74.81 |
| Telephone | 82.43 | 62.61 |
| Propane | 14.26 | 20.66 |
| Monthly Average | 1,033.14 | 1,197.65 |
| Annual Average | $12,399.12 | $14,371.80 |

Source: Division of Subsistence, Alaska Department of Fish and Game Household Surveys 1988 and 1989.

Income

Mean annual income reported by households for the two survey years is shown in Table 11. Earned income was similar for both years, at between $28,000 and $30,000 per household. The major variation was "other income, which in 1989 was 103 percent higher (Table 12). This was largely attributable to the dividends declared by regional and village corporations, which to date has not been an annual occurrence. The addition to the sample of some households of older residents who received state of Alaska longevity bonuses contributed to the increase in other income.

Table 13 shows Alaska Department of Revenue estimates of mean income tax returns for Tatitlek, Anchorage, and the Prince William Sound communities of Cordova and Valdez. The five-year mean shows Tatitlek incomes at 57 percent less than Cordova, and 112 percent less than Valdez. These figures vary from the survey data, as they represent individual tax returns, while survey data report household incomes.

TABLE 11. MEAN HOUSEHOLD INCOME IN DOLLARS, TATITLEK 1987-89

| Income Source | April 1987 - March 1988 | April 1988 - March 1989 | Percent Change |
|---|---|---|---|
| Earned Income | 29,435.47 | 28,510.00 | -3.1 |
| Commercial Fishing | 17,066.67 | 18,733.33 | +9.8 |
| Other Earned Income | 12,301.87 | 9,691.67 | -21.2 |
| Trapping | 66.93 | 85.00 | +27.0 |
| Other Income | 3,691.42 | 7,480.00 | +102.6 |
| Total Mean | 33,126.89 | 35,990.00 | +8.6 |

Source: Division of Subsistence, Alaska Department of Fish and Game, Household Surveys 1988 and 1989.

TABLE 12. OTHER SOURCES OF INCOME, HOUSEHOLD MEAN IN DOLLARS, TATITLEK 1987-89

| Income Source | APRIL 1987 - MARCH 1988 n | Percent | Income | APRIL 1988 - MARCH 1989 n | Percent | Income | Percent Change |
|---|---|---|---|---|---|---|---|
| Social Security | * | * | * | 5 | 22.7 | 668.18 | -- |
| Longevity Bonus | 0 | 0 | 0 | 4 | 18.2 | 545.50 | +545.5 |
| Energy Assistance | 10 | 52.6 | 315.5 | 4 | 18.2 | 71.36 | -77.4 |
| Disability | 0 | 0 | 0 | * | * | * | -- |
| Permanent Fund | 19 | 100.0 | 2,758.21 | 22 | 90.9 | 2,966.09 | +7.5 |
| Food Stamps | * | * | * | * | * | * | -- |
| Corporation Dividend | 0 | 0 | 0 | 17 | 77.3 | 3,228.91 | +3,228.9 |
| Total Household Mean | | | 3,691.42 | | | 7,480.00 | +102.6 |

* Income withheld because of small sample size in order to preserve anonymity.

Source: Division of Subsistence, Alaska Department of Fish and Game, Household Surveys 1988 and 1989.

TABLE 13. MEAN INCOME PER INCOME TAX RETURN BY COMMUNITY, 1981-1985

| Community | 1981 | 1982 | 1983 | 1984 | 1985 | Mean 1981-85 |
|---|---|---|---|---|---|---|
| Anchorage | 23,043 | 23,590 | 24,393 | 25,406 | 25,855 | 24,457 |
| Valdez | 27,582 | 27,587 | 27,213 | 28,635 | 28,468 | 27,897 |
| Cordova | 22,353 | 19,296 | 18,345 | 20,465 | 22,340 | 20,560 |
| Tatitlek | 20,103 | 13,504 | 11,337 | 9,686 | 11,111 | 13,148 |

Source: Division of Subsistence, Alaska Department of Fish and Game, derived from Alaska Department of Revenue.

# CHAPTER THREE

# HISTORIC USE OF NATURAL RESOURCES

This chapter describes the historic use of wild natural resources for food, shelter, tools and clothing by Tatitlek residents. Interviews with village elders and active hunters and fishermen produced historic information about resource harvesting and use activities primarily covering the past forty year period. How, where, and when people sought various resources, and how the harvests were cared for, distributed and preserved were topics covered in the interviews. Ethnographic data collected in the 1930s by other researchers (Birket-Smith 1953; de Laguna 1938) and other historical documentation of resource activities (Bancroft 1970; Hassen 1978; Merck 1980; Rickman 1966; Shelikov 1981) and uses also contribute to understanding the historic role of fish, wildlife, and vegetation in the lives of the Tatitlek people.

## MARINE FISH

### Salmon

Three households remembered moving to fish camps each summer for harvesting and processing subsistence salmon, at sites including Jack Bay, Galena Bay, Landlock Bay, Whalen Bay, and Port Fidalgo. In the 1930s and 1940s, fish camps were short term residences for one or two weeks while the fish dried. These camps typically included smokehouses, a tent or shack, and drying racks. Remains of barabaras (partially underground houses with sod roofs) are found at some of the older sites. Ethnographic interviews indicate that historically, salmon camps were owned by families or geographic groups

(Birket-Smith 1953:96). After fish camps were no longer in use, respondents reported periodically returning to catch and cut fish at the fishing site, on the creek, and transporting them to the community for additional processing.

Elders recalled that previously, village residents put up primarily coho ("silver"), chum ("dog") and pink ("humpy") salmon. Chinook ("king") and sockeye ("red") salmon were not common, except for white kings, a variety of king salmon that feeds in Prince William Sound during the winter months. The white king salmon were an additional catch while herring fishing in the early spring.

Historical reports from early contacts with the Chugach prior to commercialization of salmon fisheries documented Chugach use of harpoons for salmon fishing in the late 18th century (Rickman 1966:249). Ethnographic information collected in the 1930s indicated that Prince William Sound Natives took salmon for consumption using weirs in rivers, spearing or harpooning salmon above the weir. Gaffs were used, as were fishtraps made of roots, grass or bark placed at the mouths of streams (Birket-Smith 1953:41,96). Fishing methods also included stream fishing with hook and line, and the use of nets. When people started fishing for commercial companies, village fishermen brought home enough fish at the end of the week for their families to salt a barrel of fish at a time.

While women's roles at fish camps were conventionally those of handling and preserving the fish, men's roles at fish camp varied, including processing and fishing. One respondent recalled her father and uncle cutting fish at camp. Another remembered her father dropping off fish he had retained from a commercial catch for the family to smoke. A third respondent remembered her father hunting while the rest of the family cut fish.

Among traditional salmon products that elders recalled which are rarely made today were dried and fermented salmon eggs and salted or pickled fishheads. Salmon eggs for drying were stored in a cleaned seal stomach and hung in the smokehouse for use in winter. They would be sliced like cheese. A drying method used for silver salmon eggs included two days of sun and smoke-drying, then pressing the eggs into a keg to compact them, to be sliced and eaten later (Birket-Smith 1953:43). Salmon eggs were also smoked by some households. *Piinaq*, or fermented fish eggs, is still made today, but few people have the taste for it. Households recalled putting up as much as 10 gallons of it annually when they were younger. Loose eggs were removed from the fish that were ready to spawn and mashed or ground. Cold water was added slowly. Some preparers made a point of taking all the shells out of the mixture to avoid any bitter flavor. The concoction was stirred until it became milky in appearance, at which time all the water was squeezed out. The egg mixture was then stored in a barrel or bucket and aged. One respondent described the product as smooth, just like cheese. Another description addressed the aroma and taste, comparing *piinaq* with Limburger cheese, having a strong smell but good flavor. While most descriptions of *piinaq* referred to a substance of strictly eggs, one elder mentioned that canned blackberries or blueberries were mixed with the fermented salmon eggs. Salmon fishheads were preserved earlier either with salt or by pickling.

Another delicacy rarely enjoyed today was derived from fall silvers, which were filleted from head to tail, then put in a dry warm place until the flesh turned mushy. The fish flesh was almost spoiled. The Chugach scraped the meat off the skin with their hands and made patties which were then cooked.

Methods of salmon preservation have been varied historically. When salmon were largely processed at fish camp, drying, smoking, and salting were the dominant methods.

Traditional fish drying involved splitting the fish open by both the back and the belly, and removing the backbone. The salmon were hung by the tail, and allowed to dry for ten to fourteen days. The dried fish were tied up, twenty to a bundle. The bundles of fish were placed on boards or in gunny sacks and stored in smokehouses, attics, or outbuildings. In later years, paper bags were sometimes used. Villagers interviewed by Birket-Smith in the 1930s recalled drying and smoking coho and pink salmon, cutting the dried fish into strips, and storing the dried strips in seal oil for winter use (Birket-Smith 1953:43). Explorers in the 18th century documented Chugach use of cellars or subterranean storehouses for keeping dried salmon (Bancroft 1970:80).

Methods of smoking salmon varied among respondents, depending on the desired product and the weather at the time of harvest. The cut fish were hung on a drying rack. Some respondents remembered hanging the fish overnight, then smoking the fish in the smokehouse for three days. Then the fish were air dried. In another method, during the day the fish were air dried on racks. At night, the fish were moved to the smokehouse and a fire lit under them. Backbones, rarely dried or smoked today, were preserved in earlier years.

With the advent in the early 1900s of canneries and salteries in Prince William Sound, kippering, canning, and salting of fish came into use. Fish were smoked for two days and then canned.

Salt fish (*sulunaq*), including pink, silver and chum salmon were first gutted and split. The fish head, tail, fin and backbone were removed. The

without splitting the belly. The fish were then layered alternately with layers of salt in wooden barrels.

At the early recorded contacts, dog salmon skins were occasionally used in the construction of boots (Birket-Smith 1953:68). Salmon skins were not being used in the 20th century.

In addition to the fish camp locations mentioned earlier, Tatitlek residents fished at Ellamar and *Nunu*, in Boulder Bay. Both sites were day trips from the village. At *Nunu*, humpies were taken for smoking or salting. Historical site information documents Chugach fish camps at Glacier Island and Long Bay.

Herring

Ethnographic research in the 1930s documented herring harvests at Tatitlek from mid June through November, although there was a major harvest in the spring, usually April, as well. In January the herring appeared in large numbers in front of the village. Herring were taken in large quantities for village consumption. Small nets were used, as were three-pronged leisters and fish rakes (Birket-Smith 1953:23,24,39,41). By the mid 1900s, respondents reported using a treble hook on a long twine or dipnetting herring from a skiff. The harvest was focused in the spring.

Respondents recalled putting up herring in earlier years, filling the smokehouse. First the herring were scaled, then cut open and gutted, but not boned. Two herring were hooked together through the head, putting one head through the gills of the other fish. The herring were smoked a couple of days, using drift wood, then stored in burlap bags in the smokehouse for use later on in the winter.

days, using drift wood, then stored in burlap bags in the smokehouse for use later on in the winter.

Spawned out herring were also gathered and cut up. The fish were either smoked or salted. Salted herring could be pickled later.

Equally important in the subsistence round of Tatitlek residents, both historically and currently, is the use of herring roe. Herring spawn on seaweed (*fucus*) was gathered off the rocks at low tide, and salted in buckets. Herring sac roe were also salted. Later on, the sac roe were soaked out, boiled, and eaten with seal oil.

When electricity became more readily available and more dependable, the herring were frozen. Prior to freezers, however, respondents mentioned having many barrels of salted fish stored underneath their houses.

Other Finfish

Salmon was the most prominent of the finfish harvested by the Chugach villagers. However, several other species contributed to the diet. Respondents reported fishing for cod, halibut, and snapper as a change of meals.

Eulachon were also taken in large numbers in earlier years. Eulachon, locally called "hooligan," used to be harvested near Valdez. The fish were occasionally dried for later use.

Bottomfish were taken throughout the year as weather permitted using hooks. Halibut were taken, but were not as popular or prevalent in the diet as today. Still, Shelikov observed halibut fishing by the Chugach of Hinchinbrook Island in the late 1700s (1981:85). Halibut harvests were concentrated between February and May, and were targeted on the flooding tide.

Archaeological evidence dates bottomfish use to pre-contact years, as bones from cod occurred in middens, and fish vertebrae, such as halibut rings and disks, were used as buckles and beads by the Chugach in earlier years (Birket-Smith 1953:23,39; de Laguna 1956:49,210). Halibut and other finfish bones occurred in middens in Constantine Harbor/Port Etches sites.

Rockfish, two varieties of which are locally referred to as red snapper, were taken with handlines and cared for similarly to halibut. Respondents who spent time in Chenega said fishing for snapper was more common in the western part of the sound, and the fish were plentiful there. Most snapper were eaten fresh, although some were salted. While fishing for snapper, they took halibut, gray cod, and black rockfish, also. One respondent recalled that people used to spear bullheads or Irish Lords out in front of the village, for a change of diet.

Methods of harvest for cod depended on the species. Black cod, more of a deep sea fish, were taken on longlines. Handlines were used for gray cod. Cod were smoked or dried. Gray cod provided a couple of delicacies. The stomach and liver, "codfish poke," were prized. Care was taken not to break the gall bladder when gutting the fish. First the cod stomach was cleaned until it was smooth, then turned inside out. The stomach was cleaned again, then turned right side in again. The liver was inserted into the stomach, then boiled, with salt added. When the stomach was cool, it was sliced and eaten. Another product was *mecuutaq*, cod eggs, also called codfish bloomers. Cod eggs were baked in a pan in the oven with butter, bacon, or with seal oil. While cod eggs were sometimes taken out of the fish, "loaves" of eggs were also gathered in the intertidal area when the cod were spawning.

## MARINE INVERTEBRATES

Shellfish played an important role in the Chugach diet, especially when bad weather prevented hunting and fishing activities. Shell heaps excavated in archaeological work verify the use of clams, mussels, cockles, snails, chitons ("gumboots"), and sea urchins. Ethnographic research also reports the occasional spearing and eating of sea slugs. Clam shells also figured in the material culture of the Chugach. They were used as scrapers for depilating skins and scraping bark (Birket-Smith 1953:18,23; de Laguna 1956:6,193). Excavated sites documenting shellfish uses extend from Nuchek in Constantine Harbor, to a village site in Esther Passage, on Storey Island, and also on Montague Island in Stockdale Harbor.

Among varieties of shellfish, clams, and mussels were the most readily and consistently available. While clam populations in village harvest areas have been depressed recently, respondents reported that in earlier years clams were plentiful. Village residents dug butter clams and black and blue mussels in large quantities and ate them fresh. In addition to being consumed fresh, cockles were dried for later use. Tatitlek women threaded the cockles on a string, and either dried them in the sun or smoked them. They were later cooked and eaten with seal oil. Mussels were often eaten in chowders, or with seal oil.

Crab use was limited to incidental catches in nets when commercially gillnetting for salmon until the 1960s when commercial crab harvest got underway. Crab pots came into use at that time. Octopus were taken periodically by poking under rocks using a stick with a hook on the end.

Sea urchins, the small, dark, spiny variety, were also called "sea eggs." Besides picking them up at low water near the village, Tatitlek

residents recalled getting sea urchins at Unakwik, Jonah Bay, and Middleton Island in salmon gillnets. The urchins were cracked in half and the red eggs were typically eaten raw. Sea urchins were also boiled.

Tatitlek residents and their ancestors harvested sea cucumbers historically as well. The sea cucumbers drifted up to the beach, or came into shallow water in the spring. When the tide went out, villagers collected them on the beach. Sea cucumbers were also taken in salmon seines, or snagged with a treble hook at low water. The sea cucumbers were then thrown or hit on a rock, causing them to stiffen up. Respondents described scraping the bumps off the animal, cutting both ends off, and pulling the entrails out. The sea cucumbers were then either soaked in cold water or boiled. Boiled sea cucumbers were cooked whole or cut up in chunks. Sea cucumbers, either raw or cooked, were sliced and served with seal oil. Another method of preparation included tenderizing the inside, putting it in batter and deep frying it.

## LAND MAMMALS

Bears, primarily black bear and some brown bear, and goat were a regular part of the Chugach diet. In the twentieth century, deer became available. Trade with other Native groups brought additional resources into the region.

### Bears

Prior to the 20th century, bear fur figured prominently in the Chugach material culture. Bear fur, including brown bear fur, was used in the construction of boots and mittens. The Chugach also utilized black bear skins for bedding and coats. Rainwear was crafted from black bear intestines sewn

together. Intestines for rain gear had to be taken from bears taken in the spring, as there was less likelihood of perforations from salmon bones at that time of year. Archaeological evidence documents that bones were used to make tools; a brown bear mandible was made into a drill rest. Other bear parts were made into awls and chisels (Birket-Smith 1953:54,65,67-68; de Laguna 1956:124,187,191,235). Black bear furs were traded in the 18th and 19th centuries with the Russians (Merck 1980:123).

Bear hunting in the 1900s focused almost exclusively on black bears. Several methods were employed, depending on the season of harvest. Harvesting bears from their dens occurred in the late fall or winter, approximately a month after the bears went into their dens. One hunter described being lowered into the den head first by other hunters, from a hole dug in the top of the den. Methods of provoking the bear to come out of the den included smoking it out, taking a stick and poking the bear, or alternately, wounding it. Smoking the bear out involved tossing a smouldering object, such as an old boot, into the den, but was not recommended by some hunters because they said it damaged the den, and bears would not use the den for several years. An elder said that killing a bear in the den left a scent, and also caused bears to discontinue use of the den for years. Most hunters shot them when they came out. Active dens were considered a valuable resource, and a good hunter might farm a den, returning to it over the years. Others hunters respected a hunter's territory when he was farming a den.

Another major type of bear hunt occurred during the spring, right after hibernation. Hunters watched lagoons or bays, waiting for bears to come out of their dens, in search of kelp or grass to eat. Bear hunters ran skiffs along the coastline, looking for bear on the grassy slopes, or in the early

morning on the beach eating seaweed. Spring bears were prized because they did not taste fishy.

The third type of hunt occurred in the fall, when the bears could be found feeding at salmon streams. Skiffs were used to patrol the shoreline, or reach salmon streams where the hunter hid himself, waited for the bear to come for fish, and then shot it. Skiffs were also used for transporting the bear meat back to the village, or to the family at fish camp. In the mid 1900s, bear meat was highly valued. If a bear was sighted, the hunter or hunters went after it. When a bear was taken, everybody in the village received a piece of bear meat.

In addition to the usual meat that was salvaged, a variety of other bear parts were recovered depending on the season. In the 1900s, the hide was very rarely saved. The stomach, used for storage of other subsistence foods, was only recovered if the bear was eating grass. There would be no perforations in the stomach then. Black bear heart, liver, kidney, tongues, feet, and fat were commonly brought home to be eaten.

Black bear meat was eaten fresh, but also preserved when the temperatures warmed up. Any meat left over from winter was canned in the spring. Bear grease was jarred, or rendered. Respondents mentioned that smoked or dried salmon was eaten with bear fat instead of seal oil sometimes. Bear feet were boiled and eaten fresh. Bear fat was also roasted over an open fire and eaten.

Historic site work documents bear use at Nuchek, at sites in Constantine Harbor, and Anderson Bay. Excavations at Palugvik site on Hawkins Island revealed substantial numbers of both black and brown bear bones (de Laguna 1956:49).

Mountain Goat

The Chugach people's historical use of mountain goat has been well documented by ethnographic accounts and archaeological evidence. Mountain goat meat was a favored and often hunted source of food by the Chugach bands of the northern and northeastern sound. In the 18th and 19th centuries, the Chugach utilized goat skins for bedding, and also learned from the Russians about using goat wool to make blankets. Birket-Smith reports that the Chugach cooked mountain goat meat in the goat's stomach, which had been turned inside out (Birket-Smith 1953:23,38,43,54,64).

Goat hunting occurred largely in the fall and winter. While there was occasionally a goat low enough that hunters could shoot the goat from the skiff or boat, picking the animal off a slope near the water, most goat hunts required considerably more effort. Often, the goats were located the day before. Early the next morning, the hunters climbed the steep mountain sides to reach the goat. Once the animal was shot, one hunter recalled blowing air into the goat's wind pipe, filling the lungs with air. The lungs were then tied off, and the goat was rolled down to the river, then floated to the lagoon or the boat.

After a successful goat hunt, there was often a barbecue, or *mangiq* on the beach. In addition to the meat, goat fat was also cooked over an open fire, by wrapping the goat tallow on a stick and roasting it. Goat meat was dried, smoked, salted, or frozen for use in the winter. The stomach liner fat from the goat was also put up. First, the Chugach washed it, then hung it to dry.

Goat hunting locations in the 1900s have included Long Bay, Port Fidalgo, Galena Bay, Jacks Bay, Sumner Bay, Port Wells and the Silver Lake

area. Some hunters reported taking goats in the southwestern sound when they lived in Chenega. Goat hunting has tapered off somewhat as deer have become more plentiful near the village. Archaeological evidence from a site in the Tatitlek people's territory in Port Fidalgo substantiates historic use of goat.

Deer

Transplanted to the sound in the early 1900s, the deer population has grown and spread to virtually all the habitable islands in Prince William Sound. By the middle of the century, Tatitlek villagers were harvesting deer, taking their commercial fishing boats out to Montague Island. Much of the hunting was along the shoreline, but some hunters ventured into the hills. Prior to reliable electricity in the village, deer meat was salted in 15 or 20 gallon barrels, or hung in the smokehouse. Venison remaining in the spring time was canned.

Furbearers

The Chugach used furbearing land mammals for a variety of purposes before the end of the 18th century. The trading of fur preceded Russian contact, as Koniag groups received marmot pelts from the Chugach through trade (Holmberg 1985:39). Trade with the Russians, aside from marine mammals, included black bear furs, lynx, marmot, ground squirrel, and land otters. Other fur harvests included fox, wolf, wolverine, weasel, beaver, and muskrat. Furbearers were most commonly taken in deadfalls and snares before steel traps became readily available. According to early ethnographic interviews, marmots

were reportedly used for both food and skins. One explorer documented the use of ground squirrels for making parkas in 1790. Beaver teeth were said to have been used to sharpen knife blades (Birket-Smith 1953:16-17,38; de Laguna 1956:192; Merck 1980:111,123; Shelikov 1981:84).

Respondents talked about hunting land otters in detail. Tatitlek residents recalled poking the otters out of their dens or using hunting dogs to force the otters out. One trapper remembered when traplines were checked using bidarkas. Then, as in recent years, most trapping occurred along the shore. One respondent recalled that the land otter tail used to be eaten.

Use of furbearers prior to the 20th century is substantiated by historic site work and archaeological evidence throughout Prince William Sound. Nuchek, Montague Island, Tatitlek, and Palugvik people's sites documented usage of furbearers. Port Fidalgo was one of the closest excavated sites to Tatitlek that included furbearer bones.

Other Game

Caribou, although not indigenous to Prince William Sound, was in use by the Chugach at some of the earliest contacts, particularly in the making of clothing. Caribou were traded into the region by the Ahtna and also the Port Graham people. In exchange, the Ahtna received seal skins, dried fish, and oil. Polar bear hides were another non-local resource that reached the Chugach region via trade with other Native groups (Bancroft 1970:191; de Laguna 1956:7).

Hunters remember the first time they encountered moose, while on a goat hunt in the Kings Bay area in the western sound in the mid 1900s. Since that time, hunters have occasionally returned there to hunt moose.

Villagers used to hunt porcupine along the beaches. Dogs were sometimes used to tree the porcupines or chase them out of their dens. Porcupines were shot or clubbed. The porcupines were then thrown on a bonfire to burn the quills off. The meat was boiled, or put in a soup. In earlier years, in addition to the meat, the quills were saved and put to decorative use.

## MARINE MAMMALS

Marine mammals have dominated the diet of the Chugach since well before contact with Europeans. Marine mammals were supplemented with fishing and hunting for land mammals, and gathering intertidal resources and vegetation.

Archaeological excavations and interview data collected in the 1930s indicate that the breadth of marine mammals species harvested by Tatitlek people was much greater prior to the 20th century than it is today. In addition to the sources cited in the text, interviews with village elders were conducted, and contributed information about the types of food products that have been used in the recent past, and about hunting technologies which have been modified since the advent of the outboard motor.

### Seals

Harbor seals are and have been the most numerous species of seal in the Prince William Sound. Previous research suggests that fur seals, spotted seals, and even a rare ribbon seal were taken in the sound for subsistence purposes. Hunting took place both from land and with bidarkas (Birket-Smith 1953:23,26).

Earlier seal hunting methods included the use of seal decoys. Historically, toggle harpoons were used in the hunting of many types of marine mammals, seals among them. As new technologies became available to village residents, the toggle harpoons were replaced with firearms, and bidarkas gave way to skiffs with outboard motors. Before outboard motors, seal hunters waited for seals to swim close to shore and then shot them, rowing out from shore to retrieve the seal. The shooter was most commonly on land, while others were ready in a skiff or bidarka to retrieve the seal before it sank. Hunters used a hook to tow the seal back to land.

According to interviews with elders, much of the seal hunting occurred in the spring when young seals were available. These were easier to catch and stayed afloat longer. Seal hunting occurred throughout the year, but was least popular in the summer, because some held that the animals did not taste as good.

Seal camps were set up all over, a fact borne out by archaeological evidence of seal camps throughout the range of the Chugach people groups. Seal hunters travelled all over the northern sound and out to the large islands. Some locations, such as Columbia Glacier, were visited annually. Hunters used to go to Port Wells in the spring, before the seining season for salmon opened. For a spring seal hunt, hunters would be gone two or three weeks. One hunter described hunting with bidarkas as quieter than today's methods, and noted that the bidarkas negotiated the floating ice better than skiffs. Skiffs in floating ice could be too noisy, scaring the seals away. Sometimes an outboard motor was loud enough that hunters could not get close enough to shoot the seal.

One of the local canneries introduced outboard motors to Prince William Sound residents, making water travel much faster. Villagers continued to use

bidarkas for awhile into the winter, because gas was not always readily available. In the early 1940s, the Chugach stopped using bidarkas. Motorized water transportation changed seal hunting somewhat, in that hunters did not have to camp out as often. They could hunt and return to the village on the same day, which was especially nice in the winter time. Hunting groups also were altered. With a skiff and kicker, a single person could hunt seals.

Seal parts figured centrally in many other aspects of the Chugach culture, from transportation to clothing, tools, weapons, and decorations. A bidarka covering required twelve to fourteen seal skins. The skins were fermented to remove the hair, then dried. Historically, the Chugach used seal hides for clothing, making outer garments from the larger seal skins, and using the skins from seal pups for inner garments. Seal bones were carved into awls. The Chugach inflated seal stomachs and attached them as floats to harpoons used for hunting marine mammals. Pendants were made from canine teeth (Birket-Smith 1953:24,64; de Laguna 1956:187,216,235).

Many parts of the seal continued to be utilized during the 1900s. The seal fat was rendered into oil and used in the preservation, and later the consumption, of many resources. Oil was stored in out buildings in earlier days. Residents of the Chugach villages in the twentieth century salvaged and ate seal stomachs, intestines, heart, kidneys, lungs, livers, flippers, and tongues. One respondent recalled her mother and grandmother pouring seal oil into seal lungs, then baking the tied off lungs in the oven. Another woman remembered her grandmother cooking the seal head, to eat its brains. Seal intestines were cleaned and then braided. Expert braiders also put seal fat inside. The intestines were then boiled and eaten. Seal tongue was also boiled. Some families salted or smoked seal meat. Birket-Smith reports that

seal meat was fed to dogs earlier; dogs were once important for hauling (1953:51).

Harbor seals also have been cash producers for village hunters. While harbor seal skins were not as marketable in the mid 1900s as they were during the days of the Russian fur trade, there was still a limited market for seal skins. In the mid 1900s, a bounty was placed on harbor seals by the federal government in the belief that this would increase commercial salmon runs. Village hunters turned in seal snouts for $2 or $3 a piece. One respondent reported that his father rendered seal oil and sold it in Anchorage. The price was $25 for 5 gallons when he was growing up.

Sea Lion

Evidence of the use of sea lions occurs in the archaeological documentation from Prince William Sound sites and ethnographic information collected in the 1930s. Sea lion bones were utilized in the construction of the toggle harpoon which was used for marine mammal hunting. The hide was used in the making of boots (Birket-Smith 1953:67; de Laguna 1956:171).

While the majority of the sea lion was eaten, the most prized parts of the sea lion were the flippers and the breast meat. Sea lion flippers were sometimes pickled, just like pigs feet, and also could be dried.

By most accounts, sea lion hunting was largely opportunistic. Hunters took them when they were available or when there was an immediate need for meat. Most sea lion hunting which was not incidental to other harvesting activities took place near Tatitlek, at Ellamar and Black Point.

Sea Otter

Captain Cook observed the Chugach wearing outer garments made of sea otter on his 18th century visit to Prince William Sound. Analysis of sea otter bones excavated in middens confirms that sea otter were used for furs, as the bones were not cracked for the marrow, or charred by fire. In addition to use as clothing and burial robes, amulets were made out of sea otter fur (Birket-Smith 1953:28,64; de Laguna 1956:50,237). Interviews have verified that sea otter meat was considered a "starvation food," something to be used only in times of extreme shortage.

Russian exploration into Prince William Sound was largely in the interest of expanding the trade for sea otter furs. From the initial contacts in the late 1700s, the Chugach were involved with the harvest of sea otters for trade with the Russians. The Russians established a trading post at Port Etches, and until the 1867 sale of Alaska to the United States, engaged the Chugach in trade. The Chugach traded sea otter furs with other Native tribes, as well. American companies took over the Russian trade which was already rapidly declining due to the depletion of the sea otter population (Hassen 1978:114-151).

Whales

Whale hunting was pursued prior to the twentieth century by the Chugach (Shelikov 1981:88). Birket-Smith and de Laguna recorded some descriptions of whale hunting methods and associated customs. These ethnographers mention several kinds of whales, including beluga and killer whales. Whales were hunted only by specifically trained people, and both the hunt and the hunters

were surrounded by mystery and ceremonialism. As with other marine mammals, hunting was done from bidarkas with toggle harpoons and lances, and occurred throughout the year. Inflated sea lion stomachs were used to buoy up the whales. News of a whale harvest was shared among the villages, and resulted in a feast. Archaeological evidence has produced whale bones as part of the material culture. Whale parts were used for harpoon heads, arrowheads, and bayonets (Birket-Smith 1953:33-36; de Laguna 1956:7,49,171,177,195).

Other Marine Mammals

The Chugach also hunted porpoise. The fact that fewer bones were excavated in middens suggests that porpoise were harvested in much smaller quantities than seal and sea lion (de Laguna 1956:49).

Walrus were not available in Prince William Sound, or were extremely rare. However, Chugach possession and use of walrus ivory has been documented, likely obtained through trade with other Native groups (de Laguna 1956:9).

## WATERFOWL

Ethnographic research by Birket-Smith and de Laguna recorded bird hunting with bows and arrows, nooses, and gorges. Cormorants were netted or clubbed. Eagles were baited with salmon heads, and snared (Birket-Smith 1953:38-39). Excavated middens produced bones of loons, cormorants, albatross, scoters, eiders, gulls, auklets, and eagles (de Laguna 1956:7,49). In addition to eagles, which were taken for their skins, feathers, and later

for the bounty their talons brought, several other species were taken historically for feathers, beaks, or uses associated with shamanism.

The Chugach worked bones from birds into fishhooks, awls, and sewing needles. They used feathers in masks, head bands, and other clothing and decorative items. Cormorant skins were used for blankets. Cormorants, eagle, and guillemot skins were also used for coats. One elder recalled using eagle wings for brooms. Hummingbirds were occasionally taken for amulets (Birket-Smith 1953:17,54; de Laguna 1956:183-187,237).

Waterfowl were hunted "whenever people got hungry for ducks," from the late fall through the winter and into spring, roughly October through April. Duck hunters targeted "black ducks" (which include three varieties of scoters), goldeneyes (copperheads), mallards, geese, and petrel. Sandhill cranes were taken opportunistically. Hunters took a skiff or walked to the hunting areas. After shooting, the hunters who were afoot waited for a breeze to drift the birds ashore or waded in after them.

Cormorants, or "shags," were hunted off the rocks, and preferred by the preceding generation over geese and mallards because of the good tasting, tender meat. Hunters described cormorants as having lots of meat on them, and easy to kill.

Goose harvests typically have been fairly small, and so they were eaten fresh. Grouse were more likely to be taken by younger hunters, sometimes with rocks. Seagulls were taken when they were still young.

Egg harvests occurred in the spring. Arctic tern ("scissortail") and goose eggs were taken while hunters were searching for bears. Gull eggs were gathered in areas near salmon fisheries.

Because of the availability of ducks through much of the winter, most duck harvests were eaten fresh. A few respondents mentioned canning ducks

once or twice. Ducks were also occasionally salted for later use. Both seagull and scissortail eggs were sometimes put whole in seal oil to preserve them. When eaten fresh, eggs were commonly boiled.

## VEGETATION

Prior to dependable electricity and refrigeration, berries were stored in several ways. Some berries were mashed and dried in skunk cabbage leaves. Others were stored in seal oil. One elder described drying berries in the smoke house, the product resembling raisins when they were done. Berries were sun dried and stored on boughs in the smoke house (Birket-Smith 1953:44). Putting up berries in jars was introduced to the village by school teachers in the early 1940s.

Seaweed was dried and used in the winter. A source interviewed by Birket-Smith described seaweed which was dried, cut up, and stored with seal oil in a seal stomach (Birket Smith 1953:44). In a more recent interview, an elder described his father's and grandfather's use of seaweed. They boiled and smoked cockles, and rolled them in the seaweed to preserve them. One of the seaweeds used was a thin angel hair, which was remembered as salty and dark. In construction of earlier tools, kelp provided the material for fishing lines (Birket-Smith 1953:41).

Ethnographers and recent interviews with village elders have documented uses of various parts of trees, including the bark, pitch, and roots, in addition to planks. Baskets, matting, and cords were crafted from spruce roots, grass, and birch bark. Spruce roots were woven into conical-shaped rain hats, and also used to make fish snares which were attached to the end of a stick. Planks, coffins, small dugouts, boxes, and house posts were

fashioned from logs. Roots, grass, and bark were used in the construction of fish traps (Birket-Smith 1953:41,42,64,75). Bark from spruce, yellow cedar, and hemlock trees was pulled off and cut into strips. A portion was scraped off, dried, and smoked for later use as a flavoring in many dishes. Respondents interviewed in 1990 recalled observing the use of bark to line smokehouses when they were younger. They also recalled drying the cambium layer of the hemlock bark, and preserving it in seal oil. Smoke houses at fish camp were roofed with bark, which was anchored in place with stones. Pitch from spruce trees was used to start fires and in boat repair. Elders recalled notching trees at fish camps to obtain pitch. Log and plank houses, roofed with bark and grass, possibly at Chugach seasonal camps, were observed by Bering in 1741. Semi-subterranean sod structures were in use as food caches (Bancroft 1970:80).

Plants gathered for medicinal purposes were picked in the summer. Traditionally, some Chugach men and women were healers and curers, who diagnosed illnesses and prescribed treatments. Birket-Smith cataloged several varieties of vegetation which were used for medicinal purposes, including spruce roots, tea leaves, highbush cranberry leaves, devil's club, water lily, northern yarrow, fireweed, wild rhubarb, salmonberries, and nettle roots (1953:42).

The Chugach dried salmonberry leaves for tea. Other plants eaten included wild celery, cow parsnips, sorrel, lupine, and nettle. Fern roots were baked (Birket-Smith 1953:42,44).

Earlier in the 1900s, wood was the primary heating and cooking fuel. Elders remembered rowing out to Bligh Island for firewood, and towing a tree home. The tree was dragged up onto the beach, tied up, and then sawed by hand. Another method used for winter harvests was to cut and then drag a tree

down the hill during winter time. Obtaining wood was a steady chore in the winter. Hemlock or spruce were cut. *Allciq*, Mountain hemlock, was a preferred wood, described as splitting more easily than the other woods. Respondents noted that people lived closer to the beach in the earlier days, which meant they did not have to pack things as far as they do today. Still, packing wood home from the beach entailed considerable work.

# CHAPTER FOUR

# CONTEMPORARY USE OF NATURAL RESOURCES

Tatitlek residents harvested a wide variety of resources in the 1980s. Species harvested reflect not only what is in abundance in the region, but traditional activities and tastes as well. Distribution of resources among households was extensive.

## SPECIES HARVESTED

Table 14 lists the species used and harvested by Tatitlek residents during the two year study period. At least 75 kinds of resources were used. Finfish, marine invertebrates, and varieties of vegetation each accounted for 20 percent of the types of resources (15 varieties each). Birds and bird eggs contributed 13 types (17.3 percent), followed by 7 kinds of furbearers (9.3 percent), 6 game species (8 percent), and 4 types of marine mammals (5.3 percent). For the purposes of quantifying the harvests, some resources were grouped into categories. Ducks, geese, king crab, clams, berries, and plants are the major resources that were grouped. The individual species in each category are identified in Table 14.

Individual households attempted to harvest a mean of 14.7 resources or resource categories in 1988-89, a slight increase over the first year (Table 15). This reflects a range from 1 to 32 resources per household. The mean number of resources harvested was 13.7 in 1988-89, up from 11.7 the prior year. The number of resources used in both years was much higher than the number harvested at a mean of 19.6 for 1987-88, and 22.6 in 1988-89, reflecting sharing of resources among households. All the households surveyed

TABLE 14. RESOURCES USED OR HARVESTED BY TATITLEK RESIDENTS IN 1987-89

| Finfish | Scientific Name | Percentage of households using in 1987-88 | 1988-89 |
|---|---|---|---|
| Salmon: King | *Oncorhynchus tshawytscha* | 68 | 71 |
| Sockeye | *O. nerka* | 84 | 90 |
| Pink | *O. gorbuscha* | 68 | 81 |
| Chum | *O. keta* | 58 | 90 |
| Silver | *O. kisutch* | 74 | 90 |
| Cod, Black | *Anoplopoma fimbria* | 16 | 10 |
| Cod, Gray | *Gadus macrocephalus* | 37 | 48 |
| Dolly Varden | *Salvelinus malma* | 5 | 0 |
| Eulachon/Smelt | *Thaleichthys pacificus; Osmerus mordax* | 21 | 29 |
| Halibut | *Hippoglossus stenolepsis* | 95 | 86 |
| Herring | *Clupea pallasii* | 58 | 71 |
| Lingcod | *Ophiodon elongatus* | 0 | 10 |
| Rockfish, Red | *Sebastes ruberrimus* | 58 | 81 |
| Rockfish, Black | *Sebastes melanops; S. ciliatus* | 11 | 29 |
| Trout, Lake | *Salvelinus namaycush* | 0 | 5 |
| **Invertebrates** | | | |
| Chitons: | *Cryptochiton stelleri* (red); *Katharina tunicata* (black) | 26 | 33 |
| Clams: Butter | *Saxidomus giganteus* | 21 | 48 |
| Gaper (Horse) | *Tresus capax* | | |
| Littleneck (Steamer) | *Protothaca staminea; Tapes japonica* | | |
| Razor | *Siliqua patula* | 26 | 38 |
| Surf | *Spisula polynyma* | | |
| Cockles | *Clinocardium nuttalii* | 42 | 33 |
| Crab: Dungeness | *Cancer magister* | 32 | 10 |
| King | *Paralithodes camtschatica; P. platypus; Lithodes aequispina* | 11 | 10 |
| Tanner | *Chionoecetes bairdi* | 37 | 71 |
| Mussels, Blue | *Mytilus edulis* | 0 | 5 |
| Octopus | *Octopus dofleini* | 89 | 81 |
| Sea Urchin | *Stronglyocentrotus droebchiensis* | 0 | 5 |
| Shrimp | *Pandalus* sp. | 95 | 62 |

TABLE 14. (cont.) RESOURCES USED OR HARVESTED BY TATITLEK RESIDENTS IN 1987-89

| Wildfowl | Scientific Name | Percentage of households using in 1987-88 | 1988-89 |
|---|---|---|---|
| Sandhill Crane | *Grus canadensis* | 5 | 0 |
| Ducks: Bufflehead "Butterball" | *Bucephala albeola* | 5 | 0 |
| Goldeneye "Copperhead" | *Bucephala* sp. | 21 | 33 |
| Mallard | *Anas platyrhynchos* | 16 | 33 |
| Merganser "Sawbill" | *Mergus* sp. | 21 | 33 |
| Pintail | *Anas acuta* | 5 | 5 |
| Scoter "Black duck" | *Oidemia nigra; Melanitta deglandi & m. perspicillata* | 74 | 81 |
| Canada Geese | *Branta canadensis occidentalis* | 21 | 29 |
| Grouse, Spruce | *Canachites canadensis* | 5 | 11 |
| Ptarmigan | *Lagopus* sp. | 5 | 5 |
| Cormorant | *Phalacrocorax auritas; p. pelagicus* | 0 | 5 |
| Seagull (Eggs) | *Larus hyperboreus; L. canus* | 47 | 62 |
| Arctic Tern (Eggs) | *Sterna paradisea* | 21 | 33 |
| Land Mammals | | | |
| Black Bear | *Ursus americanus* | 5 | 43 |
| Caribou[a] | *Rangifer tarandus* | 0 | 10 |
| Dall Sheep[a] | *Ovis dalli dalli* | 0 | 5 |
| Sitka Black-tailed Deer | *Odocoileus hemionus sitkensis* | 100 | 100 |
| Mountain Goat | *Oreammos americanus* | 16 | 52 |
| Moose | *Alces alces* | 58 | 43 |
| Furbearers | | | |
| Coyote | *Canis latrans* | 0 | 5 |
| Land Otter | *Lutra canadensis* | 26 | 14 |
| Marten | *Martes americana* | 5 | 10 |
| Mink | *Mustela vison* | 21 | 10 |
| Weasel | *Mustela erminea & rixosa* | 0 | 5 |

[a] Not available locally.

TABLE 14. (cont) RESOURCES USED OR HARVESTED BY TATITLEK RESIDENTS IN 1987-89

| Marine Mammals | Scientific Name | Percentage of households using in 1987-88 | 1988-89 |
|---|---|---|---|
| Porpoise, Dall | *Phocoenoides dalli* | 26 | 19 |
| Sea Lion | *Eumetopias jubatus* | 53 | 57 |
| Sea Otter | *Enhydra lutris* | 5 | 5 |
| Seal, Harbor | *Phoca vitulina richardsi* | 89 | 95 |
| **Plants and Trees** | | | |
| Berries[b] | | 100 | 90 |
| Plants/Greens/Mushrooms[b] | | 16 | 19 |
| Wood[b] | | 84 | 76 |
| Alder | *Alnus* sp. | | |
| Beach Greens | *Honckenya peploides* | | |
| Blueberry | *Vaccinium ovalifolium, V. alaskensis* | | |
| Cranberry, Lowbush | *V. vitusidaea* | | |
| Cranberry, Highbush | *Viburnum edule* | | |
| Crowberry | *Empetrum nigrum* | | |
| Currant | *Ribes* sp. | | |
| Fiddlehead Fern | *Matteuccia Struthiopteris pensylvanica* | | |
| Goosetongue | *Plantago maritima* | | |
| Hemlock, Mountain | *Tsuga mertensiana* | | |
| Hemlock, Western | *Tsuga heterophylla* | | |
| Nagoonberry | *Rubus arcticus* | | |
| Popweed | *Fucchus* | | |
| Raspberry | *Rubus idaeus* | | |
| Salmonberry | *Rubus spectabilis* | | |
| Spruce | *Picea* sp. | | |
| Watermelonberry | *Streptopus amplexifolius* | | |
| Wild Celery | *Heracleum lanatum* | | |

[b] The survey asked about use of berries, plants, and wood. Participation in harvesting and use of individual varieties was not queried.

Source: Division of Subsistence, Alaska Department of Fish and Game, Household Surveys 1988 and 1989.

TABLE 15. CHARACTERISTICS OF RESOURCE HARVEST AND USE, TATITLEK, APRIL 1987-MARCH 1989.

| | 1987-88 N=19 HHs | 1988-89 N=21 HHs |
|---|---|---|
| Mean Number of Resources Used Per Household | 19.6 | 22.6 |
| Range | 6-30 | 11-38 |
| Median | 20 | 23 |
| Mean Number of Resources Attempted to Harvest Per Household | 13.6 | 14.7 |
| Range | 1-29 | 1-32 |
| Median | 12 | 15 |
| Mean Number of Resources Harvested Per Household | 11.7 | 13.7 |
| Range | 1-28 | 1-31 |
| Median | 10 | 14 |
| Mean Number of Resources Received Per Household | 12.3 | 13.4 |
| Range | 3-25 | 3-32 |
| Median | 11 | 12 |
| Mean Number of Resources Given Away Per Household | 9.7 | 12.8 |
| Range | 1-23 | 0-31 |
| Median | 8 | 13 |
| Mean Household Harvest, Pounds | 1,406.7 | 2,328.7 |
| Range | 0-7,875.5 | 12-12,946.0 |
| Per Capita Harvest, Pounds | 351.7 | 643.5 |
| Percent Households Using Any Resource | 100.0 | 100.0 |
| Percent Households Attempting To Harvest Any Resource | 100.0 | 100.0 |
| Percent Households Harvesting Any Resource | 100.0 | 100.0 |
| Percent Households Receiving Any Resource | 100.0 | 100.0 |
| Percent Households Giving Away Any Resource | 100.0 | 95.2 |

Source: Division of Subsistence, Alaska Department of Fish and Game Household Surveys 1988 and 1989.

for both harvest years used, harvested, and received at least one resource. All but one household gave at least one resource away.

Table 16 lists an additional 45 resources which previously have been harvested and used by Tatitlek or Chugach people for various purposes. They are included in this section because the list in Table 14 reflects only two harvest years. Availability of resources and regulations can influence harvests from year to year. Table 14 must not be construed as a comprehensive listing of resources used currently.

## SEASONAL ROUND

Figure 9 shows the seasonal round for many of the resources harvested by Tatitlek residents in the 1980s. During the study period, the harvesting year began in April, as the herring returned to Prince William Sound. Village residents fished for herring and gathered herring roe on seaweed. Other spring harvests included waterfowl, marine mammals, black bears, and intertidal resources. As the days grew longer and warmer, more people dug clams and picked chitons ("gumboots") during low tide cycles.

In May the salmon harvesting began, first chinooks, and then sockeyes. Leaves and shoots of some vegetation were gathered in the late spring. Salmon harvesting continued throughout the summer as the various runs and species came into the area. In July, pinks and chum salmon were available, and in late August, the cohos arrived. Berries were picked as each species ripened, largely in July and August.

Beginning in August, but more typically in late September and October, the harvesters' attention moved from salmon to game animals, such as deer, black bear, and goat. Ducks and geese were also taken during the fall season.

TABLE 16. LIST OF SPECIES USED OR HARVESTED HISTORICALLY BY TATITLEK RESIDENTS, BUT NOT USED DURING THE STUDY YEARS

| Finfish | Scientific Name |
|---|---|
| Flounder | *Hippolossoides elassodon; Platichthys stellatus* |
| Irish Lord | *Hemilepidotus hemilepidotus* |
| Sole: Butter | *Isopsetta isolepsis* |
| Lemon | *Pleuronectes quadrituberculatus* |
| **Invertebrates** | |
| Sea Cucumber | *Parastichopus californicus* |
| Snails | *Thais lamellosa; Littorina sitkana* |
| **Marine Mammals** | |
| Whale, Belukha | *Delphinapterus leucas* |
| Whale, Killer | *Orcinus orca* |
| Seal, Ribbon | *Phoca fasciata* |
| Seal, Ringed | *Pusa hispida* |
| Seal, Northern Fur | *Callorhinus ursinus* |
| **Wildfowl** | |
| Albatross, Black-footed | *Diomedea nigripes* |
| Auklet | Possibly *Cyclorrhynchus psittacula, Aethia cristatella, Cerorhinca monocerata* |
| Bald Eagle | *Haliaectus leucocephalus* |
| Canvasback | *Aythya valisineria* |
| Eider, Steller's & Common | *Polysticta stelleri; Somateria mollissima* |
| Guillemot, Pigeon | *Cepphus columba* |
| Hummingbird | *Selasphorus rufus* |
| Loon | *Gavia* sp |
| Oldsquaw | *Clangula hyemalis* |
| Scaup, Greater "Bluebill" | *Aythya marila* |
| Teal: Green-Winged | *Anas carolinensis* |
| Blue-Winged | *Anas discors* |
| **Land Mammals/Furbearers** | |
| Beaver | *Castor canadensis* |
| Fox | *Vulpes vulpes* |
| Lynx | *Lynx canadensis* |
| Marmot | *Marmota calligata* |
| Muskrat | *Ondotra zibethica* |
| Porcupine | *Erethizon dorsatum* |
| Snowshoe Hare | *Lepus americanus* |
| Squirrel, Ground | *Tamia Sciurus hudzonicus* |
| Wolf | *Canis lupis* |
| Wolverine | *Gulo gulo* |

TABLE 16 (cont). LIST OF SPECIES USED OR HARVESTED HISTORICALLY BY TATITLEK RESIDENTS, BUT NOT USED DURING THE STUDY YEARS

| Plants and Trees (cont) | Scientific Name |
|---|---|
| Beach Strawberry | *Fragaria chiloensis* |
| Birch | *Betula papyrifera* |
| Devil's Club | *Oplopanax horridum* |
| Fireweed | *Epilobium angustifolium* |
| Fringe-cup | *Tellima grandiflora* |
| Kamchatka lily | *Fritallaria camchatcensis* |
| Lupine | *Lupinus nootkatensis* |
| Nettle | *Urtica* sp. |
| Skunk Cabbage | *Lysichiton americanum* |
| Sorrel/Sourdock/Wild Rhubarb | *Rumex* sp. |
| Water lily | *Nuphar polysepalum* |
| Wild Celery/Cow Parsnip | *Heracleum lanatum* |
| Yarrow | *Achillea borealis* |

Sources: Birket-Smith 1953; de Laguna 1956; The North Pacific Rim 1981; Yarborough 1990.

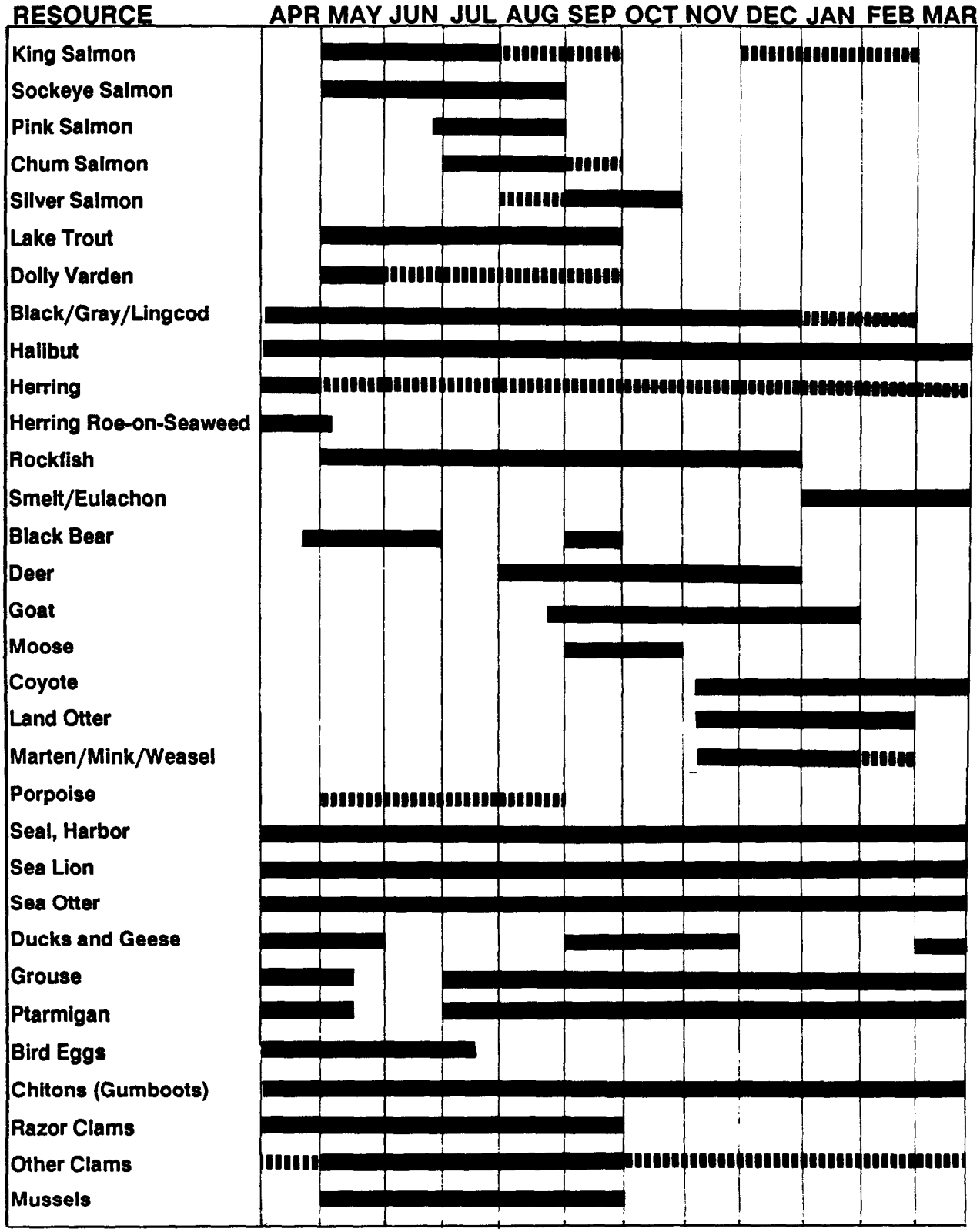



Figure 9. Seasonal Round of Harvest Activities, Tatitlek 1980s. (Solid line shows usual harvest season. Broken line indicates occasional effort).

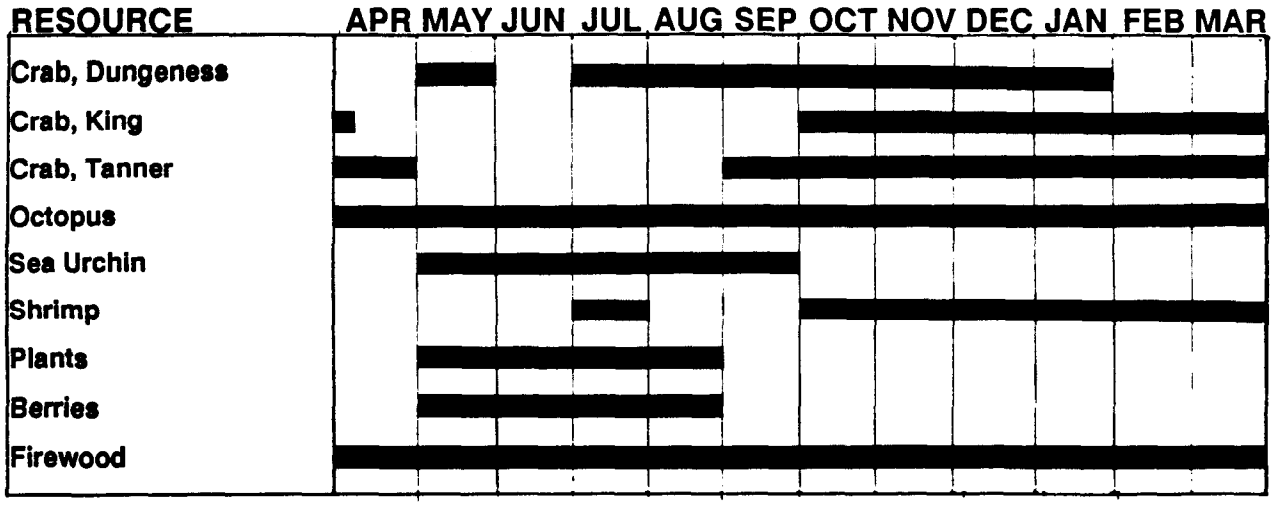



Figure 9 (cont). Seasonal Round of Harvest Activities, Tatitlek 1980s. (Solid line shows usual harvest season. Broken line indicates occasional effort).

Harvesting activities between January and March were more limited, focusing on opportunistic marine mammal harvests, crab, and furbearers. By March, waterfowl were taken occasionally. Halibut and octopus were taken throughout the year as weather and time permitted.

## HOUSEHOLD PARTICIPATION

Community and households' resource patterns are reflected not only in the quantities of resources harvested, but also in the number of households that participated in the harvest and use of natural resources. Because Tatitlek residents still engaged in the traditional practice of specialized harvesters, or particularly successful hunters or fishers who provide for a number of households, in addition to being asked if anyone in the household harvested or attempted to harvest each resource, respondents were also asked if anyone had received a resource, used it, or given it away.

### Use of Resources

Use of resources refers to households harvesting or receiving resources. It excludes any resources which were purchased, or used or sold for commercial bait. As shown in Table 17, all households surveyed in both years used deer. Salmon was used by 95 percent of the households in the 1987-88 study year, and all households in the following year. Harbor seal was used by 89 percent of the households in the first year, and 95 percent in the second year. Resources used by at least three quarters of the households during one or both of the study years included halibut, roe on kelp, scoters, octopus, red rockfish ("snapper"), sockeye, chum, pink and coho salmon, shrimp, berries and

TABLE 17. HOUSEHOLD PARTICIPATION IN USE AND HARVEST OF FISH, GAME AND PLANT RESOURCES, TATITLEK, 1987-88 and 1988-89

| Resource Name | 1987-88 Percentage of Households: Using | Attempting | Harvesting | Receiving | Giving | 1988-89 Percentage of Households: Using | Attempting | Harvesting | Receiving | Giving |
|---|---|---|---|---|---|---|---|---|---|---|
| All Resources | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 95 |
| Fish | 95 | 84 | 84 | 95 | 84 | 100 | 90 | 90 | 95 | 86 |
| Salmon | 95 | 79 | 68 | 95 | 74 | 100 | 81 | 81 | 90 | 67 |
| King Salmon | 68 | 53 | 32 | 47 | 37 | 71 | 48 | 29 | 57 | 48 |
| Sockeye Salmon | 84 | 68 | 58 | 63 | 53 | 90 | 57 | 57 | 67 | 48 |
| Chum Salmon | 58 | 68 | 53 | 37 | 42 | 90 | 71 | 62 | 57 | 52 |
| Pink Salmon | 68 | 74 | 47 | 26 | 32 | 81 | 71 | 62 | 48 | 48 |
| Coho Salmon | 74 | 53 | 37 | 58 | 42 | 90 | 62 | 48 | 62 | 43 |
| Unknown Salmon | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Non-Salmon Fish | 95 | 79 | 79 | 79 | 79 | 95 | 90 | 86 | 76 | 81 |
| Black Cod | 16 | 21 | 16 | 5 | 16 | 10 | 5 | 5 | 5 | 5 |
| Gray Cod | 37 | 26 | 21 | 21 | 11 | 48 | 29 | 29 | 24 | 29 |
| Ling Cod | 0 | 0 | 0 | 0 | 0 | 10 | 5 | 5 | 5 | 10 |
| Halibut | 95 | 58 | 53 | 79 | 53 | 86 | 57 | 43 | 67 | 43 |
| Herring | 58 | 32 | 32 | 32 | 37 | 71 | 29 | 24 | 57 | 24 |
| Herring Roe | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 |
| Roe on Kelp | 63 | 63 | 58 | 21 | 37 | 90 | 81 | 81 | 38 | 76 |
| Black Rockfish | 11 | 11 | 11 | 0 | 11 | 29 | 19 | 19 | 10 | 19 |
| Red Rockfish | 58 | 37 | 32 | 42 | 32 | 81 | 52 | 52 | 48 | 43 |
| Smelt/Eulachon | 21 | 0 | 0 | 21 | 5 | 29 | 10 | 10 | 24 | 10 |
| Dolly Varden | 5 | 5 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| Lake Trout | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 |
| Game | 100 | 84 | 84 | 84 | 89 | 100 | 71 | 67 | 100 | 76 |
| Big Game | 100 | 79 | 79 | 84 | 89 | 100 | 71 | 67 | 100 | 76 |
| Black Bear | 5 | 5 | 5 | 0 | 5 | 43 | 14 | 14 | 33 | 14 |
| Caribou | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 10 | 0 |
| Deer | 100 | 79 | 79 | 79 | 89 | 100 | 71 | 67 | 71 | 71 |
| Goat | 16 | 5 | 0 | 16 | 0 | 52 | 24 | 10 | 48 | 10 |

TABLE 17. HOUSEHOLD PARTICIPATION IN USE AND HARVEST OF FISH, GAME AND PLANT RESOURCES, TATITLEK, 1987-88 and 1988-89

| Resource Name | 1987-88 Percentage of Households: Using | Attempting | Harvesting | Receiving | Giving | 1988-89 Percentage of Households: Using | Attempting | Harvesting | Receiving | Giving |
|---|---|---|---|---|---|---|---|---|---|---|
| Big Game, cont. | | | | | | | | | | |
| Moose | 58 | 5 | 5 | 53 | 16 | 43 | 0 | 0 | 43 | 5 |
| Sheep | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 |
| Small Game/Furbearers | 26 | 32 | 26 | 5 | 0 | 19 | 19 | 14 | 5 | 5 |
| Coyote | 0 | 5 | 0 | 0 | 0 | 5 | 5 | 5 | 0 | 5 |
| Land Otter | 26 | 32 | 26 | 0 | 0 | 14 | 19 | 14 | 0 | 0 |
| Marten | 5 | 5 | 5 | 5 | 0 | 10 | 5 | 5 | 5 | 0 |
| Mink | 21 | 21 | 21 | 0 | 0 | 10 | 10 | 10 | 0 | 0 |
| Weasel | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 |
| Wolf | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wolverine | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Marine Mammals | 89 | 58 | 47 | 84 | 63 | 95 | 52 | 52 | 81 | 67 |
| Porpoise/Dolphin | 26 | 5 | 5 | 21 | 5 | 19 | 10 | 10 | 14 | 14 |
| Sea Lion | 53 | 21 | 16 | 42 | 21 | 57 | 33 | 33 | 38 | 48 |
| Sea Otter | 5 | 5 | 5 | 0 | 0 | 5 | 5 | 5 | 0 | 0 |
| Harbor Seal | 89 | 58 | 47 | 68 | 63 | 95 | 52 | 52 | 76 | 67 |
| Birds | 74 | 53 | 47 | 47 | 37 | 86 | 62 | 62 | 48 | 67 |
| Sandhill Crane | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grouse | 11 | 5 | 5 | 5 | 0 | 5 | 5 | 5 | 0 | 0 |
| Ptarmigan | 5 | 5 | 5 | 0 | 0 | 5 | 5 | 5 | 0 | 5 |
| Waterfowl | 74 | 53 | 47 | 42 | 37 | 86 | 62 | 62 | 48 | 67 |
| Ducks | 74 | 53 | 47 | 37 | 37 | 86 | 62 | 62 | 48 | 62 |
| Scoter | 74 | 47 | 47 | 37 | 37 | 81 | 62 | 62 | 43 | 62 |
| Goldeneye | 21 | 16 | 11 | 11 | 5 | 33 | 24 | 24 | 14 | 19 |
| Bufflehead | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Merganser | 21 | 11 | 11 | 11 | 11 | 33 | 29 | 29 | 10 | 19 |
| Mallard | 16 | 16 | 16 | 0 | 5 | 33 | 24 | 24 | 10 | 19 |
| Pintail | 5 | 0 | 0 | 5 | 0 | 5 | 5 | 5 | 0 | 5 |
| Geese | 21 | 11 | 11 | 16 | 5 | 29 | 19 | 19 | 10 | 10 |
| Cormorant | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 0 | 5 |

TABLE 17. HOUSEHOLD PARTICIPATION IN USE AND HARVEST OF FISH, GAME AND PLANT RESOURCES, TATITLEK, 1987-88 and 1988-89

| Resource Name | 1987-88 Percentage of Households: Using | Attempting | Harvesting | Receiving | Giving | 1988-89 Percentage of Households: Using | Attempting | Harvesting | Receiving | Giving |
|---|---|---|---|---|---|---|---|---|---|---|
| Eggs | 47 | 32 | 32 | 37 | 26 | 67 | 48 | 48 | 24 | 43 |
| Gull Eggs | 47 | 32 | 26 | 37 | 21 | 62 | 43 | 43 | 24 | 38 |
| Duck Eggs | 5 | 5 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| Tern Eggs | 21 | 16 | 16 | 11 | 11 | 33 | 29 | 29 | 10 | 29 |
| Goose Eggs | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 0 | 5 |
| Marine Invertebrates | 100 | 79 | 79 | 89 | 74 | 95 | 67 | 67 | 86 | 57 |
| Butter Clams | 21 | 16 | 11 | 16 | 0 | 48 | 43 | 43 | 14 | 29 |
| Razor Clams | 26 | 5 | 5 | 21 | 5 | 38 | 5 | 5 | 33 | 10 |
| Cockles | 42 | 42 | 42 | 0 | 11 | 33 | 33 | 33 | 5 | 14 |
| Mussels | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 0 | 0 |
| Crabs | 68 | 16 | 16 | 58 | 16 | 71 | 10 | 10 | 62 | 24 |
| Dungeness | 32 | 11 | 11 | 26 | 5 | 10 | 5 | 5 | 5 | 10 |
| King Crab | 11 | 0 | 0 | 11 | 0 | 10 | 0 | 0 | 10 | 5 |
| Tanner Crab | 37 | 11 | 11 | 26 | 11 | 71 | 10 | 10 | 62 | 24 |
| Gumboots (chitons) | 26 | 16 | 16 | 16 | 16 | 33 | 24 | 24 | 19 | 24 |
| Octopus | 89 | 47 | 47 | 63 | 63 | 81 | 48 | 48 | 57 | 52 |
| Sea Urchin | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 0 | 0 |
| Shrimp | 95 | 37 | 32 | 79 | 32 | 62 | 14 | 14 | 48 | 24 |
| Plants and Berries | 100 | 79 | 79 | 63 | 63 | 95 | 90 | 90 | 24 | 76 |
| Berries | 100 | 79 | 79 | 63 | 63 | 90 | 86 | 86 | 24 | 76 |
| Plants/Mushrooms | 16 | 16 | 16 | 5 | 5 | 19 | 19 | 19 | 0 | 14 |
| Wood | 84 | 79 | 79 | 26 | 47 | 76 | 71 | 71 | 24 | 52 |



Source: Division of Subsistence, Alaska Department of Fish and Game, Household Surveys 1988 and 1989.

wood. Fifty percent or better used king salmon, moose, herring, goat, sea lion, bird eggs, and tanner crab during at least one of the study years. Black bear showed variation in use, with 5 percent of the households using it the first year, and 43 percent of those surveyed the second year reporting use.

Harvest and Attempt to Harvest Resources

More than three fourths of the households surveyed in both years attempted to harvest berries and salmon. In 1988-89, 81 percent of the households attempted to take herring roe-on-kelp, up from 63 percent the previous year. Location of the spawns, and thus accessability, varies from year to year. While the average household attempted to harvest 13.6 resources in 1987-88 and 14.7 resources in 1988-89, the number of resources ranged from 1 to 32. Households were successful in harvesting a slightly lower number, averaging 11.7 resources in the first year and 13.7 in the second year, ranging from 1 to 31. More than half the households surveyed successfully took roe-on-kelp, salmon, red rockfish, halibut, deer, seal, scoters, berries, and firewood during at least one of the study years.

Resources where there was substantial variation in the percentage of households harvesting between the two years were herring roe-on-kelp, red rockfish, mergansers, and butter clams. Red rockfish and merganser harvest rates may vary because of the opportunistic nature of those harvests, while butter clams may be more closely related to the availability of the resource.

Sharing

Sharing was widespread in Tatitlek. Sharing patterns among households were documented by recording the number of households that reported giving a resource to or receiving a resource from another household. Resource in this case refers to a kind of fish, wildlife, or vegetation, not an amount. All households reported receiving at least one resource from someone outside their households in both study years. In 1987-88, all households gave away at least one resource. The following year, 95 percent reported giving at least one resource to another household. Sharing of resources from other areas and resources given to people residing outside of Tatitlek were also included, explaining why caribou and sheep, resources not available in Prince William Sound, were recorded.

More than half of the households surveyed in both study years shared the following resources with other households: salmon, deer, harbor seal, octopus, and berries. Sea lion sharing showed a difference between the years, with 21 percent of the households sharing the first year, and 48 percent the second. The percentage of households harvesting was higher the second year, suggesting that more households had sea lion to give to others. Scoters were similarly shared more widely during the second study year, and were also harvested by more households.

The interrelatedness of village households and the custom of providing relatives with resources plays a role in the prevalence of resource distribution, as does a value on sharing. Often, a successful hunter or fisher shared part of his harvest with many households, so that everyone might partake of the fresh harvest. Sometimes, this was accomplished by delivering portions to households. In other instances, when resources were brought into

the village in large quantities, such as seal, word was spread throughout the community for those desiring seal meat to come down to the boat or dock and pick some up. This prevalence and pattern of sharing is underscored by the average number of resources given away: a mean of 9.7 resources in 1987-88, and 12.8 resources per household in 1988-89, with a range from 0 to 31 resources.

Households commonly also received resources, with each household receiving an average of 12.3 resources during the first study period, and 13.4 resources in the second survey year. Salmon was received by at least 90 percent of the households in both study years. Resources received by 50 percent or more of the households in at least one of the survey periods were halibut, herring, deer (over 70 percent in both years), moose, seal (over 60 percent in both years), crab, shrimp, octopus, and berries.

Some resources that are received are linked to commercial activities, such as commercial shrimp and crab fisheries. Commercial fishermen, both residents of the village and fishers from elsewhere who fish in the area, may share resources they have commercially harvested. In years when the fishery is not open, or the fishing times are highly restricted, fewer resources are shared.

## Comparison of Harvest Years

With few exceptions, the percentage of households involved in resource use and harvests was higher in the second survey year. Because some particularly productive harvesters did not participate in the first survey, the increase primarily reflects a more thorough report, rather than a change in the community. Some increases were also linked with greater accessability,

as in the case of more appropriate subsistence salmon fishing regulations, and herring roe-on-kelp occurring closer to the village the second year. Participation levels decreased slightly for a few resources the second year, such as halibut, deer, moose, furbearers, and some marine invertebrates. The variations were not statistically significant, and likely reflect changes in opportunity to harvest or fluctuations in availability of the resources. Sharing patterns mirrored harvesting activities. If more households harvested a resource, a greater number of households reported giving the resource to others, and more households reported receiving it. Some resources linked with commercial fishing activites fluctuated according to the commercial seasons. In years when a particular crab fishery did not open, the resource was virtually absent from the village's diet, as crab is primarily received from non-local commercial fishermen.

## ESTIMATED HARVEST QUANTITIES

Quantities of resources harvested were recorded on surveys predominantly in numbers of the individual resource. Where appropriate, resource quantities were reported in other units. Clams and other marine invertebrates were reported in gallons, and several resources including halibut, shrimp, and plants were recorded in pounds edible weight. Standard conversion factors were used for harvest units (Appendix C). Total pounds and numbers of resources harvested were expanded to reflect an estimate of the entire community harvest.

The harvest levels reported for the two survey years were substantially different, with the household mean for the 1987-88 harvest year at 1,407 lbs, compared with 2,329 lbs for the following year (Tables 18 and 19). The per

TABLE 18. ESTIMATED LEVELS OF HOUSEHOLD HARVEST OF FISH, GAME AND PLANT RESOURCES, TATITLEK 1987-88

Household N = 19 of 31. Estimated number of people in the community = 124

| Resource Name | Amount Harvested Total | Amount Harvested HH Mean[a] | Total Pounds Harvested | Percent +/- 95% Conf Int | Mean lbs HH Harvest | Per Capita Harvest, lbs | Percent +/- 95% Conf Int |
|---|---|---|---|---|---|---|---|
| All Resources | -- | -- | 43,608.6 | 44 | 1,406.7 | 351.7 | 42 |
| Fish | -- | -- | 20,063.0 | 55 | 647.2 | 161.8 | 52 |
| Salmon | 1,757 | 57 | 10,121.5 | 52 | 326.5 | 81.6 | 51 |
| King Salmon | 44 | 1 | 872.2 | 65 | 28.1 | 7.0 | 62 |
| Sockeye Salmon | 486 | 16 | 2,333.8 | 48 | 75.3 | 18.8 | 44 |
| Chum Salmon | 506 | 16 | 2,933.5 | 80 | 94.6 | 23.7 | 81 |
| Pink Salmon | 202 | 7 | 509.8 | 39 | 16.4 | 4.1 | 40 |
| Coho Salmon | 519 | 17 | 3,471.0 | 70 | 112.0 | 28.0 | 69 |
| Non-Salmon Fish | -- | -- | 9,942.5 | 68 | 320.7 | 80.2 | 66 |
| Black Cod | 47 | 2 | 146.6 | 112 | 4.7 | 1.2 | 116 |
| Gray Cod | 866 | 28 | 2,772.3 | 121 | 89.4 | 22.4 | 118 |
| Halibut | -- | -- | 2,031.3 | 62 | 65.5 | 16.4 | 60 |
| Herring | 221 gal[b] | 7 gal[b] | 1,323.5 | 88 | 42.7 | 10.7 | 88 |
| Roe on Kelp | 132 gal | 4 gal | 920.5 | 52 | 29.7 | 7.4 | 48 |
| Black Rockfish | 8 | 0 | 12.2 | 106 | .4 | .1 | 107 |
| Red Rockfish | 677 | 22 | 2,708.4 | 72 | 87.4 | 21.8 | 70 |
| Dolly Varden | 20 | 1 | 27.4 | 130 | .9 | .2 | 132 |
| Game | -- | -- | 10,561.5 | 36 | 340.7 | 85.2 | 39 |
| Black Bear | 2 | 0 | 94.6 | 129 | 3.1 | .8 | 130 |
| Deer | 222 | 7 | 9,585.8 | 36 | 309.2 | 77.3 | 35 |
| Moose | 2 | 0 | 881.0 | 129 | 28.4 | 7.1 | 126 |
| Land Otter | 44 | 1 | 0 | 71 | 0 | 0 | -- |
| Marten | ni[c] | 0 | 0 | -- | 0 | 0 | -- |
| Mink | 10 | 0 | 0 | 77 | 0 | 0 | -- |
| Marine Mammals | -- | -- | 9,248.1 | 54 | 298.3 | 74.6 | 45 |
| Porpoise/Dolphin | 2 | 0 | 97.8 | 129 | 3.2 | .8 | 130 |
| Sea Lion | 21 | 1 | 856.5 | 77 | 27.6 | 6.9 | 84 |
| Sea Otter | 24 | 1 | 0 | 129 | 0 | 0 | -- |
| Harbor Seal | 393 | 13 | 8,293.6 | 53 | 267.5 | 66.9 | 44 |



[a] Rounded to nearest whole number.

[b] Resource amount collected in gallons.

[c] Unknown quantity harvested.

TABLE 18. ESTIMATED LEVELS OF HOUSEHOLD HARVEST OF FISH, GAME AND PLANT RESOURCES, TATITLEK 1987-88

*Household N = 19 of 31. Estimated number of people in the community = 124*

| Resource Name | Amount Harvested Total | Amount Harvested HH Mean[a] | Total Pounds Harvested | Percent +/- 95% Conf Int | Mean lbs HH Harvest | Per Capita Harvest, lbs | Percent +/- 95% Conf Int |
|---|---|---|---|---|---|---|---|
| Birds | -- | -- | 386.8 | 47 | 12.4 | 3.1 | 51 |
| Grouse | 10 | 0 | 6.8 | 129 | .2 | .1 | 126 |
| Ptarmigan | 3 | 0 | 2.2 | 129 | .1 | *[d] | 134 |
| Waterfowl | -- | -- | 377.7 | 49 | 12.2 | 3.1 | 53 |
| Scoter | 276 | 9 | 248.1 | 49 | 8.0 | 2.0 | 49 |
| Goldeneye | 18 | 1 | 14.3 | 89 | .5 | .1 | 88 |
| Bufflehead | 3 | 0 | 1.3 | 129 | *d | * | 128 |
| Merganser | 24 | 1 | 14.6 | 89 | .5 | .1 | 91 |
| Mallard | 23 | 1 | 22.8 | 94 | .7 | .2 | 96 |
| Geese | 21 | 1 | 76.3 | 91 | 2.5 | .6 | 91 |
| Eggs | -- | -- | 123.3 | 55 | 4.0 | 1.0 | 48 |
| Duck Eggs | 156 | 5 | 14.6 | 129 | .5 | .1 | 124 |
| Gull Eggs | 288 | 9 | 85.1 | 56 | 2.8 | .7 | 52 |
| Tern Eggs | 156 | 5 | 23.4 | 101 | .5 | .2 | 98 |
| Marine Invertebrates | -- | -- | 2,068.1 | 53 | 66.7 | 16.7 | 51 |
| Butter Clams | 18 gal[b] | 1 gal[b] | 53.8 | 118 | 1.7 | .4 | 112 |
| Razor Clams | 20 gal | 1 gal | 58.7 | 129 | 1.9 | .5 | 126 |
| Cockles | 30 gal | 1 gal | 90.5 | 71 | 2.9 | .7 | 68 |
| Crabs | 307 | 10 | 471.6 | 97 | 15.2 | 3.8 | 98 |
| Dungeness | 21 | 1 | 14.8 | 102 | .5 | .1 | 104 |
| Tanner Crab | 286 | 9 | 456.8 | 98 | 14.7 | 3.7 | 99 |
| Gumboots (chitons) | 22 gal[b] | 1 gal[b] | 88.1 | 97 | 2.8 | .7 | 94 |
| Octopus | 188 | 6 | 750.5 | 51 | 24.2 | 6.1 | 50 |
| Shrimp | -- | -- | 554.7 | 88 | 17.9 | 4.5 | 86 |
| Plants and Berries | -- | -- | 1,157.6 | 28 | 37.3 | 9.3 | 28 |
| Berries | 283 gal | 9 gal | 1,132.3 | 28 | 36.5 | 9.1 | 28 |
| Plants/Mushrooms | -- | -- | 25.2 | 88 | .8 | .2 | 92 |
| Wood | 166 cords | 5 cords | -- | 44 | -- | -- | -- |



[a] Rounded to nearest whole number.

[b] Resource amount collected in gallons.

[d] * denotes less than .05 lbs.

Source: Division of Subsistence, Alaska Department of Fish and Game, Households Surveys, 1988 and 1989.

TABLE 19. ESTIMATED LEVELS OF HOUSEHOLD HARVEST OF FISH, GAME AND PLANT RESOURCES, TATITLEK 1988-89

Household N = 21 of 28 Estimated number of people in the community = 101

| Resource Name | Amount Harvested Total | Amount Harvested HH Mean[a] | Total Pounds Harvested | Percent +/- 95% Conf Int | Mean lbs HH Harvest | Per Capita Harvest, lbs | Percent +/- 95% Conf Int |
|---|---|---|---|---|---|---|---|
| All Resources | -- | -- | 65,203.5 | 29 | 2,328.7 | 641.5 | 30 |
| Fish | -- | -- | 35,348.9 | 35 | 1,262.5 | 348.8 | 36 |
| Salmon | 4,989 | 178 | 26,434.9 | 37 | 944.1 | 260.9 | 37 |
| King Salmon | 97 | 3 | 1,875.6 | 54 | 67.0 | 18.5 | 56 |
| Sockeye Salmon | 1,179 | 42 | 5,233.2 | 31 | 186.9 | 51.6 | 34 |
| Chum Salmon | 793 | 28 | 4,946.2 | 39 | 176.6 | 48.8 | 40 |
| Pink Salmon | 1,469 | 52 | 3,717.4 | 53 | 132.7 | 36.7 | 53 |
| Coho Salmon | 1,451 | 52 | 10,662.4 | 54 | 380.8 | 105.2 | 55 |
| Non-Salmon Fish | -- | -- | 8,914.0 | 34 | 318.4 | 88.0 | 35 |
| Black Cod | 3 | 0 | 8.2 | 104 | .3 | .1 | 107 |
| Gray Cod | 80 | 3 | 255.1 | 38 | 9.1 | 2.5 | 41 |
| Ling Cod | 18 | 1 | 72.0 | 104 | 2.6 | .7 | 105 |
| Halibut | -- | -- | 2,360.0 | 42 | 84.3 | 23.3 | 43 |
| Herring | 256 gal[b] | 9 gal[b] | 1,536.3 | 90 | 54.9 | 15.2 | 90 |
| Roe on Kelp | 443 gal | 16 gal | 3,103.7 | 34 | 110.9 | 30.6 | 35 |
| Black Rockfish | 106 | 4 | 158.6 | 53 | 5.7 | 1.6 | 54 |
| Red Rockfish | 348 | 12 | 1,392.0 | 37 | 49.7 | 13.7 | 37 |
| Smelt/Eulachon | 8 gal | 0 gal | 28.0 | 87 | 1.0 | .3 | 90 |
| Game | -- | -- | 9,009.3 | 22 | 321.8 | 88.9 | 21 |
| Black Bear | 8 | 0 | 464.0 | 57 | 16.6 | 4.6 | 55 |
| Deer | 193 | 7 | 8,352.0 | 23 | 298.3 | 82.4 | 22 |
| Goat | 3 | 0 | 193.3 | 71 | 6.9 | 1.9 | 70 |
| Coyote | 1 | 0 | 0 | 104 | 0 | 0 | -- |
| Land Otter | 47 | 2 | 0 | 67 | 0 | 0 | -- |
| Marten | 4 | 0 | 0 | 104 | 0 | 0 | -- |
| Mink | 5 | 0 | 0 | 81 | 0 | 0 | -- |
| Marine Mammals | -- | -- | 13,162.1 | 41 | 470.1 | 129.9 | 38 |
| Porpoise/Dolphin | 3 | 0 | 160.0 | 71 | 5.7 | 1.6 | 74 |
| Sea Lion | 27 | 1 | 4,333.3 | 39 | 154.8 | 42.8 | 64 |
| Sea Otter | 16 | 1 | 0 | 104 | 0 | 0 | -- |
| Harbor Seal | 473 | 17 | 8,668.8 | 42 | 309.6 | 85.6 | 31 |



[a] Rounded to nearest whole number. [b] Resource amount collected in gallons.

TABLE 19. ESTIMATED LEVELS OF HOUSEHOLD HARVEST OF FISH, GAME AND PLANT RESOURCES, TATITLEK 1988-89

Household N = 21 of 28 Estimated number of people in the community = 101

| Resource Name | Amount Harvested Total | Amount Harvested HH Mean[a] | Total Pounds Harvested | Percent +/- 95% Conf Int | Mean lbs HH Harvest | Per Capita Harvest, lbs | Percent +/- 95% Conf Int |
|---|---|---|---|---|---|---|---|
| Birds | -- | -- | 843.2 | 36 | 30.1 | 8.3 | 36 |
| Grouse | 3 | 0 | 1.8 | 104 | .1 | *[c] | 105 |
| Ptarmigan | 1 | 0 | .9 | 104 | *c | * | 104 |
| Waterfowl | -- | -- | 807.0 | 35 | 28.8 | 8.0 | 35 |
| Scoter | 580 | 21 | 522.0 | 37 | 18.6 | 5.2 | 39 |
| Goldeneye | 112 | 4 | 89.6 | 64 | 3.2 | .9 | 65 |
| Merganser | 88 | 3 | 52.8 | 45 | 1.8 | .5 | 46 |
| Mallard | 87 | 3 | 86.6 | 47 | 3.1 | .9 | 48 |
| Pintail | 28 | 1 | 22.4 | 104 | .8 | .2 | 104 |
| Geese | 9 | 0 | 33.6 | 50 | 1.2 | .3 | 52 |
| Cormorant | 13 | 0 | 33.3 | 104 | 1.2 | .33 | 104 |
| Eggs | -- | -- | 439.2 | 36 | 15.7 | 4.3 | 36 |
| Goose Eggs | 192 | 7 | 28.8 | 104 | 1.0 | .3 | 99 |
| Gull Eggs | 1,236 | 44 | 369.6 | 37 | 13.2 | 3.7 | 38 |
| Tern Eggs | 816 | 29 | 40.8 | 45 | 1.4 | .4 | 46 |
| Marine Invertebrates | -- | -- | 4,646.0 | 60 | 165.9 | 45.8 | 58 |
| Butter Clams | 465 gal[b] | 17 gal[b] | 1,396.0 | 89 | 49.9 | 13.8 | 85 |
| Razor Clams | 7 gal | 0 gal | 20.0 | 104 | .7 | .2 | 107 |
| Cockles | 76 gal | 3 gal | 228.0 | 50 | 8.1 | 2.3 | 47 |
| Mussels | 1 | 0 gal | 2.0 | 104 | .1 | .1 | 107 |
| Dungeness Crab | 80 | 3 | 56.0 | 104 | 2.0 | .6 | 105 |
| Tanner Crab | 500 | 18 | 800.0 | 76 | 28.6 | 7.9 | 76 |
| Gumboots (chitons) | 43 gal[b] | 2 gal[b] | 173.3 | 47 | 6.2 | 1.7 | 48 |
| Octopus | 411 | 15 | 1,642.6 | 59 | 58.7 | 16.2 | 57 |
| Sea Urchins | 3 gal | 0 gal | 1.3 | 104 | .1 | *[c] | 104 |
| Shrimp | -- | -- | 326.6 | 85 | 11.7 | 3.2 | 82 |
| Plants and Berries | -- | -- | 1,754.6 | 19 | 62.7 | 17.3 | 20 |
| Berries | 424 gal | 15 gal | 1,694.6 | 18 | 60.5 | 16.7 | 20 |
| Plants/Mushrooms | -- | -- | 60.0 | 54 | 2.1 | .6 | 51 |
| Wood | 232 cords | 8 cords | 0 | 21 | 0 | 0 | -- |



[a] Rounded to nearest whole number. [b] Resource amount collected in gallons. [c] Denotes less than .05 lbs.

Source: Division of Subsistence, Alaska Department of Fish and Game Household Surveys, 1988 and 1989.

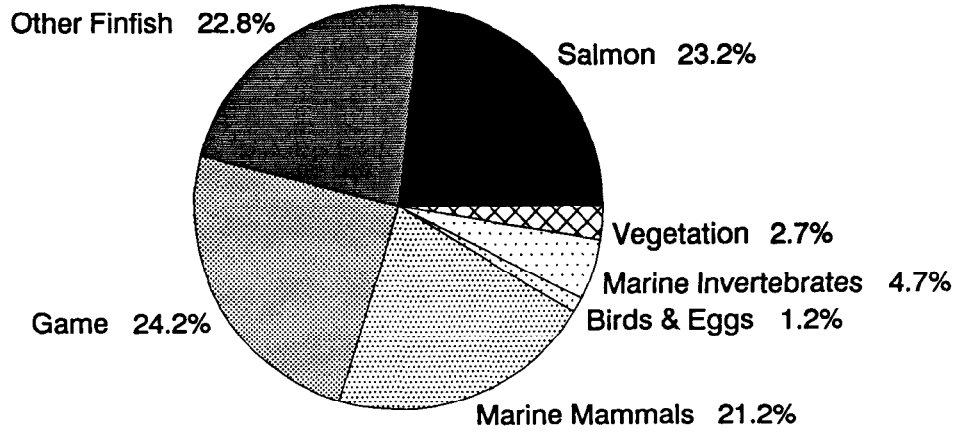
capita harvests were 351.7 lbs (+/- 42 percent) in 1987-88 and 643.5 lbs (+/- 30 percent) in 1988-89, an apparent increase of 83 percent. Confidence intervals at the 95 percent level are given in both tables for all resources.

Three factors contributed to the difference between harvest years: 1) regulatory changes regarding subsistence salmon allowed for easier access and legal reporting of higher harvests for 1988-89, 2) additional active households participated in the second survey, and 3) a few normally active harvesters were inactive in 1987-88, because of medical or equipment reasons. Assessing these factors, the 1987-88 totals probably underestimated the real per capita harvest levels for that year; however, 1988-89 harvests probably also reflect real increases over 1987-88 not due to household sampling effects.

Figures 10a and 10b show the composition of harvest by resource categories for the two survey years. The largest variations were the increase in the percent of salmon the second year and the proportional decrease in game harvests. In pounds harvested (Table 20), the salmon harvest more than doubled the second year, and non-salmon finfish harvests decreased 10 percent. Reported marine mammal harvests increased almost 4,000 lbs, or 42 percent. Game harvests decreased slightly, while harvests of birds, marine invertebrates, and vegetation were higher. Marine invertebrate harvests doubled the second year, as illustrated in Figure 11.

Differences in the mean harvests for both birds and vegetation between the two harvest years were significant at the .05 level. When considered jointly, household harvests for salmon were significantly higher the second year. Fourteen households participated in both surveys. In statistical analysis of these households, salmon, bird, and overall harvests were significantly higher the second year. There were very high correlations in

## Figure 10a. 1987-88 Tatitlek Harvest Composition




## Figure 10b. 1988-89 Tatitlek Harvest Composition

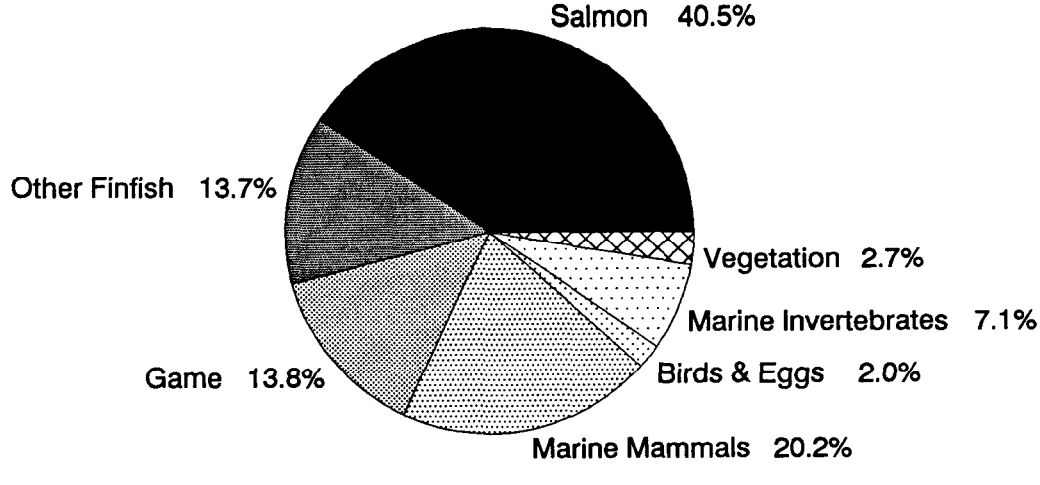


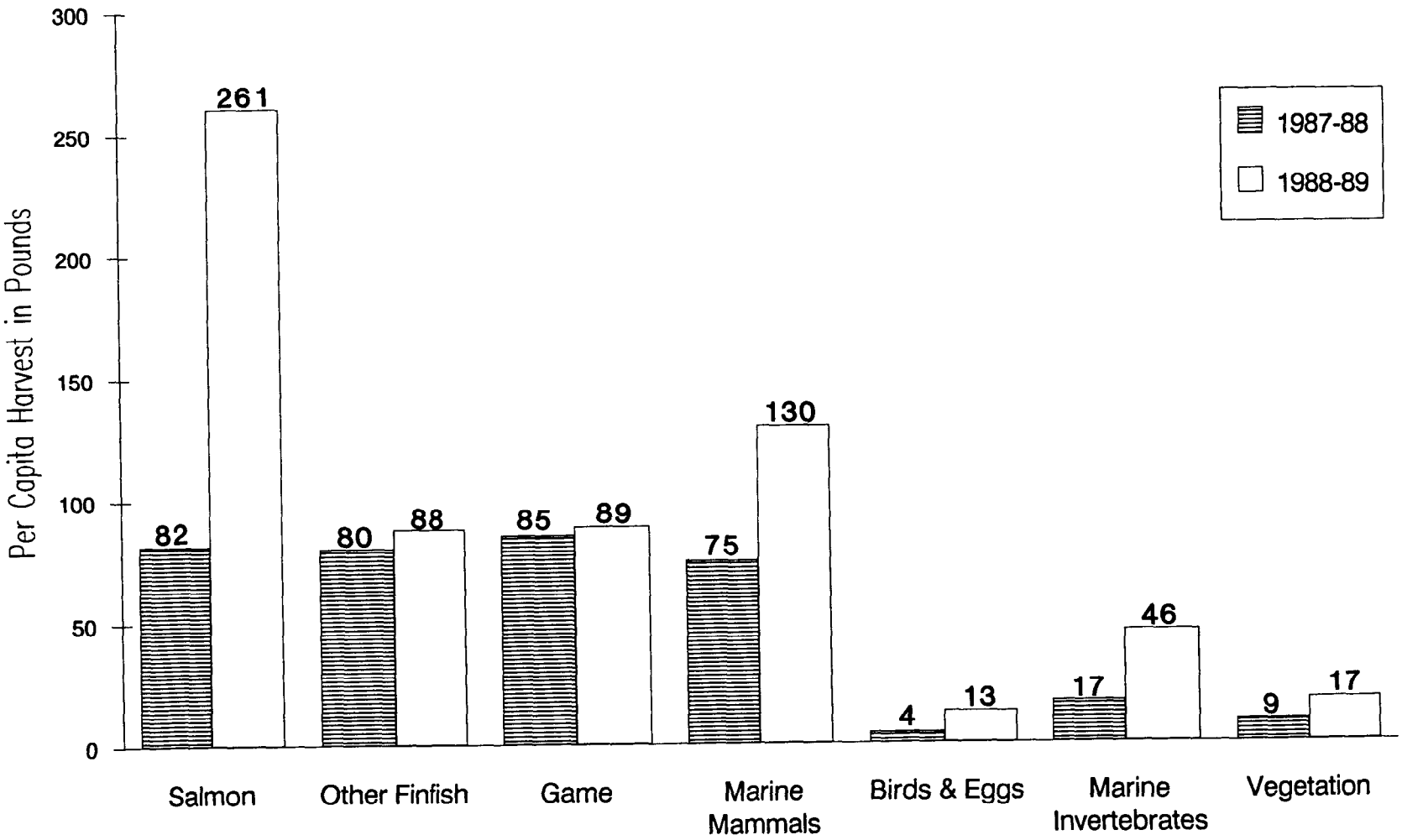
TABLE 20. COMPOSITION OF TATITLEK RESOURCE HARVESTS, 1987-89

| Resource Category | 1987-88 Harvest in Lbs | 1987-88 Per Capita Harvest | 1987-88 Percent | 1988-89 Harvest in Lbs | 1988-89 Per Capita Harvest | 1988-89 Percent | Per Capita Percent Change |
|---|---|---|---|---|---|---|---|
| Salmon | 10,121.5 | 81.6 | 23.2 | 26,434.9 | 260.9 | 40.5 | +219.7 |
| Non-Salmon Finfish | 9,942.5 | 80.2 | 22.8 | 8,914.0 | 88.0 | 13.7 | +9.7 |
| Game | 10,561.5 | 85.2 | 24.2 | 9,009.3 | 88.9 | 13.8 | +4.3 |
| Marine Mammals | 9,248.1 | 74.6 | 21.2 | 13,162.1 | 129.9 | 20.2 | +74.1 |
| Birds and Eggs | 510.1 | 4.1 | 1.2 | 1,282.4 | 12.6 | 2.0 | +207.3 |
| Marine Invertebrates | 2,068.1 | 16.7 | 4.7 | 4,646.0 | 45.8 | 7.1 | +174.3 |
| Vegetation | 1,157.6 | 9.3 | 2.7 | 1,754.6 | 17.3 | 2.7 | +86.0 |
| Total | 43,609.4[a] | 351.7 | 100.0 | 65,203.3[a] | 643.4[a] | 100.0 | +82.9 |

[a] Columns do not sum because nof rounding.

Source: Division of Subsistence, Alaska Department of Fish and Game Household Surveys 1988 and 1989.

**Figure 11. Comparison of Tatitlek Per Capita Harvests By Resource Category, 1987-89**



per capita harvests for all resource categories except marine invertebrates. This finding substantiates the non-random nature of household harvest patterns. In summary, there is stability in harvesting patterns, productive households in 1987-88 were also the productive households in 1988-89, and household harvests, particularly for salmon, were greater in the second year than the first.

## HARVEST AREAS

Tatitlek subsistence harvest areas were mapped during household interviews. Figure 12 is a composite of all areas used for harvesting of salmon, other finfish, marine invertebrates, marine mammals, deer, bear, waterfowl, and vegetation during Tatitlek inhabitants' residency in the village. Maps breaking out the resources or resource categories are also available. They can be viewed at the Department of Fish and Game, Division of Subsistence, in Anchorage, or copies can be requested from Tatitlek Village IRA Council.

As shown in Figure 12, the waters, coastline, and uplands in the Tatitlek area have been used for subsistence activities. Areas used are consistent with the historic pattern of the Tatitlarmiut group (see Figure 3). The use areas also evidence the movement and consolidation of other Chugach groups to Tatitlek in the 1900s, as Kiniklik, Shuqlurmiut, Atyarmiut, and Alukarmiut areas in particular are extensively covered by Tatitlek hunters and fishers (see Fig. 3). Areas used in southwestern Prince William Sound reflect the resettlement of Chenega people to Tatitlek in the 1960s, and the fact that they have returned to harvest in familiar areas. Areas not extensively used by Tatitlek residents include those of the Tyanirmiut (which falls within

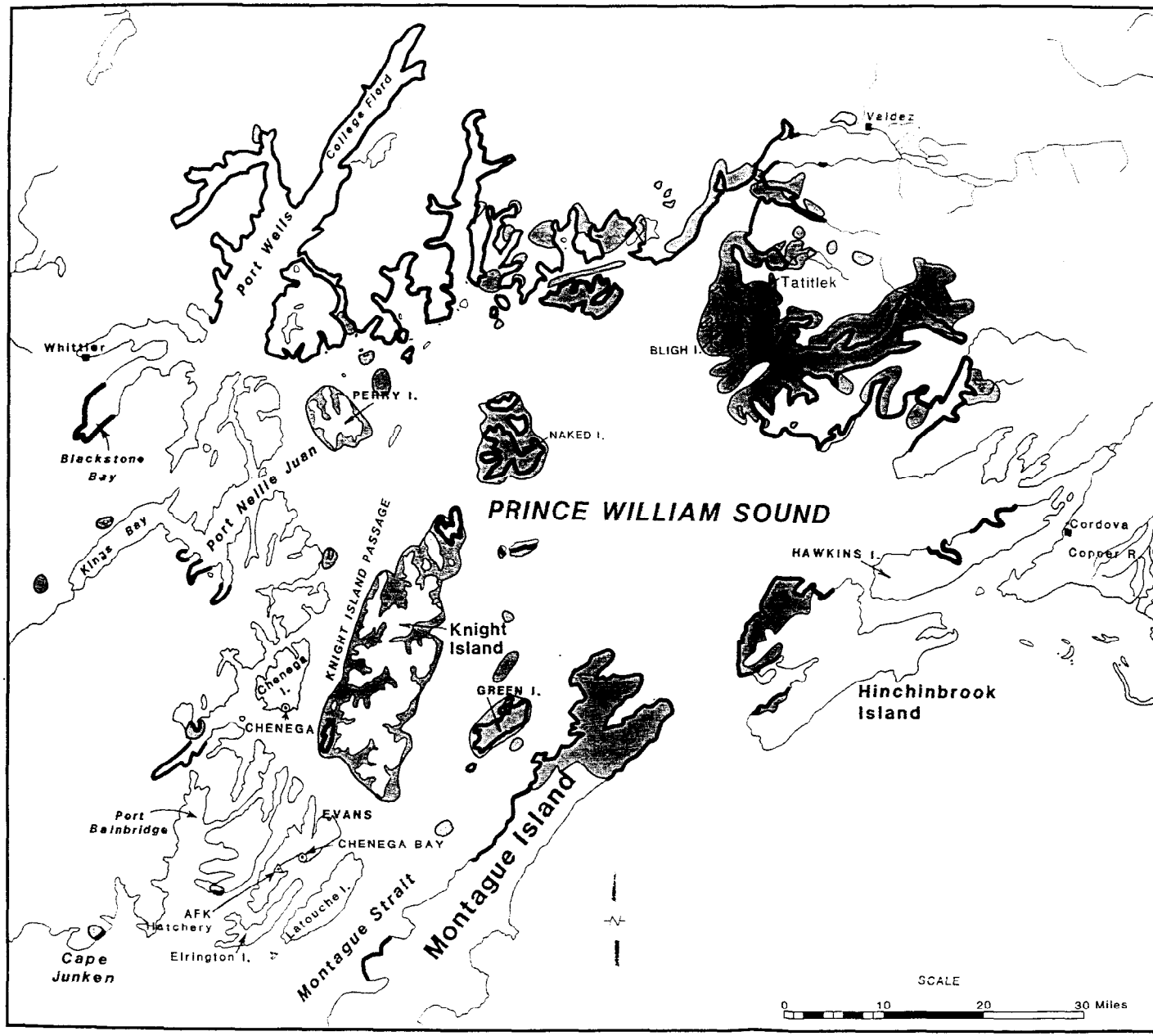



Figure 12.

Subsistence
Use Areas, Tatitlek

Coastline Used

Land and Water Areas Used

SOURCE: This map depicts areas used for resource harvesting over the lifetime of harvesters in 19 households contacted during 1988. Because not all residents were interviewed, not all areas are depicted. The map represents the minimum extent of land and water use by Tatitlek residents.

More detailed 1:250,000 scale maps of these use areas are available at the Division of Subsistence.

See *Resource Use and Harvests in Tatitlek, Alaska* by Lee Stratton, Division of Subsistence Technical Paper No. 181 for more information.

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Division of Subsistence

Chenega and Chenega Bay's area) and the Palugviumiut (in the Cordova/Eyak vicinity). In addition, since the resettlement of Chenega Bay, the two villages are extensively interrelated, and families visit between villages. Some hunting or fishing occurs when travelling to or from the villages, and while staying in the neighboring community's area.

# CHAPTER FIVE

# RESOURCE HARVEST AND USE PATTERNS

The number of households participating in resource harvests and uses, and the quantities harvested by village residents provide a broad picture of the role natural resources play in Tatitlek's economy. Additional detail, including gear types utilized for harvesting, methods of handling and preserving resources, and areas of harvest illustrate ties with historic utilization patterns and the incorporation of modern technology. Many resource uses and harvests in the 1980s can be understood in the context of the contemporary village economy and regulatory structure.

## FINFISH

During the study years, Tatitlek fishers harvested salmon by a variety of methods. In recent years, state fishing regulations have tended to associate gear types with specific types of use: for example, rod and reel gear is allowed only for sport fishing. Uses in Tatitlek do not always correspond to these regulatory distinctions. Tatitlek residents use salmon for essentially the same purposes irrespective of the gear employed for harvesting. Nevertheless, for regulatory clarity, the harvests are reported and discussed by gear type.

Salmon

## Salmon Harvests for Subsistence Purposes

Reported salmon harvests contributed 23.2 percent of the total village resource harvest in 1987-88, and accounted for 40.5 percent of the village harvest in 1988-89 (Figures 10a and b). Table 20 displays the harvests reported in the household survey for the two study years, broken out by fishing methods. Methods of harvest were broken down into three categories: commercial nets, rod and reel, and subsistence methods. Fish caught during commercial openings and brought home for family use were typically taken out of gill nets, although occasionally out of purse seines as well. Fish not taken commercially or with rod and reel were taken by gill net, purse seine, or dip net. Respondents indicated that sometimes pink salmon were so thick in the streams they could be picked up by hand.

As shown in Table 21, there was a dramatic shift in gear type from commercial to subsistence gear between the two study years. About 63 percent (6,473 lbs) of the village salmon harvest was retained from commercial catches in 1987-88, while 78 percent (20,275 lbs) of the salmon harvest was taken with subsistence nets under subsistence regulations in 1988-89. This dramatic shift in gear type is attributable to a major change in state subsistence fishing regulations in 1988, allowing Tatitlek residents to legally harvest salmon with subsistence nets in their traditional areas and seasons during the second study year.

A review of the history of subsistence salmon fishing regulations in Prince William Sound and at the mouth of the Copper River (Table 22) depicts the substantial nature of recent regulatory changes. From 1960 to 1987,

TABLE 21. ESTIMATED SALMON HARVESTS BY GEARTYPE, TATITLEK 1987-88 AND 1988-89

| Year and Salmon Species | Removed From Commercial Catch | | | Subsistence Methods | | | Rod and Reel | | | All Methods | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Harvest | | % | Harvest | | % | Harvest | | % | Total Harvest | | Percent of Total | |
| | No. | Lbs | Resource | No. | Lbs | Resource | No. | Lbs | Resource | No. | Lbs | No. | Lbs |
| 1987-88 | | | | | | | | | | | | | |
| King Salmon | 36 | 711 | 81.8 | 8 | 162 | 18.2 | 0 | 0 | 0 | 44 | 872 | 2.5 | 8.6 |
| Sockeye Salmon | 457 | 2,193 | 94.0 | 29 | 141 | 6.0 | 0 | 0 | 0 | 486 | 2,334 | 57.7 | 23.1 |
| Chum Salmon | 320 | 1,855 | 63.2 | 178 | 1,031 | 35.2 | 8 | 47 | 1.6 | 506 | 2,934 | 29.8 | 28.9 |
| Pink Salmon | 65 | 164 | 32.2 | 113 | 284 | 55.9 | 24 | 62 | 11.9 | 202 | 510 | 11.5 | 5.0 |
| Coho Salmon | 232 | 1,550 | 44.7 | 253 | 1,692 | 48.7 | 34 | 229 | 6.6 | 519 | 3,471 | 29.5 | 34.3 |
| All Salmon | 1,110 | 6,473 | 63.1 | 581 | 3,310 | 33.1 | 66 | 338 | 3.8 | 1,757 | 10,121 | 100.0 | 100.0 |
| 1988-89 | | | | | | | | | | | | | |
| King Salmon | 63 | 1,208 | 64.4 | 35 | 668 | 35.6 | 0 | 0 | 0 | 97 | 1,876 | 1.9 | 7.1 |
| Sockeye Salmon | 500 | 2,220 | 42.4 | 679 | 2,296 | 57.6 | 0 | 0 | 0 | 1,179 | 5,233 | 23.6 | 19.8 |
| Chum Salmon | 266 | 1,664 | 33.7 | 526 | 3,282 | 66.3 | 0 | 0 | 0 | 793 | 4,946 | 15.9 | 18.7 |
| Pink Salmon | 140 | 354 | 9.5 | 1,303 | 3,296 | 88.7 | 27 | 67 | 1.8 | 1,469 | 3,717 | 29.4 | 14.1 |
| Coho Salmon | 80 | 588 | 5.5 | 4,363 | 10,016 | 93.9 | 8 | 59 | .6 | 1,451 | 10,662 | 29.1 | 40.3 |
| All Salmon | 1,050 | 6,034 | 21.0 | 3,906 | 20,275 | 78.3 | 35 | 126 | .7 | 4,989 | 26,434 | 100.0 | 100.0 |

Source: Division of Subsistence Household Surveys, 1988 and 1989.

TABLE 22. PRINCE WILLIAM SOUND/COPPER RIVER SUBSISTENCE SALMON FISHING REGULATION SUMMARY 1960-1990

| Year/District | Open Areas | Season | Gear Type | Bag Limit | Additional Requirements |
|---|---|---|---|---|---|
| 1960/PWS | Areas open commercially | During commercial openers | Commercial gear type | 100 salmon | |
| Copper River/ Bering River | | | | | Must have permit from ADF&G |
| 1961/PWS | Same | Same | Same | Same | Added stipulation that commercial salmon permit holder could not hold a subsistence permit. |
| 1962/CR | Same | Same | Same | 10 kings, 25 reds, 25 cohos | One permit per person per year. |
| 1964/CR | Same | Same | Same | 5 kings, 10 reds 10 cohos | |
| 1974/PWS & CR | Same | Same | Gillnets ltd to 50 fathoms | 10 salmon annually | One permit per household per year |
| 1976/PWS & CR | Same | Same | pole and line not considered subsistence | | |
| 1981/PWS & CR | Same | Same | Same | 15 salmon for household of 1<br>30 salmon for household of 2<br>10 salmon for each additional person<br>No more than 5 kings per permit. | |
| 1988/Eastern District | Add fresh water for pinks | May 15-Oct 31 except during commercial season | Gillnets to 150 fathoms, dipnets | No limit | Permits issued in Tatitlek to residents of Ellamar & Tatitlek only; commercial fishermen allowed permits. |
| 1990/Eastern District | Same | Same | Same | Same | Permits issued to any Alaska resident |

subsistence regulations only allowed subsistence fishing during commercial fishing openings, in commercial fishing areas, and for many years with commercial fishing gear only. This meant that subsistence fishermen were required to compete directly with commercial fishermen for salmon, with respect to location, gear type, and open season. A relatively restrictive bag limit was imposed in the 1960s, which went from 100 fish per permit to 10 fish per household in 1974. A provision excluded commercial permitholders from holding subsistence permits, forcing fishers to choose between subsistence or commercial activities. The increasingly restrictive subsistence fishery regulations were initiated by commercial fishing interests in an attempt to prevent the sale of subsistence caught fish. In combination, Prince William Sound had some of the most restrictive subsistence salmon fishing regulations in the state. Modifications occurred in 1988, following proposals to the Board of Fisheries by residents of Chenega Bay and Tatitlek. Effective in 1988, residents with commercial permits could also hold subsistence permits, and the subsistence season opened May 15, with unrestricted fishing time until 2 days prior to the first commercial opening in the district. During the commercial season, subsistence fishing occurred concurrently with commercial openings. From two days after the final commercial closure until October 31, the subsistence fishery was open without interruption. Bag limits were removed. Permitholders were required to report harvests on their permits. It was this major change in subsistence regulations that is reflected in the major change in the reported harvests.

In the first study period, 94 percent of the sockeye harvest was taken from commercial catches, but in 1988-89, the commercial take comprised only 42 percent of the sockeye harvest. Similarly, chum salmon retained from commercial harvests for village use dropped from 1,855 lbs or 63.2 percent of

the 1987-88 salmon harvest to 1,664 lbs, 33.7 percent. In both years, silver salmon were, by weight, the largest component of the village salmon harvest.

King salmon was the only species that primarily came out of the commercial catches in both years, typically brought home from the Copper River Flats commercial gill net fishery. Rod and reel harvests contributed only 3.8 percent in 1987-88 and .7 percent in 1988-89 of the community salmon harvest. Pink and coho salmon were the species taken with rod and reel, mostly from streams within walking distance of the village.

Subsistence harvests reported on state subsistence fishing permits reflected only a fraction of the actual subsistence salmon harvest reported during the household interviews. Permits returned for the 1988 fishing season reported only a total of 604 salmon, primarily chum (294 fish) and pink salmon (251 fish), followed by 50 sockeyes, 8 coho and 1 king (compared with the actual harvest of about 4,989 salmon). The permit system was in its first year for Tatitlek residents. As fishermen become more familiar with the process, permit data may more accurately reflect village harvests. The permit currently only documents harvests taken with subsistence gear. Because it does not count fish brought home from commercial catches or taken with rod and reel, the permit system will continue to underestimate the actual salmon catches by Tatitlek residents.

Including all uses, over 15 million salmon were harvested in the Prince William Sound/Copper River area in 1988 (Table 23). Tatitlek's salmon take for home consumption constituted .033 percent of that total harvest. Commercial fisheries accounted for 99.5 percent of the take, while sport fisheries comprised .4 percent. Including Chenega Bay's subsistence salmon fishery and the general subsistence salmon fishery, less than .1 percent of

TABLE 23. PRINCE WILLIAM SOUND/COPPER RIVER 1988 SALMON HARVEST SUMMARY

| Species | COMMERCIAL | SPORT | SUBSISTENCE PWS/CR Permit | SUBSISTENCE Chenega Bay[a] | SUBSISTENCE Tatitlek[b] | Total |
|---|---|---|---|---|---|---|
| Chinook | 31,797 | 443 | 61 | 1 | 97 | 32,399 |
| Sockeye | 767,674 | 4,783 | 277 | 50 | 1,179 | 773,963 |
| Chum | 1,843,317 | 7,237 | 13 | 290 | 793 | 1,851,650 |
| Pink | 11,820,121 | 31,470 | 10 | 209 | 1,469 | 11,853,279 |
| Coho | 477,816 | 19,262 | 49 | 8 | 1,451 | 498,586 |
| **Total** | **14,940,725** | **63,195** | **410** | **558** | **4,989** | **15,009,877** |
| Percentage | 99.534 | .421 | .002 | .003 | .033 | 100.0 |

[a] Permit data only.
[b] Harvests for home use from all fisheries.

Sources: Brady et al 1990:34,128-130; Mills 1989:24-29; Division of Subsistence File data.

the Prince William Sound/Copper River 1988 salmon harvest went for subsistence uses.

As shown in Table 21, Tatitlek harvesters using subsistence gill nets or commercial gear brought home the largest numbers of fish. In 1987-88, the highest number of fish an individual harvester brought home from a commercial take was 125 chum salmon. Chums were also the largest reported individual non-commercial harvest, ranging as high as 70 fish per household. In 1988-89, the commercial and non-commercial harvests ran larger, ranging up to 150 chums brought home from a commercial fishery, and 555 pinks taken in a subsistence fishery. The majority of the harvests were under 50 fish the first year, and under 75 the second year. In addition, key salmon harvesters participated in the survey fully for the first time during the second year.

## Sharing

In 1988-89, all households surveyed in Tatitlek used at least one species of salmon. In the preceding year, all but one household used salmon. During that first year, 68 percent of the households reported harvesting salmon, while 81 percent of the households harvested salmon during the second study year. Active harvesters provided for households that lacked the equipment or were no longer able to take their own salmon. Often, the sharing was done along family lines. Sharing was more pervasive, occurring more widely than just harvesters sharing with non-harvesters, however. In Table 17, 95 percent of the households in 1987-88 and 90 percent in 1988-89 reported receiving salmon from others, and 74 percent in 1987-88 and 67 percent in 1988-89 gave salmon to other households. People shared fresh resources widely, particularly early in the season. When a fisherman brought in the

first load of sockeyes, for example, everyone was offered some of the fresh salmon.

## Preservation and Utilization

During the study period, Tatitlek residents preserved their salmon in a number of ways, some methods very traditional, others utilizing modern technology. Salmon were frozen, dried, smoked, canned, and salted. Most households put up their salmon in at least two or three different ways, according to the species of fish, the fish part, and household members' preference.

The many generations of Chugach knowledge and use were reflected in the variety of salmon parts utilized. In addition to the usual flesh which is prized, salmon heads, livers, and hearts were also prepared fresh or preserved for later use.

Salmon parts were also eaten raw. Some residents ate sockeye and pink salmon taken in freshwater raw (called *qasaq*, raw flesh). In particular, parts of the fishhead and the hump of pink salmon were prized. Sockeye heads and a portion near the tail were similarly eaten raw. Raw fish eggs, again from salmon taken in fresh water, were soaked in fresh water until the eggs became rubbery, then sprinkled with salt and eaten.

Salmon heads from all species except pinks were used by some households. In the 1980s, fish heads were either fresh frozen or salted. Salted heads may be pickled later. King salmon livers and hearts were valued by at least one household.

Frozen fish were put up whole, or filleted or steaked and frozen in water. Fishheads were also frozen in water. One household vacuum packed frozen fish.

Salmon to be dried were split first, then slits cut in the flesh to aid in the drying process. Then the fish were hung over a light fire. Smoked fish usually involved cutting the fish into strips, soaking the salmon in a brine, and then putting it over a fire in a smokehouse. The length of time over the smokey fire depended on the desired product. The length of time in the brine, and the recipe for the brine, varied from household to household, corresponding to the kind of fish, the thickness of the fish, and personal preference. Alder and *allciq* (Mountain hemlock) were used in the smokehouses and under drying racks.

Canned fish were put up in either cans or jars, sometimes partially smoked, known as kippered salmon. Salted fish, commonly kings, were preserved by cutting the fish into fillets or chunks, and layering them with rock salt, starting with the skin side down in the bucket. The top layer had the skin side up. Salt fish form their own brine. To keep the fish in the brine, a weight, such as a rock, was put on top of the fish, then the lid secured. Salt fish were soaked out in fresh water overnight before they were used.

Frozen salmon and salmon eggs were used to make Eskimo ice cream, a mixture of fish or fish eggs, shortening, sugar, water, and berries. Salmon eggs were frozen, both raw, and cooked. One household smoked, boiled and salted fish eggs.

## Areas of Harvest

In the 1980s, salmon were harvested in Tatitlek Narrows, around Bligh Island, in Port Fidalgo and Valdez Arm, and near Columbia Glacier and Glacier

Island as well. While some harvesters travelled relatively long distances to obtain sockeye and silver salmon, bringing back large numbers of fish to share, pink salmon were available closer to the village, at Ellamar, and in Boulder Bay. Fish brought home from commercial catches were commonly from the Coghill commercial fishery. Kings were brought home from the Copper River Flats commercial fishery.

Most of the areas fished for salmon by Tatitlek residents fell within the traditional area of the Tatitlarmiut group. Salmon areas west of Valdez Arm are within the traditional Kangirtlurmiut, or Kiniklik group territory. Archaeological evidence at several sites supports historic use of the sites for salmon harvests.

Herring

Herring contributed three products to the village diet -- whole fish, sac roe, and roe-on-seaweed. The fish were also taken for bait for subsistence harvests of a variety of other finfish. Herring roe-on-seaweed were gathered from the intertidal zone. In some years, spawning herring are taken for their sac roe.

The amount of herring and herring roe-on-seaweed taken by village residents fluctuates dramatically, a function of herring movement variability. The closer to the village and the larger the number of herring, the more taken by village residents for food and bait. Herring used for bait are included in the harvest tally only where the bait was taken for use in non-commercial harvesting activities.

## Whole Herring

In 1989, while less than a fourth of the households (23.8 percent) harvested herring, 71 percent of the households used herring. All households that harvested the fish reported sharing it with other households. Over half of the surveyed households reported receiving herring. The first fresh herring caught in the spring was often shared throughout the village. The estimated total village harvest in 1988-89 was 1,536 lbs of herring, a per capita average of 15.2 lbs. The previous year, herring were not in Tatitlek Narrows in quite as great numbers, one explanation for the slightly lower harvest of 1,324 lbs, a per capita harvest of 10.7 lbs. Individual herring harvests ranged from 12 lbs to 1,002 lbs per harvester, with a median harvest of 30 lbs in 1988-89.

Gill nets, small seines, or dipnets were used to catch herring for subsistence purposes. Occasionally, someone jigged off the dock with a hook and line. Virtually all of the harvest occurred between late March and the middle of April when the herring were spawning in Prince William Sound.

Herring were most commonly eaten fresh. They were frozen for short periods of time for human consumption, and kept longer for use as bait. Eggs stripped from the herring were eaten.

## Herring Roe-On-Seaweed

Gathering herring roe-on-seaweed was not as specialized an activity as herring fishing. In 1987-88, 58 percent of the households, and in 1988-89, 81 percent of households harvested "herring spawns." The roe-on-seaweed was in abundance closer to the village the second year, making it easier for more

people to go picking. The second year was characterized by more people using, harvesting, sharing, and receiving herring spawns. During the second year, more than three fourths (76.2 percent) of those surveyed shared them with other households and 90 percent of Tatitlek households used herring roe-on-seaweed in the second year, up from 63 percent during 1987-88. An estimated total of 920 lbs was harvested in 1987-88, 3,103.7 lbs in 1988-89, for household means of 29.7 and 110.9 lbs respectively, or per capita harvests of 7.4 and 30.6 lbs. The individual harvests ranged from 1 to 90 gallons each during the second year, with a median harvest of 10 gallons (70 lbs).

Tatitlek residents gathered herring spawn-on-seaweed at low tide after the herring spawned. The most preferred seaweed is known as "popweed" or fucus. Some gatherers also picked spawn on hair kelp. While most of the "spawns" were eaten fresh, some were frozen for later use.

Herring were taken in the immediate vicinity of the village, in the Tatitlek Narrows near Tatitlek and Ellamar. Herring roe-on-seaweed are picked over a much larger area, which can extend into Port Fidalgo and up Valdez Arm.

Other Finfish

Other finfish harvested included Dolly Varden, which were fished off Tatitlek dock, lake trout taken from a lake behind the village, eulachon, and a variety of bottomfish. Tatitlek residents reported taking bottomfish such as gray cod, black cod, halibut, and rockfish with a handline, or incidentally in a commercial longline fishery.

Halibut was second in volume only to herring and herring roe among non-salmon finfish harvests. Over half the households surveyed in April 1988 (53 percent) harvested halibut and 95 percent used it. The mean household harvest

was 65.5 lbs, or 16.4 lbs per person. The second year, 43 percent of the households harvested halibut, and 86 percent used it, reporting a mean household harvest of 84.3 lbs, and a per capita harvest of 23.3 lbs. Halibut harvests by individual fishers ranged from 10 lbs to 550 lbs.

Rockfish, primarily red rockfish or "snapper," was next in volume of harvests, with 52 percent of the households harvesting a variety of red rockfish during the second study period, and 81 percent of the households reporting using "snapper." The household harvest for all rockfish combined was 55.4 lbs, or 15.3 lbs per person, almost 4 fish per person. The preceding year, fewer households participated in harvesting, but the harvest was greater, averaging 87.8 lbs per household, 21.9 lbs per person. Commercial fishing activity did not appear to play a role in the difference, as an estimated 339.4 lbs of rockfish came out of commercial fishing activities in the first year, and 741.3 lbs the second year. One harvester during the first year brought home 200 fish, which were shared throughout the village.

Among the cod species, gray cod was the most harvested and used. Some households fished for gray cod using a handline specifically in the spring, hoping to get fish with eggs. Commercial fishing activity contributed substantially to the first year's harvest, with one commercial fisher bringing home 300 fish. Non-commercial harvests ranged in size from 4 to 200 fish. In the 1980s, as in earlier years, cod were valued for their stomach and liver. Codfish eggs were also considered a delicacy.

Black cod and ling cod were largely incidental harvests on commercial longlines. Black cod were mostly eaten fresh, but one household salted the black cod first, because they found it too rich to be eaten fresh.

Smelt and eulachon (hooligan) were taken outside of the immediate Tatitlek area. Usually smelt were harvested with gill nets in Cordova boat

harbor. Eulachon were caught at Alaganik Slough. Both smelt and eulachon were eaten fresh, or frozen for a few weeks at the most.

Halibut and rockfish were harvested in Tatitlek Narrows, Boulder Bay, and outside Goose Island. Gray cod were caught off Glacier and Bligh islands.

## MARINE INVERTEBRATES

Marine invertebrates included an array of intertidal resources such as clams and chitons, but also included some saltwater fisheries for crab and shrimp. Octopus were taken both in the intertidal area and incidentally in shellfish pots. Marine invertebrates comprised 4.7 percent of the 1987-88 Tatitlek subsistence harvest, at 2,068 lbs. In 1988-89, they made up 7.1 percent of the harvest with 4,646 lbs. Marine invertebrates were harvested by 79 percent of the households the first year, 67 percent the second year. All households reported using at least one variety during the first survey. The second year, 95 percent used at least one kind.

Of the marine invertebrates, octopus contributed the most to the total village harvests in both survey years and were used by the highest number of households (89 percent in 1987-88, 81 percent in 1988-89). In 1988-89, an estimated 751 lbs were harvested, while 1,643 lbs were taken in the second year, for a household mean of 58.7 lbs and a per capita mean of 16.2 lbs, or approximately two octopus per person. Almost half the households, 47 and 48 percent for the two study years, harvested octopus. One fisherman alone brought home 175 octopus from a commercial fishery during the second survey year, contributing 700 lbs of octopus (42.6 percent of the village's total catch). Annual octopus harvests taken through non-commercial activities

ranged in size from 1 to 31 octopus per fisher, with a median among harvesting households of 15 octopus during 1988-89.

Tatitlek residents take octopus non-commercially in two ways: incidentally on a longline or in pots when fishing for halibut, cod, shrimp, or other bottomfish, or by searching for them under rocks at low water. In the 1980s, the latter involved poking under rocks with a stick. When an octopus was located, a hose was used to funnel bleach under the rock to drive the octopus out from hiding. Octopus were eaten fresh and also frozen for later use. One common way octopus were prepared involved grinding up or pounding the meat to tenderize it, and making patties which were then fried. Village residents compared octopus to ground beef, and prepared it in similar ways. Octopus were also used in chowder. Sometimes the meat was smoked, without brine. Villagers also used octopus as bait to catch halibut and other bottomfish.

The amount of shrimp used annually depended on a few residents who participated in the commercial shrimp fishery, or who had non-commercial pots to fish for shrimp. In 1987-88, shrimp contributed an estimated 555 lbs to the village harvest, taken from both commercial and non-commercial fisheries. In 1988-89, 327 lbs of shrimp were harvested and brought home by village residents, all from commercial catches. In the second harvest survey, only 14 percent of the households reported harvesting shrimp, while 62 percent said they used shrimp. This was lower than the prior survey year, when 32 percent of the households harvested and 95 percent used shrimp. Besides what is retained from commercial harvests, shrimp pots were set in Long Bay and Cedar Bay.

Because it requires specific pots and a boat from which to set and pull them, crab fishing is a specialized activity, engaged in by only a few

Tatitlek residents. Sixteen percent of the surveyed Tatitlek households engaged in crab harvesting in 1987-88, 10 percent the following year. Crabs were shared widely however, with over half the households in both years reporting receiving crab (58 percent in 1987-88, 62 percent in 1988-89), and 68 percent of the interviewed households reporting using crab in the first year, 71 in the second year. In 1987-88, Dungeness crab and Tanner crab were used by similar numbers of households (32 percent and 37 percent, respectively). During the second year, Tanner was the primary crab species, with 71 percent of the households using Tanners, compared with only 10 percent using Dungeness. King crab were used by a few households, apparently shared with them by harvesters residing outside the village.

Crab, and particularly Tanner crab, comprised a large part of the marine invertebrate harvest both survey years. During 1987-88, an estimated 457 lbs of Tanners were harvested. In 1988/89, 800 lbs of tanner crab were harvested by village households, 7.9 lbs per person, almost 5 crabs a piece. Crab harvests have been so small in recent years that virtually all the crab is eaten fresh, or frozen only briefly. Some crab harvests, largely Dungeness, occurred when crab came up incidentally in commercial salmon nets. Those crab were cooked up on the beach.

Villagers remember clams and cockles as contributing much more to their diet several decades ago. In recent years, they have observed a decline in the availability, which is often attributed to hungry sea otters. Uplift of some clam beds during the 1964 earthquake also may be an influence. More households participated in harvesting cockles than butter clams or razor clams (42 percent in 1987-88, 33 percent in 1988-89). During the first survey year, less than 100 lbs of any of the three resources were harvested. In 1988-89, butter clams contributed the largest amount to the estimated harvest total,

1,396 lbs (a per capita harvest of 13.8 lbs), compared with 338 lbs of cockles and 20 lbs of razor clams.

Some residents dug clams and cockles in the Tatitlek village area, Tatitlek Narrows, Boulder Bay, and Bligh Island vicinity. A few households reported digging clams and cockles once a year at Coghill, when gill netting commercially in the area.

Chitons (gumboots or *urritaq*) were taken year round at low water from the tidal area. Gumboots were reportedly rarely put up, as just enough to eat were picked. Just over one fourth of the surveyed Tatitlek households used chitons the first year, and one third the second year. The harvest doubled from 88.1 lbs the first year, to 173.3 lbs the second. Both the smaller black and larger red varieties were picked. Like clams, they were said to be much harder to find in the 1980s than in earlier years. Reef Island was one location villagers used in recent years for gumboot harvests.

## MARINE MAMMALS

Marine mammals were harvested by approximately half of all households (47 percent in 1987-88, 52 percent in 1988-89), used by most (89 percent and 95 percent, respectively), and widely shared (received by 81 percent in the first year, 84 percent in the second). Comprising 21 percent of the estimated village harvest in the first survey year, the second year was comparable at 20 percent. However, the per capita harvest went up, from 74.6 lbs to 129.9 lbs.

Four varieties of marine mammals were harvested in the 1980s by Tatitlek residents: harbor seals, sea lions, porpoise, and sea otters. Harbor seals contributed the largest amount to the household diet, followed by sea lion.

Porpoise were an occasional harvest. Sea otters were taken for their hides, but as in the past, the meat was not used.

The Marine Mammal Protection Act protects all species of marine mammals. Only Alaska Natives are allowed to harvest them.

Harbor Seal

The majority of the marine mammal harvests in both years was harbor seal. In 1987-88, it was 90 percent of the marine mammal harvest, 66 percent the following year. Harbor seals singularly comprised 19 percent of the entire village subsistence harvest in 1987-88, at an estimated 8,294 lbs. The following year, it constituted a smaller percentage, 13, of the total harvest, but increased slightly in harvest quantity, to 8,669 lbs. In both years, seal was the second highest contributor to the village overall harvest, behind deer the first year, and second to the coho salmon harvest in 1988-89. Annual seal harvests by individual hunters ranged from 1 to 109. The median harvests among harvesting households were 20 in 1987-88, and 18 the second survey. Half of the harvesting households take less than 20 a year, with the remaining 4 to 6 hunting households taking substantially larger numbers.

In the 1980s, seal hunters, almost always men, conducted hunts from a skiff or larger boat, occasionally landing and hunting from land. Seals may be shot as soon as they are spotted. Some hunters called in seals, or sat quietly waiting for seals to come through an area they were known to frequent. Rifles were used. Hunters aimed for the head. As in earlier years, the hunters had to reach the kill quickly before the seal sank. The seal was pulled into the skiff or boat by hand or with the assistance of a gaff, and bled immediately.

While only about half of the village households had seal harvesters, virtually all of the households (89 percent in 1987-88, 95 percent in 1988-89) used seal. Seal hunters distributed seal meat and parts to households. Distribution often went first to relatives. A large harvest might result in word being spread through the village that there was seal meat on the beach, for those who wished to obtain some. Another form of sharing occurred when seal was barbecued over an open fire on the beach.

Seal and seal parts were used much the same way in the 1980s as elders reported when they were growing up. In addition to the meat and ribs, the intestines, fat, flippers, tongue, and liver were eaten. A few women still cleaned, braided, and cooked the intestines. The flippers were scraped and boiled. Several households rendered seal oil, to be eaten with many different subsistence foods. To render oil, seal fat was cut into small pieces, washed, and slowly cooked. The rendered oil was stored in the refrigerator.

A few hunters sold seal hides to a fur buyer authorized to buy seal hides from Alaska Natives and sell them to other Alaska Natives. Some seal meat was used as bait in crab pots. When hunting for seal skins for market, the hunting most often occurred in the winter.

Seal were hunted along the coastline in much of the northern Prince William Sound area. Hunters also watched for seal when they were deer hunting off the islands in Prince William Sound.

Sea Lion

One third of surveyed Tatitlek households harvested sea lion in 1988-89, up from 16 percent the previous year. Fifty-three percent used sea lion in the first survey year, 57 percent the second. The total village harvest was

estimated at 857 lbs in 1987-88, and 4,333 lbs the following year, which averaged out to 154.8 lbs per household, or 42.8 lbs per capita. Individual household annual harvests ranged from 1 to 6 sea lions. Villagers preferred and targetted the smaller, younger sea lions for eating, particularly pups, as the meat was tender.

Like harbor seals, sea lions were shot from skiffs, larger boats, or occasionally from land. They were towed to the beach, pulled ashore, and cleaned, or else pulled into the commercial fishing boat.

Utilization of sea lions included the flippers, liver, heart, and breast milk of nursing females when taken, in addition to the flesh. Pickled sea lion flippers were a delicacy. To pickle flippers, the skin was peeled off, then the flipper was boned out, and cut in pieces. After being washed well, the flipper pieces were boiled with salt for a couple of hours. Any remaining skin was peeled off. The flipper was sliced up and pickled. Sea lion was rarely dried in the 1980s, but one household still smoked some of the meat, and stored it in ziplock bags in the freezer. Sea lion liver and heart are fried. Ribs are used in soups.

Sea lions were hunted in Tatitlek Narrows, Valdez Narrows, Galena Bay, and near Glacier Island. In addition, they were taken opportunistically when deer hunting or fishing. Tatitlek residents originally from Chenega still hunted marine mammals in southwestern Prince William Sound when they had the opportunity.

Other Marine Mammals

Porpoises were hunted in much the same way seals and sea lions were. Only a few hunters hunted porpoise, and most hunting was opportunistic,

incidental to other harvesting activities. Some hunters preferred not to take them. In 1988-89, 9.5 percent of the households harvested porpoise, and 19 percent used the meat. Porpoise contributed an estimated 98 lbs to the village harvest the first year, and 160 lbs the second. The skin and blubber of the porpoise were cooked and eaten as well.

Since the United States Fish and Wildlife Service implemented revised sea otter regulations and cited people in two villages in the state for making non-traditional handicrafts with sea otter furs, villagers have curtailed their harvest and use of sea otters. Those that continue to harvest sea otters are holding the furs until some of the legal issues are resolved. In both survey years, only one household harvested sea otters.

## GAME

Game resources, primarily land mammals, but including wildfowl, comprised one fourth of the 1987-88 village harvest, and 16 percent of the 1988-89 harvest. All households in both study periods used at least one type of game. Most households harvested game, 84 percent in the first year, 67 percent the second year. The majority of the game harvest was deer.

### Land Mammals

Land mammals constituted 24 percent of the average Tatitlek household harvest in 1987-88, and 14 percent in 1988-89. Of this, over 90 percent was deer in both years.

Black bear, moose, and goat were the other large game species harvested during the two study years, with bear taken in both years, moose harvested in

the first year, and goat in the second study period. Goat and moose meat were eaten in the village both years. Sheep and caribou were shared with village households the second year.

## Deer

Deer comprised 22 percent of the entire village resource harvest in 1987-88, 13 percent the following year. Deer was the single largest component of Tatitlek's 1987-88 subsistence harvest, at an estimated 9,586 lbs. In 1988-89, it ranked third, after coho salmon and harbor seal, at 8,352 lbs. Deer was used by all households in both study years, and harvested by 79 percent of the households in 1987-88 and 67 percent in the following year. Fewer households harvested deer the second year, and although the overall estimated community harvest dropped 1,234 lbs, the per capita rose slightly, from 77.2 lbs to 82.4 lbs. This was attributable to the increased sample size which produced a more accurate estimate of the village population. Because the harvest numbers are expanded to reflect all households, the smaller estimated population size the second year meant the harvested deer was averaged over a smaller number of people. The per capita harvest represents approximately 2 deer per person. Among the deer harvesting households, annual harvests ranged in size from 1 to 30 deer, with a median harvest of 5 deer in 1987-88 and 8 deer in 1988-89.

Since hunting on the transplanted deer was initiated, deer hunting opportunities have increased. Table 24 summarizes the regulations since statehood. With a five month hunting season, and fairly liberal bag limits of 5 deer per hunter in the 1980s, deer were an abundant, available, and accessible source of meat for the village. As deer were most numerous on

TABLE 24. DEER REGULATIONS, GAME MANAGEMENT UNIT 6

| Regulatory Year | Seasons | Total Days | Bag Limits, Areas, Conditions |
|---|---|---|---|
| 1961-62 | Aug.1 - Nov.30 | 122 | 3 deer; provided that antlerless deer may be taken only from Sept.15 to Nov.30 |
| 1962-63 | Aug.1 - Dec.15 | 137 | 4 deer; provided that antlerless deer may be taken only from Sept.15 - Dec.15 |
| 1963-64 | Aug.15 - Dec.31 | 122 | 4 deer; provided that antlerless deer may be taken only from Sept.15 - Dec.31 |
| 1964-82 | Aug.1 - Dec.31 | 153 | 4 deer; provided that antlerless deer may be taken only from Sept.15-Dec.31 |
| 1982-91 | Aug.1 - Dec.31 | 153 | 5 deer; provided that antlerless deer may be taken only from Sept.15-Dec.31; all hunters[1] |

1. In 1985-86 subsistence, resident, and non-resident hunting seasons were established.

islands in Prince William Sound, hunting required a skiff or a larger boat, depending on the location of the hunt. A single hunter might go out alone. Often there was more than one in the hunting party. Hunters took a skiff to nearby hunting sites for a day trip. Hunting parties that took a commercial fishing boat went further, to larger islands in the sound, and stayed out longer. Much of the deer hunting involved hunting along the coastline for deer near the water's edge, although some hunting parties hunted in the forest and hills of the islands.

Most deer meat was frozen. A few households made jerky. Deer jerky was made by cutting the meat thin, about 1/4 inch thick, and marinating the meat in a mixture. One respondent included soy sauce, garlic, brown sugar, worcestershire, and ginger. The meat was then dried for approximately five days, then stored in ziplock bags in the freezer.

Tatitlek hunters used several islands near the village in the northern part of Prince William Sound, and also ranged out to Montague Island. Hunters who previously lived in Chenega also hunted deer in the southwestern part of the sound. Much of the deer hunting occurred in the winter, after commercial fishing season. Tatitlek hunters reported that they generally avoided Hinchinbrook and Hawkins islands, as Cordova hunters used those areas.

## Black Bear

In 1988-89, 14 percent of those surveyed hunted and took black bear, bringing an estimated 8 bears into the village. This was an increase from the previous year, when two black bears were harvested. It is possible that the survey sample differences account for the change, however. Hunters shared their 1988-89 harvest with additional households, so that 43 percent of the

village reported using black bear. Like marine mammal meat, bear meat may be brought in by the hunters and left on the beach, with an invitation to any villagers to come get some meat. The women take knives down and cut off portions for their households.

Black bear hunting occurred in the fall at salmon streams, in the spring on grassy slopes, and opportunistically as the occasion arose. While some people, particularly village elders, still described a craving for the meat, others indicated that they had their fill of bear meat in earlier years, or they found it less desirable than venison.

## Mountain Goat

Several households hunted goat in 1988-89, but only two (9.5 percent of the population) were successful. The single hunter in 1987-88 was unsuccessful. Harvested goat were distributed widely, as over half (52 percent) of Tatitlek households reported eating goat meat. This may also reflect goat harvests by former residents of Tatitlek that were shared with relatives in the village. Although goat meat was shared, the harvests were so limited, that respondents indicated the hunters distributed the meat, rather than leaving it on the beach for people to get.

Goat hunting regulations have become increasingly complex since the mid 1970s. Until 1976, there was a two goat bag limit in GMU 6 (Table 25), and a season that varied between four and six months in length. The bag limit was reduced to one goat in 1976. Starting in 1980, goat hunts became more area specific, with a mixture of registration and draw permits in GMU 6. The main impact on Tatitlek residents was the registration permit provision requiring a hunter to acquire a permit from a Fish and Game office, and successful hunters

TABLE 25. GOAT REGULATIONS[1] GAME MANAGEMENT UNIT 6, TATITLEK AREA

| Regulatory Year | Seasons | Total Days | Bag Limits, Areas, Conditions |
|---|---|---|---|
| 1961-62 | Aug.1 - Nov.30 | 122 | 2 goats a year |
| 1962-68 | Aug.1 - Dec.31 | 153 | 2 goats a year |
| 1968-76 | Aug.1 - Jan.31 | 184 | 2 goats |
| 1976-77 | Aug.1 - Jan.31 | 184 | 1 goat |
| 1977-80 | Aug.1 - Dec.31 | 184 | 1 goat |
| 1980-82 | Aug.1 - Dec.31 | 153 | 1 goat by registration permit; remainder of subunit 6 *(Hunt 879, "that portion of Unit 6 not covered by Hunts 878 and 830, Unit 6A east of Seal River and Unit 6D north or east of Tiger Glacier)."* Hunters required to appear in person at an ADF&G office in Seward, Anchorage, Valdez, Glennallen, Cordova or Yakutat, during regular Department working hours to obtain a permit. Successful hunters required to present their permit reports and the horns of their goat in person to an ADF&G office in the above locations and during regular working hours within 10 days of the kill. |
| 1982-83 | Aug.1 - Jan.31 | 184 | 1 goat by registration permit only; remainder of subunit 6 *(Hunt 879, that portion of Unit 6 not covered by Mountain Goat Hunts 830 and 878 (unit 6C, Unit 6A east of Bering River, Canyon Creek, and Martin River Glacier, except Suckling Hills, and Unit 6D north or east of Tiger Glacier.)* Same conditions as 1980, Fairbanks office also issued permits and collected reports. |
| 1983-85 | Aug.1 - Jan.31 | 184 | 1 goat by registration permit only; remainder of Unit 6 *(Hunt 879).* 1984 - Permits available at ADF&G offices in Seward, Anchorage, Palmer, Fairbanks, Glennallen, Yakutat, Cordova or Valdez. 1983 - Hunters required to present the horns and hunter report at the ADF&G office of permit origin within 5 days of the kill. 1984 - Hunters no longer required to bring in the horns and had 10 days to report to the office of permit origin or the Cordova ADF&G office. |
| 1985-86[2] | Aug.1 - Jan.31 | 184 | 1 goat by registration permit only; remainder GMU 6 *(Hunt 879 - GMU 6 except 6A portion and 6B - Copper River to Bering River, Martin River Glacier, and Suckling Hills, and 6D portion - Tiger Glacier).* Same conditions as 1984. |
| 1986-87 | Aug.1 - Jan.31 | 184 | 1 goat by registration permit; remainder GMU 6, *(Hunt 879), except 6A portion and 6B - Copper River to Bering River, Martin River Glacier, and Suckling Hills, and 6D portion - Tiger Glacier.* Permits available at ADF&G offices in Seward, Anchorage, Palmer, Fairbanks, Glennallen, Yakutat, Cordova or Valdez. Successful hunters required to turn in a hunter report to the office of permit origin or Cordova within 10 days. |

1. Since 1980, goat populations have been managed on a subarea basis. In 1979, there were 13 recognized subarea populations within GMU 6.
2. 1985 was the first year subsistence, resident and non-resident regulations were created.

TABLE 25 (cont). GOAT REGULATIONS GAME MANAGEMENT UNIT 6, TATITLEK AREA

| Regulatory Year | Seasons | Total Days | Bag Limits, Areas, Conditions |
|---|---|---|---|
| 1987-88 | **Subsistence Hunt** | | |
| | Aug.1 - Jan.31 | 184 | 1 goat by registration permit only; remainder of GMU 6; (Portions of 6C and 6D). Only rural residents domiciled in 6C and 6D are eligible for these hunts; *(Hunts 821W, 822W, 830W, and 879W)*. Permits available in Cordova, Chenega Bay, and Tatitlek. Hunters required to present horns and permit report in person or by mail to Cordova within 10 days of the kill. |
| 1988-89 | **Subsistence Hunt** | | |
| | Aug.1 - Jan.31 | 184 | 1 goat by registration permit; Portions of 6C and 6D; *(Hunts 821W, 822W, 828W, 829W[3], 830[4], and 879W)*. Only rural residents domiciled in 6C and 6D may apply. Permits available in Cordova, Tatitlek and Chenega Bay. Successful hunters must present the horns and hunter's report in person or by mail at the ADF&G office in Cordova within 5 days of the kill. |
| 1989-90 | **Subsistence Hunt** | | |
| | Aug.1 - Jan.31 | 122 | 1 goat by registration permit; Portion of 6D; Only rural residents domiciled in 6C and 6D qualified to participate; *(Hunts 823W, 822W, 824W, 828W, 829W, 830W, and 879W)*. Permits available in Cordova, Tatitlek and Chenega Bay. Successful hunters must present the horns and their permit report in person or by mail at Cordova within 5 days of the kill. Tatitlek hunt area 823W, 824W, and 829W - 2 additional goats may be taken in each area by subsistence hunters after the general season is closed. Chenega Bay hunt area 830W - up to 2 additional goats may be taken by subsistence hunters after the general season closes. |
| 1990-91[5] | **Subsistence, Resident and Non-resident Hunts** | | |
| | Aug.20 - Jan.31 | 184 | 1 goat by registration permit only; Portions of 6A, 6B, and 6D; *(Hunts 820, 822, 823, 824, 828, 829, 830, 878, 879);* Permits available in Anchorage, Chenega Bay, Cordova, Fairbanks, Glennallen, Palmer, Seward, Soldotna, Tatitlek, and Valdez. Successful hunters required to present the horns on the skull and their permit report in person to ADF&G in Anchorage, Cordova, Fairbanks, Glennallen, Palmer, or Valdez within 5 days of the kill. |

Sources:

Alaska Board of Game

1980-91 Permit Hunt Supplements. Alaska Department of Fish and Game.

1961-91 State Hunting Regulations No.s 1-31. Alaska Department of Fish and Game.

Alaska Department of Fish and Game

1978-91 Survey and Inventory Reports. Division of Wildlife Conservation.

3. Tatitlek hunt area 829 W, up to 6 additional goats may be taken by subsistence hunters after the general season is closed.

4. Chenega Bay hunt area 830W, up to 2 additional goats may be taken by subsistence hunters after the general season closes.

5. McDowell ruling of Dec. 1989: All Alaskans potentially eligible for subsistence hunts.

to report in person at the Fish and Game office afterwards. These requirements mandated two trips to Cordova to take one goat, making it prohibitively expensive to hunt goats legally near the village. In addition, under registration hunt management, hunt areas were often closed much sooner than the regulatory season suggested, when area harvest quotas were met. Guides, outfitters, and non-local hunters were hunting areas near Tatitlek in the early fall, before the village hunters went out. In 1987, a subsistence hunt which reserved a few goats in specified areas for rural Prince William Sound residents made permits more accessible to village residents, and ensured that a few goats were still available in the winter hunt.

Goat hunting was much the same in the 1980s as described for earlier periods. Skiffs or boats were used to access an area where the goats were. Occasionally, the goats were shot from the boat, but more often, hunters climbed up the mountain after spotting a goat to shoot it. Goat hunting occurred in Port Fidalgo, behind the village, and in Valdez Arm.

In addition to the highly prized meat, goat fat was also utilized. The fat was washed, cleaned, hung, cut into strips, and dried. The fat was eaten with dry fish. Meat not eaten fresh was frozen.

## Small Game and Furbearers

Small game such as hare and porcupine have not been seen around the village for some time. These resources occur rarely in the sound and were taken usually in the vicinity of the village. The lack of porcupines in particular may in part be due to a number of dogs in the village.

Trapping furbearers is a specialized activity, requiring traps and a skiff or boat. Trapping occurred along the coastline in the winter months.

During the 1980s, the same trappers were not always active every year, participating when there was a particular market, when their equipment was working, and when they had the time available. Land otter were the most harvested furbearers during the study years, with estimated harvests in both years of more than 30 animals. Mink and marten were the other two species most commonly trapped. Most furbearers were taken with steel traps. Occasionally, land otters were shot. The hides were marketed. The meat was not salvaged.

## Wildfowl

Tatitlek households took both upland game birds, such as grouse and ptarmigan, and waterfowl, including geese and several varieties of ducks. The majority of households (74 percent in 1987-88, 86 percent in 1988-89) used at least one kind of bird during the survey year. In 1987-88, 47 percent of the households harvested birds, and in the following year, 62 percent of the households reported taking at least one kind of bird. Birds and bird eggs comprised 1.2 percent of the total village harvest in 1987-88, and 2 percent the following year.

### Grouse and Ptarmigan

Grouse and ptarmigan were taken by only a few households over both study years, and only in one household in 1988-89, a school teacher. Few birds were harvested. In 1987-88, the higher of the harvest years, 6 grouse and 2 ptarmigan were taken. For the most part, the birds were an opportunistic

harvest occurring in conjunction with other hunting activities, such as deer or bear hunting.

## Ducks

During the two study years, six types of ducks were harvested: scoters ("black ducks," more than one species), goldeneyes ("copperheads"), mergansers ("sawbills"), mallards, pintails, and buffleheads ("butterballs"). Scoters, known locally as black ducks and whistlers, including common, white-winged, and surf scoters, were harvested by the most households (61.9 percent in 1988-89), and in the largest quantities, a household average of 18.6 lbs, a per capita harvest of 5.2 lbs, or about 4 scoters a person. Actual household harvests ranged from 2 to 100 scoters, with the median scoter harvest among harvesting households for both years at 20 birds. Scoters were taken near the village, shooting from shore, which did not require a skiff, although some duck hunters used skiffs to reach hunting sites and retrieve birds. Other varieties of ducks were taken in the same manner, although hunters had to travel a little further from the village to obtain some of the species.

Ducks were most often eaten fresh. The strong-tasting sea ducks were soaked before cooking. Ducks were roasted, or boiled and put in soup, among other uses.

## Other Waterfowl

Geese, specifically Canada geese, were taken by a few hunters, 19 percent of the 1988-89 survey households, 11 percent in the earlier survey year. Geese were not particularly abundant in the Tatitlek Narrows and Port Fidalgo area, which is reflected by the small harvests both study years, with

harvesting households taking from 1 to 8 geese, an estimated annual total of 21 geese in 1987-88, and 9 the second year.

Cormorants were the only other seabird reported taken during the two study years. Only one hunter pursued them, reportedly for elders who like "shags," and compare the tender meat to chicken. Sandhill cranes are taken when they come into the area, which does not occur every year.

Spring waterfowl harvests occurred in the 1980s, particularly for scoters. Recent enforcement actions by Fish and Wildlife Protection officers (occurring in 1990) operating under a policy to enforce the ban on spring waterfowl hunts by Alaska Natives may influence future village hunting patterns. Until enforcement efforts were implemented, the seasonal round of subsistence activities included the harvest of scoters and possibly other waterfowl in March and April as it had for hundreds of years.

## Eggs

A variety of bird egg harvests were documented in the 1980s, including seagull eggs, arctic tern eggs, goose eggs, and duck eggs. Seagull eggs were harvested by the most households (43 percent in 1988-89), and also in the largest quantities, with a total of 77 dozen eggs collected by village households. Egg harvests traditionally occurred in the spring. Recent enforcement efforts regarding spring waterfowl harvests may also have affected the egg gathering activities of the village.

# VEGETATION

Berry and plant gathering are activities many households participated in during the study years. Over three fourths of the households harvested berries in both study years. Most households also cut firewood.

## Berries

In 1987-88, all Tatitlek households surveyed used berries. Over the two study years, the per capita harvest of berries varied from 9.1 lbs (1987-88) to 16.7 lbs in 1988-89. Berries picked were predominantly blueberries, salmonberries, cranberries, and currants. Mossberries and nagoonberries were also gathered. Berries figured prominently in the exchange network, as over three fourths of the households in 1988-89 reported sharing berries or berry products.

Berries were frozen, put up whole in jars, and also processed. Jams and jellies were made from several of the berries. Eskimo ice cream was made with berries a couple of different ways. The most common variety consisted of sugar, berries, and oil, preferably salmon oil but more typically commercial shortening.

## Other Wild Plants

Plants were not gathered in the variety or quantity of earlier years. Only a few households picked greens or mushrooms, 19 percent in 1988-89. School teachers' families were some of the most active harvesters in the most recent study year, gathering beach greens and fiddlehead ferns.

## Wood

Fire wood was cut by 79 percent of the households in 1987-88, and 71 percent in the second year. An estimated 166 cords were taken by the whole village the first year, a household average of 5 cords of wood. In 1988-89, the household average was 8 cords. Many homes are wood-heated. In addition, fire wood is used in steambaths and smokehouses.

Wood cutting in the 1980s was typically a group effort, with several men going out with a commercial fishing boat to cut logs. The logs were towed back to the village, hauled up on the beach, and cut into rounds or blocks with a chainsaw. Villagers used a truck to deliver blocks to the homes, where they were split and stacked for firewood. Blocks of wood were often left at homes without wood cutters.

# CHAPTER SIX

## DISCUSSION AND CONCLUSIONS

Tatitlek is a Chugach Eskimo community tied to centuries of subsistence uses in Prince William Sound. Subsistence resources continue to play a vital role in the diet and culture of Tatitlek residents. In the late 1980s, residents of Tatitlek harvested at least 75 kinds of resources. Individual households in 1988-89 harvested a mean of 13.7 different resources and used 22.6 kinds. Annual harvest levels were substantial: a per capita harvest of 351.7 pounds in 1987-88, 643.5 lbs the following year. Participation in harvest and use of resources was widespread, with all surveyed households harvesting, using, and receiving at least one resource in both study years. All but one household shared resources with others in the second year. Sharing of resources was extensive.

Tatitlek residents followed a seasonal harvest round based on historic uses and the availability of resources, harvesting different resources throughout the year. The locations of harvest revealed a high emphasis on areas around the village, as well as ties with geographic bands of the previous century indicating that historic territories were still utilized.

In many respects, methods of harvest during the study years were very similar to historic patterns of the 1930s, 1940s, and 1950s. Hunting and fishing groups were still largely male. Tatitlek women were the primary work force for preserving resources, smoking, drying, salting, and canning resources, in addition to freezing some. Utilization of the resources included traditional uses such as seal intestines and tongue, sea lion flippers, and porpoise blubber.

Tatitlek resource use and harvest patterns bear similarities to other Prince William Sound and Kodiak communities with respect to harvest composition. In harvest levels, it has more in common with communities in southwest Alaska. Table 26 illustrates Tatitlek's harvesting characteristics in comparison with other comunities, representing a variety of locations, populations sizes, and local economies throughout southcentral and southwest Alaska.

In comparison with Cordova and Chenega Bay, the two Prince William communities for which there is comparable information, Tatitlek harvests were much higher. The Chenega Bay harvest estimates, however, were collected after the village's second year of being re-established and prior to the liberalization of subsistence salmon fishing regulations. The harvest levels reported for 1985-86 must be viewed as a minimum. Apart from the *Exxon Valdez* Oil Spill, it could be projected that a current survey would reveal increased harvests as residents became better acquainted with the area and acquired the necessary equipment to pursue subsistence activities.

The composition of harvest varied among Prince William Sound communities. Salmon dominated the resource uses of all three communities. Other finfish contributed more substantially to Cordova's harvest, in comparison with Tatitlek. Marine mammals constituted a higher percentage of the resource harvest in Prince William Sound villages compared with Cordova. Only Alaska Natives are allowed to hunt marine mammals, and Cordova has a much smaller percentage of Alaska Natives in its population. However, culture and tradition also shape harvest choices, and it is likely that most Euro-Americans do not consider seal, sea lion, and porpoise to be preferred food sources.

TABLE 26. WILD RESOURCE HARVESTS IN SELECTED ALASKAN COMMUNITIES.

| Community | 1990 Population | Per Capita Harvest | Study Year | % HARVEST COMPOSED OF Salmon | Other Fish | Marine Invert. | Land Mammals | Marine Mammals | Birds & Eggs | Plants |
|---|---|---|---|---|---|---|---|---|---|---|
| *Cook Inlet* | | | | | | | | | | |
| English Bay | 157 | 303 | 1987 | 41 | 38 | 6 | 3 | 7 | 1 | 5 |
| Homer | 4,513 | 104 | 1982 | 16 | 32 | 22 | 29 | 0 | [a] | 1 |
| Ninilchik | 658 | 76 | 1982 | 24 | 28 | 18 | 27 | 0 | [a] | 3 |
| Port Graham | 172 | 251 | 1987 | 47 | 33 | 6 | 2 | 5 | 1 | 6 |
| Tyonek | 208 | 272 | 1982-83 | 71 | 3 | 2 | 21 | 1 | 1 | 1 |
| *Kodiak* | | | | | | | | | | |
| Akhiok | 77 | 158 | 1986 | 66 | 4 | 8 | 20 | 1 | 1 | 1 |
| Karluk | 71 | 381 | 1986 | 66 | 11 | 1 | 12 | 7 | 2 | 1 |
| Larsen Bay | 147 | 205 | 1986 | 48 | 16 | 12 | 19 | 2 | 1 | 2 |
| Old Harbor | 284 | 418 | 1986 | 43 | 9 | 6 | 15 | 25 | 2 | <1 |
| Ouzinkie | 209 | 401 | 1986 | 46 | 16 | 7 | 17 | 8 | 6 | 1 |
| Port Lions | 222 | 323 | 1986 | 47 | 15 | 10 | 23 | 2 | 2 | 1 |
| *Prince William Sound* | | | | | | | | | | |
| Chenega Bay | 94 | 378[b] | 1985-86 | 21 | 17 | 2 | 21 | 37 | 1 | 1 |
| Cordova | 2,282 | 234 | 1988 | 25 | 39 | 9 | 21 | .3 | 2 | 2 |
| Tatitlek | 119 | 642 | 1987-88 | 41 | 14 | 7 | 14 | 20 | 2 | 3 |
| *Alaska Peninsula* | | | | | | | | | | |
| Egegik | 122 | 385 | 1984 | 24 | 4 | 4 | 64 | 0 | 4 | NI[c] |
| Pilot Pt. | 53 | 384 | 1986-87 | 25 | 4 | 2 | 63 | 1 | 4 | 2 |
| Ugashik | 7 | 814 | 1986-87 | 39 | 5 | 0 | 51 | 0 | 3 | 2 |
| *Chignik Area* | | | | | | | | | | |
| Chignik | 188 | 194 | 1984 | 74 | 11 | 4 | 7 | 3 | 1 | NI |
| Chignik Lagoon | 53 | 229 | 1984 | 55 | 8 | 7 | 26 | 1 | 3 | NI |
| Chignik Lake | 133 | 282 | 1984 | 52 | 5 | 1 | 39 | 1 | 2 | NI |
| Ivanof Bay | 35 | 445 | 1984 | 62 | 3 | 6 | 22 | 5 | 3 | NI |
| Perryville | 108 | 391 | 1984 | 59 | 11 | 3 | 22 | 5 | 2 | NI |

[a]Included in land mammals. [b]Per capita revised from 1986 report. [c]No information, data not collected.
Sources: Fall 1990; Fall and Morris 1987; Fall et al 1984; Stanek 1991; Stratton 1991; US Census 1991

With respect to harvest composition and cultural preferences, Kodiak villagers' harvest patterns bore a marked resemblance to Tatitlek's. The Alutiiq communities focused on salmon, marine mammals and other marine resources. Both Kodiak and Prince William Sound have had deer transplanted into the area, which now constitute a regular part of the annual harvest cycle.

## FACTORS INFLUENCING HARVESTS AND USES

The study indicated that reported subsistence harvest levels can vary considerably from year to year in a community like Tatitlek. Some of this is attributable to sample selection. As discussed above, the household sample was more complete for the second study year (1988-89) in comparison with the first (1987-88). Consequently, the 1987-88 harvests are an underestimate of the community's true harvests that year. In addition to these methodological factors, differences in harvests between the two study years illustrated some other factors which influence annual levels of harvest and use. Variables such as regulations, availability of resources, and seasonality affected harvests.

### Regulatory Influences

Regulations have influenced village resource uses in three ways. First, hunting and fishing regulations, primarily state but including some federal rules, have directly affected access to subsistence resources by Tatitlek residents. Less directly, commercial activities, or closures, have affected

what was available to village residents. Third, levels of enforcement effort have figured into harvesters' decisions.

Legalization of customary activities by federal or state governments, or conversely, prohibition of traditional practices, can permit or discourage local harvesting activities by northern peoples. Regulatory impacts on subsistence uses of Tatitlek residents have been seen most recently in the subsistence salmon fishery and GMU 6 goat hunting. As discussed in Chapter 5, reported subsistence salmon harvests in Tatitlek increased greatly between 1987-88 and 1988-89 when seasons, bag limits, and gear specifications were modified to more accurately reflect traditional harvesting activities. Similarly, goat hunting activities by Tatitlek residents have been reported in recent years, again due to changes in the regulatory regime which begin to recognize traditional hunting seasons and make permits more available to village residents. Regulations appropriate to local harvesting patterns allow traditional activities, and encourage the reporting of harvests and cooperation with resource managers.

In the case of federal regulation of subsistence harvesting, marine mammal harvests for seal and sea lion were the least regulated subsistence harvests. To date, federal management of marine mammals has not required permits, imposed any seasonal restrictions or bag limits, or implemented restrictions other than that the harvests be for subsistence purposes and hunters not waste the harvest, and that sea otter hides be sealed. Under these relatively non-restrictive management rules, harbor seals are a major part of the village resource harvests and marine mammals were contributing substantial quantities to the village food supply.

Most fishing and hunting regulations in Prince William Sound which restricted subsistence undertakings predate Alaska's 1978 subsistence statute.

Up until the late 1980s, few hunting and fishing regulations had been reviewed for consistency with customary and traditional uses and with the provisions for subsistence in state statute and ANILCA. Most existing regulations were put in place to conserve resources and provide for harvests in keeping with the hunting and fishing ethics and values of Euro-American cultural traditions. Restrictions on subsistence harvests were established in part to curb perceived abuses and violations of commercial fishing and sport hunting regulations. Regulations by design have supported the sport hunters' "quality experience" and "fair chase" values, and sought to discourage commercial abuses. What resulted were unnecessary restrictions of legitimate subsistence activities by Tatitlek residents. In the few instances where regulations have been evaluated for their appropriateness for traditional subsistence uses, the result has been a liberalization of the regulatory regime. The best example of this has been the change in subsistence salmon fishing regulations.

Commercial harvesting activities or closures also continue to affect subsistence uses by Tatitlek residents. Closures of commercial king crab fisheries in Prince William Sound in 1988 eliminated the entry of king crab into the village. As described above, residents with commercial permits and non-local fishermen retain part of their commercial catch, sharing the crab widely throughout the community. Commercial catches, such as shrimp and halibut, and by-catches, including cod and rockfish, also are occasionally brought back to the village. Thus, changes in the commercial fishing sector have consequences for the non-commercial uses of wild foods in Tatitlek.

Finally, enforcement of state and federal regulations can influence harvesting activities. As noted above, many of these restrictions were imposed without consideration of traditional use patterns or application of statutory provisions regarding subsistence uses. Tatitlek's proximity to

Cordova and Valdez, combined with the growing rate of natural resource exploitation in Prince William Sound, probably is resulting in increased enforcement effort of regulations by state Fish and Wildlife Protection officers.

While the populations of Prince William Sound communities have increased only slightly over the last decade, bringing a few hundred more resident users into the area, tourism and recreational use of the area by non-local users have seen substantial growth annually. For instance, the number of anglers in Prince William Sound increased 38 percent between 1984 and 1989, to 26,238 rod and reel fishers. Angler days for the same time period went up 66 percent to 99,295 days, which was an increase of 113 percent over 1979 levels. Sport salmon harvests have increased 131 percent since 1984, with an estimated 1989 harvest of 72,292 salmon (Mills 1990:15,18-19, 27).

Increased sport uses, such as deer and goat hunting and salmon fishing, have necessitated more attention to enforcement of regulations. Because enforcement officers have expended the greatest effort targeting commercial abuses in the past, spending less time in the remote areas of Prince William Sound in the spring, fall, and winter, various subsistence activities have continued outside of the regulatory system for many years with little interference. Stepped-up enforcement actions may inhibit traditional harvesting activities, such as spring waterfowl hunting and sea otter hunting.

## Availability of Resources

The availability and accessibility of resources appear to play important roles in harvesting effort and levels of use by Tatitlek residents from year

to year. Resource population status and movements, and availability of equipment are factors affecting harvests.

The local abundance of targeted resources drives harvest and use levels. During the study period, high numbers of sea otters have reduced the numbers of clams, cockles, mussels, and sea urchins in the Tatitlek area. For the most part, Tatitlek's marine invertebrate harvests have declined as the resource availability has decreased. Herring and herring spawn were taken in relatively greater quantities in 1988 when the number of herring and the mass of roe on seaweed was high near the village, compared with 1987 when herring mass and spawning was sparse in Tatitlek Narrows. Migratory bird species also move through Tatitlek's hunting area in variable patterns from year to year. In years when sandhill cranes do not land in the vicinity, the village does not harvest them, such as occurred during the two study years.

Equipment factors such as transportation and gear influence harvests. The availability of a commercial boat or a skiff to a harvester make deer, marine mammals, and a variety of fish accessible. Possession of or access to appropriate gear, such as shotguns, rifles, or gill nets, determines an individual harvester's ability to hunt deer, seal, or waterfowl. Some hunters and fishers experience greatly reduced harvests when their skiff or commercial boat is inoperable for a prolonged period of time, or they lose access to a shotgun or rifle.

## Seasonality of Harvests

The annual round of subsistence activities occurred in the 1980s much in keeping with historically documented patterns, except in instances where enforced regulations have closed traditional seasons. Seasonal harvests are

associated with the presence of the resource, and the effort of the harvester. Most marine mammal harvests occurred in the winter when the animals float better after being shot and the hides were marketable, and in the spring when new pups were available. Black bears were taken in the fall and spring. While summer was characterized by salmon and berry harvests for many village residents, and opportunities to earn cash, the fall, winter and spring were spent engaged in myriad subsistence activities that provided as much as 60 percent of the village harvests. In the three seasons of less favorable weather and shorter days, this reflected substantial effort and commitment to harvesting resources.

While salmon harvests necessarily occurred in the busiest season for Tatitlek residents, as many rely on summer cash-producing activities to provide the needed annual income, Tatitlek residents made financial sacrifices to insure sufficient salmon for their own use. For example, one year a fisherman had very limited success during a commercial king salmon fishery on the Copper River Flats. Rather than sell the few fish he netted, he salted them down, providing first for home use. Prior to the legitimization of the village's subsistence salmon fishery in 1988, commercial fishermen brought home more sockeyes and cohos from their commercial catches. Since the regulatory revisions, fishermen have returned to the traditional seasons, an early harvest of sockeyes and a late harvest of cohos.

## SUMMARY

The residents of Tatitlek have a long history and tradition of subsistence uses in Prince William Sound. The village has a mixed cash-

subsistence economy that is reliant on salmon both for commercial and non-commercial uses.

Per capita subsistence harvests increased from 351.7 lbs in 1987-88 to 643.5 lbs in 1988-89. Several factors contributed to the variation in harvest level, including liberalization of hunting and fishing regulations, changes in individual harvesters' situations, fluctuations in availability of resources, and sampling considerations.

The diversity of resources harvested, the traditional methods of harvest and preservation, and the widespread distribution of resources throughout the village demonstrate a continuity with the subsistence patterns of past generations of Alaska Native peoples within Prince William Sound. With the highest per capita resource harvest in the Prince William Sound region, and one of the highest in southcentral Alaska, Tatitlek residents have demonstrated a continued reliance on traditional resources.

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TATITLEK RESOURCE USE STUDY

HOUSEHOLD ID# _____ Date _____ Interviewer_____

The purpose of this survey is to gather information about the fish and game resource activities of your household from April 1987 through March 1988. When we ask "Did you use a resource?" we mean did your family eat it, serve it, or otherwise use it in your home.

1. HOUSEHOLD INFORMATION (* = Respondent)

| ID # | M/F | BIRTH DATE MM/DD/YY | RESIDENCE OF PARENT WHEN YOU WERE BORN | MOVED TO THIS VILLAGE | | ETHNICITY |
|---|---|---|---|---|---|---|
| | | | | YEAR | FROM WHERE | |
| 1 HEAD | | | | | | |
| 2 SPOUSE | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |

2. Using Person's I.D. #'s from the table above, indicate which household members participated in harvesting activities during 1987-1988.

Hunting ___ ___ ___ ___ ___ Fishing (include clams, etc) ___ ___ ___ ___ ___

Plant Gathering ___ ___ ___ ___ ___ Trapping ___ ___ ___ ___

3. COMMERCIAL FISHING

Did members of your household participate in commercial fishing during 1987? YES ___ NO ___

If YES, please complete the following table:

| SPECIES | FISHED | | | GEAR TYPE | NUMBER REMOVED | | I.D.#'S OF FISHERMEN | |
|---|---|---|---|---|---|---|---|---|
| | YES | NO | INCIDTL. | | FOR OWN HOME USE | GAVE AWAY | Permit H. | Crew |
| KING (1) | | | | | | | | |
| RED (2)--- | | | | | | | | |
| CHUM (3) | | | | | | | | |
| PINK (4) | | | | | | | | |
| SILVER (5) | | | | | | | | |
| HERRING(6) | | | | | gals | gals | | |
| HER SACROE(7) | | | | | | | | |
| ROE ON KELP(8) | | | | xxx | gals | gals | | |
| KING CRAB (9) | | | | xxx | | | | |
| DUNGENESS(10) | | | | xxx | | | | |
| TANNER (11) | | | | xxx | | | | |
| COD, BLACK(12) | | | | xxx | | | | |
| HALIBUT (13) | | | | xxx | lbs | lbs | | |
| GROUND FISH Specify:(14) | | | | xxx | | | | |
| SHRIMP (15) | | | | xxx | lbs | lbs | | |
| RAZOR CLAMS(16) | | | | xxx | gals | gals | | |
| OTHER | | | | | | | | |

4. NON-COMMERCIAL FISHING

Did your household try to harvest or use any type of fish or marine invertebrates in 1987-1988?

YES _____ NO _____

5. Did your household try to harvest or use salmon in 1987? YES _____ NO _____

If YES, please complete the following table:

| SPECIES | USED | | TRIED TO HARVEST | | NO. HARVESTED BY GEAR TYPE | | | REC. | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | SUBS. GILLNET | ROD & REEL | OTHER | YES | NO | YES | NO |
| KING (21) | | | | | | | | | | | |
| RED (22) | | | | | | | | | | | |
| CHUM (23) | | | | | | | | | | | |
| PINK (24) | | | | | | | | | | | |
| SILVER(25) | | | | | | | | | | | |
| SLM (unk)(26) | | | | | | | | | | | |
| SPAWNERS (27) | | | | | | | | | | | |

6. Did your household try to harvest or use any other marine fish in 1987-88? YES ____ NO ____

If YES, please complete the following table:

| SPECIES | USED | | TRIED TO HARVEST | | NO. HARVESTED BY GEAR TYPE | | | REC. | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | SUBS. NET | ROD & REEL | OTHER | YES | NO | YES | NO |
| HALIBUT(28) | | | | | lbs | | | | | | |
| SMELT (29) | | | | | | | | | | | |
| HERRING (30) | | | | | gals | | | | | | |
| HHRNGROE(31) | | | | | gals | | | | | | |
| GRAY COD(32) | | | | | | | | | | | |

6. (cont)

| SPECIES | USED | | TRIED TO HARVEST | | NO. HARVESTED BY GEAR TYPE | | | REC. | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | SUBS. NET | ROD & REEL | OTHER | YES | NO | YES | NO |
| BLACK COD(33) | | | | | | | | | | | |
| LINGCOD(34) | | | | | | | | | | | |
| RKFISH-BLK(35) | | | | | | | | | | | |
| RKFISH-RED(36) | | | | | | | | | | | |
| FLOUNDER (37) | | | | | | | | | | | |
| SOLE (38) | | | | | | | | | | | |
| OTHER | | | | | | | | | | | |

7. DID YOUR HOUSEHOLD TRY TO HARVEST OR USE ANY FRESHWATER FISH IN 1987-88? YES ____ NO ____
IF YES, please complete the following table:

| SPECIES | USED | | TRIED TO HARVEST | | NO. HARVESTED BY GEAR TYPE | | | REC. | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | SUBS. NET | ROD & REEL | OTHER | YES | NO | YES | NO |
| RAINBOW (41) | | | | | | | | | | | |
| LAKE TROUT(42) | | | | | | | | | | | |
| GRAYLING (43) | | | | | | | | | | | |
| DOLLY (44) VARDEN | | | | | | | | | | | |
| OTHER | | | | | | | | | | | |

8. Did your household try to harvest or use any type of marine invertebrate in 1987-1988? YES ____ NO ____? If YES, please complete the table below:

| SPECIES | USED | | TRIED TO HARVEST | | NUMBER HARVESTED | RECEIVED | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | | YES | NO | YES | NO |
| DUNGNS CRAB (48) | | | | | | | | | |
| KING CRAB (49) | | | | | | | | | |
| TANR CRAB (50) | | | | | | | | | |
| SHRIMP (51) | | | | | lbs | | | | |
| BUTTER CLAMS(52) | | | | | gals | | | | |
| RAZOR CLAMS(53) | | | | | gals | | | | |
| OTHER CLAMS(54) | | | | | gals | | | | |
| MUSSELS (55) | | | | | gals | | | | |
| COCKLES (56) | | | | | gals | | | | |
| CHITONS (57) | | | | | gals | | | | |
| OCTOPUS (58) | | | | | | | | | |
| OTHER | | | | | | | | | |

9. MARINE MAMMALS

Did your household try to harvest or use marine mammals or marine mammal products during 1987-1988?

YES _____ NO _____ If YES, please complete the table below:

| SPECIES | USED | | TRIED TO HARVEST | | AMOUNT OR NUMBER HARVESTED | PORTIONS USED* | RECEIVED | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | | | YES | NO | YES | NO |
| HARBOR SEAL(62) | | | | | | | | | | |
| SEA LION (63) | | | | | | | | | | |
| SEA OTTER (64) | | | | | | | | | | |
| OTHER | | | | | | | | | | |

* Which parts were used for food?

10. LAND MAMMALS

Did your household try to harvest or use game in 1987-1988? YES _____ NO _____

If YES, please complete the following table:

| SPECIES | USED | | TRIED TO HARVEST | | NUMBER HARVESTED | RECEIVED | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | | YES | NO | YES | NO |
| BLACK BEAR (68) | | | | | | | | | |
| DEER (69) | | | | | | | | | |
| GOAT (70) | | | | | | | | | |
| MOOSE (71) | | | | | | | | | |
| PORCUPINE (72) | | | | | | | | | |
| RABBIT/HARE(73) | | | | | | | | | |
| OTHER | | | | | | | | | |

11. FURBEARERS

Did anyone in your household try to harvest or use furbearers during 1987-1988? YES _____ NO _____

If YES, please complete the following table:

| SPECIES | USED | | TRIED TO HARVEST | | # HARV. | USED FOR | | RECEIVED | | | GAVE AWAY | | | SOLD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | YES | | NO | YES | | NO | | |
| | YES | NO | YES | NO | | FOOD | FUR | FOOD | FUR | | FOOD | FUR | | # | AVE PRICE |
| BEAVER (76) | | | | | | | | | | | | | | | |
| MINK (77) | | | | | | xx | | xx | | | xx | | | | |
| FOX (78) | | | | | | xx | | xx | | | xx | | | | |
| WOLF (79) | | | | | | xx | | xx | | | xx | | | | |
| WOLVERINE(80) | | | | | | xx | | xx | | | xx | | | | |
| LAND OTTER(81) | | | | | | xx | | xx | | | xx | | | | |
| MUSKRAT (82) | | | | | | | | | | | | | | | |
| LYNX (83) | | | | | | | | | | | | | | | |
| MARTEN (84) | | | | | | XX | | XX | | | XX | | | | |
| COYOTE (85) | | | | | | XX | | XX | | | XX | | | | |
| WEASEL (86) | | | | | | XX | | XX | | | XX | | | | |
| OTHER | | | | | | | | | | | | | | | |

12. BIRDS

Did your household try to harvest or use birds during 1987-1988? YES _____ NO _____

If YES, please complete the table below:

| SPECIES | USED | | TRIED TO HARVEST | | SEASON | NUMBER HARVESTED | RECEIVED | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | | | YES | NO | YES | NO |
| PTARMIGAN(90) | | | | | | | | | | |
| GROUSE (91) | | | | | | | | | | |

12 cont.

| SPECIES | USED | | TRIED TO HARVEST | | SEASON | NUMBER HARVESTED | RECEIVED | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | | | YES | NO | YES | NO |
| GEESE sp(92) | | | | | | | | | | |
| f(93) | | | | | | | | | | |
| SNDHL CRANE(94) | | | | | | | | | | |
| f(95) | | | | | | | | | | |
| MALLARD (96) | | | | | | | | | | |
| f(97) | | | | | | | | | | |
| PINTAILS(98) | | | | | | | | | | |
| f(99) | | | | | | | | | | |
| BUFFLEHEADS(100) | | | | | | | | | | |
| f(101) | | | | | | | | | | |
| GADWALL (102) | | | | | | | | | | |
| f(103) | | | | | | | | | | |
| WIGEON (104) | | | | | | | | | | |
| f(105) | | | | | | | | | | |
| TEAL (106) | | | | | | | | | | |
| f(107) | | | | | | | | | | |
| GOLDENEYE(108) | | | | | | | | | | |
| OLD SQUAW(109) | | | | | | | | | | |
| HARLEQUIN(110) | | | | | | | | | | |

12 cont.

| SPECIES | USED YES | USED NO | TRIED TO HARVEST YES | TRIED TO HARVEST NO | SEASON | NUMBER HARVESTED | RECEIVED YES | RECEIVED NO | GAVE AWAY YES | GAVE AWAY NO |
|---|---|---|---|---|---|---|---|---|---|---|
| EIDERS (111) | | | | | | | | | | |
| SCOTERS (112) | | | | | | | | | | |
| MERGANSERS(113) | | | | | | | | | | |
| SCAUP (114) | | | | | | | | | | |
| SHOREBIRDS (snipe, yellowlegs, etc. | | | | | | | | | | |
| GULL EGGS (118) | | | | | | doz. | | | | |
| DUCK EGGS (119) | | | | | | doz. | | | | |
| OTHER EGGS | | | | | | doz. | | | | |

13. PLANTS

Did your household harvest or use wild plants in 1986-1987? YES ____ NO _____

If YES, please complete the table below:

| | USED YES | USED NO | TRIED TO HARVEST YES | TRIED TO HARVEST NO | AMOUNT HARVESTED | RECEIVED YES | RECEIVED NO | GAVE AWAY YES | GAVE AWAY NO |
|---|---|---|---|---|---|---|---|---|---|
| BERRIES(122) | | | | | gals | | | | |
| PLANTS (123) | | | | | lbs | | | | |
| WOOD (124) | | | | | cords | | | | |

What kinds of berries and plants did your household harvest? _____

_____

14. EMPLOYMENT HISTORY

Please complete the following information for each adult (18 or older) and for all jobs held by the adult households members listed in question 1 between April 1987 and March 1988. Please include commerical fishing activities.

| ID # FROM QUESTION 1 | JOB TITLE | EMPLOYER/[a] DISPOSITION | LOCATION OF JOB | # OF MONTHS WORKED P/YEAR | HOURS WORKED PER WEEK | AMOUNT EARNED |
|---|---|---|---|---|---|---|
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |

[a] includes Retired, Unemployed, Homemaker, Student, Disabled.

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15. Other Income Sources (Check all that apply and indicate amount)

_____ Social Security Income $ _____ _____ Pension $_____

_____ Longevity Bonus $ _____ _____ Energy Assistance $_____

_____ Adult Public Assistance $ _____ _____ Disability $_____

_____ Food Stamps $ _____ _____ Other (Specify) $_____

_____ Aid to Families with Dependent Children _____ $_____

16. Please estimate your monthly expenses:

_____ Heating fuel _____ Transportation fuel _____ Water _____ Housing

_____ Food _____ Electricity _____ Phone _____ Propane

TATITLEK RESOURCE USE STUDY, 1989

HOUSEHOLD ID# _____ Date _____ Interviewer _____

The purpose of this survey is to gather information about the fish and game resource activities of your household from April 1988 through March 1989. When we ask "Did you use a resource?" we mean did your family harvest it, eat it, serve it, or otherwise use it in your home.

1. HOUSEHOLD INFORMATION, Household members during study year of 1988-89.

| ID # | M/F | BIRTHDATE MM/DD/YY | RESIDENCE OF PARENT WHEN YOU WERE BORN | YEAR YOU MOVED TO CORDOVA | PLACE YOU MOVED FROM | ETHNICITY |
|---|---|---|---|---|---|---|
| 1 HEAD | | | | | | |
| 2 SPOUSE | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |

2. Using Person's I.D. #'s from the table above, indicate which household members participated in harvesting activities during 1988-89.

Hunting __ __ __ __ __ Fishing (incl clams, etc) __ __ __ __ __ Plant Gathering __ __ __ __ __

Trapping __ __ __ __ __ Held 1988 Sport Fish license __ __ __ __ __

3. COMMERCIAL FISHING

Did members of your household participate in commercial fishing during 1980? YES ___ NO ___

If YES, please complete the following table:

| SPECIES | FISHED | | | LOCATION & GEAR TYPE | NUMBER REMOVED | | I.D.#'S OF FISHERMEN | |
|---|---|---|---|---|---|---|---|---|
| | YES | NO | INCIDTL. | | FOR OWN HOME USE | GAVE AWAY | Permit H. | Crew |
| KING | | | | | | | | |
| RED | | | | | | | | |
| CHUM | | | | | | | | |
| PINK | | | | | | | | |
| SILVER | | | | | | | | |
| HERRING | | | | | gals | gals | | |
| HER SACROE | | | | | | | | |
| ROE ON KELP | | | | xxx | gals | gals | | |
| KING CRAB | | | | xxx | | | | |
| DUNGENESS | | | | xxx | | | | |
| TANNER | | | | xxx | | | | |
| COD, BLACK | | | | xxx | | | | |
| HALIBUT | | | | xxx | lbs | lbs | | |
| GROUND FISH Specify: | | | | xxx | | | | |
| SHRIMP | | | | xxx | lbs | lbs | | |
| RAZOR CLAMS | | | | xxx | gals | gals | | |
| OTHER | | | | | | | | |

4. NON-COMMERCIAL FISHING

Did your household try to harvest or use any type of fish or marine invertebrates in 1988-1989?
YES _____ NO _____

5. Did your household try to harvest or use salmon in 1989? YES _____ NO _____
If YES, please complete the following table:

| SPECIES | USED | | TRIED TO HARVEST | | NO. HARVESTED BY GEAR TYPE | | | REC. | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | SUBS. GILLNET | ROD & REEL | OTHER | YES | NO | YES | NO |
| KING | | | | | | | | | | | |
| RED | | | | | | | | | | | |
| CHUM | | | | | | | | | | | |
| PINK | | | | | | | | | | | |
| SILVER | | | | | | | | | | | |
| SLM (unk) | | | | | | | | | | | |
| SPAWNERS | | | | | | | | | | | |

6. Did your household try to harvest or use any other marine fish in 1988-89? YES ____ NO ____
If YES, please complete the following table:

| SPECIES | USED | | TRIED TO HARVEST | | NO. HARVESTED BY GEAR TYPE | | | REC. | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | SUBS. NET | ROD & REEL | OTHER | YES | NO | YES | NO |
| HALIBUT | | | | | lbs | | | | | | |
| SMELT | | | | | gals. | | | | | | |
| HERRING | | | | | gals | | | | | | |
| HHRNGROE | | | | | gals | | | | | | |
| GRAY COD | | | | | | | | | | | |

6. (cont)

| SPECIES | USED | | TRIED TO HARVEST | | NO. HARVESTED BY GEAR TYPE | | | REC. | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | SUBS. NET | ROD & REEL | OTHER | YES | NO | YES | NO |
| BLACK COD | | | | | | | | | | | |
| LINGCOD | | | | | | | | | | | |
| RKFISH-BLK | | | | | | | | | | | |
| RKFISH-RED | | | | | | | | | | | |
| FLOUNDER | | | | | | | | | | | |
| SOLE | | | | | | | | | | | |
| OTHER | | | | | | | | | | | |

7. DID YOUR HOUSEHOLD TRY TO HARVEST OR USE ANY FRESHWATER FISH IN 1988-89? YES ____ NO ____
IF YES, please complete the following table:

| SPECIES | USED | | TRIED TO HARVEST | | NO. HARVESTED BY GEAR TYPE | | | REC. | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | SUBS. NET | ROD & REEL | OTHER | YES | NO | YES | NO |
| RAINBOW | | | | | | | | | | | |
| LAKE TROUT | | | | | | | | | | | |
| GRAYLING | | | | | | | | | | | |
| DOLLY VARDEN | | | | | | | | | | | |
| OTHER | | | | | | | | | | | |

8. Did your household try to harvest or use any type of marine invertebrate in 1988-1989? YES ____ NO ____? If YES, please complete the table below:

| SPECIES | USED | | TRIED TO HARVEST | | NUMBER HARVESTED | RECEIVED | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | | YES | NO | YES | NO |
| DUNGNS CRAB | | | | | | | | | |
| KING CRAB | | | | | | | | | |
| TANR CRAB | | | | | | | | | |
| SHRIMP | | | | | lbs | | | | |
| BUTTER CLAMS | | | | | gals | | | | |
| RAZOR CLAMS | | | | | gals | | | | |
| OTHER CLAMS | | | | | gals | | | | |
| MUSSELS | | | | | gals | | | | |
| COCKLES | | | | | gals | | | | |
| CHITONS | | | | | gals | | | | |
| OCTOPUS | | | | | | | | | |
| OTHER | | | | | | | | | |

9. MARINE MAMMALS

Did your household try to harvest or use marine mammals or marine mammal products during 1988-1989?

YES _____ NO _____ If YES, please complete the table below:

| SPECIES | USED | | TRIED TO HARVEST | | AMOUNT OR NUMBER HARVESTED | PORTIONS USED* | RECEIVED | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | | | YES | NO | YES | NO |
| HARBOR SEAL | | | | | | | | | | |
| SEA LION | | | | | | | | | | |
| SEA OTTER | | | | | | | | | | |
| OTHER | | | | | | | | | | |

* Which parts were used for food?

10. LAND MAMMALS

Did your household try to harvest or use game in 1988-1989? YES _____ NO _____

If YES, please complete the following table:

| SPECIES | USED | | TRIED TO HARVEST | | NUMBER HARVESTED | RECEIVED | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | | YES | NO | YES | NO |
| BLACK BEAR | | | | | | | | | |
| DEER | | | | | | | | | |
| GOAT | | | | | | | | | |
| MOOSE | | | | | | | | | |
| PORCUPINE | | | | | | | | | |
| RABBIT/HARE | | | | | | | | | |
| OTHER | | | | | | | | | |

11. FURBEARERS

Did anyone in your household try to harvest or use furbearers during 1988-1989? YES _____ NO _____

If YES, please complete the following table:

| SPECIES | USED | | TRIED TO HARVEST | | # HARV. | USED FOR | | RECEIVED | | | GAVE AWAY | | | SOLD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | YES | | NO | YES | | NO | | |
| | YES | NO | YES | NO | | FOOD | FUR | FOOD | FUR | | FOOD | FUR | | # | AVE PRICE |
| BEAVER | | | | | | | | | | | | | | | |
| MINK | | | | | | xx | | xx | | | xx | | | | |
| FOX | | | | | | xx | | xx | | | xx | | | | |
| WOLF | | | | | | xx | | xx | | | xx | | | | |
| WOLVERINE | | | | | | xx | | xx | | | xx | | | | |
| LAND OTTER | | | | | | xx | | xx | | | xx | | | | |
| MUSKRAT | | | | | | | | | | | | | | | |
| LYNX | | | | | | | | | | | | | | | |
| MARTEN | | | | | | xx | | xx | | | xx | | | | |
| COYOTE | | | | | | xx | | xx | | | xx | | | | |
| WEASEL | | | | | | xx | | xx | | | xx | | | | |
| OTHER | | | | | | | | | | | | | | | |

12. BIRDS

Did your household try to harvest or use birds during 1988-1989? YES ____ NO ____

If YES, please complete the table below:

| SPECIES | USED | | TRIED TO HARVEST | | SEASON | NUMBER HARVESTED | RECEIVED | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | | | YES | NO | YES | NO |
| PTARMIGAN | | | | | | | | | | |
| GROUSE | | | | | | | | | | |

12 cont.

| SPECIES | USED | | TRIED TO HARVEST | | | NUMBER HARVESTED | RECEIVED | | GAVE AWAY | |
|---|---|---|---|---|---|---|---|---|---|---|
| | YES | NO | YES | NO | | | YES | NO | YES | NO |
| GEESE | | | | | | | | | | |
| SNDHL CRANE | | | | | | | | | | |
| MALLARD | | | | | | | | | | |
| PINTAILS | | | | | | | | | | |
| BUFFLEHEADS | | | | | | | | | | |
| GADWALL | | | | | | | | | | |
| WIGEON | | | | | | | | | | |
| TEAL | | | | | | | | | | |
| GOLDENEYE | | | | | | | | | | |
| OLD SQUAW | | | | | | | | | | |
| HARLEQUIN | | | | | | | | | | |

12 cont.

| SPECIES | USED YES | USED NO | TRIED TO HARVEST YES | TRIED TO HARVEST NO | | NUMBER HARVESTED | RECEIVED YES | RECEIVED NO | GAVE AWAY YES | GAVE AWAY NO |
|---|---|---|---|---|---|---|---|---|---|---|
| EIDERS | | | | | | | | | | |
| SCOTERS | | | | | | | | | | |
| MERGANSERS | | | | | | | | | | |
| SCAUP | | | | | | | | | | |
| SHOREBIRDS (snipe, yellowlegs, etc. | | | | | | | | | | |
| GULL EGGS | | | | | | doz. | | | | |
| DUCK EGGS | | | | | | doz. | | | | |
| OTHER EGGS | | | | | | doz. | | | | |

13. PLANTS

Did your household harvest or use wild plants in 1988-1989? YES ____ NO ____

If YES, please complete the table below:

| | USED YES | USED NO | TRIED TO HARVEST YES | TRIED TO HARVEST NO | AMOUNT HARVESTED | RECEIVED YES | RECEIVED NO | GAVE AWAY YES | GAVE AWAY NO |
|---|---|---|---|---|---|---|---|---|---|
| BERRIES | | | | | gals | | | | |
| PLANTS | | | | | lbs | | | | |
| WOOD | | | | | cords | | | | |

What kinds of berries and plants did your household harvest? _____

_____

14. EQUIPMENT

Did your household own any of the following equipment, or use it for hunting or fishing in 1988-89?

| TYPE OF EQUIPMENT | NUMBER OWNED (0 if only used) | RESOURCE ACTIVITIES IN 1988-89 FOR WHICH EQUIPMENT WAS USED |
|---|---|---|
| Airplane | | |
| Airboat | | |
| Skiff (under 18 ft) | | |
| Pleasure craft | | |
| Commercial Boat | | |
| Non-motorized boat | | |
| 3 wheeler/ATV | | |
| Snowmachine | | |
| Highway vehicle | | |

15. EMPLOYMENT HISTORY

Please complete the following information for all jobs held by the employed adult household members listed in question 1 during the calendar year 1988-89.

| ID# FROM Q. #1 | JOB TITLE* | EMPLOYER | LOCATION | WHICH MONTHS WORKED IN YEAR | HOURS WORKED PER WEEK | INCOME |
|---|---|---|---|---|---|---|
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |
| | | | | A M J J A S O N D J F M | | |
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* For those not employed, please specify Retired, Unemployed, Disabled, Student, Homemaker

16. Other Income Sources (Check all that apply and indicate amount)

| | | | | | |
|---|---|---|---|---|---|
| Social Security | $_____ | Pension/Retirement | $_____ | Longevity Bonus | $_____ |
| Adult Public Asst | $_____ | Disability | $_____ | Energy Assistance | $_____ |
| AFDC | $_____ | Food Stamps | $_____ | Perm Fund Dividend | $_____ |
| Corp Dividend | $_____ | Other | $_____ | | |

17. Please estimate your monthly household expenses.

| | | | |
|---|---|---|---|
| _____ Heating fuel | _____ Transportation fuel | _____ Water | _____ Housing |
| _____ Food | _____ Electricity | _____ Phone | _____ Propane |

# APPENDIX C

## 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 berries and many invertebrates, 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.

Conversion weights for the five species of salmon found in Prince William Sound and Copper River were computed by obtaining live weights from commercial fishery data (Brady et al. 1988:94-96; 1990:37,82,94,103). For king, sockeye, and silver salmon, weights were taken from the Copper River-Bering River district. Weights from the Prince William Sound district were used for pink and chum salmon. Then, a usable weight factor, based on Seagrant research (Crapo et al. 1988) was applied. Because weight information is available for each year, there are separate salmon conversion factors for the two harvest years. For the remaining species, there is a single conversion weight, derived from the best available source, or a figure from a similar area was used. For crab, a usable weight of 30 percent of live weight was applied.

| Species | Usable Weight (lbs) 1987 | 1988 |
|---|---|---|
| *Finfish:* | | |
| King Salmon | 19.80 | 19.27 |
| Sockeye Salmon | 4.80 | 4.44 |
| Pink Salmon | 2.52 | 2.53 |
| Chum Salmon | 5.80 | 6.24 |
| Silver Salmon | 6.69 | 7.35 |

| | Usable weight | Source |
|---|---|---|
| Cod, Black | 3.1 | Bracken 1986 |
| Cod, Gray | 3.2 | Subsistence Division file data |
| Cod, Ling | 4.0 | Mills and Firman 1986 |
| Dolly Varden | 1.4 | Subsistence Division file data |
| Herring | 6.0/gal | Subsistence Division file data |
| Herring Roe-on-Kelp | 7.0/gal | Brady 1985 |
| Rockfish, Black | 1.5 | Subsistence Division file data |
| Rockfish, Red | 4.0 | Researcher Estimate |
| Smelt/Eulachon | 3.5/gal | Subsistence Division file data |
| *Marine Invertebrates:* | | |
| Chitons (Gumboots) | 4.0/gal | Subsistence Division file data |
| Clams, Cockles, Mussels | 3.0/gal | Subsistence Division file data |
| Sea Urchins | .5/gal | Subsistence Division file data |
| Crab, Dungeness | .7 | Subsistence Division file data |
| Crab, Tanner | 1.6 | Subsistence Division file data |
| Octopus | 4.0 | KANA 1983 |
| *Marine Mammals:* | | |
| Sea Lion | 100.0 | Researcher Estimate |
| Harbor Seal | 37.8 | Pitcher and Calkins 1979 |
| Porpoise, Dall | 60.0 | Researcher Estimate |
| *Game:* | | |
| Black Bear | 58.0 | Miller 1983 |
| Deer | 43.2 | Subsistence Division file data |
| Mountain Goat | 70.0 | Griese 1985 |
| Moose | 540.0 | Subsistence Division file data |
| *Birds:* | | |
| Waterfowl: | | |

Based upon the average of the mean live weights of the male and female of each species as reported by Bellrose (1976), multiplied by a standard factor of .4.

| | | |
|---|---|---|
| Bufflehead | .4 | |
| Goldeneye | .8 | |
| Mallard | 1.0 | |
| Merganser | .6 | |
| Pintail | .8 | |
| Scaup & Scoter | .9 | |
| Canada Geese, Dusky | 3.6 | |
| Grouse & Ptarmigan | .7 | Subsistence Division file data |
| Cormorant | 2.5 | Researcher Estimate |

| | Usable weight | Source |
|---|---|---|
| Eggs | | |
| Arctic Tern | .05 | KANA 1983 |
| Seagull | .3 | Subsistence Division file data) |
| Duck & Goose | .15 | Subsistence Division file data |
| *Vegetation:* | | |
| Berries | 4.0 lbs/gal | Stratton & Georgette 1984 |