

RESOURCE USE  
IN A SMALL ALASKAN CITY -- SITKA  
by  
George Gmelch and Sharon Bohn Gmelch

with the assistance of  
Richard K. Nelson

Technical Paper Number 90

Alaska Department of Fish and Game  
Division of Subsistence  
Box 3-2000  
Juneau, Alaska 99802

1985

## ABSTRACT

This report describes the results of a baseline study of the use of wild, renewable resources by the inhabitants of a small Alaskan city -- Sitka (pop. 7,803). Despite a proliferation of research on resource use throughout Alaska in the past ten years, very little information has been gathered on the subject for larger Alaskan communities. A multi-method strategy for gathering data was used, including an interview survey with a random sample of Sitka households (n=139), in-depth interviews, and participant observation.

The research found that Sitkans of all backgrounds make extensive use of the wild resources available to them; half to over three-quarters of the survey households participated in each of the major harvesting activities -- fishing, hunting, plant and intertidal gathering -- examined. Wild foods are valued by residents for their taste, nutrition, and freshness; other resources (e.g., woods, seaweed) are important for fuel, soil supplementation, and use in expressive arts. Harvesting activities bring Sitkans, both Native and non-Native, closer to their physical environment and are enjoyed for this reason as well as for recreation. Sitkans regularly share wild foods with other residents; in this way, resource harvesting also strengthens social relationships.



## TABLE OF CONTENTS

Table of Contents .....	ii
List of Tables .....	iii
List of Figures .....	v
Acknowledgements .....	vi
Chapter 1      Introduction .....	1
Chapter 2      The Setting .....	4
Chapter 3      Fishing .....	16
Chapter 4      Hunting .....	45
Chapter 5      Intertidal Gathering .....	80
Chapter 6      Plant Gathering .....	118
Chapter 7      Sharing and Resource Distribution .....	145
Chapter 8      Attitudes and Values in the Use of Local Resources .....	156
Chapter 9      Issues and Differences in Resource Utilization .....	170
Chapter 10     Conclusion .....	186
Appendix A: Methodology .....	189
Appendix B: Characteristics of Sample .....	195
Appendix C: Interview Schedule .....	197
Bibliography .....	212

LIST OF TABLES

1	Sitka Population Pyramid, 1980.....	10
2	Ethnic Composition of Sitka, 1980.....	10
3	Educational Background of Sitka Residents, 1980.....	11
4	Household Income in Sitka, 1980 .....	11
5	Home Ownership by Ethnicity, 1980 .....	14
6	Target Fish Species Caught by Sitka Households, 1982 ....	18
7	Mean and Median Household Harvests of Fish, 1982 .....	18
8	Subsistence Salmon Fishing Gear, 1982 .....	25
9	Subsistence Salmon Fishing Locations .....	25
10	Salmon Harvests on Subsistence Permits .....	28
11	Types of Boats Owned by Sitka Households .....	28
12	Species Hunted by Sitka Residents .....	47
13	Relationships of Hunting Party Members .....	51
14	Deer Kills by Month, 1974-78.....	51
15	Parts of Deer Used by Sitka Hunters .....	57
16	Areas and Size of Goat Harvests, 1973-82 .....	64
17	Intertidal Gathering by Sitka Households .....	82
18	Collection of Intertidal Resources by Ethnicity.....	104
19	Annual Harvest of Intertidal Resources.....	105
20	Composition of Plant Gathering Groups .....	121
21	Berries Gathered by Sitka Households .....	121
22	Green Plants Harvested by Sitka Households .....	128
23	Source of Harvested Wood .....	128
24	Distribution of Harvested Resources .....	146

25	Relationship of Households Sharing Harvest.....	146
26	Intertidal Resources Exchanged by Households .....	148
27	Reasons for Harvesting Natural Resources.....	158
28	Reasons for Hunting Expressed in Student Essays.....	165

LIST OF FIGURES

1	Baranof Island .....	viii
2	Salmon Harvest Areas .....	22
3	Halibut Harvest Areas .....	32
4	Crab Harvest Areas .....	36
5	Deer Harvest Areas .....	55
6	Goat Harvest Areas .....	63
7	Trapping Areas .....	78
8	Abalone Harvest Areas .....	95
9	Herring Egg Harvest Areas .....	100

## ACKNOWLEDGEMENTS

This report owes many things to many people. Richard K. Nelson conceived the idea of this project, supervised the pilot phase of the study, compiled the mapping data for this report, and as the most experienced subsistence researcher in Alaska provided expert advice throughout the research. Robert Schroeder conducted the pilot study which laid the groundwork for the study. Libby Halpin, Gabe George, and Matt Kookesh assisted with the household interviews and provided many helpful comments. We owe a special thanks to both Libby Halpin and Nita Couchman for their unflagging enthusiasm, good cheer, and commitment to the project. Nita Couchman also had the thankless task of transcribing many hours of fieldnotes. Dave Mills gave good advice about subsistence research at the start of the fieldwork. And Linda Ellanna and Robert Wolfe of the Division of Subsistence gave sound advice on the presentation of the data and the organization of this report.

This report benefited greatly from the knowledge and experience of the staff of the Sitka office of the Alaska Department of Fish and Game who generously gave their time and shared their data. In particular we thank biologists Dave Hardy, Loyal Johnson, Bob deJong, Art Schmidt, and Alan Davis; and support staff Linda Schmidt and Tammy Gray.

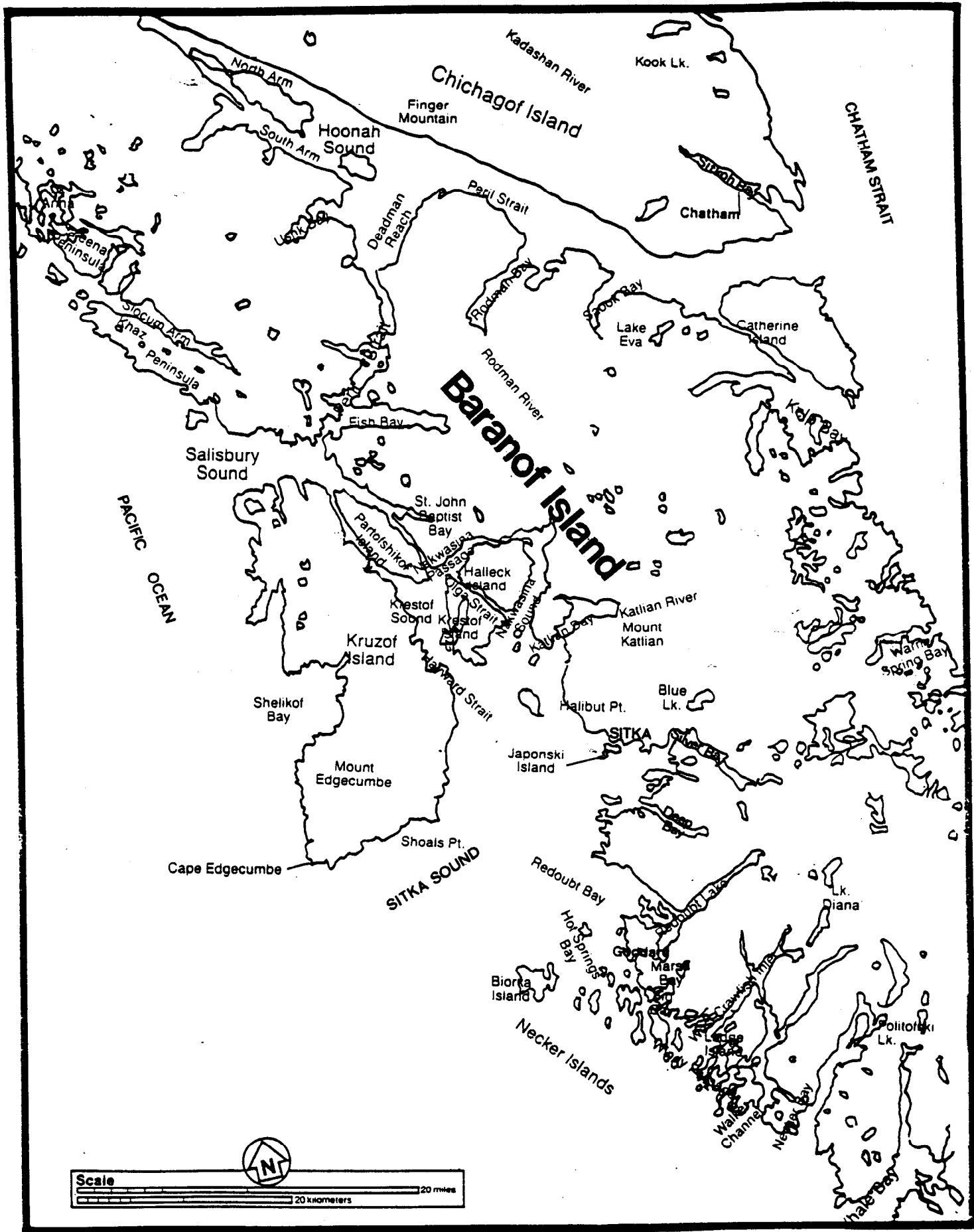
Others who helped in various ways were Mike Schmidt,



Frank O. Williams, Bill Hughes, Ron McClain, Mark Jacobs, Ann Lowe, Gail Johansen, Kelly Lundy, John McMann, Les Kinnear, Dick Wilson, Bruce Lester, Jill Thayer, Mary Richards, Mary Muller, Jill Thayer, Barbara Minard, Isabel Brady, Barton Sollars, Helen Hooper, Warren Pellet, Carl Stedman, Sue Riggs, and Bill Brady.

Finally, we owe special thanks to the many Sitkans who opened their homes to us, answered our survey questions, and willingly shared their knowledge and experience. Their hospitality -- toward strangers whose exact purpose may have been difficult to understand -- is the basis for whatever success this project might have.

FIGURE 1. BARANOF ISLAND



## CHAPTER 1

### INTRODUCTION

This report is a baseline description of the use of wild, renewable resources by the inhabitants of a small Alaskan city -- Sitka. The report is based on fieldwork conducted in the summer of 1983, with a pilot study carried out the preceding fall. The pilot phase was designed to provide a brief profile of resource use patterns in Sitka, for inclusion in a Division of Subsistence comparative resource use study (Wolfe and Ellana 1983) and to lay groundwork for the community study conducted the following summer.

Despite a proliferation of research on resource use throughout Alaska over the past ten years, very little information has been gathered on the subject for larger Alaskan communities. More precisely, no previous systematic research had been devoted to an ethnographic description of "subsistence" and its importance to local residents in an Alaskan community with a population of 7,000 or more. The major aim of this study

---

<sup>1</sup> The findings of the pilot study (Schroeder and Nelson 1983) are reported in a volume of seven comparative community studies compiled by Wolfe and Ellanna (1983).

was to make a start toward filling this gap in our knowledge of Alaskan community resource use patterns.

The project's specific objectives included:

1. description of all resource harvesting -- fishing, hunting, trapping, intertidal collecting, and plant gathering -- by Sitka residents;
2. quantification of harvest levels of specific resources for a random sample of Sitka households;
3. identification and mapping of the range and focal areas in which resources are harvested;
4. description of the motivations and values relating to hunting, fishing, intertidal collecting, and plant gathering;
5. description of the sharing and distribution of resources; and
6. identification of local issues pertaining to resource use.

Before proceeding, a brief note on terminology is in order. Because of its current political and legal context in Alaska, the term "subsistence" is avoided as much as possible in this report. Where the term is used it refers to activities in which wild renewable resources are used by the harvester and his and her family or by other residents of the harvester's community or traditional exchange network. "Subsistence" does not indicate or imply a particular ethnicity, personal heritage, or economic

status of the harvester.

A multi-methodological strategy for gathering data was used, including an interview survey of a random sample of Sitka households (n=139), in-depth interviews with specialists and experts, and participant observation. Through the use of several different strategies the study tried to achieve a satisfactory mix of quantitative and qualitative data. Appendix A contains a detailed discussion of methodology; appendix B provides demographic information on the sample.

The report is divided into ten chapters. Chapter 1 describes the objectives of the study. Chapter 2 examines the geographical setting and the characteristics of Sitka's population as well as the seasonal round of resource use. The major resource harvesting activities -- fishing, hunting, intertidal gathering, and plant gathering -- are treated in Chapters 3 through 6. Chapter 7 examines the sharing and distribution of resources. Chapter 8 deals with the values and motivations involved in resource harvesting. Chapter 9 discusses patterns of resource use among major ethnic and occupational groups, examines attitudes towards regulations, and outlines Sitka residents' concerns about the stability and health of locally available resources. Finally, chapter 10 provides a concluding statement about the importance of resource harvesting in the lives of Sitka's residents.

## CHAPTER 2

### THE SETTING

#### INTRODUCTION

Sitka is located on the west coast of Baranof Island in southeastern Alaska. The city exists within the boundaries of Sitka Borough which includes all of Baranof Island (with the exception of Port Alexander at the southeastern end), approximately half of Chichagof Island, Kruzof Island, and scores of smaller islands. More than 300 miles of marine coastline lie within the borough's boundaries as well as thousands of square miles of forest and mountain (see Figure 1).

The terrain is rugged and covered with dense rain forests of Sitka spruce and western hemlock, extending from sea level up to timberline near 2,400 feet (City and Borough of Sitka Planning Office 1974). Harbor Mountain and the peaks and ridges of the Baranof Mountains, which range from 3,000 to 5,300 feet in height, rise sharply behind the city. The skyline west of Sitka is dominated by the dormant volcanoes of Kruzof Island, including the 3,201 foot peak of Mt. Edgecumbe. This mixture of mountains, forest, and sea creates a scene of great beauty, enhanced by the many small islands that dot Sitka Sound. The urban landscape is also picturesque, with harbors, fishing boats, and historic sites

like Castle Hill, Pioneer Home, St. Michael's Russian Orthodox Cathedral, Sheldon Jackson College, and Sitka National Historical Park.

Sitka has a maritime climate with mild winters, cool summers and abundant precipitation, an annual average of 97 inches. The seasonal range of mean temperature -- from 26 (F.) in midwinter to 62 degrees (F.) in midsummer -- is narrow compared to the continental climate of interior Alaska. Light westerly and southwesterly winds prevail in the summer, while in fall, winter and early spring the winds are predominantly from the east and southeast. Sitka is protected from cold air flowing in from the north and northwest by mountainous islands. The wettest month is October, with precipitation averaging over 15 inches. April through July are the driest months; June has the lowest mean precipitation of 3.5 inches (City and Borough of Sitka Planning Office 1981). Nevertheless, in an average year there are 200 days with some form of precipitation (City and Borough of Sitka Planning Office 1974).

Sitka is isolated overland from other communities in the region and can only be reached by air or sea. Daily jet service, however, connects Sitka with major Alaskan communities and the rest of the United States. Charter flights are also available to southeastern villages and to remote recreational areas. The city is connected to other points in southeast Alaska and to the state of Washington and Canada by Alaska's marine highway system, which maintains a terminal six miles north of town. Ferries serve

Sitka eight times weekly during the summer tourist season and four times weekly in the winter. From May through September, cruise ships also stop in Sitka. Most general cargo and consumer goods come to Sitka by barge from Seattle.

Sitka's paved highways extend less than 15 miles, from Starrigavin campground north of town to a point just beyond the Alaska Lumber and Pulp Company mill southeast of the city at Silver Bay. Local roads thus provide only limited access to resource harvest areas, and most people depend on privately owned boats for resource harvesting and recreational activities.

#### HISTORY

The Tlingits have resided in the Sitka area for many centuries, living in several villages scattered throughout the area (see <sup>de</sup>Laguna 1972, Bancroft 1886). In 1880 Russian explorer Ivan Petrof counted 540 Natives near Sitka, including 39 in Silver Bay, 26 at Goddard Hot Springs, 43 at Indian River, and 273 at the Old Sitka site (Gabe George pers. commun., 1984). But they also used a wide area surrounding Sitka -- from Cape Ommaney on the southern tip of Baranof Island to Point Adolphus on the northern portion of Chicagof Island and to the east of Peril Straits -- for hunting, fishing, and gathering.

The rich coastal resources of the area, especially the sea otter, attracted traders of many nationalities including Russians, Americans, and English. By 1799, Sitka Sound was a favored trading spot on the northwest coast. In that year Alexander Baranof, the manager of the Russian-American Company,



made Sitka (then called New Archangel) the headquarters of its vast Alaskan fur trading business.

Sitka remained the major center of Russian activity and settlement until Alaska was purchased by the United States in 1867. Twenty years of inept political and military administrations followed the purchase, until Sitka became the seat of territorial government in 1884 (Wilson, Kaufman, and Hinckley 1972). It then regained some of its earlier vitality. The Pribilof seal harvest stimulated shipping through the community, and nearby gold strikes and a salmon cannery (first opened in 1878) also contributed to the economy.

When the territorial capital moved to Juneau in 1906, Sitka became a quiet village. The development of refrigeration, which opened new markets for fish, led to the opening of Sitka's first cold storage plant in 1913, which processed salmon, halibut, crab, and black cod. Salmon canneries set up operations along the waterfront; the old Cutting and Company had left in 1880, but the Sitka Packing Company began operations in 1917 and the Pyramid Packing Company in 1918 (Alaska Geographic 1982). A shark fishery existed here until World War II; and whaling flourished for several years but ended in 1923. Major changes in Sitka since 1940 have included a large military presence during World War II.

Logging operations at Sitka began during the Russian occupation which required building materials for settlers and logs for the massive stockades (Bancroft 1886). Three small

capacity, water-powered sawmills were built near Sitka in the 1800s (Rakestraw 1981). But the modern growth of the lumber industry began in 1959 when a large pulp mill, operated by the Alaska Lumber and Pulp Company, a Japanese-owned company, opened in Sitka. It has processed timber continuously since then, producing a high grade pulp used in the manufacture of rayon products, cellophane, and camera film for export to Japan.

Other important elements in Sitka's economic growth include the establishment of Mount Edgecumbe boarding school and the expansion of U.S. Coast Guard facilities in 1977 to enforce the new 200 mile limit. Also, the Halibut Producers Cooperative built a major cold storage plant in 1980, for processing salmon, black cod, herring, and halibut.

#### POPULATION

Sitka is the third largest community in southeast Alaska and the fifth largest in Alaska, with a population of 7,803 in 1980.[1] It is one of only three communities in southeastern Alaska with a population over 3,000. Most communities in the region are small towns and villages with populations of between 200 and 1,000 people. Sitka's population has been growing steadily by approximately 2,000 people each decade since 1950. Using a modest two percent growth rate as suggested in the Sitka Coastal Management Program

---

1. According to the city planner, the real population of Sitka is closer to 8,200 since many people were missed in the last census, including those living on boats.

Report (1981), the projected population of Sitka in 1990 is about 9,500 and in the year 2000 is 11,500.

The population of Sitka is young. Table 1 summarizes 1980 federal census data on Sitka's age distribution. The mean age in 1980 was 26.4 years, skewed upwards by the presence of the Pioneer's Home. Table 2 shows the ethnic composition of Sitka's population. In 1980, Alaskan Natives comprised 21 percent of the population, compared with about 50 percent at the beginning of World War II. There were 2,440 households in Sitka in 1980, with a median size of 3.05 persons. As shown in Table 3, the population is well educated, with 43 percent having attended college.

#### WAGE ECONOMY

Sitka's economy includes a mixture of manufacturing (i.e., lumber), government, services, and fishing. Over the years the economy has gone through many transitions and cycles. For example, the commercial fishing and cannery boom that started in the late 1800s, had ended by the 1930s, as salmon runs and herring stocks diminished. More recently, the fishing industry has gone through a recovery. Seafood processing plants provide seasonal employment for some Sitkans and there is a home fleet of over 100 seiners, power trollers, and hand trollers (City and Borough of Sitka Planning Office 1974). During the summer a transient fleet also makes Sitka its service and supply port.

Gold mining and commercial whaling also came and went. The upswing in the population and the economy caused by the

TABLE 1. SITKA POPULATION PYRAMID, 1980.

Age in Years	Population										
	100	200	300	400	500	600	700	800	900	1000	1100
75+	XXX	81									
65-74	XXXX	103									
55-64	XXXXXXXX	200									Females
45-54	XXXXXXXXXXXXXX	320									
35-44	XXXXXXXXXXXXXXXXXXXXXX	487									
25-34	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	742									
15-24	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	732									
0-14	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	1023									
0-14	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	866									
15-24	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	802									
25-34	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	853									
35-44	XXXXXXXXXXXXXXXXXXXXXX	575									
45-54	XXXXXXXXXXXXXX	374									
55-64	XXXXXXXXXX	228									Males
65-74	XXXX	97									
75+	XXX	80									

Source: 1980 U.S. census.

TABLE 2. ETHNIC COMPOSITION OF SITKA, 1980.

Ethnic Background	Percentage of Sitka Population (n=7803)	
White		74
Native *		21
Filipino		2
Japanese		1
Other		2

Source: 1980 U.S. census.

\* Includes Eskimo, Indian, and Aleut.

TABLE 3. EDUCATIONAL BACKGROUND OF SITKA RESIDENTS, 1980.

Level of Education Completed	Percentage of Population		
	Natives (n=713)	Non-Natives (n=3277)	All Residents (n=4126)
Elementary	28	4	8
High School	54	47	49
College	18	48	43

Source: 1980 U.S. census. Includes persons 25 years and older.

TABLE 4. HOUSEHOLD INCOME IN SITKA, 1980.

Income Range	Percentage of Population		
	Natives (n=344)	Non-Natives (n=1472)	All Residents (n=2405)
0-\$9,999	17	5	10
\$10,000-\$24,999	30	24	29
\$25,000-\$49,999	38	54	48
\$50,000-\$74,999	15	16	13

Source: 1980 U.S. census.

military's presence during World War II had disappeared by 1950. The opening of the Alaska Lumber and Pulp Company mill created between 700 and 800 new jobs in the community and nearby logging camps, and it was an important part of Sitka's economy in the 1960s and 1970s. Recently, this industry has also suffered a decline and many mill workers in Sitka are currently unemployed or on reduced work schedules. The fastest growing area of the economy since 1970 has been trade and services.

Currently about 30 percent of salaried jobs are with local, state and federal government; 25 percent are in manufacturing, primarily in logging, lumber mill operations, and in fish processing; and 35 are percent in trade, business and services. Self-employment in commercial fishing and jobs tied to construction or tourism tend to be seasonal with a mid-winter slack period.

The average monthly wage for Sitka residents on payrolls in 1980 was \$1,896.[2] The median family income, according to the 1980 federal census, is \$32,732. A breakdown of household income for non-Native and Native Sitkans is provided in Table 4. As shown, proportionately more non-Natives are in the upper income categories than Natives. The federal census further indicates that while only 3 percent of non-Native Sitkans were below the poverty line in 1980, 12 percent of Natives were. More

---

2 Figures come from the 1980 federal census' "nonagricultural employment and payroll industry series" data for the 2nd quarter 1980. The differences between quarters or seasons was slight.

non-Native Sitkans also own their homes than do Natives, although the differences are not great and housing for all Sitkans is in short supply. A high proportion of both groups rent their homes, as shown in Table 5.

#### RESOURCES AND THE SEASONAL ROUND

The major plant and animal habitats found in the Sitka area include spruce-hemlock forest, alpine tundra, muskeg, freshwater streams and wetlands, coastal marshes and estuarine tidal flats, quiet bays, and exposed coastal waters and shoreline (City and Borough of Sitka Planning Office 1981). The forests and mountains, including the alpine tundra, provide habitat for Sitka deer, mountain goat, smaller mammals such as mink and marten, and a variety of edible plants. The streams support Dolly Varden, spawning salmon, cutthroat trout, and steelhead/rainbow trout. Freshwater wetlands support mink, otter, waterfowl, and other birds.

Coastal marshes and estuarine tidal flats provide habitat for waterfowl, shorebirds, invertebrate life (such as clams), eagles, young fish, mink, and other wildlife at certain seasons of the year. Muskegs, the largest wetland type in the Sitka area, are home for many edible plants, deer, brown bear, and many bird species. Marine habitats range from quiet bays to exposed rocky shorelines and open ocean, which support a variety of edible seaweeds, invertebrate fauna (such as abalone, shrimp, scallops, and crab), fish, hair seals, seal lions, porpoise, and whales.

TABLE 5. HOME OWNERSHIP BY ETHNICITY, 1980.

Ethnic Group	Percentage Home Owners	Percentage Renters
White (n=1922)	57	43
Native (n=412)	41	59
Asian (n=65)	35	65
Other (n=41)	25	75

Source: 1980 U.S. census.



Resource harvesting takes place throughout the year but peaks during the summer months and tapers off dramatically in winter. The Alaska Public Survey found that the percentage of the population engaged in food gathering increases steadily from January through August and then tapers off steadily from September through December (Clark and Johnson 1981:37). Fishing in Sitka takes place the year round, although typically little occurs in January, February, and March. Plant gathering activities extend from early spring to late fall, although individual species often have very short harvest periods. In 1983 the open season for deer hunting was August 1 through December 15, and for mountain goat it was August 1 through December 31. Brown bear hunting was legally open from September 15 through May 31. Spring is the prime harvest season for most intertidal resources, although various species are taken the year round.

## CHAPTER 3

### FISHING

#### INTRODUCTION

In 1983 there were three types of fishing defined by Alaska Department of Fish and Game regulations: 1. fishing for profit by sale, barter, or trade in commercial channels; 2. sport fishing which means the taking for personal use of any freshwater or marine fish by hook and line; and 3. subsistence fishing which means taking fish resources under permit for subsistence use with prescribed gear.

The distinctions among these types of fishing may be unclear when looking at the aims of the fishermen and the disposition of their harvest. Sitka commercial fishermen regularly bring home part (hand trollers may bring all) of their catch for home consumption; some sport fishermen with rod and reel are as much concerned with subsistence as pleasure; and while some subsistence fishermen may be oriented toward harvesting a large quantity of fish for home consumption, they may be also doing it for recreation.

In 83 percent of the Sitka households surveyed one or more household members fished; 29 percent were involved with

commercial fishing. During the 12 months prior to the survey the households fished, sport and subsistence only, an average of 30 times. By comparison, Pacific Coast fishermen outside of Alaska, interviewed as part of a national survey of marine recreational fishing, averaged just 12 trips per year (Heitt et. al. 1983). Close proximity to the water and the fact that most households keep their boats in the water makes fishing convenient for Sitkans. In contrast, the average one way distance from the angler's home to the fishing location for the national sample was 163 miles.

In the household survey Sitkans reported harvesting an average of 201 pounds of fish for home consumption in 1982. [1]

#### SALMON

Salmon is the most actively sought and most highly prized fish in Sitka and in southeast Alaska generally. As shown in Table 6, 65 percent of the sample households fish for salmon; and Sitkans harvest more pounds of salmon than any other species. Deer and salmon together, according to findings from the Alaska Public Survey, provide nearly two-thirds of all locally harvested wild foods for residents of the Southeast (Alves 1981). Dried salmon was the staple diet for the native Tlingit

---

1 For computing the quantity of fish harvested for home consumption the following average weights were used: pink salmon = 4 lbs, king = 18 lbs, chum = 10 lbs, sockeye = 6 lbs, halibut = 20 lbs, dolly varden = .5 lbs, rockfish = 2 lbs, and lingcod = 8 lbs (Art Schmidt pers. commun., 1983).

TABLE 6: TARGET FISH SPECIES CAUGHT BY SITKA HOUSEHOLDS, 1982.

Species	Percentage of all households (n=139)	Percentage of fishing households (n=114)
Salmon	65	80
Halibut	55	67
Dolly Varden	28	34
Crab	24	30
Trout	23	28
Rockfish	21	25
Lingcod	19	23
Herring	16	19
Smelt	9	11
Shrimp	6	7

TABLE 7: MEAN AND MEDIAN HOUSEHOLD HARVESTS OF FISH, 1982.

Species	Mean number fish all sample households (n=139)	Median number fish all sample households (n=139)	Mean number fish for households that fish (n=115)
Salmon (all)	16.1	3.5	19.5
Sockeye salmon	5.3		6.4
Pink salmon	4.8		5.7
Coho salmon	2.7		3.3
King salmon	2.0		2.5
Chum salmon	1.3		1.5
Halibut	4.3	.45	5.2
Rockfish	4.3	.17	16.8
Dolly Varden	3.9	.18	15.2
Trout	3.9	.15	16.9
Lingcod	1.0	.16	4.2
Crab	7.7	.28	35.0
Herring*	1.0	.01	5.9
Smelt*	.9	.03	17.9
Shrimp*	.49	.15	7.6

\* Measurement given in gallons, not individual fish.

(Oberg 1973, Jacobs Jr. and Jacobs Sr. 1982).

All five species of salmon are found in the Sitka area. King salmon (Onchorhynchus tshawytcha) are present year round but are harvested mainly from late winter through summer; pinks (Onchorhynchus gorbuscha) are harvested in summer, especially during the July-September spawning; cohos are caught from mid-summer through October (earlier in salt water, and later in streams); sockeye (Onchorhynchus nerka) are taken primarily in July, at or near spawning streams; and chums (Onchorhynchus keta), which are less plentiful, are taken in streams during August and September.

Sockeyes and pinks were the species of salmon most heavily harvested by the sample households, as shown in Table 7. Nearly all of the catch was taken by net on subsistence permits. Although the sample households harvested slightly more sockeye, pink salmon are far more numerous in the area (ADF&G data for commercial harvests show that 2.6 of the 2.7 million salmon harvested in the Sitka area in 1982 were pinks).

Pink salmon are a popular sportfish, particularly among Sitkans who do not have boats, since they can be caught from waters along the road system; Starrigavan at the northern terminus of the road system and the shore near Sheldon Jackson hatchery in town are the favorite locations. Similarly, pinks are a favorite among tourists and visitors who can catch them with little gear or effort.

Although abundant and easily caught, pinks are not as

valued as the other salmon species because of their small size, low fat content, and taste. On the other hand, some residents, particularly Natives, prize the pinks for smoking. Mark Jacobs, in an essay on Sitka Native uses of wild foods (1982), states that the characteristics of local pink salmon vary depending on the stream they come from. Traditionally, for example, pinks from the Indian River had qualities that made them ideal for boiled fish, while those from Nakwasina River were better for smoking.

Coho salmon, an important sportfish in Sitka and Southeast generally, ranked third among fishing households in the survey, with a mean harvest of 3.3 fish during the year. Coho (or silvers) are usually taken by trolling in coastal waters; they are also occasionally caught from shore with sportgear in late summer. Like pink salmon, cohos spawn in most streams in the Sitka area, but they enter the streams much later and are far less abundant.

Among households that fished, the mean harvest of king salmon, the largest and most prized of the salmon species, was 2.5 during the year. The least frequently harvested species was the chum with a mean harvest of 1.5 per household.

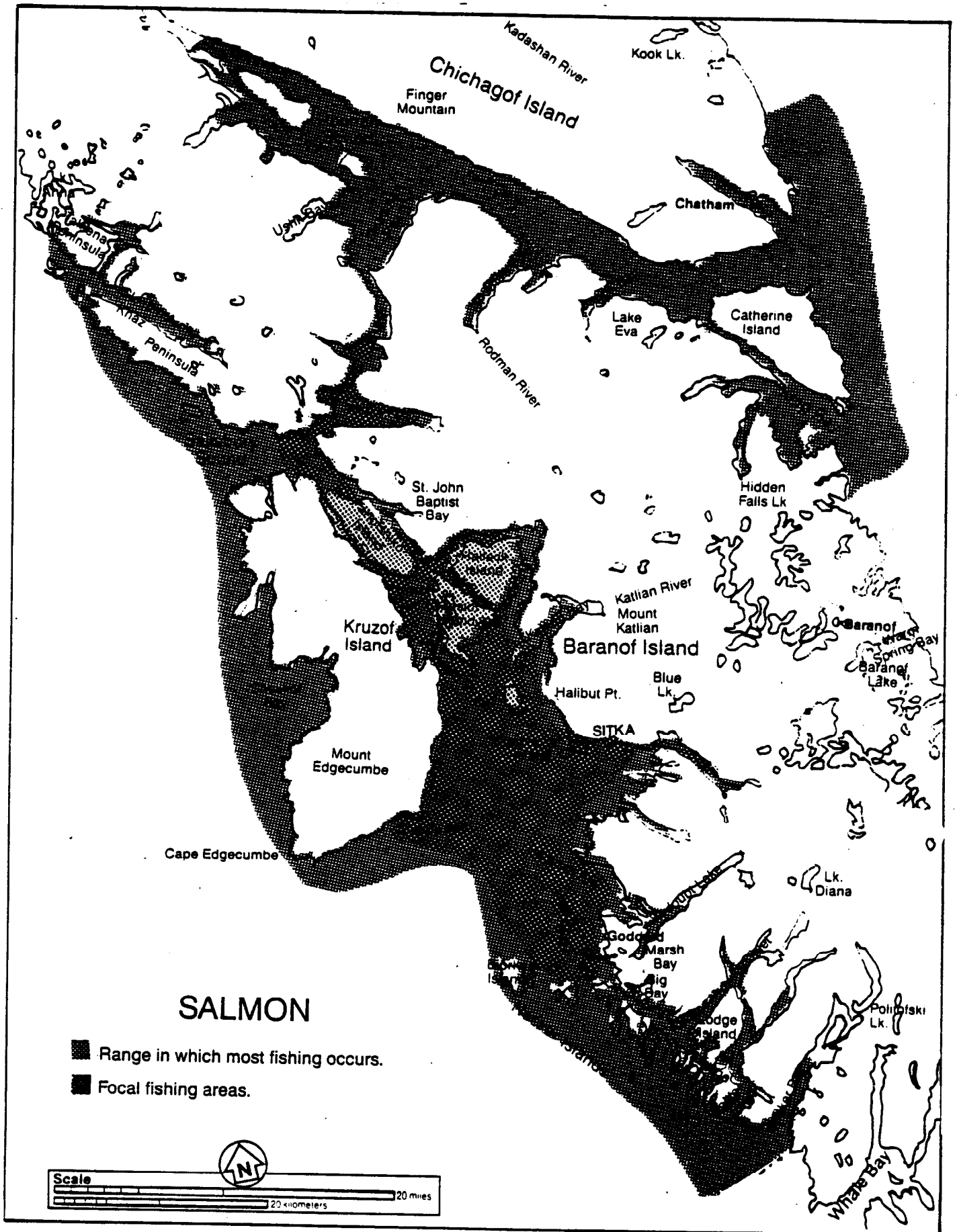
Most Sitka fishermen are able to identify all five salmon species; however there is sometimes confusion in distinguishing small kings from cohos. Once the fish begin their spawning migration and "color-up", their identification becomes more certain.

Figure 2 shows the range and focal areas of salmon fishing for the survey households. Map survey data combines all five species of salmon. Sitka residents harvest salmon throughout the region -- in open ocean, protected salt water areas, and spawning streams. Survey results show that by far the greatest salmon fishing activity takes place in the waters of Sitka Sound and the surrounding islands and bays. A second focal area is the complex of waterways and islands from Olga Strait north to Salisbury Sound and Peril Strait. More specific salmon fishing areas which were frequently listed by survey respondents include the following: Vitskari Rocks, Starrigavan River, Hayward Strait, the waters between Sugarloaf Point and Povorotni Point, Silver Bay, Redoubt Bay, Katlian Bay, Biorka Island, Nakwasina Sound, Neva Strait, and Salisbury Sound. About twenty other areas were specifically identified by respondents, ranging from Klag Bay in the north to Snipe Bay in the south, and as far east as Sitkoh Bay at the mouth of Peril Strait.

#### Subsistence Salmon Permit Fishing

Data discussed in this section are based both on the household survey and on information provided by applicants for Sitka ADF&G subsistence salmon permits. To obtain a subsistence permit in 1983 the applicant had to fill out a form providing the following information: (1) the species and number of fish requested (only sockeye, pink, and chum salmon could be taken on a subsistence permit in the Sitka area in 1983); (2) the watershed or location where the fish are to be harvested; (3) the

FIGURE 2. SALMON, 1983.





type of gear to be used; and (4) the number of persons in the applicant's household.

Over one third (36 percent) of the households surveyed had obtained a subsistence permit in 1982.[2] According to the household survey, a higher percentage of Natives obtained permits than did non-Natives.

The primary target species of subsistence salmon fishermen is the sockeye: 78 percent of the 1983 subsistence permits were for sockeye, followed by 13 percent for pinks and 12 percent for chum.[3] According to harvest reports of the permittees, 70 percent of the fish taken were sockeyes, 20 percent were pinks, and 10 percent were chums. Sockeye are the most prized of the three salmon species. They are the best eating but they seldom take a lure or bait and therefore are seldom caught by sport fishing methods. Most permittees, when filling in the number of fish they wished to harvest, requested the limit (25 sockeye or chum and 50 pink).

In 1983 Sitkans were able to obtain a second or even a third subsistence permit for a given species if the escapement goals were being met. However, most households were unaware of this provision and we did not know of any who had applied.

---

2 From a total of 877 subsistence salmon permits issued by the Sitka ADF&G office in 1982, 491 were residents of Sitka. This represents approximately 18 percent of all Sitka households.

3 The total of the percentages exceeds 100 percent because some permits were for more than one species.

Several Natives were critical of the small number of fish they were allowed to take under subsistence regulations, because it kept them from going out on long trips and harvesting their winter supply at one time. When told that they could obtain additional subsistence permits, they said it would not make any difference, that having to return from a fish camp to obtain a new permit for each additional 25 fish was impractical.

In the Sitka area the following subsistence salmon gear are allowed: drift gillnet, purse and beach seines, spear, gaff, and dipnet (ADF&G 1982:5). The list excludes, of course, the hand-held sportsfishing rod.

Table 8 shows the frequency of each type of gear used by Sitkans. Most frequently used is the drift net, which is the gear most popular among non-Natives. Second is the beach seine -- which usually involves circling a school of fish with a net stretched between two boats and then drawing the net into shore where the fish are removed from the net. [4]

Third is the purse seine, but the figure of 103 permits for purse seining is somewhat misleading, because many of the permits were held by elderly people, mostly Alaska Native Brotherhood (ANB) members or Pioneer Home residents, who did not fish themselves. Leaders of the ANB, for example, have made an

---

4 In choosing where to make the set fishermen look for:  
1) bright-colored fish - the condition of the fish is observed when they jump, and 2) a clean beach where they can haul the net without getting a lot of seaweed or eelgrass which would necessitate cleaning the net before it could be set again.

TABLE 8. SUBSISTENCE SALMON FISHING GEAR, 1982.

Type of Gear	Percentage of Sitka Subsistence Fishermen
Beach seine	27
Drift net	35
Purse seine	23
Dip net (also spear and gaff at some locations)	15

Source: Sitka ADF&G subsistence salmon permits.

TABLE 9. SUBSISTENCE SALMON FISHING LOCATIONS\*

Area	Number of Permits Applied for	Percentage of Total Permits
Sitkoh Bay	196	41
Sitka Sound Area	112	23
Nakawasina Sound	56	12
Necker Bay	34	7
Klag Bay & Lake Anna	24	5
Redfish Bay	16	3
Leo's Anchorage	13	3
Politofski / Whale Bay	8	2
Ford Arm	7	2
Lake Eva	5	1
Katljan Bay	5	1
<b>Total</b>	<b>476</b>	<b>100</b>

\*Source: Sitka ADF&G subsistence salmon permits.

arrangement with ADF&G to assist their elderly or infirm members and others without access to a boat in obtaining subsistence permits. Then the ANB fishermen go out in a large commercial vessel using a purse seine and fish for up to 25 permittees simultaneously. The catch is distributed evenly with each permittee usually receiving a few salmon.

The least common types of gear used for subsistence salmon fishing are the dipnet, spear and gaff. Use of a dipnet is associated with several locations where it is well suited, notably Redoubt Bay. At the head of this bay the salmon must ascend a low, narrow falls to get into Redoubt Lake, making it possible for the fishermen to catch the migrating fish with a dipnet provided the fishermen are there when the fish arrive. In 1981-1983 the sockeye runs at Redoubt have fallen off and most fishermen have returned home empty-handed.

Where do Sitkans go for subsistence salmon fishing? Table 9, which gives a breakdown of fishing locations based on 1983 permits, shows that Sitkoh Bay (at the eastern end of Peril Strait) is by far the favorite location. Sitkoh Bay is popular for several reasons: the run is consistent and predictable, both in size and timing, and Sitkoh is relatively accessible, without need for an open ocean traverse to reach it. The Sitkoh run, however, may not be very large. The only year ADF&G counted escapement there were 7,200 fish, considerably less than Redoubt which had 50,000 (1981), or Necker and Redfish Bays which have runs of 25,000 fish (Bob deJong pers. comm., 1983). But these

larger runs are less consistent in timing and/or size, and some are difficult to get to.

The Sitka Sound area and Nakwasina Sound are the next most popular places. Together, Sitkoh and these two areas accounted for two-thirds of the 1983 subsistence salmon fishing. When fishing outside of Sitka Sound, Sitkans generally prefer to go north where they are in inside and more sheltered waters; all fishing locations to the south of Sitka require travelling on the open sea. The West Chichagof sites (Klag Bay, Lake Anna, Ford Arm, Leo's Anchorage) also require open sea travelling.

The only information available on harvests of salmon on subsistence permits is that reported to the ADF&G by the fishermen themselves. Upon expiration of their permits, fishermen are required to report the species and number of fish harvested. The total subsistence harvest reported by permittees for 1982 and previous years is shown in Table 10.

Data obtained from the 1983 returns show that 24 percent (n=117) of the fishermen said they had caught the limit. On the other hand, many permittees (35 percent) reported not taking a single fish. Some never found the time to get out fishing, while others interviewed in the household survey had made several trips without any success.

In several households where the men are busy with commercial fishing, the women assume responsibility for harvesting the household's subsistence fish. One female respondent had a boat of her own for this purpose.

TABLE 10: HARVESTS OF SALMON ON SUBSISTENCE PERMITS\*

Year	No. of Permits	No. of Salmon	Average No. of Salmon per Permit
1965	166	1,190	7.2
1970	284	3,397	12.0
1975	275	3,182	11.6
1978	396	3,532	8.9
1979	483	4,062	8.4
1980	734	8,897	9.8
1981	906	8,897	9.8
1982	877	10,253	11.7

Source: Sitka ADF&G subsistence permit applications.

\* Figures are based on all subsistence permits issued by the Sitka ADF&G office and include permittees who are not Sitka residents.

In 1983, 55 percent of permit holders were Sitka residents.

Figures are for returned permits only. In 1982, for example, 722 of 877 (82 percent) of the permittees reported their harvest.

When unreturned permits are figured in with the returned permits, the harvest for 1982 increases to a projected 12,770 or 14.5 salmon per permit holder.

TABLE 11: TYPES OF BOATS OWNED BY SITKA HOUSEHOLDS

Type of Boat	Percentage of Households (n=83)
Canoe	4
Kyak	4
Punt, dinghy	10
Skiff, whaler	59
Cruiser	43
Troller	13
Seiner	2
Crabber	2
Sailboat	2

Under the general heading of subsistence salmon fishing one might also include many of Sitka's commercial hand trollers who use their catch primarily, in some cases exclusively, for home consumption. For example, one interviewee said he had purchased his hand troll license as an investment and a means of buying gas at a cheaper rate, but not to fish commercially. In the words of another fisherman, "A hand-trolling license here is really a subsistence license." More information is needed on this practice than we were able to obtain in this study.

Salmon not eaten fresh is mostly frozen or smoked. Smoking is popular among non-Natives as well as Natives (51 percent of the sample owned or had use of a smokehouse or smoker). Half-smoked fish is popular among Natives. Natives traditionally smoked salmon at summer fish camps, but this practice declined after many entered the wage labor market during World War II (F.O. Williams and B. Brady pers. comm., 1983). Once Native people became employed they no longer had enough free time during the summer months to go to fish camps. Today most Sitka Natives smoke their fish at home, or those who belong to the Sitka Community Association may use its large communal smoke house. A few families, however, still smoke their fish out of town; there are several smoke houses in use at Katlian Bay.

Salmon are also canned, often after being lightly smoked. One survey household canned 6 cases (288 #1 cans) of salmon in 1982, much of it for distribution to friends and relatives. Some commercial fishermen have canners on their boats

in order to put up fish for home consumption during slow times at sea.

Salmon heads are cooked (baked or boiled in a fish stew) by Natives and non-Natives alike. They may be obtained free from a local fish processor. A traditional Native dish using fermented salmon heads is called "stinkheads". It was formerly prepared by placing the heads between layers of skunk cabbage in a barrel, and then burying it on the beach below the tide line. Few Natives prepare stinkheads today, though when they do the heads are now placed in a barrel or tub of water and left to ferment in a smoke house (G. George, pers. comm., 1983). An ANB leader attributes the declining use of this food to the association many younger natives make today of stinkheads with "rotten" and not merely "aged" food. The making of stinkheads, he explains, is actually a clean process, one that simply mimics the aging process in nature. Nevertheless, most Natives no longer prepare stinkheads and those who do will usually not admit to it (F. O. Williams pers. comm., 1983).

The use of salmon eggs by all sectors of the community is increasing. Most often the eggs are boiled with black seaweed and rice. Some people soak the eggs overnight in soy sauce before eating them raw or boiled. A traditional Native food, called stinkeggs, involved fermenting the eggs.

#### HALIBUT

Halibut(Hyppoglossus stenolepis)is second in importance to salmon. Fifty-five percent of the sample households fished



specifically for halibut during the year prior to the survey. The mean harvest for households that fished was 5.2 halibut, which at an average weight of 20 pounds per fish equals 104 pounds per household for the year. At Sitka supermarket prices, the value of the halibut fillets would be over \$300. per household.

In 1983 halibut could be taken from March 1 to October 31 under either sport or subsistence regulations. Because the subsistence regulations in 1983 allowed the same daily limit of two fish and provided no advantage in gear (a single hand held line with no more than two hooks), nearly all Sitkans took halibut as a sportfish. Some Sitkans try to get their halibut in the days or weekends prior to the commercial halibut opening, in the belief that the fish, especially the large ones, will be less plentiful after the short (5 days in 1983) but intensive commercial fishery.

Some interviewees said they preferred fishing for halibut to any other species. In the words of a 29 year old tradesman:

Like a lot of people I like bottom fishing. You never know what you're going to catch. If I don't get a halibut I'll get rockfish or I might get a king salmon down on the bottom. I really like the taste of halibut, even more than salmon; I've had it many different ways and it's always good. When my relatives come up (from Oregon) they all want to go halibut fishing. It's the idea of getting an 80 to 100 pound fish— there's always that possibility— with really good meat.

Sitka residents take halibut in saltwater throughout the range shown in **Figure 3**. Halibut fishing is strongly concentrated in Sitka Sound, and the area around Vitskari Rocks



is far more important than any other.

While non-Native households usually consume halibut fresh or else freeze it, many Native households also smoke and dry it. Natives may also boil or bake the heads which are discarded by most non-Natives. The cheeks, which are stringy and have a different flavor than the fillets, are used by some resident commercial fishermen. In former times they were a source of income for Native children, who sold them door-to-door for as little as 5 cents per pound. One interviewee, a commercial fisherman who had caught 14,000 pounds of halibut during the 1983 opening, had saved and frozen 200 pounds of cheeks. Previously the local fish plants allowed residents to come in and remove halibut cheeks for their own use. At least one plant now saves them for commercial sale.

#### DOLLY VARDEN

Dolly Varden trout (Salvelinus malma) occur in fresh and salt water throughout southeast Alaska. Twenty-eight percent of the surveyed households reported fishing for "dollies" in 1982. Although they have firm pink flesh and a rich flavor, many Sitkans consider them a trash fish. This negative opinion dates to the pre-statehood era of Alaska when there was a bounty on "dollies". Based on the idea that Dolly Varden ate enormous quantities of salmon fry, the territorial government paid

fisherman two to three cents per tail. Although this practice was stopped in the late 1940s, the prejudice toward the Dolly Varden has been slow to change (Art Schmidt pers. comm., 1983). In the Dry Bay and Yakutat areas in 1982, we observed fishermen routinely discarding "dollies" which had been caught in their gillnets into their boats or onto the beach. This was done in the belief that dollies harmed the salmon fishery and were not good eating.

Dolly Varden are taken all summer, especially up in the rivers just before and during the salmon run. For shoreline fishermen the primary locations for catching "dollies" are Starrigavan, Katlian, Nakwasina, and the Sheldon Jackson Hatchery. These areas are considered especially good in spring when the "dollies" are feeding on outmigrating fry. For residents with boats the favorite locations for catching "dollies" are Nakwasina Sound and Katlian Bay, where they are abundant and large fish up to six pounds can be caught. The south fork of Katlian River is known to have a run of unusually large fish.

#### CRAB

Twenty-four percent of the households surveyed went crabbing in 1982; they harvested an average of 35 crab during the year. Dungeness crab (Cancer magister) is the primary species caught by Sitkans, followed by king crab (Paralithodes camtschatica) and tanner crab (Chionoecetes bairdi).[1]

1 Dungeness crab comprised over half the 124,000 pounds of crab caught commercially in the Sitka region in 1982.

The most popular harvest method is the crab pot. For personal use, most Sitkans use only one or two pots. Crabbing with pots is usually incidental to other activities. For example, Sitkans will throw over a pot while fishing or on an overnight camping trip; commercial fishermen also usually carry a pot or two on board to set when they anchor near shore at night. But few people go out specifically to harvest crabs with pots. A good method for serious crabbers is the crab ring, though it requires more effort than a pot.

Another harvest method, but one requiring a minus tide, is raking. A garden rake is used to locate and dislodge dungeness crabs from the tidal seaweed; alternatively, the subtidal vegetation may be raked by a wading fishermen and the disturbed crabs caught by hand. Raking can only be done in late spring and summer when the crab move into shallower water.

A third and the surest method of harvesting crab is snorkeling or diving. While the rakers and dipnetters can only gather from the intertidal area accessible at low tide, those who can move under the surface of the water have relatively unlimited range and at present little competition. There are an estimated 60 divers in Sitka, of which 15 to 20 dive often.[2] One of their main objectives is to collect shellfish (particularly abalone) and crab for personal use. Since diving requires a

---

2 This figure is based on estimates given by several divers and by the proprietor of the sports shop that refills most of their tanks.

sizeable capital investment for gear, and special training, it may be that Sitkans of lower socioeconomic status are less able to participate in this harvest activity.

Map survey data depicted in Figure 3 reveals that Sitka residents harvest crabs near the heads of protected bays and sounds. These places are scattered throughout the region, but a few places seem to attract much of the harvesting activity; these include Krestoff Sound, Hayward Strait, Nakwasina Sound, and bays in the western portion of Peril Strait. Some respondents complained that crab have been over-exploited by commercial harvesters and as a result they harvest fewer crab today than in the past and must travel further to get them.[3]

As one middle-aged resident explained:

Crab have gone from being under-exploited to being over-exploited in just a few years. Crab are becoming so scarce that it has turned a lot of people away from crabbing for household use. People simply don't want to go all the way to Hoonah Sound to get a pot of crabs; it's just too expensive. (Hoonah Sound is about 130 miles one way, which in a small boat can mean at least 30 gallons of gas and perhaps several times that for a cruiser.)

Some Sitka residents expressed bitter feelings over what they consider over-exploitation by commercial fishermen. The following statement represents the feelings of many:

There aren't enough crabs here to make it (harvesting)

-----

3 In Southeast Alaska crab are associated with alluvial areas -- stream mouths -- where they inhabit eel grass beds in spring and summer; not many are found in the outside waters (Bill Hughes pers.commun., 1983).







worthwhile. The commercial fishermen have wiped them out. Now take Katlian Bay, it used to be packed with crabs, but no more. I can't find a place to put my pots. I put them down and get nothing or ones that are too small to keep.

Another concern of sport or subsistence crab fishermen that has surfaced in the past five years is the increasing loss of pots due to theft. One informant attributed the problem, like theft in other areas, to the urbanization and growth of Sitka. Some crabbers have responded by using shorelines -- that is, a ground line which runs from the pot up to the beach. The single brown nylon line is less visible than the traditional marker buoy.

#### SHRIMP

Unlike crabs, shrimp are not widely harvested; only six percent of the survey households fished for them in 1982. The households harvested an average of 7.56 gallons (1 gallon = 4 pounds) during the year. Reasons often given for not harvesting shrimp were that they are too deep (50 to 80 fathoms), too difficult to catch, and there are too few good shrimping locations near Sitka.

Shrimp are found, but not in great quantity, in Katlian Bay, Pirate Cove, Crawfish Inlet, and Nakwasina Sound near Sitka. Hoonah Sound is considered the nearest prime location. A number of species are found in the area, but the main species caught by sport shrimpers is the spot (Pandalus platyceros). The species which the two Sitka commercial shrimpers catch by trawling are humpy, pink, and coonstripe shrimp.

## FRESHWATER FISH

The major freshwater target species are rainbow trout (Salmo gairdneri), cutthroat trout (Salmo clarki), and the seagoing rainbow or steelhead (Salmo gairdneri). Of the survey households, 23 percent fished for trout or steelhead in 1982, and they took an average of 16.9 fish. Because of the small bag limits, type of gear used, and distance to fishing locations, Sitkans' primary reason for trout fishing is recreation or sport rather than subsistence. For this reason the harvest figures for some respondents do not reflect the number of fish caught but merely the number that were kept. One man reported that he went trout fishing approximately 30 times in 1982 but only kept 10 fish.

Rainbow trout have been introduced in most lakes around Sitka, the major fishing places being Davidof, Plotnikof, Avoss, and Blue lakes, and the Resinof chain. Other rainbow lakes, such as Deer, Fawn, and Betty lakes, are further inland and more difficult to reach. Cutthroat, the only naturally occurring trout in the area, have a wider distribution than the rainbow; they are found in most streams on west Chichagof Island and in some on Baranof Island. A favorite location for cutthroat near Sitka is Salmon Lake.

There are no large steelhead runs in the Sitka area, though Salmon FLake in Silver Bay has a fishable population of steelhead. Steelhead aficionados go to the Sitkoh system, Lake Eva, and West Chicagof streams. There are, however, local

streams with small steelhead runs, including Indian River, Starrigavan, Katlian River, and Sawmill Creek. Most streams in fact have a few steelhead, but systems without lakes generally do not have many. Steelhead are considered more difficult to catch than trout, in part because they are only in the streams for about two to three weeks, so they are not accessible to anglers for very long.

Due to the remoteness of many of the best trout fishing locations, a few Sitkans and probably most visiting sports fishermen charter airplanes to transport them to fishing sites. One of Sitka's major air charter firms, for example, flew 106 charters in 1982 solely for freshwater fishermen. The duration of the fishing trips was generally three days, and fishermen usually stayed in U.S. Forest Service cabins. Most travelled to lakes within 30 minutes flying time; Lake Eva and Kook, Goulding, and Baranof lakes were popular destinations.

#### ROCKFISH

Rockfish is a generic term applied to some 20 different species of small to medium sized bottom fish. Many Sitkans use the term rockbass interchangeably with rockfish, and they are able to identify only a few species. Most familiar is the yellow-eye rockfish, commonly called red snapper, a longlived (60 to 70 years) fish with excellent white flesh which is now harvested commercially.

About one-fifth (21 percent) of the households surveyed fished for rockfish, and these households harvested an average of

16.8 fish during the year. Rockfish are a target fish for some Sitkans, sought mainly during the winter months when the halibut season is closed. But for most they are only taken incidentally, although they are reported to be quite good eating. Moreover, many Sitkans, particularly Natives, consider them a "trash" or "junk" fish.

Some people say that they do not keep rockfish because spines on the gillcovers and dorsal fins make them difficult to clean. Also, the fish do not yield much meat (for most species, fillets comprise about 35 percent of total weight), at least not enough meat to justify the effort required to clean them while risking a poke from the spines. As one man explained, "They're too much bother to fillet. You don't get a good flat fillet and they are small. I'll keep red snapper but not other rockfish."

Also, according to the Sitka sport fisheries biologist Art Schmidt, because of a basic lack of information, "Most people never keep rockfish because they simply don't know how good eating they are." He believes the negative opinion locals have of rockfish stem from the attitudes of commercial fishermen, who have long considered them a nuisance and their spines a hazard. An elderly Native man asserted that many Sitka Natives ate rockfish until the canneries opened up and the rockfish moved in around the docks to feed on waste and sewage.

Attitudes about and knowledge of the rockfish's qualities results in many being wasted. Unintentionally hooked and brought to the surface, some species such as the tasty red

snapper cannot survive decompression -- their eyes pop out and their swim bladder distends into the throat. Unable to return to their normal depth, they die discarded on the surface of the ocean.

The percentage of survey households who fished for lingcod (Ophiodon elongatus girard) in 1982 is about the same as for rockfish. The average number of lingcod caught in these households in 1982 was 4.2. Lingcod average 8 pounds (commercially caught lingcod average 20 pounds) and can range up to 120 pounds. They are not widely sought after, but are a favorite target species of some Sitkans. Some prefer its flaky and moist flesh to halibut.

#### HERRING

As shown in Table 6, 16 percent of the households went for herring (Clupea harengus pallasi) in 1982. They harvested an average of 5.9 gallons. When they spawn in the intertidal zone in late March to early April, herring are caught by snagging, primarily from the docks of the three harbors and from the causeway on Japonski Island. This is a favorite activity of children. Herring are also harvested with gillnets during their spawning, with gillnets set at various places along the road system. Traditionally, Sitka Natives used a rake device to harvest these fish from the beaches.

Herring are mostly consumed fresh, though a few

households pickle them and some freeze them for bait. Long lasting, high quality oil rendered from herring was once used by Native people for perserving berries. Berries simply dumped uncooked into the oil would last all winter (Jacobs Jr. and Jacobs Sr. 1982). The harvest and use of herring eggs is discussed in Chapter 5.

#### INFREQUENTLY USED SPECIES

Finally, it may be useful to discuss some fish occurring locally which are either ignored or little used. We have already discussed the negative attitudes toward some species, notable Dolly Varden and rockfish. To that list we could add several species of greenling, a relatives of the lingcod. Greenlings are ignored by all Natives and most non-Natives primarily because the males have greenish flesh. Few fishermen who throw these fish back into the sea realize that their flesh changes to white in the process of cooking.

Similarly few Sitkans make use of skate, dogfish, turbot, or sculpins. Flounder and sole — popular eating fish outside Alaska which currently sell for over \$3 per pound at many seafood stores — are rarely harvested. Jacobs and Jacobs (1982), writing about Sitka Natives, state that large flounder are "not eaten except probably when one is desperate for food." It seems the abundance of salmon, halibut, and several other species has meant that Sitkans have never needed to expand the range of species they harvest, and as a result many edible fish found in Sitka waters which are considered desirable by buyers on the U.S.

commercial market are not utilized.

#### THE ROLE OF BOATS IN FOOD GATHERING

"Everything here revolves around a boat. You have to have a boat to be able to fish or hunt successfully" (28 year old white male).

This belief is widely shared by Sitkans. With the road system only stretching 16 miles and the town surrounded on all sides by water or mountains, few good hunting or fishing locations can be reached except by air or sea. Although some residents can harvest considerable quantities of wild foods along the roads, most depend heavily upon boats. Many species of fish and shellfish are scarce or non-existent along the shoreline accessible by road, due to habitat degradation or local harvesting activity.

Forty-two percent of the survey households own a boat and many own more than one. To a considerable degree, the type of boat people own determines, or at least limits, the type of food gathering activities in which they can engage. Owners of small boats, for example, cannot easily make overnight trips and this essentially puts some resources out of reach.

As Table 11 shows, the most common type of boat owned by Sitkans is an open skiff or whaler. Boston whalers are seen more than any other type in the stalls of Sitka's three harbors and on trailers in yards. Second are cruisers (average length 18 to 26 feet), which, unlike skiffs, are provided with cabins and heaters. The major advantage of a cruiser is that it protects

passengers from the weather. Also, a boat above 24 ft. in length usually has some of the amenities of home, such as a stove, refrigerator, and bunks. Hence cruiser passengers can stay aboard overnight and travel further to fish, hunt, or gather. Although we did not cross tabulate data on income with the type or size of boat a family owned, it did appear that fewer low income families owned large boats. If so, then access to resources beyond the immediate vicinity of Sitka may be restricted among these families.

Aside from income, family status may also be an important factor determining which type of boat is purchased. According to a salesman at one of Sitka's boat dealerships, "If you have a family -- wife and kids -- you usually end up with a cabin."

Smaller boats, however, have some advantages for the food gatherer. There are not many good anchorages for big boats in the Sitka region, and even where good anchorages are found, there is always the worry of the anchor coming free. A small skiff, in contrast, can be put safely on the beach. Moreover some places are accessible only to small boats. Small boats are also cheaper to operate and maintain and require less preparation before use. For these reasons it is not uncommon for Sitkans who have purchased cruisers to revert back to smaller craft.



## CHAPTER 4

### HUNTING

#### INTRODUCTION

Sitka residents devote a great amount of time, energy, and enthusiasm to hunting activities. For many households, hunting is an important source of nutritious food and a highly valued outdoor pursuit. It is also a significant part of the community social network, bonding those who hunt together and share the proceeds of their success.

Our 1983 survey revealed that in 56 percent of the households sampled, at least one person had hunted during the past 12 months. Of the households where no one had hunted over the past year, 27 percent had done some hunting in the past 5 years. Two of the non-hunting households, and possibly more, were new residents who were waiting for one year before hunting to avoid paying the high non-resident license fee (\$60 versus \$12 for residents) and deer tag (\$135 for one deer). In over three-quarters of the hunting households only one person hunted; 23 percent of the households had two hunters, and 9 percent had more than two hunters.

For the entire sample the mean number of hunters per household was .7 or about half the mean of 1.5 for the Native

community of Angoon (George and Kookesh 1983). The hunters were primarily male and household heads. The frequencies of different species hunted is shown in Table 12. Deer is the primary species by a large margin, with waterfowl and mountain goat a distant second and third.

#### DEER

The Sitka black-tailed deer (Odocoileus hemionus sitkensis) is indigenous to the coastal rainforests of southeast Alaska and is relatively abundant in the Sitka area. In 1983 the hunting season for the Sitka region (Game Management Unit 4) ran from August 1 through December 15; the limit was 4 deer with antlerless deer legal after October 15. Seventy-one percent of the hunting households in our sample reported that they had killed at least one deer during the hunting season. This is close to the figure of 66 percent obtained in the ADF&G's 1982 survey of Sitka hunters in which questionnaires were mailed to one-third of Sitka's deer harvest ticket holders (n=2,224).[1] The five percentage point difference is at least partially due to the units being measured: in our survey it is the household (which sometimes contains more than one hunter) whereas in the ADF&G mail questionnaire it was the individual hunter. Also, the ADF&G sample may be biased, because 31 percent of the hunter questionnaires were not returned.

Johnson and Wood (1979) report that Sitka ADF&G deer

---

1 Statistics supplied by Rod Flynn, ADF&G.

TABLE 12: SPECIES HUNTED BY SITKA RESIDENTS, 1982.

Species	Percentage of All Households (previous 12 mos.) (n=139)	Percentage of All Households (previous 5 yrs.) (n=139)	Percentage of Hunting Households Only (previous 12 mos.) (n=78)
Deer	55	66	97
Waterfowl	8	17	14
Mt. goat	6	13	10
Seal	2	5	4
Moose	2	6	4
Brown bear	2	4	-
Black bear	-	1	-
Sea lion	-	1	-

harvest surveys normally find that 75 percent of the hunters take at least one deer. Because of the high deer population, residents of Sitka and the other communities in the region (e.g., Angoon, Pelican, Hoonah) have the highest success rate (i.e., deer kill per effort) of all areas in southeast Alaska.[2].

The mean harvest for the entire sample was 1.2 deer per household, compared with a mean of 2.2 deer for hunting households (n=78). The mean harvest from the ADF&G survey for 1982 was 1.45 deer per hunter; this is consistent with this study's survey figure of 2.2 deer per hunting household, based on a random sample. In household interviews and mail questionnaires, it is expected that hunters only report their harvest up to the legal limit.

Two of the unsuccessful survey households attributed their failure to not having boats, which meant they lacked access to the best hunting locations. People who hunt from the road system also tend to be newer residents and therefore less experienced hunters. With time they get to know the area better, buy a boat, travel further away to hunt, and harvest more deer.

A mean of 6.7 of deer hunting trips were made by survey household members in the 1982 season. The median was 3.9, with a range of 1 to 40 trips. Several active people said they tried to hunt every weekend. Since Sitka residents sometimes combine

---

2 The success rate for Sitka is eight percentage points higher than the mean for all southeastern Alaska, as shown in the mail survey of 1982 deer hunters conducted by ADF&G, Game Department (Rod Flynn pers. commun., 1983).

hunting with other activities, we asked the respondents how many of their 1982 trips were specifically to hunt deer. The results showed that all but five percent of the trips were made specifically to hunt deer. Hence the success rate (mean harvest divided by mean number of trips) for hunting households appears to be one deer per three trips. This is the same ratio -- three days effort per deer taken -- reported by Johnson and Wood (1979) as the average for Sitka through 1978 based on data from harvest tickets and hunter interviews.

The deer hunting success ratio may be inflated, however, because an unknown but possibly large number of deer are harvested each year by Sitkans engaged in activities other than deer hunting. For example, people out subsistence salmon fishing in August and September commonly take along a rifle in case they spot a deer. Commercial fishermen, who comprise nearly one-quarter of Sitka's population, often hunt while out fishing, especially later in the fishing season and when the weather is bad. Rarely were such trips counted by respondents in their calculations of deer hunting trips.

In addition to how many trips they had made in the past year, hunters were also asked how many trips they made in an "average" year. This result was slightly higher, with a mean of 7.2 trips; the similarity in the two figures may indicate that 1982 was a fairly average hunting season.

In over 80 percent of the sample households, hunting trips (n=536) were of a single day duration. The remaining 20

percent were split evenly between overnight trips and trips of two days or more. Curiously, when respondents were asked how long they had been gone on their last hunting trip, the result was an average of 2.2 days. Either the respondents were more likely to forget their single day trips or their final trip of the season, perhaps trying to fill their bag limit, was longer than average.

How many people do Sitkans hunt with? The mean number of persons per hunting trip was 2.7. Only 11 percent of the hunts included women in the group and just under half of these women were hunting themselves. Otherwise, nearly everyone (99 percent) in the parties was hunting. The respondents were asked how the members of the group on their last hunting trip were related to them. As shown in Table 13, the other hunters were primarily (58 percent) "friends", with relatives and other household members combined comprising 42 percent. Few respondents hunted with their neighbors. The absence of visitors in the hunting parties is perhaps because these data pertain to late-season hunts (November and December), long after summer when the residents might have entertained relatives or friends from outside Sitka. Also, for safety some hunters said they only invite experienced hunters to join them, which may exclude visitors.

Three types of deer hunting can be distinguished, on the basis of habitat, timing, and effort needed -- these are alpine, forest/muskeg, and beach hunts. Alpine hunting is done on the fringe of the tree-line and above. It runs from the season's

TABLE 13. RELATIONSHIPS OF HUNTING PARTY MEMBERS.

Relationship	Percentage
Friends	58
Relatives	25
Co-workers	22
Household members	17
Neighbors	6
Visitors	0

TABLE 14. DEER KILLS BY MONTH (1974-1978).

Month	Percentage of Kills
August	4.8
September	6.0
October	13.6
November	42.6
December	25.0

Source: Loyal Johnson, ADF&G, 1983. Data are for the Sitka region (Game Management Unit 4).

opening until about mid-September, when frosts kill off the alpine vegetation and drive the deer to lower elevations.

Alpine hunting is for bucks only. Because it involves longer shots with high velocity rifles and requires considerable physical effort, it is considered by some Sitkans a high quality hunt. Those who hunt in the alpine tend to be young and physically fit; occupational groups heavily represented in this type of hunting are teachers and Coast Guardsmen, and in general young, serious hunters. Alpine hunting usually ends by mid-September and accounts for no more than ten percent of the annual harvest, as shown by the monthly deer kill breakdown in Table 14.

Forest and low elevation muskeg are the major zone for hunting from about mid-September until snowfall. This type of hunting, which involves stalking the openings and fringes of muskeg and hiking the hillsides, is for deer of either sex. Calls are often used. It requires physical effort, but much less than alpine hunts, and accounts for the bulk of the annual harvest as indicated in Table 14. This table shows that the months of October and November, when most hunting is in the forest and muskeg, yield 56 percent of the kills.

Shooting deer on or near the shoreline, known as beach hunting, is most common late in the season. It is done especially after heavy snowfalls which drive the deer to beach fringe forest, where large mature trees minimize snow accumulation on the ground. Hunters cruise the shoreline in



small boats. When they sight deer they must go ashore to shoot, although some shoot illegally from their boats. A Native informant explained his technique:

For beach hunting you must go slow to look for the deer. You want an offshore wind that pulls the sound of the engine away from the deer. Sure, snow and rain bring the deer down to the beach, but you must know where to look. A lot of people look in the middle of the beach, but that's wrong. You want to look up in the forest, where the beach and forest meet, or you look at the kelp: that is where you will find the deer feeding, not in the middle zone.

The primary objective of beach hunting is meat and not sport. Beach hunting is the primary hunting strategy of many Sitka Natives, but it is also done opportunistically by most Sitkans while travelling in boats near the shoreline during hunting season. Although people commonly assume that the biggest deer kills occur on the beach, this is not the case. As Table 14 shows, December, which is main time of beach hunting, accounts for only 25 percent of the annual harvest.

Game biologists L. Johnson and R. Wood (1979) add a fourth period of hunting -- the year-long "gunny sack" season, in which an unknown but probably large number of deer are taken illegally.

The most popular deer hunting rifle, according to a proprietor of Sitka's major sport shop, is the .30/06. For alpine hunters the larger caliber rifles and high velocity ammunition are popular, while many Natives who are predominantly beach hunters prefer smaller caliber weapons, notably the .222, .243, and the .250 (Ron MacClain pers. comm., 1983).

The map survey data in **Figure 4** indicate that deer are harvested virtually everywhere in the Sitka region. As indicated in the adjoining map, the range of deer hunting by Sitka residents extends from the northwest shore of Peril Strait south to Lodge Island. People from Sitka do not travel east of Peril Strait or south of Windy Passage unless the weather promises to be good. At least 75 percent of the Sitka resident deer harvest occurs within the area indicated (L. Johnson pers. comm., 1983).

Key or focal areas for deer hunting are indicated by shading in **Figure 4**. Areas of particular importance for deer hunting are middle and eastern Kruzof Island, Nakwasina Sound, Silver Bay, Katlian Bay, Neva Strait, and Redoubt Bay. For Sitkans without boats, the areas most frequently hunted are Harbor Mountain, Indian River, Gavin Hill, and the logging roads north of Starrigvan. Because of their proximity to town and the resultant hunting pressure, these areas are said to be less productive. Many long term residents say that due to Sitka's increasing population, they must now travel much further to get their deer than they did a decade and more ago.

In general, most Sitkans travel north and west from Sitka to hunt; the areas south of Sitka are traditional hunting locations for just a few people, mostly old-time trollers (L. Johnson pers. comm., 1983). Sitkans also harvest deer in other parts of southeast Alaska in conjunction with other activities such as commercial fishing and visiting other communities.

What form of transportation do Sitkans use to get to



their hunting areas? Eighty-one percent of the surveyed hunters said they travelled by boat for their last hunting trip, compared with just nine percent who used a car or truck. Although boats are an integral part of most hunting trips, the figures above are somewhat distorted because the survey asked only the form of transportation used in the most recent hunting trip. For many hunters, the last trip would have occurred in November or December when the predominant hunting area is the beach.

Only 37 percent of the most recent trips involved any walking, a figure again affected by the time of year. Ten percent of the trips also involved the use of an off-road vehicle, such as a three-wheeler. One informant transported a pick-up truck on his boat to use on logging roads in a remote area. Unlike some other regions of Alaska, the least frequently used form of transportation (five percent) was the airplane.[3]

For many Sitkan families deer is a major source of winter protein; and for numerous seasonally employed fishermen, loggers, and the unemployed it can be the only source of meat. Deer meat comprised 22 percent of all the meat consumed in the Sitka households interviewed in the Alaska Public Survey (Clark and Johnson 1981). Moreover, the consumption of deer in the average household was found to be equivalent to that of salmon

---

3 All the respondents in this category owned their own planes. One of Sitka's air charter companies reported making an average of three deer hunting charters a week from August through October. Most of the destinations were within 30 minutes flying time; the duration of the average trip was three days.

and all other fish combined. The average October live weight of Sitka black-tailed deer is 100 pounds for does and 135 pounds for bucks, which boned-out yields about 35 pounds of meat for does and about 95 pounds for bucks. When multiplied by the mean harvest of 2.2 deer we get an average of around 94 pounds of meat per hunting household.

Respondents in the household survey were asked which parts of the deer they used. The results (see Table 15) show that while everyone used the meat and 80 to 90 percent used the heart and liver, the other parts of the carcass are generally discarded. Natives reported using the heart, liver, stomach, and bones more frequently than did non-Natives (significant at the .05 level or better). In fact, 100 percent of the Native households which hunted (n=19) consumed the heart and liver. While just two percent of the non-Native households consumed the stomach, 42 percent of the Natives did so.

Deer meat which is not eaten fresh is mostly frozen, though some households, especially those of Natives, also smoke and can. Deer stomach or tripe is prepared by either boiling or frying. According to Jacobs and Jacobs (1982), a traditional delicacy was made by placing the liver and heart inside the stomach along with heated rocks to cook them. Two Native informants said they use the tongue in the same fashion as one prepares a cow's tongue: boiled, skin peeled, and then sliced for serving and later for sandwiches. Some people also use the bones for soup stock, and a few make tools from them.

TABLE 15: PARTS OF DEER USED BY SITKA HUNTERS, 1982.

Part	Percentage of Sitka Hunters
Meat	100
Heart	90
Liver	83
Hide	34
Antlers	33
Bones	21
Stomach	14
Head	12

Most of the 33 percent of the sample that reported using deer hides donated them to the ANB or the Elks. The Elks encourage local hunters to bring in the hides, and they received 451 in 1982. After being fleshed and salted by local Elk members, the hides are air freighted to the "Grand Lodge" in Washington state, where they are distributed to disabled veterans for use in making handicrafts. The ANB runs a similar but much smaller program for local elderly people. Rarely are hides taken to Sitka's taxidermy shop for tanning. According to the local taxidermist, deer hair is brittle and easily falls out, so most people do not attempt to use the hides for clothing or rugs. They are suitable for small handicrafts, however. A small number of hides are made into buckskin (i.e., soft leather without hair).

Members of non-Native households who were long term residents took great pride in using every part of the deer. In addition to most of the uses discussed above, they made buttons and letter openers from the antlers; they mailed the skins to Wisconsin for tanning and made them into gloves, mittens, jackets; and they separated the last scraps of meat from the bones in a pressure cooker to be used in chilis and sausage or put into loaf pans with the natural gelatins to make headcheese.

While this case is exceptional for non-Natives, and while Natives, according to survey responses, used more parts of their deer than did non-Natives, no group in our sample was as thorough in its use of the animal as the Filipinos. One Filipino household, for example, consumed the brain by cooking it with

vinegar, the skin by burning it to a crisp and eating it as an appetizer, and the intestines by cooking them with hot spices. In short, they used all of their deer except the feces. However, due to the small size of the Filipino subsample we cannot generalize from these data.

#### MOUNTAIN GOAT

Mountain goat (Oreamnos americanus) were introduced to Baranof Island in 1934. Their number has increased from the initial 14 transplants to over 500 in 1982.[4] Mountain Goat were hunted by 6 percent of the sample households during the previous year, and by 13 percent in the previous five years.

The survey did not request harvest information on mountain goat or other mammals not regularly hunted. However, data from registration permits (1976-1982) were made available by the local ADF&G game biologist, Loyal Johnson. The number of goat registration permits issued, which has grown from about 175 during 1976-1978 to 370 in 1982, demonstrates a steady increase in the number of permitted goat hunters. About 60 percent of the persons who obtain a permit actually hunt. The majority of the hunters are residents of the Sitka area.

The most difficult part of hunting goats, according to several informants, is getting into their terrain -- remote and rugged alpine. Some Sitkans fly into hunting areas, but

---

4 This figure is based on aerial surveys conducted by the Sitka ADF&G (L. Johnson pers. commun., 1983).



sportsmen say that the real challenge is getting there by foot.

As one experienced hunter explained:

Ninety percent of goat hunting is getting into the terrain that they occupy. Once you get into their area they are easy to kill, much easier than deer. Goats are stoic animals, they don't react like deer, they don't panic... The excitement comes from the long trek in.

Most hunts last three to four days -- one day hiking in, a day or two hunting, and another day packing out. Goats are usually found at 2,000 feet elevation and above, and successful hunters must carry out 100 pounds of meat in addition to the gear they brought in. It is not uncommon for hunters to spend a day or two without spotting any goats, then move down into the timber and hunt deer.

Sitka's two major air charter firms flew a combined total of about 40 goat hunting parties to alpine hunting areas in 1982. Two or three hunters comprise an average party, and trips generally last three days or "until the weather clears". The success rate of fly-in hunters, estimated by the charter firms to be about 50 percent, appears to be considerably higher than that of the hunters who hike in. Several informants attributed this to being able to spot the location of game from the air or having the pilots provide them with this information. Several hunters who do not fly complained about the advantage these hunters have; in particular they singled out Coast Guardsmen, who are widely believed to spot goats and other game from helicopters while on patrol.

As Figure 5 shows, the major areas of goat hunting are the high lakes and mountains northeast of Sitka and due east of Katlian Bay and Nakwasina Sound. Most who hike in concentrate on areas that afford access, such as Goat and Hogan lakes, Katlian, and Blue Lake. Favorite locations for those who fly in, mentioned by the air charter firms, are Rosenberg, Cold Storage, Goat, Indigo, and Hemorrhoid lakes, and Lake Diana. Table 16 lists in rank order the most productive areas in terms of the total numbers of goats harvested since 1973. Only those areas with three or more kills are listed.

Although goat hunting is done primarily for sport or trophies, all the hunters that we interviewed used the meat. One owner of an air charter firm said he would not permit a client to leave the meat (it is also illegal). An average size billy weighs about 125 pounds dressed. In 1982 Sitka's taxidermist handled about 35 goats or a little less than half the number of goats harvested. Most clients had them made into rugs often with head and feet attached.

#### WATERFOWL

The Sitka area is not particularly good for bird hunting. Only 12 percent of the sample households had hunted waterfowl or land birds in the previous year and 19 percent within the past five years. No one in the Native households surveyed (n=29) had hunted in the past year, though land birds and waterfowl were hunted traditionally. Among the bird hunters last year 88 percent had hunted ducks, 50 percent geese, and 13 percent ptarmigan.

FIGURE 6. MOUNTAIN GOAT, 1983.

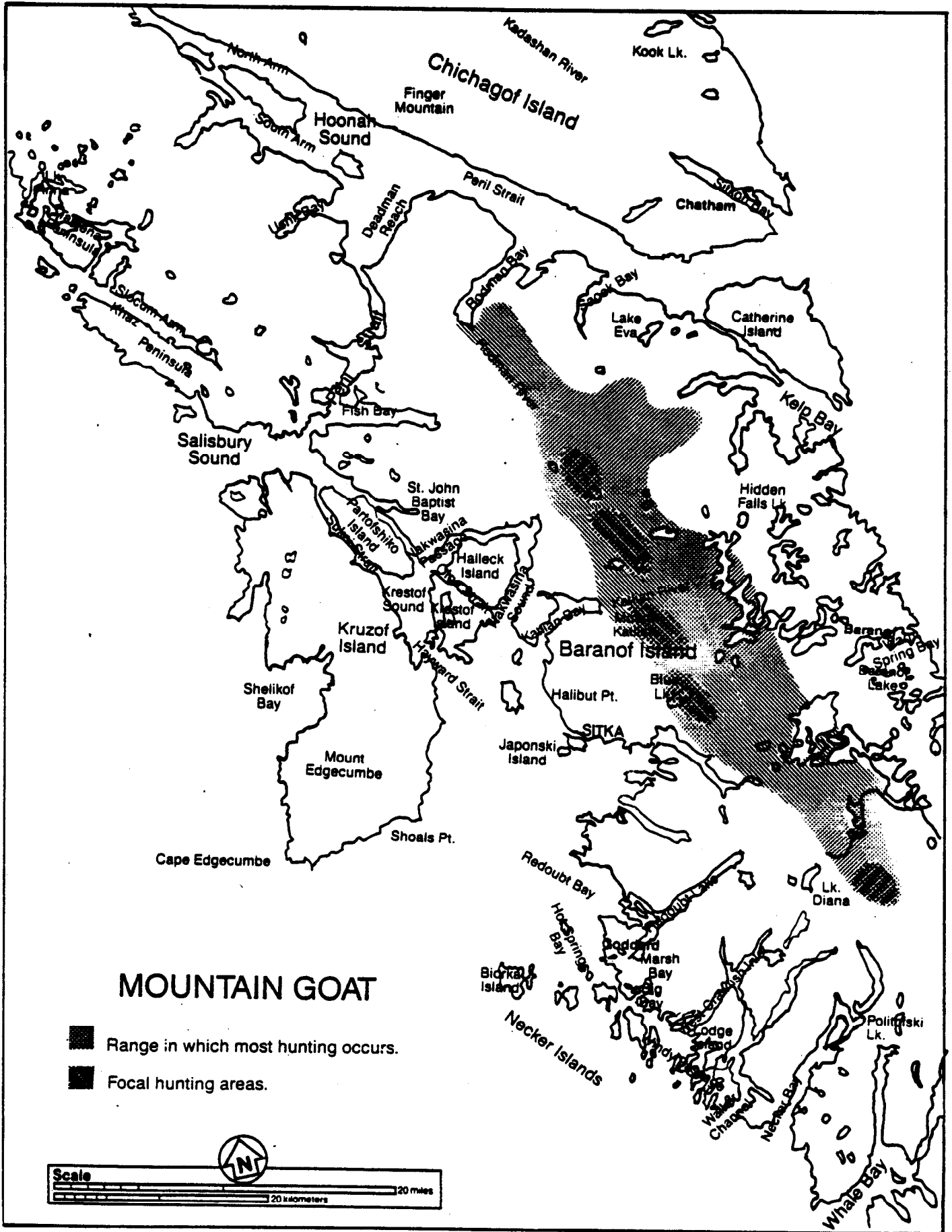


TABLE 16. AREAS AND SIZE OF GOAT HARVESTS, 1973-1982.

Area	Total Harvest
Anahoots	22
Bear Mtn.	18
Blue Lake	50
Cold Storage	38
Fish Bay	6
Glacier Lake	8
Goat Lake	11
Hogan Lake	13
Indigo Lake	6
Katlion Mtn.	62
Lake Diana	6
Lake Eva	8
Medvejic Lake	6
Mt. Bassie	6
Nakwasina	11
Redbluff	8
Rosenburg	83
Three Sisters	7

Source: Loyal Johnson, ADF&G, 1983,

The mean number of trips in the past year made by the subsample of bird hunters was 4.7, but two-thirds had only gone twice or less. For most informants waterfowl hunting is incidental to other activities: one individual who had hunted duck and geese on four occasions in 1982 said that all his trips were done in conjunction with deer hunting, another hunted waterfowl while crabbing, another shot several ducks while bear hunting, and several commercial fishermen said they normally hunted when the weather turned too "sour" to fish. Game biologist Loyal Johnson estimates that 70 percent of all duck hunting by Sitkans is incidental to other trips. The waterfowl hunting season in 1983 was September 1 through December 15 which coincided with the deer and bear season and, of course, with fall fishing.

The most popular duck and geese hunting areas are the coastal wetlands in Katlian Bay, Nakwasina Passage, and Port Krestof, all a short distance north of Sitka. The prime locations are the grassy flats surrounding river mouths, usually in the heads of the bays. At the east ends of Nakwasina Passage and Katlian Bay, there are over 150 acres of excellent wetland habitat for waterfowl. Further from Sitka, Hoonah Sound and Ushk Bay are also favorite locations, though the distance means few hunters travel there specifically for waterfowl.

Many waterfowl and other bird species move through the Sitka Sound area during spring migrations; however, they generally remain only long enough to feed and rest before

continuing north (Watson 1981). They return in fall, with the height of the migration being in October, but a survey conducted by Watson (1981) showed that fewer species and fewer birds are sighted in the fall. Although most of the waterfowl are highly seasonal, some bays are said to have a small resident flock of geese who stay all year (Watson 1981).

According to all informants, the most common species of waterfowl harvested are mallard (Anas platyrhynchos) and Canada goose (Branta canadensis). Other frequently mentioned species are pintail (Anas acuta) and green-winged teal (Anas crecca); infrequently mentioned are the white-fronted goose (Anser albifrons) and blue-winged teal (Anas discors). None of the survey respondents harvests the diving ducks (e.g., goldeneye, surf scoter, harlequin, oldsquaw, and bufflehead), all found locally but considered bad eating.

Ptarmigan (Lagopus) are harvested by just two of the survey respondents. Their scarcity in the Sitka area today is widely attributed to the 1934 introduction of marten, which became their primary predator. Natives once considered them fairly easy to snare in their feeding areas after a snowfall (Jacobs, Jr. and Jacobs, Sr. 1982).

Blue grouse (Dendragapus obscurus pallidus) also occur in the Sitka area but are not common. They are occasionally hunted during the spring when they "hoot" from high perches in the forest.

## BEAR

Only two percent of the sample households had hunted brown bear (Ursus arctos) and no one had hunted black bear (Ursus americanus) in the past year. For the previous five years, the percentages among households that hunted were four percent for brown bear and one percent for black bear. All the hunters in the sample were non-Natives. The residence of bear hunters was derived from bear sealing certificates for the 1983 spring season. Over half (55 percent) of the successful hunters (n=49) were from outside Alaska. Only seven hunters or 14 percent were residents of Sitka.

The knowledgeable proprietor of Sitka's major sports shop, who is also a hunter, described local bear hunters in this way:

Almost all bear hunters are Caucasian. Most are outsiders who have been living here (Sitka) for only a few years, such as the Coasties. But there are also some locals who are waiting for a really big bear. They won't just shoot any bear...they have been waiting for years for a really large one. And then there is that segment of the population that feels a need to kill every bear they see.

In particular, bear hunting is a popular sport among the Coast Guardsmen based in Sitka.

Since the mid-1920s the harvest of brown bear for the Sitka region (Game Management Unit 4) has averaged about 60 annually. The ADF&G have a policy to maintain the harvest at this level.[5]

---

5 Seventy-six percent of the brown bear harvested in the spring and 57 percent in the fall were males.

Not included in the harvest figures, which are based on bear sealing certificates, are the "problems" or "nuisance" bears shot in defense of life or property. Also omitted are the unknown numbers of bears shot illegally.

Of the 49 brown bears reported harvested during the spring 1983 season, 28 were taken on Admiralty Island, 15 on Chichagof Island, and 5 on Baranof Island. With the exception of Gut and Kelp bays, bear hunting on Baranof Island is insignificant (Loyal Johnson, pers. comm., 1983). The two air charter companies flew a total of 15 to 20 bear hunting parties in 1982. Their clients went primarily to Kuiu and Kupreanof islands for black bear and to Kelp Bay, Kruzof Island, and the west side of Chichagof Island for brown bear. Black bears are not found on Baranof, Chichagof, or Admiralty islands. The prime location for black bears, according to people who hunted them or knew others who had, was Kuiu Island, east of Baranof.

Brown bear hunting is almost exclusively for sport and trophy since the meat is not considered palatable by local hunters. Most hunters have the hides prepared. The Sitka taxidermist prepared 7 brown bear hides in 1982, most of them as rugs, often with the head attached. Some local hunters consider black bear meat to be edible, particularly in the spring; however, informants estimated that only half of the local hunters used any of the meat. An air charter firm manager and



pilot estimated that no more than 25 percent of his clients, keep any of the meat. One man who had brought home some of the meat from a black bear earlier explained why he had not used any of it: "It's very rich and gamey...I am not used to a real gamey taste and I am still thinking of some way to use the meat." Two people mentioned that they had used black bear meat in making sausages.

An elderly Native informant who once ate black bear meat attributed the neglect of bear meat today to the amount of time needed prepare it. In his household this involved parboiling, smoking, followed by further cooking. Also, he explained, that with cash incomes today, many Natives would rather buy beef in the market than go to all the trouble of preparing bear meat, whose taste is less desirable than other wild foods.

#### SEAL AND SEA LION

Under the Marine Mammal Protection Act of 1972, only Natives are permitted to harvest seals and sea lions. Three (or about 10 percent) of the 29 Native and mixed Native-non-Native survey households had harvested seals in the previous year; 24 percent of the same households had harvested seals in the past five years. No household had harvested sea lion in the previous year and only one household within the previous five years.

All seals harvested in the Sitka region are harbor seals (Phoca vitulina). The average weight of an adult is about 200 pounds and length is 5 to 6 feet (Klinkhart 1978). There is no bag limit; but hunters are required not to waste the carcass,

which means using either the meat or hide.

Seals are generally hunted from late fall through early spring. During the cold weather season, the seals are fatter, so fewer seals will sink when shot. Also, the hide is considered better during this period than in summer. One household said that they hunt seal around the time of the herring egg harvest in order to have fresh seal oil with the eggs. Another informant said his family traditionally hunted seal in April when the females were pregnant, because his mother used fur from the unborn seals for mocassins.

Today seals are usually hunted incidental to some other activity, rather than during trips designed specifically for seal hunting. One interviewee, for example, said that when hunting on the beach he keeps an eye out for seals. Others said they harvest their seals when out either fishing or deer hunting. Because seals are normally taken incidental to other food producing activities and because they are common and fairly widespread in the Sitka region, none of the households interviewed had a favorite or special location to hunt them. As one informant said, "You just run the beaches until you find them."

The use of seal meat -- which can be smoked, dried, boiled or fried -- has declined along with other traditional Native foods. One Native informant explained it this way:

(Seal) is a taste people have gotten away from. But its also the smell. It gets into your clothes and into the house. Today people say they aren't used to the smell, and they can't get it out very easily.

Nevertheless, seal meat is said to be good eating provided the animal is not too big or old. The liver is liked and may be consumed more often than the meat by Sitka Natives. Some hunters sell the meat to local crab fishermen for use as bait, although this practise is not as common in Sitka as in Yakutat, where there is a large crab fishery. The blubber is perhaps the most widely used part of the animal and is rendered into oil. The process is not unlike frying bacon to render bacon grease. Because of the strong odor given off in the process, some people render oil away from town. Seal oil is used in various ways, but mostly as flavoring with other foods -- for example, it is spread on herring eggs. Both seal oil and eulachon oil are used much like butter among non-Natives (Jacobs Jr. and Jacobs Sr. 1982).

Seal hides are widely used for handicrafts, most of them for the tourist trade. Some families prepare the hides themselves, although many of the elderly have them done at the local taxidermist which costs about \$70 each. The taxidermist prepared about 30 seal hides per year until 1983 when he stopped the trade. One informant gave his hides to the Alaska Native Brotherhood for use by elderly members.

The main reason sea lions (Eumetopias jubata) are rarely harvested is that currently Natives have little use of them. The hide is not as useful as seal for clothing and crafts

as the hair is sparse and coarse, although one Native woman had used it to make moccasins. The meat was never eaten by Sitka Natives, according to Jacobs Jr. and Jacobs Sr. (1982). However, one elderly informant recalled his family preparing sea lion flippers, "We'd burn the hair off the hide with a blow torch. Then you'd put them in the oven. They had a lot of gristle and were a bit like pigs feet." Today the meat is sometimes sold, like seal meat, to crab fishermen for bait. The only other use is of the whiskers in a dancing head dress called a shak.ee.at..

#### TRAPPING

Although trapping is not directly a household food producing activity since the furs are sold for cash and the carcasses are discarded, it does involve the use of local resources and therefore is included in this study. Two percent of the households surveyed had trapped in the previous year, but twice that figure had trapped within the past five years. Apart from the survey, in-depth interviews were conducted with three trappers as well as the game biologist and protection officers who had expert knowledge of trapping activities.

There are an estimated 40 Sitka residents who trap, which expert informants divided into two groups: "recreational" or "part-time" and "serious". In the first category are those -- estimated at half the total or about 20 individuals -- who trap part-time, mostly on weekends, and who tend to be young and inexperienced. Some are recent high school graduates who were

introduced to trapping in school, where two of the veteran trappers give a guest lecture each year. The recreational trappers work close to town. The second category -- the serious trappers -- work at it full-time, trap much further away from Sitka, and are generally older and more experienced. Trapping is a favorite winter activity of some commercial fishermen.

All but two of Sitka's trappers are men, and all but one are non-Native. The trappers are about evenly split between those who work alone and those who work with a partner. In general the younger and inexperienced trappers work with a partner.

The number of people trapping in any given year varies according to fur prices. As one explained, "If fur prices are good, then the next year everybody will be out trapping; but if they are bad, you won't see many people." For example, in the 1982-3 winter season there were many trappers because prices were good the year before.

The target species are marten (Martes americana), mink (Mustela vison), and land otter (Lutra canadensis). Marten is by far the most important and for some trappers it is the only animal worth going for. Marten are valued over the other species, because they bring better prices, are easy to skin and flesh (20 minutes for a marten versus 1 hour for mink), and are easier to trap. Because of the comparatively mild climate, southeastern mink do not produce top grade fur, so they cannot compete in the marketplace with northern mink or with

ranch-raised mink.

Southeast Alaska otter, on the other hand, are among the finest in the United States. But they are infrequently trapped, because they are of superior intelligence and are less plentiful than marten and mink. Other animals trapped unintentionally include ermine, squirrels, and an occasional eagle.

Reliable data on trapping harvests are lacking. Some data are gathered by the State from trappers and buyers who export their furs outside Alaska. However, because the individuals are only required to provide information on the furs they export, which may be just part of their total harvest, the data are incomplete. Further, many trappers do not export any of their furs; state tabulations showed only 11 Sitka trappers in 1982-83 season when in fact there were three times that many (Loyal Johnson pers. comm., 1983).

Although the state data are incomplete, they do provide some information on harvest levels and species ratios. For the 11 Sitka trappers who exported their furs the mean harvest of marten was 8.1 and the mean mink harvest was 10. The somewhat even split between marten and mink is consistent with the harvest information we gathered from three informants. The greatest number of marten harvested by any single trapper was 28; the figure for mink was the same. One Sitkan sold 26 squirrels, which was unusual in that squirrels, though frequently trapped unintentionally, are usually discarded. The number of otter pelts exported specifically by Sitkans was not shown, although

for all of Game Management Unit 4, 163 otters were reported. Half of these were shot and the other half trapped. Unit 4 produces about 10 percent of the annual statewide total of otters.

The harvest figures above are substantially less than that estimated by our informants. The most experienced trapper, a reliable informant, estimated the average harvest for part-time trappers at about 15 furs per season, while the full-time trappers harvest upwards of 100 furs.

The average prices paid for furs in 1983 were \$34 for marten, \$18 for mink, and \$40 for otter. Prices vary depending upon size and condition. At these prices, with most harvests split between marten and mink, and with about 2 otter taken for every 10 mink and marten, a fairly typical part-time trapper might have made something in the region of \$500 in 1983. The highest income was estimated at \$10,000, earned by a partnership of two hardworking and experienced young men. No one else was believed to have achieved earnings approximating this.

The small incomes placed against the considerable effort expended in trapping suggest that for most trappers, earning money is not the main objective. This was confirmed by all of our informants, who without exception talked at length about why they liked to trap. According to a middle-aged female trapper:

Like most people, I do it [trapping] for the experience, for the refreshment of mind, body, and soul. Being out there by myself I get fueled up and recharged. It's the experience of competing against nature and

surviving. It's hard to explain, I really don't know the right words for it, but its an emotional sort of thing. And it's the same for the men, though they are not eager to express their emotional desires. Instead they talk in terms of the bucks [money], but you see them get emotional when people talk about restricting trapping.

Though the trapping season officially opened December 1 in 1982, most trappers did not start until the weather turned cold and the fur "primed-up". Trappers disagree about when that usually occurs: some say around mid-November, while others argue mid-December. In 1982 the two and a half month season ended February 15. Most trappers traveled out to check their traps and return home the same day. An estimated eight to ten of the "serious" trappers stayed out on their traplines, which are located a good distance from Sitka. A few trappers stayed out for most of the season.

In the following field note the routine of a fairly typical part-time trapper is described:

L has two traplines: one on Kruzof Island and the other at Silver Bay. At Kruzof the trapline runs off a logging road that crosses the island from Mud Bay to Shelikof Bay. L leaves home in Sitka at 7 am, travels by boat to Mud Bay, and then by a small Honda trailbike to the trapline. By trailbike and foot it takes all day to check the 36 traps on her line, which stretches more than 7 miles. She arrives home around 6 pm. It's an all day routine. The trapline near Silver Bay, which comprises 18 traps spread along a 7 mile line, takes just 3 hours to check. She travels out to checks her traps once every three days, weather permitting.

Trappers who have jobs, unlike the person above, must check their lines in the dark after work or on weekends. Like L, other trappers said they tried to check their lines every few

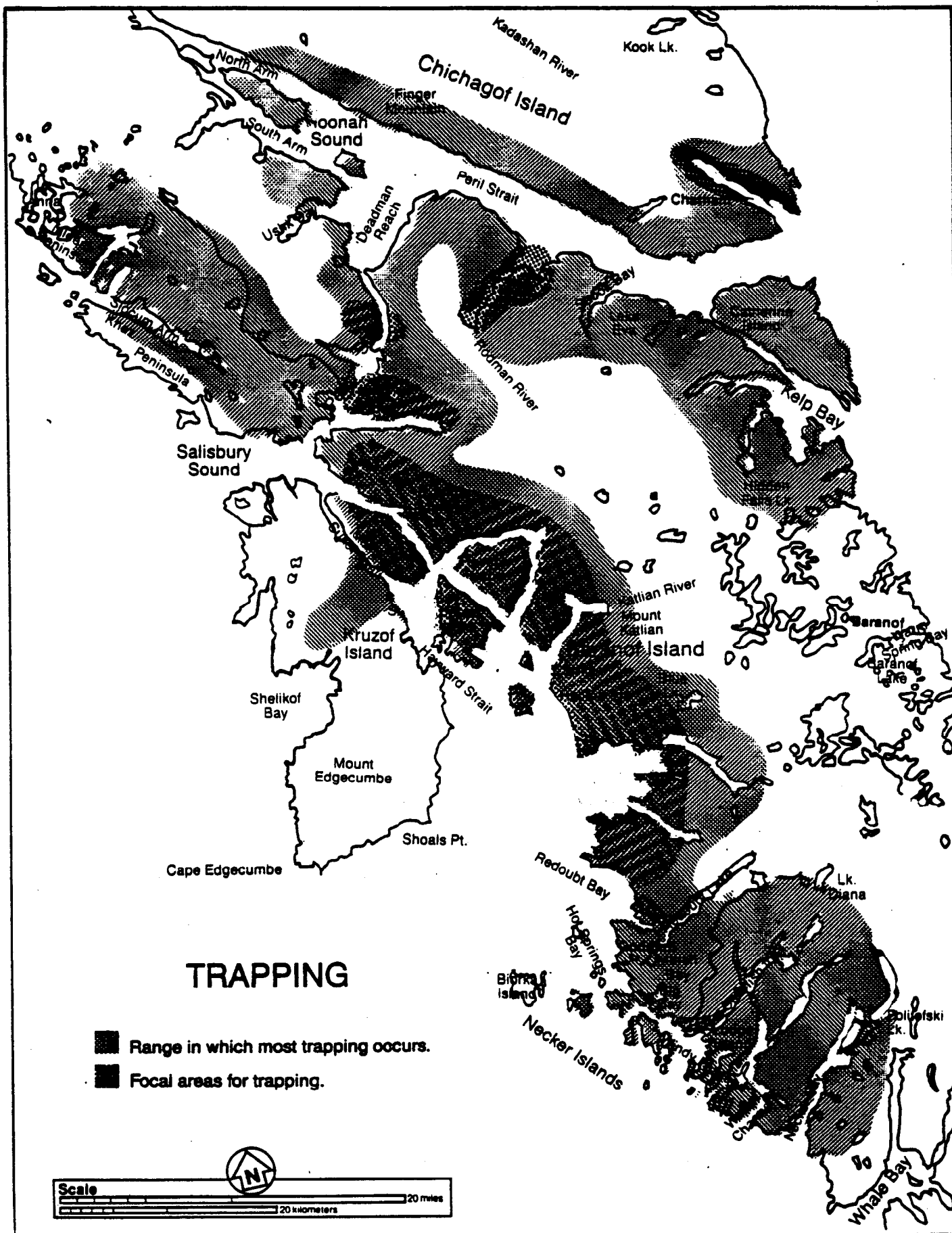


days, a little less often when the weather is cold and more often when the weather warms up. Some trappers considered it "inhumane" to set traps and not check them in less than three or four days: "This is especially true for mink. A mink will chew off his foot and leave and die. It's cruel and it's a waste of the resource."

**Figure 6** shows the areas trapped by Sitkans during the 1982-83 season. The most intensely trapped areas are Nakwasina Sound, Katlian Bay, and the area south of Sitka extending to Stranger's Bay and Pirate's Cove. According to the chief protection officer, most trappers work within a 20 mile radius of Sitka. The serious, full-time trappers work further away from Sitka where there has been less pressure. Several of the major trappers start the season around Whale and Necker bays south of Sitka and then move north to the Peril Strait area. Because trapping is done in winter and the open sea is risky, Sitka trappers choose protected waters and try to avoid areas where they would have to travel on the ocean. Within these areas most trapping is done near the beach, since when the snow falls marten come down to the water's edge and mink are always found near water. A few trappers also set their traps a few hundred yards along creek mouths.

In recent years poaching or the theft of animals from traps has become a problem for trappers nearest Sitka. In response, some trappers have moved further out while others have taken pains to set their traps in places where they will not be discovered. Boys and young men are blamed for the thefts. One

FIGURE 7. TRAPPING, 1983.



informant believes the thefts have resulted in trappers becoming secretive about where they are setting, even with other trappers.

CHAPTER 5  
INTERTIDAL GATHERING

INTRODUCTION

As a coastal people it is not surprising that the Native population of Sitka has a long and complex tradition of utilizing intertidal resources.

Modern residents of Sitka, both Native and non-Native, continue this tradition. Sixty percent of survey households had harvested intertidal resources in the previous year, 68 percent within the past five years.

Sitkans harvest many intertidal resources, including clams (six types), cockles, abalone, seaweeds including kelp, herring eggs, gumboots (chitons), sea cucumbers, sea urchins, scallops, mussels, limpets, and octopus. A few families also gather seagull eggs along the coastal shores. Some of these resources, such as cockles and gumboots, are traditional Native foods which still remain popular among Native people. Others, such as herring eggs and seaweed, are becoming more popular among non-Natives as well. Still other resources, such as clams and abalone, have long traditions of use among both non-Natives and Natives. Table 17 lists the intertidal species which are

targeted by Sitka residents and the percentage of Sitka households which harvested them between June 1982 and July 1983. As seen in the table, clams, abalone, and seaweeds are the favored resources, closely followed by herring eggs. Ethnicity has an effect on which species are targeted. A significantly greater percentage of Native households collect cockles, herring eggs, gumboots, and black seaweed than non-Native households (see Table 17).

A significantly higher proportion of unemployed (including retired) and seasonally employed households harvested intertidal resources than fully employed households (77 percent compared to 56 percent). Socioeconomic status, as measured by household income and educational background of the household head, had no statistically significant effect on whether or not a household harvested beach foods.

Intertidal gatherers went harvesting an average of 7.4 times in the past year; the median was 3.9 times. The mean size of harvesting groups for intertidal resources was 3.5 persons. Fifty-three percent of survey households harvested with household members and other relatives, 35 percent with friends, 9 percent with co-workers, and 3 percent with neighbors.

Interest in intertidal resources among Sitkans appears to be growing according to some National Park Service rangers in Sitka and the cooperative extension agent. The Sitka National Historical Park organizes guided beach walks during the summer at minus tides to familiarize people with vegetation and fauna in

TABLE 17. INTERTIDAL RESOURCES GATHERED BY SITKA HOUSEHOLDS

Resource	Percentage of All Households (n=139)	Percentage of Households who Intertidal Gathered (n=83)
Butter & Littleneck clams	50	84
Cockles	19	33
Razor clams	19	33
Abalone	32	53
Herring eggs	24	40
Gumboots	12	21
Black seaweed	12	21
Red seaweed	4	6
Kelp	10	16
Scallops	6	11
Sea cucumbers	6	10
Sea urchins	6	10
Mussels	4	7
Limpets	4	7
Seagull eggs	1	1

the intertidal zone. The walks have been well attended, and one of the main subjects participants have been interested in is edible seaweed (Barbara Minard pers. commun., 1983). As one interviewee put it: "My husband and I have always used a lot of berries but now I'm more aware of other plants and of beach gathering for seaweeds. The more I learn, the more I use."

#### CLAMS

Clams are the most commonly harvested intertidal resource in Sitka: 50 percent of survey households had harvested them. This is comparable to the findings of the Alaska Public Survey, which showed that 52 percent of Sitkans had been clamming or crabbing in the last 12 months (Clark and Johnson 1981). Several species are found in Sitka, including butter or hardshell clams, steamers or Pacific littleneck clams, razor clams, cockles, pinkneck or Alaska surf clams, soft-shell clams, and horse clams. The major target species discussed below are butter clams, littleneck clams, cockles, and razor clams.

The butter or hardshell clam (Saxidomus giganteus), also known as the northern quahog, is the most abundant species in the Sitka region both in terms of its availability and actual harvest levels. Adults average about four inches in diameter and are easily found at low tide in the numerous gravel and rock beaches around Sitka. The steamer or Pacific littleneck clam (Protothaca staminea) is smaller than the butter clam, averaging

two inches in diameter, but it occupies the same habitat.[1]

The mean estimated number of butter and littleneck clams taken by harvesting households was 7.5 gallons (1 gallon = about 45 clams); the median was 4.7 gallons. The mean for the entire sample was 3.2 gallons, which represents an annual harvest for the population of Sitka of approximately 6,400 gallons.

Clams can be found throughout the year but are only collected during certain months due to the threat of paralytic shellfish poisoning (PSP). During the warm summer months and early autumn, the waters of many coastal areas become inundated with phytoplankton. Sometimes a luminescent sheen can be observed in the sea; this phenomenon is referred to as a red tide (Larken and Hunt 1982). Some of the phytoplankton produce neurotoxins that are ingested by mollusks during feeding and concentrate in their tissues. The principal neurotoxin is saxitoxin, "one of the most powerful natural poisons known" (Larken and Hunt 1982:195). The butter clam and mussel species are the most dangerous shellfish species to consumers.

Different opinions about when and where it is safe to dig clams exist. Some people, including most Natives, only harvest them in early spring (March and April). Others only harvest in winter: one interviewee said he dug clams only in November and January. Other people, following the adage that clams are safe in any month containing the letter R, will harvest them any time.

---

1 There is confusion among residents about species and terminology. Many people use the word "steamer" to refer to both the Pacific littleneck and butter clam or else as a catch-all term for all small hardshell clams.



from September to April. The only point of general agreement is that clams should not be harvested and eaten in the summer and early autumn, which is their breeding period and the time when toxic organisms in the water are most common.

But a few people even dispute the danger of summer harvesting.

According to one informant:

I'm not worried about when I collect them (clams). It's all old wife's tales. In Juneau I wouldn't go in the summer but here there's enough tidal action to make it safe.[2]

Another resident remarked:

We go for clams whenever there's a low tide. We're not worried about shellfish poisoning because we watch the water. If it's dirty, we don't take them. We just stay away from town and we're okay. I was brought up here and I would never take clams or dollies [Dolly Varden] in Sitka...the sewer dumps in the water..

And according to a Native woman:

We go for clams and cockles mostly in the winter but we'll eat them any time of the year. When we collect in the non-winter months we make sure to cut off the black tip and the insides. The months that don't have an "R" are bad months. Our people believe that that's the bad time because they [clams] eat junk in the water then. If you're away from town though, you can eat them as long as you clean the stomachs and the black tips.

As the above remarks indicate, many people consider

---

2 The amount of flushing action in the water apparently does affect how much of the toxin is absorbed by the shellfish in a given area. Nevertheless, cases of PSP have been reported from the Aleutians where there is vigorous flushing action in coastal waters (Jill Thayer pers. commun., 1985).

factors other than season in deciding when it is safe to harvest clams. Such practices as only collecting clams at beaches away from the city of Sitka and of digging only at very low tide show an awareness of and concern with man-made pollution. Shellfish do concentrate contaminating organisms from polluted water, and should not be harvested from areas near discharges of sewage containing human or animal wastes or industrial wastes (Larkin and Hunt 1982). Certain beaches in the Sitka area are believed to be "hot" or contaminated and are avoided by knowledgeable collectors.

Many residents take precautions when preparing and eating clams. Most people carefully clean the clams before cooking, discarding the dark digestive organs at the top of the body, the dark tip of the siphon, the gills, and the broth or nectar in which they are cooked. One informant's family used to test for toxicity by throwing a silver coin in the frying pan with the clams. If the clams turned black, they were tossed out. Other people test for toxicity by eating a small amount and then waiting. If they experience no tingling sensation in the lips (an early symptom of PSP) they will eat them. One man told of doing this, and of his family eating the clams for dinner only to have their cats, who had dined on the discarded entrails, die a few hours later.

In the past year a number of Sitkans have been sufficiently frightened by ADF&G warnings that they have stopped gathering clams. Said one retired engineer, "There's been so much in the newspapers

lately that we've stopped clamming."

According to experts, PSP can happen at any time of the year, not just summer. It can occur in the absence of a red tide, since the toxic organisms can concentrate in sediments and remain there for years. There is no way to look at a clam and determine whether or not it contains the toxin. Care in cleaning and cooking are not absolute safeguards (except with razor clams, as discussed below). Testing small amounts for toxicity (either by people or house pets) does not provide insurance, since some clams may be safe while others from the same bed may be toxic. There is also no evidence that the "coin test" described above is useful for detecting toxins. And while some people appear to be less susceptible to PSP, others are highly sensitive. Alcohol consumption is known to increase the likelihood and severity of PSP.

The effects of PSP begin with tingling or numbness around the lips, spreading to the face and neck, followed by prickly feelings in the fingers and toes, dizziness or nausea, then stiffening of the limbs, rapid pulse, and respiratory difficulty. These symptoms may begin immediately or not become apparent until four or five hours after eating. By affecting the nervous system, PSP can lead ultimately to respiratory failure. Because PSP is so unpredictable and dangerous, state agencies advise residents to avoid all filter-feeding bivalves such as clams, mussels, and cockles, except those taken from regularly tested beaches. At present there is only intermittent testing in the

Sitka area.

Harvesting clams is a simple process. All that is required is a good low tide (preferably in the zero range or lower), a pitchfork and bucket, and knowledge of where to go. There are many good gravel beaches with clam beds in the Sitka area, so this is not difficult. Many people, especially those without a boat, dig clams close to town. Two popular locations are the Halibut Point recreation area and the beach near Starrigavan campground. Those with boats travel further -- to DeGroff Bay, Goddard Hot Springs, Krestof Island, Olga Strait, Kruzof Island, and to some of the islands in Sitka Sound.

Clams are prepared and stored in a variety of ways. The most popular method is to eat them freshly steamed, but many people no longer prepare clams this way for fear of PSP. Instead they carefully clean the clams and then grill or fry them. Clams may be kept in saltwater overnight, adding cornmeal which is said to help them clean out their digestive tracts. Large clams are usually cut or ground up and used in chowder. Natives once dried clams to preserve them, pulverizing some into a powder which was later used like a soup stock. Today excess clams are frozen, either in the shell or cleaned and packaged. Some people also put up canned clams.

In addition to the smaller species, large horse clams (Tresus capax), are sometimes dug by Sitka residents. However, most people feel that they are too difficult to collect, hard to clean, and tough to eat. Typically they are boiled and

ground for chowder.

Nineteen percent of the survey households harvested cockles (Clinocardium nuttallii) within the past year. The mean quantity taken by these households was 2.3 gallons (1 gallon = 35 cockles), and the mean for the entire sample was .3 gallons. This represents an annual harvest for the population of Sitka of approximately 600 gallons. Cockles are hardshelled bivalve mollusks somewhat larger than butter clams. They are collected at the same time of the year as other clams, spring and winter being the preferred seasons, and they are subject to the same precautions regarding pollution and PSP. Cockles occupy the same general beach habitat as the butter and littleneck clams and are often mixed in with them. But they are also found in separate beds, preferring fine sand or mud rather than the coarse gravel that attracts other clams.

Cockles have a long tradition of use among the Native population of Sitka: 41 percent of the sample Native households had collected them in the last year compared to 13 percent of the non-Native households. Traditionally they were smoked and dried, in contrast to clams which were intended primarily for immediate use. First they were boiled, then split open, strung, and smoke dried. Prepared in this way they would last for long periods (Mark Jacobs pers. commun., 1983). Today households that collect cockles prepare them like abalone, pounding them to tenderize and then frying them. Cockles are a nutritionally valuable food, low in fat and very high in iron (Hooper 1981).

The razor clams (Siliqua patula), another popular mollusk in Sitka, were harvested by 19 percent of the survey households. The mean annual harvest for those households that gathered was 5.7 gallons (1 gallon = 15 razor clams); the median was 2.5 gallons. The mean for the entire sample was 1.1 gallons, which represents an annual harvest for the population of Sitka of approximately 2,200 gallons.

Unlike butter and littleneck clams or cockles, razor clams live in firm, surf-pounded sand beaches, from four feet above the mean low water level down to depths of 180 feet. The razor clam has a long, narrow shell about seven inches in length at maturity. The outer layer of the shell is either yellowish-brown or brown in color; the interior is glossy white (Nickerson 1978). Like other clams and cockles, razor clams may become contaminated with PSP; but they accumulate the toxin less readily and are safe to eat once all the dark portions (siphon, gills, digestive tract) have been removed. With the other clams and mussels, any part of the animal may contain high concentrations of toxin.

Razor clams are less abundant and accessible than other clams. Productive beds are found only at very low tide levels and on certain outer beaches accessible to Sitka residents only by boat. The most popular razor clam beaches in Sitka are Kamenoi and Brent's beaches on Kruzof Island. Commented one fisherman: "There's really only one worthwhile beach -- Kamenoi on Kruzof. On

a good tide -- there are only three or four tides a year where you can get razors -- you'll see a hundred people there. They're a bit of a novelty, a delicacy." Razor clams are collected primarily in the spring and early summer when good minus tides occur during daylight hours. Tides low enough for harvesting razor clams in the winter occur only at night.

Some informants report past declines in razor clams as a result of localized overharvesting, but the beds have usually re-established themselves within a few years. There does not appear to have been any overall decline in the number of razor clams in the Sitka area.

Survey results indicate that harvesting activities for clams and cockles are fairly evenly distributed among clam beaches from Neva Strait southward to the southern shores of Sitka Sound. Highest use is apparently on the beaches of east Kruzof Island and the Sitka shore from Sandy Beach to Starrigavan. Lower harvesting activity is indicated for areas beyond Salisbury Sound in the north and Hot Springs Bay in the South. Sitka residents harvest clams throughout the areas of this map, however, and elsewhere in southeastern Alaska. Distant harvests are coincident to other activities such as commercial fishing, hunting, and visits to neighbor communities.

#### ABALONE

Abalone was the second most popular intertidal resource harvested by survey households -- 32 percent had gathered them in the last year. The mean amount collected by harvesters was 5.2

gallons (1 gallon = 20 abalone); the median was 3 gallons. The mean for the entire sample was 1.5 gallons, which represents an annual harvest for the population of Sitka totalling approximately 3,000 gallons.

The species harvested is the pinto abalone (Haliotis kamtschatkana), the only species of abalone found in Alaska. It is abundant along the coastal waters of southeastern Alaska from Icy Straits south to Dixon Entrance. The pinto abalone is usually found clinging to cracks and crevices in rocks in thick kelp beds where surging waves cannot easily dislodge them. On more exposed islands and rocks, they are generally found on the lee side where they can maintain their hold on the rocks. Abalone prefer steep, outside coastlines where deep ocean swells and stiff currents circulate oxygen and algae, which is their main food. In deeper water they are found exposed on rocky patches near kelp beds and sandy bottoms. Their habitat ranges in depth from low low water (-2.5 to -3 foot tide) to 30-40 feet below sea level (Parker 1977).

The pinto abalone grows to six inches in length, but is rarely found longer than five and a half inches. A study in the waters of Ketchikan and Cordova determined that it takes 11 years for the pinto abalone to grow 4 inches (Koeneman and Larson 1980). Roughly 40 percent of the abalone's weight is edible meat. ADF&G personal use regulations for District 13, which includes Sitka, require that harvested abalone be at least 3.5 inches in diameter. In 1983 collectors are allowed a daily bag



and possession limit of 50 abalone per person. Permits were required in 1982 but were eliminated in 1983.

Abalone can be harvested throughout the year. There are two main methods: hand picking in the intertidal zone and diving in deep water. Intertidal collecting involves walking out onto the rocks at extremely low tides (minus 2-3 ft) and hand picking or prying the abalone off the rocks with a small knife or pry bar. Some people wear wetsuits and then snorkel around the rocks, prying the abalone off. Some abalone rocks such as those at Halibut Point and John Brown's Beach can be reached from Sitka's road system, but the best can only be reached by boat. Intertidal harvesting is best in fall and winter when the tides are minus and the water is clear of algae.

Deep-water collection of abalone involves diving with drysuits and SCUBA gear. Divers prefer a high tide so that they are not washed around by the waves and against the rocks. They harvest throughout the year, usually at a depth of 20 to 25 feet, many preferring late winter and early spring when the kelp is not too thick. Divers have a number of advantages over intertidal collectors. Among other things, they can find abalone in a wider range of habitats and can pick in seasons when daylight low tides do not occur and in less than ideal weather and surf conditions (Mills 1982). Intertidal gatherers accuse divers of overexploiting abalone rocks near Sitka. According to a Native interviewee:

We used to go for abalone, but now that they're diving for it, there's not enough. Diving should be outlawed. All of the locals are talking about how they don't get them any more.

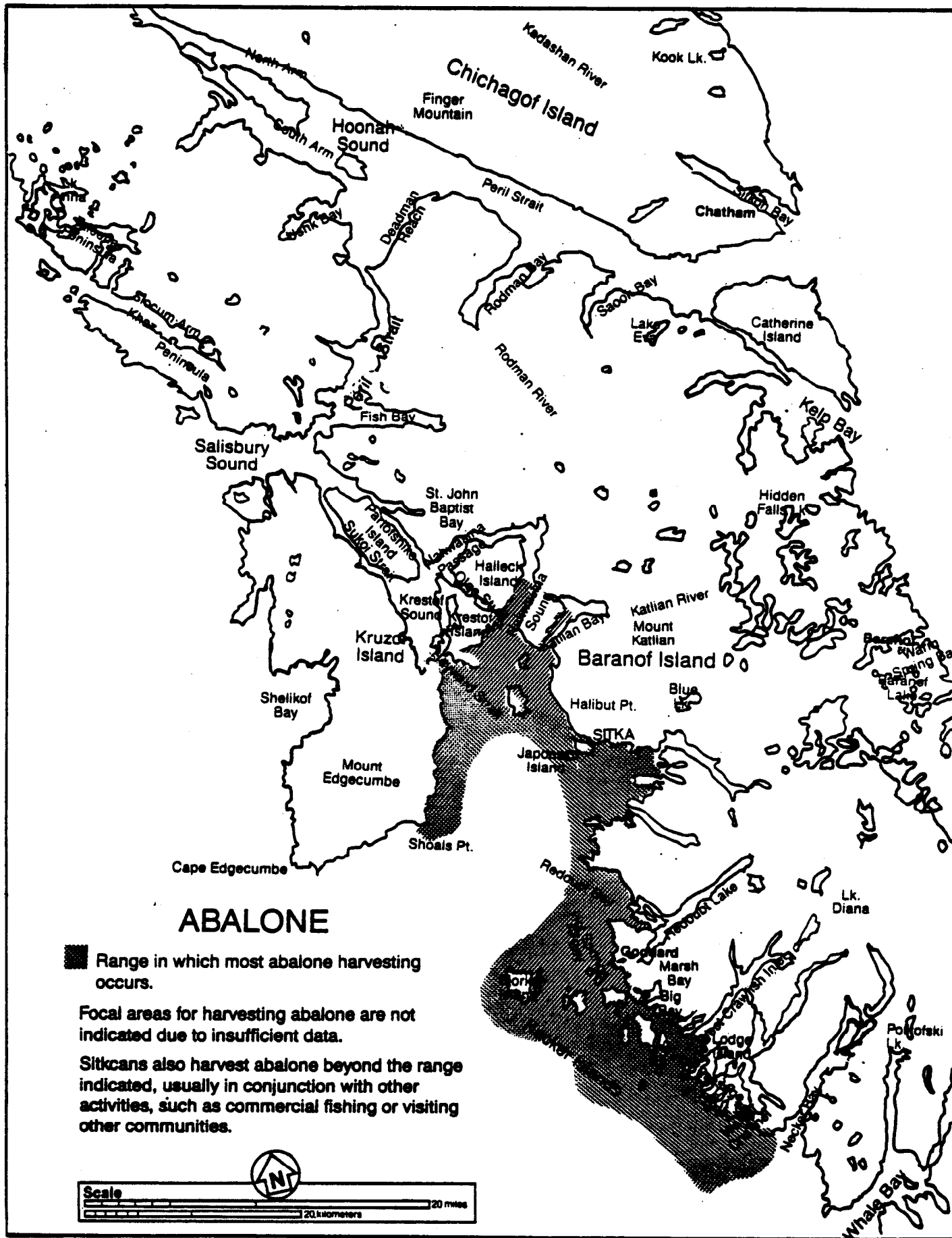
However, Sitka harvest data tabulated from 1981 catch calendars indicated that SCUBA collectors harvested fewer abalone in a year than intertidal collectors: a mean of 66.5 abalone compared to a mean of 81.6 (Mills 1982). According to a survey (n=224) by Mills, 65 percent of Sitka abalone harvesters do intertidal picking, 2 percent use snorkels, 17 percent use SCUBA gear, and the remaining 16 percent use a combination of methods.

Diving is fairly popular in Sitka, due largely to the exceptionally favorable conditions: water with a visibility of 40 to 50 feet in winter (up to 90 feet in some places), and a wide diversity of flora and fauna due to the relatively warm water (summer surface temperatures are around 55 degrees, winter temperatures are in the low 40s).

Data from the map survey as illustrated in Figure 7 indicates that Sitka residents do most of their abalone harvesting on the wave-exposed shores of Sitka Sound. Areas of special importance include Middle Island and the coast and islands from Cape Burunof to West Crawfish Inlet. Sitka residents harvest abalone throughout the exposed coasts of this region and beyond, when they travel to distant areas for such activities as commercial fishing.

Abalone are a delicacy and are highly prized. People relish their distinctive flavor; the pinto abalone has a delicate flavor all its own. Abalone are prepared by cutting the muscle

FIGURE 8. ABALONE, 1983.



or edible portion from the shell, cleaning it, and then slicing it in half. (The muscle is creamy-white in the center and mottled orange on the sides.) Most people pound the muscle before cutting, but this is unnecessary since pinto abalone are small and tender. Others marinate them before grilling or frying. Some Native households also cut off the "buttons", or portion of the muscle that attaches the abalone to its shell, and eat these. Most households freeze a quantity of abalone for winter use. Natives have long used abalone as a supplemental food and a trade item, and the shell makes iridescent decorations for their carvings, ceremonial dress, and fish lures (Jacobs Jr. and Jacobs Sr. 1982).

Abalone is one resource many Sitkans feel is declining. People complained repeatedly during interviews of not being able to find abalone at traditional collection spots in Sitka Sound and of having to travel further and further away to obtain them. Several people claimed that a person now has to travel between 15 and 20 miles from Sitka to find a decent abalone bed. According to one Native:

It [abalone] was an important food. Years ago there was a lot of them. But now you must go far to get them. We go to the entrance of Redoubt Bay. We used to go outside Middle Island but now that's picked over.

Abalone are not only scarce in the immediate area but also small in size. If secrecy about where to find abalone can be taken as an index not only of its desirability but also of its scarcity, then abalone are indeed becoming harder to find. Few

people would provide information, except in general terms, on the location of abalone rocks. They were much more open about other intertidal resources.

Alaska's only commercial harvests of abalone occur in southeast, with the Sitka region once contributing an important share of the harvest. Commercial harvesting developed slowly through the 1960s and 1970s, and reached a peak in 1979 when over 350,000 pounds were picked. Of this, nearly 70,000 pounds came from the Sitka area. Such large commercial harvests caused considerable resentment among local residents who found it harder to find abalone (Alaska Magazine 1980:32). Residents of some communities -- Hydaburg, Craig, and Klawock -- petitioned the Board of Fisheries to ban commercial harvesting and in 1978 part of their area was withdrawn from commercial use. Subsequently, the commercial harvesting of abalone in Sitka Sound was stopped. Today commercial abalone picking only occurs southwest of Dorothy Narrows.

#### HERRING EGGS

Herring eggs are an important resource in Sitka, both in terms of the number of households and the quantities harvested. Herring eggs were collected by 24 percent of survey households, and significantly more Native households (62 percent) than non-Native households (11 percent) harvested them. The mean annual estimated harvest for the gatherers was 14 gallons; the median was 3.5 gallons. The mean harvest for the entire sample was 3 gallons which represents an estimated annual harvest of

approximately 6,000 gallons for the entire population of Sitka.

In early spring, usually in April, the warming waters around Sitka trigger the herring (Clupea harengus pallasii) to spawn. The male fish emit their milt into the water. The females then deposit their roe in the milt, completing the fertilization process. The developing eggs fasten to kelp, seaweed, rocks, or any object placed in the water. They sometimes occur in such numbers that they form waverows on the beach. And many people recalled a time when the herring spawned in such numbers that bays and miles of shoreline around Sitka were said to have turned white and milky. Commented one woman, "The waters used to be white from Sandy Beach miles up the channel but no longer." A good spawn takes only a few days to develop into a thick layer of eggs.

Herring eggs are harvested for personal use in two ways: 1) by placing hemlock branches into the intertidal zone, and 2) by collecting the eggs which have formed naturally on seaweed or kelp. In Sitka the first method is preferred. Green hemlock branches or entire trees are cut and attached to a buoy or line from the beach and lowered into the water. They are left in the water from two days to a week to collect eggs and are then recovered.

Theft appears to have become a problem in recent years. Several residents complained that other people steal their hemlock boughs. One man attributed this development to the influx of newcomers into Sitka since World War II:

Before the war you could leave hemlock boughs in the water for a week and no one would touch them. Today you have to put more branches in the water than in the past and you have to have someone watch them. My brother put 14 trees down last year and only 1 was not taken, and that was across Sitka Sound.

Some collectors have dispensed with buoys to avoid drawing attention to the location of their hemlock branches.

Herring eggs are also harvested from kelp and seaweed. Most people go by boat to kelp beds and pull up the egg-laden kelp with grappling hooks. A few dive into the kelp or seaweed and pull it up by hand. Still others bring kelp or seaweed into an area prior to the spawn and then collect it as they would hemlock branches. The most popular seaweed for eggs is maiden hair seaweed or "hair kelp". It is collected at low tide, the eggs showing up as a large white ball or spot in the water. Other seaweeds from which eggs are collected include ribbon kelp, giant kelp, and eel grass. In Sitka kelp or seaweed-based herring eggs are not as popular as hemlock-bough eggs. Explained one Native informant: "... the seaweed gives it a taste I don't like and the eggs are slimy. I like the taste the branches give it."

Herring eggs are collected many places in Sitka Sound, usually within ten miles of town and often right along the city's shoreline. Areas noted in the map survey (**Figure 8**) include Japonski and Middle islands, and the shore of Baranof Island from Silver to Redoubt bays. Actual harvest areas vary each year, depending on where the herring spawn. The year 1983 was





acknowledged to be a good year for herring eggs and they were harvested in many areas along the shoreline of Sitka Sound.

Despite the abundance of the herring egg harvest, many informants complained about what they view as a serious decline in the number of herring in Sitka. Most attributed the decline to pollution from the pulp mill and city sewage and to commercial over-exploitation. According to one resident, "it's not safe to put branches along the shore in Sitka because of the sewer. We used to go just past Halibut Point, but not now. Now most people go away from town."

One resident, a commercial fisherman himself, objected strongly to the type of herring fishery that is allowed because of the large numbers of fish destroyed in the process. In a sac-roe fishery, herring are caught in purse seines, allowed to ripen a few days, and then the roe is squeezed directly from the female fish. The fish die in the process and are not utilized nor do they enter the food chain for salmon to eat. He asserts that herring have been wiped out in many areas outside Sitka, with Sitka Sound and Tenakee being two of the few areas within the Sitka-based fishery where they are still found. He believes that herring roe should be collected from kelp rather than live fish. This same man also expressed a common local belief that the current limited entry system, with its expensive permits and high profits for those few who have them, places political pressure on the ADF&G to keep areas open to the "Rich 50" (commercial fishermen with herring permits) which should be

closed to preserve stocks of herring, and indirectly of salmon.

According to an ADF&G fisheries biologist, however, herring stocks in Sitka Sound are currently high and have been increasing steadily over the last 15 years (Alan Davis pers. commun., 1983). Many Sitka residents noted the abundance of herring near Sitka in 1983 and expressed hopes that the increase would continue.

Herring eggs are a prized food in the Native community and are served on all special occasions. At home the eggs are removed from the branches by quickly dipping them in hot water. The roe turns white and is then stripped off the branches. The traditional cooking method is to quickly immerse the eggs in hot water, just until they are opaque. If left in the water longer, the eggs become tough. They are then dipped in eulachon grease, seal oil, butter, or soy sauce, and are usually served with boiled seaweed. Herring eggs are a nutritional food, low in calories and high in B vitamins (Hooper 1981).

In the past, herring eggs were preserved for winter use by salting, air drying for several days, and sometimes by smoking. They were soaked in water before use to reconstitute them. But just as butter and soy sauce have replaced eulachon grease and seal oil in many households, so freezing has replaced traditional methods of preservation. According to one Native woman,

Before we used to salt them and then freshen them up before cooking. We also used to dry them in the sun. We'd hang them in a tree for days. You could eat them dry or pour seal oil over them in a bowl. But now we freeze them.

#### SEAWEED

Seaweeds including kelp are also harvested by many Sitka households. The most popular species collected by the survey households were: black seaweed (Porphytra perforata) by 12 percent; red or ribbon seaweed (Palmaria palmata) by 4 percent; and bull kelp (Nereocystis luetkeana) by 10 percent of the households. Black seaweed is especially important to the Native community; significantly more Native households harvested it (31 percent) than non-Native households (7 percent). More Natives than non-Natives also collect red seaweed (see Table 18), but the subsample was small and the difference was not statistically significant. Kelp is collected by an equal percentage of Natives and non-Natives.

As shown in Table 19 the mean quantity of black seaweed collected by harvesting households (based on survey estimates) was 17.4 gallons (the median was 5 gallons); for red seaweed it was 7 gallons (median 5 gallons); and for kelp it was 7.3 gallons (median 6 gallons). Means for the entire sample and the approximate annual harvest for Sitka of each resource are as follows: black seaweed, a mean of 1.75 gallons and total of 3,500 gallons; red seaweed, a mean of 12 gallons and total of 400 gallons; and kelp, a mean of .5 gallons and total of 950 gallons.

TABLE 18. COLLECTION OF INTERTIDAL RESOURCES BY ETHNICITY

Species Collected	Percentage of Sitka Households		
	All (n=139)	Native* (n= 29)	non-Native (n= 98)
Clams	50	55	47
Abalone	32	28	34
Herring eggs**	24	62	11
Razor clams	19	14	21
Cockles**	19	41	13
Gumboots**	12	28	8
Black seaweed**	12	31	7
Kelp	10	10	10
Scallops	6	3	8
Sea cucumbers	6	3	8
Sea urchins	6	7	5
Mussels	4	3	5
Limpets	4	0	6
Red seaweed	4	7	3
Seagull eggs**	1	3	0

\* "Native" includes native and mixed native-white households.

\*\* Indicates that the difference in household usage was statistically significant using the Chi Square test at the .05 level of significance.

TABLE 19. ANNUAL HARVEST OF INTERTIDAL RESOURCES

Resource	% Households Harvesting* (n=139)	Mean Gallons Harvested by Gatherers (n=86)	Mean Gallons Harvested by Entire Sample**	Total Annual Harvest (gallons)
Butter & Littleneck clams	50	7.5	3.2	6,400
Cockles	19	2.3	.3	600
Razor clams	19	5.7	1.1	2,140
Abalone	32	5.2	1.5	3,000
Herring eggs	24	14.0	3.0	6,000
Gumboots	12	10.5	.3	600
Black seaweed	12	17.4	1.8	3,500
Red seaweed	4	7.0	.2	400
Kelp	10	7.3	.5	950
Scallops	6	1.5	.1	180
Mussels	4	4.6	.2	330
Limpets	4	4.6	.2	330

\* The total number of Sitka households used in this table is 2,100. This is a rounded average of two figures: the 1978-79 figures (2,282) used by the Alaska Public Survey and a 1983 estimate (1,900) provided by the Sitka city manager.

\*\* Although most households provided harvest data, not every household did. Consequently, these figures should be treated as rough estimates only.

Black seaweed is harvested at two times of the year: spring and winter. The spring growth is known among Natives as "fake seaweed" or "herring spawn seaweed" and is harvested during a two-week period beginning in late April or early May. A second spring growth, called "the budding of the bush" in Tlingit, is ready a month later and is also harvestable for a two or three-week period only (Pelayo 1983). Once the seaweed has lost its blackness and acquires a greyish "washed out" appearance, it is no longer good. Black seaweed is seldom good after mid-June in Sitka (Jacobs Jr. and Jacobs Sr. 1982). Seaweeds come into season at slightly different times in different locations around Sitka, apparently depending on water temperature.

May is considered the best time to gather black seaweed. The new growth is said to have a better flavor than older seaweed, and its quality is not diminished by shellfish eggs which often cover the leaves of older plants. The weather in May is also better for drying seaweed. Winter seaweed, the third growth, is available in February. It is more tedious to harvest because it is shorter and harder to pull off the rocks, but many say its flavor is the best.

Black seaweed is picked on a minus tide. It is pulled off the rocks and placed in plastic garbage bags or five gallon plastic buckets. Picking on the slippery seaweed-covered rocks can be treacherous. Most people gather enough in one trip to last an entire year. There is access to black seaweed from the road system at Halibut Point recreation area, John Brown's Beach,

Starrigavan, and Silver Bay. But people with boats prefer to get away from Sitka and its sewage to collect seaweed on the outer islands or away from Sitka Sound altogether; places mentioned were Salisbury Sound, Biorka Island, and Redoubt Bay.

Red seaweed grows from 5 to 15 feet in length and is reddish-brown in color. It grows year round on rocks or on bull kelp in the intertidal and subtidal zones. It too acquires a washed out look when it<sup>is</sup> old and no longer growing and edible. Red seaweed, described as having a nut-like flavor, is a delicacy among Natives and the local Japanese. Yet it is collected less often than black seaweed apparently because it is harder to find. One Native family reported formerly travelling to Salisbury Sound to harvest their annual supply, but now it is even rare there. Consequently, they no longer collect it but buy it dried from a friend in Haines. A Native commercial fisherman stops to harvest his supply near Yakutat each year on his way back home.

Bull kelp is usually collected from a boat when it is intended for use as food. For example, one person collects it in five fathoms of water when it has just grown high enough to reach the surface. The kelp is simply pulled up by hand. Many Natives use a long pole with a "T" on the end of it, twisting it up from the bottom. When they want to collect it for garden fertilizer or a soil substitute, many people wait until February and harvest it off the beach after big winter storms.

Seaweed is considered a delicacy or prestige food among Natives. Indeed, black seaweed is very expensive to buy if a

household cannot collect its own supply. One person referred to it as "black gold". Another paid \$50 for a 10 pound sack in Hoonah last year. This year he made sure he had enough to last until next spring, commenting:

Several people saw me preparing my seaweed and wanted to know if I'd sell them some. I wouldn't sell any if I had just enough for our own household. Now that most people work for wages, they can't always get out when the tide is right.

Black seaweed is also highly valued by those non-Native households who use it.

Black seaweed is usually dried for household use.

According to Jacobs Jr. and Jacobs Sr. (1982) before the days of the meat grinder it was pounded into a uniform mass and completely dried. A few Native households still compress seaweed into cakes: while drying it is weighed down in a container with a flat board and rocks. Dried seaweed is sometimes sprayed with clam juice or dipped in vinegar and eaten like a potato chip, since it is crisp and slightly salty. Black seaweed also makes a good condiment or nutritional additive to flour or cereal.

Red seaweed is chewier and slightly nutty in flavor.

Natives flavor seaweed with seal oil, eulachon oil, or salmon roe. They may add it to any kind of boiled fish and seafood dishes, use it in soups and chowders, or mix it with rice, diced abalone, or clams in chop suey-like dishes. Non-Natives use it too, eating it dry as a snack, adding it to oriental dishes, and even cooking it as a side vegetable with roasts. One man said he



crushes his dried seaweed, places it in a shaker, and uses it as a seasoning salt. Japanese households in Sitka also make extensive use of seaweeds.

Bull kelp is seldom used as food by non-Natives or Natives except when it is harvested with herring eggs. The fronds are edible: when dried, they can be quickly dipped in water and fried, popping up into a natural potato chip. Several households (the researchers included) started using kelp this way after being introduced to it in a National Park Service-sponsored edible plant class held in the summer of 1983. Also, a few non-Natives make kelp pickles, and recently more are learning as a result of Cooperative Extension Service information. Kelp is also used as a vegetable in egg and tomato dishes (Jill Thayer pers. commun., 1985).

The most common use of kelp, however, is not as a food but as a fertilizer and in some cases a soil substitute for gardens. Fifty-seven percent of the survey households with gardens harvested kelp for use as fertilizer; 17 percent of the entire sample did. According to the Sitka Cooperative Extension agent, kelps (Macrocystis and Nereocystis) and seaweeds (Fucus) add body and nutrients to the soil, make plants more disease and frost resistant, and possibly, contribute to the shelf-life of fruits (Jill Thayer pers. commun., 1985). One avid gardener annually collects an estimated 100 cubic feet of Fucus for his garden. He also adds broken clam shells and occasionally starfish. He has a potato patch in which the

potatoes are growing entirely in kelp; the yield was superior to potatoes that were grown in soil.

#### GUMBOOTS

Three species of chitons or gumboots are found in the Sitka area: in order of importance, the black katy or leather chiton (Katharina tunicata), the giant Pacific chiton or gumboot (Cryptochiton stelleri), and the lined chiton (Tonicella lineata). All are edible and the term "gumboot" is used generically, but only the leather chiton and giant Pacific chiton are commonly harvested by Sitka residents; the lined chiton is rarely harvested because of its small size (Jill Thayer pers. commun., 1985). This pattern of harvest is also true for Tlingits throughout the northern part of the Southeast (Gabe George pers. commun., 1984). The gumboot samples turned in by Native informants to the Mt. Edgecumbe hospital in Sitka for nutritional analysis were all leather chitons (Hooper 1981).

Gumboots were collected by 12 percent of the sample households. They are primarily a Native food: 28 percent of Native households had collected them compared to only 8 percent of non-Native households. Due to incomplete reporting and small sample size, harvest figures are not given here.

Gumboots occupy boulder-strewn, wave-beaten outer beaches, not gravel, sand, or mud habitats like most other mollusks. Gumboots are a special-occasion food, not a daily staple. They are served at feasts, potlucks, celebrations honoring an individual, holidays, and special Alaskan Native

Brotherhood events. They are either eaten raw, sauteed very quickly, or gently simmered -- virtually rubbing them over a hot surface will cook them enough for eating. The taste is similar to abalone.

#### SCALLOPS

Only six percent of survey households had harvested scallops in the last year. The species available in the Sitka area include the rock scallop (Hinnites multirugosus), which is the primary target species, the weathervane or giant Pacific scallop (Pecten caurinus), and two other species --Chlamys hastata and Chlamys rubida. Scallops are not widely harvested because of their subtidal habitat. Both the rock scallop and giant Pacific scallop are found in deep water -- 80 to 100 feet -- and are therefore available only to divers. Even then they are not plentiful. According to one diver,

On an ab [abalone] dive you might find two or three scallops if you're lucky. They are long-lived and slow-growing and cannot stand much pressure. Their distribution is spotty. Some days we'll find weathervane scallops and others we won't.

The chlamys or pectins are more numerous, especially in Katlian and Silver bays, but are also subtidal. There is some commercial scallop fishing in the Sitka region.

#### SEA CUCUMBERS

Six percent of survey households had harvested sea cucumbers in the previous year. Several species are found in the Sitka area, but only one (Parastichopus californicus) is

eaten. The sea cucumber is an echinoderm like starfish and sea urchins and resembles a warty cucumber. Those in the Sitka area average about four inches in length and are easily collected in the intertidal zone. They are considered a delicacy by Natives in that they taste like scallops but are little used today. The reasons for their declining popularity among Natives, according to our conversations with Native informants, are the abundance of other desirable resource and the small amount of edible meat harvested from each. Non-Native interviewees also cited the "messiness" involved in preparation: sea cucumbers are prepared by first cutting off one end, at which time the animal discards its viscera -- described as an unpleasant "goo" -- "in the hope that you will be satisfied with that and allow it to escape" (Jill Thayer pers. commun., 1985). Then they are slit open and five thin longitudinal muscles, the only edible portion, are peeled away from the wall, rinsed, and prepared for frying.

#### SEA URCHINS

Sea urchins were also harvested by six percent of survey households. Several species occur in the Sitka area, including the purple urchin (Strongylocentrotus purpuratus), red urchin (S. franciscanus), and green urchin (S. droebachiensis). The Native people consider the smaller, green urchins to be a "special snack" or treat to be eaten in summer when the gonads ripen, or as a survival food when necessary on hunting trips or during emergencies (Mark Jacobs pers. commun., 1983). Eighty percent of the innards in both sexes of sea urchin are edible roe.

Sea urchins have the same disadvantages as sea cucumbers for food. They require considerable effort for little food and are highly perishable. Furthermore, the prime season for eating, when the gonads ripen, is short -- approximately one month. But most important, other desirable resources are abundant and hence the sea urchin is not commonly used. As one non-Native couple explained, "We've tried sea urchins but don't need to use them. After all, we have two freezers full [of other sea food]."

#### LIMPETS AND MUSSELS

Limpets were harvested by four percent of the survey households. Several kinds of limpets are found in the Sitka area, including the fenestrate or chinaman's hat limpet (Acmaea fenestrata), the mask limpet (Notoacmea persona), the dunce cap or right cap limpet (Acmaea mitra), the keyhole limpet (Diadora aspera), and the fingued limpet (Collisella digitalis). Limpets share the same habitat as gumboots -- boulder-strewn, surf-pounded outer shorelines. At low tides they are easily pryed off the rocks. The edible portion is easily popped out of its shell and can be eaten raw, steamed, fried, or added to chowder. And like abalone and chitons, they do not carry PSP.

Mussels were also collected by four percent of sample households. Blue mussels are harvested from intertidal waters throughout the Sitka area. Like clams, mussels are only harvested in winter or spring and are susceptible to PSP toxin. According to some experts, mussels are the most dangerous

bivalves in this regard (Bill Hughes pers. commun., 1984).  
Mussels can be prepared in the same way as clams and cockles.  
Both limpets and mussels are considered survival foods by Native  
people -- as something to be eaten when stranded and hungry or  
when other foods were unavailable.

#### SEAGULL EGGS

Only one percent of the households surveyed had harvested  
seagull eggs the previous year and all were Native households.  
Current migratory waterfowl management in Alaska prohibits the  
taking of seagull eggs (Linda Ellanna pers. commun., 1984).  
Informants, however, often expressed confusion as to the  
legality of harvesting seagull eggs. And once, seagull eggs were  
a valued Native resource. Older Natives still talk about how  
good they are and how they miss eating them (Helen Hooper pers.  
commun., 1983).

In the Tlingit language, June is known as the "breeding"  
or "nesting month" and was traditionally the time for gathering  
bird eggs of many species (Jacobs Jr. and Jacobs Sr. 1982).  
Favorite locations for gathering seagull eggs in the Sitka area  
include Beili Rocks, Sea Lion Islands, and (before they became a  
National Wildlife Refuge) St. Lazaria Islands. According to  
Native interviewees, eggs should be harvested when the grass is  
about 18 inches high. And before use they should be subjected to  
the "float test" -- if an egg floats in fresh water, the chick is  
too developed for human consumption but if it sinks, it is fresh  
and suitable for eating. Seagull eggs are large, about twice the

size of hen eggs. And they can be used in the same way as hen eggs; Natives used to fry and sometimes pickled them.

#### OCTOPUS

While no data were collected on the harvest of octopus (Octopus dofleini) in the household survey, several informants mentioned harvesting them. Their primary use in Sitka, however, appears to be as halibut bait. They are caught in baited pots and are excellent for fishing because they stay on the hooks. As a food, they appear to be most popular among Native and Japanese households. According to one person, "Every time there's a Japanese potluck dinner in town, they serve octopus."

Octopus are usually caught on the reefs at low tide. Natives used to put bluestone (hydrated copper sulfate) into a canvas glove and tied it to the end of a stick, which they pushed into a hole in the reef, forcing any octopus hiding there to flee. Today they put a "T" on the end of a stick which the octopus grabs, and then they pull it out. Others use a halibut hook attached to a stick. Explained one man:

You look for dens which you can tell by the number of crab shells or clam shells which the octopus has been feeding on. Then you reach into the den with a halibut hook and yank the octopus out. You never get many, maybe one or two each trip.

Still others gather octopus while scuba diving.

While some people go out specifically to harvest octopus, most of them are taken incidental to other gathering. One

non-Native Sitkan said he usually gets his when out clamming, abalone picking, or diving. Similarly a Native explained, "If we were on a poor deer hunting trip we would go out for octopus or dig a few clams, get something to make the trip pay." Octopus are said to taste like cockles. After cleaning, they can be pickled, boiled or fried; large ones need to be pounded to tenderize the meat before frying.

Other intertidal resources like starfish, broken clamshells, herring, and fish heads are collected for use as garden fertilizer. Thirty-five percent of those households with gardens harvested starfish (11 percent of the entire sample) for this purpose. Starfish and shells are high in lime and nitrogen and make an excellent fertilizer. An additional 12 percent of survey households used fish heads (38 percent of those with gardens) and 7 percent used herring (22 percent of those with gardens).

#### SUMMARY

Residents of Sitka use a wide range of intertidal resources. The most popular of these -- measured by the percentage of the population that harvests them -- are clams, abalone, seaweeds and kelp, and herring eggs. In terms of the amounts harvested, the same resources are most important, although the order of their importance is reversed: clams, herring eggs, seaweed and kelp, followed by abalone.

Intertidal resources are used primarily for food, but also indirectly as a soil supplement and in crafts. Two Sitka



women, for example, collect shells, sea urchins, gumboot shell plates, starfish, seaweed, and other items found in the intertidal zone. These are made into a variety of craft objects, including jewelry, stationary, book marks, and lamps. Their business, Alaskan Beach Treasures, sells through gift shops and book stores in Sitka. Other residents make similar items for home use.

## CHAPTER 6

### PLANT GATHERING

#### INTRODUCTION

Plant gathering is the second most popular resource use activity in Sitka when measured by the number of households that engage in it. Seventy-seven percent of survey households had gathered berries, greens, roots, or mushrooms in the last year; 86 percent had done so in the last 5 years. More Sitka households collect wild plants than cultivate gardens (30 percent).[1] In addition, 69 percent of the survey households had collected wood from local beaches, forests and ocean, primarily to heat their homes but also for construction, handicrafts, and smoking fish and game.

The information in this chapter comes from a variety of sources including the household survey, interviews with U. S. Forest Service and National Park Service botanists, a wild foods expert, Sitka's Cooperative Extension agent, and numerous

---

1 This figure is somewhat higher than that reported by the Alaska Public Survey which found that 25 percent of southeast Alaskan households had grown their own vegetables in the last 12 months.

knowledgeable plant harvesters. Written sources were also consulted, and one researcher participated in several plant identification classes and gathering field trips. Edible plants are abundant in the Sitka area. The main habitats where edible plants are found in the Sitka region include bogs (muskeg), the upper beach rocks and meadows, old growth forest edges, logged areas, sub-alpine, and disturbed areas.

Sitka residents harvest most plants quite close to home, seldom travelling more than a few miles. They gather plants along the roadside or in the forests of their immediate neighborhood, make excursions to Indian River Trail, Harbor Mountain, Blue Lake Road, or the campground at Starrigavan Bay. Substantial travel is only necessary to find resources like cranberries, nagoonberries, strawberries, and certain mushrooms, which may be unavailable or scarce near Sitka. When this is the case, the plants are often gathered coincident to other activities such as boating, beachcombing, fishing, camping, or exploring.

Compared to hunting, fishing, and even intertidal gathering, plant gathering is a relatively home-based activity. It is usually (although, not of necessity) done by women and children. While we have no survey data to directly support this, it was readily apparent from observation and interviews. Women who do not work outside the home often go out gathering in the summer while their husbands are at work or away fishing. Plant harvesting is compatible with child care, being done close to

home and presenting little danger (bears can be a threat in some places). Women are the primary plant gatherers in most foraging societies for the same reason.

The household survey supports the observation that plant gathering is very much a family activity: 76 percent of those who gathered plants in the last year had done so with members of their immediate household. Table 20 shows the composition of plant gathering groups. Most people gather with two other people: the mean was 2.7 including the respondent. The mean number of trips made to gather plants in the last year was 12.1, but this figure fell to 7.6 times (close to the median of 6.3) when households going over 20 times were eliminated.

Plant harvesting requires little equipment other than a pail or bags and possibly a knife or small trowel. Because most plants are abundant, individuals can spend as much or as little time as they decide to invest and still achieve success. Only a poor season brought on by unusual or untimely weather conditions (e.g., excessive rain, early and late frost), or heavy gathering by other residents in a particular locale, can seriously diminish individual harvests.

Plant gathering is the easiest of the harvest activities, especially for the majority who only harvest berries. As mentioned above, it can be done close to home, equipment is minimal, and little experience is required. Other types of plant collection, however, often demand substantial knowledge. Making full use of the plant requires a familiarity with edible plant

TABLE 20. COMPOSITION OF PLANT HARVESTING GROUPS

Relationship of Harvesters*	Frequency (n=105)	Percentage**
Household Members	71	76
Friends	32	34
Other Relatives	25	27
Neighbors	3	3
Co-Workers	1	1
Visitors	0	0

\* Respondents were asked how the people they usually gather with are related to them.

\*\* Up to three responses were coded. Percentages, therefore, do not add up to 100.

TABLE 21. BERRIES HARVESTED BY SITKA RESIDENTS

Species	Percentage of Harvesting Households (n=105)	Percentage of Entire Sample (n=139)
Blueberry	99	75
Salmonberry	92	70
Red huckleberry	78	59
Strawberry	20	15
Stink currants	14	11
Cranberries	12	11
Thimbleberry	11	9
Cloudberry	9	6
Nagoonberry	8	6
Red elderberry	6	4

identification, productive locales, harvest times, preparation and preservation methods, and non-food uses (such as medicine or dyes). In traditional times, the Tlingits used a wide assortment of plants; but they were also selective, ignoring some, such as mushrooms, altogether. Modern residents of Sitka use far less than the indigenous population once did. Still, the range of plants used by some residents is impressive and includes a variety of berries, greens, roots, and mushrooms as well as wood.

#### BERRIES

The berries most commonly picked by survey households (as shown in Table 21) are blueberries, salmonberries, and huckleberries. All are prized for their taste, especially blueberries and huckleberries, but they are surprisingly low in vitamin C, apparently due to the limited sunshine which is known to affect the production of ascorbic acid in plants (Hooper 1981). Berries are harvested during the summer and early fall, the prime months being July and August.

Blueberries were harvested by 75 percent of the survey households. Two species of blueberries are abundant in the Sitka area: the early blueberry (Vaccinium ovalifolium), which ripens in early July, and the Alaska blueberry (Vaccinium alaskanese) which ripens in late July and lasts until late August. The Alaska blueberry is darker, more juicy, and has a bland taste compared to the early blueberry. Both are prone to get wormy when they grow in wooded areas.

Seventy percent of the survey households had harvested

salmonberries (Rubus spectabilis) in the last year. These orange and red berries ripen in late June through July on large shrubs which form dense thickets in open areas such as roadsides, shorelines, and forest clearings. In early spring, April and May, the young tender shoots can be peeled and eaten raw. Both shoots and berries were traditionally eaten by the Native population. Few people today eat the shoots, except as a casual activity when walking past a salmonberry patch. The large, watery berries, however, are harvested in large quantities by both Natives and non-Natives.

Red huckleberries (Vaccinium parvifolium) were harvested by 59 percent of survey households. They are plentiful in Sitka, growing on bushes in open forests and clearings and stumps and ripening in August and September. Huckleberries are sometimes eaten or prepared with other berries, but most people value their flavor highly and make a special effort not mix them with anything else.

Wild strawberries (Fragaria chiloensis) are highly prized but difficult to find in the immediate Sitka area. Nevertheless, 15 percent of survey households reported harvesting some. Their usual habitat is sandy forelands just above coastal beaches. They ripen in July and are considered a sign that July has arrived, "whether it's here by the calendar or not." A few residents gather strawberries as far away as Lituya Bay (although such trips are combined with other activities like commercial fishing). One beach north of Cross Sound was described as having

so many strawberries in summer that it has a "pink sheen" when approached from the sea.

Natives traditionally preserved strawberries by letting them fully ripen, spreading them in a shallow pan until the juice had separated from the pulp, then discarding the pulp and allowing the juice to dehydrate. This left a rubbery mass, the consistency of taffy, which was smoked and stored for future use as a food sweetener.

Stink currants (Ribes bracteosum), also known as blue or skunk currants, were harvested by 11 percent of survey households. They have a waxy coating which gives them a blue-grey appearance. They are gathered in late summer from lanky, trailing shrubs occurring in forest openings and along the banks of streams. Traditionally they were used by Natives to preserve other berries. They were also boiled in cedar boxes, mixed with powdered skunk cabbage leaves, and dried for four or five days on wooden frames over a low fire. The dried cake could then be dissolved in water and eaten mixed with eulachon grease. Natives also made a home brew out of currants and elderberries in more recent years (Mark Jacobs pers. commun., 1983). Today currants are eaten fresh with milk and sugar or made into a rather musty tasting jam.

Cranberries (Vaccinium vitis-idaea) were harvested by nine percent of survey households. They are harvested in the mid-fall because the fruit is sweeter after a frost. These tiny shrubs occur on the mossy slope sometimes found between high tide



and the forest edge, open forest near muskegs, and dry muskegs. Numerous informants reported that these tart berries are becoming scarce at Sitka; some of the best patches were built over as the town expanded. This fact may well be limiting consumption.

Thimbleberries (Rubus parviflorus) were also harvested by nine percent of survey households. These thicket forming shrubs grow in clearings and along roadsides and shorelines. The red berries ripen in August. Thimbleberries are a member of the rose family and are closely related to salmonberries, nagoonberries, cloudberry, and raspberries. The berries are palatable but coarse and seedy in texture.

Red elderberries (Sambucus racemosa) were collected by four percent of survey households. These large shrubs grow along the forest edge, in forest openings, near stream banks, shorelines, and along roadsides. Despite their abundance, they are hard to use because the raw berries are very tart, contain a large hard seed that causes nausea, and the plant itself is poisonous. Nevertheless, Natives once used red elderberries widely, mixing them with other berries. Traditionally they were cooked overnight in steaming pits lined with skunk cabbage leaves or else boiled in cedar boxes. The mixture was then ladled onto skunk cabbage leaves atop cedar racks and dried over a low fire for a day. The resulting cakes were then stored in cedar boxes. Today, people use red elderberries for jam and wine.

Other edible berries found in the Sitka area include the cloudberry and nagoonberry. Both of these tiny shrubs produce

only one-two berries per plant. Cloudberries commonly occur in muskegs and have watery, yellow-orange raspberry-like fruit. Nagoonberries have a delicious red raspberry-like fruit and are locally abundant in some upper-beach meadows.

Berries are used in a variety of ways. The most immediate use is simply to eat them raw; this is especially true for salmonberries, which are large, plentiful, and easy to pick. Few people, however, gather berries solely for immediate consumption. Most bring back large quantities to freeze, make into pies, sauces, or preserve as jams and jellies -- the most popular use. Some Natives still make berry cakes or "leathers" from blueberries, huckleberries, and currants. Liquors and wines are also made from berries. One interviewee made five gallons of wine from huckleberries, another family made five gallons each of huckleberry, salmonberry, and raspberry brandy, as well as several gallons of currant wine.

A substantial amount of berries can be harvested with little effort in a good year. On one outing, the authors filled a five gallon bucket with salmonberries weighing 34 pounds in one and a half hours. This single harvest produced 36 pints of jam. Of all the available berries in Sitka, salmonberries are said to give the best yield per time spent due to their abundance and large size. Some Sitka families put up as much as 100 pints of jelly each year. Most jam and jelly is for home use or distribution to relatives and friends, but some small-scale commercial production is also involved. One enterprising 11

year old boy, for example, collects salmonberries and red huckleberries, buys glass jars at garage sales, and pectin, sugar, and lids from the grocery store and makes jam which he sells to tourists from the street corner in downtown Sitka.

#### GREENS

The Sitka area contains many edible wild greens, and 15 different species are regularly harvested by local residents (see Table 22). The percentage of households harvesting the various greens, however, is substantially less than the number harvesting berries. The most commonly harvested greens -- fern fiddleheads and goose tongue -- had been gathered by only 12 percent of survey households. Labrador or Hudson Bay Tea had been harvested by ten percent of survey households; the remaining species were harvested by five percent or less.

Still, the range if not the number of green plants utilized is impressive. And according to National Park Service Rangers and the cooperative extension agent there appears to be a growing interest in learning more about edible plants. Two courses on identifying wild edible plants at the local community college in the summer of 1983 could not accomodate the number of interested people. And the cooperative extension agent, National Park Service rangers, and U.S. Forest Service botanist are frequently approached by residents with plant specimens to identify.

Not every usable plant is harvested, however. Many common edible plants are ignored, such as the leaves and flowers

TABLE 22. GREEN PLANTS HARVESTED BY SITKA HOUSEHOLDS

Species	Percentage of Harvesting Households (n=105)	Percentage of Entire Sample (n=139)
Fern Fiddleheads	16	12
Goosetongue	15	12
Hudson Bay Tea	13	10
Fireweed	7	5
Beach Greens	5	4
Wild Celery	5	4
Wild Cucumber	6	4
Dandelion	5	4
Devil's Club	4	3
Lambsquarter	3	2
Beach Asparagus	3	2
Chamomille	3	2
Yarrow	3	2
Kamchatka Lily	2	1
Clover	2	1

TABLE 23. SOURCE OF HARVESTED WOOD

Location	Percentage of Harvesting Households (n=93)	Percentage of Entire Sample (n=139)
Beach	60	40
Forest	53	35
Water	25	16
Other	14	9

Percentages do not add up to 100 since respondents may have harvested wood in more than one place.

of violets, the spring leaves of saxifrage or "salad greens", the seed tops of the broad leaf plantain, sweet cicely roots, and the seeds and pith of most grasses and sedges. One of the primary reasons for the underuse of greens compared to berries is the fact that harvesting greens requires greater knowledge. Some plants are poisonous, even some that look perfectly edible, like wild peas and vetches. The deadly water hemlock, for example, is easily mistaken for cow parsnip. The false lily of the valley is very similar in appearance to the violet, and the poisonous swamp or bog laurel can be confused with Hudson Bay tea.

In other cases precautions have to be taken before plants are used. The ergot (black powdery substance) found on the surface of the otherwise edible seeds of many sedges and grasses is very poisonous. The brown stems of the common horsetail, which taste like asparagus, can be eaten in spring if the bracts on the stems are peeled off. The green shoots of the horsetail, however, are poisonous (Ken Wilson pers. commun., 1983). Other plants and flowers are inedible or poisonous under all conditions. A caller on "Problem Corner", a popular community radio program in Sitka, came on the air one day to announce: "Will the woman who is eating foxglove at the corner of Cathedral and Seward please report to the Emergency Room at the hospital before you go into convulsions."

Fern fiddleheads were the most popular green plant harvested by the survey households. Most ferns have edible rhizomes and fiddleheads although mature fronds are poisonous in

some species. Several species of fern fiddleheads are harvested in Sitka, by far the most commonly collected is the lady fern (Athyrium filix-femina). This abundant fern produces numerous large fiddleheads that are easy to harvest and clean. Although it is also abundant, the spiny wood fern (Dryopteris austriaca) is avoided because removing the bitter-tasting brown scales from the fiddleheads is difficult. Brachen fern (Pteridium aquilinum) is found infrequently in the Sitka area and therefore is not used locally.

The fiddlehead season is early and short, roughly two weeks in April. The ferns are collected when the fiddleheads are still in a tight curl and not more than six inches long. They are highly valued for taste and are also an "excellent" source of vitamin A and a fairly good source of calcium, vitamin C and niacin (Hooper 1981). Some residents collect large amounts which they laboriously clean (by rinsing and lightly abrading to remove the brown scales which impart a bitter taste), blanch, and freeze for future use. Two interviewees reported that they harvest fiddleheads according to the number of meals a month they intend to serve them, carefully calculating, harvesting, blanching, packaging, and freezing the correct amount for their families. Others simply collect small amounts to eat fresh as a steamed vegetable or in stir-fry dishes. During the season, fiddleheads are also savored raw as an appetizer or in salads,

Goosetongue (Plantago maritima), a plantain, was also harvested by 12 percent of survey households. It is fairly

abundant around Sitka, growing in the cracks of rocks just above the high tide line. A large patch grows in a saltwater lagoon on Japonski Island near the airport. It is popular because of its good taste and long edible season. Goosetongue can be harvested from spring until August, although June is said to be the best month. The plant is best early in the season when it is tender, later it becomes stringy and tough. One family estimated last season's harvest at 48 pounds and another's estimate was 30 pounds. Large-scale collectors such as these parboil most of their goosetongue and freeze it for future use. The fresh young plants are used in salads. Some people prefer to blanch goosetongue and then fry it with bacon and onions; Native interviewees more commonly cook it with rice and fish flavored with soya sauce. The leaves can also be boiled as a tea.

Hudson Bay tea (Ledum groenlandium) is the next most commonly used "green". Ten percent of survey households had collected it. It grows abundantly in muskegs and muskegy mountain meadows. The leaves can be harvested year round, although some Native people collect them just before winter when they are biggest. Once picked, they are dried and then hard boiled to make a pleasant tea. Some people throw the first water away as it is said to cause heartburn. We met an elderly couple from Oregon who have been coming to Sitka each spring for several years to pick Hudson Bay tea for the wife, who is arthritic. No Sitka residents reported medicinal uses. The sprouts, peeled and eaten raw, are also edible, although few if

any Sitka residents use the plant in this way.

Teas can be made out of a number of other plants found near Sitka including rosehips, hemlock and spruce tips, licorice fern rhizomes, and bedstraw leaves. The seeds from bedstraw are also a good coffee substitute.

Fireweed (Epilobium angustifolium) was harvested by five percent of survey households. It grows in extensive patches in open clearings, logged areas, and along roadsides. Peeled young spring stalks are sweet and tasty when eaten fresh; hikers often break them off to eat along the trail. Natives traditionally ate young fireweed shoots, either soaked in seal or eulachon oil, or steamed as a vegetable which tastes like asparagus (Jacobs Jr. and Jacobs Sr. 1982). Before the days of matches, Natives also collected the cotton from fireweed flowers which had gone to seed, and they stored it in seal stomachs to use as tinder in fire building. Today the young leaves are used as salad greens, and the flowers, together with clover flowers, are boiled in water and sugar to make fireweed "honey".

Devil's club (Oplopanax horridum) was harvested by three percent of survey households. This flowering shrub, a member of the ginseng family, grows abundantly in the moist, well-drained soils of forests around Sitka. The stalks may be one and a half inches in diameter and reach a height of eight feet. They are covered with sharp spines which are extremely painful on contact. Both stems and roots are collected.

Devil's club is harvested primarily by Natives for



medicinal use. The most common use is as an all-purpose elixir, usually made by heating the dried roots or stems in water just below the boiling point for several hours. The extract is then filtered, cooled, and stored in airtight bottles. According to one user, the usual daily dose is half a glass. A tea made from the green inner bark mixed with Hudson's Bay tea is also taken as a strengthening tonic and to relieve pain from colds, stomach upsets, arthritis, and a variety of other ailments. The inner bark can also be eaten raw for high energy or pulverized and applied to wounds as an emergency analgesic. It can be mixed with spruce pitch and applied directly to small skin abrasions, to protect them from constant immersion in water. Some native fishing boats carry a supply. Devil's club can also be made into an ointment for sore ligaments and muscles. Laboratory experiments with hares have demonstrated that the extract has potent hypoglycemic properties when administered orally or intramuscularly. A small study carried out on human subjects at Mt. Edgecumbe hospital in Sitka confirmed the animal experiments (Justice 1966).

Devil's club was used by Tlingit people in generations past as part of the neophyte shaman's purification rites (Krause 1950). In 1836 a Sitka physician reported 25 plants used by the Tlingits for medicine (cited in Krause 1950), but devil's club is apparently the only member of this pharmacopia in common use today. Most elderly Natives are well acquainted with its use and preparation. One informant used to be given devil's club elixir

as a spring tonic, after which he would vomit. Its purgative powers seem to be legendary. Many teenagers are being introduced to it for the first time and it is currently enjoying a revival along with other aspects of traditional Tlingit culture. Its medicinal value is fairly well recognized; a powdered form of the root is sold in health stores in Alaska and the northwestern United States.

Sitkans also reported several non-medicinal uses for devil's club. One person collects the root knots, dries them, and then pulverizes them to use as a spice and preservative before smoking fish. Others use devil's club as a ginseng substitute. The very young shoots are also edible and taste like celery.

Lambsquarter (Chenopodium album) or wild spinach was harvested by three percent of survey households. This plant grows in disturbed soil around towns, such as roadsides, ditches, and old gardens, as well as near some beaches. It is not indigenous and is considered a noxious weed in many parts of the United States. Lambsquarter can be harvested from early spring until fall, although the young plants and leaves are best. It is eaten as a salad green or a steamed vegetable and tastes very much like spinach.

Beach asparagus (Salicornia pacifica) was also harvested by three percent of survey households. Both Natives and non-Natives collect this small plant, which grows in thick bunches or mats on tidal flats near rivers. The nearest good

harvesting areas for Sitka residents are said to be Goose Cove and Sergius Narrows, although some people know where to find it locally. This delicious vegetable tastes like asparagus and is high in vitamin A and sodium (Hooper 1981). It is most commonly eaten raw as a salad green.

Chamomile and yarrow were each harvested by three percent of survey households. Chamomile, an introduced plant, grows in disturbed soil and is commonly found along the roadside, in lawns, and graveled areas like play grounds. Its leaves and flowers are brewed as a mild, relaxing tea. Yarrow, a native plant, is also primarily used as a tea, although Natives once used the fresh leaves as compresses. Some Sitkans also place the harvested leaves with water in a kitchen blender, then spray the resulting mixture on garden plants as an insecticide.

Several other green plants are also used by Sitka residents but in far smaller numbers. These include nettles, spring beauty or miner's lettuce, clover, skunk cabbage (as a remedy for boils), and foxglove (as a medicinal tea or diuretic).

#### ROOTS, TUBERS, AND BARK

Although roots are infrequently used, they are the best protein source available from plants. They also have a long harvest season and are best collected from fall to spring when the roots are biggest; during summer they tend to become fibrous.

The most commonly harvested root is the tuber of the Kamchatka lily (Fritillaria camschatcensis), also known as Indian rice, rice root, mission bells, and chocolate lily, which

grows in open areas from salt marshes to mountain meadows. It is also seen on rocky cliffs along the beach fringe. The plant is not as common as it once was in Sitka, because beachfront housing has obliterated its prime habitat. The Kamchatka lily is best harvested in spring since it is bitter at other times of the year. Natives traditionally dug the bulbs, boiled them a short time, and ate them like rice, often mixed with wild rhubarb. The bulbs can also be eaten raw or dried and pounded into a flour for starch or thickener. Natives also mixed berries with rice root and salmon roe, then smashed it into a pulp that was kept as a preserved food. The Kamchatka lily is used by only a small number of people today.

A few other edible roots traditionally used by Sitka Natives will be mentioned briefly, although they are seldom harvested and prepared today. These include silverweed or wild sweetpotato (Potentilla pacifica Howell), fern rhizomes, yellow pond lily root (Nuphar polysepalum Engeln.), and wild onions. Patches of silverweed were once owned by individuals and other members of the tribe could not dig them without obtaining permission. Fern rhizomes were prepared by burning a fire directly on top of the plant for several hours. This cooked the heavy rhizome, which was then dug up, rinsed, and peeled. The edible portion is said to taste like squash. A common root which grows along river banks, called tseit in Tlingit, is still harvested by some Natives. It is boiled and eaten with seal oil and berries. The roots can also be dried or smoked to preserved

them for future use (Mark Jacobs pers. commun., 1983).

Hemlock sap was once a popular Native food. A tree's outer bark was stripped in spring when the sap was running. Then the whitish sap-saturated inner bark was scraped off, and on contact with the air it dried and turned brown, resembling corn flakes. These flakes kept for long periods when dry, but were moistened for eating and served as a side dish. They were an important source of sugar in spring (Jacobs Jr. and Jacobs Sr., 1982). Foods such as these, which have a history of traditional use, are used as survival foods today.

#### MUSHROOMS

Thirteen percent of the survey households had harvested mushrooms in the last year. Substantially more non-Natives than Natives had gathered them, but due to the small subsample, this difference was not statistically significant. The Native community, however, has no tradition of eating mushrooms. One Native person summarily stated:, "As far as the Indian is concerned, it's nothing but a fungus." Another told of an incident that took place at his son's class picnic. When some of the non-Native children made faces at the idea of Natives eating seaweed and gumboots, his son said to them, "Do you eat mushrooms? How primitive can you get!"

Edible mushrooms in Sitka include the funnel-shaped chanterelle (Cantharellus infundibuliformis), golden chanterelles (Cantharellus cibarius), shaggy manes (Coprinus comatus), king boletus (Boletus edulis),

chicken-of-the woods (Laetiporus sulphureus), morels (Morchella angusticeps), puff balls (Lycoperdon perlatum), orange delicious (Lactarius deliciosus), gypsy mushroom (Rozites caperata), golden pholiota (Phaeolepiota aurea), oyster shells (Pleurotus porrigens), and honey mushroom (Armillariella mellea). Woodland russellas, spreading hedgehogs, delicious milky caps, and gelatinus coral are also harvested. The mushrooms most commonly collected by people we interviewed were chicken-of-the woods, king boletus, shaggy manes, and morels.

Most mushrooms are gathered in August, September, and October though some are available in the spring. Morels, for example, are found in May or June through early July. People who collect mushrooms tend to be enthusiasts, rhapsodizing about their exotic flavor. One interviewee took five people in a chartered plane to the far side of Baranof Island to collect their supply. They returned with 150 pounds of king boletus, 5 gallons of chanterelles, and a number of orange delicious mushrooms. The most common preservation techniques are canning and freezing.

Households that gather mushrooms also tend to harvest a wide range of other plant foods. One elderly couple, for example, collects eight species of mushrooms as well as goosetongue, fern fiddleheads, wild parsley, beach asparagus, dandelions, strawberries, and cranberries. Another, younger household collects seven species of mushrooms, goosetongue, fern

fiddleheads, Hudson Bay tea, wild cucumber, chamomile, blueberries, salmonberries, red huckleberries, currants, cranberries, and nagoonberries.

#### WOOD

Sixty-nine percent of survey households had collected wood in the last year. As shown in Table 23, 60 percent of these had gathered drift logs from Sitka's beaches, 53 percent had taken wood from the forest, 25 percent had pulled logs from the water, and 14 percent had collected wood from other sources. Some obtained wood from the Alaska Pulp Company, where logs too large for the machinery are set out for workers to cut away. Also set out are "salt logs" -- logs that have been in the water too long or have been badly damaged by toredos.

The most important use of wood was for home heating: 89 percent of survey households who had harvested wood in the last year used it for firewood. The mean percentage of home heat derived from harvested wood was 48 percent; 12 percent of the survey households relied exclusively on wood heat. The mean number of cords harvested by survey households in 1982 was 7.6, with a median of 4.4. There were no significant relationships between the amount of wood harvested by a household and household income, age composition, or ethnic makeup.

Drift logs are a noticeable feature of beaches and waters of Sitka Sound. Many of them are lost from barges or storage areas near the Alaska Pulp Company at Silver Bay. Logs found above the mean high tide that carry the company brand are legally

the property of the pulp mill for 90 days, and afterward they enter the public domain. Beach logs found below the mean high tide are under state jurisdiction. There currently is no salvage operator with a permit to take logs from Sitka Sound beaches or adjacent water. The informal salvage done by Sitka area residents is, according to the Sitka Coastal Management Report, "probably illegal" (City and Borough of Sitka Planning Office 1981:11-12). Nevertheless, it is a widespread, overt activity which most residents appear to regard as perfectly legal.

The water and beaches closest to Sitka are scoured for drift logs by local residents, who frequently tow logs to shore with boats. Throughout the year public shores and boat launching ramps are busy with men cutting and loading wood into the back of the family truck. Residents who own beach-front property pull drift logs up their backyard boat ramps or walk out at low tide to secure logs that float in. Drift logs seldom remain unclaimed, and a friendly rivalry exists between some beach neighbors to see who will tow a particular log in first. Other residents have to go to greater efforts to obtain drift wood. One person we interviewed owns a truck fitted with a small crane and trailer modified to carry logs. He regularly checks the steep banks of Silver Bay near the mill for butt logs and chunks that have been caught on shore.

Wood harvesting is quite different from other plant gathering. For example, it is not primarily a female or family activity but is a task usually undertaken by men. And unlike



other plant gathering which involves a minimum of equipment, the collection of wood often requires boats, chainsaws, cranes, and towing vehicles. One large-scale collector who lives near the water owns a motor-operated winch, a 13-foot skiff and engine (used exclusively for log salvage), a chain saw, and a log-splitter. He estimates that the value of this equipment is \$7,500. The land where his pier and machinery sits was created by landfill at a cost of \$2,500, for a total expenditure of \$10,000. He has been gathering wood for ten years and feels he has more than paid off the investment he made.

Besides the value of salvaged wood for the individuals who harvest it, residents who recover drifting logs also provide a useful service for the community at large. First, they remove potential hazards from the busy inshore waterways. And second, drift logs, which can weigh several tons, may have a tremendous ecological impact on plant and animal populations inhabiting the intertidal and shallow subtidal zones. The Sitka Coastal Zone Management report (1981) notes, for example, that beaches with large accumulations of drift logs had rock surfaces which had been scraped clean of macro-invertebrate and plant life. It supported efforts to remove drift logs from the beaches of Sitka Sound and further recommended in favor of "log transportation systems, such as barging and upland storage, that minimize the loss of wood fiber from the forest to the mill" (City and Borough of Sitka Planning Office 1981:76).

Most log salvage is for personal use, although

large-scale private operations border on being commercial and some are overtly so. One informant, for example, collected 60 cords of wood last year, which he sold to other residents. The previous year he collected 190 cords which he sold unsplit for \$55 a cord for a total of \$10,450. Another large-scale operator does not sell commercially; instead he allows friends to use all his equipment to harvest, cut and split wood in exchange for their help in harvesting his own household's supply. Last year his household and friends gathered approximately 125 cords of wood, and roughly 90 percent went to other households.

Not much needs to be said about the actual mechanics of using wood for heat. Many people will burn any log that is "halfway decent", that is, not wormy, badly insect eaten, or punky. Others, however, think it is unwise to burn drift logs in their stoves because of possible salt corrosion. Instead they collect firewood from the forest, although some merely let their wood weather long enough to wash the salt away.

Most timber is harvested on state land where no permit is required for personal use. On National Forest land only dead and down timber can be cut without a permit and a household can take as much as it wants. Thirty-seven percent of survey households had collected wood from the Forest last year. The amount of wood harvested from Forest land appears to be much less than that taken from the beach and water, although we have no hard data to support this. Since cutting and removing wood from the forest is more difficult than salvaging beach logs, however, this would

appear to be likely.

The use of wood heat in Sitka appears to have increased substantially over the last ten years, just as it has in other parts of the United States. One man noted that in 1971 few people bought the spruce logs he had cut: "The wood just sat in the back of the trailer. No one was interested. Everybody was using oil which was cheap then." Others noted that they began harvesting wood about ten years ago, usually retaining their oil furnace for back-up heat. Many people like the kind of heat wood provides. Still others, probably a majority, enjoy the activity of gathering and cutting wood. According to one man, "I get my exercise this way and stay in shape. Even if it was a break-even situation, I'd still do it. Otherwise I'd be watching the boob-box."

Another use of drift logs and forest trees is for lumber and construction. Fourteen percent of the survey households who had harvested wood in the last year had used some for construction. People are much more selective when harvesting wood for this purpose than they are when collecting firewood. They look for straight grained logs at least 18 inches in diameter and in good condition. Some residents, including a number of those living on small islands in Sitka Sound, have their own small mills for cutting logs into boards. Other residents take logs to the sawmill for cutting. One large-scale cutter who gets his wood cut free through an arrangement with a friend is currently building a house with the lumber he has gathered. This is not unusual in Sitka. Shakes and roofing shingles are also made from

harvested wood

Thirty-five percent of households who harvest wood gathered some for smoking fish or venison. The most popular wood for this purpose is alder, which imparts a rich, pleasant taste and odor to smoked meat. The amount of wood collected for this purpose is, of course, not great.

Sixteen percent of survey households had collected wood for use in handicrafts in the year prior to the study. This ranged from gathering small pieces of driftwood for use in dried flower arrangements and natural sculptures to special woods cut for sophisticated craft work and carvings. One Native craftsman, for example, collects crabapple for carving knife and adze handles; alder for carved bowls, trays, masks, and miniature totem poles and canoes; and yellow cedar for basket making. A small number of Natives still harvest spruce roots to make the traditional, finely woven Tlingit baskets.

## CHAPTER 7

### SHARING AND RESOURCE DISTRIBUTION

People in the surveyed households were asked a number of questions about sharing and distribution of harvested resources: whether or not they gave harvested foods to anyone outside their immediate household, what they gave, how many households they gave to, and how these households were related to them. The same information was also solicited about harvested foods they received from others (see Appendix C). The results, as summarized in Table 24, show that there is a substantial amount of sharing and redistribution of wild foods in Sitka.

Fish were given away by more households than other resource. Sixty-two percent of the survey households that had fished in the last year gave a portion of their catch to others excluding their fishing partners. Respondents were asked to estimate the percentage of harvested fish they shared with people not living in their households. Answers ranged from 1 to 75 percent, with an average figure of 22 percent. They reported giving fish to a mean of 3.7 households and receiving fish from a mean of 2.8 households. Respondents were also asked to indicate how the households they gave fish to were related to them -- that is, whether they were relatives, neighbors, co-workers, friends,

TABLE 24. DISTRIBUTION OF HARVESTED RESOURCES

Resource	Percentage of Households Who Share Resources (n=139)	Mean Number of Households Resources Given To	Mean Number of Households Resources Received From
Meat/venison	59	3.1	1.2
Fish	62	3.7	2.8
Intertidal foods	45	2.8	.9
Plant foods	40	4.7	2.3

TABLE 25. RELATIONSHIP OF HOUSEHOLDS SHARING HARVESTED FOODS

Relationship to Harvesters	Percentage of Households*			
	Meat (n=41)	Fish (n=68)	Intertidal Resources (n=52)	Plants (n=44)
Relatives	71	66	40	66
Friends	34	62	44	61
Neighbors	12	15	13	18
Co-Workers	5	16	2	14
Visitors	0	6	4	2

\* Percentage of the survey households that had harvested the resource in the last year and given a portion of what they harvested to persons outside their immediate household.

or visitors. As illustrated in Table 25, fish were distributed most often to relatives (66 percent) and friends (62 percent) and much less frequently to neighbors (15 percent), co-workers (16 percent), and visitors (6 percent).

Venison was given away by 59 percent of the survey households who had harvested deer in the last year. This figure refers to households other than that of a hunting partner; 88 percent of respondents shared meat with their hunting partner. Respondents gave venison to an average of 3.1 households but reported receiving it from half as many, a mean of 1.2 households. Survey households that had taken deer the previous year overwhelmingly shared it with relatives (71 percent), rather than friends (34 percent), neighbors (12 percent), or co-workers (5 percent).

Beach foods were also shared with other people. Forty-five percent of the survey households who had harvested intertidal resources in the last year reported giving some to other households. They gave beach foods to an average of 2.8 households and received beach foods from less than half that number, an average of .9. Intertidal gatherers shared equally with relatives (40 percent) and friends (44 percent) and much less frequently with neighbors (13 percent), co-workers (2 percent), or visitors (4 percent). As presented in Table 26, the main intertidal resources shared were clams, abalone, herring eggs, and seaweed.

Forty percent of the survey households that had harvested

TABLE 26. INTERTIDAL RESOURCES EXCHANGED BY HOUSEHOLDS

Resource	Percentage of Harvesters Giving Resource to Other Households (n=39)	Percentage of Harvesters Receiving Resource from Other Households (n=59)
Clams and Cockles	64	53
Abalone	33	78
Herring Eggs	28	34
Black Seaweed	13	8
Red Seaweed	3	5
Kelp	3	0
Sea Urchins	0	2



plants in the last year shared their harvest with other households. They gave plants and plant products (i.e., jam and jelly) to an average of 4.6 households and received them from 2.3 households. Most sharing took place with relatives (66 percent) and friends (61 percent). As with other resources, harvested plant foods were given far less often to neighbors (18 percent), co-workers (14 percent), and visitors (2 percent). A few people said they never give berries away, because they are a delicacy and it takes so much work to gather them.

They're just like gold. A big halibut is a different story. But after spending three hours in the rain for a bucket's worth (of berries), you hang on to them.

Those who do share berries most often give salmonberries, blueberries and huckleberries, usually as jams and jelly. Many people reported giving away pints of jam at Christmas. The next most common plant foods given away by survey households were mushrooms, fern fiddleheads, and goosetongue. In short, a large percentage of Sitka harvesters give a portion of what they harvest to persons outside their immediate household. Overall, the survey households gave to an average of 3.5 other households, and reported receiving harvested foods from an average of 1.8 households. Furthermore, most people share with relatives and secondarily with friends. This is especially true for deer meat, which is a valuable dietary staple and given primarily to relatives. As one 35 year old man explained:

I only share with my brother. Whoever has meat helps

out the other person. If I have meat this year and he doesn't, I'll give him some. Next year it may be the other way around.

Intertidal foods are distributed by a smaller number of harvesters and to fewer households than either fish or deer. This may be due to taste preference, perishability, scarcity, and in some cases, fear of PSP. For example, while some people like shellfish, others definitely do not. Most people like meat and fish, but not everyone has acquired a taste for seaweed. Also, resources like abalone, which are not that easily acquired, are less likely to be given away. On the other hand, the scarcity of abalone makes it a valued gift. A number of people expressed concern about the safety of eating mussels and clams -- both fresh and canned -- that had been given to them.

Sitka harvesters often give portions of their harvest to those who cannot obtain their own supply such as elderly persons, widows, and people without boats. As previously discussed, the ANB in Sitka organizes sockeye fishing trips on behalf of its elders. As part of the Sitka Native Education Program, volunteers harvest a number of subsistence foods such as seaweed for other Natives, particularly elderly ANB members (I. Brady pers. commun., 1983). According to the head of the program:

Non-natives don't understand how much these foods are a way of life. Your body craves them. Herring eggs and other foods are a part of our culture. That's why we go to so much trouble to get them for the elders and to teach young people about them.

Sitka's Pioneer Home also receives donations of meat, fish, and some intertidal foods from commercial and sports

fishermen, Pioneer Home employees, Sitka Sound Seafood, and the ADF&G when it is conducting tests or has recovered an illegally shot animal. The most common species of fish donated, according to Pioneer Home employees, are black cod, ling cod, and salmon. During the last herring spawn, approximately 30 people, primarily commercial fishermen, brought in nearly 50 pounds (7 gallons) of herring eggs. The National Marine Fisheries Service donated a large leatherback turtle that had been caught in a commercial fisherman's net. Enough fish had been given to the Pioneer Home in the summer of 1983 that it had not had to buy fish in over two months (S. Wilson pers. commun., 1983). Harvested foods are also donated to the Double O Club for the elderly and to the Salvation Army.

Harvested resources are not only given to groups but also to individuals who do not hunt, fish, or gather themselves. One elderly retired fisherman, for example, regularly receives fish from three friends. During the summer of 1983 he was given fish an average of once every ten days. Another elderly woman annually receives deer meat, fish, jam, and fresh berries from several relatives and neighbors.

How are resources actually distributed? Much, of course, is given as informal, spontaneous gifts to relatives and friends. But sharing and redistribution of wild foods in Sitka also takes place indirectly at dinner parties and social gatherings. At most group-sponsored potlucks, such as those organized by church congregations and clubs, locally obtained wild foods are served.

One function attended by the researchers included grilled salmon and halibut, deep fried rock fish, abalone, and berries. At the Sitka summer fair and annual community celebrations such as the Fourth of July, local foods are often sold along with the hotdogs and french fries.

Members of the Native community share wild foods at ANB dinners, including fund raising dinners that are open to the public. At one such dinner attended by the researchers in the summer of 1983, salmon, halibut, clams and abalone (in chop suey), seaweed (in soup), fish chowder, and berries were served. The 40-day parties sponsored by families in memory of deceased relatives are also important occasions for eating and sharing wild foods. The hosts try to serve their deceased relative's favorite foods, and many Natives make special trips to harvest traditional foods for these functions. This sometimes conflicts with legal regulations on harvest activities. Referring to these conflicts, one person concluded, "If we were not so tied to obeying rules and regulations, we would always harvest fresh resources for these parties."

Sharing harvested foods at dinners and gatherings is also common among the non-Native community. Many commercial fishermen get together in the summer for dinners and potlucks, and they may bring salmon, halibut, dungeness crab, and occasionally more exotic foods like pickled shrimp for everyone to sample. Being able to serve dinner guests harvested rather than store-bought foods is a matter of pride with many people, and foods such as

smoked salmon are often taken to friends' homes on social visits in place of the bottle of wine that people elsewhere in this country might bring. As one resident explained:

Someone will go out and get a halibut and come back and share it with four or five friends. Every one will bring something. One person will bring deer, another person might bring a salad with crab sprinkled over it. Even if you don't go for dinner, it's a common practice to take smoked salmon with you to eat while you're there. Instead of stopping at a store to buy potato chips, most people take salmon.

Locally harvested foods are often distributed well beyond the community, to relatives and friends living in other Alaskan communities, and in the "lower 48". For non-Natives the bulk of this distribution takes place in the summer, when friends and family come on visits and take harvested foods back home with them. Although no precise figures were available, two Alaska Airlines employees reported a large number of boxes of frozen halibut and salmon being taken south on flights out of Sitka in July and August. The airline provides special heavy-duty cardboard containers to accomodate travellers taking frozen fish home.

One Sitka resident's visiting daughter, husband, and five children returned home with 500 pounds of frozen fish. Each child was entitled to two suitcases and most of them were filled with fish. Sitkans who visit family and friends outside Alaska also typically take wild foods with them. One interviewee takes five or six packages of frozen clams each time he visits his brother in Minnesota. Another family takes a 50 pound box filled primarily with frozen fish, but also with clams, cockles, and abalone on trips

south. According to one woman:

Every time we go to California, which we do every two years, we take 80 to 100 pounds of smoked salmon, crab and halibut. But we bring back lots of fresh produce from their gardens -- corn on the cob, beets, squash, fresh zucchini. The relatives love to see us come.

At Christmas many food parcels go south containing canned or smoked salmon, berry jellies and jam, and even frozen venison. Natives distribute wild foods more evenly throughout the year. Locally harvested foods have traditionally been traded and bartered within the Native community. Sitka was once famous among Natives for its herring roe, sockeye, smoked salmon, sea otter pelts, fur seal pelts, and smoked deer meat. Sitka Tlingit traded these items for mainland king salmon, high bush cranberries, mountain goat horn (for use in ladles and handles), wool (for weaving), eulachon oil, meat, and hides (Jacobs Jr. and Jacobs Sr. 1980).[1]

Trading is not as important today in the past, but many Native households in Sitka still carry it on. For example, one person sends humpies, herring, and sea cucumbers to relatives in Juneau who do not have the opportunity to fish or harvest them. Last year he air freighted 600 pounds of herring to a relative who then distributed them to other relatives. In exchange he receives eulachon oil, itself obtained from relatives further

-----

1. According to Mark Jacobs, each clan had its own design of deep aeration cuts on the smoked salmon it produced. When visiting in other villages pieces were given as important tokens of respect and goodwill. The trademark clearing indicating where the dried fish came from and its quality. For a detailed discussion of traditional Tlingit trade see Oberg (1973).

inland. The most commonly traded items by Sitka Natives today are herring eggs, seaweed, and dried or smoked halibut. These are exchanged for eulachon oil, seal oil (which many Natives no longer like to render in town because of its odor), seaweed, and dry fish. Often this trade involves the communities of Wrangell, Haines, and Angoon. On "Problem Corner", a community-service radio program in Sitka, callers frequently offer resources for sale or trade. In the summer of 1983 these included smoked salmon strips, herring eggs, smoked halibut, salmonberries and blueberries, seaweed, eulachon oil, and dry fish.

## CHAPTER 8

### ATTITUDES AND VALUES IN THE USE OF LOCAL RESOURCES

Why do so many Sitkans fish, hunt, and gather? At least one member in over 80 percent of the households surveyed had fished in the past year, 56 percent had hunted, 60 percent had gathered beach foods, and 77 percent had gathered plants or berries. What is it about these activities that makes them so appealing? Do Sitkans participate in these activities primarily for recreation or do they do it more for subsistence? To understand people's reasons for engaging in harvest activities, our survey included a series of questions about motives with regard to each activity (see Appendix C). We also explored this through in-depth interviews outside the household survey, and we asked a 10th grade English class of 15 and 16 year olds to write an essay about what they liked about their favorite subsistence activity.

In the household survey, the respondents were asked how important each of eight factors was in their decision to participate in a particular activity. These factors included: (1) enjoyment of being outdoors; (2) enjoyment of the activity itself; (3) enjoyment of the harvested food's taste; (4)



satisfaction of providing one's own food; (5) nutritional value of harvested food; (6) lowering food costs; (7) sharing harvested foods; and (8) cultural importance of the activity. Respondents were asked to indicate the importance of each factor or reason on a 4 point scale, with 0 being "not important" and 3 being "very important".

The percentages of informants who considered the reasons "very important" for all four activities are shown in Table 27. As this table shows, a majority of the respondents considered several motives to be "very important". In fact, just over half the respondents rated at least four factors to have been "very important" in their decisions to participate in the different harvesting activities; this number jumps to six factors when both the categories "very important" and "important" are combined. "Enjoyment of being outdoors" was cited by 80 percent of the respondents (for all hunting, fishing, and gathering activities combined) as being very important in their decision to engage in harvesting activities. "Enjoyment of the harvesting activity" was cited by 72 percent. These two factors were the most important reasons given for engaging in harvesting activities. Talking about deer hunting, for example, one man said:

One reason I like hunting so much is that you walk really slow. You walk ten times slower than you've ever walked before and that gives you a chance to see the scenery. You see a lot of animals that you would not see otherwise. Deer hunting is really a high quality way to be out in the woods.

A woman explained why she picked berries and dug clams:

TABLE 27. REASONS FOR HARVESTING NATURAL RESOURCES

Reasons for Participating	Fishing	Hunting	Intertidal Gathering	Plant Gathering	Total
Enjoyment of being outdoors	82%	88%	76%	72%	80%
Enjoyment of the activity	74	75	74	64	72
Enjoy the taste of the harvested food	70	56	69	77	68
To provide one's own food	51	56	49	46	51
Nutritional value of the harvested food	55	39	47	47	47
To lower food costs	46	61	38	29	44
To share the harvested food with friends/family	29	38	27	32	32
The activity is part of my cultural background	25	15	25	27	23

\* The percentages represent the respondents who considered the reasons to be "very important" on a four point scale ranging from "0" being not important to "3" being very important.

I like being busy without any stress and I like the quiet of being out of town. I can do it for hours. And I also like the fact that I get something out of it, the food as well as the pleasure.

And a woman who was born in New Zealand, raised in Vancouver, and moved to Alaska 43 years ago explained why she still goes out:

I've always enjoyed everything in nature. I think there is so much beauty in seaweed... There is a shell that I love, called an umbrella limpet. It's exciting to find these little treasures. There is adventure too, you never know what's going to happen to you when you're out. There is a lot of pleasure in just being out. That is why I live here, in Alaska.

Other people said that the peace and quiet of being outside, away from town and job, are among their main reasons for hunting, fishing, or gathering. The geographical and physical isolation of Sitka, according to a city government employee, forces people to turn the outdoors for recreation:

Here the outdoors becomes a way of life. You have to enjoy the outdoors for recreation, to relax. We only have a bowling alley, a movie, and some bars. You must be able to enjoy the wilderness in order to live here.

According to a local government official, "Having a boat and just being able to boogie off is real important to my sanity. I can never really get away unless I leave town and go out into the woods." As shown in Table 27, enjoyment of the outdoors as a reason for participating in harvest activities was greatest in hunting and least in plant gathering.

Enjoyment of the taste of wild foods was next in importance after the "recreational" factors discussed above.

This was most important for plant gathering and berry picking (77 percent) and lowest for hunting (56 percent). Anyone who has tasted these foods -- fresh salmon, abalone, or halibut, or salmonberry jam, huckleberry cobbler, or deep fried chicken-of-the-woods mushrooms -- will easily understand why this factor is important to so many people. For Natives this motive ranked higher than any other in their decision to hunt, fish, and gather (for further discussion see Chapter 9). The desire for wild foods appeared to be greatest among long-term residents who grew up eating them. An executive at the Sitka Pioneer Home, for example, reported that the residents -- all elderly Alaskans with at least 15 years residence in the state -- crave certain wild foods:

We get frequent requests for these (wild) foods. Their favorites are salmon, black cod, venison, and berries. Wild foods are really meaningful to these people, and its not just the Natives.

Some Pioneer Home septogenerians arrange to go out harvesting their own foods (usually to pick berries and gather plants) when they are not available at the home. And many also keep their own private stores of wild foods in their rooms.

"Desire to provide one's own food", that is, the wish to be self sufficient, was next in order of reasons mentioned. Not surprisingly, this was most important in deer hunting (56 percent), in which a successful harvest can yield 90 or more pounds of meat; and least important in plant gathering (46 percent), in which the harvest usually provides a garnish,

side-dish, or dessert rather than the main course. One man, who considered being independent the most important reason in his decision to harvest wild foods, said:

I enjoy being outdoors, but being independent is what it is all about. If you knew everything there was to know about the natural resources we've got, you wouldn't have to go to the store at all.

Appreciation of the nutritional value of the food ranked fifth overall and (as shown in Table 27) it was most important for fishing (55 percent) and least important for hunting (39 percent). A consideration for many households was the absence of additives and chemical preservatives found in store-bought foods. Otherwise, most people seemed to know little about the actual nutritional qualities of harvested foods. For example, many said they had no idea what the nutritional value of deer meat was, but this made little difference, since they believed the foods were at least free of harmful chemicals. A nutrient analysis of 20 local foods, including venison, cockles, salmon, herring eggs, seaweeds, berries, and several plants, found that they contained an excellent variety of essential nutrients (cf. Hooper 1981). Indeed, the study referred to the availability of so many local foods as a "nutritional gold-mine."

Being able to lower food costs, a factor somewhat related to providing one's own food, was ranked sixth. It was least important as a motive for participating in plant gathering (29 percent) and most important for hunting (61 percent), due of course to the significant potential impact of harvesting a deer

on the household's grocery bill. As discussed earlier, the average hunting household in our sample shot 2.2 deer in 1982, which yielded about 180 pounds of meat. At local supermarket prices, a comparable amount of beef was worth about \$500. The meat department manager at Sitka's major supermarket estimated that the store's beef sales dropped by more than two percent after the opening day of deer season, and that year round beef sales are considerably less than in comparable supermarkets in non-hunting communities.

Two interviewees said that being able to reduce household food costs had become a more important factor since they had been laid off their jobs. Some also suggested that this motive may become more important in the community if additional lay-offs take place at Alaska Lumber and Pulp Company. In short, participation in food producing activities and the importance of reducing food costs as a motive for these activities is undoubtedly linked to the level of unemployment and underemployment.

Offsetting the economic value of hunting and fishing for some households are the expenses of the activity, including cost of a boat, fuel, licenses, and tackle or ammunition. Several people asserted that hunting or fishing solely to reduce their household's food costs is economically irrational. One man estimated that over the past few years he had spent \$20 for every pound of deer meat he harvested. The relative cost of fuel and gear, however, declines when it is used for multiple harvest activities. And not every household can afford nor feels it

necessary to purchase the expensive equipment that other households consider indispensable.

Sharing wild foods with friends and family was ranked seventh in importance as a reason for harvesting. The sharing and redistribution of wild foods were discussed at length in Chapter 7.

The role of harvesting activities as a part of respondents' "cultural background" ranked last in importance. Natives were more likely than non-Natives to list this reason as "very important," but some Native households considered it of no importance. Likewise, a number of non-Natives who grew up in households where hunting, fishing, or gathering was commonplace rated this factor high.

#### SUMMARY

These findings suggest that a number of factors are important in Sitkans' decisions to hunt, fish, and gather; enjoyment of the outdoors and enjoyment of the harvest activity being the two most important motives. The Alaska Public Survey (Clark and Johnson 1981), also asked its respondents why they participated in food producing activities -- whether they participated in their favorite food producing activity for "recreation" or for "subsistence." Sixty percent of the Sitkans answering this survey said that their motive was "all" or "mostly" recreational; 38 percent said it was "all" or "mostly" subsistence. The percentage of Sitkans indicating subsistence as their major reason for harvesting wild foods was the highest of any of the southeastern communities surveyed, which included

Ketchikan, Stikine, Chatam, and Juneau.

To gain some understanding of the value of hunting, fishing, and gathering for young people, we arranged for students of a 10th grade English class at Sitka High School to write an essay on their favorite outdoor activity. The students were asked to choose one activity and write about why they participated in it. Out of the 28 students, 16 wrote about hunting -- all were boys. Three female students chose to write about berry picking, and a mix of nine boys and girls wrote about fishing. None chose gathering beach foods as their subject. We had hoped to do a content analysis of the values expressed for each activity, but only hunting had a large enough sample size to make this practical. A larger sample size would have been preferable. However, the school essay was initiated more as an experiment -- to see if high school students would reveal much about their reasons for participating in these subsistence activities -- than as a data collecting strategy.

Themes relating to the students' reasons for hunting are shown in Table 28. Most of the essays were 250 to 300 words in length and discussed an average of just under three reasons and/or benefits in hunting. The most frequently mentioned reason for hunting, cited in 50 percent of the essays, was to save money by bringing home deer meat. Most of the students mentioned this to explain why hunting is important to their family and not just to themselves.

The following quotation was fairly typical of this



TABLE 28. REASONS FOR HUNTING EXPRESSED IN STUDENT ESSAYS

Reason	Percentage of Essays (n=16)
Saves our family money	50
An activity to share with friends	44
Learning experience	38
Physical aspects - hiking and stalking	31
Enjoyment of being outdoors	25
Eating food you have harvested yourself	25
Vacation, opportunity to get away	13
Peace and quiet, a time to be alone	13
To obtain a trophy	6

category:

The deer meat is important to our family because it cuts down on the grocery bill and also takes the place of beef. A deer or a couple deer can last from three to six months in our family.

Another student wrote, "Hunting is important in our family because it saves us money and it teaches me how to hunt for food."

Hunting as a shared activity with friends and fathers was an important reason in 44 percent of the essays. One student wrote:

Hunting is a very fun sport. Its fun for lots of reasons. You go hunting with people you like. My favorite people are the ones that are experienced and that don't shoot the small ones. Last year I went hunting with a guy who shot a deer as big as a dog. What a jerk!

Thirty-eight percent of the essays discussed hunting as a learning experience. Specifically, they mentioned learning how to survive in the woods, how to find deer, and how to dress the animal.

The following was a fairly typical statement:

Everytime I go hunting I learn something new. One time I go hunting and I learn that when you hunt in the woods you have to be very quiet. Then another time I'll go hunting and I'll learn that if you walk slower and stop every once in awhile, you will stand a better chance of seeing a deer. Also, the more you go hunting, the more places you learn to go.

Physical activity -- hiking and stalking of deer -- was mentioned in 31 percent of the essays. It was not always clear, however, whether this was discussed as a reason for hunting or included simply because it is a prominent aspect of hunting,

perhaps one of which they are proud.

The satisfaction of having provided one's own food was a reason discussed in four essays (25 percent). One student wrote: "Hunting is not just something to do. To eat something you worked your tail off to get adds to the taste." A Native student wrote:

It's very important to have your own meat because you will probably feel much better because you will know that you had done it yourself, you had gone out and brought yourself home with meat.

One-quarter of the essays also discussed the pleasures of being outdoors, that hunting provided an opportunity for them to get into the woods. One student wrote:

Hunting is my favorite activity because there is more to it than just hunting. When you go through the woods you find yourself in the middle of the wildlife. That's how I really got interested in hunting, because I get to see different animals and birds on the island.

In a similar vein, two students (13 percent) wrote about hunting as a "vacation", an opportunity to get away from town and home, while two others wrote about it as a "quiet" time. One student said, "I enjoy hunting for many reasons but mainly to get out into the wilderness and be alone to think out all my thoughts." Only one student mentioned obtaining a trophy for the wall as a motive for hunting.

The essays on fishing differed from the hunting essays in one significant respect: fishing as an activity shared with friends was discussed far more frequently (75 percent) than any other factor, including the benefit of lowering household food

costs.

Whatever the reasons for harvesting local resources given by the students or the survey respondents, it is clear that these activities are of great importance for most Sitkans. One of the final household survey questions asked if harvesting natural resources was important in the respondents' decision to live in Sitka. Over half (56 percent) of the households said yes. One man stated emphatically:

Fishing and hunting is a large part of why I live here. There are not many places where you can subsist and have a culturally active town at the same time. If you took away the resources we wouldn't stay.

A number of people said that the excellent opportunities for fishing, hunting, and (to a lesser degree) gathering had been a major reason for moving to Sitka. We spoke to a middle-aged man who came to Alaska from Michigan and works part-time on the North Slope. He chose to live in Sitka rather than Anchorage or Fairbanks, despite the distance from his job, because of the area's natural beauty and the opportunities for hunting and fishing:

We have always been outdoorsy people and take advantage of what it provides. It costs me time and money (referring to the long commute to the North Slope) to live here, but it's worth it.

At the time of the interview, his wife was studying a book on edible plants so she could learn to use a wider variety of species.

Another person who came to Sitka because of the richness of its environment said:

I came here in '65 and watched goats up on the ridge. I fell in love with it (Sitka). I've always loved the outdoors and this is it. This is what living here is all about -- the fishing, the hunting, the viewing, everything.

The Sitka City and Borough Planning Department (1981) conducted a survey in 1979 to gather information for their coastal management program. In a questionnaire mailed to several hundred households, respondents were presented with a list of ten attributes of Sitka and asked to indicate on a five point scale how much they liked each. The results ranked the most important qualities of Sitka life as follows: living near water, the scenery, fishing and hunting opportunities, and living close to a wilderness environment. All variables relating to the human constructed environment and social characteristics were ranked below these.

It should be clear from the preceding discussion that harvesting local resources is an integral part of life in Sitka for a majority of its residents. Any policies that would result in a decline of harvesting opportunities could adversely effect the quality of life. As one man said, "It's the fishing and hunting that keep us here. It's our reward for putting up with the isolation and the wet."

## CHAPTER 9

### ISSUES AND DIFFERENCES IN RESOURCE UTILIZATION

This chapter examines variation in the use of resources by different sectors of the Sitka population. It then discusses perceptions and concerns of Sitkans about the decline of certain resources and their opinions about current fish and game regulations.

#### GROUP DIFFERENCES IN RESOURCE USE

The patterns of resource use described so far have dealt with Sitka's population as a whole. Although differences between Natives and non-Natives have been pointed out along the way, we have focused on sample or community averages. This approach is entirely appropriate for the relatively homogeneous rural communities which have been the subjects for most previous subsistence research in Alaska. But large settlements may have different subgroups with important variations in resource use. For example, Sitka's total population of about 8,000 includes a number of distinct ethnic and occupational groups. In this section we will explore some major differences in the ways that such groups use local resources based on survey results.

Six groups will be examined, including two ethnic groups (Natives and Filipinos) and four occupational groups

(millworkers, commercial fishermen, teachers and U.S. Coast Guardsmen). These groups were selected because early in our research informants repeatedly drew our attention to specific harvest and utilization practices associated with one group or another. For example, in a discussion of deer hunting, one man said, "teachers and coasties will take them high [alpine hunts] while Natives like 'em down low [beach hunts]."

Later, we began asking people how they perceived their activities to differ from those of other groups. We do not have quantitative data from the household survey to support the assertions made here: due to the small size of some occupational subsamples and the lumping of others into larger categories, no cross tabulations between occupation and food gathering activities were done. The following discussion is therefore based largely on the perceptions of people we interviewed. At the very least this section outlines an area in need of further research.

### Natives

As briefly mentioned in Chapter 8, Native values concerning harvest activities appear to differ somewhat from those of most non-Natives. Many Natives are primarily concerned with the harvest -- obtaining wild foods for consumption -- while non-Natives are more often oriented toward the activity itself. In short, Natives may tend to view harvest activities principally as the means to the end of obtaining food. This is not to say that Natives derive less pleasure from hunting, gathering, or

fishing, but that the roots of the satisfaction are different. Support for this was found in the survey data on reasons for participating in various harvest activities. Natives ranked factors related to providing one's own food, lowering food costs, and enjoyment of the taste of wild foods highest. The factors ranked highest by non-Natives were enjoyment of the outdoors and enjoyment of the activity itself.

Natives in Sitka tend to be oriented more toward the sea for their subsistence than toward the land, although both are important. Fishing yields more food per effort than land based activities, except for deer hunting on the beach. In the words of one Native man: "Hauling fish from the sea is a lot easier than hiking through muskeg and devil's club for deer." Many Natives obtain subsistence permits for salmon, which is the most efficient way to take a large quantity of fish in a short period of time. Several Native informants said they tried to get their entire winter's supply of sockeye in one day and their supply of pinks in another single day outing.

This is not to suggest, however, that Natives harvest resources in greater quantities than non-Natives. Several people stated that when a resource was abundantly available, Natives were more likely to regulate their harvest level according to their current need. Non-Natives placed in the same situation were said to be more likely to take all they could transport home and then devise ways of storing or preserving their harvest. During the household survey several non-Natives described trips



that yielded enormous harvests, particularly of shellfish. One person, for example, described filling the bottom of a skiff with clams after finding an especially rich bed, and another described an outing in which his family brought back several hundred abalone.

A Native leader commented on the tendency of non-Natives to store large amounts of wild foods, recalling a principle taught by his grandmother: "The best place to store food is in the ground where you find it." It would be difficult to overstate the importance of wild foods to traditional Natives.

In interviews with middle-aged and elderly Natives it was clear that traditional wild foods assumed much greater importance in their lives than any type of food does in the lives of our non-Native interviewees. Native people mentioned craving certain foods at particular times of the year. Some went to great effort and cost to obtain traditional foods not easily available in Sitka, including eulachon oil, seaweed, dry fish, and seal oil from other areas.

There appears to be a generational difference in commitment to wild foods within the Native community; many younger Natives have turned away from traditional foods. Elders attribute this to the integration of Natives into a wage economy, which has reduced the necessity of using wild foods, and to the integration of the children into the predominately non-Native school system. Wanting to be part of the school community, Natives children often shed food habits and other customs that make them different from their non-Native peers. As one

father, a leader within the Native community, explained:

My kids don't want to be different. My son doesn't want to admit that he eats dry fish and seal oil... He likes to fish but he sticks to sport fishing because that's where his friends are. Sport fishing fits in with their families. He doesn't tell them about how to get humpies out of a river to dry. I think my boy would give up a lot just to be part of the basketball team.

Many younger Natives have also gotten away from unusual traditional foods, such as fermented fish heads ("stinkheads") which are looked down on by much of the non-Native community. Fish heads may also have become a stigmatized food because they are given out for free by the fish processing plant. Some people also suggested that the time required to harvest and prepare certain traditional Native foods, such as gumboots, has also discouraged Native use.

The trend away from wild foods among young Natives may have reached its peak; a number of Native interviewees believe that a reawakening of interest in these foods has begun. A Native education program under the auspices of the Sitka Community Association has for several years tried to expose its young members to Native foods -- as well as to traditional Tlingit dance, crafts, and language. For example, the youngsters make a trip for seaweed in May and for subsistence salmon in June, and they learn to prepare foods in the traditional way.

#### Commercial Fishermen

No occupation in Sitka has a profile larger than commercial fishing. An estimated 10 percent of Sitka households depend on fishing as their major source of income, and another 15

percent fish commercially part-time. People generally agree that commercial fishermen are heavily involved in subsistence activities. This is not surprising given that fishermen are out in the environment and away from town much of the time, so they have regular access to wild food resources. As one person said about commercial fishermen, "They're out there almost every day of the week, while the rest of us are lucky to get away on weekends." All but a few of the commercial fishermen interviewed said they harvested some foods (other than fish) while out fishing.

There is considerable variation, however, within the fishing community. The most active harvesters of wild foods have traditionally been trollers, who stay out for long periods and typically anchor in small bays at night. Seiners also work near the coastline and anchor up near shore, but because of the short openings, they are not away from town for long. Longliners, on the other hand, typically work far out at sea, do not come into shore at night, and therefore have little opportunity to hunt or gather during fishing periods. Many trollers and seiners spoke of carrying a crabpot which they used at night when anchored up in a bay, and of sometimes going ashore to hunt deer, collect mushrooms, pick berries, dig clams, fish for trout, or harvest some other wild food.

However, most fishermen said they engage in less subsistence and sport activity during the fishing season today than they did in the past. In the past they tended to stay out

for long periods and even when bad weather was forecast they would more often anchor up in a sheltered bay than return to town. Shorter openings, overcapitalized boats, and inflated operating expenses (such as fuel and crew costs) have also meant that fishermen must work longer hours and more intensively than they did in the past. As a veteran fishermen of 30 years said:

It used to be that when the wind was blowing around a bit, you would anchor and pick up some abalone or whatever. It wasn't such a bad thing to give up a day of fishing. Now a guy can't afford to take time off.

Another longtime fishermen said he used to go ashore to do a little trout fishing, pick strawberries, or go beach combing at the end of a day's fishing but now that he fishes longer hours (due to shorter openings), he stays aboard instead:

By the end of the day you're too tired to do anything, there might be gold on shore but you'd be too tired to go after it. You just want to collapse on your bunk and go to sleep.

Personal or household use of the catch by commercial fishermen is a generally overlooked aspect of resource harvesting, perhaps because there is little hard data on the subject. Commercial fishermen are permitted to take for personal consumption any fish from their catch, provided they are in season and of legal size. Fishermen encountered in the household survey and in other interviews were asked about this. Although we have no reliable statistical data to report, it was clear that most fishermen retain enough of their catch to satisfy household needs, and in some cases to share with friends and relatives. Part of the catch is also used to feed themselves and crew while

at sea.

Some residents who own hand troll permits fish primarily for subsistence. Ideally, fishermen retain fish that cannot be sold for personal use (i.e., damaged or undersized fish), fish caught out of season which will not live if returned to the sea, and fish that will not fetch a good price, such as white kings (king salmon with white instead of pink flesh). As one fishermen said, "Any strange fish goes straight into the skillet."

Commercial fishermen also do some hunting, gathering, and sport fishing during their trips, which often take them a considerable distance from Sitka. For this reason, their harvesting often takes place farther from town than any other group.

#### Millworkers

About 250 Sitkans are employed by Alaska Lumber and Pulp Company, the state's largest pulp mill. All but the professional employees are referred to locally as millworkers. Millworkers are stereotyped as heavy users of local resources, an opinion which is supported by data from the dozen millworker households interviewed in the survey. Like the U.S. Coast Guardsmen to be discussed later, they are especially active in fishing and hunting. But unlike U.S. Coast Guardsmen, their primary motivation is often subsistence, with recreation an important but secondary motive. Millworkers have more free time to devote to harvesting activities than most Sitkans because of five day breaks when work shifts change, annual maintenance shutdowns, and

recent temporary plant closings. In summer 1983, for example, most millworkers had six weeks off because of a temporary plant closing.

Compared to the average Sitkan, millworkers are also said to have large boats (many own fiberglass cruisers). This, coupled with the extra free time, enables them to range more widely than most Sitkans for resources. However, many people said that millworkers prefer the more sheltered inside waters and therefore usually travel to the north of Sitka, while teachers and a few others more often choose to travel south on the open ocean. A fair number of millworkers have hand or power troll permits and fish commercially.

Millworkers are also described as avid deer hunters. Unlike teachers and U.S. Coast Guardsmen, they seldom hunt in the alpine or high timber. Rather than hike, they prefer to use three-wheelers or trailbikes on logging roads. A preference for hunting areas with logging roads, more common to the north than south of Sitka, may help explain their geographical orientation described above.

Millworkers are said to hunt and fish in large groups. According to a knowledgeable Sitkan, "They often hunt in fours." Another said, "They (millworkers) like to go out in groups. If you see eight boats tied up together, you'll know they're millworkers." In contrast, teachers and white collar workers more often go out alone or with just one other family. As one person said, "They go out for solitude...they anchor by

themselves." A favorite outing for millworkers is a trip to Ushk Bay where they hunt deer, fish, set crab pots and have a cookout. The millworkers have left a 50 gallon cauldron for cooking crab at Ushk Bay on these occasions.

### Teachers

In contrast to millworkers, teachers are viewed as being fairly independent outdoorsmen who engage in harvest activities equally for subsistence and recreation. They are similar to millworkers in having a lot of free time which some use to fish commercially during the summer months. Because they earn good incomes, the expenses of commercial fishing are an important tax deduction. Many of those who do not fish commercially obtain subsistence fishing permits. Redoubt Bay, south of Sitka, is said to be a favorite subsistence fishing location for many teachers, whereas Sitkoh Bay to the north is a favorite among millworkers. One observer noted with regard to the teachers' preference for Redoubt Bay, "They like to go where the beauty is."

Most of our sources said teachers prefer the more challenging alpine deer hunts, and many also hunt goats. Teachers were generally reported to hunt and fish in small groups.

### Coast Guardsmen

There are 175 U.S. Coast Guardsmen stationed in Sitka, of which 22 are officers and the remainder are enlisted men. Most are in Sitka for only a short time: 1-1/2 years for single men

and 3 years for married men. About one-quarter request a year extension when their Sitka duty is up, while the rest move on to other stations. U.S. Coast Guardsmen, or "Coasties" as they are sometimes called by locals, are generally considered to make extensive use of local resources. Many requested their assignment to Sitka because of an interest in hunting and fishing. Even those who were not sportsmen often get involved, as one Coast Guard officer explained: "Even the city slickers get interested once they get up here. It is the thing to do here."

The U.S. Coast Guardsmen's primary motivation for hunting and fishing is recreation. Most chose to hunt deer in the alpine where the challenge is greatest. According to a game biologist, they approach hunting in the same way as sport hunters in the "Lower-48". Goat hunting is popular, especially among the pilots who become familiar with the terrain while flying patrols and know the prime locations for these animals. Bear hunting is also popular but is pursued by fewer men. A number of locals expressed antagonism toward U.S. Coast Guardsmen, asserting that they unfairly spot game from the air. The local ADF&G office receives a number of complaints about such alleged abuses each year, and the Guardsmen are occasionally criticized in letters to the Sitka newspaper and on a radio call-in program.

Two U.S. Coast Guard officers questioned about these complaints during an interview said they have no more of an advantage in hunting than any other pilots in the area. Moreover, they claimed that some guardsmen got information about



the location of game animals from private air charter pilots. Admitting that criticisms of U.S. Coast Guard fliers had become a sensitive issue at the base, one officer said:

During hunting season we take pains to stay away from the ridges and valleys. We don't want to be accused unfairly. But sometimes you fly by, looking over an area, and you'll see a person on the ground and you might not know if they are in distress, so you fly low to check it out, and then later you're accused of chasing off their animal or buzzing them.

In defense of the U.S. Coast Guard personnel, one person said:

I am sick and tired of my fellow Sitkans complaining about the Coast Guard. It's none of our business whether their pilots look for animals. Just because some [hunter] sees them when flying around, he accuses them of harrassment.

Guardsmen as a rule do not hunt goats or bear until after their first year in Sitka. This way they can avoid the high non-resident license fee, and, in the case of bear, having to hire a guide as well.

Most of the fishing done by Sitka U.S. Coast Guardsmen is for sport: Dolly Varden, coho salmon, and steelhead were said to be the primary target species. In the summer of 1983, 54 percent of the 22 officers and an estimated 15 to 20 percent of the enlisted men owned their own boats. Boats owned by the U.S. Coast Guard are also available for use by the men. Despite their short tenure in Sitka, a few guardsmen fished commercially for halibut in 1983. There was never any mention of guardsmen focusing their fishing, hunting or gathering activities on any particular locations. They frequently make use of U.S. Forest

Service cabins for both hunting and fishing. Unlike the stereotyped millworkers, they do not go out in large groups; most were reported to hunt in pairs and to fish in small groups of two to four.

None of the three guardsmen households in the survey did much gathering other than berry picking, a fact which appears to be generally true of new residents. Their intertidal gathering was also less than average; however the survey respondents said diving for abalone was popular among their colleagues.

### Filipinos

According to several Filipino interviewees, there are 30 Filipino families in Sitka. About two-thirds are permanent residents, while the other third is comprised of seasonal workers many of whom work in one of the fish plants. All but three of the families are from the northern Philippines and are ethnically Ilocano. The Filipinos have formed their own cultural association; they consider themselves a tightly knit community and are also regarded this way by others.

Filipinos stand out in the minds of other Sitkans for their use of a wide range of local resources. They compare with Natives in the variety of fish and intertidal resources harvested. They make extensive use of several fish species -- including greenling, flounder, and bullhead as well as "colored" humpies -- which are neglected by most other Sitkans. Some also gather mussels, which are ignored by most Sitkans because of the PSP threat; and they harvest large quantities of

clams.

Filipinos are also reputed to make fuller use of the animals they harvest than any other subgroup of Sitka. For example, they frequently use every part of the fish they catch, including the innards (cooked with vinegar, ginger, and garlic) and the heads (which are boiled). Even the eyeballs may be eaten. Likewise, Filipinos use all parts of deer, including the blood for blood pudding and sausages. In an earlier chapter we mentioned a Filipino who prepared and ate deer brain, skin, and intestines. In the words of one observer, "They (Filipinos) know how to use everything and don't waste anything."

Filipinos are similar to Natives in that their motivation for hunting, fishing, and gathering is more for subsistence than recreation. Put differently, the desire to lower household food costs is a major reason for engaging in these activities. And consistent with their emphasis on subsistence, they try to harvest their foods in the most efficient way possible. For example, most Filipinos hunt deer down low rather than up in the forest or alpine. Referring to fishing and intertidal gathering, one person said: "They want to get as much food as they can in the shortest possible time. They go after things in a big way."

The zeal with which they approach harvesting wild foods has gotten some members of the community into trouble. According to all three Fish and Wildlife Protection officers interviewed, Filipinos are cited more frequently than any other group for violating fish and game regulations, mainly exceeding bag limits

or taking undersized specimens. Apparently some are aware of the regulations.

Many Filipinos do not own boats and are largely restricted to harvesting along the road system. The Starrigavin area is their favorite location for hunting, fishing, and gathering. A Fish and Wildlife Protection officer said that he rarely sees Filipinos **engaging in harvest activities outside Starrigavin** (Bruce Lester pers. commun., 1983).

#### PERCEPTIONS CONCERNING THE DECLINE OF LOCAL RESOURCES

During the early household interviews, Sitkans sometimes expressed opinions on the status -- usually the decline -- of certain resources. In later interviews, people were asked directly about their experience concerning the decline of particular resources. Much of this information has been discussed in earlier chapters in reference to particular species; however, a brief discussion of some general points is in order.

The species perceived to have suffered the greatest decline and subject to the most concern were crab, abalone, and deer. Mentioned less often were sockeye salmon, herring, and certain species of berries, particularly cranberries. Explanations informants gave for the decline of these resources usually fell into one of two categories: 1) pressure on the resource stemming from the growth of Sitka's population, and 2) over-exploitation by commercial harvesters. Population pressure

was cited to account for the perceived decline of deer populations and berry crops in areas near Sitka. Declines in crab, abalone, and herring were blamed primarily on local overharvesting by commercial fishermen.

The decline of these resources, real or imaginary, has affected Sitkans in several ways. First, long-term residents say they must travel further today to harvest certain wild foods (e.g., deer, crab, abalone) than they did in the past. Secondly, a number of households reported combining several food producing activities on each outing in order to make harvesting trips worthwhile. Third, the scarcity of certain resources close to Sitka has discouraged some residents from harvesting them; households without a boat or owning only a small boat can find it difficult to harvest. Some Sitkans have responded to the perceived decline of certain species by proposing regulations that would limit or restrict the harvest pressure, especially by commercial harvesters.

## CHAPTER 10

### CONCLUSION

This study was undertaken to gather information on the use of fish, wildlife, and plant resources by the residents of Sitka. It is the first study to focus on resource use in an urban Alaskan community (population 7,803). As the data presented in the preceding chapters have shown, Sitkans make extensive use of the wild food resources available to them. Half to over three-quarters of the survey households participated in each type of harvesting activity (fishing, hunting, plant and intertidal gathering) examined. Harvesting wild foods is a fundamental part of life in this Alaskan community. Indeed, many residents have chosen to live in Sitka precisely because of the abundant and diverse resources available and the rewards they find in harvesting them.

What rewards does the harvesting of wild foods provide? For most Sitkans, fishing, hunting, and gathering are their major outdoor recreational activities. While many Americans living in the "Lower 48" may spend their weekends watching sports on television, Sitkans are often outdoors on the water or in the tidelands or forest with friends and neighbors. As discussed in Chapters 3 through 6, harvesting activities are usually done with other people. Such shared activities and common interests are

important not only to the individuals directly engaged in them, but -- by promoting social interaction -- they are important to the community at large. Sitka is a community of diverse origins with differing subgroups utilizing resources in a variety of ways; a large majority of its residents share a deep interest in the natural environment and its bounty.

The animal and plant species harvested by Sitkans are also important in other ways. They provide protein and a vitamin-rich source of food, and one that is free of the chemical additives of commercially processed food. The high nutritional value and the pleasure of eating fresh, savory wild foods adds to the quality of life in Sitka. The value of this aspect of resource use to Sitkans is demonstrated in many ways, ranging from the frequency with which wild foods are the subject of conversation among residents to the cravings of elderly residents in the Pioneer Home who keep private stocks of their favorite wild foods in their rooms.

Sitkans regularly share wild foods with other residents as well as with friends and relatives living outside the community. The giving and exchange of food in many cultures is a major way of reaffirming social relationships. When neighbor helps neighbor and younger households help support older, less active households, both sides benefit. The food providers feel useful and their social and self-esteem is raised by having given to others; the recipients' larder is supplied and their hearts are warmed by having been the object of goodwill or reciprocity.

The exchange of food, as Wolfe (1981:231) notes for another Alaskan community, becomes a media of communication in which symbolic messages concerning personal sentiments are transferred.

The harvesting of wild resources also brings Sitkans closer to their environment. For many, the passing of the year is conceived not just in terms of major changes in climate and vegetation (e.g., coloring of leaves), as is customary in places where people do not live close to the land, but in myriad, more subtle changes in the biotic environment -- the spawning of herring in early spring, the blossoming of salmonberry bushes in early summer, the salmon runs of mid-to-late summer.

Native Tlingit culture has traditionally been defined largely by its relationship to the environment. The survival of Tlingit traditions depends on the sea and land continuing to provide resources; if the foundation of Native subsistence is weakened, other elements of the culture will begin to crumble.

Though subsistence is not part of the cultural background of most non-Natives in Sitka, it is nonetheless a crucial element in the adaptation many have made to life in Alaska. If the opportunity to fish, hunt, and gather wild foods were removed or diminished, many Sitkans would no longer wish to live there. When policy decisions concerning the use of wild resources are being made, the integral role of harvesting activities in the lives of a large majority of residents should be remembered.



APPENDIX A  
METHODOLOGY

The research was conducted by George Gmelch and Sharon Bohn Gmelch. Richard K. Nelson assisted with overall development of the project and pilot study. Libby Halpin, a graduate student at the University of Washington, and Gabe George and Matt Kookesh of the Division of Subsistence, Angoon, assisted in the household survey, and Robert Schroeder of the Division of Subsistence laid much of the groundwork for the research during the pilot study. A multi-method strategy for gathering data was used, including an interview survey of a random sample of Sitka households, in-depth interviews with experts, and participant observation.

The survey data are based on interviews with 139 randomly selected households, representing roughly 6 percent of Sitka's households. The interviews were conducted during June, July and August 1983. The following procedure was used to select the sample:

1. First a map of Sitka's electoral districts, which divides the population into roughly equal numbers of electors, was obtained from the City Clerk's office. The office also provided figures on the number of electors in each district, and the exact percentage of electors for each district was then calculated. A list of persons living on boats in Sitka's two harbors was also obtained.

2. The number of households to be interviewed in each district was determined by dividing the desired sample (n=146) by each percentage obtained. The researchers concluded that a six percent sample of the population (146 households) could realistically be interviewed within the time allocated for the research (three months), given the number of interviewers available (four interviewers including the two principal investigators, one full-time assistant, and two part-time assistants). A sample of this size is statistically adequate; survey research in other urban areas has frequently utilized a five percent sample.

3. More detailed maps of Sitka, showing every street, were obtained from the town planner. Boundaries of the electoral districts were marked and every street within a district was numbered.

4. To randomly determine how many streets interviewers would go to in each district, squares of paper numbered one through ten were placed in a bowl and a number drawn out. This was done for each district, replacing all the numbers before each drawing.

5. This number was then divided into the number of households to be interviewed in each district (step 2), to determine how many households on each street would be interviewed.

6. To randomly determine which streets interviewers would go to, numbered squares corresponding to the numbered

streets on the map (step 3) were placed in the bowl. Then for each district the number of squares, as determined in step 4, were drawn out. If interviewers were to go to three streets in District 1, for example, three squares were drawn out and the names of the streets they corresponded to were written down.

7. Each interviewer was given a map of his/her district(s) with the selected streets and the number of needed households marked in red and an envelope with approximately 50 numbered squares. They were instructed to go to each selected street (in some cases, a harbor) and count the number of houses (or apartment units, trailers, boats) on it.

8. The correct squares (e.g., numbers 1-15 if there were 15 houses on the street) were then placed in the envelope, the envelope shaken, and the needed number of squares drawn out.

9. Interviewers then walked up the street, starting up the right hand side and down the left, stopping for interviews at the houses they had selected (e.g., the 4th and 9th houses).

Interviews were conducted with the heads of 139 households; seven householders declined to be interviewed or could not be contacted after repeated attempts.

The interview schedule (see Appendix C) focused on household harvest activities (i.e., hunting, fishing, intertidal collecting, and plant gathering), the location and social composition of those activities, the utilization and distribution of harvested foods, and individuals' motivations for participating in the different activities. The 105-item

interview schedule took anywhere from 1/2 hour to 1-1/2 hours to administer. Whenever possible an effort was made to discuss harvest activities beyond what the specific survey questions called for. This additional information was then written up as fieldnotes.

Mapping of harvest areas was done by each respondent during the interview for the major species, including deer, salmon, halibut, abalone, and crab. Respondents were asked to circle with colored felt-tipped pens all of the areas where they regularly harvested each species. By gathering harvest location data from the entire sample rather than just a subsample or from experts, we had hoped the mapping would yield quantitative measures of the importance of particular areas or places for specific resource harvesting.

Unfortunately, however, the map interviews did not produce this kind of information. First, the sample size was too small to measure the importance of any specific localities, because people choose from a huge selection of places when they carry out a harvest activity. Observations and information from local experts showed some areas to be important for harvesting a particular resource, yet only a few people in the survey sample happened to use them. For example, one important fishing area near Sitka was only circled by one survey respondent. For some species, such as crab, the problem was compounded by the small number of sampled households who harvested the species, further reducing the sample size. Therefore, maps based on sample

surveys could be quite misleading, especially if some measure of use intensity is sought.

In spite of these problems, mapping was useful for indicating the general harvest areas for each species. It is significant that the maps of overall harvest areas produced from the survey data are nearly identical to the maps we asked experts at the Department of Fish and Game, U.S. Fish and Wildlife Service, and Fish and Wildlife Protection to draw for each species. Much valuable field time could have been saved by relying on a small sample of experts. In retrospect, it appears that interviews with experts may also be the most reliable way to determine the important or critical areas for specific harvest activities. A very large sample of resource users would be necessary to do this by the map survey technique.

The response to the survey was exceptional; only five (three percent) of the chosen households declined to be interviewed. The high response rate may be due in part to pre-survey publicity -- an article about the study appeared in the local newspaper and announcements on both radio stations alerted residents that their household might be contacted by the researchers. During the planning stages of the study there were concerns that residents would not be candid about their hunting and fishing activities, particularly concerning their favorite locations. With few exceptions the respondents seemed very willing to answer the questions. Moreover, many gave the questions on the size of the last year's harvest much thought;

they appeared to be trying to be as accurate as their memory would permit. Nevertheless, it should be pointed out that survey information on past events is only as reliable as respondents' memories and honesty.

In-depth and focused interviews were conducted on a wide variety of topics with 39 specialists and others with expert knowledge of resource-use patterns. The interviews were done with specialists at government agencies (National Park Service, Sitka City and Borough Planning Department, National Marine Fisheries Services, Co-operative Extension Service, U.S. Forest Service, U.S. Coast Guard, and Alaska Department of Fish and Game), community and cultural organizations (Alaska Native Brotherhood, Sitka Community Organization, the Elks, Mt. Edgecumbe Hospital, and the Pioneer Home), and local businesses (taxidermist, radio station, two sporting goods stores, two air charter firms, Alaska Airlines, a boat dealership, and the Northern Southeast Aquaculture Association).

The different types of data collection strategies described above, and some participant-observation in harvest activities (primarily fishing and plant gathering), were used in hopes of achieving a satisfactory mix of quantitative and qualitative data.

APPENDIX B

CHARACTERISTICS OF SURVEY SAMPLE

Ethnic Composition of Household (n=139)

Non-Native *	71 %
Native	21 %
Filipino	4 %
Japanese	2 %
Other	2 %

\* Non-Natives other than ethnic groups listed below, primarily Caucasian.

Educational Background of Household Head (n=139)

Elementary	2 %
High School	49 %
Undergraduate College	32 %
Postgraduate College	17 %

Occupations of Household Members (n=219)

Managerial, professional	26 %
Technical, administrative	7 %
Service	26 %
Fishing	7 %
Forestry, logging	6 %
Laborer, operator, fabricator	12 %
Precision production, craft, repair	10 %
Self-employed	2 %
Military	4 %

Household Income (n=139)

under \$9,999	5 %
\$10,000-24,999	19 %
\$25,000-39,999	31 %
\$40,000-54,999	26 %
over \$55,000	18 %

Birthplace of Household Heads (n=139)

West Coast	35 %
Alaska	26 %
Midwest	18 %
South	5 %
Non-U.S.	5 %
Atlantic	4 %
Southwest	4 %
Northeast	2 %
Mt. States	1 %

APPENDIX B (continued)

Number of Years Residence in Sitka by Household Head (n=139)

less than 1 year	4 %
1-5 years	28 %
6-10 years	20 %
11-15 years	11 %
16-20 years	14 %
21-25 years	8 %
25 or more years	15 %

Ownership of Major Resource Collection/Preparation Equipment (n=139)

Freezer	76 %
Boat	64 %
Smokehouse/Smoker	51 %
Off Road Vehicle	12 %
Airplane	5 %



APPENDIX C

SITKA RESOURCE USE SURVEY

Your household has been randomly selected for a study of the hunting, fishing, and gathering activities of Sitka residents and their attitudes towards the use of local resources. It is being sponsored by the Subsistence Division of ADF&G. The information from this survey will be pooled and will not identify the responses of individuals. It will appear in a report and may be important for future land use and management decisions.

HUNTING

1. Did anyone in your household hunt last year (last 12 months)?  
     yes 1  
     no 2
  
2. IF YES, how many members of your household hunted last year? \_\_\_\_\_
  
3. IF NO, did anyone in your household hunt in Southeast in the last five years?  
     yes 1  
     no 2 (IF NO, skip to question 30.)
  
4. What animals did members of your household hunt last year?
 

deer	1	sea lion	6
mt. goat	2	moose	7
brown bear	3	waterfowl	8
black bear	4	other	9
seal	5		
  
5. Have members of your household hunted any other animals in the Sitka area in the last five years?
 

deer	1	sea lion	6
mt. goat	2	moose	7
brown bear	3	waterfowl	8
black bear	4	other	9
seal	5		

4	
5	
6	
7 8 9	
10 11 12	
13 14 15	
16 17 18	

DEER HUNTING (If respondent does not hunt deer, use hunting supplement for any other species he hunts.)

6. About how many times did members of your household go deer hunting last year?  
     main hunter      second      third  
     \_\_\_\_\_          \_\_\_\_\_      \_\_\_\_\_

19									
----	--	--	--	--	--	--	--	--	--

The following questions refer to the main hunter only.

7. On how many of these trips was your specific goal to hunt deer? \_\_\_\_\_
8. Last year how many of your deer hunting trips were:  
 day trips \_\_\_\_\_  
 overnight trips \_\_\_\_\_  
 2 days or more \_\_\_\_\_
9. In an average year about how many times do you go deer hunting? \_\_\_\_\_
10. On an average trip, how many days are you gone? \_\_\_\_\_
11. On an average trip, how many people, including yourself, are in your party? \_\_\_\_\_
12. In which areas do you normally hunt? (Please circle on map. Use red.)
13. Which of these area(s) are most important?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Now I'd like to ask a few questions about the main hunter's last deer hunting trip.

14. How many days were you gone? \_\_\_\_\_
15. How many people, including yourself, were in your party? \_\_\_\_\_
16. How were these people related to you?  
 household member 1  
 relatives 2  
 neighbor 3  
 co-worker 4  
 friends 5  
 visitors 6
17. How many of these people were hunting? \_\_\_\_\_
18. Were there any women in your group?  
 yes 1  
 no 2
19. IF YES, were any of the women hunting?  
 yes 1  
 no 2
20. What form of transportation did you use to get to your hunting area?  
 boat 1                      plane 4  
 car 2                        ORV 5  
 on foot 3                    other 6

25 26

--	--

27 28 29 30


31  
32  
35  
36

39 40

--	--

41

--

42

--

43 44

--	--

45

--

46 47 48

--	--	--

49

--

50

--

51

--

52 53 54

--	--	--



BIRD HUNTING

30. Did you hunt birds last year?  
yes 1  
no 2

5

31. Which of the following did you hunt last year?  
ducks 1 ptarmigan 3  
geese 2 other 4 \_\_\_\_\_

6 7 8

32. How many times did members of your household go bird hunting last year?  
main hunter second third  
\_\_\_\_\_

9 10 11 12 13 14

33. How many of each of the following birds did they shoot?  
ducks 1 ptarmigan 3  
geese 2 other 4 \_\_\_\_\_

15 16 17 18 19 20

34. In which areas do members of your household normally bird hunt? (Please circle on map.)

TRAPPING

35. Did any member of your household trap in the last five years?  
yes 1  
no 2

21

36. IF YES, did any member of your household trap last year?  
yes 1 (IF YES, use trapping supplement.)  
no 2

22

FISHING FOR HOUSEHOLD USE

37. Does any member of your household fish?  
yes 1  
no 2 (IF NO, skip to question 53.)

23

38. Does anyone in your household have a commercial fishing license, including crew members' license, at the present time?  
yes 1  
no 2 (IF YES, use commercial fishing supplement.)

24

39. Which of the following fish did people in your household go for last year?  
salmon 1 halibut 6  
rockfish 2 lingcod 7  
dolly varden 3 herring 8  
smelt 4 crab 9  
shrimp 5 trout 0  
other \_\_\_\_\_

25 26 27  
    
28 29 30  
    
31 32 33  
    
34

40. Approximately how many times did members of your household go fishing last year? \_\_\_\_\_

35 36 37  

--	--	--

41. Please estimate how many fish of each of the following types were caught by members of your household in Southeast last year. (Indicate the measurement used: number, lbs., buckets.)

salmon: \_\_\_pink; \_\_\_king; \_\_\_coho; \_\_\_chum; \_\_\_sockeye  
halibut \_\_\_\_\_ rockfish \_\_\_\_\_  
dolly varden \_\_\_\_\_ lingcod \_\_\_\_\_  
herring \_\_\_\_\_ smelt \_\_\_\_\_  
crab \_\_\_\_\_ shrimp \_\_\_\_\_  
trout \_\_\_\_\_ other \_\_\_\_\_

38 39 40 41  

42/43			
44/47			
50/61			
54/55			

58 59 60 61

42. Please indicate on the map where you usually go for (sport and personal use only) the following: (Please circle on the map. Use yellow.)

salmon  
halibut  
bottom fish  
crab

43. Did anyone in your household have a subsistence fishing permit last year?

yes 1  
no 2

62

44. How many people, including yourself, do you usually fish with? \_\_\_\_\_

63 64  

--	--

45. How are these people related to you?

household member 1  
relatives 2  
neighbor 3  
co-worker 4  
friends 5  
visitor 6

65 66 67  

--	--	--

46. Did you give fish to anyone outside your household in the last year (excluding fishing partners)?

yes 1  
no 2

68

47. IF YES, how many households did you give fish to? \_\_\_\_\_

69 70  

--	--

48. How are these people related to you?

relatives 1  
neighbor 2  
co-worker 3  
friends 4  
visitor 5

71 72 73  

--	--	--

49. Approximately what percentage of your harvested fish do you share with people not living in your household? \_\_\_%  
(Think of your last catch.)

74 75

50. Did anyone give your household fish in the last year?  
 yes 1  
 no 2

76

51. IF SO, how many persons gave your household fish? \_\_\_

77 78

52. How important are the following factors in your decision to fish (on a scale of 0 to 3, with 0 = not important and 3 = very important)?

1 2 3  
    
 card 3

- a. enjoy taste of fresh fish
- b. nutritional value of fish
- c. to lower food costs
- d. provide one's own food
- e. enjoyment of fishing
- f. enjoyment of outdoors
- g. to share fish with friends/ family
- h. it is part of my cultural background

	0	1	2	3

4

5

6

7

8

9

10

11

12

INTERTIDAL GATHERING

53. Has any member of your household gathered beach foods (clams, seaweed, etc.) in the last year?  
 yes 1  
 no 2

13

54. IF NO, has any member of your household gathered beach foods in the last five years?  
 yes 1  
 no 2

14

55. Which of the following species did members of your household gather in the last year?

- |              |   |                 |    |
|--------------|---|-----------------|----|
| razor clams  | 1 | limpets (incl.  |    |
| clams        | 2 | china slippers) | 9  |
| cockles      | 3 | sea cucumbers   | 10 |
| abalone      | 4 | sea urchins     | 11 |
| mussels      | 5 | black seaweed   | 12 |
| herring eggs | 6 | red seaweed     | 13 |
| scallops     | 7 | kelp            | 14 |
| gumboots     | 8 | seagull eggs    | 15 |

15 16 17 18

19 20 21 22

23 24 25

26 27 28 29

56. Please estimate how many times members of your household gathered food from the inter-tidal zone in the last year? \_\_\_

30 31

57. Please estimate the amounts of the following foods members of your household gathered in the last year. (Gallons or

indicate other measurement)

- |                      |                        |
|----------------------|------------------------|
| 1 razor clams _____  | 8 limpets _____        |
| 2 clams _____        | 9 sea cucumbers _____  |
| 3 cockles _____      | 10 sea urchins _____   |
| 4 abalone _____      | 11 black seaweed _____ |
| 5 mussels _____      | 12 red seaweed _____   |
| 6 herring eggs _____ | 13 kelp _____          |
| 7 scallops _____     | 14 seagull eggs _____  |

58. Which of the above foods does your household consider to be the most important (even if not gathered last year)?

first \_\_\_\_\_  
 second \_\_\_\_\_  
 third \_\_\_\_\_

59. Where do you go to gather beach foods? (Please circle on the map. Use green.)

60. How many people do you usually gather with, including yourself? \_\_\_\_\_

61. How are these people related to you?

- |                  |   |
|------------------|---|
| household member | 1 |
| relatives        | 2 |
| neighbor         | 3 |
| co-worker        | 4 |
| friends          | 5 |
| visitor          | 6 |

62. Did you give beach foods to anyone outside your household in the last year?

- yes 1  
 no 2

63. IF SO, how many households did you give beach foods to? \_\_\_\_\_

64. How are these people related to you?

- |           |   |
|-----------|---|
| relatives | 1 |
| neighbor  | 2 |
| co-worker | 3 |
| friends   | 4 |
| visitor   | 5 |

65. What did you give them? \_\_\_\_\_

66. Did anyone give your household beach foods in the last year?

- yes 1  
 no 2

67. How many people gave your household beach foods in the last year? \_\_\_\_\_

32	33	34	35	36	37
38	39	40	41	42	43
44	45	46	47	48	49
50	51	52	53	54	55
56	57	58	59	60	61
62	63	64	65	66	67
68	69	70	71	72	73

74	75
76	77
78	79

1	2	3
card 4		

5	6	7

8

9	10

11	12	13

14	15	16	17	18	19

20

21

68. What did they give you? \_\_\_\_\_

22 23 24

69. How are these people related to you?

- relatives 1
- neighbor 2
- co-worker 3
- friends 4
- visitor 5

25 26 27

70. Do you have a garden?

- yes 1
- no 2

28

71. IF YES, do you use any of the following in your garden?

- seaweed/ kelp 1
- starfish 2
- shells 3
- herring 4
- fish heads 5

29 30 31 32  
     
 33

72. How important are the following factors in your household's decision to gather beach foods (on a scale of 0 to 3, with 0 = not important and 3 = very important)?

- a. enjoy taste of wild foods
- b. nutritional value of the food
- c. desire to reduce food costs
- d. provide one's own food
- e. enjoyment of gathering
- f. enjoyment of outdoors
- g. to share food with others
- h. it is part of my cultural background

	0	1	2	3

34  
 35  
 36  
 37  
 38  
 39  
 40  
 41

PLANT GATHERING

73. Has any member of your household gathered berries, greens, roots, or mushrooms in the last year?

- yes 1
- no 2

43

74. IF NO, has any member of your household gathered these items in the last five years?

- yes 1
- no 2

44



75. Which of the following plants did members of your household gather in the last year?

- |                           |    |                             |    |
|---------------------------|----|-----------------------------|----|
| blueberries               | 1  | currents                    | 16 |
| salmonberries             | 2  | thimbleberries              | 17 |
| red huckleberries         | 3  | cloudberries                | 18 |
| strawberries              | 4  | cranberries                 | 19 |
| elderberries              | 5  | nagoonberries               | 20 |
| goosetongues              | 6  | fern fiddleheads            | 21 |
| beach asparagus           | 7  | Hudson's Bay Tea            | 22 |
| beach greens              | 8  | wild cucumber/twisted stalk | 23 |
| wild celery               | 9  | miner's lettuce/            |    |
| wild rice/Kamchatka       | 10 | Spring Beauty               | 24 |
| fireweed                  | 11 | devil's club                | 25 |
| lamb's quarter            | 12 | nettles                     | 26 |
| chamomille/pineapple weed | 13 | dandelion                   | 27 |
| yarrow                    | 14 | clover                      | 28 |
| mushrooms                 | 15 | other _____                 | 29 |

45	46	47	48	49	50
51	52	53	54	55	56
57	58	59	60	61	62
63	64	65	66	67	68
69	70	71	72	73	74

76. How do you use these plants? \_\_\_\_\_

---



---

77. Which of the above foods does your household consider to be the most important?

first \_\_\_\_\_ second \_\_\_\_\_ third \_\_\_\_\_

75	76	77	78	79	80

78. Please estimate how many times members of your household gathered berries, greens, roots, or mushrooms in the last year? \_\_\_\_\_

1	2	3
4	5	

79. Where do you typically go to collect these foods? \_\_\_\_\_

---

80. How many people do you usually gather with, including yourself? \_\_\_\_\_

6

81. How are these people related to you?

- |                  |   |
|------------------|---|
| household member | 1 |
| relative         | 2 |
| neighbor         | 3 |
| co-worker        | 4 |
| friends          | 5 |
| visitor          | 6 |

7	8	9

82. Did you give berries, greens, roots, or mushrooms (or any products made from them) to anyone outside your household in the last year?

- |     |   |
|-----|---|
| yes | 1 |
| no  | 2 |

10

83. IF YES, how many households did you give such foods to? \_\_\_\_\_

11 12  

--	--

84. How are these people related to you?

- relative 1
- neighbor 2
- co-worker 3
- friends 4
- visitor 5

13 14 15  

--	--	--

85. What did you give them? \_\_\_\_\_

16 17 18 19 20 21  

--	--	--	--	--	--

86. Did anyone give your household gathered plant foods last year?

- yes 1
- no 2

22  

--

87. How many people gave your household such foods in the last year? \_\_\_\_\_

23 24  

--	--

88. How are these people related to you?

- relatives 1
- neighbor 2
- co-worker 3
- friends 4
- visitor 5

25 26 27  

--	--	--

89. Do you use plants or wood for craft purposes?

- yes 1
- no 2

28  

--

90. IF YES, please describe. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

91. How important are the following factors in your household's decision to harvest plants (on a scale of 0 to 3, with 0 = not important and 3 = very important)?

- a. enjoy taste of wild foods
- b. nutritional value of wild plants
- c. to lower food costs
- d. to provide one's own food
- e. enjoy gathering plants, berries
- f. enjoy the outdoors
- g. to share gathered food with others
- h. it is part of my cultural background

	0	1	2	3

29  
30  
31  
32  
33  
34  
35  
36

92. Do you make use of wood?

- yes 1
- no 2

37  

--

93. IF YES, where do you gather it?

- beach 1
- water 2
- forest 3
- other 4

38 39 40

94. What did you use of the wood for?

- fire wood 1
- construction/ lumber 2
- smoking (fish/meat) 3
- handicrafts 4 (specify \_\_\_\_\_)
- other 5 (specify \_\_\_\_\_)

41 42 43  
    
 44 45

95. How do you use wood for craft purposes? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

96. Please estimate how many cords of timber your household gathered last year? \_\_\_\_\_

46 47

97. What percentage of the heat in your home comes from wood? \_\_\_\_\_

48 49

Background Information

98. What is the ethnic background of members of your household?

- White 1
- Native 2
- mixed Native and non-Native 4
- other \_\_\_\_\_ 5

50

99. Household:

(4) Relationship	(5-6) Age	(7) Birth Place	(8) Ethnicity	(9-10) Years Sitka	(11) Occupation	(12) Employment Status

1 2 3  
    
 card 5

	4	5	6	7	8	9	10	11	12
13/21									
22/27									
28/33									
34/39									
40/45									
46/51									
52/57									
58/63									
	X	X	X	X					

64 65 66 67

100. Which of the following do you own or have use of:

- boat 1
- ORV 2
- plane 3
- freezer 4
- smokehouse 5  
or smoker

68 69 70  
    
 71 72

--	--	--

card 6

101. If you own a boat, what type of boat is it?
- |         |  |         |
|---------|--|---------|
| a. type |  | c. type |
| length  |  | length  |
| b. type |  |         |
| length  |  |         |

4			
5			6
7			
8			9
10			
11			12

102. What is the last level of education completed by the household head?
- |             |   |                        |   |
|-------------|---|------------------------|---|
| elementary  | 1 | college, undergraduate | 4 |
| junior high | 2 | college, postgraduate  | 5 |
| high school | 3 |                        |   |

13

103. In which category does your annual household income fall? Indicate the appropriate letter only.
- |    |                 |   |
|----|-----------------|---|
| A. | up to \$10,000  | 1 |
| B. | \$10,000-25,000 | 2 |
| C. | \$25,000-40,000 | 3 |
| D. | \$40,000-55,000 | 4 |
| E. | \$55,000 above  | 5 |

14

ATTITUDES TOWARDS RESOURCES AND HARVESTING

104. Is harvesting natural resources important in your decision to live in Sitka? If so, please explain.

105. How involved is your household in the use of local resources compared to five years ago?

15

106. How do you feel about current regulations concerning hunting and fishing?

THANK YOU FOR YOUR COOPERATION. Are there any questions that you would like to ask me about this study?

Street \_\_\_\_\_  
Date \_\_\_\_\_

HUNTING SUPPLEMENT

Species \_\_\_\_\_

1. On your last hunting trip, how many days were you gone? \_\_\_\_\_
2. On your last hunting trip, how many people were in your party including yourself? \_\_\_\_\_
3. How are these people related to you?
 

household member	1	co-worker	4
relatives	2	friends	5
neighbor	3	visitor	6
4. How many of these people were hunting? \_\_\_\_\_
5. Were there any women in your group?
 

yes	1
no	2
6. IF YES, were any of the women hunting?
 

yes	1
no	2
7. What form of transportation did you use to get to your hunting area?
 

boat	1	plane	4
car/truck	2	ORV	5
on foot	3	other	6 _____
8. How many animals did you take on your last hunting trip? \_\_\_\_\_
9. What parts of the animal did you use?
 

meat	1	antlers	6
heart	2	hide	7
liver	3	bones	8
stomach	4	other	9 _____
head	5		
10. Did you share the meat with anyone outside your household?
 

yes	1
no	2
11. IF YES, how many households did you give meat to? \_\_\_\_\_
12. Were your motivations for hunting \_\_\_\_\_ (species) any different from your motivations for deer hunting? \_\_\_\_\_

17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	

TRAPPING SUPPLEMENT

1. How many people in your household trapped last year? \_\_\_\_\_
2. Do you trap with a partner?  
     yes 1  
     no 2
3. How long have you been trapping? \_\_\_\_\_
4. How long have you been trapping in Alaska? \_\_\_\_\_
5. Please estimate the number of the following animals that you trapped last year.  
     marten \_\_\_\_\_  
     mink \_\_\_\_\_  
     otter \_\_\_\_\_  
     other \_\_\_\_\_
6. How many days per week did you trap last winter? \_\_\_\_\_
7. Please circle on the map the general areas where you trap.
8. How do you feel about existing regulations concerning trapping?

76			
77			
78	79	1	2
4	5	Card?	
6	7	8	
9	10	11	
12	13	14	
15	16	17	
18			

COMMERCIAL FISHING SUPPLEMENT

1. What kind of commercial fishing do you do?  
 hand troll 1      longline 5  
 power troll 2      crab 6  
 seine 3      crew member on one of the above 7  
 gill net 4      other 8 \_\_\_\_\_
  
2. How many years have you been commercial fishing in Alaska? \_\_\_\_\_
  
3. How many months of the year do you fish? \_\_\_\_\_
  
4. On an average trip, how long are you out?  
 type \_\_\_\_\_ days \_\_\_\_\_  
 type \_\_\_\_\_ days \_\_\_\_\_  
 type \_\_\_\_\_ days \_\_\_\_\_
  
5. Do you eat fish while you are out fishing?  
 never 1  
 about once a week 2  
 2 to 4 times a week 3  
 more than 4 times a week 4
  
6. Please estimate how much fish (lbs. or number of fish) out of your catch you retained last year for household use? \_\_\_\_\_
  
7. What species do you usually keep for personal use? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
  
8. What other wild foods do you harvest/make use of while out fishing? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
  
9. Do you do any deer hunting when out fishing?  
 yes 1  
 no 2
  
10. IF YES, how many deer did you take last year while fishing? \_\_\_\_\_
  
11. Which of the above wild foods (including deer) is most important to you when out fishing?  
 first \_\_\_\_\_  
 second \_\_\_\_\_  
 third \_\_\_\_\_
  
12. Why are they important to you?

39	40	41	42
43	44		
45	46		
47	48	49	50
51	52	53	54
55	56	57	58
59			
60	61	62	
63	64	65	66
67	68	69	70
71			
72			
73	74	75	

## BIBLIOGRAPHY

- Alaska Geographic  
1982 Sitka and Its Ocean/Island World. Alaska Geographic Society, volume 9.
- Alaska Magazine  
1980 "Fishing with a Pry Bar: Southeastern's Pinto Abalone." Alaska Magazine, August 1980, pp.32-35.
- Alves, William  
N.D. Residents and Resources: Findings of the Alaska Public Survey on the Importance of Resources to the Quality of Life in Southeast Alaska. Fairbanks: University of Alaska, Institute of Social and Economic Research.
- Bancroft, Hubert H.  
1886 History of Alaska:1730-1885. San Francisco: A.L. Bancroft & Co.
- Barr, Lou and Nancy Barr  
1983 Under Alaskan Seas:The Shallow Water Marine Invertebrates. Anchorage: Alaskan Northwest Publishing Co.
- City and Borough of Sitka Planning Office  
1974 Comprehensive Plan: Inventory Phase. Sitka: City and Borough Planning Office.
- City and Borough of Sitka Planning Office  
1981 Sitka Coastal Management Program Report. Sitka: City and Borough Planning Office.
- Clark, Roger N. and Darryll R. Johnson  
1981 Selected Findings From the Alaska Public Survey: A Summary of Responses From Southeast and Southcentral Alaska.
- Cooperative Extension Service  
1981 Wild Edible and Poisonous Plants of Alaska. Publication No. 28. Fairbanks: Cooperative Extension Service, University of Alaska.
- Ellanna, Linda J. and Robert J. Wolfe (compilers)  
1983 Resource Use and Rural-Urban Concepts: Case



Studies of Fishing and Hunting in Alaskan  
Communities. Technical Paper No. 61. Juneau:  
Subsistence Division of ADF&G.

- George, Gabe and Matt Kookesh  
1983 Angoon Deer Hunting, 1982. Juneau:  
Subsistence Division of ADF&G.
- Gruening, Ernest  
1968 The State of Alaska. New York: Random House.
- Hinckley, Ted C.  
1970 "The Canoe Rocks - We Do Not Know What Will  
Become of Us". The Western Historical Quarterly  
1:265-90.
- Hooper, Helen  
1981 "Nutrient Analysis of Twenty Southeast Alaska  
Native Foods." Mimeo. Sitka: Mt. Edgecumbe  
Hospital.
- Jacobs, Mark, Jr. and Mark Jacobs, Sr.  
1982 "Southeast Alaska Native Foods." In  
Raven's Bones. Sitka: Sitka Community  
Association.
- Johnson, L. and David Wood  
1979 "Deer Harvests in Southeast Alaska." Mimeo. Sitka:  
ADF&G.
- Justice, James W.  
1966 "Use of Devil's Club in Southeast Alaska." Alaska  
Medicine, volume 8.
- Klinkhart, Edward  
1978 "The Harbor Seal in Alaska". Wildlife Notebook Series.  
Juneau: ADF&G.
- Krause, Aurel  
1950 The Tlingit Indians. Seattle: University of  
Washington Press.
- Larkin, Edward P. and Daniel A. Hunt  
1982 "Bivalve Mollusks: Control of Microbiological Contaminants".  
BioScience 32(3):193-97.
- Mills, David  
1982 The Procurement and Use of Abalone in Southeast  
Alaska. Technical Paper No. 40. Juneau: Division  
of Subsistence of ADF&G.
- Mills, Michael J.

- 1981 "Statewide Harvest Study - 1981 Data". Juneau: ADF&G, Division of Sportfish.
- Nickerson, Richard  
1978 "The Razor Clam in Alaska." ADF&G: Wildlife Notebook Series.
- Oberg, Kalervo  
1973 The Social Economy of the Tlingit Indians. Seattle: University of Washington Press.
- Parker, James  
1977 "The Abalone in Alaska." ADF&G: Wildlife Notebook Series.
- Pelayo, Mary  
1983 Kaa T'eix's. Sitka: Alaska Native Brotherhood.
- Rakestraw, Lawrence W.  
1981 A History of the United States Forest Service in Alaska. Anchorage: Alaska Historical Commission.
- Schroeder, Robert and Richard K. Nelson  
1983 "Sitka: Resource Uses in a Large, Non-Road Connected Community of Southeast Alaska." In Resource Use and Socioeconomic Systems: Case Studies of Fishing and Hunting in Alaskan Communities, compiled by, Robert Wolfe and Linda Ellanna, Technical Paper No. 61. Juneau: Division of Subsistence of ADF&G.
- Sundberg, Kimbal  
1981 Sitka Coastal Habitat Evaluation: Final Project Summary with Management Recommendations. Anchorage: ADF&G, Habitat Protection Service.
- Wallmo, O.C. and J.W. Schoen, editors  
1979 "Sitka Black Tail Deer: Proceedings of a Conference in Juneau, Alaska." U.S. Dept. of Agriculture, Forest Service, Alaska Region.
- Watson, Sarah  
1981 "Wetlands Habitat Investigations in Sitka Sound, Alaska" Anchorage: ADF&G, Habitat Protection Section.
- Wolfe, Robert  
1981 Norton Sound/Yukon Delta Sociocultural Systems Baseline Analysis. Technical Report No. 72. Juneau: Subsistence Division of ADF&G.
- Wolfe, Robert and Linda Ellanna

1983 Resource Use and Socioeconomic Systems: Case Studies of Fishing and Hunting in Alaskan Communities. Technical Paper No. 61. Juneau: Subsistence Division of ADF&G.