WRANGELL HARVEST STUDY

A COMPREHENSIVE STUDY OF WILD RESOURCE HARVEST AND USE BY WRANGELL RESIDENTS

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CHAPTER 1

INTRODUCTION

PURPOSE AND SCOPE

The purpose of this Wrangell Harvest Study (WHS) is to document the hunting, fishing and gathering activities of Wrangell residents. The information will be used for planning and policy-making by the Alaska Department of Fish and Game (ADF&G), the United States Forest Service (USFS) and other government and private agencies.

Initially, the WHS was an independent project of the ADF&G, Division of Subsistence. The opportunity developed, however, to coordinate this project with the efforts of other government agencies interested in similar data. It was believed that a cooperative project would yield more and better data, especially geographic information on harvest activities. As finally implemented, the WHS was both a component of a larger cooperative effort, as well as an independent study. The planning, data gathering and data encoding were done in conjunction with the Tongass Resource Use Cooperative Study (TRUCS). TRUCS is a harvest study of twenty-nine (29) Southeast Alaska communities being undertaken by the ADF&G, USFS, and the University of Alaska, Institute for Social and Economic Research (ISER). The remainder of the WHS, including background research specific to Wrangell, key informant interviewing, data analysis and preparation of this report, was conducted by Phoenix Associates working independently as a consultant to the ADF&G.

Much of the data gathered during the cooperative phase of TRUCS is beyond the scope of this report. That data, such as detailed information on deer hunting areas, will not be analyzed nor discussed. Certain other data, such as digitized geographic information on harvest activities, was not available for inclusion in this report.

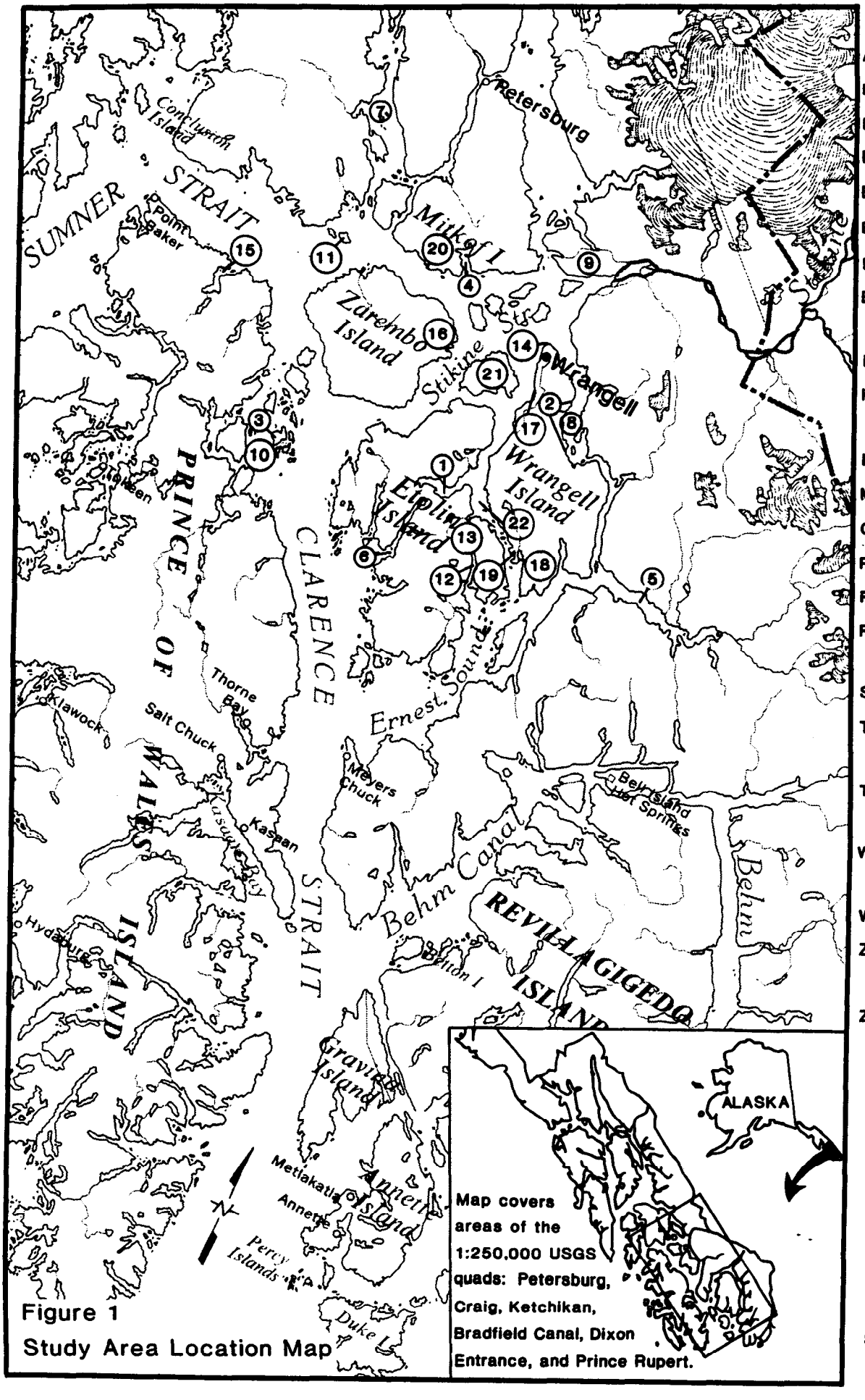
The study area was defined to include all of the communities on Wrangell Island, including Thoms Place and the Back Channel, as well as Olive Cove on Etolin Island. The following were not included: the logging camps at Anita Bay, Roosevelt Harbor and Woodpecker Cove; the oyster farmers who live in the Kashevarof Pass area and in Ernest Sound; the family that lives at the remote FAA installation on Level Island; residents of Farm Island in the mouth of the Stikine River; the people who live at Bradfield Canal to maintain the Tyee power station; and, the caretaker family at the Burnett Inlet hatchery site. Figure 1 is a study area location map.

METHODOLOGY

Development of the methodology for the WHS was a cooperative effort between the ADF&G, USFS, and ISER. The survey instrument consisted of two elements, a structured questionnaire and detailed mapping of harvest areas. The questionnaire concentrated on resource harvesting for the period between November 1986 and October 1987. The mapping element required respondents to indicate any hunting and fishing areas ever used while living in Wrangell on mylar overlays on United States Geological Survey (USGS) 1:250,000 scale quadrants.

The initial survey instrument was field tested, found to take too long to administer, and revised. The survey instrument was again field tested and adopted. After Wrangell data was gathered the survey instrument was again revised by ISER personnel to allow for easier interviewing and data entry. ISER personnel transferred the Wrangell data from the original forms to the new forms so that the data encoding would be consistent throughout all the TRUCS communities. A copy of the final TRUCS survey instrument is presented in Appendix A.

The Wrangell community was directly involved in the WHS. Kathryn Cohen of Phoenix Associates, the project manager, and Dave Rak of the USFS are Wrangell residents. In addition, three local residents were hired as interviewer-interpreters using



Anita Bay 1
Back Channel . . 2
Blashke I. 3
Blind Slough . . . 4
Bradfield Canal . 5
Burnett Inlet . . . 6
Duncan Canal . . 7
Eastern Passage 8
Farm I. 9
Kashevarof Passage 10
Level I. 11
Menefee Inlet . . 12
Olive Cove . . . 13
Pt. Highfield . . 14
Red Bay. 15
Roosevelt Harbor 16
Shoemaker Bay. 17
Thoms Place (bay). 18
Thoms Place (community) . . 19
Woodpecker Cove 20
Woronkofski I. . 21
Zimovia Highway 17
Zimovia Strait . . 22

SCALE
1:1,000,000

Subsistence Division

Figure 1
Study Area Location Map

funds provided by the Bureau of Indian Affairs (BIA): Nora Black; Sandra Churchill; and, Janice Hotze.

A letter from ADF&G describing the WHS was sent to the Wrangell City Council, the Wrangell Cooperative Association (Wrangell's IRA organization), the Alaska Native Brotherhood/Sisterhood, Tlingit and Haida Central Council and the Wrangell Fish and Game Advisory Committee. The study plan was reviewed with representatives of each group. Local media explained the project to the community. The Wrangell Sentinel, the local weekly newspaper, carried an article about the project and a special column describing the survey. The local radio station, KSTK, covered the survey through a broadcast interview with the project manager. The high local profile given the WHS paid handsome dividends in respondent cooperation and community support.

The sample selection procedure required a stratified random sample. ADF&G wanted to over sample very productive resource harvesting households to obtain more detailed data. This technique resulted in overall reliability in the data without the cost of a more time consuming sample selection procedure. Households were to be stratified according to eight (8) attributes intended to measure in advance probable intensity of harvest activity by each household.

Unfortunately, there was no readily available list of all Wrangell households that also identified each adult household member. We constructed such a list in several steps. First, a list of all adult Wrangell residents was prepared from the telephone directory, a utility billing list, a voter registration list, a post office box directory and ADF&G harvest records. Each adult Wrangell resident was assigned to a household based upon commonly held characteristics (such as same last name, same address, etc.) using a computerized sort program and a custom algorithm. Each household was assigned a unique "household" number. The same number was assigned to each member of that household. The resulting household list was reviewed by key informants to assure accuracy. After some small adjustments were made, the general consensus was that the list seemed relatively complete and accurate.

By this process, we arrived at 998 total households in the road connected Wrangell community, and 17 households in the outlying areas, for a total of 1,015. This number corresponded closely with a visual household count done by City of Wrangell officials in 1986. They found 974 households, including houseboats, float houses and Back Channel houses, but not including Thoms Place or Olive Cove, for an adjusted total of 986. The difference may be attributed to some growth between the two counts, including trailer court expansion.

ADF&G supplied a list of Wrangell residents who possessed any one or more of the following: a 1985 commercial fishing permit; a 1986 deer harvest ticket; a 1985 moose harvest ticket; and/or, a 1985 goat harvest ticket. This list was reviewed by four key informants selected on the basis of longevity in the community, occupation, and ethnicity. Each key informant identified individuals they believed were "very productive" wild resource harvesters. A positive identification of an individual by a key informant was considered a separate attribute.

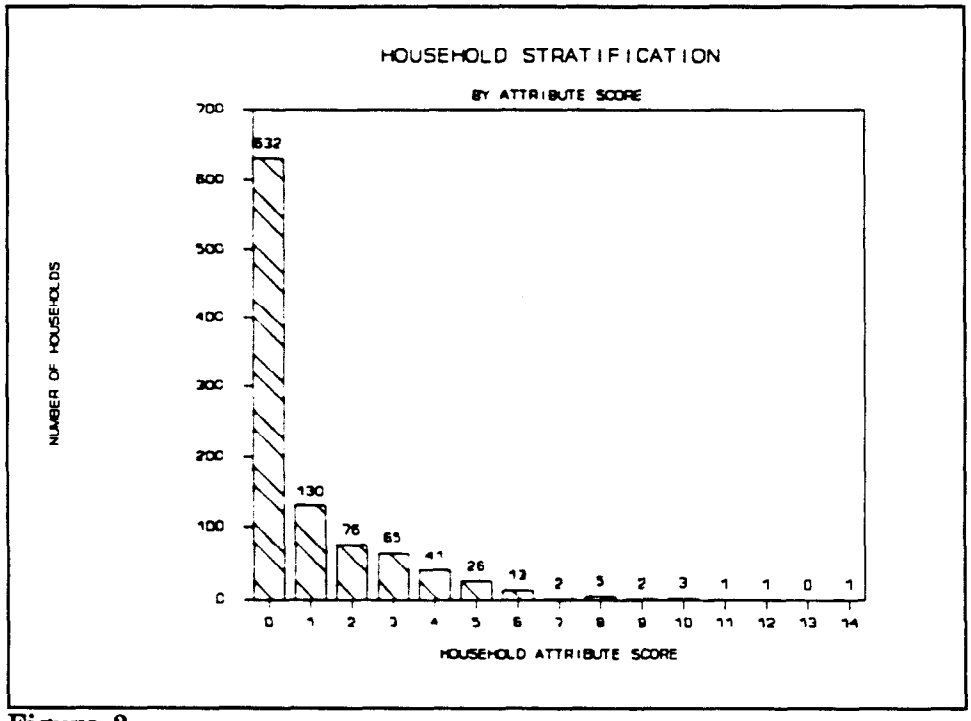


Figure 2

We combined the attribute score of all individuals in each household to arrive at a combined household attribute score. The high stratum was defined as any household with an attribute score of greater than two. The low stratum was defined as any household with a score of less than two. We then ranked the households by score: 236 households (23.6%) scored greater than two (2) and the remaining 762 households (76.4%) scored less than two (2). Figure 2 depicts the household stratification by score. The highest ranked household scored 14 and the mean score was 0.990. ADF&G determined that 32 households should be randomly selected from the "high" stratum, and 33 households randomly selected from the "low" stratum. Figure 3 depicts the household stratification by score for the 65 selected households.

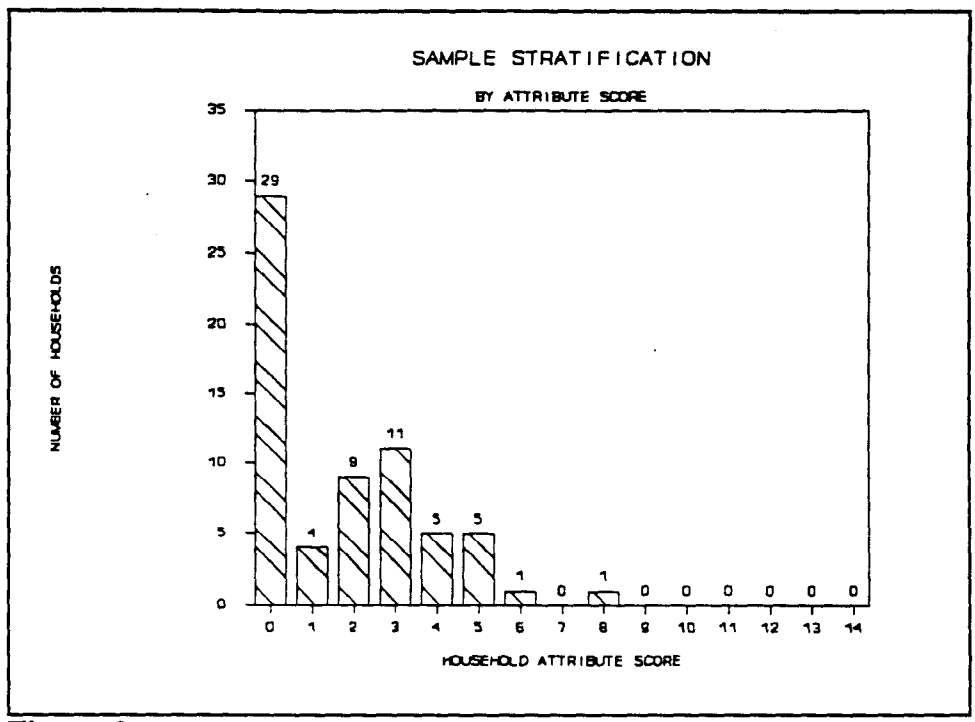


Figure 3

A slightly different procedure was used for Thoms Place, Olive Cove and the Back Channel. The Alaska Department of Natural Resources files were reviewed, and occupied parcels were identified. Key informants provided supplemental information. We found eleven (11) households in Thoms Place, one (1) household at Olive Cove and

five (5) on the Back Channel. Several other homes and cabin sites were also found, but these sites were not occupied on a full-time basis. Thirteen (13) of these seventeen (17) households were opportunistically sampled at the following rates: Thoms Place (8/11); Olive Cove (1/1); and, Back Channel (4/5).

A total of 78 interviews were administered between December 1, 1987 and January 31, 1988. Interviews were done at a place and time convenient to the respondent. When possible, we asked the respondent to come to our temporary office in the Episcopal Church Parish Hall where we had tables set up to spread out maps; however, we also conducted interviews at the respondent's home, business, and boat. Respondents at three (3) households declined to participate.

Surveys took anywhere from 10 to 388 minutes to administer. The average time was 62 minutes. The entire process was complicated. Following each interview, the map mylars were edited to assure that the marks placed on them by the respondent were consistent with the coding format established for the TRUCS project. In addition, the survey forms themselves were reviewed to assure coding criteria were met. The completed survey instruments and map mylars were then sent to ADF&G and ISER for processing.

Throughout the data collection process, confidentiality has been maintained. Each household was assigned a code number. No household information has been used in isolation from other households.

FINAL REPORT

Phoenix Associates prepared this final report. Harvest data from other sources is included in this report to help explain a pattern or to clarify a trend in the WHS data. We tried to note all the data inconsistencies. Care must be taken, however, not to generalize across data gathered from other sources because it was collected under different circumstances.

The WHS data was encoded by ISER personnel using the Statistical Package for the Social Sciences (SPSS). A portable file was created so Wrangell data could be analyzed on an IBM personal computer. Some minor problems were encountered in this down loading process, but for the most part the procedure went smoothly.

While the survey data was being processed, we conducted background research on Wrangell. Many sources were checked. There is no comprehensive history of Wrangell and comparable data on its economy and demography is difficult to find. Most information is too general, or would justify a separate research project to sort out. The information we present in this report is meant to give a "broad picture" and "sense" of Wrangell to the reader, and is neither definitive nor comprehensive.

Unfortunately, the geographic information gathered during the WHS was not digitized in time for this report, however, ADF&G personnel prepared hand drawn composite maps. These maps depict the outer boundaries of all the areas reportedly used by Wrangell residents for harvesting particular resource categories. In general, the data analysis for this report follows procedures used by ADF&G for similar studies. Survey data was weighted to account for the stratified sample. In this report we generalize the data obtained from the sample to arrive at estimates of total communtiy harvests. Appendix B lists the confidence intervals for the total community harvests within each resource category.

ADF&G Division of Subsistence reviewed the report draft. Bob Wolfe, Division of Subsistence Research Director, contributed his expertise and wrote a chapter for this report entitled "Resource Harvest by Alaska Native Households." We made corrections and changes to the text. The text was finaled in March, 1989.

CHAPTER 2

STUDY AREA PROFILE

GEOGRAPHY

Wrangell Island is located in the Alexander Archipelago in the central part of Southeast Alaska's Panhandle (Figure 1). Northeast of Wrangell Island is the Stikine River. The river stretches over three hundred fifty miles from its glacial headwaters in northwestern British Columbia to a broad expansive tidal delta adjacent to Wrangell Island. To the east is the Eastern Passage, separating Wrangell from the mountainous mainland. To the southeast lies Bradfield Canal, which extends southwest to Ernest Sound. To the southwest is Etolin Island, separated from Wrangell Island by Zimovia Strait. To the west is Woronkofski Island which abuts Sumner Strait.

Wrangell Island is relatively small. It extends for approximately 30 miles north to south and 15 miles east to west at its widest point. The terrain is steep in places with elevations as high as 3,350 feet. Wrangell City is situated on the northern tip of the island. Wrangell's neighboring communities are Petersburg, located on Mitkof Island, approximately 40 miles to the north, and Ketchikan, located on Revillagigedo Island, approximately 85 miles to the south.

Downtown Wrangell has a turn-of-the-century flavor. In spite of devastating fires in 1906 and 1952, the false front, wood frame buildings and bungalow style houses reflect the town's early twentieth century heritage. The older section of town surrounds a natural harbor. It is still possible to live in Wrangell without a car. The grocery stores provide free delivery. If you live in the older section of town, you can easily walk to anywhere to take care of any business. The post office, government offices, library, museum, public schools and hospital are all within a short stroll.

The road connected portion of town extends in a loop around the northern most tip of the island, and then out 10 miles on Zimovia Highway down the western shoreline. Houses are spread out along the highway. A second harbor is located at Shoemaker Bay about five miles from downtown. The main sawmill complex is located about two miles farther out at "seven mile".

Three outlying areas were included in this study. Although several rugged individuals have lived in each of these areas at one time or another, the current residents are developing property acquired through recent public land disposal. Although these areas are outside the road connected Wrangell City, the residents of all three areas rely on Wrangell as a service center and supply base.

The first area is the "Back Channel". It stretches for about 12 miles along the northeast shore of the island along the Eastern Passage. The Back Channel is within city limits, however, it is only accessible by water. There were six (6) households on the Back Channel at the time of this study. The second area, Thoms Place, is located on the southwest end of Wrangell Island, on Zimovia Strait, approximately 25 miles south of town. Thirteen (13) families are living in a series of houses built along the beach, some in sheltered "salt chucks" and others along Zimovia Strait. The third area, Olive Cove, is located on the northeast shore of Etolin Island, across Zimovia Strait from Thoms Place, approximately 21 miles south of town. There was only one household at Olive Cove on a full-time basis at the time of this study.

ENVIRONMENT

Wrangell Island has a maritime climate. Summers are cool, winters are mild and the rain falls year-round. Temperatures range from 42 degrees to 57 degrees Fahrenheit in summer and 29 degrees to 44 degrees in winter. Recorded extremes are -10 degrees and 91 degrees. Annual precipitation averages 82 inches per year. Winds average six miles per hour from an easterly direction.

The Wrangell Island area supports a variety of animal and plant resources. Sitka black tail deer range within the forest from the alpine tundra to the beach. Both black and brown bear are present, although only black bear is taken for meat. Mountain goat climb in the mainland mountains. Moose browse along the Stikine River where there is an abundance of cottonwood, alder and willow. Furbearers include wolf, wolverine, mink, land otter, marten and occasionally lynx.

Marine mammals in the Wrangell area include harbor seal, stellar sea lions, dall and harbor porpoises, and humpback, minke and killer whales. Only the seal and occasionally the sea lion are legally hunted.

There are a wide variety of waterfowl, seabirds and upland birds in the Wrangell area and adjacent tide flats. Waterfowl include canada geese, snow geese, sandhill crane, mallards, widegons, teals, shovelers, old squaw, golden eye, and bufflehead ducks. Seabirds include scoters, murres, murrlets, seagulls and commorants. Spruce grouse and blue grouse are present in the upland forest and along logging roads.

Each year, all five varieties of Pacific salmon are present. King salmon are available throughout the winter; however, they are most abundant in the spring as they migrate to the Stikine River to spawn. Sockeye arrive in early July, followed by pinks and chum and then by coho salmon in the late summer and early fall. Other species of finfish present include halibut and black cod, a variety of sole and flounder, grey cod, walleye pollock, and a variety of rockfish. Shallow water species harvested include herring, lingcod, smelt, and tom cod. Each spring, hooligan arrive to spawn in the Stikine River. Fresh water fish include steelhead, dolly varden, rainbow trout and cutthroat trout.

Invertebrates present include dungeness, tanner and king crab, as well as all of the available species of shrimp. Octopus are taken both for food and bait. Along the tide flats, people gather cockles and clams. Gumboots, sea urchins, sea cucumbers, and scallops are also present.

Wrangell lies within a coastal western hemlock - sitka spruce forest. The forest cover consists of western hemlock, sitka spruce, mountain hemlock, Alaska yellow cedar,

western red cedar, lodgepole pine and alder. The forest understory consists of shrubs and ferns growing through moss covered ground. Plants within the understory include high bush blueberry, huckleberry, salmonberry, cranberry, watermelon berry and raspberry. Other plants such as fiddlehead fern and various mushroom species are present. Plants along the beaches include goose tongue, and beach asparagus. Intertidal areas support various species of kelp and seaweeds.

HISTORY

The history of Wrangell and the Stikine River flow together. The river is a natural transportation corridor into the interior of British Columbia, Canada. This locational advantage has shaped Wrangell's early history, first as Tlingit settlement and later as an exchange and supply center for foreign fur traders and prospectors in search of gold. Even today, the Stikine River contributes its rich fishery resources, timber, sand, gravel and minerals, and unmatched scenic beauty to sustain Wrangell's basic industries.

Wrangell Island belonged to the Stikine Tlingit (Shtax'heen Kwan). Their oral history retells the story of an ancient journey taken by Tlingit ancestors down the Stikine River, through a glacial tunnel until they arrived at the river's ocean outlet. These first settlers established a number of villages near the river mouth. During the nineteenth century, they occupied the village of Kotzlitzna, approximately 18 miles south of present-day Wrangell known locally as "Old Town" (Keithahn 1940:3).

Shtax'heen Kwan were a powerful and warlike tribe with a reputation for ferocity. Stikine Tlingit territory included the mainland coast from Cape Fanshaw to the Cleveland Peninsula. They claimed parts of Kupreanof and Prince of Wales Islands, and all of Wrangell Island, Etolin Island and other small islands in the vicinity. Their seasonal camps and settlements extended along the shores of the Stikine River as far up river as Telegraph Creek about 160 miles upriver, with an overlap area with the Tahlten between Glenora and the Tahltan River (Olson 1967: 3; MacLachlan 1981:458).

The Tlingit economy revolved around seasonal hunting, fishing and gathering activities. Throughout the winter, the Tlingit lived in substantial wooden houses in large villages. During other seasons, they occupied seasonal settlements to harvest available resources. Active traders, the Stikine Tlingit at Wrangell monopolized trade with the Tahltan Athabascan Indians who lived along the upper reaches of the Stikine River. They exchanged coastal marine products such as hooligan oil and sea mammal products for interior products such as moose and caribou hides (Oberg 1973: 70,109). Trade between these groups increased with the addition of trade goods brought by Russian, British and American traders.

Access to the rich fur resources from the interior attracted Russian and British traders. The Russian-American Company began trading in the vicinity of Wrangell as early as 1811. The Russians faced tough competition from the British owned Hudson Bay Company. To protect their interests, the Russians built a small trading post or fort known as Redoubt St. Dionsysius in 1834. According to Russian records, the site of the fort was purchased from the brother of Chief Shakes, Kek-khal'-tsech (Arndt, 1988: 30). The Tlingit settle of Kotslit-an was abandoned during this period and relocated around the Russian trading post.[1]

The Russian post operated for six years. In 1840, as part of a legal settlement, the Russian American Company leased part of their trading territory to the Hudson Bay Company. This lease included Redoubt St. Dionsysius which the British renamed "Fort Stikine" (Tikhmenev 1978:355).

The British operated Fort Stikine for four years. By the beginning of the 1840s, the fur trade faded in economic importance. Fashions changed, and the depression of 1841-43 all but eliminated the fur market. To cut costs, the Hudson Bay Company closed Fort Stikine in 1843 (Gibson 1987). The trading post was replaced by the Beaver, a company steam ship, which periodically visited Wrangell to trade.

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[1] *The settlement may have relocated as early as 1798 according to the local newspaper published May 14, 1898 (Greene 1982:5).*

The United States purchased rights to Alaska from Russia in 1867. Alaska became a territory under federal control. The U.S. Army selected Wrangell, a community of 32 houses and 508 people, for a small military post (Andrews 1937:38). The post was completed in 1870 and named Fort Wrangell. The army abandoned the post the following year.

During this period (1860-1900), Wrangell's economy was based on supplying Native traders and gold prospectors. As the fur trade waned, interest in gold increased. There were three gold strikes. Gold was first discovered on the Stikine River in 1861. River placer deposits were shallow and the rush short-lived. In 1872, gold was discovered in the Cassiar area of northern British Columbia. Wrangell boomed. By 1875 there were over 1,000 miners dependent on Wrangell as a supply center. Within a few years, however, miners exhausted Cassiar gold and left for richer ground.

In 1898, the Klondike strike brought another period of economic prosperity, but this too was short-lived. Wrangell was the first stop on the Stikine route to the Klondike. The population of Wrangell soared as nearly 5,000 hopeful prospectors landed in the community. The Canadians promised, but never built, a railway to connect the Stikine River to Teslin Lake and create a better route to Dawson City. When the railroad idea failed, miners bypassed Wrangell for other established routes (Cohen 1986).

The gold mining activities of the late 1800s firmly established Wrangell as a multi-cultural community. In 1877 missionaries arrived in Wrangell and established the first Presbyterian Church in Alaska. That same year, Catholic missionaries built their church, St. Rose of Lima. These missionaries also brought Euro-American education, and opened the first schools for Indian children.

By 1895, a commercial fish processing plant and a sawmill were operating in Wrangell. Although Wrangell continued to serve as a trading center, the fishing and timber industries brought new diversity and stability to the community. In 1903, Wrangell City incorporated. Industry in the town included one large sawmill, a fish cannery, several carpenter and cabinet shops, plus two breweries. The town boasted three hotels, three general merchandise stores, two restaurants, two newspapers, a

hardware store, a drugstore, a bakery, a dairy, a tobacco and candy shop, several transportation companies, several attorneys, doctors, real estate agents and custom house brokers, and a number of saloons.

The mix of industry and services in Wrangell has not changed much since then. Wrangell remains the "Gateway to the Stikine". Recent gold discoveries in British Columbia are promising another trade and transportation boom with Wrangell serving as way station and supply center. Tourists come to Wrangell each year, some stay, others move on. The fishing and timber industries are still primary, though cyclical and seasonal. The government sector has grown, and now provides the most stable employment base. The local Native community continues its proud heritage, which is shared by all residents of Wrangell.

CONTEMPORARY COMMUNITY

Wrangell City is a home rule city. An elected mayor and six member city council govern the city. The daily administration of city government is delegated to the city manager who serves at the pleasure of the council.

The City provides utilities to most in-town residents, including electricity, water, sewer, and trash collection. There is a professional police department, and a well equipped volunteer fire department with a search and rescue group. The city operates a hospital, long term care facility and public library and maintains public parks, playgrounds and cemetery.

Public education is administered through a five member elected school board. Public school buildings are new within seven years, and consist of a elementary school and a junior/senior high school complex. In 1987, a total of 494 students were enrolled in Wrangell schools. The schools were staffed by the equivalent of 53 to 57 full-time employees, including teachers and administrators (Barton 1988: pers.comm.).

The Alaska State Housing Authority maintains public low income housing in Wrangell. Senior housing is run by a private nonprofit group, as is a day care center,

a public radio station and an alcohol and drug abuse center. The Wrangell Museum is operated by the Wrangell Historical Society in a city owned building. Native organizations active in Wrangell include Tlingit Haida Central Council, Alaska Native Brotherhood/Sisterhood and an IRA Council known as the Wrangell Cooperative Association. There are several churches, some of which also sponsor community service programs such as day care and youth recreation.

Wrangell is a regular stop on the Alaska Marine Highway System ferry route. In addition, the town is served by two major barge lines. Several smaller freight operators service the surrounding islands and the small Stikine River settlements as far up as Telegraph Creek. There is a public airport complex with daily jet service. Several small airline companies operate commuter flights. Within the city there are roughly 16 miles of public road. In addition, single-lane logging roads crisscross Wrangell Island and most surrounding islands and provide access to upland areas.

Boats are a primary form of transportation and commerce. There is a public wharf capable of berthing large ships, and a barge loading facility. The two downtown harbors have moorage for 264 small boats plus transient moorage. Shoemaker Bay, a harbor located five miles from town, can accommodate 231 boats in exclusive stalls. These harbor facilities operate at full capacity.

DEMOGRAPHY

Early population estimates for Wrangell are confusing. Native and non-Native people were sometimes counted separately, and sometimes counted together. In addition, outlying populations were sometimes counted, other times they were not. People who made these early population estimates did not always qualify their census methods adequately for accurate analysis.

The 1839 population in the Wrangell area was estimated at 1,530 (Rogers 1985:43). During the period of fur trade (1804-1867), foreigners introduced alcohol, smallpox and

typhoid. A series of epidemics swept through the Native community. The aboriginal population was almost halved (Krause 1970:63).

In 1869, Vincent Colyer, Special Indian Commissioner, described Wrangell as having 32 houses, and 508 inhabitants (Andrews 1937:38). Other estimates suggest a slightly larger population (Rogers 1985:43). Those estimates, however, appear to include outlying areas. The population of Wrangell recorded in 1880 as part of the first United States census of Alaska, the tenth census of the United States, was 106, composed of 105 whites and one creole (Krause 1970:63). The census ignored the Wrangell Native population, which may be estimated at 317 from another source (Rogers 1985:43).

John Muir, naturalist, who visited Wrangell in 1879, noted two Indian villages in Wrangell, one of Stikine Tlingit and one of "foreign" Indians (Muir 1979:27). Aurel Krause, German geographer who traveled through Southeast Alaska in 1881, estimated the total Stikine Indian population to be about 1,000 (Krause 1970:63).

Records taken roughly every ten years since 1900 illustrate the Wrangell population's slow but steady growth (Figure 4). According to the 1980 census, Wrangell's population was 2,184, organized into 834 households. In 1985, the Alaska Department of Labor estimated Wrangell's population at 2,387, plus 193 persons in the outlying areas.

In 1987, City officials claimed the Wrangell population was 3,112 based on a formula used by the Alaska Department of Community and Regional Affairs to compute population estimates for local revenue sharing funds (Gove 1988: pers.comm.). City officials counted 974 households in Wrangell, but did not count any households in areas outside city limits. Our estimate for this study is based on a total count of 1,013 households, which includes those households in all of the outlying areas included in this study.

Expanding the household information from this study, Wrangell had an estimated population of 2,841. This estimated population is composed of 1,560 (54.9%) males and 1,281 (45.1%) females. The 75 surveyed households had an average size of 2.77 people. The mean age of the sample was 32.5 years, with males having a mean age of 30.1

years, and females slightly older with a mean age of 35.3 years. About thirty percent (30%) of the population was eighteen (18) years or younger, while less than ten percent (9.7%) were sixty-five or older. Figure 5 is an age and gender profile of the surveyed households.

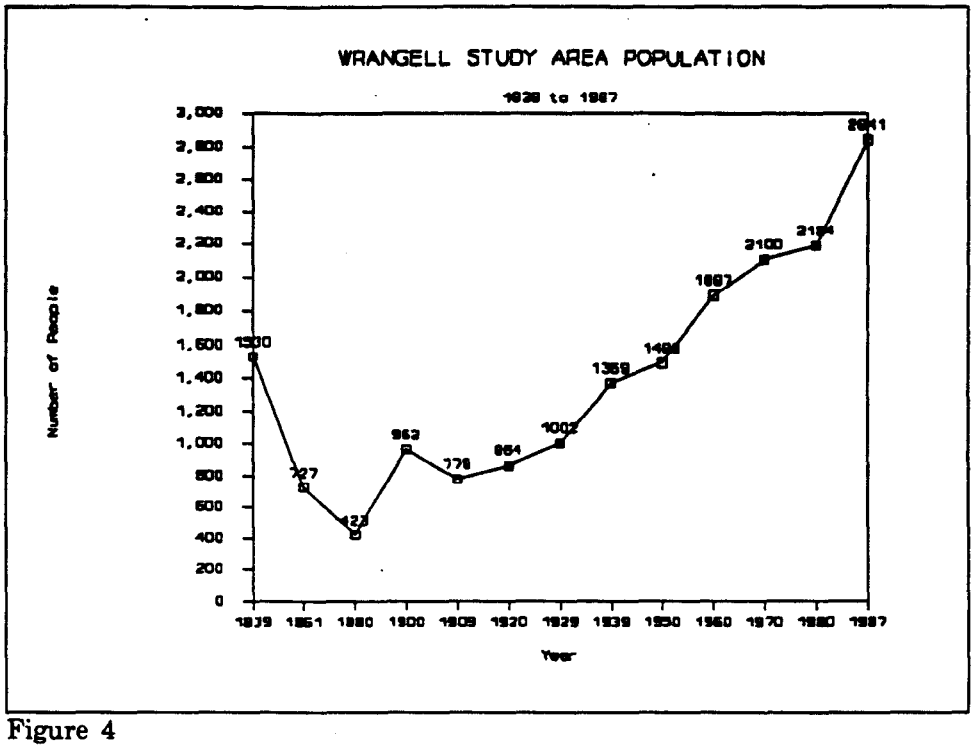

Figure 4

Approximately 23.2% of all households surveyed described all of its members as being Alaska Natives, while 53.1% of the households described all of their members as non-Native. The remaining 23.7% of the households reported themselves as including both Alaska Natives and non-Natives. According to the population estimates expanded from survey data, approximately 1,016 (35.8%) of the individuals in Wrangell considered themselves Alaska Natives, 1,515 (53.3%) considered themselves White, 184 (6.5%) considered themselves "other" and 126 (4.4%) declined to answer. This information is depicted in graphic form in Figure 6.

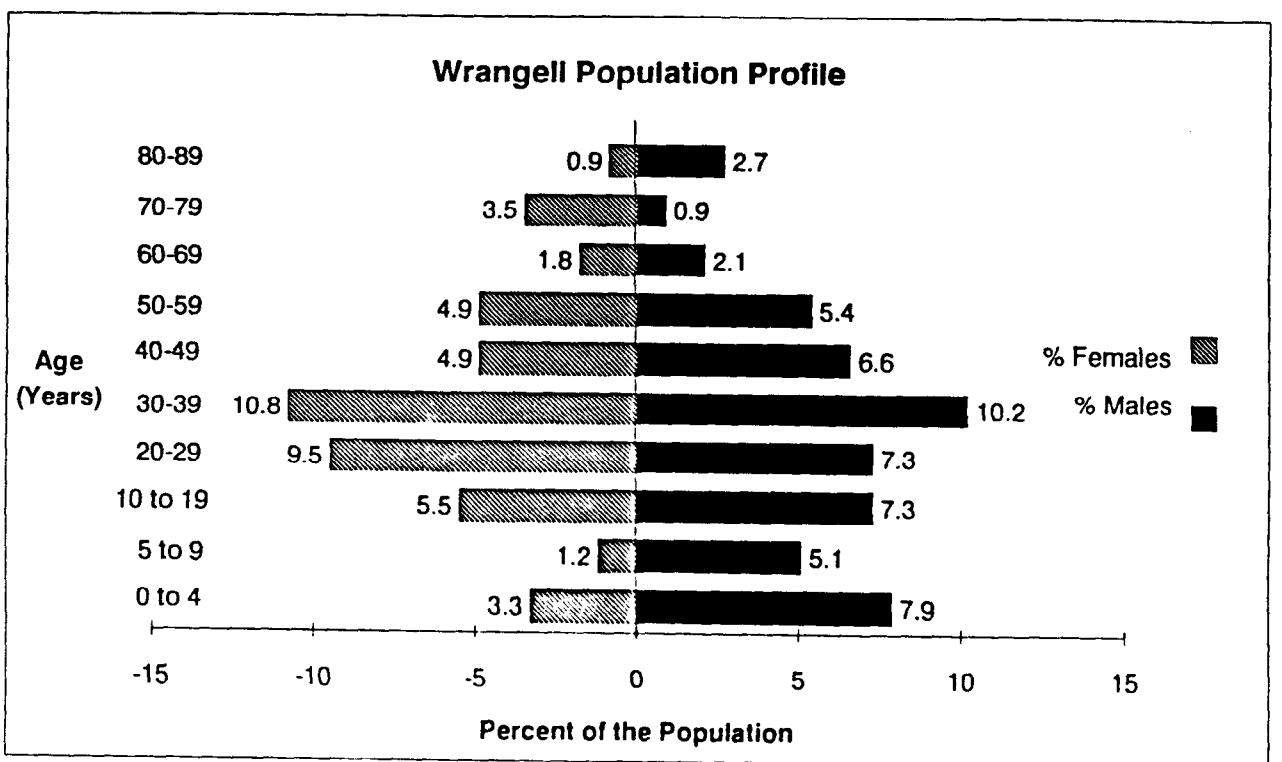
Wrangell Population Profile
Age (Years)
80-89
70-79
60-69
50-59
40-49
30-39
20-29
10 to 19
5 to 9
0 to 4
0.9
2.7
3.5
0.9
1.8
2.1
4.9
5.4
4.9
6.6
10.8
10.2
9.5
7.3
5.5
7.3
1.2
5.1
3.3
7.9
% Females
% Males
-15
-10
-5
0
5
10
15
Percent of the Population

Figure 5.

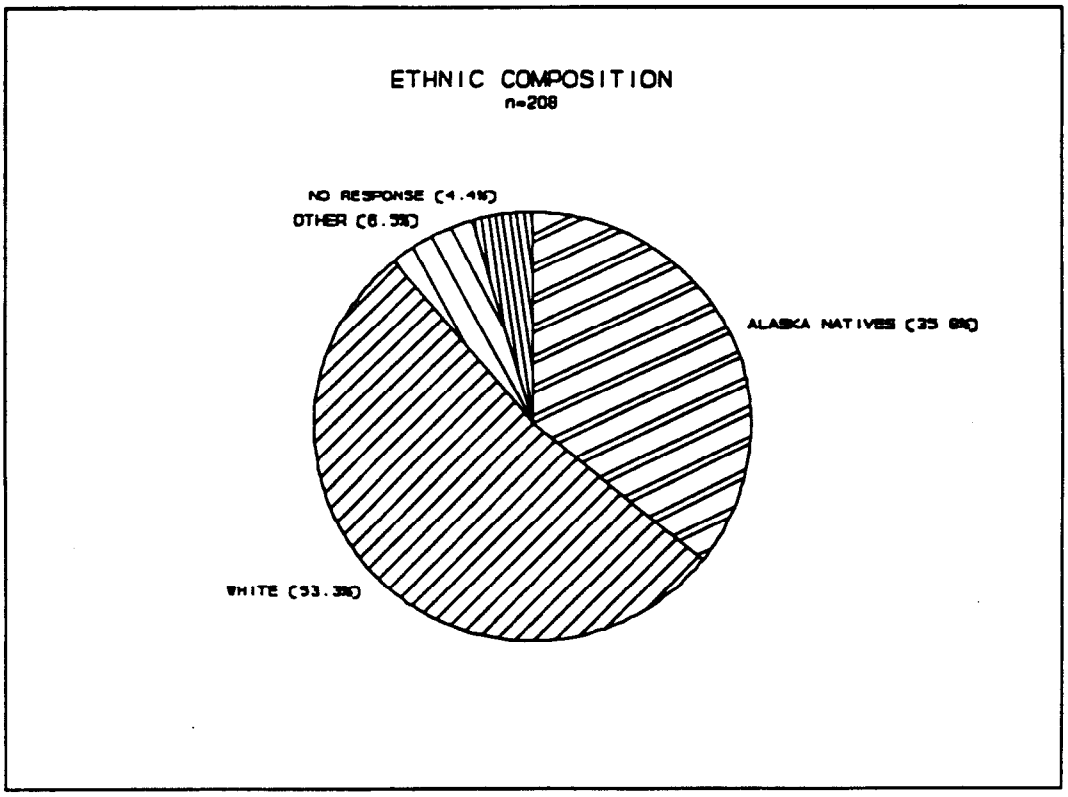

Figure 6

Wrangell is a community of longtime residents and many families have aboriginal roots. Approximately 60% of Wrangell households include a member who has lived in Wrangell over 20 years (Figure 7). Across all households, the member with the longest tenure in Wrangell averaged 25.8 years. The average Wrangell resident had an even longer tenure in Alaska. Sixty-nine percent (69%) of all Wrangell households include a member who has lived in Alaska more than 20 years, with the mean across all Wrangell households of 30.6 years. Alaska Permanent Fund information suggests that 43% of 1985 recipients from Wrangell were born in Alaska (ADOR 1986:53).

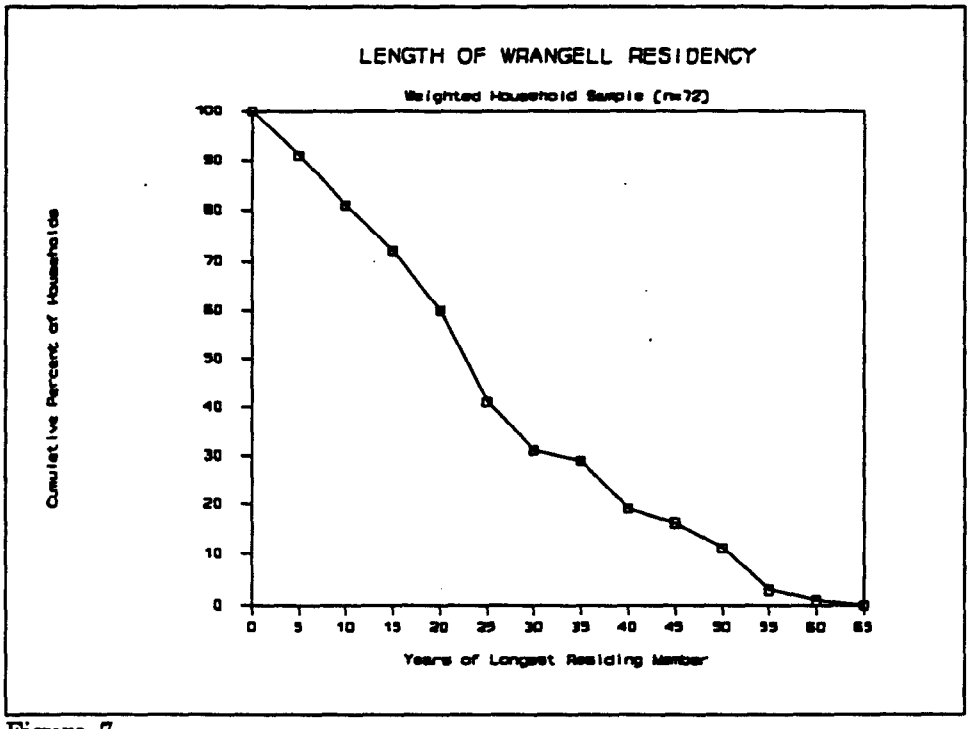

Figure 7

ECONOMY

The contemporary economy of Wrangell is based on government employment, timber, commercial fishing, transportation and tourism combined with noncommercial fishing and hunting for family use. Private sector industries tend to be cyclical and seasonal. As a result, the strength of Wrangell's monetary economic sectors fluctuates, sometimes dramatically. For example, less than five years ago during a low cycle in the timber and fishing industries, both the principal sawmill and the major fish processor were shut down indefinitely. Today, however, with an upturn in both industries, timber and fish processors are running at high relatively high capacity. In addition, in recent years the public sector has helped stabilize the local economy and is currently the largest and most consistent wage employment source.

Timber processing has been an important part of the Wrangell economy since 1888 when Rufus Sylvester and Thomas Wilson built a sawmill to provide construction

lumber and wooden boxes to salmon processors (Cohen 1986:20). Currently, Wrangell Forest Products (WFP) operates a modern sawmill complex at Shoemaker Bay. In addition, several very small portable mills operate to service local demand.

In 1987, WFP was the largest single employer in Wrangell. During the peak milling period the company employed 185 mill workers and 12 construction workers. During the winter season, the work force consisted of 157 hourly employees and 17 management employees (Gove 1987, 1988a). The gross payroll for 1987 was $5,148,658. The mill produced 70.4 MMBF of lumber (Gove 1988a).

In addition, there were four local logging companies. Two of these companies operated on Wrangell Island, one worked on Mitkof Island and the other on Bushy Island. The total lumber harvest for 1987 was 15.5 MMBF (USFS 1988). The WFP complex also helps support other businesses, including fuel and materials suppliers, mechanical repair shops, and tug and barge operators. The total annual contribution of the WFP complex to the Wrangell economy has been estimated at $ 8,973,000 (Gove 1987).

The seafood industry arrived in Wrangell in 1887. The Aberdeen Packing Company built a salmon processing plant near the mouth of the Stikine River. By 1889 the plant had relocated to Point Highfield near the present day airport. Cold storage plants began processing crab and shrimp in the 1930s. A variety of seafood processing companies have established operations in Wrangell during the past 100 years, some more long lived than others. Usually, however, at least one seafood processing plant has operated every summer. In 1987, four fish processing companies operated in Wrangell: Wrangell Fisheries, Ltd.; Sea Level Seafoods; Alaska Crown Seafoods; and, Breakwater Seafoods. In addition, a number of fishermen marketed their own product.

The seafood processors in Wrangell make a very significant contribution to the local economy. In 1987, a total of 148 workers were employed by all processors during the peak period, and a skeleton work force is maintained all year. These employees earned $ 700,110 in gross wages. Processors purchased 2,908,804 pounds of seafood, primarily

from local fisherman, and paid out a total of $4,305,852 for seafood products (Gove 1988a).

The Wrangell fishing fleet is dominated by individually owned and operated small boats. The fleet size has been relatively stable during the recent past. In 1985 there were 190 operators as compared to 197 in 1975, the year limited entry was instituted for salmon. Table 1 summarizes the fleet size and annual harvest for the eleven year period 1975 through 1985.

Table 1

Wrangell Commercial Fishing Fleet
Permits, Operators, Harvest and Gross Earnings
1975 to 1985

Year	Permits	Operators	Pounds	Gross Earnings
1975	239	197	3,397,230	1,048,914
1976	210	171	3,602,430	1,829,439
1977	262	205	6,304,406	3,599,207
1978	287	224	4,686,330	3,664,379
1979	268	182	5,342,887	4,616,469
1980	252	170	4,626,773	3,076,273
1981	232	151	5,751,462	3,640,093
1982	247	168	4,995,415	3,381,700
1983	282	174	6,246,831	3,672,992
1984	343	196	5,962,206	3,725,319
1985	338	190	8,623,777	5,090,935

(Source: CFEC 1988)

Figure 8 depicts the number of Wrangell salmon permits by gear type in the fleet between 1975 and 1985. In the salmon fishery, the number of permits has declined slightly. The number of hand troll permits quickly increased and just as quickly decreased following the announced limit on permits. In general, the overall number of permits has dropped by a third in the last ten years.

The Wrangell fleet is relatively well diversified. Among the 190 operators licensed in 1985, with 338 permits, there were a total of 122 salmon permits, 130 other finfish

permits including herring sac roe and halibut, and 86 shellfish permits (CFEC 1988). Table 2 shows a complete breakdown of Wrangell limited entry permits by gear type.

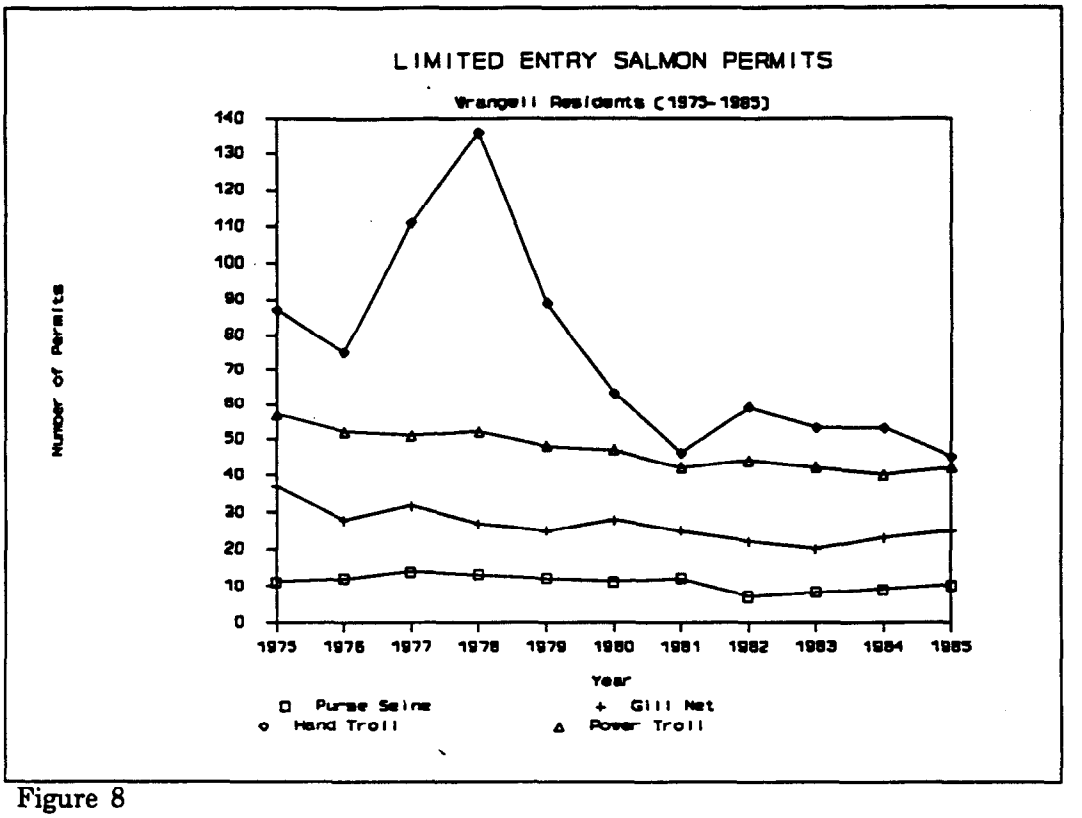

Figure 8

Without question, salmon is the primary commercial species harvested, both in terms of total poundage and gross receipts. Table 3 lists the 1985 harvest by species (CFEC 1988). Salmon accounted for over 76.8% of the poundage and 70.5% of the gross revenue, with halibut coming in a poor second with 7.8% and 9.6% respectively. The total harvest across all species for the Wrangell fleet is slightly larger than the above data would suggest because harvest quantities and earnings are not reported in those fisheries with less than four operators. Thus, the herring roe and bait seine, bottom fish trawl, and crab pot large boat harvest data are missing.

Table 2
Limited Entry Permits Fished
Fishery and Gear Type 1985

Fishery	Gear Type	Boat Size	# of Permits
Halibut	longline	under 5 ton	39
	longline	5 ton & over	47
Black Cod	longline	5 ton & over	5
Bait Herring	purse seine		1
Miscellaneous Finfish	longline	5 ton & over	9
	longline	under 5 ton	3
	otter trawl		1
	beam trawl		3
	hand troll		1
Salmon	purse seine		10
	gillnet		25
	hand troll		45
	power troll		42
Herring Sac Roe	purse seine		2
	gillnet		6
Dungeness Crab	pots	50'and under	38
	pots	over 50'	3
	other		8
Tanner Crab	pots	5 ton & over	2
King Crab	pots		3
Shrimp	beam trawl		9
	pots	50' and under	20
	pots	over 50'	3

Table 3
1985 Commercial Harvest By Species

Fishery	Pounds	Estimated Gross Earnings*
Salmon	5,334,373	2,978,108
Halibut	546,397	407,606
Dungeness Crab	317,710	393,263
Shrimp	545,038	296,779
Herring Sac Roe	195,489	144,271
Total	6,939,007	4,220,027

(Source: CFEC 1988)

Transportation and supply also are important industries in Wrangell. Over the years, from the time of the first Native community, Wrangell has served as a transportation and supply point for the Stikine River and surrounding area. Local merchants provide equipment and services and supplies to logging camps, fish hatcheries, and mining operations throughout the region. These goods are transported by barge and air service. Wrangell has a deep water port facility, a barge loading facility and a full service airport.

Wrangell is one of four major shipping points for timber products in Southeast Alaska. Round logs and semi-finished goods are regularly loaded onto ocean going steamers, usually bound for the orient. Nine ships docked at Wrangell in 1987 to transport 68.3 MMBF of lumber. Fuel and petroleum products are warehoused for transhipment in smaller quantities to remote places. At least three barge lines make regular stops in Wrangell, and several smaller operators serve the outlying communities from Wrangell. In the 1986-87 fiscal year, the Wrangell port facility handled a total of 16,154 tons of cargo, not including forest products (Phillips 1988: pers.comm.).

Wrangell has a full-time U.S. Customs Service agent to handle international trade. In addition to marine related activities, there are two trucking companies, four air transportation companies, a radio station, a telephone company and a cable television company. All of these transportation and communications oriented companies together employed an average of 81 full time employees with an estimated annual payroll of $2,559,728 (ADOL 1988).

Wrangell was visited by approximately 18,868 tourists between May and September 1987 (WCVB 1988). In addition, many visitors travel to Wrangell in the winter months. These visitors make a significant contribution to the local economy. They spend dollars in restaurants, hotels and gift shops. In addition, Wrangell is home to several charter boat operators, hunting guides and tour companies, as well as a full time travel agency.

During 1987, four hotels/motels and two bread and breakfasts operated in Wrangell. These establishments provided 74 rooms, with an overall 22.8% occupancy rate. There are at least seven restaurants in Wrangell, serving everything from three meals a day to pizza and snack foods without sit down service. There is no hard data on the collective impact visitors have on the Wrangell economy, but some believe it is substantial.

Government employment provided the most stable part of Wrangell's economic base in the recent decade. The United States Forest Service alone accounted for 27 full-time jobs and 20 seasonal jobs (USFS 1988). The total payroll for all federal jobs in 1987 was approximately $1,291,628 (ADOL 1988). Other federal employers included the U.S. Customs Service, the Public Health Service, the Federal Aviation Administration and the U.S. Postal Service.

The State of Alaska employed full and part time staff in the Department of Fish and Game and the Department of Transportation and Public Facilities. The State gross payroll for these two agencies was approximately $ 837,700 for 1987 (ADOL 1988). In addition, the Department of Public Safety and the Court System employed several people in Wrangell, but comparable payroll information was not available.

Local government employed approximately 137 people including general city employees, the school system and hospital staff. There were an average of 40 people who worked directly for the city (Wrangell, n.d.:12), 57 people worked for the school district and 40 worked for the hospital (Bartlett 1988: pers.comm.; Vowell 1988, pers.comm.). Local government wages in 1987 totaled $ 4,848,156 (ADOL 1988).

In addition to wage employment, the government contributed to the economy through grants for public works project as well as transfer payments made directly to Wrangell residents. Wrangell residents received approximately $546,064 in government transfer payments in 1987, including general welfare, AFDC and food stamp benefits, but not including Permanent Fund dividends. The number of persons receiving benefits varied between 113 and 128 for the year (ADHSS 1988).

While these primary sectors provide the economic base, secondary industries, such as retail trade, small manufacturing, equipment repairs, professional services, financial services, and construction trades multiply the economic impact of the base industries and distribute the benefits throughout the community. Approximately 22 retail businesses provided an average of 141 jobs during 1987. The gross payroll was $1,714,108 (ADOL 1988). This figure does not include a number of owner operated businesses.

Manufacturing businesses include several welding shops and boat builders and repair shops. The Hanson Boat Shop is one of the few full service small boat yards in Southeast Alaska. The Freeman-Bell machine shop services equipment from throughout the region. These businesses and others accounted for an average of 84 jobs with a gross 1987 payroll of $1,229,780 (ADOL 1988).

Service businesses include hotels, restaurants, dry cleaning and laundry, beauty and barber shops, consulting, accounting, VCR rentals, legal services, social and health professionals. Approximately 20 service businesses operated in Wrangell in 1987, employing a total of 59 people with a gross payroll of $721,724 (ADOL 1988). In addition, banks, insurance agents and real estate services added about 14 jobs and a 1987 payroll of $222,832 (ADOL 1988).

There were about 15 construction trade businesses in 1987, including building contractors, plumbers, electricians, carpenters and masons. Employment was seasonal and varied between 20 and 73 jobs. The gross 1987 payroll was $1,724,288 (ADOL 1988).

Although there is no comparable data available for all industries, Figure 9 is constructed from composite data. Based on gross payroll, it suggests the relative contribution of each industrial sector to the overall Wrangell economy.

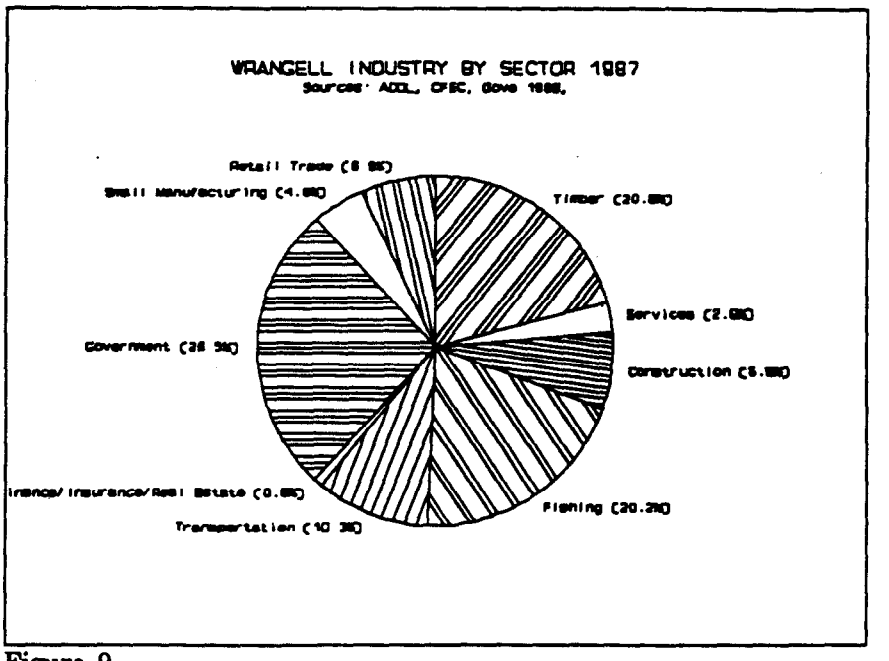

Figure 9

While Wrangell's economy is relatively diversified for a small community, many people work seasonally and there is some unemployment. WHS data indicates that at least 19.3% of Wrangell adults in the sample were unemployed during a portion of 1987, but only 0.5% did not work at all. Over half of all households (56%) had two members who worked. About 27.8% of all residents who worked were self employed. Overall, however, only 51.3% of the work force was employed during the full year.

Table 4 shows household employment by industry. This table shows the first occupation of each respondent. Many respondents held two or more jobs during the year.

Table 4
Employment By Industry in 1987
(n=75)

Industry	Percent of Households
Forestry	7.2
Wood Processing	11.4
Fisheries	12.3
Fish Processing	3.4
Construction	8.8
Transportation, Communication and Utilities	13.3
Retail Trade	7.3
Finance, Insurance and Real Estate	2.2
Business and Repair Service	4.5
Entertainment, Recreation and Tourist	3.3
Health and Social Service	13.2
Educational Service	5.0
Local Government	7.1
State Government	0.5
Federal Government	0.1

Household income is summarized in Table 5. Gross income was recorded and commercial fishing or other business expenses subtracted to arrive at an adjusted gross income for the sample households. Household income appears to be distributed in a bimodal curve. A substantial number of households (15.1%) earned less then $10,000 in 1987. A second peak in the curve occurs between $25,000 - 34,999 (27.1% of households). This data suggests that while some families enjoy adequate cash resources, many households make ends meet on a meager cash income.

Table 5
Household Adjusted Gross Income
n=75

Adjusted Gross Income	Percent of Households
Less than $5,000	3.2
$ 5,000 - 9,999	11.9
$10,000 - 14,999	2.8
$15,000 - 19,999	8.8
$20,000 - 24,999	7.4
$25,000 - 29,999	16.8
$30,000 - 34,999	10.3
$35,000 - 39,999	7.4
$40,000 - 44,999	9.4
$45,000 - 49,999	2.6
$50,000 - 54,999	2.6
$55,000 - 59,999	8.5
$60,000 - 69,999	3.7
$70,000 - 79,999	2.8
$100,000 or more	1.7

CHAPTER 3

RESOURCE HARVEST AND USE

INTRODUCTION

Wrangell households take full advantage of available wild food resources. The theoretical "average" household harvested 438.7 pounds, useable weight[1], of wild food during the survey period. Three out of every four households (75%) harvested one or more resources. The harvest was widely distributed. Almost two thirds (62%) of all households shared a portion of their harvest with other households. Eighty-nine percent (89.5%) of all households received resources from other households. Almost all households (95.1%) used wild food.

Household harvests are summarized in Table 6. The data is divided by harvest method: hunting; fishing; and, gathering. Within those categories, related species are grouped together. In those instances where a species is harvested commercially and noncommercially, the data is presented for each type of harvest. The order of presentation was governed by the data collection format of the survey instrument. Appendix D is a series of tables prepared by ADF&G with the same data arranged in a manner to allow for comparisons between communities.

It is important to note that harvest estimates from the WHS survey may underestimate a typical annual harvest. Respondents were asked if their 1987 harvest was unusual. Over half of all households (51.9%) indicated their harvest was less than usual while only 12.8% indicated their harvest was more than usual.

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[1] *Useable weight represents the weight of wild resources brought into the family kitchen for use. The useable weight conversion factors from round weight to useable weight for all species are based on ADF&G information and are listed in Appendix C.*

Table 6

Wrangell Harvest Study Primary Harvest Data

	Percent Using Resource[1]	Percent Harvesting Resource	Mean Quantity Active HH[2]	Mean Quantity All HH	Total Quantity Sample	Total Quantity Population	Mean Useable Wt. Active HH	Mean Useable Wt. All HH	Total Useable Wt. Sample[3]	Total Useable Wt. Population	Percent Giving Active HH	Percent Giving All HH	Percent Receiving Resource
HUNTING & TRAPPING	75.0	38.1	****	****	****	****	340.1	130.60	9,717.5	132,290.7	66.7	25.4	62.2
LAND MAMMALS	70.3	34.6	****	****	****	****	301.8	104.71	7,831.4	106,067.3	59.8	20.7	56.8
Deer	65.4	27.6	2.59	0.72	53.5	725	207.4	57.25	4,282.4	57,996.8	46.0	12.7	45.5
Moose	42.5	6.3	1.00	0.06	4.7	64	549.7	34.63	2,590.5	35,079.0	100.0	6.2	37.7
Goat	7.7	3.0	1.25	0.04	2.8	38	150.2	4.51	336.0	4,566.0	76.7	2.3	6.2
Black Bear	8.4	4.8	1.16	0.06	4.2	56	173.3	8.32	622.5	8,425.0	54.2	2.5	6.9
Furbearers	1.8	1.0	13.49	0.13	10.1	137	****	****	****	****	0.0	0.0	0.9
SEA MAMMALS	4.6	3.0	****	****	****	****	653.6	19.61	1,416.6	19,862.1	****	****	****
Harbor Seal	4.6	3.0	7.26	0.22	16.2	221	653.6	19.61	1,416.6	19,862.1	50.0	1.5	2.4
Other	0.8	0.8	1.88	0.02	1.1	15	****	****	****	****	87.5	0.8	0.0
BIRDS	27.5	17.5	****	****	****	****	35.8	6.29	469.5	6,361.3	85.7	15.0	15.1
Ducks	23.3	16.1	12.94	2.08	156.0	2,111	19.4	3.13	233.9	3,166.6	85.7	13.5	11.2
Seabirds	1.6	1.6	14.45	0.23	17.4	234	21.7	0.35	26.1	351.3	50.0	0.8	0.0
Canada Geese	14.1	11.7	4.24	0.50	37.1	503	21.2	2.48	185.3	2,514.0	53.8	6.2	3.1
Other Birds	10.5	7.3	6.36	0.46	34.7	471	4.5	0.33	24.3	329.4	20.5	1.5	3.2
FISHING	95.1	73.3	****	****	****	****	408.1	282.37	22,738.9	286,040.4	69.3	50.8	89.5
SALMON	82.3	52.6	15.19	7.99	599.4	8,099	160.7	84.66	6,339.9	85,759.6	47.0	24.7	63.8
Salmon Removed From Commercial Catch	****	9.8	19.11	1.87	140.5	1,892	196.3	19.22	1,442.8	19,455.2	61.2	6.0	****
King	****	8.9	9.74	0.87	65.0	879	149.0	13.28	994.8	13,448.2	66.3	5.9	****
Sockeye	****	3.4	11.29	0.38	28.8	388	48.5	1.65	123.8	1,670.0	2.9	0.1	****
Coho	****	5.9	7.88	0.46	34.9	466	60.7	3.54	268.4	3,586.0	20.3	1.2	****
Pink	****	1.1	5.25	0.06	4.3	58	11.5	0.13	9.5	127.0	18.2	0.2	****
Chum	****	2.5	3.98	0.10	7.5	101	24.7	0.62	46.3	624.0	100.0	2.5	****
Noncommercial Salmon Net or Gaff	****	3.0	32.65	0.97	73.5	997	129.5	3.90	291.3	3,932.0	****	****	****
King	****	0.0	0.0	0.00	0.0	0	0.0	0.00	0.0	0.0	****	****	****
Sockeye	****	2.8	13.41	0.37	28.2	378	57.7	1.60	121.1	1,625.0	****	****	****
Coho	****	0.8	18.67	0.15	11.2	152	143.7	1.16	86.2	1,172.0	****	****	****
Pink	****	1.0	42.49	0.42	31.9	437	93.5	0.95	70.1	946.0	****	****	****
Chum	****	0.8	3.73	0.03	2.2	30	23.1	0.19	13.9	189.0	****	****	****

Table 6 (cont.)
Wrangell Harvest Study Primary Harvest Data

	Percent Using Resource	Percent Harvesting Resource	Mean Quantity Active HH	Mean Quantity All HH	Total Quantity Sample	Total Quantity Population	Mean Useable Wt. Active HH	Mean Useable Wt. All HH	Total Useable Wt. Sample	Total Useable Wt. Population	Percent Giving Active HH	Percent Giving All HH	Percent Receiving Resource
Noncommercial Salmon Rod and Reel	****	50.3	10.22	5.15	385.5	5,218	122.1	61.50	4,605.7	62,374.0	****	****	****
King	****	39.5	8.49	3.35	250.7	3,396	129.4	51.29	3,834.9	51,960.0	****	****	****
Sockeye	****	6.8	4.82	0.33	24.6	331	20.7	1.40	105.7	1,422.0	****	****	****
Coho	****	21.8	4.51	0.98	73.7	997	34.7	7.58	567.6	7,677.0	****	****	****
Pink	****	6.5	6.62	0.43	32.3	437	14.6	0.95	71.0	961.0	****	****	****
Chum	****	0.9	6.31	0.06	4.3	57	39.1	0.35	26.4	354.0	****	****	****
Noncommercial Salmon All Methods of Harvest	****	50.7	12.07	6.12	459.0	6,204	128.8	65.35	4,897.1	66,318.2	45.2	22.9	****
King	****	39.5	8.46	3.34	250.7	3,388	129.4	51.17	3,834.9	51,960.0	49.4	19.5	****
Sockeye	****	9.6	7.33	0.70	52.7	713	31.5	3.03	226.8	3,065.7	50.0	4.8	****
Coho	****	22.6	5.01	1.13	84.9	1,148	38.6	8.73	653.9	8,839.5	21.2	4.8	****
Pink	****	7.5	11.41	0.86	64.2	867	25.1	1.88	141.2	1,908.2	20.0	1.5	****
Chum	****	1.6	5.42	0.09	6.5	88	33.6	0.54	40.3	544.8	56.3	0.9	****
Total Salmon Harvest	82.3	52.6	15.19	7.99	599.4	8,099	160.7	84.66	6,339.9	85,759.6	47.0	24.7	63.8
King	74.6	41.4	10.19	4.22	315.7	4,275	156.0	64.57	4,829.8	65,408.6	51.4	21.4	56.4
Sockeye	24.4	13.0	8.39	1.08	81.5	1,097	36.1	4.66	350.6	4,716.8	38.0	4.9	13.2
Coho	44.6	28.5	5.59	1.59	119.8	1,615	43.1	12.27	922.3	12,434.2	23.9	6.0	21.9
Pink	18.4	7.8	11.70	0.91	68.5	924	25.7	2.01	150.7	2,033.1	21.8	1.7	10.6
Chum	11.4	4.2	4.42	0.19	14.0	188	27.4	1.15	86.6	1,167.0	100.0	3.4	11.1
OTHER FINFISH	89.5	63.8	****	73.76	****	****	181.9	118.72	8,703.3	120,264.3	62.1	39.6	67.0
Finfish Removed From Commercial Catch	****	19.2	****	2.24	****	2,266	66.4	12.70	955.7	12,869.0	****	****	****
Halibut	****	13.1	****	****	****	385	79.2	10.36	777.8	10,500.0	99.2	13.0	****
Cod	****	1.7	5.20	0.09	6.6	86	20.6	0.34	26.3	345.8	94.1	1.6	****
Flounder/Sole	****	0.1	6.00	0.01	0.5	6	18.0	0.02	1.4	17.0	100.0	0.1	****
Rockfish	****	5.0	16.15	0.80	60.6	807	32.3	1.59	121.1	1,614.0	84.0	4.2	****
Herring	****	2.4	****	.97	****	982	16.2	0.39	29.1	393.0	0.0	0.0	****
Noncommercial Finfish Net or Gaff	****	7.8	****	****	****	55392	297.1	23.24	1,737.0	23,544.0	****	****	****
Cod	****	0.2	2.40	0.01	0.4	5	9.6	0.02	1.4	18.0	****	****	****
Flounder/Sole	****	0.1	28.80	0.03	2.2	28	86.4	0.08	6.5	83.0	****	****	****
Rockfish	****	0.1	28.80	0.03	2.2	28	57.6	0.05	4.3	55.0	****	****	****
Herring	****	7.4	****	7.80	****	7,897	41.6	3.12	233.7	3,159.0	****	****	****
Hooligan	****	7.7	****	43.71	****	44,287	225.7	17.48	1,303.7	17,711.0	****	****	****
Other Fish	****	4.8	65.39	3.11	235.4	3,147	52.3	2.49	188.3	2,518.0	****	****	****

Table 6 (cont.)
Wrangell Harvest Study Primary Harvest Data

	Percent Using Resource	Percent Harvesting Resource	Mean Quantity Active HH	Mean Quantity All HH	Total Quantity Sample	Total Quantity Population	Mean Useable Wt. Active HH	Mean Useable Wt. All HH	Total Useable Wt. Sample	Total Useable Wt. Population	Percent Giving Active HH	Percent Giving All HH	Percent Receiving Resource
Noncommercial Finfish													
Rod and Reel	****	45.3	****	16.85	****	17,065	182.4	82:77	6,198.0	83,851.0	****	****	****
Halibut	****	43.8	****	****	****	1,614	99.0	43.50	3,252.0	44,062.0	****	****	****
Cod	****	4.3	8.58	0.37	27.7	372	34.3	1.47	110.7	1,487.0	****	****	****
Flounder/Sole	****	2.7	22.07	0.59	44.7	601	66.2	1.78	134.1	1,804.0	****	****	****
Rockfish	****	15.2	14.26	2.16	162.5	2,184	28.5	4.31	325.1	4,369.0	****	****	****
Trout	****	39.6	29.22	11.57	867.8	11,734	78.9	31.28	2,343.0	31,682.0	****	****	****
Other Fish	****	6.4	8.63	0.55	41.4	560	6.9	0.44	33.1	448.0	****	****	****
Total Other Finfish Harvest	89.5	63.8	****	73.76	****	74,714	181.9	118.72	8,703.3	120,264.4	62.1	39.6	67.0
Halibut	76.6	47.3	4.17	1.97	****	1,999	113.9	53.86	4,029.8	54,561.4	46.3	30.2	54.1
Cod	24.5	7.7	5.93	0.46	34.6	463	23.7	1.83	138.5	1,850.8	13.0	2.6	18.4
Flounder/Sole	9.2	2.8	22.37	0.63	47.3	635	67.1	1.88	141.9	1,903.5	60.7	1.8	7.2
Rockfish	30.5	19.3	15.44	2.98	225.2	3,019	30.9	5.96	450.5	6,037.7	30.1	9.8	14.6
Herring	18.9	11.6	75.56	8.77	****	8,879	30.2	3.51	262.8	3,552.0	****	****	8.2
Hooligan	36.2	7.7	567.66	43.71	****	44,278	227.1	17.48	1,303.7	17,711.2	100.0	9.2	31.7
Trout	45.2	39.6	29.25	11.58	867.8	11,734	79.0	31.28	2,343.0	31,682.0	35.9	14.2	16.6
Other Fish	8.0	8.0	45.75	3.66	41.4	3,707	36.6	2.93	33.1	2,965.8	61.3	4.9	****
SHELLFISH (crab, shrimp and Octopus)	83.2	43.1	****	****	****	****	337.5	78.98	7,695.7	80,016.4	62.8	19.1	75.9
Shellfish Removed From Commercial Catch	****	11.8	****	****	****	****	199.1	23.50	1,762.1	23,841.0	89.8	10.6	****
King Crab	****	0.0	****	0.00	0.0	0	****	0.00	0.0	0.0	0.0	0.0	****
Dungeness Crab	****	8.1	84.86	6.88	515.5	6,971	212.1	17.20	1,288.8	17,428.0	90.1	7.3	****
Tanner Crab	****	2.4	15.17	0.36	27.3	369	33.4	0.80	60.1	811.9	100.0	2.4	****
Shrimp	****	5.0	****	****	****	****	110.2	5.53	413.3	5,602.0	96.0	4.8	****
Noncommercial Shellfish & Misc.	****	47.6	****	****	****	****	166.2	55.43	5,933.5	56,175.0	35.3	16.8	****
King Crab	****	1.6	25.27	0.41	30.3	412	176.9	2.83	212.3	2,885.0	43.7	0.7	****
Dungeness Crab	****	24.8	46.25	11.51	863.7	11,660	115.6	28.78	2,159.2	29,150.0	66.7	16.6	****
Tanner Crab	****	6.4	23.04	1.48	110.6	1,498	50.7	3.25	243.3	3,296.0	60.9	3.9	****
Shrimp	****	13.2	****	****	****	****	139.7	18.44	3,147.6	18,684.0	75.0	9.9	****
Octopus	****	6.3	3.37	0.21	15.9	216	36.2	2.13	171.1	2,160.0	23.8	1.5	****

Table 6 (cont.)
Wrangell Harvest Study Primary Harvest Data

	Percent Using Resource	Percent Harvesting Resource	Mean Quantity Resource	Mean Quantity Active HH	Total Quantity Sample	Total Quantity Population	Mean Useable Wt. Active HH	Mean Useable Wt. All HH	Total Useable Wt. Sample	Total Useable Wt. Population	Percent Giving Active HH	Percent Giving All HH	Percent Receiving Resource
Total Shellfish & Misc. Harvest	83.2	30.4	****	****	****	****	337.5	78.98	7,695.7	80,016.4	62.8	19.1	75.9
King Crab	17.5	1.6	25.43	0.41	30.3	412	178.0	2.85	212.3	2,884.7	43.7	0.7	17.4
Dungeness Crab	78.3	27.1	67.87	18.39	1,379.2	18,631	169.7	45.98	3,448.0	46,578.0	66.8	18.1	66.1
Tanner Crab	16.6	6.4	28.80	1.84	137.9	1,867	63.4	4.05	303.4	4,107.6	60.9	3.9	11.0
Shrimp	64.9	17.1	****	****	****	****	140.2	23.97	3,560.9	24,286.1	81.3	13.9	58.2
Octopus	9.2	6.3	3.38	0.21	15.9	216	33.8	2.13	171.1	2,160.0	61.9	3.9	2.9
GATHERING	79.1	70.3	****	****	****	****	****	23.72	1,766.7	26,051.4	47.7	33.5	50.6
MARINE INVERTEBRATES (and Herring Eggs)	48.3	30.8	****	****	****	****	47.4	16.77	1,095.9	16,989.0	70.5	21.7	46.4
Sea Urchins	2.5	0.0	****	0.00	0.0	****	0.0	0.00	0.0	0.0	0.0	0.0	2.5
Abalone	9.5	7.1	****	2.30	171.1	****	32.3	2.29	171.1	2,322.7	21.1	1.5	8.7
Scallops	7.4	4.2	****	1.00	74.4	****	23.6	0.99	74.4	1,006.0	0.0	0.0	3.4
Gumboot	4.8	4.0	3.31	0.13	9.9	134	66.1	2.65	39.6	2,680.0	80.0	3.2	0.8
Sea Cucumbers	7.6	6.1	3.37	0.21	15.4	208	6.7	0.41	30.9	416.4	54.1	3.3	2.4
Clams & Cockles	40.8	27.9	3.31	0.92	69.1	936	28.1	7.85	587.1	7,953.5	63.1	17.6	29.9
Other Invertebrates	9.9	4.2	****	****	29.0	****	9.1	0.38	29.0	386.2	57.1	2.4	5.7
Herring Eggs	31.8	7.9	****	****	163.8	****	27.8	2.20	163.8	2,224.2	30.4	2.4	29.4
PLANTS	75.9	57.5	****	****	****	****	15.2	8.95	670.9	9,062.4	55.8	32.1	40.6
Beach Greens	8.7	8.7	4.70	0.41	30.8	414	4.7	0.41	30.8	414.4	41.4	3.5	3.3
Seaweed	27.6	7.6	29.19	2.22	166.7	2,248	29.2	2.22	166.7	2,247.6	47.4	3.5	20.9
Berries	65.5	57.5	10.99	6.32	473.4	6,400	11.0	6.32	473.4	6,400.4	41.4	23.2	23.2
Firewood	44.7	43.9	7.63	3.35	250.9	3,391	****	****	****	****	29.8	12.8	4.9
TOTAL ALL RESOURCES	95.1	75.0	****	****	****	****	602.8	438.68	34,223.1	444,382.4	82.7	62.0	89.5

1."Percent Using Resource" is the percent of all households in sample that either harvested or received a resource.

2. "Active" includes the mean harvest quantity for households that actually harvested a resource. The values in these columns are not additive because a different number of households were "active" harvesters for each species.

3. Useable weights are based on weight conversions provided by ADF&G, see Appendix C

DIVERSITY OF RESOURCE USE

Wrangell households rely on a wide variety of resources. Figure 10 shows the percent of households that used one or more of eight major resource categories: land mammals, sea mammals, birds, salmon, other finfish, shellfish, gathered marine invertebrates (including herring eggs) and gathered plants. During the survey period, 74.9% of all households used resources from four or more categories, with an overall average of 4.8 categories per household.

There were a total of 40 separate species identified within the eight major resource categories. Figure 11 shows the percent of households that used each number of species from 0 to 40. During the survey period, 29% of all households used between 2 and 6 species; 35.1% used between 7 and 12 species, 13.7% used between 13 and 16 species, and 10.4% used between 17 and 23, and 6.5% greater than 24 species. Overall, households used an average of 10.5 species.

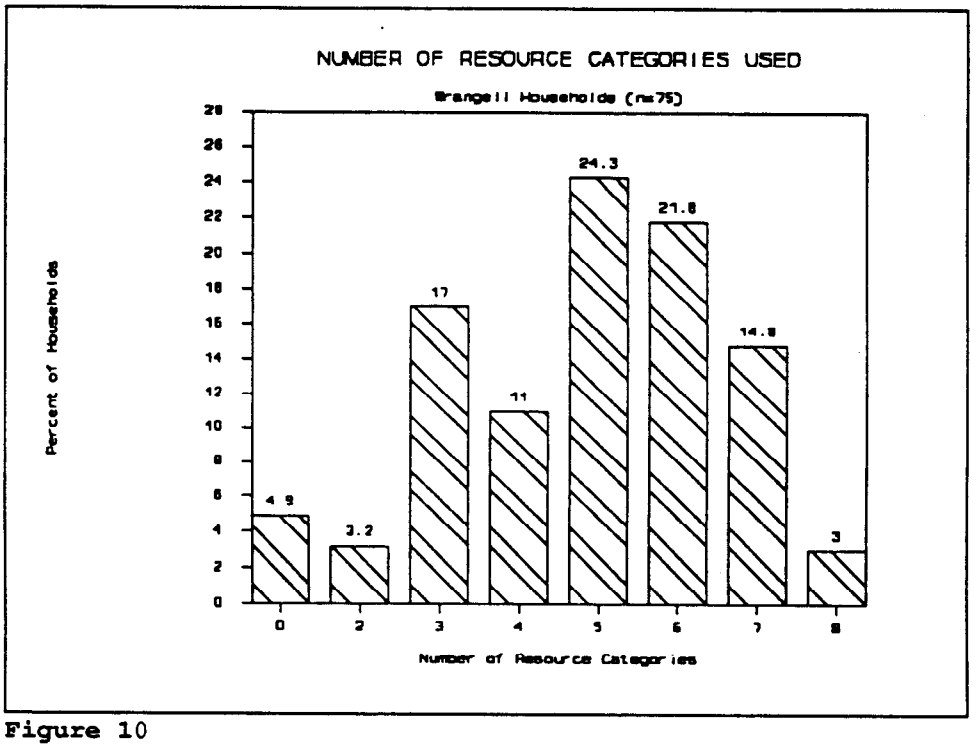


Figure 10

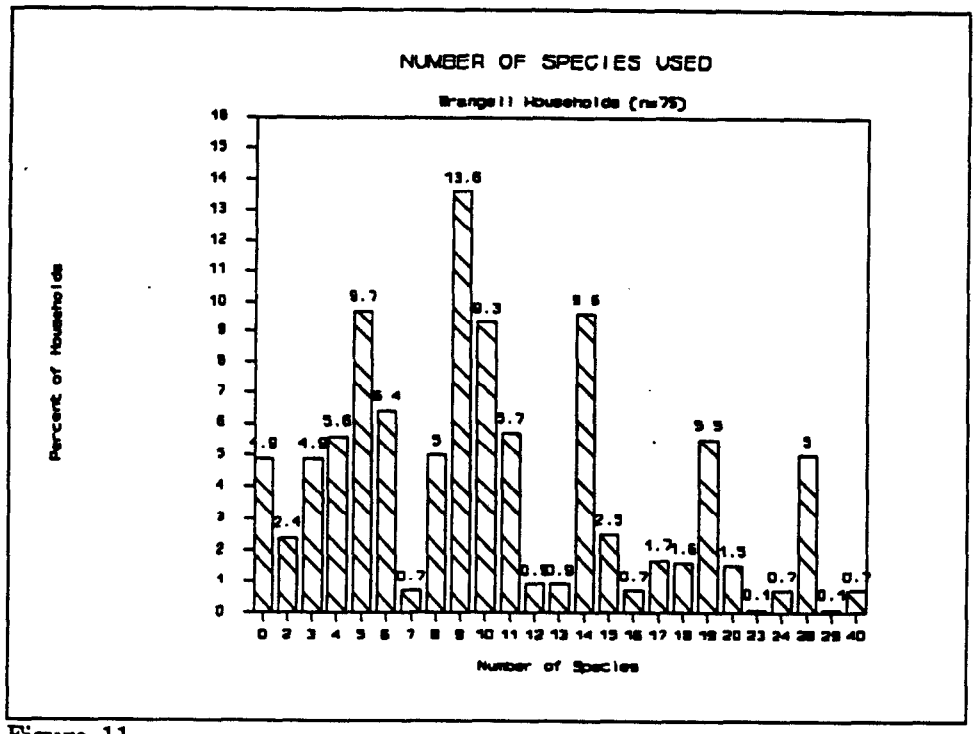


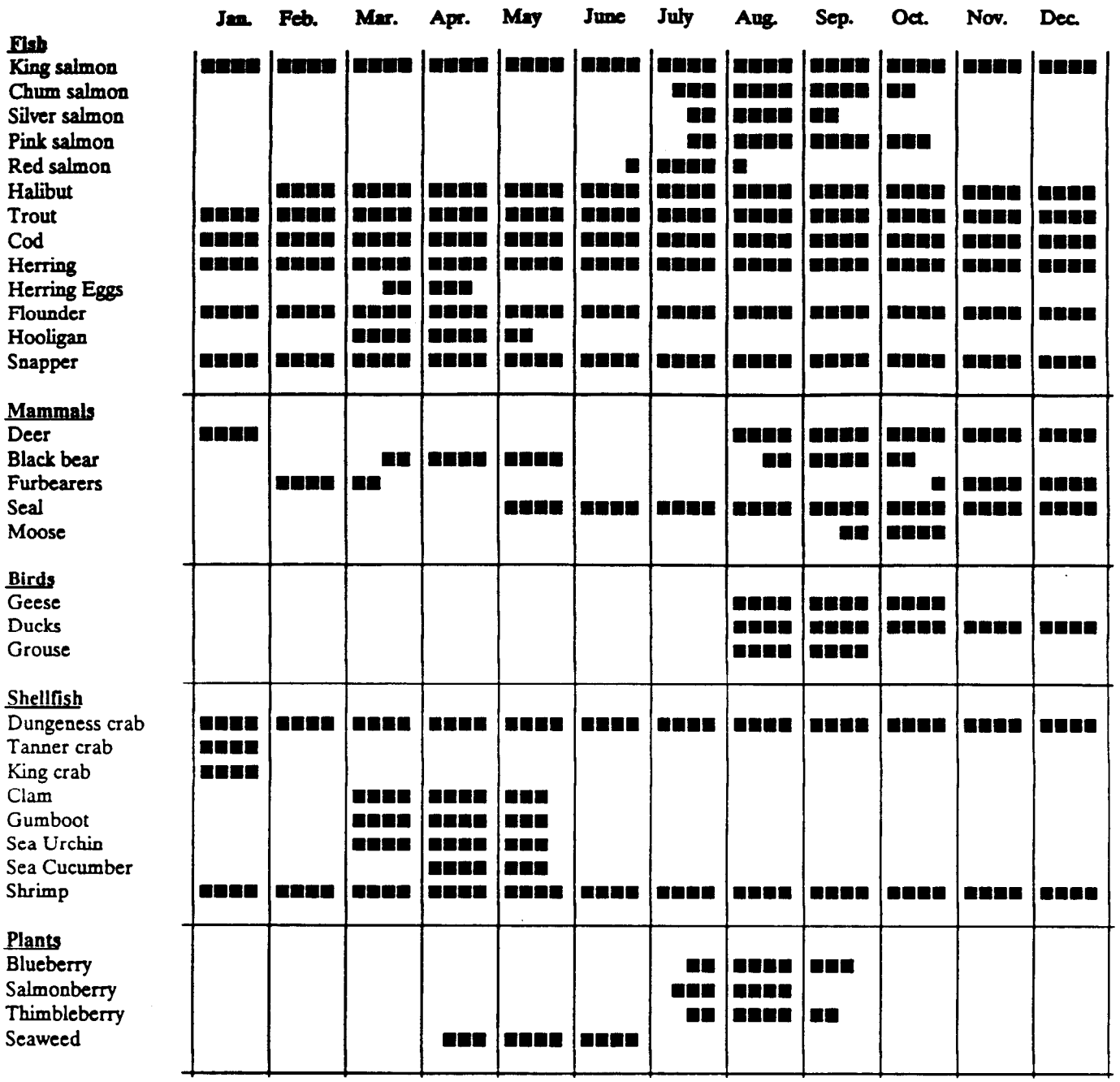
Figure 11

SEASONAL ROUND OF HARVEST

Wrangell households harvest wild food throughout the year. Figure 12 depicts the seasonal round of harvest activities. The following description of contemporary resource harvest activities is based on key informant interviews.

Spring (March through May): During the spring, people take advantage of the big tides to harvest seaweed and dig for clams and other marine invertebrates on the beaches. They fish for herring and gather herring eggs on kelp and hemlock boughs. People use dip nets and beach seines to catch hooligan in the Stikine River flats. People fish for halibut, flounder, rockfish and cod species that are taken throughout the year. Late May marks the beginning of the local salmon derby and people intensively harvest king salmon. Crab and shrimp are also taken. Spring black bear are hunted.

Figure 12. Seasonal Round of Harvest Activities, Wrangell



Summer (June through August): During the summer people harvest the various salmon species as they appear in the area. People catch crab and shrimp using pots and trawls. By late July, berries ripen and residents troop into sunny open spaces in the woods and along logging roads to pick berries. Many families process berries into jams and jellies. August also brings the opening of deer and goat season. Hunters prepare for their annual hunting activities.

Fall (September through November): By early fall, many residents set off up the Stikine River to hunt moose. Deer hunting intensifies as colder weather drives the animals down from the uplands. Ducks and geese are hunted on the river flats and in various estuaries throughout the area.

Winter (December through February): The short, wet, cold, dark days of winter discourage many harvest activities. Usually, crab and shrimp pots are set and checked. Many hardy Wrangell residents fish for winter king salmon. Trapping usually begins after the first snowfall in November, and continues through late February. By then, the days are getting longer and the annual cycle of harvest activities begins again.

HARVEST METHODS

We divided harvest data into hunting, fishing and gathering activities. These categories were convenient and follow contemporary regulatory distinctions and commonly held notions of how harvest activities group together. Fishing was the most productive activity in Wrangell. Wrangell is located in a marine environment, and marine resources are considerably more abundant and accessible than terrestrial resources. Figure 13 shows the proportion of food harvested by harvest method. Fishing produced about 282.4 pounds of useable food per household, almost twice as

much food as both other methods combined. Hunting produced 130.6 pounds of food and gathering produced 25.7 pounds of food per household.

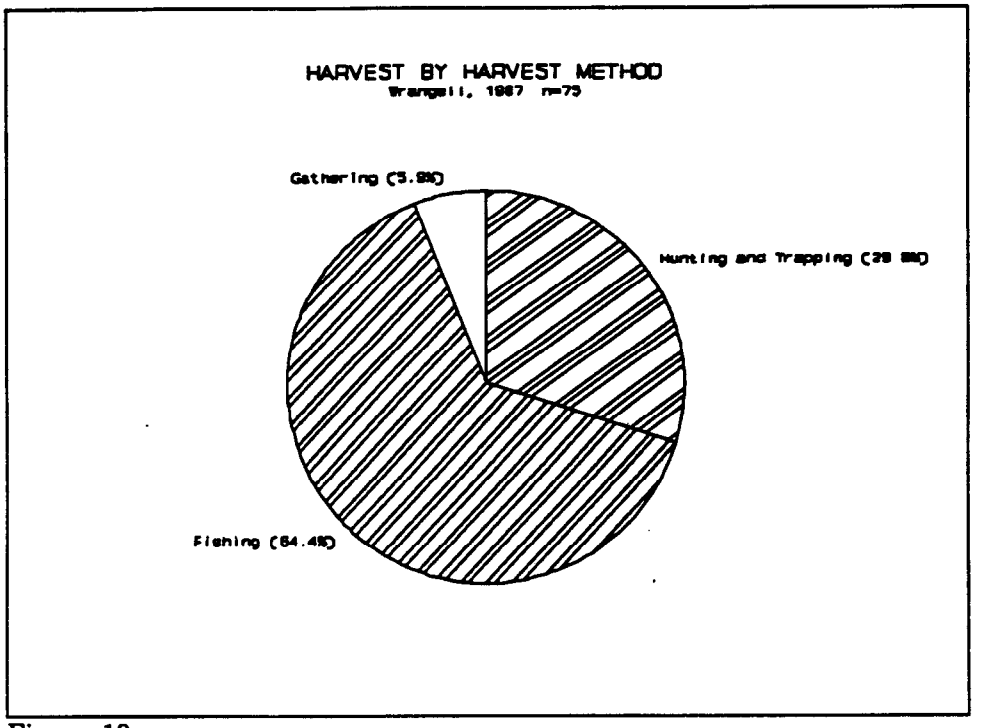


Figure 13

More households participated in successful fishing (73.3%) and gathering (70.3%) than hunting (38.1%) (Figure 14). There are a number of factors that contribute to this. Both activities can occur close to town and only a minimum amount of equipment is necessary to successfully harvest. On the other hand, hunting is a more specialized activity. It requires travel usually by boat some distance from town and specialized knowledge. Hunting effort in Wrangell is probably higher then the 38.1% of households that were successful.

Wrangell households participate in a regular pattern of sharing. Although harvest success rates vary among different species; resources are redistributed throughout the

community. While only 38% of Wrangell households harvested game, 75% of all the households used game. Similarly, while 73% of the households harvested by fishing, 95% of all households used fish (Figure 14). Almost all Wrangell households harvest, share and use wild resources as part of their diet and their way of life (Table 6). Wrangell residents place a high value on wild food harvest and use.

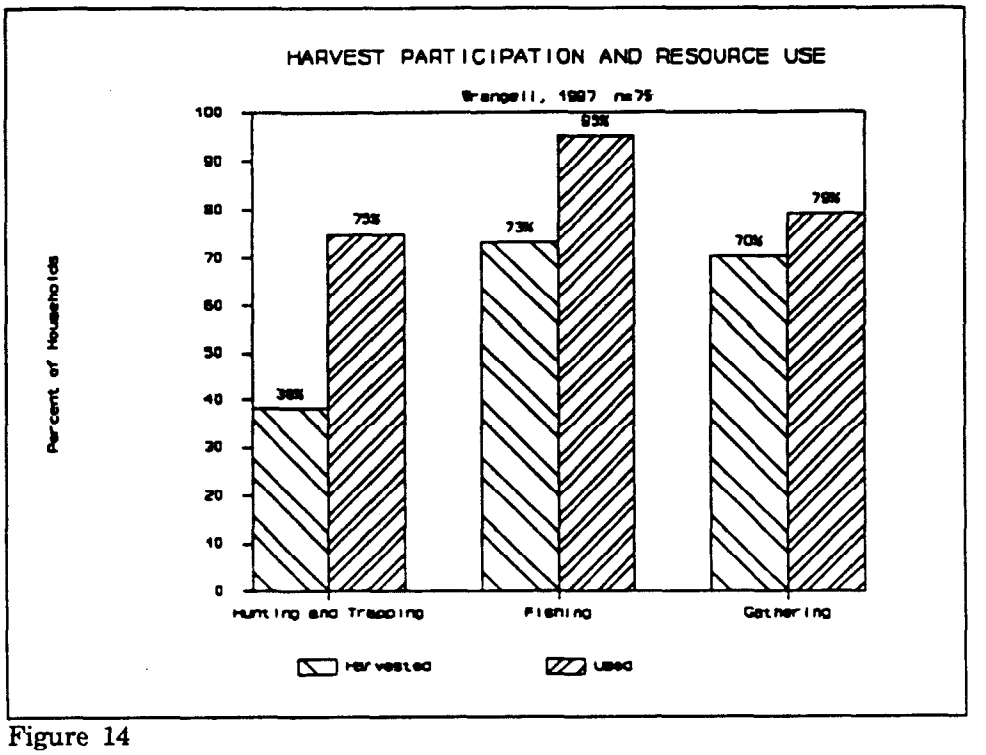


Figure 14

HUNTING AND TRAPPING

Wrangell residents hunt and trap for food, fur and the joy of being in the wilderness. Three out of every four Wrangell households include someone who has hunted while living in the community. Every fall, when hunting season arrives, street talk turns to killing deer and getting upriver for a moose.

Where game is hunted and how much is harvested is influenced by ADF&G regulations, as well as environmental and social factors. To manage game species, ADF&G has divided southeast Alaska into five Game Management Units (GMUs), with a number of subunits. Figure 15 is a map of these GMUs. Hunting seasons and bag limits are established for each GMU.

Wrangell hunters harvest in all GMUs except GMU 5; however, effort is concentrated in GMUs 1B and 3. When game populations have decreased, Wrangell hunters have demonstrated a willingness to travel great distances to hunt successfully. This determination to harvest wild game is particularly well illustrated by increased deer hunting outside the Wrangell area as a result of a dramatic decrease in the local deer population.

Environmental conditions, such as weather, predation, and human activities which modify habitat, may affect the number of animals available for harvest. In turn, game populations change in relation to food supply, shelter, and hunting pressure. These interrelationships are complex and beyond the scope of this report; however, these population fluctuations have a profound influence upon the quantity and mix of resources harvested by Wrangell residents.

Social conditions influence a household's ability to hunt. Effective hunting requires a skilled hunter, available equipment, and opportunity. A hunter may be unable to hunt because of illness or age. Aside from having a firearm, most hunting requires a boat to reach hunting areas. Even small skiffs and motors are expensive, and large boats are often required to reach more distant areas. The opportunity to hunt may be limited or enhanced by employment. Those working "in town" jobs generally have less access to game. On the other hand, commercial fishing and logging may provide hunting opportunities at or near the workplace.

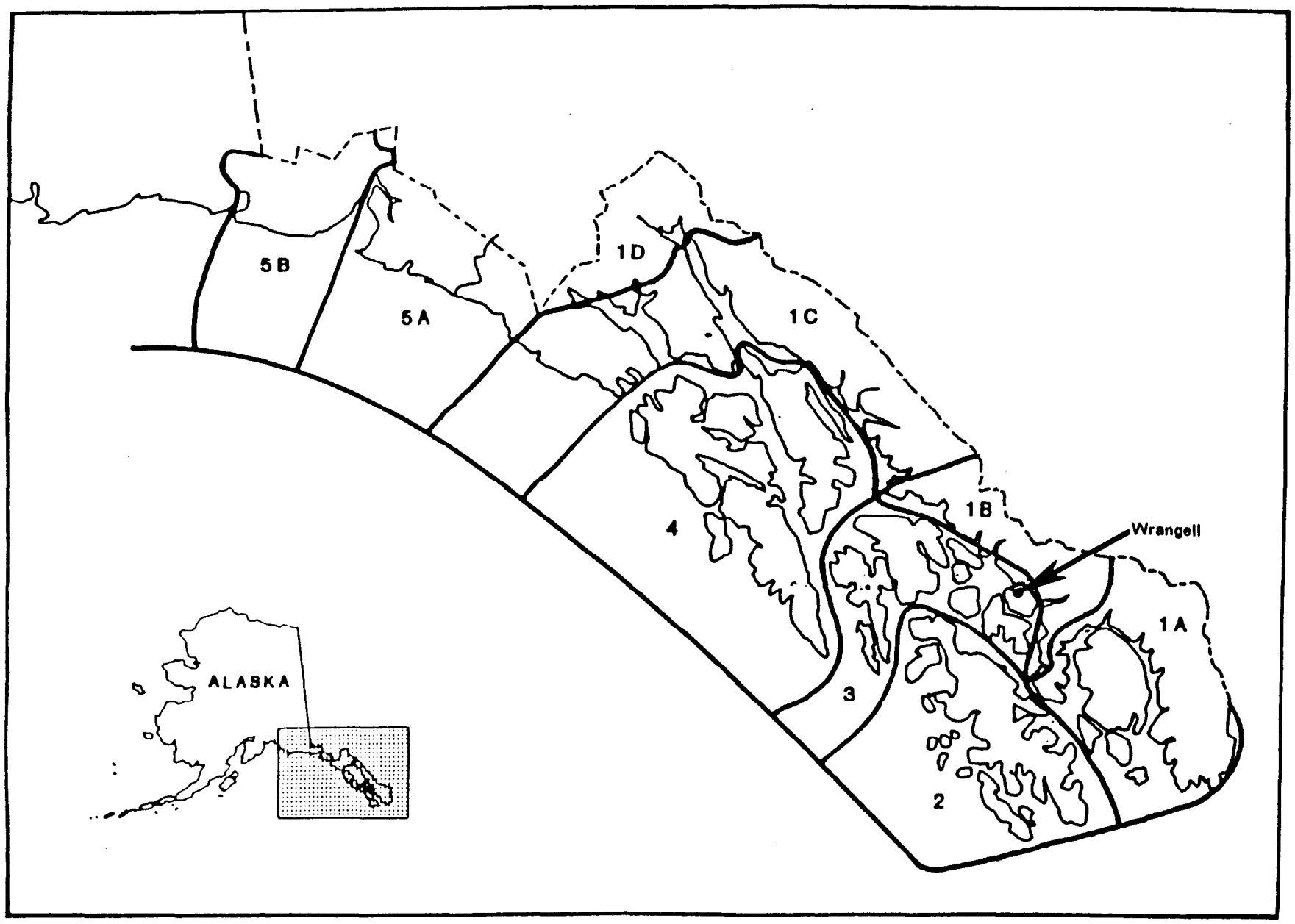


Fig. 15. Game management units in the Southeast Region.

active hunters produced the largest amount of edible meat (653.6 lbs), followed by moose (549.7), deer (207.4 lbs.), goat (150.2), black bear (173.3 lbs.), and birds (35.8 lbs.).

Table 7

Household Game Harvest by Resource (Number)

Species	Active Households*	All Households
Deer	2.59	0.72
Moose	1.00	0.06
Bear	1.16	0.06
Goat	1.25	0.04
Seal	7.26	0.22
Ducks	12.94	2.08
Seabirds	14.45	0.23
Canada Geese	4.24	0.50
Other Birds	6.36	0.46

* Active Households are those that actually harvested.

Table 8

Household Game Harvest by Resource (Pounds)
Mean Useable Weight in Pounds Harvested

Species	Active Households*	All Households
All Species	340.1	130.60
Deer	207.4	57.25
Moose	549.7	34.63
Black Bear	173.3	8.32
Goat	150.2	4.51
Seal	653.6	19.61
Birds	35.8	6.28

*Active Households are those that actually harvested.

When harvest by hunting is spread across the entire community, the ranking of harvest quantities by species is substantially altered and more closely reflects the relative importance of each species to the community. Among all Wrangell households, the harvest by hunting accounted for an average of 130.6 pounds of useable meat. Table 8 shows that deer accounted for the largest quantity (57.2 lbs.), followed by moose

(34.6 lbs.), harbor seal (19.6 lbs.), black bear (8.3 lbs.), birds (6.2 lbs.), and goat (4.5 lbs.).

The food harvested by hunting is typically shared and used by other households in the community. Table 9 shows the percentage of households which participated in game harvest and distribution during the survey period. Moose and deer, the two most important species, are good examples of the distribution of wild resource harvests. Moose was harvested by a relatively few households (6.3%), however, it was shared by all of those who harvested it, received by 37.7%, and used by 42.5% of all households. The deer harvest was less specialized, but overall use was more widespread. Deer were harvested by about three out of ten households (27.6%), shared by 46% of those harvesting, received by 45.5% of community households, and used by 65.4% of all households in Wrangell.

Table 9

Game Harvest participation and Distribution by Household

Species	%Harvesting	%Giving*	%Receiving	%Using
All Species	38.1	66.7	62.2	75.0
Deer	27.6	46.0	45.5	65.4
Moose	6.3	100.0	37.7	42.5
Bear	4.8	54.2	6.9	8.4
Goat	3.0	76.7	6.2	7.7
Seal	3.0	50.0	2.4	4.6
Ducks	16.1	85.7	11.2	23.3
Canada Geese	11.7	53.8	3.1	14.1
Other Birds	7.3	20.5	3.2	10.5

* Households that actually harvested.

Overall, hunting provided meat to 75% of all Wrangell households. The game harvest of surveyed households expanded to the entire community is 132,290.7 pounds. Wrangell residents are dependent on hunting for this valuable food, as well as to sustain a tradition of independence and self-sufficiency.

Trapping is also important to Wrangell residents, but on a much smaller scale. Some families have trapped for generations, and continue the tradition. Other

households, many in outlying areas, use trapping as a source of cash income during the winter months. Overall, only 1% of the surveyed households trapped during the survey period. Twice as many households used furbearers, demonstrating that furs are shared between households (see page 62 for a more detailed discussion).

Deer

Deer have always been an important resource to the Wrangell community. During the WHS survey, respondents repeatedly commented on the decreased number of deer in the Wrangell area. Time and again, hunters mentioned how much better hunting was in the old days when "deer were like rabbits." The deer were so plentiful "...they'd almost jump in your boat."

The importance of deer is reflected in the response of hunters to a sudden crash in deer population following a series of severe winters in the late 1960s. Deer harvest by Wrangell residents was most dramatically affected (Doerr 1986:6,8,44).[3] Between 1960 and 1968, Wrangell hunters harvested an average of 680 deer annually. The number of deer harvested fell from 520 in 1968 to only 250 in 1969. Between 1969 and 1974, the average estimated annual deer harvest was reduced to only 140 (Doerr 1986:29). In recent years, harvest levels have increased, but they have not yet returned to previous levels (Doerr 1986:29; Fay 1986:38)(Figure 20).

The Board of Game responded to the deer population crash by reducing bag limits. Since 1925, the deer season has opened in August and closed in December except for a January season on the west side of Admiralty Island in 1983-84. Bag limits have varied from one buck to six deer. Bag limits were reduced in GMU 3 from four deer to one deer in 1973. Between 1975 and 1979 the area was closed to all hunting. Between 1980 and 1987 one buck was allowed. The bag limit in GMU 4 was four deer in 1986 and six deer in 1987.

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[3] *Historic information on deer hunting in Southeast Alaska is summarized in Division of Habitat Technical Report 86-5 and 86-10.*

Scarcity of deer and reduced bag limits in GMU 3 caused Wrangell hunters to shift their effort to other areas. Historically, Wrangell hunters concentrated their hunting in GMU 3. Between 1960 and 1968, eighty percent (80%) of the Wrangell deer harvest occurred on Wrangell Island and immediately surrounding islands of Zarembo, Vank, Woronkofsk, Etolin, and Shrubby (Doerr 1986:40). By 1985, the Wrangell harvest was divided almost equally between GMU 2, 3 and 4 (Table 10).

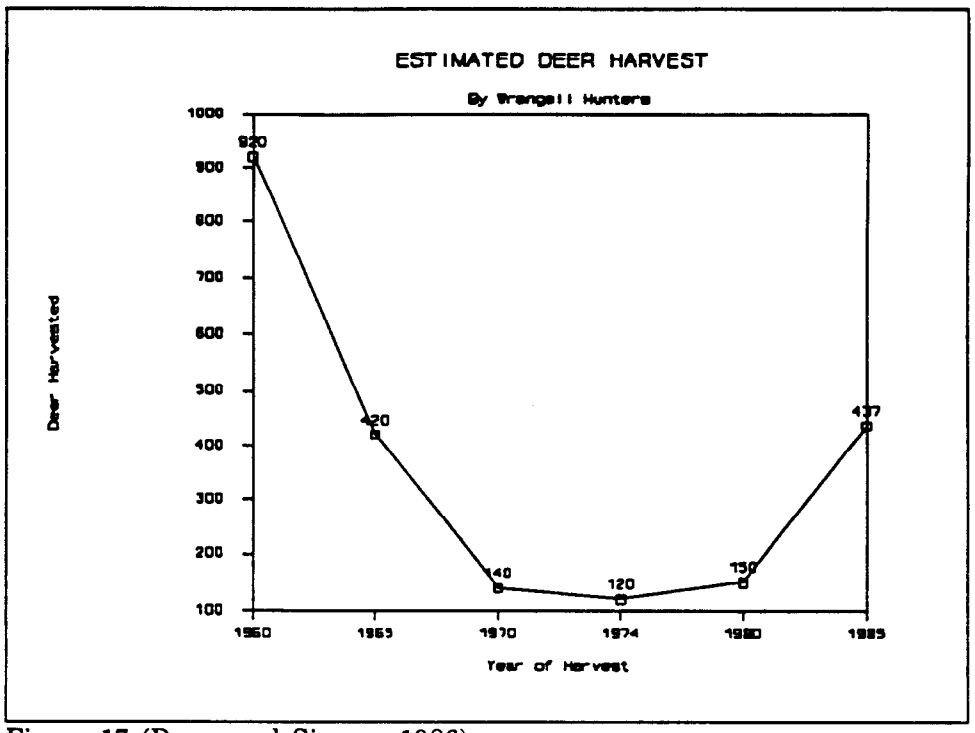


Figure 17 (Doerr and Sigman 1986).

Table 10
Wrangell Hunter Deer Harvest by GMU

Year	GMU 1	GMU 2	GMU 3	GMU 4
1959 (n=110)	1%	3%	96%	0%
1983 (n=240)	9%	9%	51%	30%
1985 (n=437)	3%	29%	35%*	29%

* 41% of GMU3 deer were taken on Woronkofski Island. 1959 and 1983 (Doerr 1986:43,47) 1985 (Fay 1986:34).

During the survey, one hunter said "lots of country [is] so poor in deer we've moved away from much of the old hunting grounds." Most people, however, would still prefer to hunt closer to home were deer populations and bag limits higher.

Figure 18 is a map which shows all areas ever used by Wrangell residents to hunt deer.[4] The deer hunting use area is extensive. Some households hunt deer while doing other things, including commercial fishing, logging, sport fishing, or hunting other game. Shorelines, roadsides, and trails passed in the course of a days work are commonly scrutinized for deer.

Survey participants were asked the distance from Wrangell to three specific types of hunting places: a "particularly good" hunting place; a "once reliable but no longer used" hunting place; and, a "most often used" hunting place. Table 11 shows the average distance to each type of place and the proportion of hunters who identified a place in three distance ranges. The mean distance traveled to "once reliable but no longer used" places was closest to home (25.3 miles). The majority of hunters (55.5%) still have a "particularly good" hunting area within 25 miles of Wrangell; however, the overall average distance has increased to 47.9 miles. This indicates hunters now travel a further distance to hunt in a "particularly good" place. The average distance to "most often used" places was 34 miles from Wrangell, closer than a "particularly good" places.

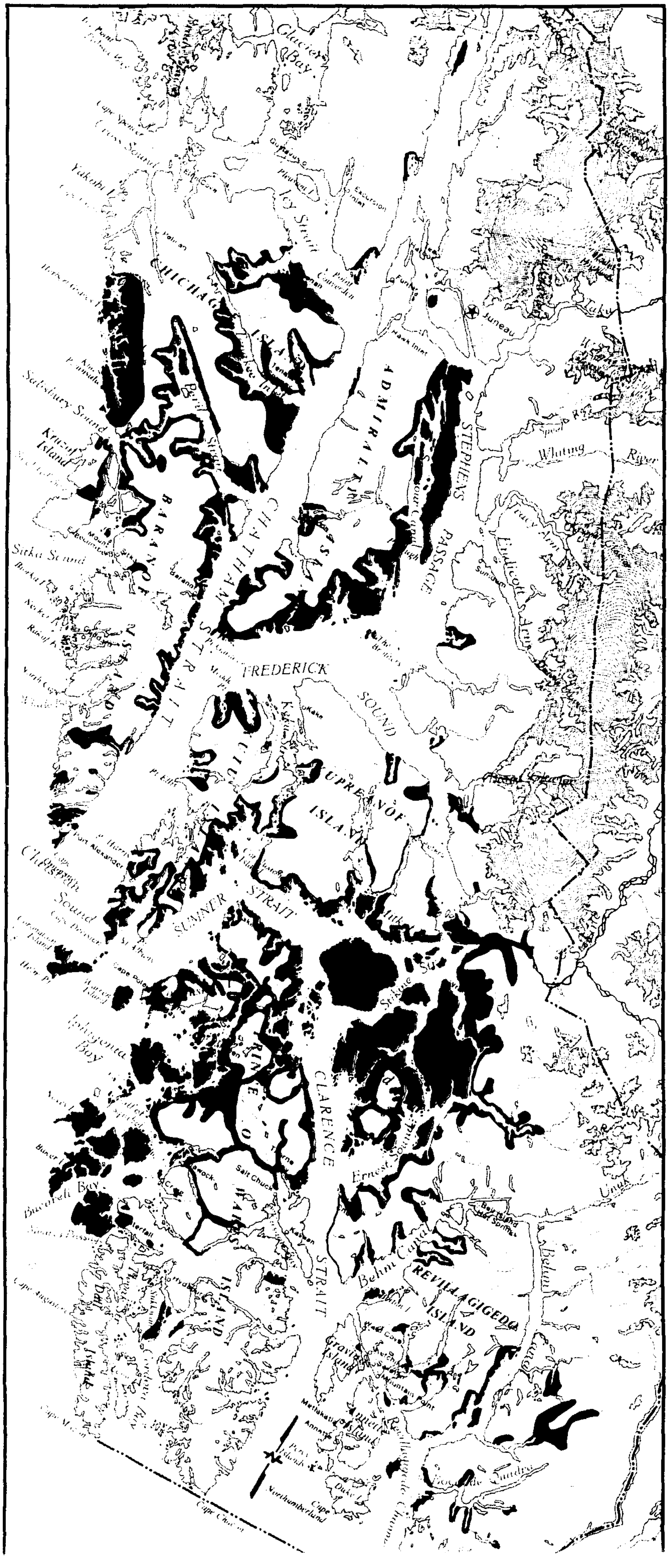
Table 11

Distance From Wrangell of Types of Hunting Areas and Percentage of Use.

	Distance from Wrangell in Miles			
Category	Mean	0 - 25	26 - 80	81 +
Particularly Good	47.9 mi.	55.5%	23.6%	20.8%
No Longer Used	25.3 mi.	64.4%	31.3%	4.6%
Most Often	34.2 mi.	64.7%	23.2%	12.0%

[4] *Survey respondents were asked to map places they have hunted deer while living in Wrangell in four different ways: all places hunted; places hunted that were particularly reliable; places hunted that were once reliable but are no longer used, and, places hunted most often. When completed the maps will show the areas used and the intensity of use and will be available through the USFS in Juneau.*

Figure 18.



Areas used for deer hunting by residents of Wrangell

SCALE 1:1,351,351

0 10 20 30 40 MI

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This map depicts areas used for resource harvesting during the lifetimes of a sample of Wrangell residents while they lived in Wrangell. Interviews were conducted with 75 Wrangell households from December 1987 through January 1988. Because not all residents were interviewed, it is likely that some use areas have been omitted. Therefore this map must be considered to be an incomplete representation of all Wrangell use areas.

See: Wrangell Harvest Study by Kathryn A. Cohen, Division of Subsistence, Technical Paper No. 165 for more information. More detailed 1:250,000 scale maps of these use areas are available at the Division of Subsistence.

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The primary reason a place becomes a "no longer used" place is shown in Table 12. Not surprisingly, absence of deer was the reason given most often. The second most often made response was "no longer hunt" perhaps due to increasing age, health problems, time conflicts, or other possibilities. Lack of transportation was the third most often mentioned reason for abandoning a hunting place.

Table 13 shows the primary mode of transport used to reach the three types of hunting places. Hunters used boats in the overwhelming majority of cases. The relative ease of access to "no longer used places" is shown by the higher percent of hunters who used cars/trucks (17.2%) or simply walked (6.5%) to reach those hunting areas.

Table 12

Reason Once Reliable Hunting Areas Were Abandoned

Reason	Percent of Households
Absence of deer	36.9%
No longer hunt	21.9%
No means to get there	15.7%
Closed area	7.9%
Do not know	6.1%
Found better area	5.6%
Logged area	3.7%
Too many hunters	1.9%
Inconvenient	.3%

Table 13

Primary Means of Transport to Hunting Places

Type of Place	Mode of Transport	Percent of Hunters
Particularly Good	Boat	86.8
	Car/Truck	1.0
	Ferry	6.7
	Airplane	5.4
No Longer Used	Boat	69.9
	Car/Truck	17.2
	Walk	6.5
	Air	6.5
Often Used		
	Boat	84.1
	Car/Truck	11.1
	Ferry	3.4
	Walk	.2
	Airplane	1.0
	Other	.2

The type of boat used to reach a hunting area controls the distance hunters tend to travel. Outboard powered skiffs were the most popular craft used. In most instances, skiffs were used to travel within 40 miles of Wrangell. Pleasure cruisers also tended to be used close by. On the other hand, commercial fishing boats were used to reach areas as far as 145 miles away. It is most likely that hunting accessed by these vessels was done enroute to or from fishing, rather than as a separate activity.

Despite the decline in deer population, deer hunting remains important in Wrangell. Over 76% of all Wrangell households have hunted deer while living in Wrangell. In 1987, 65.4% of all households used deer, that is, either harvested or received deer. Deer ranked first in total poundage for all animals hunted in 1987. Over one quarter (27.6%) of the households surveyed actually harvested deer during the survey period. These active households harvested an average of two and a half (2.59) deer or approximately 207.4 pounds of useable meat. The total harvest represented a mean of 57.2 pounds of meat per Wrangell household.

Almost half (46%) the deer harvesting households shared. Some gave deer to relatives (27.7%), friends (30.5%), friends from work (13.7%), elders (19.4%) and people known in another way (8.7%). Close to half (45.5%) of all Wrangell households received some deer meat from other households. The majority of households that received deer meat, received the deer from friends.

Moose

Moose are an important source of meat to the community of Wrangell. Moose average about 550 pounds of useable meat, equivalent to about seven deer. Moose accounted for the second largest amount of game meat used by Wrangell households in 1987. Based on the WHS survey, Wrangell households harvested an estimated 64 moose in 1987 accounting for about 35,079 pounds of useable resource.

There is an small, isolated, but healthy moose population along the lower Stikine River. The moose hunting season has been fairly constant for the past 25 years. Since 1960, the Stikine River moose hunt has opened September 15 and lasted between two and six weeks. The bag limit has been one bull moose except in 1972-1973 when the bag limit was one moose, either sex. In 1987, the season lasted four weeks with a bag limit of one bull moose.

Wrangell moose hunters travel to the Stikine River drainage by skiff or river scow. Stikine River moose hunters commonly hunt from trees. Hunters use tall trees that surround open muskeg and meadows as moose spotting posts. To become a genuine "moose tree", a strategically placed tree is modified to make it comfortable for moose spying. Some trees have branches trimmed and steps to the sighting spot. Other trees have places for tarpaulin roofs and expanded sitting areas, almost like tree houses. Hunters sit in the tree until a moose appears and then either shoot it from the tree or pursue the animal on foot.

Moose trees are jealously guarded. A hunter with tree privileges camps at the foot of the tree. Some lucky hunters have trees located near cabins. Although trees cannot be legally owned, there are trees possessed by families through consistent use and local tradition. Stories are retold of the fate of hunters discovered sitting in someone else's tree.

The number of moose reported harvested in the Stikine area by all hunters has gradually increased since 1960, with the exception of a sharp increase and decrease between 1973 and 1975 [5] (Figure 19). In 1975, the smallest reported harvest was 16 moose. The largest reported harvest occurred in 1987 when hunters killed 51 moose. It was also the year when more hunters hunted than ever before, twice as many as in

[5] *Stikine moose hunters are required to obtain a harvest ticket and to return the ticket following the hunt. The harvest ticket form contains questions for the hunter to answer regarding where they killed their moose and other details. These tickets are not always returned. As a result, moose harvest figures are believed to be low (Doerr 1986:66).*

1986. The number of hunters has ranged from a low of 125 in 1971 to a high of 232 in 1987 (Doerr 1986:67; ADF&G 1988a).

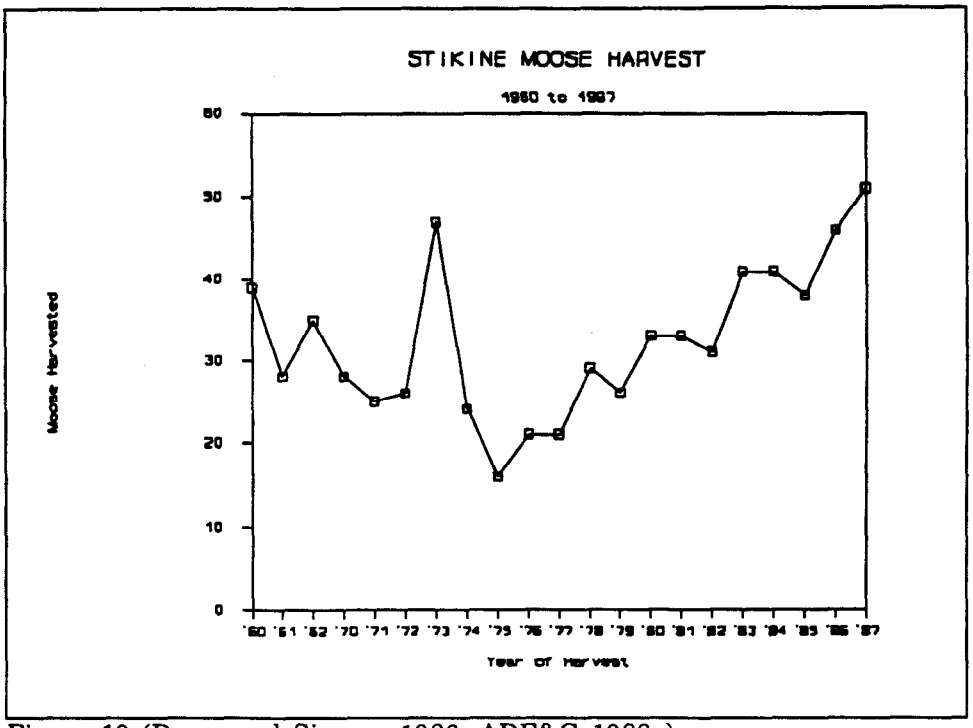

Figure 19 (Doerr and Sigman 1986; ADF&G 1988a)

Wrangell moose hunters dominate the hunt in the Stikine River drainage near Wrangell. In 1987, Wrangell residents comprised 63% of all the hunters in the Stikine River drainage (GMS 1B south of LeConte Bay) (ADF&G 1988a). Occasionally Wrangell hunters harvest moose outside the Stikine River drainage. Wrangell hunters have killed moose at Arron Creek, Crittenden Creek and Virginia Lake on the mainland, as well as other areas throughout the State (Doerr 1986:69).

Moose provided an average of 34.6 pounds of meat per household. Active households harvested a mean of 549.7 pounds of meat or approximately one moose. The proportion of households harvesting moose was quite small (6.3%), perhaps indicating a specialized group of harvesting households, or merely reflecting the limited

harvest opportunities. The distribution of moose, however, is extensive. All moose hunters shared their harvest. Over one third (37.7%) of all households received moose meat in 1987. A total of 42.5% of all households used moose.

Black Bear

Black bear are hunted for their meat and hide. Hunters usually hunt bear in the spring, although some bear are killed in the fall often incidental to other hunting (ADF&G 1984: 5,10). The open season for bears is long and extends from September 1 to June 30. The bag limit varies between one and two bear.

Bears are plentiful and are easily hunted close to Wrangell. The majority of Wrangell hunters hunt bear in the Stikine River drainage, the mainland area in GMU 1B and on local islands in GMU 3. Bears provide Wrangell households with a reliable alternative meat source. One resident indicated he hunted bear as a meat animal in the past and would fall back on bear meat if he were unable to harvest adequate deer or moose.

The reported bear harvest is increasing. According to ADF&G harvest records, the total harvest for the five year period from 1975 to 1979 in the Stikine River drainage (GMS 1B) and the islands near Wrangell (GMU 3) was 262 bear. Between 1980 to 1984, the number rose to 422, a 62% increase (Doerr 1986:86). In 1987, Wrangell hunters harvested 28 black bears, 22 bears in GMU 1B and 6 bears in GMU 3 (ADF&G 1988a). According to the WHS survey Wrangell households harvested 56 black bear in 1987.

Bear harvesting households comprised 4.8% of all households. These active bear hunters harvested a mean of 173.3 pounds of useable meat in 1987. Bear provided an average of 8.3 pounds of useable meat across all Wrangell households, considerably less than either deer or moose. Over half of the households (54.2%) harvesting bear shared their meat. Distribution of the meat, however, was less widespread. Only 6.9% of all

households received bear meat, whereas approximately forty percent received moose and/or deer. A total of 8.4% of all Wrangell households used bear in 1987.

Goat

Mountain goat live in the mountainous area of the mainland. Near Wrangell, goat are found in the Stikine River drainage and along mountain ridges by Bradfield canal and the LeConte Glacier. Goat are a challenging animal to harvest. They provide approximately 120 pounds of useable meat.

Wrangell residents have hunted goat for generations. A Wrangell elder retold a story heard from his grandfather about goat hunting during the late nineteenth century. Grandfather recalled how as a young man he was sent along with the other young men up a mountain at the head of a small valley in Bradfield Canal. The young men surrounded the goats on the mountain and drove them down the valley to hunters waiting at the valley entrance.[6]

One Wrangell resident recalled how he hunted goat actively for over a decade and regularly harvested two goat a year. He began hunting goat as a substitute for deer meat during years when the deer population was low in the late 1960s. His family did not care for bear meat. This hunter hunted goat between three and seven days every August, before the meat became "too strong".

In 1987, goat season opened August 1 and closed December 31 in the Stikine River drainage (GMU 1B). The bag limit was two goats of either sex. Thirty-eight goat were harvested (ADF&G 1988a). According to the WHS survey, 38 goats were harvested by Wrangell residents in 1987. Three percent of all households harvested goat. The animals harvested provided an average of 150.2 pounds of useable meat for active households and an average of 4.5 pounds for all households. Three out of four (76.7%)

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[6] *Anthropologist Kalerov Oberg, who investigated Tlingit economy in the 1930s documented the nineteenth century hunting method of driving goats into narrow gorges where men could kill them (Oberg 1973:71).*

successful hunting households shared their harvest with other households. About 6.2% of all households received goat meat. Seven percent (7.7%) of all households used goat.

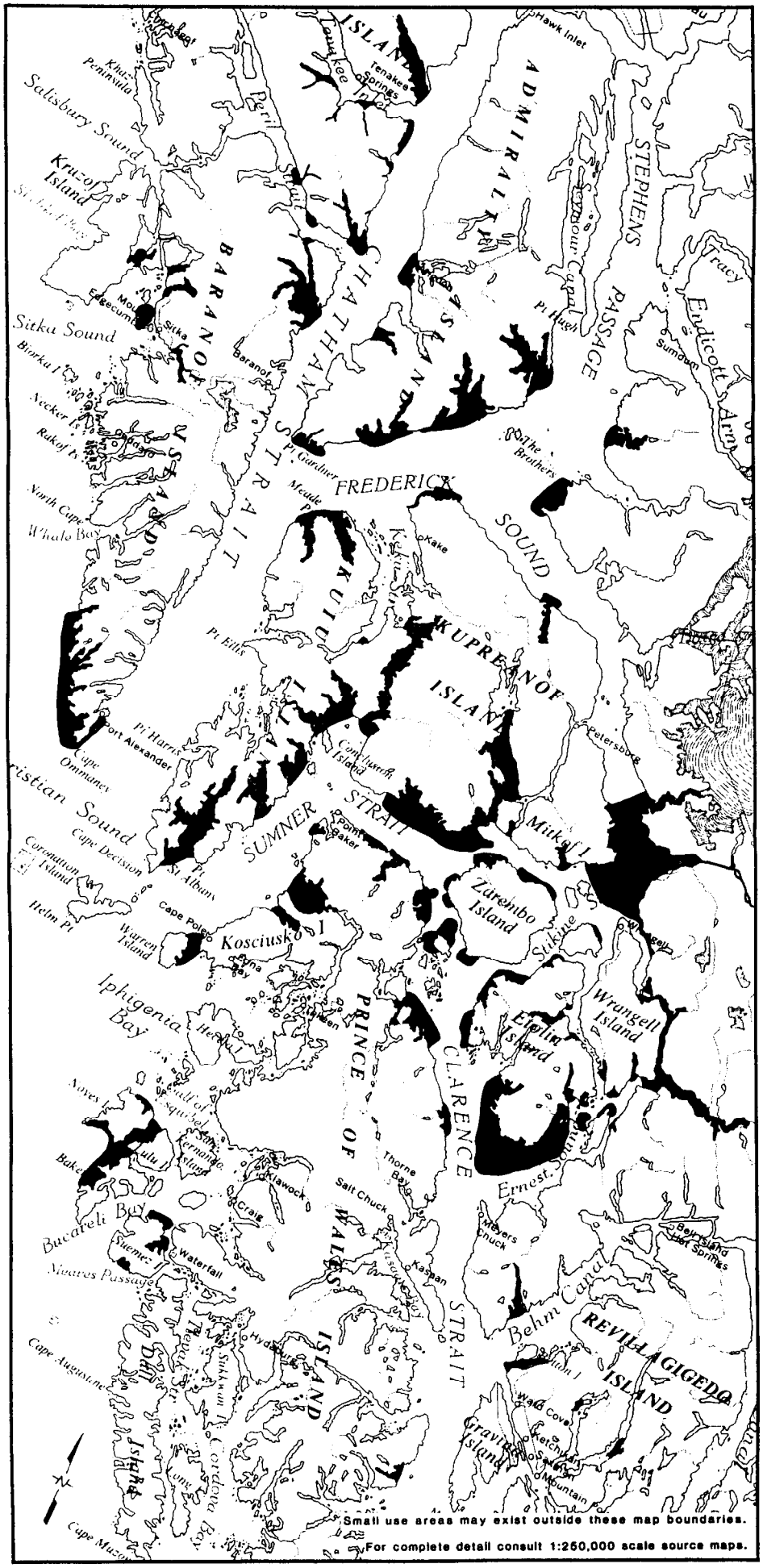
Seal

Seal hunting is a traditional part of some Wrangell household's harvest. During territorial days there was a bounty on seal because they prey on salmon. A number of Wrangell residents recalled when the bounty amounted to between three and six dollars a "scalp." Today, only Alaska Natives may harvest seal since passage of the Marine Mammal Protection Act of 1972. Alaska Natives continue to harvest seal for meat (seal liver is considered a delicacy), seal oil, and hides.

Figure 20 is a composite map of seal harvest areas used by Wrangell residents. Wrangell hunters have hunted seal as far north as St. James Bay in Lynn Canal, east to the waters of Bradfield Canal, south to the entrance of Boca De Quadra and west to Sitka Sound. Areas closer to town include the Stikine River flats and the mainland shore of Eastern Passage, the coast of Etolin Island and Menefee Inlet, Olive Cove and Anita Bay. Also used is Stikine Strait, the islands in Kashevarof Passage, the shores of Zarembo Island, the north end of Prince of Wales Island at Red Bay and Buster Bay, as well as Keku Strait and Duncan Canal.

According to the WHS survey, Wrangell households harvested about 213 seal in 1987. Harbor seal were harvested by 3.0% of all Wrangell households in 1987. The average harvest per active household was 653.6 pounds of useable meat. The total seal harvest represented an average of 19.6 pounds of meat per household. Seal meat is shared, but less extensively then other hunted species. Although half of the harvesting households gave away a portion of their harvest, only 2.4% of all households received seal. Overall, 4.6% of all Wrangell households used seal.

Figure 20.



Areas used for harbor seal hunting by residents of Wrangell

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This map depicts areas used for resource harvesting during the lifetimes of a sample of Wrangell residents while they lived in Wrangell. Interviews were conducted with 75 Wrangell households from December 1987 through January 1988. Because not all residents were interviewed, it is likely that some use areas have been omitted. Therefore this map must be considered to be an incomplete representation of all Wrangell use areas.

See: Wrangell Harvest Study by Kathryn A. Cohen, Division of Subsistence, Technical Paper No. 165 for more information. More detailed 1:250,000 scale maps of these use areas are available at the Division of Subsistence.

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

Subsistence Division

Birds

The Stikine River flats and several smaller tidelands in the Wrangell area are excellent for bird hunting. Wrangell residents hunt ducks, seaducks and seabirds, canada geese, and other birds. Duck species present include bufflehead, golden eye, mallard, shoveler, teal, and widegon. Seaducks and seabirds available include eiders, harlequin, mergansers, old squaw, scoters, commorants, murre, and seagulls. Canada geese arrive in the spring and fall along with other goose species such as brant, snow geese, and white-fronted geese. Sandhill crane come too. Grouse or "hooters" are present all year in the upland forest and are actively hunted.

Often, birds are hunted incidently to other activities. According to several 1984 surveys administered by ADF&G in Southeast Alaska, waterfowl were hunted during 14% of moose hunting trips and 34% of goat hunting trips. Grouse were hunted during 6% of moose hunting trips and 5% of goat hunting trips in 1984 (Fay 1986a:28; 1986b:27). Birds are also hunted during other activities such as commercial fishing and logging.

The 1987 waterfowl hunting season opened September 1 and closed December 16. The Bag limit varied depending on the species. In general ducks were limited to a maximum of seven per day, except for seaducks with a limit of fifteen per day. The limit on Canada geese was four and sandhill crane was two per day. Grouse season opened August 1 and closed May 15 with a bag limit of five per day.

Figure 21 is a composite map of bird harvest areas used by Wrangell residents. Waterfowl is hunted as far north as Port Frederick on Chichagof Island, east into Bradfield Canal, south to Boca De Quadra and west to Krestof Sound near Sitka. Most hunters, however, generally hunt closer to Wrangell. The Stikine River flats, the coast of Wrangell Island, Etolin Island and along Blind Slough at the south end of Mitkof Island are popular spots. Grouse are generally hunted in the interior of Wrangell Island where hunters can walk along the logging roads. Hunters also hunt grouse on the road system on Woronkofski Island.

Table 14 shows the 1987 bird harvest by useable weight and quantity of birds harvested by species. Ducks provided the largest average amount of meat (3.13 lbs.), followed by Canada geese (2.48 lbs.), seabirds (.35 lbs.) and other birds (.33 lbs.). Seventeen percent (17.5%) of all Wrangell households harvested birds in 1987. The largest percentage of households harvested ducks (16.1%), followed by Canada geese (11.7%), "other birds", primarily grouse (7.3%), seabirds (1.6%). The 1987 bird harvest provided active households with an average of 35.8 pounds of useable meat, and all Wrangell households with a total of 6.28 pounds of meat.

Bird hunters were generous with their harvest. Ducks were shared the most frequently with 85.7% of all duck harvesters sharing. As a result, more households received ducks then any other bird. 11.2% of all households received ducks followed by other birds (3.2%) and Canada geese (3.1%). Better than one in every four Wrangell households (27.5%) used birds in 1987.

Table 14

Harvest of Bird by Species Category

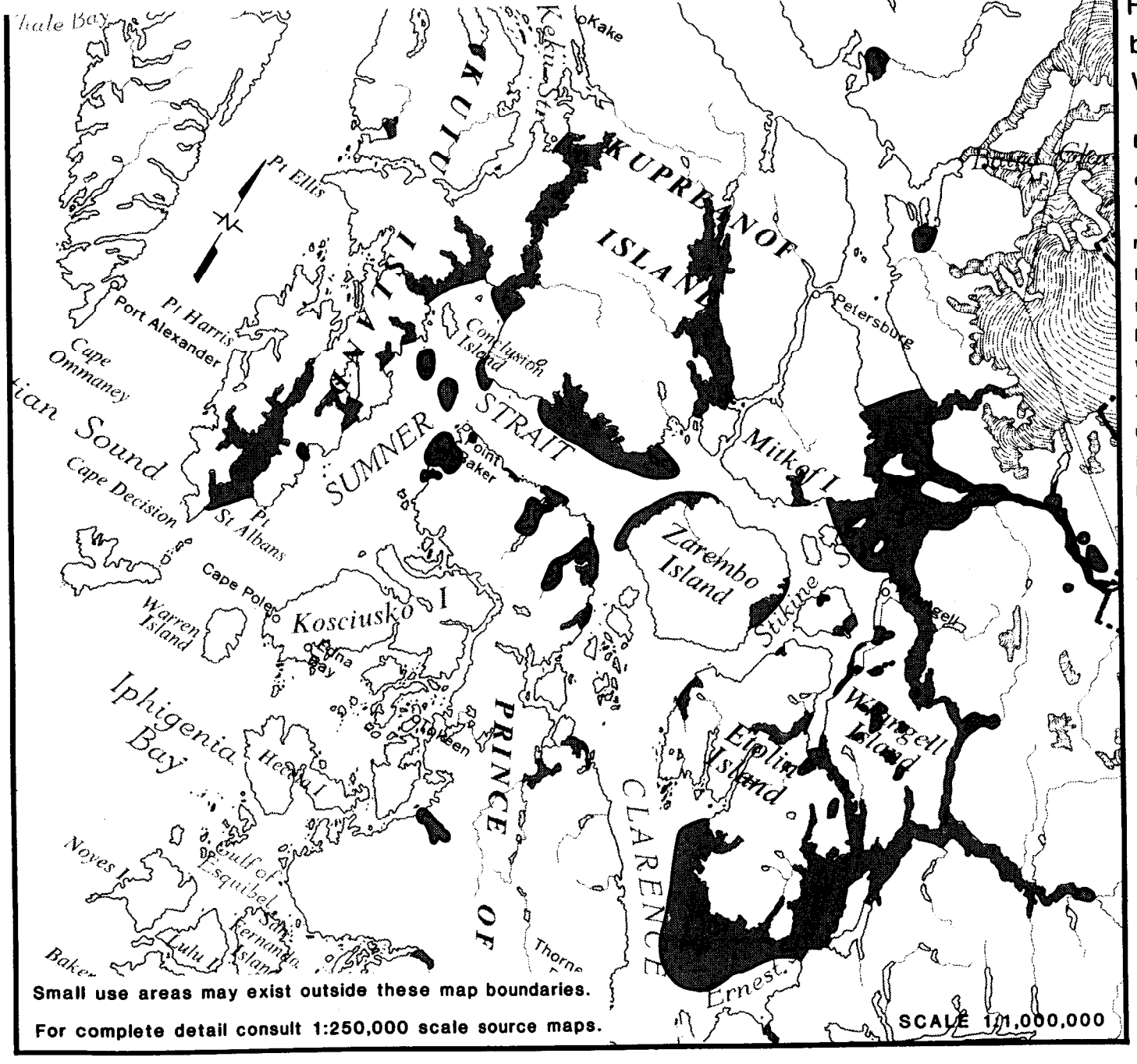
Species Category	Mean Edible Weight in Pounds		Number of Birds Harvested	
	Active Households*	All Households	Active Households	All Households
Ducks	19.4	3.13	12.94	2.08
Seabirds	21.7	0.35	14.45	0.23
Canada Geese	21.2	2.48	4.24	0.50
Other Birds	4.5	0.33	6.36	0.46

Table 15

Bird Harvesting Participation and Distribution

Birds	% Harvesting	% Giving*	% Receiving	% Using
All Species	17.5	85.7	15.1	27.5
Ducks	16.1	85.7	11.2	23.3
Seabirds	1.6	50.0	0.0	1.6
Geese	11.7	53.8	3.1	14.1
Other Birds	7.3	20.5	3.2	10.5

* Active harvesting households only.



Small use areas may exist outside these map boundaries.

For complete detail consult 1:250,000 scale source maps.

Figure 21. Areas used for bird hunting by residents of Wrangell

Birds includes: ducks, geese, grouse, cranes, ptarmigan, and sea ducks. This map depicts areas used for resource harvesting during the lifetimes of a sample of Wrangell residents while they lived in Wrangell. Interviews were conducted with 75 Wrangell households from December 1987 through January 1988. Because not all residents were interviewed, it is likely that some use areas have been omitted. Therefore this map must be considered to be an incomplete representation of all Wrangell use areas.

See: Wrangell Harvest Study by Kathryn A. Cohen, Division of Subsistence, Technical Paper No. 165 for more information. More detailed 1:250,000 scale maps of these use areas are available at the Division of Subsistence.

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
Subsistence Division

Furbearers

The history of Wrangell attests to the richness of the fur resources. Animals harvested for their furs are relatively abundant on the islands and the mainland. Furs harvested include mink, muskrat, marten, land otter, beaver, wolf, wolverine and occasionally lynx.

During the early nineteenth century, the Stikine Tlingits became a wealthy and powerful tribe through their ability to monopolized the fur trade on the Stikine River. The rich fur resources of the area attracted the Russian-American Company and the Hudson Bay Company in the early nineteenth century. The fur trade continued through the various gold rushes and the start of the fishing and timber industries. In 1922 furs valued at $51,000 were brought down from the Stikine River and shipped south (Cohen, 1986:49). A Wrangell fur buyer who purchased furs in the 1940s recalled when mink brought 30 dollars a pelt. Fur prices fell in the 1950s and trapping activities declined. A few Wrangell residents, however, continued to trap during the 1980s.

In 1983-84 season, nine Wrangell trappers sold or exported the following furs: 115 mink, 12 muskrat, 59 marten and 14 land otter (Doerr 1986:104). In 1986-87 there were seven trappers operating out of Wrangell (ADF&G 1988a). WHS survey indicated only one percent of the Wrangell households successfully trapped in 1986-1987.

FISHING

The water around Wrangell Island is brimming with good things to eat. Large, fat king salmon and small, oily hooligan appear every spring on their way to spawn in the Stikine River. Halibut can be caught year-round along with other tasty bottom fish. There are large populations of shellfish, including dungeness crab and tiny "popcorn" shrimp.

People depend on the abundant fish and shellfish for food, cash and personal satisfaction earned through self-sufficiency. When spring arrives, morning coffee shop conversations revolve around the coming fishing season, boat repairs and gear choices. Sounds of boat engines compete with the noise of morning traffic. Children appear with hooks and line to collect "scrap" fish off the dock.

Wrangell residents participate in fishing more often than any other harvest activity. Almost three quarters (73.3%) of all households harvested fish, 69.3% of these households share their catch, and 89.5% of all households received fish in 1987. Overall, 95.1% of all Wrangell households used fish in 1987.

The estimated total community fish harvest during the 1987 survey year was 286,040 pounds useable weight (n=1013), an average of 282.37 pounds per household. Active harvesters averaged 408.1 pounds edible weight per household. The category "other finfish" accounted for the largest share of the average household harvest (118.7 lbs.), followed by salmon (84.6 lbs.) and shellfish (78.9 lbs.). Figure 25 depicts the species mix of the Wrangell fish harvest by species category. Salmon accounts for the largest proportion of the harvest, followed by halibut, and crab in roughly equal proportions.

Current government regulations separate fish harvest opportunities into two broad categories, "commercial" and "noncommercial", and further divide noncommercial into sport and subsistence. These regulatory distinctions are important because they profoundly influence the manner by which all seafood is obtained. The Alaska Board of Fisheries regulates the harvest of finfish and shellfish through seasons, gear restrictions and harvest limits. Halibut stocks are managed by the International Pacific Halibut Commission.

Overall, commercial fishers represent a small proportion of the Wrangell population. Participation rates for all households in different commercial fisheries vary from 9.8% for salmon to 13.1% for halibut. The contribution of commercial fishers, however, to the total quantity of fish used by Wrangell households is significant. Wrangell residents who participate in commercial fishing, almost without exception, remove a portion of

their commercial catch for home use. Commercial fishers typically share their catch with other Wrangell households.

In 1987, the commercial fleet removed an estimated 56,165 pounds useable weight of fish from their catch for home use. This represented 19.6% of the total Wrangell fish, crab and shrimp harvest. In addition, some commercial fishers may have underestimated home use amounts expressing concerns that reporting their full personal use harvest might result in further restrictions on by-catch or reduce harvest quotas.

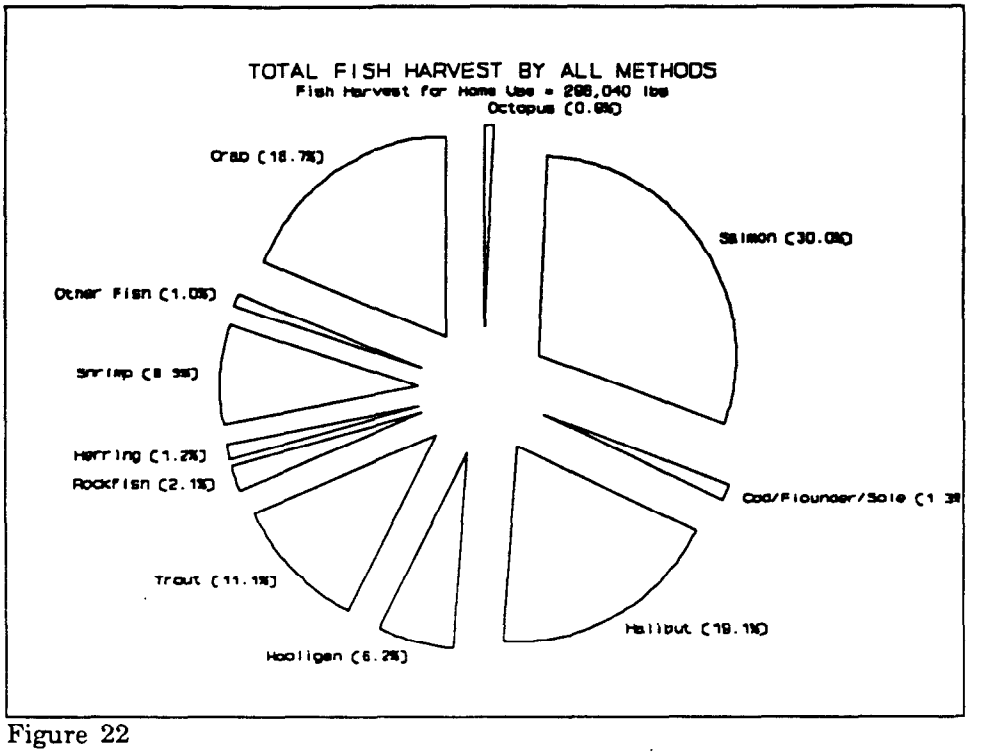


Figure 22

ADF&G regulations as well as the economics of commercial fishing influence the mix of species kept for home use. For example, in one year there may be no commercial market for a certain species. A harvester is likely to be generous with that fish. In another year, a market may exist for that species and another, perhaps less valuable species, will be taken for home use. In addition, ADF&G regulations

sometimes limit or prohibit incidental catch, or place a quota on certain species. More often than not, these regulated species are the fish kept for home use. Figure 26 shows the species mix of the fish removed from commercial catch by Wrangell fishers during the 1987 season.

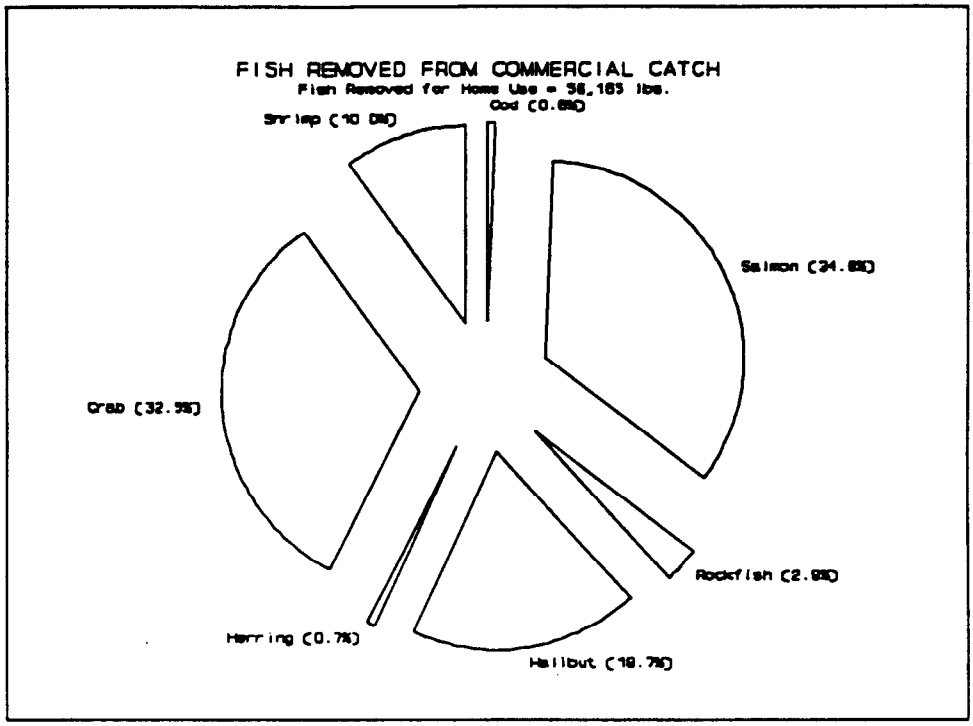


Figure 23

To regulate commercial fishing, the waters of southeast Alaska are divided into 16 fishing districts, some with sub-districts. The waters around Wrangell Island are geographically central to Southeast Alaska and are located in Districts 6, 7 and 8 (Figure 24). Commercial fishers with large seaworthy boats harvest fish at the northern or southern limit of their range and return to Wrangell to sell their catch and resupply. Sometimes fish are delivered to tenders which return to Wrangell to off-load. Members of the commercial fishing household pick-up fish from the tender for home processing. In this way, fish removed from a commercial catch by Wrangell residents

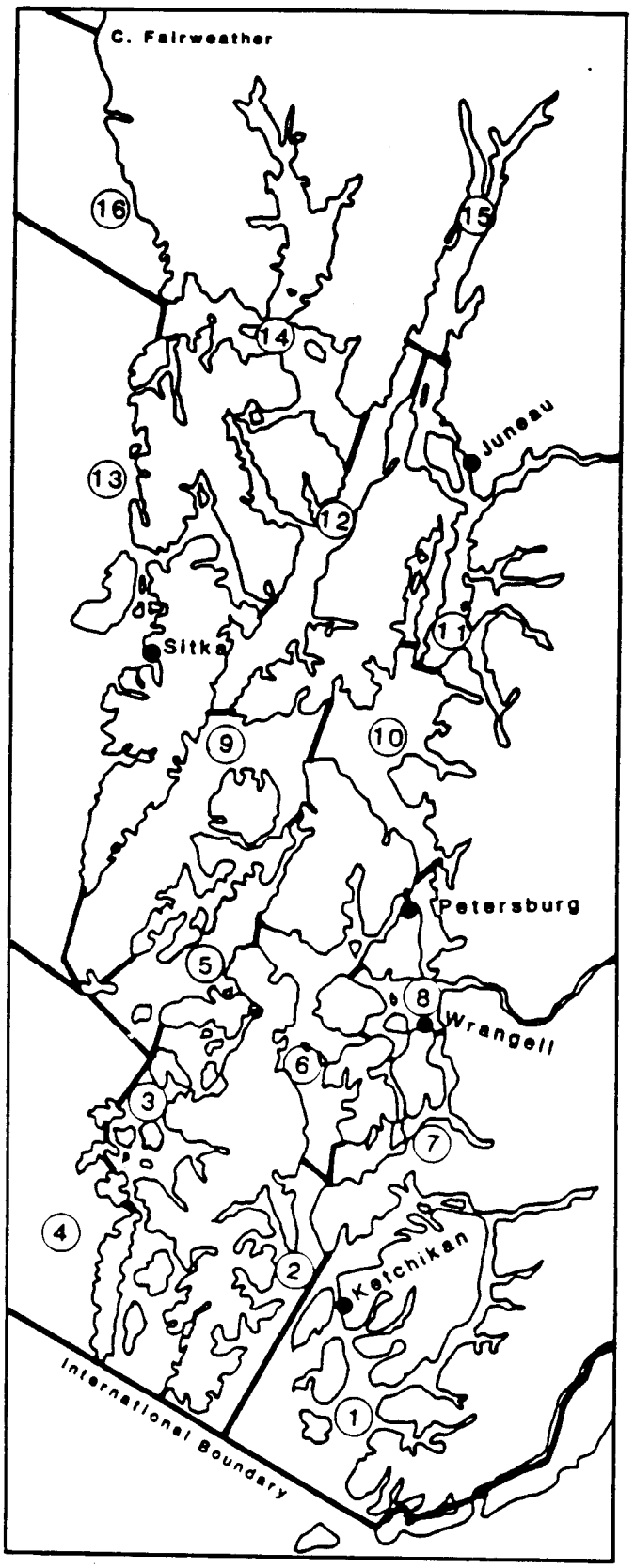


Figure 24. Southeastern Alaska Area regulatory commercial fishing districts.

for personal use may have been harvested in any of one of the regulatory districts in southeast Alaska.

Since limited entry was established in 1975, participation in certain commercial fisheries has been limited. Prior to that time, there was no effective distinction between noncommercial fishing and removal of fish from a commercial catch. If a local resident wanted to harvest fish with efficient gear, he simply bought a fifteen dollar license, and went commercial fishing on a small scale. A few fish might be sold to pay for expenses and the rest kept for home use. Limited entry, however, has all but eliminated the low-key commercial operator, except possibly within the salmon hand troll fleet. Over the years, for communities like Wrangell, the net effect may be an increased demand for noncommercial harvest opportunities that permit the use of efficient gear.

Wrangell residents most often harvest finfish noncommercially under sport regulations with rod and reel gear. Although there is a small harvest with subsistence nets, harvest opportunities in the Wrangell area are limited. For example, in 1987 only 5.9% of all noncommercial salmon were harvested with nets under a subsistence permit. Other finfish, not readily harvested with rod and reel, such as hooligan and herring, are taken with nets. Dungeness crab and shrimp are usually harvested with pot gear. A few households also harvested shrimp noncommercially with otter trawls and beam trawls.

Overall, the following proportion of Wrangell households harvested fish noncommercially in 1987: salmon 50.7%; other finfish 45.3% and shellfish (crab, shrimp and octopus) 47.6%. The estimated total noncommercial harvest of all species was 229,770 pounds useable meat (n=1013). This harvest represents 226.8 pounds per household. Figure 25 depicts the species mix of the 1987 noncommercial harvest.

It is important to note that fish populations very, sometimes dramatically due to complex environmental and biological factors. As species abundance changes, the harvest mix may change. In recent years, halibut, shrimp, and crab stocks have been

plentiful in the Wrangell area. The WHS data suggests a heavy reliance on these species.

During the WHS, respondents were asked to map those areas where they noncommercially harvested salmon, other finfish and invertebrates. This geographic data suggests that noncommercial fishing effort is concentrated within a 30 mile radius of Wrangell, in Districts 6, 7 and 8. This data is confirmed by the annual sport fishing creel census data (ADF&G 1988c).

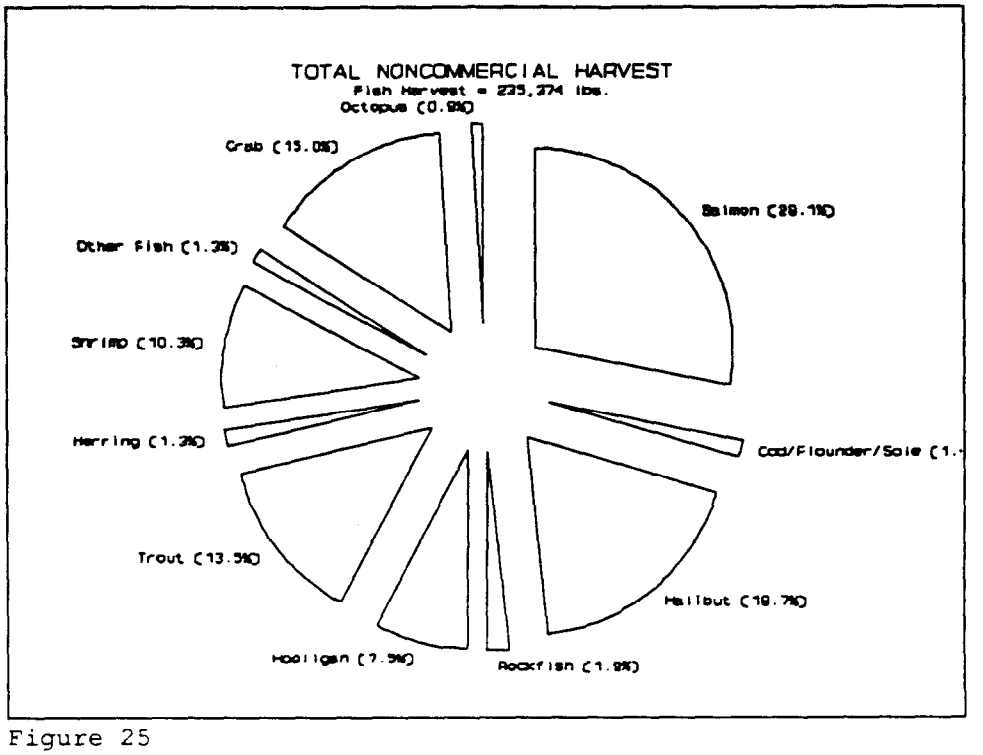


Figure 25

Salmon

Wrangell residents use of salmon is characterized by a heavy dependence on king salmon. This is partially because king salmon possess certain biological traits which make their harvest more convenient and productive than other salmon species. Unlike other salmon species, king salmon are present in the Wrangell area year-round. They

use the inside waters as a rearing ground and feed continuously. In addition, several enhancement projects have released hatchery fish in the area. King salmon are usually at least twice as big as any other salmon species.

Table 16 shows the harvest quantities of salmon taken for home use by all methods. Commercial operators removed an estimated total of 19,455 pounds useable weight of salmon from their 1987 catch for home use (Table 6). King salmon comprised he bulk of these fish, about 69.2%. Coho were the next most commonly removed (18.4%), followed by sockeye (8.6%), chum (3.2%) and finally pink salmon (.7%). Figure 26 depicts the mix of salmon species removed from commercial catches.

Table 16

Harvest of Salmon by Species and Method

Mean Useable Weight in Pounds Harvested

	Commercial		Noncommercial	
Species	Active Households*	All Households	Active Households	All Households
Salmon	196.3	19.21	128.8	65.34
King	149.0	13.28	129.4	51.17
Sockeye	48.5	1.65	31.5	3.03
Coho	60.7	3.54	38.6	8.73
Pink	11.5	0 13	25.1	1.88
Chum	24.7	0 62	33.6	0.54

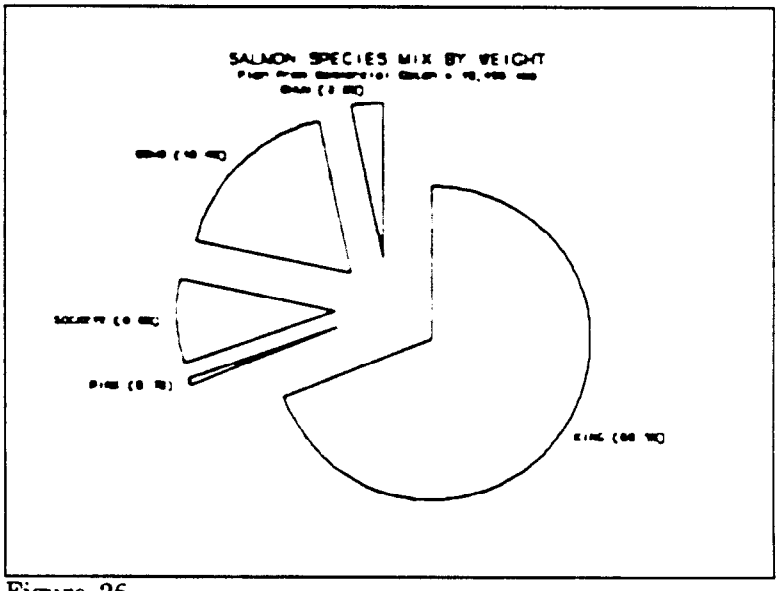


Figure 26

Commercial salmon fishing regulations encourage the home use of king salmon. All three commercial gear groups (trollers, gillnetters and seiners) harvest king, either as a targeted species or by-catch. Perhaps more importantly, the recent International Pacific Salmon Treaty between the United States and Canada has established strict quotas on the commercial king salmon harvest. Fish kept for home use are not counted against the quota. Also, small king salmon, known as "jacks", are not legally marketable by trollers and have little market value to other fishers. After they have been caught, these fish are often dead or badly injured and "throwing them back" is commonly considered by fishers to be a waste of good food. Frequently these fish are taken home or distributed throughout the community.

King salmon dominate the noncommercial harvest as well. More households harvested king salmon noncommercially than any other salmon species (39.5%). Figure 27 depicts the species mix of salmon taken by noncommercial methods. King salmon accounted for more than three quarters of the harvest. The king salmon harvest was 51.17 pounds per household, more than all the other salmon species combined.

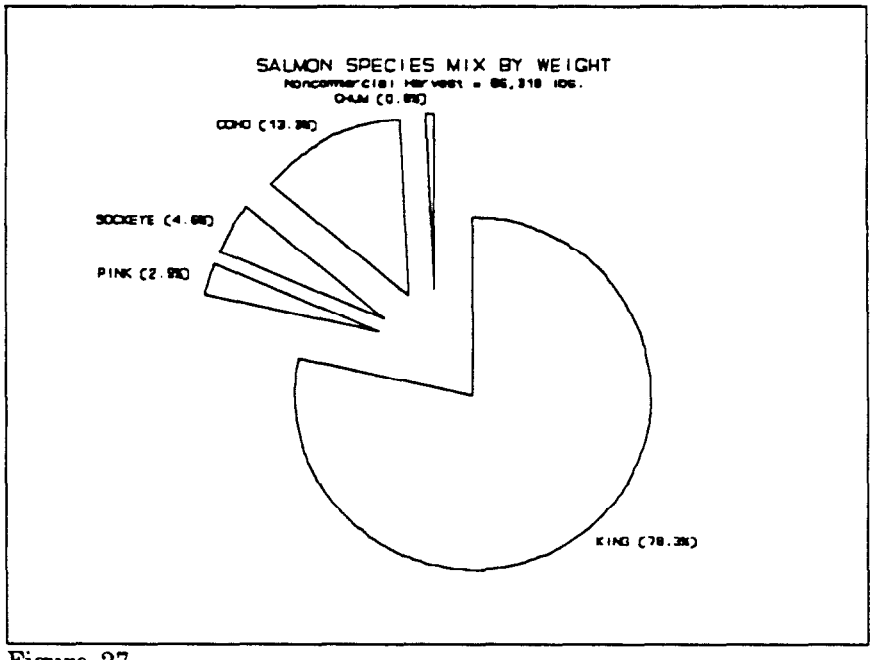


Figure 27

Wrangell households concentrate their noncommercial salmon harvest efforts on king salmon for a number of reasons. The fish are abundant and available all year in waters close to town. King salmon are harvested with rod and reel primarily used a troll gear although some may be caught in the spring off the downtown harbor or breakwater and the float plane dock. Many king salmon are taken in May during the major spring run when Wrangell conducts a king salmon derby. The derby draws heavy local participation.

Overall, 82.3% of all Wrangell households used salmon in 1987. Table 17 shows the salmon harvest participation and distribution rates. Salmon were widely distributed. Salmon were shared by 61.2% of the commercial harvesting households and 45.2% of the noncommercially harvesting households. Over half of all Wrangell households (63.8%) received salmon.

Table 17

Salmon Harvest and Distribution

	%Harvesting		%Giving*			
Species	Commercial	Noncomm.	Commercial	Noncomm.	% Receiving	% Using
Salmon	9.8	50.7	61.2	45.2	63.8	82.3
King	8.9	39.5	66.3	49.4	56.4	74.6
Sockeye	3.4	9.6	2.9	50.0	13.2	24.4
Coho	5.9	22.6	20.3	21.2	21.9	44.6
Pink	1.1	7.5	18.2	20.0	10.6	18.4
Chum	2.5	1.6	100.0	56.3	11.2	11.4

*Actively harvesting households only.

The noncommercial harvest of salmon is characterized by the use of rod and reel as a harvest method as shown in Table 18. Active households harvested approximately the same amount of salmon regardless of harvest method. The proportion of households harvesting, however, were dramatically different. This may be due to regulatory factors. Harvest of king salmon with net or gaff is prohibited by regulation. Subsistence permits for other species specify a catch limit and a relatively narrow range

of harvest locations. During 1987, subsistence permits limited the catch to 10 sockeye or coho and 25 pink salmon. A household could return to ADF&G and obtain another permit with a new limit. However, the trip back to town from the harvest location was troublesome. Respondents who participated in the subsistence fishery frequently reported that limits for all species were too small. Subsistence permits specify areas where fish may be caught. While these areas are within 30 miles of the community, they are not as convenient for most Wrangell households as areas open to sport fishing. This may be why the majority of WHS respondents who participated in the subsistence net harvest of salmon lived in outlying areas that are close to a permitted subsistence harvest stream.

Table 18

Noncommercial Harvest of Salmon by Method

Method	Harvest Active Households	Edible Weight Harvested All Households	Edible Weight Harvested Households that Harvested
Rod and Reel	122.1	61.50	50.3%
Net or Gaff	129.5	3.90	3.0%

The history of the home use salmon harvest in Wrangell may be another limiting factor in the subsistence permit fishery. Prior to limited entry, many Wrangell households met their salmon requirements through commercial and sport fishing. Before participation in commercial salmon fishing was limited, a resident who wanted to efficiently harvest salmon with a net purchased an inexpensive commercial license. Limited entry has been in effect for only 12 years. The average length of residency for Wrangell households is over 20 years. Therefore, many households who harvested salmon for home use with commercial gear acquired a limited entry permit through past involvement in the fishery, or are part of a household network that includes commercial salmon fishers. These households continue to meet their salmon needs through salmon removed from their commercial catch supplemented by sport fishing. It

is likely, however, that the demand for subsistence harvest opportunities will increase if the number of commercial salmon fishing households decreases.

Table 19 shows the reported salmon harvest from subsistence permit fisheries in District 6 and 7 from 1977 to 1987. The number of permits fished tends to increase in years of sockeye abundance. Also, it is likely that the increase in the number of households in outlying areas may increase demand for subsistence permits.

Table 19

Salmon Harvested with Subsistence Permits in Districts 6 & 7

Year	Permits Fished	Sockeye	Pink	Chum	Coho
1977	59	358	107	75	--
1978	105	971	15	0	--
1979	80	333	180	2	--
1980	105	449	50	0	10
1981	121	645	87	0	--
1982	98	908	25	0	25
1983	101	417	33	4	0
1984	97	427	171	6	37
1985	105	464	116	1	0
1986	90	402	190	0	0
1987	143	955	--	--	--

(source: ADF&G 1988b) *These figures may include non-Wrangell harvesters. -- = no data

Figure 28 shows noncommercial salmon harvest areas identified during the WHS survey. Respondents were asked to indicate all areas where they have ever noncommercially fished salmon while Wrangell residents. This map does not indicate intensity of use; however, such information should be available in the future. The map illustrates the relatively large areas used by Wrangell households to harvest salmon. Wrangell residents fish throughout the region, including Frederick Sound, Sumner Strait, Stikine Strait, Eastern Passage, and Kashevarof Strait. They have traveled as far north as Sullivan Island, 50 miles north Juneau, as far south as Boca De Quadra, 45 miles southeast of Ketchikan, and west to the shores of Baranof Island. It is quite likely that many of these distant harvest areas were used while the respondent was in other areas visiting friends, or traveling for employment, such as commercial fishing, logging, or tug boat work.

Figure 28.

Areas used for non-commercial salmon harvest by residents of Wrangell

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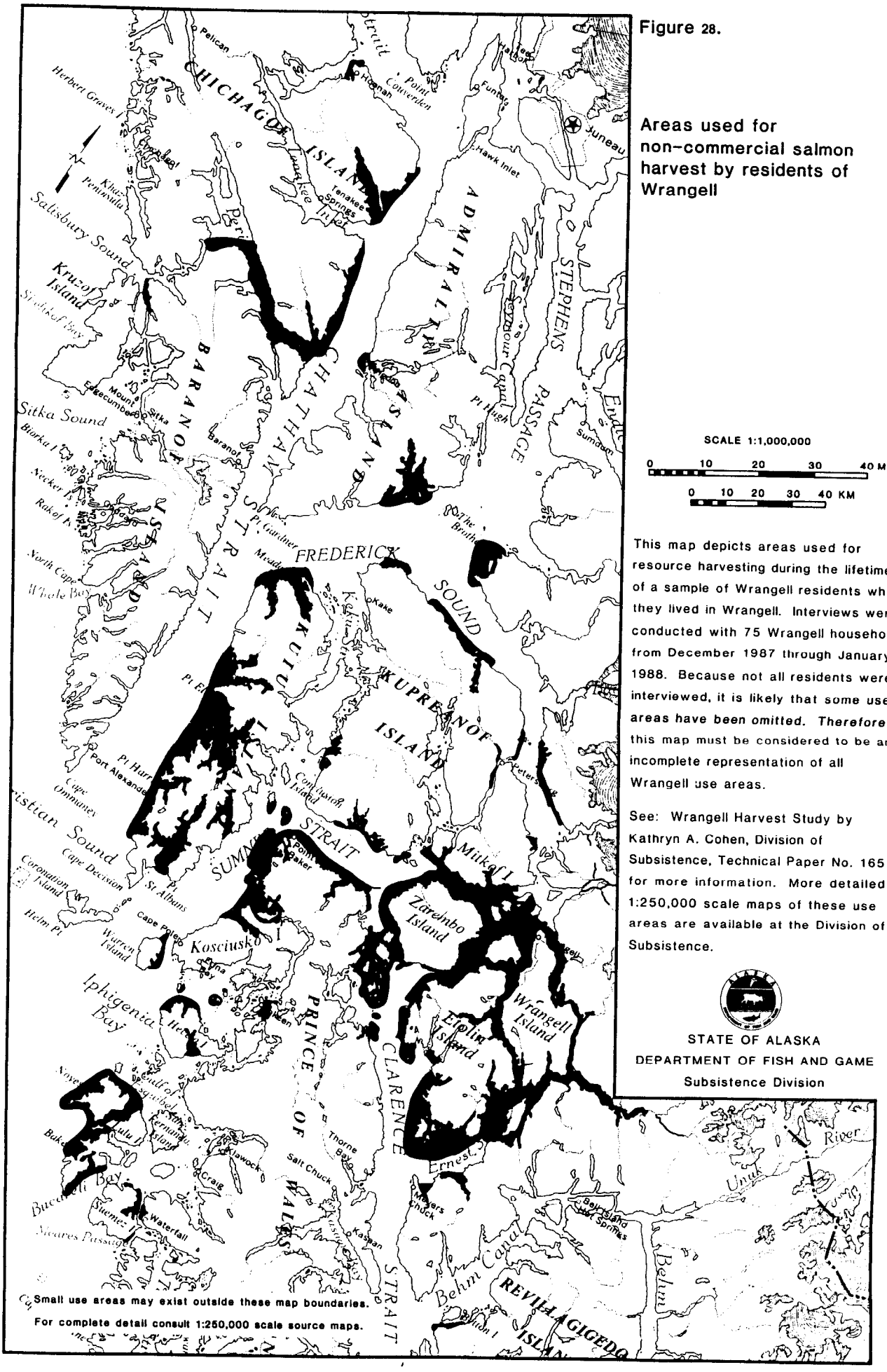
This map depicts areas used for resource harvesting during the lifetimes of a sample of Wrangell residents while they lived in Wrangell. Interviews were conducted with 75 Wrangell households from December 1987 through January 1988. Because not all residents were interviewed, it is likely that some use areas have been omitted. *Therefore* this map must be considered to be an incomplete representation of all Wrangell use areas.

See: Wrangell Harvest Study by Kathryn A. Cohen, Division of Subsistence, Technical Paper No. 165 for more information. More detailed 1:250,000 scale maps of these use areas are available at the Division of Subsistence.

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
Subsistence Division



Other Finfish

The category "other finfish" includes all finfish species except salmon. This category is further subdivided into the principal species: halibut, cod[6], flounder/sole, rockfish, herring, hooligan, trout and "other fish."[7] All of these fish are present year-round in the Wrangell area waters, except hooligan and some species of anadromous trout. Wrangell residents fish commercially for all fish except hooligan and trout, and noncommercially for all species. Cod, herring, rockfish and flounder are caught for use as bait to harvest halibut, crab and shrimp.

Halibut was the most important "other finfish" harvested in 1987 (Figure 29). Halibut account for 46.3% of the total, almost twice as much as any other species. Certain factors help explain this. Halibut are present year-round. The fish are not difficult to catch and often weigh over 50 pounds per fish. Halibut have a mild flavor preferred by many households. Table 20 depicts the "other finfish" harvest by harvest method. Halibut comprised 81.5% of all the "other finfish" removed from commercial catch and 41% of the noncommercial catch of "other finfish" for all households.

Trout ranked second to halibut in overall harvest quantity. This species category includes steelhead, Dolly Varden, cutthroat, and rainbow trout. Both steelhead and Dolly Varden are caught as a by-catch of commercial fishing. These fish have little market value and are usually retained for home use. WHS survey only recorded trout caught with rod and reel, it is likely that the overall trout harvest is underestimated.

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[6] *The cod category includes black cod (sablefish), ling cod and gray (true) cod. The fisheries that harvest each of these species are very different. For example, the black cod fishery is a limited entry fishery. Black cod are also caught incidently during other longline fisheries. In the past, this by-catch was kept for home use. Recently, however, regulations changes make keeping any black cod by-catch illegal.*

[7] *Generally the "other fish" category includes smelt, skate and small shark.*

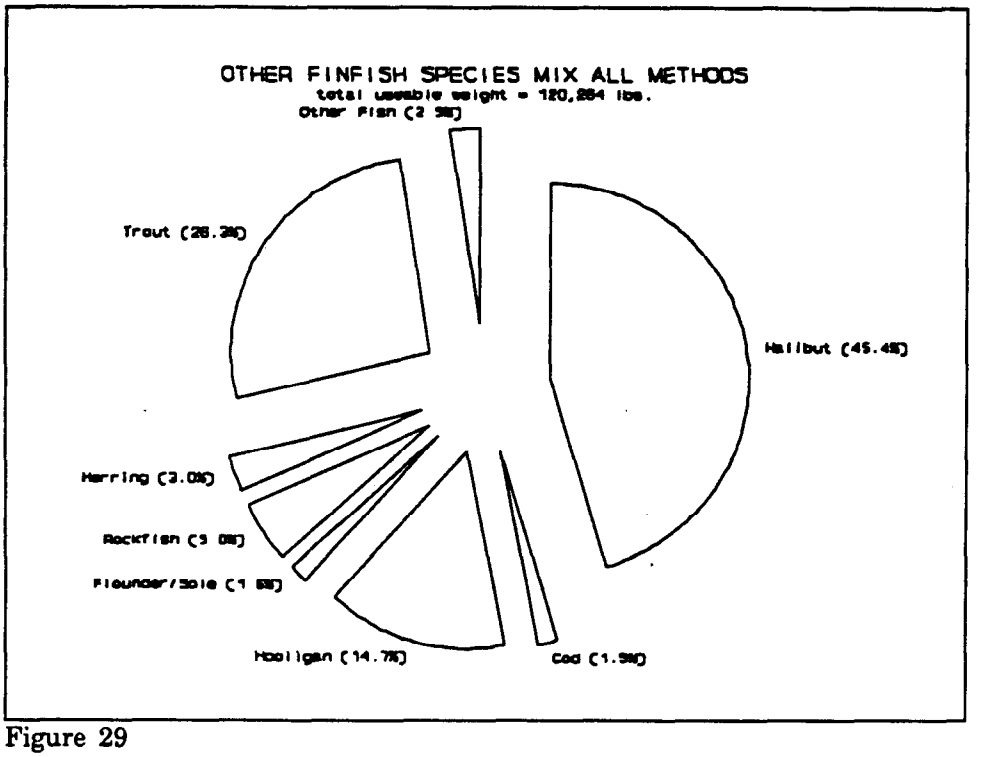

Figure 29

Table 20

Harvest of Other Finfish by Species and Method
Mean Useable Weight in Pounds Harvested per Household

Species Category	Commercial	Noncommercial Rod & Reel	Noncommercial Net or Gaff
Halibut	10.36	43.50	***
Cod	0.34	1.47	0.02
Flounder	0.02	1.78	0.08
Rockfish	1.59	4.31	0.05
Herring	0.39	***	3.12
Hooligan	***	***	17.48
Trout	***	31.28	***
Other Fish	***	0.44	2.49
Totals	12.70	82.77	23.24

*** = Not applicable

The third "other finfish" particularly significant to Wrangell is hooligan (also known as ooligan and eulachon). Active fishers harvested an average of 225.7 pounds. The Stikine River is one of two rivers in Southeast Alaska that support a hooligan run. The only other hooligan fishery in Southeast Alaska is on the Chilkat River near Klukwan (Sackett 1979:66).

People catch these small, oily fish using small beach seines or dip nets. A resident recalled how his family made special little hooligan seines. In the spring as hooligan enter the fresh waters of the Stikine River, fishers watch for the seagulls who arrive with the fish. A seine is stretched across the slough to surround the fish or they are scooped up with a dip net. Large numbers of these fish are caught. One resident estimated he caught 600 pounds one year.

The hooligan fishery has always been important to the Wrangell Native community. In the past, hooligan were rendered for their oil to be used as a condiment with other foods. The oil was one of the chief trade items exchanged between the coastal and inland people (Oberg 1973:70,109). Today, people smoke the fish. They are still used as a trade item. Recently, one resident exchanged smoked hooligan from the Stikine for herring roe on kelp from Sitka.

Table 21 summarizes "other finfish" harvest and distribution rates. Again, the relative importance of each species is revealed in the participation and distribution rates. More households participated in the commercial halibut fishery than all the other fisheries combined. Almost half of all households (43.8%) harvested halibut noncommercially.

The overall harvest of halibut was widely distributed. About half (46.3%) of all active harvesters shared their catch. More than half of all Wrangell households (54.1%) received halibut. Three quarters (76.6%) of all households used halibut in 1987.

Over one third of all households (39.6%) harvested trout. Trout are not as widely distributed as halibut. Although better than one third (35.9%) of all active harvesters gave away a portion of their catch, only 16.6% of all households received trout. Almost half of all Wrangell households used trout (45.2%) in 1987.

Table 21

Other Finfish Harvest and Distribution

Species	% Harvesting Commercial All Gear	Noncommercial Rod & Reel	Noncommercial Net or Gaff	%Giving*	%Receiving	%Using
All Other Finfish	19.2	45.3	7.8	62.1	67.0	89.5
Halibut	13.1	43.9	***	46.3	54.1	76.6
Cod	1.7	4.3	0.2	13.0	18.4	24.5
Flounder/Sole	0.1	2.7	0.1	60.7	7.2	9.2
Rockfish	5.0	15.2	0.1	30.1	14.6	30.5
Herring	2.4	***	7.4	***	8.2	18.9
Hooligan	***	***	7.7	100.0	31.7	36.2
Trout	***	39.6	***	35.9	16.6	45.2
Other Fish	***	6.4	4.8	61.3	0.0	8.0

*Active Households

Hooligan is a more specialized fishery. Less than ten percent of all households harvested the fish (7.7%). The harvest, however, was widely distributed. Almost one third (31.7%) of all households received the fish, and better than one third (36.2%) of all households used hooligan in 1987.

Figure 30 depicts "other finfish" harvest areas identified during the WHS survey. Respondents were asked to map all areas where they noncommercially harvested any species included in the "other finfish" category while a Wrangell resident. The map illustrates the maximum harvest range. It is likely many of the distant harvest areas were used coincidentally to other household activities and it is likely the most intensively used areas are within 30 miles of town.

Shellfish (Crab, Shrimp and Octopus)

Wrangell is located near a rich shellfish ground. Wrangell households harvest three species of crab: king, tanner and dungeness; and five species of shrimp: northern pink, sidestripe, coonstripe, spot, and occasionally, humpy. Crab and shrimp are harvested commercially and noncommercially. Octopus are usually harvested as a commercial

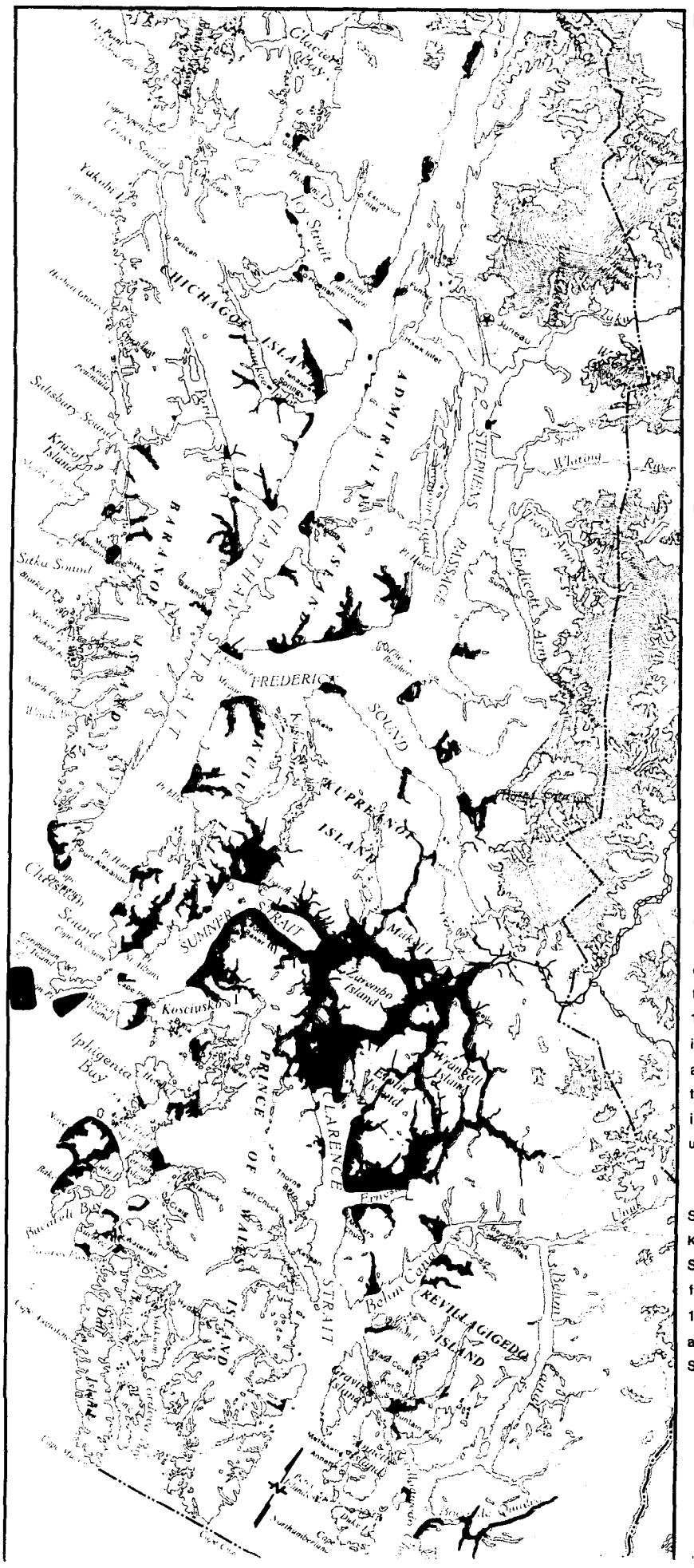

Figure 30.

Areas used for non-commercial harvest of finfish other than salmon by residents of Wrangell

Fish other than salmon includes: cod, halibut, flatfish, rockfish, herring, hooligan, dolly vardon, cutthroat trout, steelhead, and other finfish.

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This map depicts areas used for resource harvesting during the lifetimes of a sample of Wrangell residents while they lived in Wrangell. Interviews were conducted with 75 Wrangell households from December 1987 through January 1988. Because not all residents were interviewed, it is likely that some use areas have been omitted. Therefore this map must be considered to be an incomplete representation of all Wrangell use areas.

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STATE OF ALASKA

shellfish by-catch. Other shellfish, such as scallops, abalone, and clams are discussed in the Gathering section.

Figure 31 shows the mix of crab, shrimp and octopus species harvested for home use by all methods. Dungeness crab and shrimp account for the most pounds of shellfish harvested by Wrangell households. Harvest quantities are shown in Table 24. The total 1987 shellfish harvest averaged 78.9 pounds useable weight per household. Together, dungeness crab and shrimp comprised 88.6% of the total.

The total quantity of dungeness crab removed from the commercial fishery for home use was greater than three times the total quantity of shrimp removed from the commercial fishery. The noncommercial harvest of shrimp[8], however, surpassed the noncommercial harvest of crab. This may be partially attributed to households that use an otter trawl and beam trawl to harvest shrimp noncommercially. In general, however, shrimp are commonly used and widely distributed throughout the community.

Tables 22 and 23 depict the shellfish (crab, shrimp and octopus) harvest and distribution. Dungeness crab was commercially harvested by 8.1% of all households while shrimp was commercially harvested by 5% of all households. One quarter (24.8%) of all households noncommercially harvested crab, almost twice as many as harvested shrimp.

There is a dramatic difference between the noncommercial dungeness crab and shrimp harvest participation levels. This is due to several factors. Noncommercial crabbing is common because good grounds are convenient. One of the most intensely used dungeness crabbing areas is the harbor in Shoemaker Bay. People simply drop pots off the dock, let them soak awhile and return another day to pull them. Pots are also taken out by boat to shallow water spots all along the nearby coastline.

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[8] *WHS data indicated a large noncommercial harvest of shrimp, an average of 317.9 pounds per actively harvesting household. During data analysis, it was determined this figure resulted from oversampling households that harvested shrimp noncommercially with otter trawls and beam trawls.*

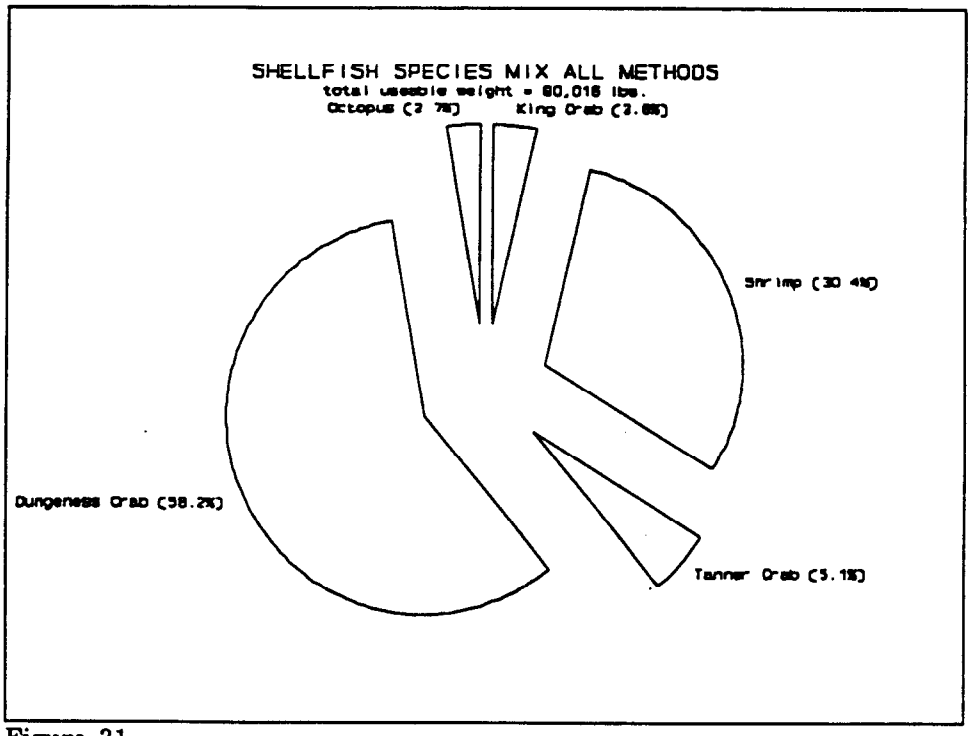


Figure 31

Table 22

Harvest of Shellfish by Species and Method
Mean Useable Weight in Pounds

Species	Commercial Active Households	Commercial All Households	Noncommercial Active Households	Noncommercial All Households
All	199.1	23.5	166.2	55.43
King crab	***	***	176.9	2.83
Dungeness crab	212.1	17.2	115.6	28.78
Tanner crab	33.4	0.8	50.7	3.25
Shrimp	110.2	5.5	139.7	18.44
Octopus	***	***	36.2	2.13

Table 23

Shellfish Harvest and Distribution

Species	% Harvesting Commercial	% Harvesting Noncommercial	% Giving*	% Receiving	% Using
All Shellfish	11.8	47.6	62.8	75.9	83.2
King crab	0.0	1.6	43.7	17.4	17.5
Dungeness crab	8.1	24.8	66.8	66.1	78.3
Tanner crab	2.4	6.4	60.9	11.0	16.6
Shrimp	5.0	13.2	81.3	58.2	64.9
Octopus	0.0	6.3	61.9	2.9	9.2

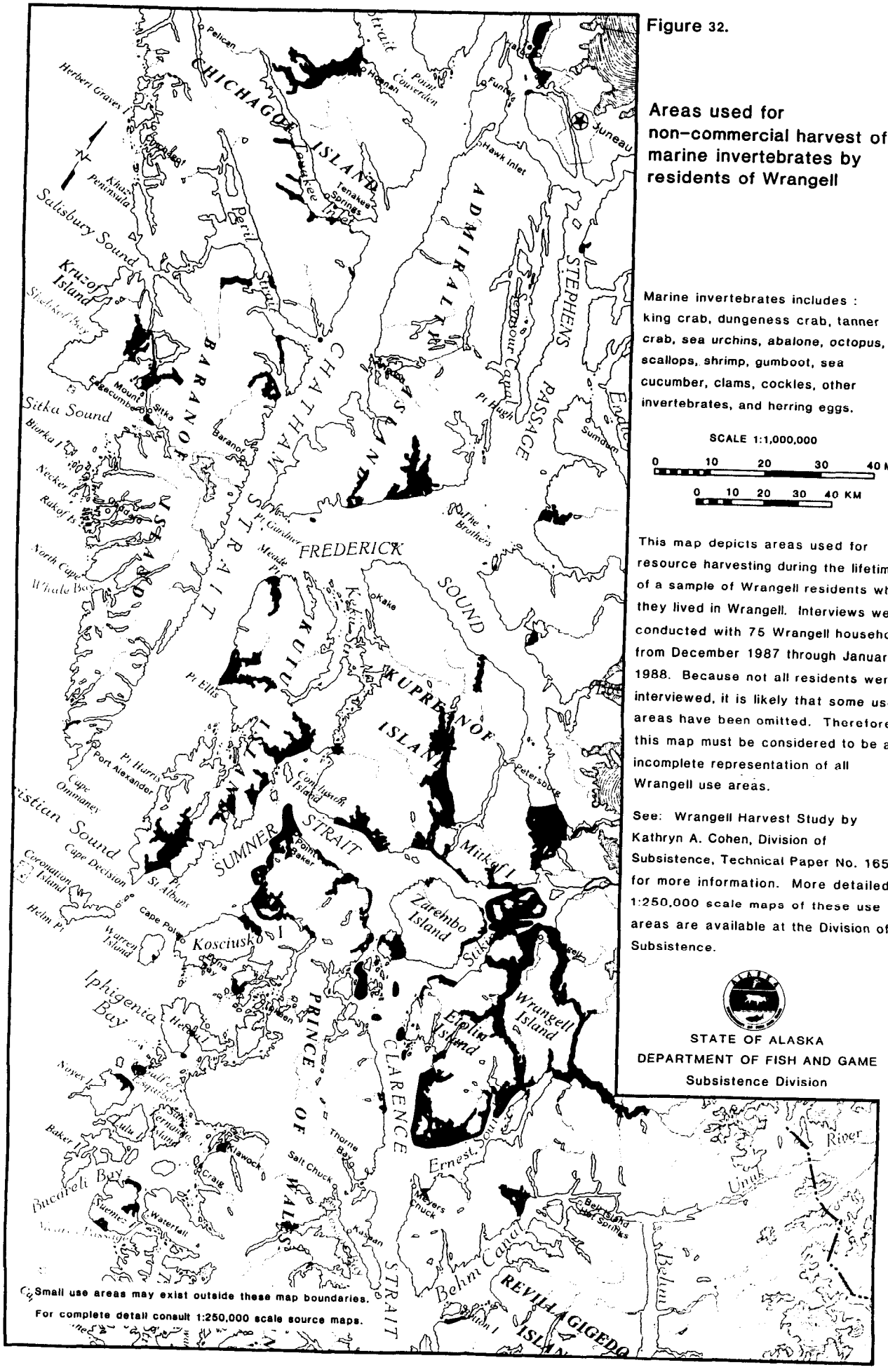
* Active Households

There is a dramatic difference between the noncommercial dungeness crab and shrimp harvest participation levels. This is due to several factors. Noncommercial crabbing is common because good grounds are convenient. One of the most intensely used dungeness crabbing areas is the harbor in Shoemaker Bay. People simply drop pots off the dock, let them soak awhile and return another day to pull them. Pots are also taken out by boat to shallow water spots all along the nearby coastline.

Shrimp are more difficult to harvest. They live in deeper water. Shrimp pots, used to catch larger species such as spots and coonstripe, must be set deeper and are therefore more difficult to retrieve. The households who specialize in the noncommercial harvest of smaller species of shrimp use an otter trawl. Trawls are not commonly used, however, because they require specialized skill and a boat capable of pulling the net.

Both dungeness crab and shrimp are widely distributed throughout the community. Dungeness crab were shared by over 66.8% of the harvesting households, and received by 66.1% of all households. Similarly, the vast majority of households harvesting shrimp (81.3%) share their catch. As a result, 58.2% of all households received shrimp. Dungeness crab were used by 78.3% of all households. Shrimp were used by 64.9% of all households.

Figure 32 shows the noncommercial invertebrate harvest areas. These areas include all invertebrate species: intertidal, subtidal and deep water animals. The map shows a composite of those areas used for noncommercial harvest of any invertebrate species by any member of a household while that person lived in Wrangell. Crab were most often harvested along the west shore of Wrangell Island between Thoms Place at the southern end to Point Highfield at the northern end. Crab and shrimp are also harvested in the waters of Eastern Passage or "Back Channel" as far south as Channel Island.



Small use areas may exist outside these map boundaries.

For complete detail consult 1:250,000 scale source maps.

Figure 32.

Areas used for non-commercial harvest of marine invertebrates by residents of Wrangell

Marine invertebrates includes : king crab, dungeness crab, tanner crab, sea urchins, abalone, octopus, scallops, shrimp, gumboot, sea cucumber, clams, cockles, other invertebrates, and herring eggs.

SCALE 1:1,000,000

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0 10 20 30 40 KM

This map depicts areas used for resource harvesting during the lifetimes of a sample of Wrangell residents while they lived in Wrangell. Interviews were conducted with 75 Wrangell household from December 1987 through January 1988. Because not all residents were interviewed, it is likely that some use areas have been omitted. Therefore this map must be considered to be an incomplete representation of all Wrangell use areas.

See: Wrangell Harvest Study by Kathryn A. Cohen, Division of Subsistence, Technical Paper No. 165 for more information. More detailed 1:250,000 scale maps of these use areas are available at the Division of Subsistence.

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
Subsistence Division

GATHERING

Dressed in rubber boots and armed with shovel and bucket, Wrangell residents stalk the beaches during low tide in search of clams and other animals. They stoop to collect beach greens and seaweed. They follow trails to pick tender shoots of forest plants and berries. They drive along logging roads in search of firewood. Most Wrangell households participate in gathering activities, although compared to hunting and fishing, the gross harvest is small. Gathering provides an average of 23.7 pounds of food per household. Gathered invertebrates and herring eggs accounted for 16.7 pounds of food per household; gathered plants accounted for the remaining 8.9 pounds of food. Figure 33 shows the mix of all gathered resources by category.

Overall, household participation in gathering was similar to household participation in fishing. About three out of four households harvested gathered foods and firewood (70.3%). Twice as many households gathered plants including firewood (57.5%) as gathered marine invertebrates and herring eggs (30.8%). Invertebrates and herring eggs, however, were slightly more widely distributed than plants. About 6% more households received marine invertebrates and herring eggs than plants.

Gathering requires little equipment and usually occurs close to town. A boat or vehicle is sometimes necessary to reach a favorite beach or berry picking spot, but there are good harvest places within easy walking distance of town. Once there all a person needs is time and a container. Areas where marine invertebrate species are gathered are included in Figure 32, although the gathered species are not specifically delineated. Plant gathering locations were not mapped.

Marine Invertebrates and Herring Eggs

Marine invertebrates gathered in intertidal and subtidal areas include species such as sea urchins, abalone, scallops, gumboots, sea cucumbers, clams and cockles. The species category "other invertebrates" includes limpets, blue mussels, moon snails and

oysters. Table 24 shows the quantities of invertebrates including herring eggs gathered. Clams and cockles provide the largest quantity of food for all households. Active households harvested an average of 28 pounds of clams and cockles in 1987. This harvest was recorded in buckets and converted to pounds. Household harvests ranged from one to thirty, five-gallon buckets. Converted to pounds, the clam harvest averaged 7.8 pounds per household (see Appendix C). Clams and cockles are generally gathered during winter and spring tides. During the summer, clams are more likely to be contaminated by paralytic shellfish poisoning (PSP) which according to respondents discourages summer and fall clam harvesting.

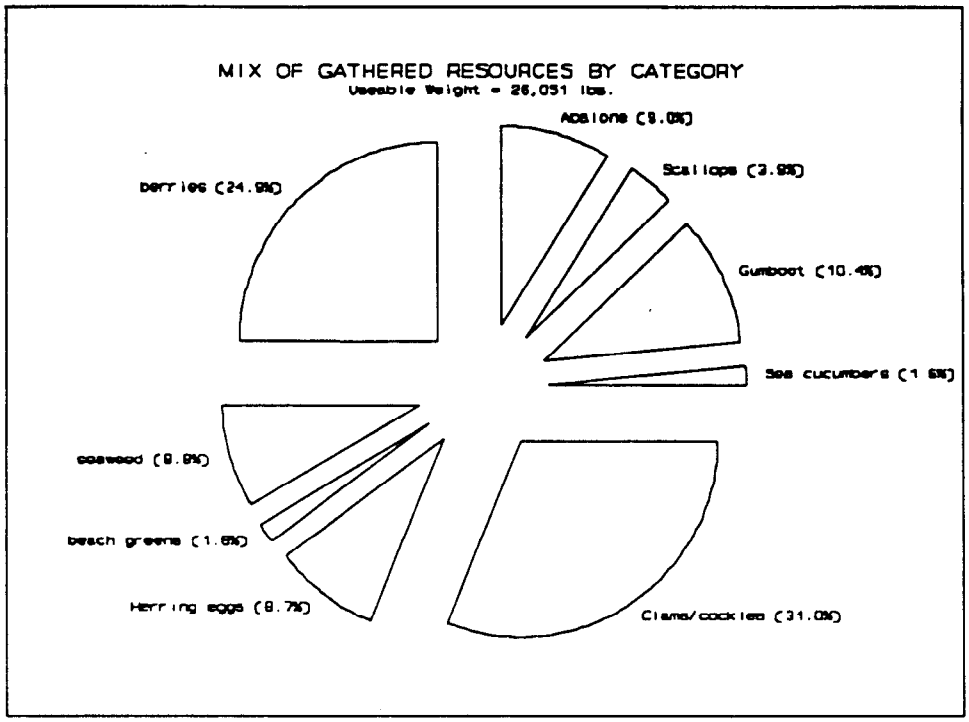

Figure 33

Table 24

Gathered Marine Invertebrates and Herring Eggs
Harvest and Distribution

Species Category	Mean Weight in Pounds Active HH	All HH	% Harvesting	% Giving*	% Receiving	% Using
All Categories	47.4	16.77	30.8	70.5	46.4	48.3
Sea Urchins	0.0	0.00	0.0	0.0	2.5	2.5
Abalone	32.3	2.29	7.1	21.1	8.7	9.5
Scallops	23.6	0.99	4.2	0.0	3.4	7.4
Gumboot	66.1	2.65	4.0	80.0	0.8	4.8
Sea Cucumbers	6.7	0.41	6.1	54.1	2.4	7.6
Clams/Cockles	28.1	7.85	27.9	63.1	29.9	40.8
Other	9.1	0.38	4.2	57.1	5.7	9.9
Herring Eggs	27.8	2.20	7.9	30.4	29.4	31.8

* Active Households

Gumboots, abalone and herring eggs ranked second to clams in harvest quantities. Active household harvest amounts of gumboots averaged 66.1 pounds per household. Abalone harvest amounts ranged from 4 pounds to over 115 pounds per household. Active households harvested an average of 32.3 pounds per household. The abalone harvest for all households averaged 2.29 pounds per household. Active herring egg harvesting households averaged 27.8 pounds per household. The herring egg harvest for all households averaged 2.2 pounds.

Table 24 shows harvest participation and distribution rates for gathered marine invertebrates and herring eggs. Three times as many households gathered clams as compared to all other animals. Clams were more widely distributed than other gathered animals. Sixty-three percent (63.1%) of all households that harvested clams shared a portion of their harvest. Thirty percent (29.9%) of all households received clams. Forty-one percent (40.8%) of all households used clams.

Herring eggs and abalone ranked a poor second to clams in household harvest participation levels. Only 7.9% of Wrangell households harvested herring eggs and 7.1%

harvested abalone. This may be because the harvest of these resources requires specialized knowledge. Neither of these resources are found close to Wrangell.

Herring eggs are gathered in the spring when herring spawn on the beaches. The roe is collected on kelp and hemlock boughs. Although only 30.4% of the active harvesting households shared their harvest, herring eggs are widely distributed. In 1987, 29.4% of all Wrangell households received herring roe. As a result of wide distribution, 31.8% of Wrangell household used herring eggs making it second only to clams. The general distribution of herring roe may be attributed to trade with Sitka and Craig in addition to a Wrangell custom. Wrangell commercial herring roe fishers usually bring home roe on hemlock boughs gathered after the closure of the commercial fishery. The return of these boats to the harbor is announced on local radio station and the cable TV scanner. Anyone may share in the harvest by simply going down to the dock and picking some up.

The abalone harvest is distributed within a smaller percent of households than herring eggs. Twenty-one percent (21.1%) of the harvesting households shared their harvest and 8.7% of Wrangell households received abalone. As a result of a narrower pattern of distribution, only 9.5% of Wrangell households used abalone.

Plants

Wrangell households gather seaweed including black and ribbon seaweed and bulb kelp. They gather various beach and forest greens including goose grass, beach asparagus, fiddlehead ferns, and mushrooms. Berries harvested include blueberries, cranberries, huckleberries, raspberries and salmonberries. Table 25 shows the quantity of plants harvested and household harvest participation and distribution. Berries and seaweeds are the most significant plants harvested in both quantity and participation levels.

Table 25

Plant Harvest Participation and Distribution

Species Category	Mean Weight in Pounds Active HH	All HH	% Harvesting	% Giving*	% Receiving	%Using
All Plants	15.2	8.95	57.5	55.8	40.6	75.9
Beach Greens	4.7	0.41	8.7	41.4	3.3	8.7
Seaweed	29.2	2.22	7.6	47.4	20.9	27.6
Berries	11.0	6.32	57.5	41.4	23.2	65.5

* Active Households

Active Wrangell households harvested an average of 11 pounds of berries per household in 1987. The overall harvest accounted for an average of 6.3 pounds of berries per household, the largest amount among all the plants. Over half (57.5%) of all households gather berries. Forty percent (41.4%) of these households shared a portion of their harvest, and 23.2% of all households received berries. Sixty-five percent (65.5%) of all households used berries, almost twice as many as used all other gathered plants combined.

Seaweed ranked second to berries in harvest quantity. During the WHS survey, obtaining accurate seaweed harvest information was difficult. The difference in volume and weight between wet and dry seaweed is dramatic. Harvest amounts were recorded in quarts and converted to pounds (see Appendix C). One 30 gallon plastic bag of seaweed dries to an amount to fill a single 1 pound coffee can. It was unclear during the interview whether information received was consistently wet or dry volume. Seaweed is also gathered in large quantities to use as garden fertilizer. During data analysis, ADF&G distinguished seaweed used for fertilizer from seaweed used for food by assuming that any household harvest over 500 pounds was used for fertilizer. The mean total household harvest of seaweed for fertilizer was .6 pounds and the total community harvest of seaweed for fertilizer was 575 pounds.

Although seaweed gathering is a specialized activity, the harvest is widely distributed. About 7.6% of all households gathered seaweed. Forty-seven percent of the harvesting households shared a portion of their harvest. About one fifth (20.9%) of all Wrangell households received seaweed, making it the second most widely distributed plant product.

Firewood was gathered by 43.9% of all Wrangell households. Wood heat is common in Wrangell as either a primary or secondary heat source. Wood is gathered along the road systems and on the beach. The USFS manages local wood cutting. Generally there are few restrictions. The amount of wood cut ranged up to a maximum of 35 cords. The mean harvest per harvesting household was 7.6 cords. As with other resources, firewood was shared. Over one quarter (29.8%) of all active harvesters gave away a portion of their harvest and 4.9% of all households received firewood. Some firewood sharing goes to older residents no longer able to provide wood for themselves.[9]

[9] *During the WHS survey, we specifically asked respondents to indicate the amount of firewood either used by their own household or given away, not firewood they might have sold.*

CHAPTER 4

RESOURCE HARVESTS BY ALASKA NATIVE HOUSEHOLDS IN WRANGELL
by Robert J. Wolfe

INFLUENCE OF CULTURE ON SUBSISTENCE PRODUCTIVITY

Wrangell is a multi-cultural community. Its current population derives from both Alaska Native (primarily Tlingit) and non-Native cultural traditions. This cultural pluralism affects the pattern of subsistence harvests in Wrangell in several ways, which are examined in this portion of the report. This section describes the wild resource harvests by Alaska NAtive households and non-Native households in Wrangell in 1987. It explores the similarities and differences in harvests that may be related to cultural factors.

In Alaska, the cultural background of a community's population usually is highly related to the community's overall pattern of wild resource harvest (Wolfe and Walker 1987). It has been found on a statewide basis that as the percent of Alaska Natives in a community's population increases, the quantity of subsistence harvests in the community increases (as measured on a per capita basis)(Wolfe and Walker 1987). That is, as a community becomes more predominantly Alaska Native, the community harvests and consumes more wild foods. Similarly, as ore non-Natives settle into a community, wild food harvests decrease. This general relationship between culture and resource harvest levels in a community applies across communities despite differences in incomes, geographic locations and kids of wild resource harvested (although these other variables independently influence subsistence harvest levels also)(wolfe and Walker 1987).

There are a number of reasons why a community's resource harvests increase with the percent of Alaska natives in the populations, most of them tied to cultural patterns of food procurement and use. In Alaska NAtive cultures, there is a traditional

orientation t using the land as a source of food, by fishing, hunting, gathering, and trapping. This orientation contrasts with the cultures of non-Native agrarian and industrial societies, which produce food through agriculture (for grains, vegetables, and fruits) and domestic stock rearing (For meat ad mile products). Primary land uses of agrarian and industrial societies are for economic activities to allow for the production and trade of domesticated foods.

Food preferences are linked to these economic orientations. In Alaska Native cultures, the diets traditionally have included substantial quantities of wild fish and wild meats. This traditional set of foods influences contemporary food preferences for Alas native peoples. In non-Native cultures, good preferences are for domesticated foods, although, as will be shown in Wrangell, wild meats and fish are incorporated into this diet by non-Natives. To meet traditional food preferences, Alaska Native populations traditionally have been ordered into social groups assigned roles and responsibilities of harvesting, processing, and distributing wild resources. Members of the community are socialized into these roles acquiring the knowledge and skills to successfully procure and use wild foods. Counterparts of these traditional social organizations for food procurement continue today in many contemporary rural Alaska communities.

Traditional cultural patterns of food preferences, food procurement, and food use continue to be passed on in many contemporary rural Alaska communities. This is why there is such a strong correlation between the level of wild resource use and the cultural composition of the community. Cultural composition of the population is the single best predictor of wild resource harvests of communities in Alaska (Wolfe and Walker 1987).

Wrangell is an interesting community in that it's current population derives from multiple cultural roots. The historic core of the Wrangell area population is the Tlingit cultural tradition, derived from the Stikine Tlingit of the Wrangell area. According to the random household survey, an estimated 35.8 percent of Wrangell's population were Alaska Native in 1987 (1,016 people of 2,841), most of whom trace their history through the Tlingit culture. Added to this historic core are the cultural traditions brought to

the area by settlers into southeast Alaska, primarily from the continental United States and secondarily from other regions (such as the Soviet Union, Scandinavia, and the Philippines). In 1987, about 64.2 percent of Wrangell's population were not Alaska Native (1,699 people), tracing their socioeconomic traditions to these other cultural systems (Table 26).

Table 26

Wrangell Population By Cultural Groups
Expanded From Sampled Households (n=75)

	Non-Native	Native	Missing	Total Wrangell
Number of Households*	514	499	*	1013
Percent of Households	50.7%	49.3%	*	100.0%
Mean Households	2.82	2.94	*	2.71
Number of People	1699	1016	126	2841

"Native households" are households with at least one spouse greater than 16 years who is Alaska Native by self report. "Non-Native households" are the remainder.

The overall pattern of wild resource use in Wrangell in 1987 is to a large extent the result of the interaction of this mix of cultural traditions. A statewide model of subsistence output (Wolfe and Walker 1987) predicts that a southeast community like Wrangell with a population of 35.8 percent Alaska native (from this study) and mean taxable income levels of $21,301 per income tax return (from 1982 Federal Income Tax Returns; Alaska Department of Revenue 1987), should be harvesting about 119 lbs of wild resources per person per year. Wrangell's reported 1987 harvest of 158.3 lbs per person is in fact close to this predicted value. Thus, Wrangell's current wild resource harvest is at expected levels given the community's cultural composition.

Wrangell's harvest of wild food (158.3 lbs per person) is substantial in comparison with the food use in the continental United States, where about 222 lbs of meat, fish, and poultry are purchased and brought into the kitchen for each person each year (Wolfe and Walker 1987). Wrangell's wild resource harvest is about 70.3 percent of the

U>S> standard of meat, fish and poultry use. It places Wrangell in the same range of harvests as communities in the Copper River Basin of south central Alaska (149 lbs per capita) and communities such as Cordova (151 lbs), Kodiak City (143 lbs) and Naknek (188 lbs)(Wolfe and Walker 1987).

In sum, Wrangell's cultural composition effects the community's overall subsistence productivity in the predicted fashion. The effects of culture on Wrangell's level of subsistence productivity is similar to that observed in other communities in the state.

HARVESTS BY ALASKA NATIVE HOUSEHOLDS AND NON-NATIVE HOUSEHOLDS

Household Classifications

In a culturally mixed community like Wrangell, describing the extent to which Alaska Natives and non-Natives produce the wild foods used by the community is complicated by the substantial integration of cultural traditions in the community, especially at the household level. As shown in Table 27, of the 75 sampled households interviewed for this study, 44 households (58.6 percent) had non-Native members, 14 households (18.7 percent) had Alaska Native members, while 15 households (20 percent) had a combination of Alaska Native and non-Native members. There were two households (2.7 percent) with missing information on cultural affiliation.

Table 27

Cultural Affiliation of Households
And Household Members, Wrangell

		Cultural Affiliation of Children at Home				
Parent/Spouse	(freq)	None	Non-Native	Native	Both	Missing
Non-Native	(n=44)	20	23	0	0	1
Native	(n=14)	6	0	8	0	0
Both	(n=15)	7	2	5	1	0
Missing	(n=2)	1	0	*	*	1

Of eight bi-cultural households with both Alaska Native and non-Native parents, most (five households) reported their children to be Alaska Native; two households reported their children to be non-Native, and one household reported both Native and non-Native children.

To analyze household harvests by cultural group, Wrangell households were classified into two groups: "non-Native households" and "Alaska Native households." The 44 households with all non-Native members and the 2 households with missing cultural information were classified as "non-Native." The other 29 households with Alaska Native members were classified as "Alaska Native". The primary reason for this classification are the advantages of having two groups for comparison rather than three or four: it keeps subgroups large enough for comparing the effects of culture. However, the classification of households could be done in other ways. One could justifiably classify the households with both Alaska Native and non-Native members into a third group, "bi-cultural" households. As most of these households identified their children to be Alaska Native, the self-identification of the majority of the household members in this group of households was with the Alaska Native cultural tradition. This fact supports combining them into the "Alaska Native" category for comparative purposes, as is done here.

Table 26 shows the result of this classification scheme. Expanded to the entire community, there were 514 non-Native households (50.7 percent) and 499 Alaska Native households (49.3 percent) in Wrangell. Thus, the households in Wrangell were almost evenly split among the two cultural groups. In terms of household size, there was no statistically significant difference between the two groups. The non-Native households had an average size of 2.82 members, and the Alaska Native households had an average size of 2.94 members (Table 26). Because the mean household sizes are similar, "mean household harvests" can be used to make valid comparisons, and this is used below. If household sizes had been substantially different, a preferable measure for comparison would be a household's per capita harvest (that is, household harvest divided by number of household members).

Harvest Levels

The wild resource harvests by Alaska Native households and non-Native households in Wrangell are shown in Table 28 and Figures 34 and 35. In 1987, Alaska Native households in Wrangell harvested a total of 232,374 lbs of wild foods. Non-Native households in Wrangell harvested a total of 212,008 lbs of wild foods. Of the total harvest of 444,384 lbs of wild foods harvested in Wrangell in 1987, 52.3 percent was harvested by Alaska Native households and 47.7 percent was harvested by non-Native households. Thus, Alaska Native households and non-Native households contributed equally to the production of Wrangell's wild resource harvest in 1987.

Table 28

Expanded Community Harvest (lbs.)By Cultural Group
Wrangell, 1987

Resource	Non-Native	Native	Wrangell
Salmon	45,990 53.6%	39,770 46.4%	85,760 100.0%
Halibut	26,774 49.1%	27,787 50.9%	54,561 100.0%
Other Finfish	37,386 56.9%	28,317 43.1%	65,703 100.0%
Marine Invertebrates	50,713 52.3%	46,292 47.7%	97,005 100.0%
Deer	23,215 40.0%	34,782 60.0%	57,997 100.0%
Moose	8,993 25.6%	26,086 74.4%	35,079 100.0%
Other Mammal	11767 90.6%	1224 9.4%	12991 100.0%
Seal	0 0.0%	19862 100.0%	19862 100.0%
Birds	3177 49.9%	3184 50.1%	6361 100.0%
Plants	4015 44.3%	5047 55.7%	9062 100.0%
Total	212008 47.7%	232374 52.3%	444384 100.0%

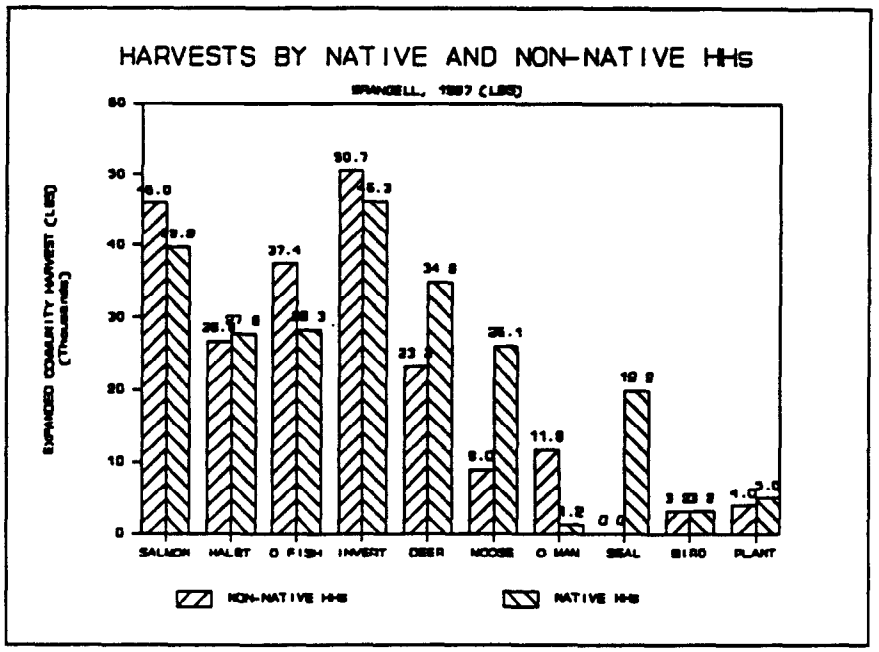

Figure 34

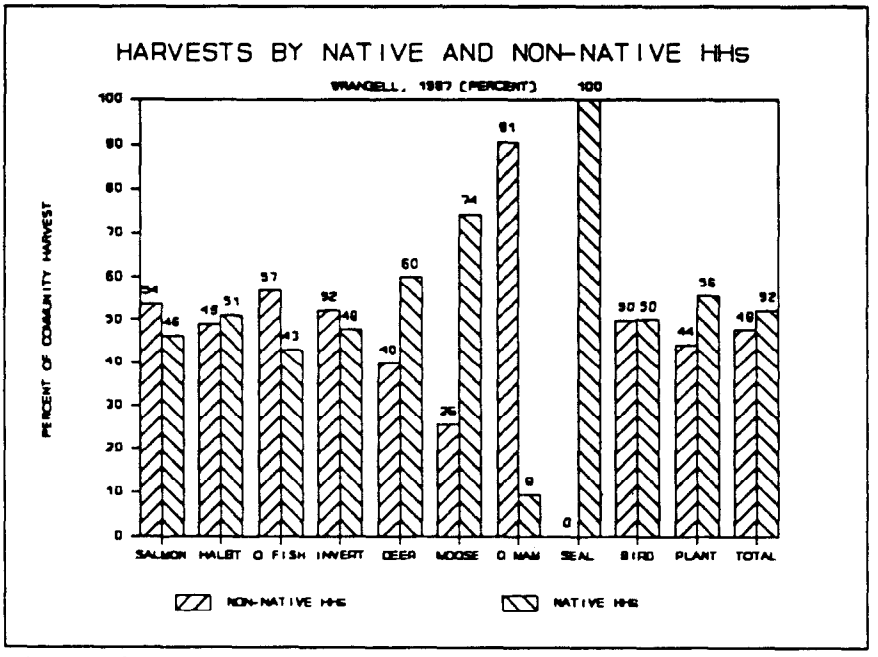

Figure 35

The resource harvests of Alaska Native households are shown by major resource category (Table 28 and Figures 34 and 35). In 1987, Alaska Native households in Wrangell harvested 39,770 lbs of salmon, 27,787 lbs of halibut, 28,317 lbs of other finfish, 46,292 lbs of marine invertebrates, 34,782 lbs of deer, 26,086 lbs of moose, 1,224 lbs of other land mammals (bear and goat primarily), 19,862 lbs of seal, 3,184 lbs of birds, and 5,047 lbs of wild plants. Non-Native households in Wrangell harvested 45,990 lbs of salmon, 26,774 lbs of halibut, 37,386 lbs of other finfish, 50,713 lbs of marine invertebrates, 23,215 lbs of deer, 8,993 lbs of moose, 11,767 lbs of other land mammals, 0 lbs of seal, 3,177 lbs of birds, and 4,015 lbs of wild plants.

Alaska Native households and non-Native households produced about equal quantities of wild foods in each resource category except for marine mammals and land mammals (Figure 35). Alaska Native households produced 100.0 percent of the community's seal harvest in 1987. Seal is a traditional food item in Tlingit culture and not a traditional food item in Euro-American culture. Also, the Marine Mammal Protection Act limits marine mammal harvests to Alaska Natives. These two factors probably account for the finding that Alaska Native household harvested all the community's seals. In 1987, Alaska Native households produced 60.0 percent of the community's deer and 74.4 percent of the community's moose (Figure A2). Why Alaska Natives seem to have taken a greater percent of the community's deer and moose in 1987 is unknown. This may be simply a quirk of the year observed or the households sampled; on a different year or with a different household sample, the apparent differences might disappear. If not for these reasons, they may represent different harvest patterns for deer and moose by some Alaska Native households, such as more efficient hunting techniques (beach hunting by skiff instead of forest-muskeg-alpine hunting by foot) or greater desired harvest levels. Conversely, non-Native households harvested 90.6 percent of the community's other land mammals in 1987, primarily black bear and goat. Again, this may simply be a quirk of the sampled households and year. If not, it may represent a different hunting pattern by some non-Native households, such as harvesting for special trophies (black bear hides or goat heads), or willingness

to spend more money on relatively less productive meat hunts (goats). Whether these are valid differences and interpretations depends upon support from future research.

Another comparison of harvest levels is shown in Table 29 and Figure 36, which depict mean household harvests (lbs) by Alaska Native households and non-Native households in 1987. On average, Alaska Native households in Wrangell harvested a total of 465.7 lbs per household of wild resources in 1987. Of the mean household harvest, Alaska Native households harvested an average of 79.7 lbs of salmon, 55.7 lbs of halibut, 56.7 lbs of other finfish, 92.8 lbs of marine invertebrates, 69.7 lbs of deer, 52.3 lbs of moose, 2.5 lbs of other land mammals (primarily black bear and goat), 39.8 lbs of seal, 6.4 lbs of birds, and 10.1 lbs of wild plants in 1987. By comparison, on average non-Native households in Wrangell harvested a total of 412.5 lbs per household of wild resources in 1987. Of the mean household harvest, non-Native households harvested an average of 89.5 lbs of salmon, 52.1 lbs of halibut, 72.7 lbs of other finfish, 98.7 lbs of marine invertebrates, 45.2 lbs of deer, 17.5 lbs of moose, 22.9 lbs of other land mammals (primarily black bear and goat), 0 lbs of seal, 6.2 lbs of birds, and 7.8 lbs of wild plants in 1987.

Table 29

Mean Household Harvests (lbs) by Cultural Group
Wrangell, 1987

Resource	Non-Native	Native	Total
Salmon	89.5	79.7	84.7
Halibut	52.1	55.7	53.9
Other Finfish	72.7	56.7	64.9
Marine Invertebrates	98.7	92.8	95.8
Deer	45.2	69.7	57.3
Moose	17.5	52.3	34,6
Other Mammal	22.9	2.5	12.8
Seal	0.0	39.8	19.6
Birds	6.2	6.4	6.3
Plants	7.8	10.1	8.9
Total	412.5	465.7	438.7

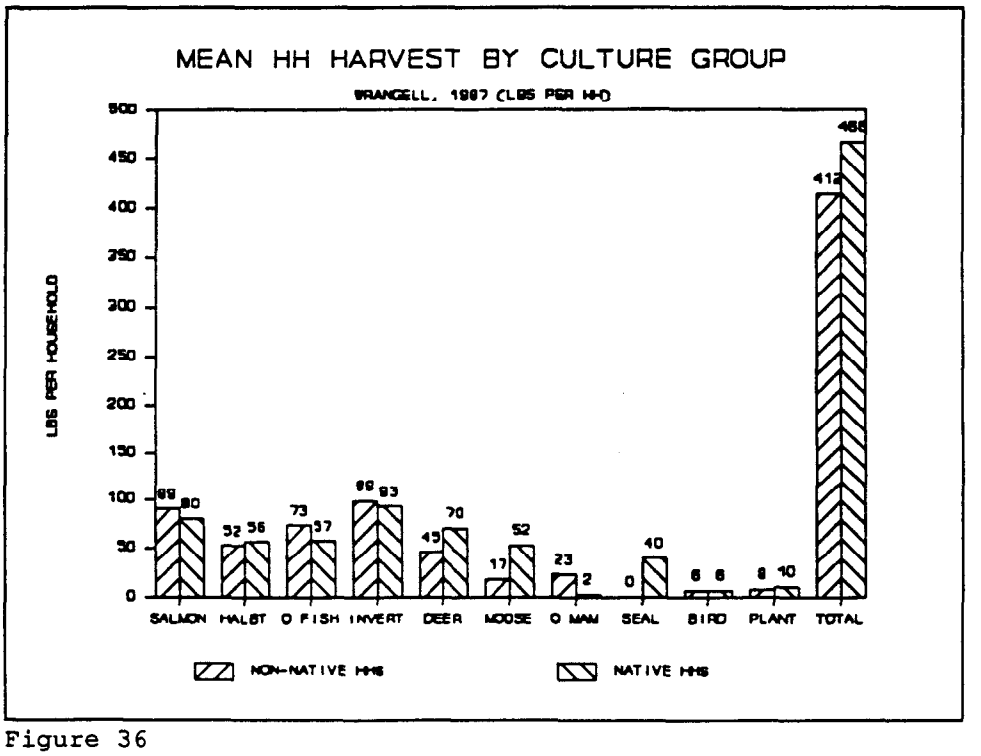

Figure 36

As stated above, these are substantial harvests of wild foods by both Alaska Native and non-Native households. The mean household harvests of wild resources in 1987 appear to be quite similar between Alaska Native households and non-Native households, except for seal, which was harvested by only Alaska Native households. Statistically, none of the apparent differences between mean household harvests by Alaska Native and non-Native households were statistically significant. That is, on average, Alaska Native households and non-Native households in Wrangell harvested the same quantity of wild resources per household in 1987.

This finding of similar mean household harvests between Alaska Native households and non-Native households has important theoretical and policy implications. It demonstrates that in a bi-cultural rural community like Wrangell, fishing and hunting for family use are important to households from all cultural traditions. The harvest and use of wild foods have become part of the economy and social life of many households who have settled into Wrangell from other places and cultures. The

harvests of many non-Native households have become similar to the harvests of households from Alaska Native traditions. This means that over time many non-Natives become socialized into the community's historic patterns of wild resource use, learning how to fish and hunt, and learning how to use many of the wild foods that have been part of the traditional diet in the area.

Specialization in Salmon Harvests and Total Harvests

One difference between harvests by Alaska Native households and non-Native households in Wrangell in 1987 was in salmon harvests. A substantial percent of non-Native households in Wrangell harvested relatively modest quantities of salmon. By contrast, a substantial percent of Alaska Native harvested no salmon at all in 1987; instead, a minority of Alaska Native households harvested large quantities of salmon.

These generalizations are supported by Figure 37, which show the percent of households harvesting certain amounts of salmon, broken out by cultural group membership. Of non-Native households, 29.8 percent harvested no salmon in 1987, while a substantial percent of non-Native households (44.2 percent) harvested modest quantities of less than 100 lbs (that is, 1 to 99 lbs of salmon). This contrasts sharply with the pattern of salmon harvests by Alaska Native households in 1987. Of Alaska Native households, the majority (60.2 percent) harvested no salmon at all in 1987. Further, only 8.2 percent of Alaska Native households harvested modest quantities of less than 100 lbs of salmon

How is it, then, that the mean household salmon harvests of Alaska Native households (79.7 lbs) and non-Native households (89.5 lbs) were virtually identical in Wrangell, when so many of the Alaska Native households harvested no salmon? This is because a significant minority of Alaska Native households harvested relatively large quantities of salmon: 26.8 percent harvested between 100-499 lbs and 4.8 percent harvested between 500-1000 lbs. By comparison, of non-Native households, 25.1 percent harvested between 100-499 lbs and 1.7 percent harvested more than 500 lbs. These few high-harvesting Alaska Native households produced more than the high-harvesting

non-Native households, so that on average the household salmon harvests were equivalent between Alaska Native households and non-Native households.

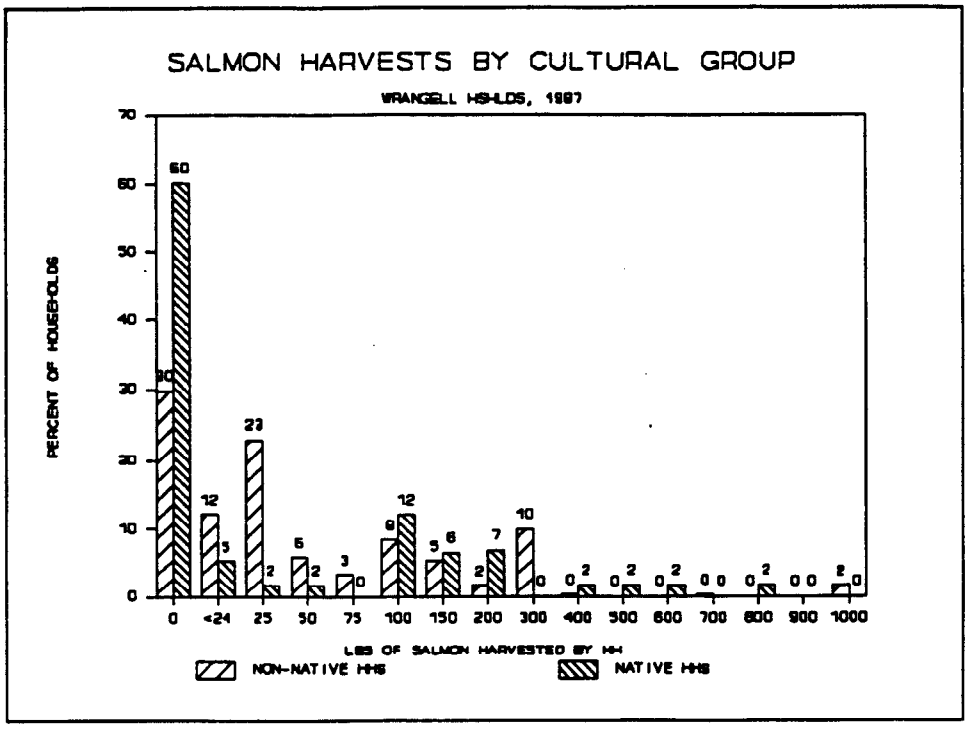

Figure 37

These findings suggest that there may have been different patterns of salmon harvests between the two cultural groups in 1987. As a general rule among Alaska Native households, a household took relatively substantial quantities of salmon or did not fish for salmon at all. This pattern was not specifically researched in the Wrangell study, but may be due to several factors. The pattern of salmon harvests by Alaska Native households in Wrangell may be an example of household specialization in subsistence harvests which are common in other rural Alaska communities, as documented by Wolfe (1987). In this common pattern, a minority of highly productive households produce a majority of the community's food harvests and share the harvests with the less productive households in the community. The specialization of productive roles is explainable by socio-cultural factors: productive households tend to be family units at peak maturity with a larger and older work force, greater equipment holdings, and more social obligations in food procurement. Less productive households tend to be

households with incomplete work forces (such as new families or single parents with small children), households with elderly or other dependent members, and households with no equipment (Wolfe 1987). It is possible that the salmon production is organized in this fashion among Alaska Native households in Wrangell, with most salmon being produced efficiently by a small percent of households, who in turn give it out to other households in the community through traditional networks of distribution and exchange. In this manner, most households use salmon which are efficiently produced by a subset of households in the community.

The non-Native household pattern of salmon use may reflect a somewhat different pattern. The large percent of households taking relatively modest numbers of salmon may be due to several factors. First, some of the small harvests may be households fishing for recreational values, using rod and reel in a relatively inefficient fashion and producing small catches. Second, some of the modest harvests may be households who are not part of food sharing networks, and who produce salmon primarily for their own use. Thus, they cannot count on salmon from others, nor do they have to produce beyond their household's own consumption level to share with others, so the household produces modest amounts. Finally, some of the modest harvests may represent greater holdings and use of certain types of fishing equipment, like boats and rod and reel gear, among non-Native households.

It should be noted that there also were non-Native households taking substantial quantities of salmon in 1987, similar to the highly productive minority of Alaska Native households. In this case, one may suspect that these non-Native households fit into the same harvest pattern as Alaska Native households, that is, harvest specialization and high production for sharing with other households in the community. The details of these possible use patterns must await further study.

The pattern of specialization in resource harvests are illustrated again in Figures 38, 39, and 40, except for total resource harvests (lbs). These figures illustrate that resource harvesting is more specialized among Alaska Native households in comparison with non-Native households. As shown in Figure 38, among Alaska Native households, about 80 percent of the households produced 20 percent of the harvest by weight (lbs),

while 20 percent of the households produced 80 percent of the resources. Among non-Native households, about 80 percent of the households produced 40 percent of the harvest, while 20 percent of the households produced 60 percent of the harvest. There is a great degree of specialization in harvests for both non-Native households and Alaska Native households, and the Alaska Native households appear to be the more specialized of the two groups.

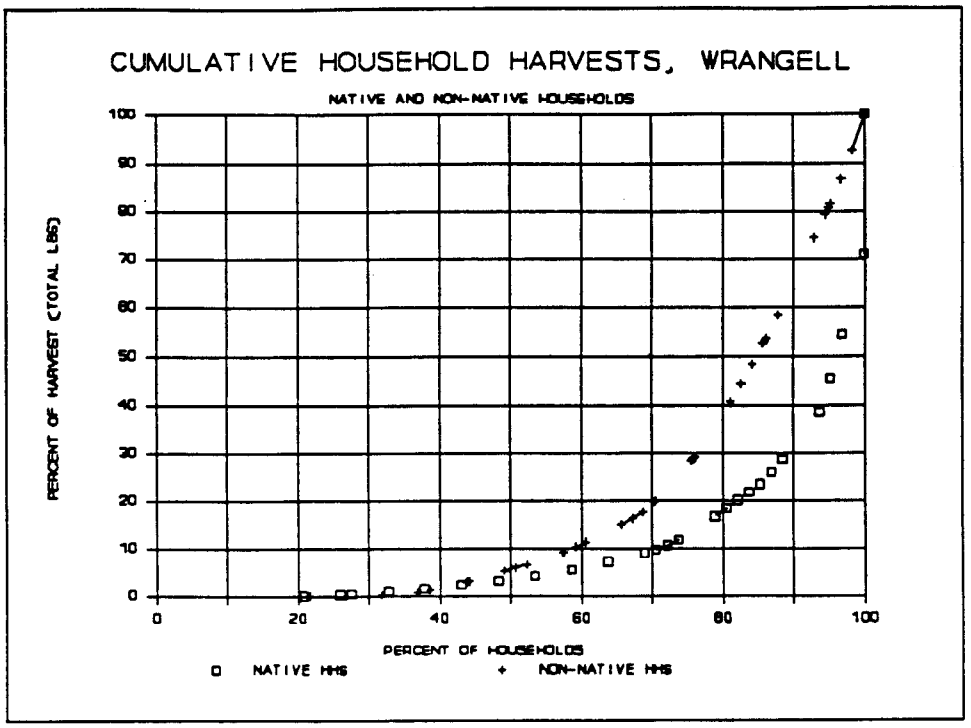

Figure 38

Among the two groups, this means that there are some Alaska Native households taking large quantities of wild foods. As shown in Figure 39, there were an estimated 32 Alaska Native households in the community harvesting more than 2,500 lbs in 1987. Among non-Native households there were no households estimated to harvest over 2,500 lbs. There were an estimated 160 non-Native households harvesting between 1,000 to 1,999 lbs in 1987, compared with 73 Alaska Native households. The number of households were equivalent harvesting between 1-999 lbs (290 Alaska Native households, 242 non-Native households). The number of households taking no resources were also equivalent (103 Alaska Native households, 112 non-Native households).

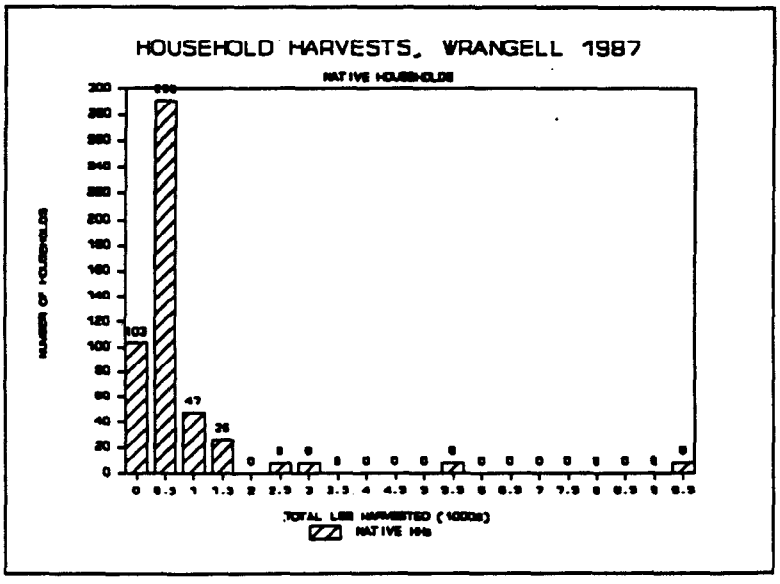

Figure 39

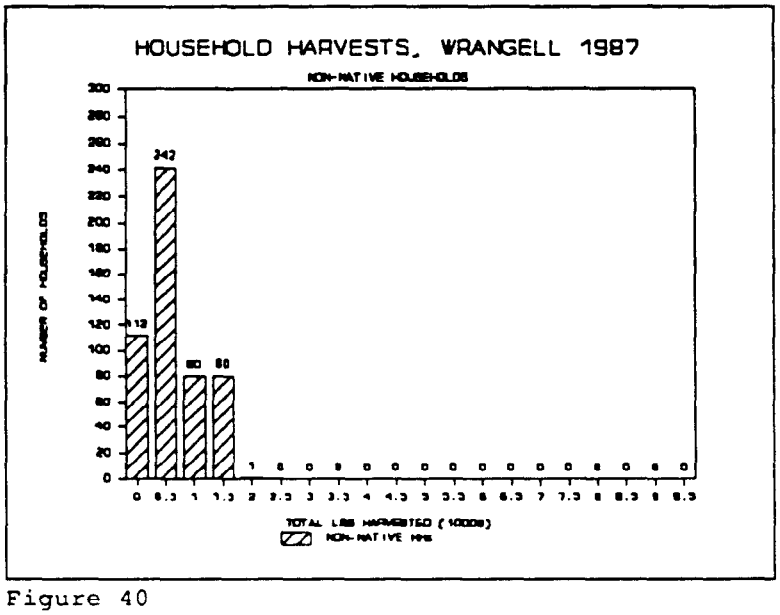

Figure 40

The probable reasons for specialization in the production of subsistence foods by Alaska Native and non-Native households were outlined above in relation to salmon production. This specialization may have implications for the management of particular resources, as discussed by Wolfe (1987). Fishing and hunting regulations that distribute

the harvestable surplus of a resource equally across all potential harvesters through equal bag limits and quotas, may not be realistic given the specialization in harvests among households. A regulatory system that allows for substantial harvests of a few households (such as with a community bag or quota, or with transferable bags or quotas), recognizing that the harvests will be shared with the majority of households that do not hunt, is better able to accommodate the type of specialization found in rural communities like Wrangell.

Summary

In summary, culture is related to the harvest and use of wild resources in Wrangell in several ways. At the community level, the overall productivity in Wrangell of wild resources (about 156 lbs per person in 1987) is related to the cultural composition of the community (35.8 percent of the population and 49.3 percent of the households being Alaska Native). The higher percentage of non_Native settlers in Wrangell is associated with a decreased subsistence productivity in comparison with other rural Alaska communities with a larger percent of Alaska Natives.

The non-Native households in turn have been socialized into using more wild fish and game than non-Native households in the continental United States. Thus, it was found that both non-Native households and Alaska Native households in Wrangell use substantial quantities of wild resources compared with U.S. standards of food consumption.

Alaska Native households and non-Native households contributed equally to the community's overall harvest of wild foods (444,384 lbs). Also, the mean household harvest levels were quite similar between Alaska Native and non-Native households, except for seal harvests and perhaps land mammal harvests.

More subtle differences appear to exist between the way the Alaska Native households produce their wild foods in comparison with non-Native households. The organization of production of salmon appears to be different between Alaska Native households, being more specialized and efficient than salmon production by non-Native

households. Also, some Alaska Native households appeared to produce at substantially higher levels than non-Native households, probably related to greater involvement in traditional networks of distribution and exchange of wild resources between households.

CHAPTER 5

SUMMARY AND CONCLUSION

Wrangell is located on a remote island surrounded by a dense rainforest, extensive coastline, and protected marine waters. Wrangell Island has been occupied by Tlingit Indians for centuries. In addition, Wrangell is one of the older non-Native communities in Alaska. The town dates from the construction of the Russian-American trading post in 1836. Wrangell city began as a fur trading post and supply center that served trappers, prospectors, and miners. By the turn of the twentieth century, it had become a town with a mixed commercial and subsistence economy based on fishing and timber. Wrangell's commercial economy remains dependent on these industries which are characterized by seasonal employment and cyclical periods of prosperity and decline.

The community has a relatively long-term, stable population. Population growth during the last four decades has been slow and steady, with a mean annual change of about 1.8% compared with all of Alaska at about 3.4% (1944-85)(ADOL 1987: 9). The majority of Wrangell households include a member who has lived in the community longer than 20 years. The community is ethnically well-integrated. Almost half of the households include a member who is an Alaska Native.

The use of wild resources is important to the well-being of Wrangell residents. During the WHS survey period, Wrangell households harvested an average of 438.7 pounds of food from wild resources. The harvest was distributed widely throughout the community. Better than three out of four harvesting households shared a portion of their harvest. Nine out of ten households received food. Almost every Wrangell household (95.1%) used wild food in 1987 as a result of a community wide pattern of harvesting and sharing.

Wrangell residents harvest a diversity of resources throughout the year in a recurring seasonal pattern. The average household used over ten species during the

survey period. When possible, Wrangell households fill their need for wild food close to home. For example, Wrangell hunters hunt moose primarily in the Stikine River area. Favorite noncommercial fishing areas tend to be close to home. If necessary, however, people will travel elsewhere in southeast Alaska to harvest certain resources. Since the deer population crash in the late 1960s, hunters have been forced to travel away from Wrangell to areas where deer are abundant. Other resources, such as abalone and herring eggs, are unavailable near Wrangell and some residents either travel substantial distances to harvest these resources or obtain them through customary exchange.

Wrangell is located near the Stikine moose herd and, as a result, Wrangell residents regularly harvest moose. Moose provide Wrangell households with an average of over thirty pounds of meat annually. Although a relatively small number of households actually harvest moose as compared to deer, almost all harvesting households distribute meat to other households. As a result, almost half of all households use moose.

A large proportion of the overall Wrangell harvest is fish. Fish for home use are taken from commercial catches and harvested noncommercially. The commercial fleet provides a large proportion of the fish for home use relative to the number of commercial fishers. During the survey year, fish from commercial catches accounted for over one quarter of all fish harvested regardless of method.

The Wrangell fish harvest is characterized by a reliance on king salmon, halibut, dungeness crab and shrimp. King salmon accounted for the majority of all salmon taken for home use both from commercial catches and caught noncommercially. This is the result of abundance and certain regulatory conditions. The majority of salmon are harvested noncommercially with rod and reel used primarily as trolling gear. There has been, however, an increase in the subsistence permit salmon harvest.

Halibut accounted for about one fifth of the total fish harvest. By regulation, halibut may only be noncommercially harvested with rod and reel. Dungeness crab and shrimp accounted for 27% of the total fish harvest. The noncommercial harvest of dungeness crab exceeded the amount of crab taken home from commercial catches by

almost half again as much. The majority of the shrimp for home use was also harvested noncommercially.

The WHS data clearly demonstrates that most Wrangell residents use wild food, and some residents depend on it for most of their meat and fish. The importance of the wild resource harvest, however, goes beyond nutritional need. A quality of life that revolves around seasonal harvests, household interdependency as expressed by sharing, and pride in self-sufficiency remains central to the overwhelming majority of Wrangell households.

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APPENDIX A

Wrg/Pb Version: 12/2/87

OMB #: 0596-0096
EXPIR.DATE: 7/31/89

U.S. FOREST SERVICE

ALASKA DEPT. OF
FISH & GAME
SUBSISTENCE DIVISION

FINAL
DRAFT

UNIVERSITY OF ALASKA
ANCHORAGE

INSTITUTE OF SOCIAL &
ECONOMIC RESEARCH

TONGASS RESOURCE USE SURVEY
FALL 1987

FACE TO FACE
COVER SHEET

1. INTERVIEWER ID _____ 3. STUDY NO. _____

2. INTERVIEW NO. _____

4. COMMUNITY _____ 5. SEGMENT ____ 6.LINE ____

7. ADDRESS _____

_____

_____

CONTACT RECORD

	DATE	DAY	TIME	RESULT	INITIALS
FIRST CALL					
SECOND CALL					
THIRD CALL					
FOURTH CALL					
FIFTH CALL					

(1) Hello. I'm _____ with the [Alaska Department of Fish and Game.] I am working on the Tongass Resource Use Survey and I would like to ask your help. Your household has been randomly chosen in a survey on hunting and fishing in southeast Alaska. I would like to talk with the adult in your household who knows the most about hunting and fishing.

The survey is being jointly sponsored by the U.S. Forest Service, the Alaska Department of Fish and Game and the University of Alaska. The Forest Service will use the information to determine if timber harvest, fish hatcheries, or other activities could affect hunting and fishing in southeast Alaska. The Department of Fish and Game will use the results to help ensure that the management of wildlife resources is sensitive to the needs and concerns of local residents.

I will be asking you to show on maps the areas where members of your household hunt and fish. I will also ask for descriptions of selected locations where the household hunts, information on annual species harvests, and background characteristics that will help policy makers understand different types of resource use.

The interview takes about one hour. You can choose not to take part in the survey or to not answer any questions you don't wish to. Your answers will be kept strictly confidential and used only in combination with the answers of other residents. Do you have any questions before I begin?

(2) First of all, could you please list the persons who have been members of your household during the past year, giving their age, sex, ethnicity and relationship to you.

PERSON NO.	AGE	SEX	RELATIONSHIP TO R	RACE/ ETHNICITY *
1			RESPONDENT	
2				
3				
4				
5				
6				
7				
8				

* 1=ALASKA NATIVE, 2= WHITE, 3=OTHER

OMB #: 0596-0096
EXPIR.DATE: 7/31/89

1.START TIME ——:—— (1-2:3-4)

U.S. FOREST SERVICE

ALASKA DEPT. OF
FISH & GAME
SUBSISTENCE DIVISION

FINAL
DRAFT

UNIVERSITY OF ALASKA
ANCHORAGE

INSTITUTE OF SOCIAL &
ECONOMIC RESEARCH

TONGASS RESOURCE USE SURVEY
FALL 1987

2.————	3.————	4.————	5.1	6.——	7.————
INTW'R ID (5-6)	INT'W NO. (7-8)	STUDY NO. (9-12)	DECK (13)	MONTH (14-15)	DATE (16-17)

8.————
COMMUNITY (18-19)

SECTION A
DEER HUNTING

A1. First, I would like to ask about deer hunting. Have you or anyone else in your household hunted deer while living in this community?

1. YES (20)
2. NO
8. DON'T REMEMBER
9. NOT ASCERTAINED

SKIP TO P.11, Q.B1

A2. I would like you to draw a line around each of the areas that members of your household have used to hunt deer while living in this community. (PROBE: CAN YOU BE MORE SPECIFIC? HAVE R DRAW AREAS IN GREEN ON MAP. ASSIGN AND LABEL EACH AREA WITH A UNIQUE NUMBER, A01-A99).

A3. Now I would like you to draw a line around each of the locations that members of your household think are most reliable; that is, locations where you are most likely to find deer some time during the year. (RECORD ON MAP IN RED AND ASSIGN EACH AREA A UNIQUE NUMBER, B01-B99).

A4. Now I would like you to pick one place that you think is particularly good for deer hunting. I won't record this place on the map but I would like to ask you a few questions about this place. Would you point to the place you're thinking about? (PROBE: CAN YOU BE MORE SPECIFIC?)

Thinking just about this place, how do you usually travel there? (PROBE FOR ALL MEANS OF TRANSPORTATION USED)

1. BOAT
2. CAR/TRUCK
3. FERRY
4. WALK
5. AIR
6. ATV
7. OTHER _____
9. NA

1st	2nd	3rd	4th
(21)	(22)	(23)	(24)

IF BOAT USED:

A5. What kind of boat or boats do you usually use to get there?

BOAT 1 (25)

BOAT 2 (26)

1. SKIFF
2. COMMERCIAL FISHING BOAT
3. CHARTER
4. PLEASURE CRUISER
7. OTHER _____
8. DON'T KNOW
9. NA

A6. Does the route you take to this place include open water that can get dangerously rough in stormy weather?

1. YES
2. NO
9. NA

(27)

A7. Now I would like to measure how many miles you travel to get to this place from your community, from the beach, and from the nearest road. (RECORD BELOW)

DISTANCE TO PLACE IN MILES FROM: COMMUNITY	BEACH	ROAD
(28-29)	(30-31)	(32-33)

A8. Does this place include:

Y	N	
☐	☐	A8a. young clearcuts, where it is open and there is little brush? (34)
☐	☐	A8b. middle aged clearcuts, where the trees touch each other and are difficult to see through?
☐	☐	A8c. older clearcuts, where the trees are taller than houses and the ground beneath the trees is open?
☐	☐	A8d. old growth forest?
☐	☐	A8e. muskeg or meadows?
☐	☐	A8f. open beach?
☐	☐	A8g. grassy meadow?
☐	☐	A8h. areas above treeline?
☐	☐	A8i. and roads including logging roads? (42)

A9. During what months of the year do members of your household hunt in this place? (1=YES, 2=NO, 9=NA)

☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
J	F	M	A	M	J	J	A	S	O	N	D

(43) (54)

A10. What is the first year that a member of your household hunted deer in this place?

☐ YEAR (55-56)

98. DON'T KNOW
99. NA

A11. Are there any past or present members of your family who do not live in this household who hunted deer in this place?

1. YES
2. NO
8. DON'T KNOW
9. NA
(57)

A11a. What is the first year that a past or present family member hunted deer there?

☐ YEAR (58-59)

98. DON'T KNOW
99. NA

A12. During the past twelve months, who from your household hunted deer in this place? (RECORD PERSON NO. FROM COVER SHEET)

[ ] FIRST PERSON (PERS.NO.)	[ ] SECOND P.	[ ] THIRD P.
(60)	(61)	(62)

A12a. Could you please estimate on about how many days each of these household members hunted deer in this place?

[ ] FIRST PERSON (DAYS)	[ ] SECOND P.	[ ] THIRD P.
(63)	(64)	(65)

A13. On your household's last deer hunt in this place, who from your household went?

[ ] FIRST PERSON (PERS.NO.)	[ ] SECOND P.	[ ] THIRD P.
(66)	(67)	(68)

A14. On that last hunt, did (you/they) go with someone from another household?

(69)

1. YES
2. NO
8. DK
9. NA

SKIP TO P.5, Q.A16

A15. Was this person a relative, a friend, a friend from work, or someone (you/they) know in some other way? (IF MORE THAN ONE OTHER PERSON, OBTAIN RELATIONSHIP FOR EACH OTHER PERSON)

A15a. (FIRST OTHER PERSON) (70)

1. RELATIVE
2. FRIEND
3. FRIEND FROM WORK
7. KNOW IN OTHER WAY _____
8. DON'T KNOW
9. NA

A15b. (SECOND OTHER PERSON) (71)

1. RELATIVE
2. FRIEND
3. FRIEND FROM WORK
7. KNOW IN OTHER WAY _____
8. DON'T KNOW
9. NA

A15c. (THIRD OTHER PERSON) (72)

1. RELATIVE
2. FRIEND
3. FRIEND FROM WORK
7. KNOW IN OTHER WAY _____
8. DON'T KNOW
9. NA

A16. Are there any areas that have been reliable for deer hunting that your household no longer uses to hunt deer?

1. YES (73)
2. NO ——— SKIP TO P.7 Q.A27

A17. Please draw a line around each of the areas that have been reliable for deer hunting that your household no longer uses to hunt deer. (RECORD ON MAP IN BROWN AND ASSIGN EACH AREA A UNIQUE NUMBER, C01-C99)

A18. Now I would like you to pick one place that was particularly good for deer hunting that for some reason your household no longer uses to hunt deer. Could you point to this place? Thinking just about this place, could you tell me how you used to travel there? (PROBE FOR ALL MEANS OF TRANSPORTATION USED)

1. BOAT
2. CAR/TRUCK
3. FERRY
4. WALK
5. AIR
6. ATV
7. OTHER _____
9. NA

1st	2nd	3rd	4th
(74)	(75)	(76)	(77)

IF BOAT USED:

A19. What kind of boat or boats did you usually use to get there?

BOAT 1 (78)
BOAT 2 (79)

1. SKIFF
2. COMMERCIAL FISHING BOAT
3. CHARTER
4. PLEASURE CRUISER
7. OTHER _____
8. DON'T KNOW
9. NA

A20. Did the route you took to this place include open water that could get dangerously rough in stormy weather?

1. YES
2. NO
9. NA (80)

A21. Now I would like to measure how many miles you travelled to get to this place from your community, from the beach, and from the nearest road. (RECORD BELOW)

DISTANCE TO PLACE IN MILES FROM: COMMUNITY	BEACH	ROAD
(81-82)	(83-84)	(85-86)

A22. Does this place <u>now</u> include:

Y	N	DK	
☐	☐	☐	A22a. young clearcuts, where the trees are short and there is heavy brush? (87)
☐	☐	☐	A22a. middle aged clearcuts, where the trees touch each other and are difficult to see through?
☐	☐	☐	A22c. older clearcuts, where the trees are taller than houses and the ground beneath the trees is open?
☐	☐	☐	A22d. old growth forest?
☐	☐	☐	A22e. muskeg or meadows?
☐	☐	☐	A22f. open beach?
☐	☐	☐	A22g. grassy meadow?
☐	☐	☐	A22h. areas above treeline?
☐	☐	☐	A22i. and roads, including logging roads? (95)

A23. During what months of the year did members of your household hunt in this place? (1=YES, 2=NO, 9=NA)

☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
J	F	M	A	M	J	J	A	S	O	N	D

(96) (107)

A24. What is the first year that a member of your household hunted deer in this place?

☐ YEAR 98. DON'T KNOW
99. NA

(108-109)

A25. Are there any past or present members of your family who do not live in this household who hunted deer in this place?

1. YES 8. DON'T KNOW (110)
2. NO 9. NA

A25. What is the first year that a past or present family member hunted deer there?

☐ YEAR 98. DON'T KNOW (111-112)
99. NA

A26. Why did your household stop using this place to hunt deer?

☐ _____ (113-114)

☐ _____ (115-116)

☐ _____ (117-118)

1. _____	2. _____	3. _____	4. 2
INTW'R ID	INT'W NO.	STUDY NO.	DECK
(1-2)	(3-4)	(5-8)	(9)

A27. Now, I would like to ask you to draw a line around all the areas that you and other members of your household use the most often to hunt deer (RECORD ON MAP IN BLUE AND ASSIGN UNIQUE NUMBERS TO EACH AREA, D01-D99).

A28. I would like you to pick one location that your household uses most often for deer hunting. Again I won't record this place on the map but I would like to ask you a few questions about this place. Would you point to the place you're thinking about?

INTERVIEWER CHECKPOINT

☐ 1= SAME PLACE AS MOST RELIABLE PLACE: SKIP TO P.10 Q.A38 (10)

2= DIFFERENCE PLACE —— CONTINUE

Thinking just about this place, how do you usually travel there? (PROBE FOR ALL MEANS OF TRANSPORTATION USED)

1. BOAT
2. CAR/TRUCK
3. FERRY
4. WALK
5. AIR
6. ATV
7. OTHER _____
9. NA

☐	☐	☐	☐
1st	2nd	3rd	4th
(11)	(12)	(13)	(14)

IF BOAT USED:

A29. What kind of boat or boats do you usually use to get there?

☐ BOAT 1 (15)
☐ BOAT 2 (16)

1. SKIFF
2. COMMERCIAL FISHING BOAT
3. CHARTER
4. PLEASURE CRUISER
7. OTHER _____
8. DON'T KNOW
9. NA

A30. Does the route you take to this place include open water that can get dangerously rough in stormy weather?

1. YES
2. NO
9. NA

(17)

A31. Now I would like to measure how many miles you travel to get to this place from your community, from the beach, and from the nearest road. (RECORD BELOW)

DISTANCE TO PLACE IN MILES FROM: COMMUNITY	BEACH	ROAD
(18-19)	(20-21)	(22-23)

A32. Does this place include:

Y	N	
☐	☐	A32a. young clearcuts, where it is open and there is little brush? (24)
☐	☐	A32b. middle aged clearcuts, where the trees touch each other and are difficult to see through?
☐	☐	A32c. older clearcuts, where the trees are taller than houses and the ground beneath the trees is open?
☐	☐	A32d. old growth forest?
☐	☐	A32e. muskeg or meadows?
☐	☐	A32f. open beach?
☐	☐	A32g. grassy meadow?
☐	☐	A32h. areas above treeline?
☐	☐	A32i. and roads, including logging roads? (32)

A33. During what months of the year do members of your household hunt in this place? (1=YES, 2=NO, 9=NA)

J	F	M	A	M	J	J	A	S	O	N	D
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

(33) (44)

A34. What is the first year that a member of your household hunted deer in this place?

☐ YEAR 98. DON'T KNOW
99. NA

(45-46)

A35. Are there any past or present members of your family who do not live in this household who have ever hunted deer in this place?

1. YES 8. DON'T KNOW (47)
2. NO 9. NA

A35a. What is the first year that a past or present family member hunted deer there?

☐ YEAR 98. DON'T KNOW (48-49)
99. NA

A36. During the last year, who from your household hunted deer in this place? (RECORD PERSON NO. FROM COVER SHEET)

☐ FIRST PERSON (PERS.NO.) (50) ☐ SECOND P. (51) ☐ THIRD P. (52)

A37. Could you please estimate on about how many days each of these household members hunted deer in this place?

☐ FIRST PERSON (DAYS) (53) ☐ SECOND P. (54) ☐ THIRD P. (55)

A38. How many deer, if any, did members of your household harvest altogether between November 1986 and October 1987?

[ ] DEER (56-57)

98. DON'T KNOW
99. NA

A39. About how many deer or portions of deer, if any, did your household give away last year? (RECORD NO. OF EACH SIZE CATEGORY)

[ ]	[ ]	[ ]	[ ]
WHOLE (58-59)	3/4 (60-61)	1/2 (62-63)	1/4 (64-65)

(IF GAVE ANY DEER MEAT AWAY):

A40. Did your household give any deer meat to:

Y	N		
[ ]	[ ]	A40a. relatives?	(66)
[ ]	[ ]	A40b. friends?	
[ ]	[ ]	A40c. friends from work?	
[ ]	[ ]	A40d. elders?	
[ ]	[ ]	A40e. people you know in another way?_____	

_____ (70)

A41. Who from your household personally harvested deer in the last twelve months? (PROBE FOR ALL MEMBERS AND RECORD PERSON NO. FROM COVER SHEET)

PERS.NO.

[ ]	[ ]	[ ]
FIRST PERSON	SECOND P.	THIRD P.
(71)	(72)	(73)

********** ALL RESPONDENTS **********

SECTION B

B1. Did your household receive any deer meat from another household between November 1986 and October 1987?

1. YES (74)
2. NO — SKIP TO Q.B4
8. DK
9. NA

B2. About how many deer or portions of deer did your household receive last year? (RECORD NO. OF EACH SIZE CATEGORY)

WHOLE (75-76)	3/4 (77-78)	1/2 (79-80)	1/4 (81-82)

B3. Did your household receive any deer meat from:

Y	N		
☐	☐	B3a. relatives?	(83)
☐	☐	B3b. friends?	
☐	☐	B3c. friends from work?	
☐	☐	B3d. elders?	
☐	☐	B3e. people you know in some other way (SPECIFY HOW)? _____	(87)

B4. Now I would like to ask you about salmon fishing. COMPLETE CHART FOR SALMON FISHING; MAP SALMON FISHING NON-COMMERCIAL HARVEST AREAS AND CONTINUE WITH OTHER HARVESTS.

SALMON
HOUSEHOLD HARVEST & DISTRIBUTION
DURING LAST YEAR

Did someone in your household go commercial fishing for salmon last year? ____/____ [IF NO, SKIP TO NON-COMMERCIAL]
yes no

	KINGS	SOCKEYE (REDS)	COHOS SILVERS	PINKS (HUMPY)	CHUM (DOG)
COMMERCIAL FISH? (1=YES, 2=NO)					
How many were removed from the commercial catch for home use?					
How many were given to other households or at community events?					
NON-COMMERCIAL FISH? (1=YES, 2=NO)					
How many were caught with nets or gaffs?					
How many were caught with rod and reel?					
How many of these were given away?					
How many were received by your household					

MAP AREAS WHERE HOUSEHOLD HAS HARVESTED SALMON NON-COMMERCIALLY IN PURPLE. MARK EACH AREA WITH UNIQUE NO. E01-E99

FINFISH
HOUSEHOLD HARVEST & DISTRIBUTION
DURING LAST YEAR

Did someone in your household go commercial fishing for finfish other than salmon during the last year? ____/____ yes no
[IF NO, SKIP TO NON-COMMERCIAL]

	COD	HALIBUT	FLOUNDER SOLE FLATFISH	ROCK FISH	HERRING
COMMERCIAL FISH? (1=YES, 2=NO)					
How many were removed from the commercial catch for home use?		(lbs.)			(lbs.)
Were any given away? (1=YES, 2=NO)					
NON-COMMERCIAL FISH? (1=YES, 2=NO)					
How many were caught with nets					(lbs.)
How many were caught with rod and reel?					
Were any given away? (1=YES, 2=NO)					
Were any received by your household? (1=yes, 2=no)					

FINFISH
HOUSEHOLD HARVEST & DISTRIBUTION
DURING LAST YEAR

	HOOLIGAN	Dolly Vardon/ STEELHEAD/ TROUT	OTHER FISH
NON-COMMERCIAL FISH? (1=YES, 2=NO)			
How many were caught with nets			(lbs)
How many were caught with rod and reel?			
Were any given away? (1=YES, 2=NO)			
Were any received by your household? (1=yes, 2=no)			

MAP AREAS USED TO HARVEST FINFISH IN GREEN. ASSIGN UNIQUE NUMBER TO EACH AREA, F01-F99

SHELLFISH
HOUSEHOLD HARVEST & DISTRIBUTION
DURING LAST YEAR

Did someone in your household go commercial fishing for shellfish during the last year? ____/____ [IF NO, SKIP TO NON-COMMERCIAL]
yes no

	KING CRAB	DUNGENESS CRAB	TANNER CRAB	SHRIMP
COMMERCIAL HARVEST? (1=YES, 2=NO)				
How many were removed from the commercial catch for home use?				(lbs.)
Were any given away? (1=YES, 2=NO)				
NON-COMMERCIAL HARVEST? (1=YES, 2=NO)				
How many were harvested?				(lbs.)
Were any given away? (1=YES, 2=NO)				
Were any received by your household? (1=yes, 2=no)				

SHELLFISH
HOUSEHOLD HARVEST & DISTRIBUTION
DURING LAST YEAR
(PAGE TWO OF THREE)

IF NO COMMERCIAL FISHER IN THE HOUSEHOLD, SKIP TO NON-COMMERCIAL

	SEA URCHINS	ABALONE	OCTOPUS	SCALLOPS
COMMERCIAL HARVEST? (1=YES, 2=NO)				
How many were removed from the commercial catch for home use?	(5 Gal)	(lbs.)	#	
Were any given away? (1=YES, 2=NO)				
NON-COMMERCIAL HARVEST? (1=YES, 2=NO)				
How many were harvested?	(5 Gal)	(lbs.)	#	(lbs.)
Were any given away? (1=YES, 2=NO)				
Were any received by your household? (1=yes, 2=no)				

SHELLFISH
HOUSEHOLD HARVEST & DISTRIBUTION
DURING LAST YEAR
(PAGE THREE OF THREE)

	GUMBOOT	SEA CUCUMBER	CLAMS COCKLES	OTHER INVERT.	HERRING EGGS
NON-COMMERCIAL HARVEST? (1=YES, 2=NO)					
How many were harvested?	(Gal.)	(5 Gal.)	(5 Gal.)	(lbs.)	(lbs.)
Were any given away? (1=YES, 2=NO)					
Were any received by your household? (1=yes, 2=no)					

MAP INVERTEBRATE HARVEST AREAS IN RED. MARK EACH AREA WITH UNIQUE NUMBER, G01-G99.

PLANTS
HOUSEHOLD HARVEST & DISTRIBUTION
DURING LAST YEAR

	SEAWEED	Other Plants	BERRIES	FIREWOOD
How many (UNIT) were harvested?	(lbs.)	(lbs.)	(Qts.)	(CHRDS.)
Were any given away? (1=YES, 2=NO)				
Were any received by your household? (1=yes, 2=no)				

plants includes: beach plants, mushrooms, all other wild plants

seaweed includes: kelp, black seaweed, sea ribbons, sea lettuce, etc.

BIRD
HOUSEHOLD HARVEST & DISTRIBUTION
DURING LAST YEAR

	DUCKS	SEABIRDS	GEESE	SEA-BIRD EGGS	OTHER
HARVEST? (1=YES, 2=NO)					
How many were harvested?					
Were any given away? (1=YES, 2=NO)					
Were any received by your household? (1=yes, 2=no)					

NOTE: Ducks include: Mallards, Widgeons, Teals, Shovelers, Old Squaws, Golden Eyes, Buffleheads. Seabirds include: Scoters, Murres, Murrlets, Puffins, Seagulls, Commorants

MAP BIRD HARVEST AREAS IN BLUE. MARK EACH AREA WITH UNIQUE NUMBER, H01-H99.

LAND MAMMAL
HOUSEHOLD HARVEST & DISTRIBUTION
DURING LAST YEAR

	MOOSE	GOAT	BLACK BEAR	FURBEARERS
HARVEST? (1=YES, 2=NO)				
How many were harvested?				
Were any given away? (1=YES, 2=NO)				
GIVEN TO HOUSEHOLD? (1=YES, 2=NO)				

MARINE MAMMAL
HOUSEHOLD HARVEST & DISTRIBUTION
DURING LAST YEAR

	HARBOR SEAL	OTHER
HARVEST? (1=YES, 2=NO)		
How many were harvested?		
Were any given away? (1=YES, 2=NO)		
GIVEN TO HOUSEHOLD? (1=YES, 2=NO)		

MAP MARINE MAMMAL HARVEST AREAS IN BROWN. MARK EACH AREA WITH UNIQUE NUMBER I01-199.

SECTION C
BACKGROUND QUESTIONS

C1. During the last year, did your household harvest an unusually small amount of any of the animals and plants your household normally uses?

1. YES (10)
2. NO
9. NOT ASCERTAINED

SKIP TO Q.C3

C2. Please tell me which harvest amounts were unusually small and why you think they were unusually small.

C2a. Species 1: _____ (11-12)

Why: _____

_____ (13-14)

C2b. Species 2: _____ (15-16)

Why: _____

_____ (17-18)

C2c. Species 3: _____ (19-20)

Why: _____

_____ (21-22)

C3. During the last year, did your household harvest an unusually large amount of any of the animals and plants your household normally uses?

1. YES (23)
2. NO
9. NOT ASCERTAINED

SKIP TO Q.C5

C4. Please tell me which harvest amounts were unusually large and why you think they were unusually large.

C4a. Species 1: _____ (24-25)

Why: _____

_____ (26-27)

C4b. Species 2: _____ (28-29)

Why: _____

_____ (30-31)

C4c. Species 3: _____ (32-33)

Why: _____

_____ (34-35)

C5. What percent of all the meat and fish that your household ate in the last year came from your household's hunting, fishing, and gathering activities (as opposed to meat and fish purchased or given to household)?

[ ] (36-38)

PCT.

C6. What percent of all the meat and fish that your household ate in the last year came from people who live in another household (who may or may not be relatives)?

[ ] (39-41)

PCT.

C7. And what percent of all the meat and fish you and your household got from hunting, fishing, and gathering did your household give to others?

[ ] (42-44)

PCT.

C8. What percent of all the plants that your household ate in the last year came from your household's gardening, and gathering activities?

[ ] (45-47)

PCT.

C20. What is the longest total number of years someone in your household has been living in (COMMUNITY)?

[ ] (YEARS) (95-96)

C21. What is the longest total number of years someone in your household has been living in Alaska?

[ ] (YEARS) (97-98)

EMPLOYMENT

C25. Have you had a job for pay in the last twelve months?

1. YES 9. NA (10)
2. NO

C26. Were you self-employed in the last twelve months?

1. YES 9. NA (11)
2. NO

C27. At any time in the last twelve months, were you unemployed and looking for work?

1. YES 9. NA — SKIP TO Q.C28 (12)
2. NO

C27a. How many weeks were you unemployed and wanting a job during that time?

[ ] (13-14)
WEEKS

INTERVIEWER CHECKPOINT

[ ]
1= R DID NOT WORK IN LAST 12 MONTHS: SKIP TO P.23, Q.C30 (15)
2= R WORKED IN LAST 12 MONTHS — CONTINUE

C28. How many weeks did you work between November 1986 and October 1987?

[ ] (16-17)
WEEKS

C29. For each job you had during the last year, please tell me what kind of work you did and what type of business you worked in.

JOB NO.	TYPE OF WORK	TYPE OF BUSINESS
1	(18-19)	
2		
3		
4		
5		

(IF NO MORE ADULTS, SKIP TO P.28, Q.C50)

C30. Did (PERSON NO.2) have a job for pay in the last twelve months?

1. YES 9. NA (38)
2. NO

C31. Was (he/she) self-employed in the last twelve months?

1. YES 9. NA (39)
2. NO

C32. At any time in the last twelve months, was (he/she) unemployed and looking for work?

1. YES 9. NA — SKIP TO CHECKPOINT (40)
2. NO

C32a. How many weeks was (he/she) unemployed and wanting a job during that time?

[ ] (41-42)

WEEKS

INTERVIEWER CHECKPOINT

[ ]

1= P2 DID NOT WORK IN LAST 12 MONTHS: SKIP TO P.24, Q.C35 (43)

2= P2 WORKED IN LAST 12 MONTHS — CONTINUE

C33. How many weeks did (he/she) work between November 1986 and October 1987?

[ ] (44-45)

WEEKS

C34. For each job (he/she) had during the last year, please tell me what kind of work (he/she) did and what type of business (he/she) worked in.

JOB NO.	TYPE OF WORK	TYPE OF BUSINESS
1	(46-47)	
2		
3		
4		
5		

(64-65)

(IF NO MORE ADULTS, SKIP TO P.28, Q.C50)

C35. Did (PERSON NO.3) have a job for pay in the last twelve months?

1. YES 9. NA (66)
2. NO

C36. Was (he/she) self-employed in the last twelve months?

1. YES 9. NA (67)
2. NO

C37. At any time in the last twelve months, was (he/she) unemployed and looking for work?

1. YES 9. NA — SKIP TO CHECKPOINT (68)
2. NO

C37a. How many weeks was (he/she) unemployed and wanting a job during that time?

[ ] (69-70)

WEEKS

INTERVIEWER CHECKPOINT

[ ] 1= P3 DID NOT WORK IN LAST 12 MONTHS: SKIP TO Q.C40 (71)

2= P3 WORKED IN LAST 12 MONTHS ——— CONTINUE

C38. How many weeks did (he/she) work between November 1986 and October 1987?

[ ] (72-73)

WEEKS

C39. For each job (he/she) had during the last year, please tell me what kind of work (he/she) did and what type of business (he/she) worked in.

JOB NO.	TYPE OF WORK	TYPE OF BUSINESS
1	(74-75)	
2		
3		
4		
5		

(92-93)

(IF NO MORE ADULTS, SKIP TO P.28, Q.C50)

C40. Did (PERSON NO.4)have a job for pay in the last twelve months?

1. YES 9. NA (94)
2. NO

C41. Was (he/she) self-employed in the last twelve months?

1. YES 9. NA (95)
2. NO

C42. At any time in the last twelve months, was (he/she) unemployed and looking for work?

1. YES 9. NA ——— SKIP TO CHECKPOINT (96)
2. NO

C42a. How many weeks was (he/she) unemployed and wanting a job during that time?

[ ] WEEKS (97-98)

1. _____ INTW'R ID (1-2) 2. _____ INT'W NO. (3-4) 3. _____ STUDY NO. (5-8) 4. 8 DECK (9)

INTERVIEWER CHECKPOINT

[ ] 1= P4 DID NOT WORK IN LAST 12 MONTHS: SKIP TO Q.C45 (10)

2= P4 WORKED IN LAST 12 MONTHS ——— CONTINUE

C43. How many weeks did (he/she) work between November 1986 and October 1987?

[ ] WEEKS (11-12)

C44. For each job (he/she) had during the last year, please tell me what kind of work (he/she) did and what type of business (he/she) worked in.

JOB NO.	TYPE OF WORK	TYPE OF BUSINESS
1	(13-14)	
2		
3		
4		
5		

(31-32)

(IF NO MORE ADULTS, SKIP TO P.28, Q.C50)

C45. Did (PERSON NO.5) have a job for pay in the last twelve months?

1. YES 9. NA (33)
2. NO

C46. Was (he/she) self-employed in the last twelve months?

1. YES 9. NA (34)
2. NO

C47. At any time in the last twelve months, was (he/she) unemployed and looking for work?

1. YES
2. NO
9. NA — SKIP TO CHECKPOINT (35)

C47a. How many weeks was (he/she) unemployed and wanting a job during that time?

[ ] (36-37)

WEEKS

INTERVIEWER CHECKPOINT

[ ]

1= P5 DID NOT WORK IN LAST 12 MONTHS: SKIP TO P.25, Q.C50 (38)

2= P5 WORKED IN LAST 12 MONTHS — CONTINUE

C48. How many weeks did (he/she) work between November 1986 and October 1987?

[ ] (39-40)

WEEKS

C49. For each job (he/she) had during the last year, please tell me what kind of work (he/she) did and what type of business (he/she) worked in.

JOB NO.	TYPE OF WORK	TYPE OF BUSINESS
1		
2		
3		
4		
5		

C50. Considering all sources of income you and all other members of your household received in 1986, what was your total household income for 1986, before taxes and deductions were made? Please just tell me the number of the category on this card that fits your income. (What is your best guess?)

[ ] (61-62)

CATEGORY

INCOME CATEGORIES

1. Less than $5,000
2. $5,000 to $9,999
3. $10,000 to $14,999
4. $15,000 to $19,999
5. $20,000 to $24,999
6. $25,000 to $29,999
7. $30,000 to $34,999
8. $35,000 to $39,999
9. $40,000 to $44,999
10. $45,000 to $49,999
11. $50,000 to $54,999
12. $55,000 to $59,999
13. $60,000 to $69,999
14. $70,000 to $79,999
15. $80,000 to $89,999
16. $90,000 to $99,000
17. $100,000 or more

98. DON'T KNOW
99. NOT ASCERTAINED

C51. Did any of the income you just reported go toward commercial fishing or other business expenses?

1. YES
2. NO
8. DON'T KNOW
9. NA

SKIP TO Q.C52 (63)

C51a. What income category would you choose if you took out your commercial fishing or other business expenses?

[ ] (64-65)

CATEGORY

C52. In case I need to call you to correct a mistake I may have made in writing down your answers, is there a telephone number that I can use to reach you?

[ ] ~~(DO NOT CODE)~~

C53. Thank you! That is all I need to ask. Is there anything that I can write down that you would like the Forest Service or the Alaska Department of Fish and Game to know about?

END TIME ———:———

THUMBNAIL SKETCH

Appendix B

Confidence Intervals of Total Community Harvests, Wrangell, 1987

Resource Category	Total Community Harvest*	Confidence Intervals (+/- Percent)
LAND MAMMALS		
Deer	725	52.6
Moose	64	88.2
Black Bear	56	104.3
Goat	38	94.0
Furbearers	137	165.6
SEA MAMMALS		
Harbor Seal	221	131.2
Other	15	185.8
BIRDS		
Ducks	2111	52.8
Canada Geese	503	65.0
Sea birds, sea ducks	234	151.2
Grouse, ptarmigan, other	471	97.0
SALMON		
King	4275	37.5
Sockeye	1097	67.7
Coho	1615	48.3
Pink	924	105.7
Chum	188	115.2
OTHER FISH		
Halibut	54561	35.5
Cod	463	82.6
Flounder, sole, flatfish	635	96.3
Rockfish	3019	60.8
Herring	8879	195.3
Hooligan, smelt	44278	89.1
Trout, steelhead Dolly Varden	11734	46.4
Other finfish	3707	133.3
MARINE INVERTEBRATES		
King crab	412	171.6
Dungeness crab	18631	68.0
Tanner crab	1867	100.3
Shrimp	24286	70.1
Octopus	216	84.7
Sea urchin	0	0.0
Abalone	2323	103.0
Scallop	1006	147.2
Gumboot	134	127.7
Sea cucumber	208	142.0
Clams and cockles	936	58.1
Other invertebrates	386	97.0
Herring roe on kelp	2224	129.5
PLANTS		
Beach Greens	414	105.6
Seaweed (estimates food)	2248	123.9
Berries	6400	39.8
Firewood	3391	36.0

* Numbers of animals, except number of lbs (halibut, shrimp,abalone, scallops, other invertebrates, and roe on kelp), number of 5 gal. buckets (gumboots, sea cucumbers, clams and cockles), number of quarts (beach greens, seaweed, berries) and number of cords (firewood).

APPENDIX C

ADF&G Converstion Factors for Determining Useable Weights of Resources

Common Name	Edible Weight in Pounds
Land Mammals	
Deer	80.0
Moose	550.0
Black Bear	150.0
Goat	120.0
Sea Mammals	
Harbor Seal	90.0
Birds	
Duck	1.5
Seabird/Seaduck	1.5
Canada Goose	5.0
Other Birds	.7
Salmon	
King (Chinook)	15.3
Sockeye (Red)	4.3
Coho (Silver)	7.7
Pink (Humpy)	2.2
Chum (Dog)	6.2
Other Finfish	
Cod	4.0
Halibut	recorded in pounds
Flounder, Sole, Flatfish	3.0
Rockfish	2.0
Hooligan	recorded in pounds
Dolly Varden, Trout, Steelhead	2.7
Herring	.4
Shellfish and Other Invertebrates	
King Crab	7.0
Dungeness Crab	2.5
Tanner Crab	2.2
Shrimp	recorded in pounds
Octopus	recorded in pounds
Abalone	recorded in pounds
Scallops	recorded in pounds
Gumboots	20.0 lbs./5 gal. bucket
Sea Cucumber	2.0 lbs./5 gal. bucket
Clams, Cockles	8.5 lbs /5 gal. bucket
Other Invertebrates	recorded in pounds
Herring Eggs	recorded in pounds
Plants	
Beach Greens	1.0 lbs./qt.
Seaweed	20.0 lbs./5 gal. bucket
Berries	1.0 lbs./qt.

Appendix D

Wild Resource Harvest By Wrangell Households, 1987

RESOURCE CATEGORY	Percent hh's Using	Percent hh's Harvesting	Percent hh's Giving	Percent hh's Receiving	Mean hh Harvest (Numbers)*	Total Community Harvest (Numbers)*	Mean hh Harvest (lbs.)	Total Community Harvest (lbs.)	Mean Per Capita Harvest (lbs.)
SALMON									
King	74.6	41.4	21.4	56.4	4.22	4275	64.57	65408.6	23.02
Sockeye	24.4	12.9	4.9	13.2	1.08	1097	4.66	4716.8	1.66
Coho	44.6	28.5	6.0	21.9	1.59	1615	12.27	12434.2	4.38
Pink	18.4	7.8	1.7	10.6	0.91	924	2.01	2033.1	0.72
Chum	11.4	4.2	3.4	11.2	0.19	188	1.15	1167.0	0.41
OTHER FISH									
Halibut	76.6	47.3	30.2	54.1	1.97	1999	53.86	54561.4	19.20
Cod	24.5	7.7	2.6	18.4	0.46	463	1.83	1850.8	0.65
Flounder, sole, flatfish	9.2	2.8	1.8	7.2	0.63	635	1.88	1903.5	0.67
Rockfish	30.5	19.3	9.8	14.6	2.98	3019	5.96	6037.7	2.13
Herring	18.9	11.6	0.0	8.2	8.77	8879	3.51	3552.0	1.25
Hooligan, smelt	36.2	7.7	9.2	31.7	43.71	44278	17.48	17711.2	6.23
Dolly Varden, trout, steelhead	45.2	39.6	14.2	16.6	11.58	11734	31.28	31682.0	11.15
Other finfish	0.0	8.0	4.9	0.0	3.66	3707	2.93	2965.8	1.04
MARINE INVERTEBRATES									
King crab	17.5	1.6	17.4	17.4	0.41	412	2.85	2884.7	1.02
Dungeness crab	78.3	27.1	73.4	66.1	18.39	18631	45.98	46578.0	16.39
Tanner crab	16.6	6.4	14.2	11.0	1.84	1867	4.05	4107.6	1.45
Shrimp	64.9	17.1	62.2	58.2	*	*	23.98	24286.1	8.55
Octopus	9.2	6.3	6.8	2.9	0.21	216	2.13	2160.0	0.76
Sea urchin	2.5	0.0	2.5	2.5	0.00	0	0.00	0.0	0.00
Abalone	9.5	7.1	9.5	8.7	*	*	2.29	2322.7	0.82
Scallop	7.4	4.2	0.0	3.4	*	*	0.99	1006.0	0.35
Gumboot	4.8	4.0	3.2	0.8	0.13	134	2.65	2680.0	0.94
Sea cucumber	7.6	6.1	3.3	2.4	0.21	208	0.41	416.4	0.15
Clams and cockles	40.8	27.9	17.6	29.9	0.92	936	7.85	7953.5	2.80
Other invertebrates	9.9	4.2	2.4	5.7	*	*	0.38	386.2	0.14
Herring roe on kelp	31.8	7.9	2.4	29.4	*	*	2.20	2224.2	0.78
LAND MAMMALS									
Deer	65.4	27.6	12.7	45.5	0.72	725	57.25	57996.8	20.41
Moose	42.5	6.3	6.2	37.7	0.06	64	34.63	35079.0	12.35
Black bear	8.4	4.8	2.5	6.9	0.06	56	8.32	8425.5	2.97
Goat	7.7	3.0	2.3	6.2	0.04	38	4.51	4566.0	1.61
Furbearers	1.8	1.0	0.0	0.9	0.13	137	0.00	0.0	0.00
SEA MAMMALS									
Harbor seal	4.6	3.0	1.5	2.4	0.22	221	19.61	19862.1	6.99
Sea otter	0.8	0.8	0.8	0.0	0.02	15	0.00	0.0	0.00
BIRDS									
Ducks	23.3	16.1	13.5	11.2	2.08	2111	3.13	3166.6	1.11
Canada Geese	14.1	11.7	6.2	3.1	0.50	503	2.48	2514.0	0.88
Sea birds, sea ducks	1.6	1.6	0.8	0.0	0.23	234	0.35	351.3	0.12
Grouse, ptarmigan, other	10.5	7.3	1.5	3.2	0.46	471	0.33	329.4	0.12
Sea bird eggs	0.0	0.0	0.0	0.0	0.00	0	0.00	0.0	0.00
PLANTS									
Beach greens	8.7	8.7	3.5	3.3	0.41	414	0.41	414.4	0.15
Seaweed (estimated food)	27.6	7.6	3.5	20.9	2.22	2248	2.22	2247.6	0.79
Berries	65.5	57.5	23.2	23.2	6.32	6400	6.32	6400.4	2.25
Firewood	44.7	43.9	29.8	4.9	3.35	3391	0.00	0.0	0.00
Total Salmon		52.6					84.66	85759.6	30.19
Total Other Finfish		63.8					118.72	120264.3	42.33
Total Marine Invertebrates		43.1					95.76	97005.4	34.14
Total Land Mammals		34.6					104.71	106067.3	37.33
Total Sea Mammals		3.0					19.61	19862.1	6.99
Total Birds		17.5					6.28	6361.3	2.24
Total Plants		57.5					8.95	9062.4	3.19
Total All Resources		75.0					438.68	444382.4	156.42

* Numbers of animals, except number of 5 gal buckets (gumboots, sea cucumbers, clams and cockles), number of quarts (plants, berries), and number of cords (firewood).