

**SALT LAKE COHO SUBSISTENCE PERMIT FISHERY**

by

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## ABSTRACT

The Division of Subsistence conducted a study of the Salt Lake coho subsistence permit fishery in 1982. The purpose was to obtain information on permit holder characteristics, fishery characteristics, harvest levels and distribution of harvest. Methodology included the use of a survey instrument and open-ended interviews.

Survey results indicated permit holders are characterized by an average of three decades of Angoon residency. About two-thirds of the permit holders are also involved in other subsistence permit salmon fisheries. The fishery is characterized by the use of beach seines and gaff hook to harvest Salt Lake coho. At least two persons and a skiff are required to operate a beach seine, but as many as six people and two skiffs can be involved in a single set. The fishery occurs in Salt lake with one respondent stating he had made one set below the falls without success.

Coho harvest levels during the time of the permit fishery (1981 and 1982) were reported to range between 1,260 coho in 1981 to 418 coho in 1982. Eight of the permit holders interviewed actually harvested coho successfully. During the past ten years, heaviest estimates received during the survey ranged between a low of 400 fish to a high of 2,500 fish.

Today, as in the past, coho harvested are distributed widely throughout the community. The first distribution occurred among the fishing crew. Crew members then shared their catch with their family often turning it over to the matrilineal head of the household. She distributed

fish to family members outside the household, other dependents such as  
elders and to community organizations.



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## INTRODUCTION

This report describes the subsistence permit coho fishery at Salt Lake near Angoon on Admiralty Island for the years 1981 and 1982. The study was undertaken by the Division of Subsistence to provide information useful to the Fish and Game advisory system and Board of Fisheries considering proposed regulatory changes.

The Salt Lake subsistence permit coho fishery was created by regulation in January 1981 (Appendix A). Subsistence fishing in Salt Lake, however, has a long history. While this study concentrates on the contemporary permit fishery, a brief description of historical use of the lake is provided.

In 1979, the Angoon local Fish and Game advisory committee presented testimony and proposals to the Board of Fisheries requesting recognition of a coho salmon subsistence fishery in the Mitchell Bay area (Hall 1981). The Board directed the Department of Fish and Game to research the problem. Research on the Salt Lake coho fishery was first conducted in 1980 through a series of open-ended interviews with residents of Angoon (Hall 1981). An interim report which provided background information on the fishery was completed in January 1981 and submitted to the Board. This current study provides additional information including patterns of use, approximate harvest numbers for the last two years, extent of local resident participation in the fishery, and distribution patterns of the coho harvest.

## METHODOLOGY

A systematic survey of permit holders and in-depth interviews with key respondents were used to collect information on the 1981 and 1982 Salt Lake coho fishery. A survey instrument was developed which concentrated on three research areas: permit holder characteristics; fishery characteristics; and distribution of harvest (Appendix B). A total of 59 people were surveyed. The Angoon field staff interviewed 36 of 46 1981 permit holders (78 percent) and 17 of 28 1982 permit holders (61 percent). Taking into account persons with permits in both 1981 and 1982, there were interviewed 45 permit holders. In addition, interviews were given to 14 out of the 49 households without permits to obtain information about households who did not fish for coho at Salt Lake. Seven in-depth open-ended interviews were conducted with households involved in the Salt Lake fishery to gather more detailed information on distribution patterns and to develop case studies of households engaged in the fishery. Research began the second week of November and was completed the first week of December.

TABLE 1  
SURVEY SAMPLE

	<u>Total permit holders</u>	<u>Permit holders interviewed</u>	<u>Percent Interviewed</u>
1981	46	36	78.3
1982	28	17	60.7

## STUDY AREA

### Admiralty Island

Admiralty Island, covered in dense spruce-hemlock forests with scattered clear mountain lakes, is the second largest island in southeast Alaska. The island stretches ninety miles from north to south and thirty miles from east to west. The northern and southern portions of the island are characterized by a steep terrain. On the west side of the island, Kootznahoo Inlet and Mitchell Bay extend ten miles northeast into the main island. Small narrow islands scattered throughout inlet and bay waters combine with strong tides to create swift currents flowing more than 18 feet per second, with frequent whirlpools and rapids (Figures 1 and 2).

The community of Angoon is located on the south side of the entrance to Kootznahoo Inlet (Figure 2). The community population was 516 in 1982 and consisted of 136 households. The community economy is mixed, based on a combination of cash and the harvest of local resources. Commercial hand troll fishing is a major source of cash income. A short fishing season, stiff competition, and variations in salmon run size and in fish prices combine to make annual incomes for Angoon hand trollers relatively low. Jobs outside the fishing industry are limited. In 1982, the city, state, and federal governments provided 13 full-time jobs and nine seasonal or part-time jobs. The school system employed 30 people, primarily from outside the community. Private industry and small businesses provided eight jobs. In addition, summer construction work is sometimes available (Environmental Services 1982).

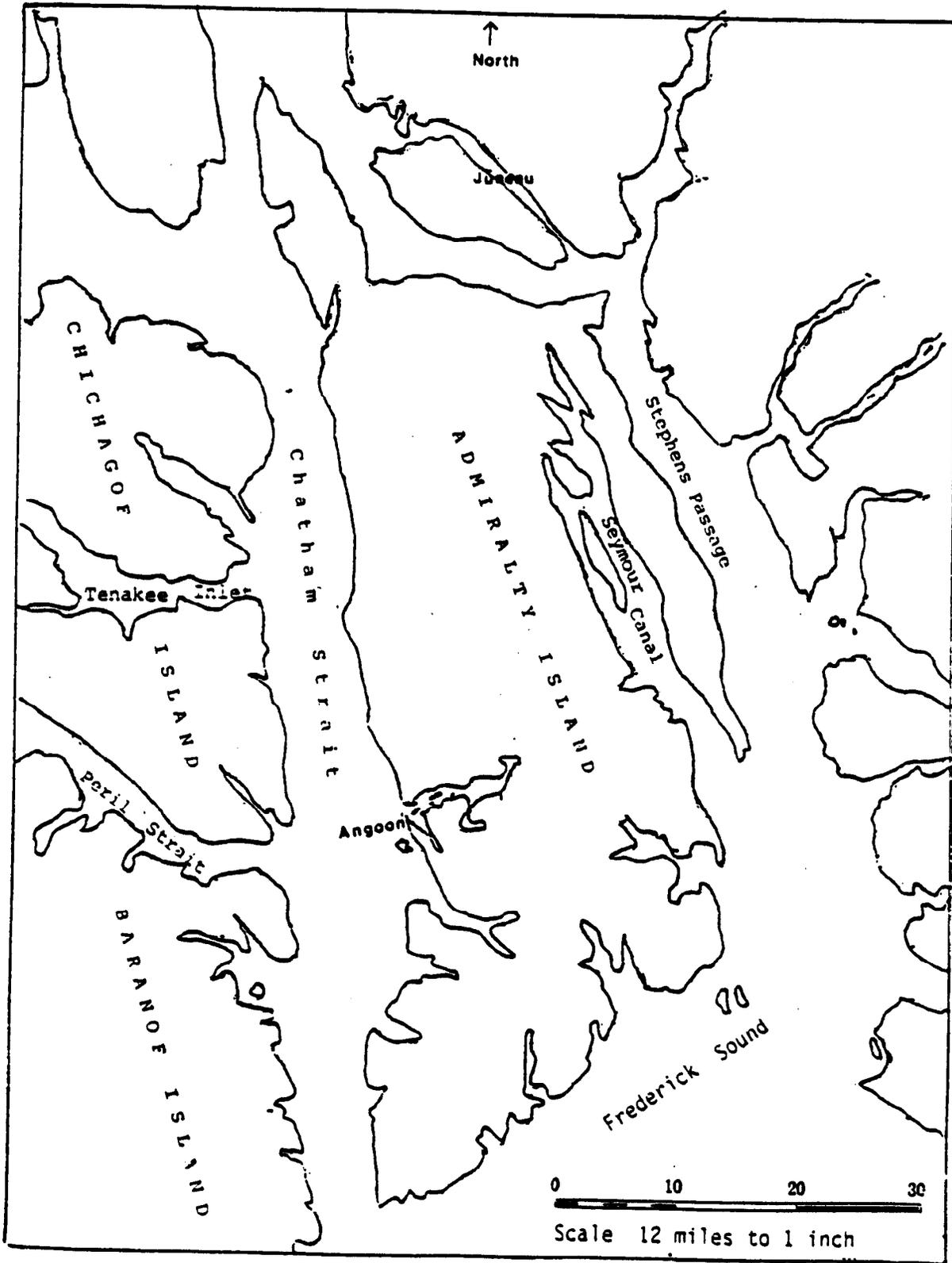


Fig. 1. Admiralty Island and Angoon.

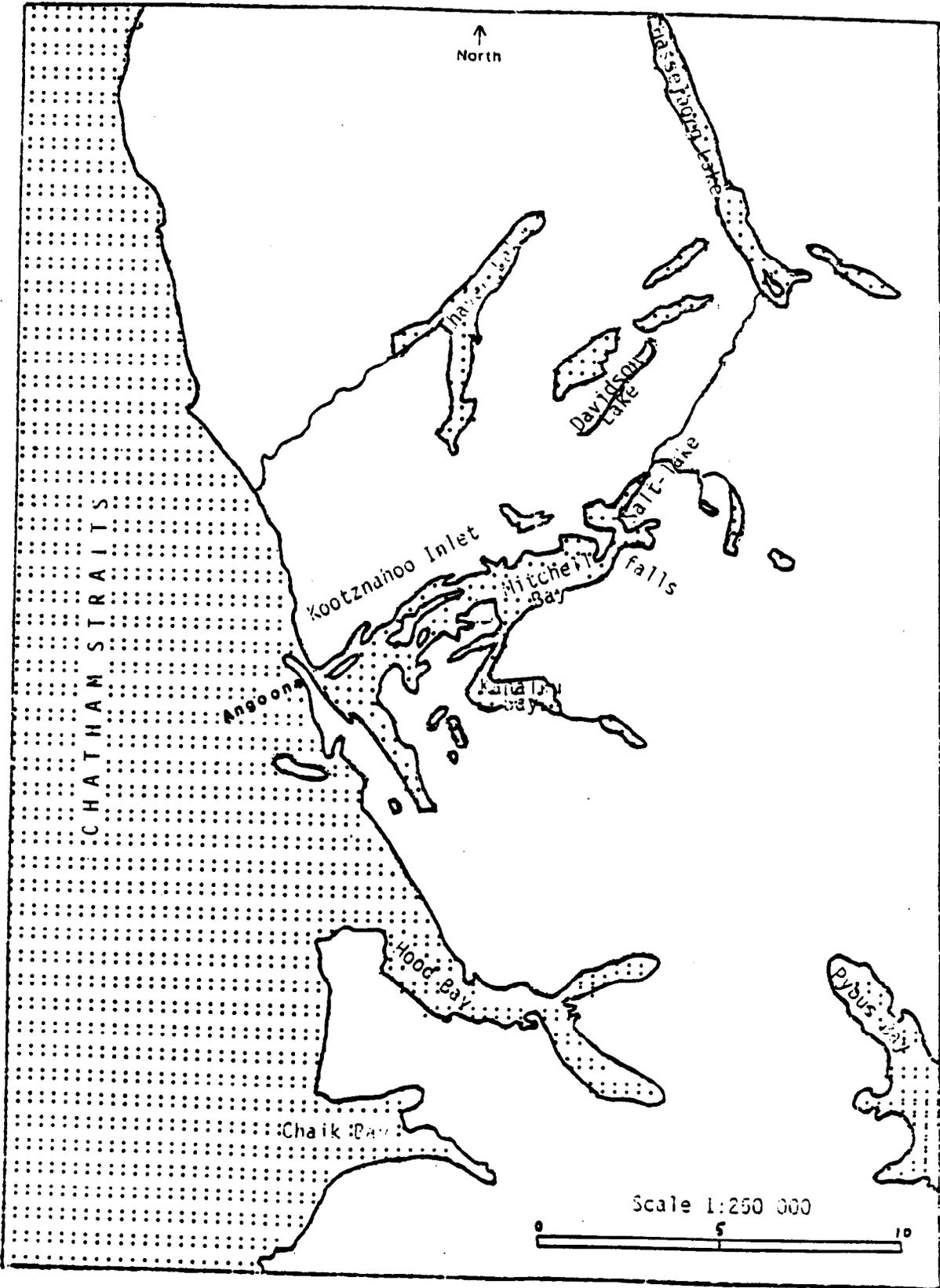


Fig. 2. Salt Lake Drainage.

Residents of Angoon use the rich variety of local, wild resources, and harvest deer, bear, seal, salmon, halibut, shellfish, seaweed, waterfowl, wild greens, and berries. The extent of community dependence on these resources is reflected in a survey conducted in 1976 by Alaska Consultants, Inc., shown as Table 2. Fifty-six percent of surveyed households reported that wild, renewable resources comprised 25 percent or more of their total diet.

TABLE 2  
 SUBSISTENCE HARVEST PARTICIPATION  
 (PERCENT OF SURVEY RESPONDENTS; n=50)

<u>Percent of Food Value from Subsistence</u>	<u>Percent of Households</u>
None	6
A very small amount	14
10 percent	24
25 percent	22
50 percent	24
75 percent	6
More than 75 percent	4

From Alaska Consultants, Inc. 1976: 48

Salt Lake

Salt Lake, located at the head of Mitchell Bay, is surrounded by gently sloping terrain. The lake is fed by a number of fresh water streams flowing from over 13,500 acres of lakes. The largest lake is the nine-mile-long Hasselborg Lake. Out of this lake flows the Hasselborg River, the largest river in the system. The river flows for eight miles from its source in Hasselborg Lake to its outlet in Salt Lake. Salt Lake connects to Mitchell Bay at a place known locally as "the Falls." The Falls are actually rapids formed by water cascading over large boulders at receding tide. During high tide, boats with outboard motors can easily cross the rapids to enter Salt Lake (Figure 2).

There are two routes travelled to reach Salt Lake. The most common passage follows the main channel of Kootznahoo Inlet. The second route follows the coastline. Too shallow for travel with outboard motor, it is usually used when people are in pursuit of intertidal marine resources found on the shores of the small coves and islands throughout Mitchell Bay. The inlet waters can be treacherous for inexperienced boaters. There are many shallows, whirlpools, and standing waves created by the extreme tides which average 18 feet difference per tidal change.

The Salt Lake drainage is the largest coho producing system on Admiralty Island (Donald Ingledue, personal communication). Sockeye, pink, chum, and coho swim through Mitchell Bay and Salt Lake to spawn in local fresh water streams. The salmon runs begin with sockeye in June. Coho are the last to arrive. They begin their ascent into the system in late August and continue throughout October (Table 3).

TABLE 3  
SALMON AVAILABILITY

Salmon Species	Spawning Age (years)	Available in Shallow Water	Mean Adult Weight (lbs)
Sockeye	3-6	late June through early August	6
Pink	2	mid-July through September	2
Chum	3-5	mid-July through October	8
Coho	3-4	late August through October	9

Langdon 1977: 38; Ingledue 1982

Salt Lake provides habitat to fish species other than salmon, including dolly varden, steelhead, and other trout. Game resources, including deer, bear, and waterfowl frequent the lake and river shores.

## HISTORY OF THE SALT LAKE COMO FISHERY

The resources of Salt Lake have been harvested by humans at least since occupation of the Angoon area by Tlingit Indians (de Laguna 1960). The Tlingit controlled the use of their territory through complex social and land tenure systems. Each community included a number of clans and each individual was born into clan membership. Among social institutions, clans held significant positions of political and legal authority. Clans owned specific hunting and fishing territory, controlled access to the land, and assumed responsibility for resources within their territories.

During the nineteenth century, the Deisheetaan clan of Angoon owned Mitchell Bay, Salt Lake, and the Salt Lake drainage system. A summer settlement was located on the shores of Hasselborg River. At this site Deisheetaan people harvested and processed salmon for winter use. Knowledgeable Angoon elders say there were four large smokehouses along the banks of the river, which required four fires apiece to fill them with smoke.

In the late nineteenth century, a serious accident in Deisheetaan territory caused the death of a Teikweidee clan member. As a result, the Deisheetaan gave the bay, lake, and drainage system to the Teikweidee. Ownership of the smokehouses, cabins, and a fish trap on the Hasselborg River also passed from the Deisheetaan to the Teikweidee. During the early twentieth century, people moved the summer camp from the river west into Mitchell Bay. But, Teikweidee people in Angoon retain their ties to the area through use and oral traditions.

Although the smokehouses were moved away from Salt Lake, people continued to harvest salmon at the lake. During the early twentieth century, salmon were harvested from Salt Lake using traps and gaff hooks. A fish trap, last used in 1925, was located in a natural hole under Hasselborg falls three miles upstream from the river's outlet into Salt Lake (Joseph 1982). The trap, made of twigs woven together into a cage to enclose the fish, was placed beneath the falls. A trough carved from a log stretched from the trap to a basket onshore. When salmon attempted to ascend the falls, they frequently failed and fell back into the trap. From the trap, fish slid to the trough which delivered them into the basket.

Gaff hooks were constructed of a pole 12 to 20 feet long, with a large metal hook lashed to the end. The gaff enabled fishermen to fish selectively in clear water. Once a fish was spotted, the fisherman walked upstream of the fish and allowed the hook to slowly drift down above the target. When the gaff was positioned over the selected fish, it was flipped to hook the fish's body. By keeping pressure on the hook through the pole, the fisherman carefully pulled the fish onto shore.

#### SALT LAKE SUBSISTENCE COHO FISHERY IN 1981 AND 1982

This section provides a profile of subsistence permit holders, a description of the coho fishery, approximate harvest figures and preliminary data regarding distribution patterns in 1981 and 1982. As discussed in the methodology 45 permit holders were interviewed, representing 72 percent of all 1981 and 1982 permit holders. Eight of the 45 permit holders surveyed held permits in both 1981 and 1982. In the presentation below, the 1981

and 1982 permittees are discussed as a single group except when comparisons are made between the two years.

Subsistence Permit Holders

The profile of an average Salt Lake subsistence permit holder in 1981 and 1982 is an individual who has lived in Angoon for over three decades, fished in Salt Lake as a child, and learned to fish the lake from family members. According to the 1982 survey results, permit holders exhibited a long-term residency in Angoon (Table 4). Permit holders lived in Angoon

TABLE 4  
YEARS OF ANGOON RESIDENCY OF 1981 AND 1982 PERMIT HOLDERS  
(n=45)

<u>Years residency</u>	<u>Number</u>	<u>Percent</u>
1-10	3	6.7
11-20	1	2.2
21-30	10	22.2
31-40	8	17.8
41-50	7	15.6
51-60	6	13.3
61-70	3	6.7
71-80	4	8.9
No response	3	6.7

an average of 31 years. Fifty-three percent of the sample was born in Angoon. The mean length of time since permit holders first fished in Salt Lake was 17 years. Sixty percent of those surveyed learned to fish at Salt Lake from a family member, 12 percent learned from friends, and 9 percent taught themselves. Most permit holders learned to fish at Salt Lake as children or early adolescents.

The demographic and economic characteristics of permit holders varied. Households averaged four members with a range of one to ten as compared to the average Angoon household of 4.2 members. The sample was about evenly divided between those having no, part-time, or full-time paid employment in 1982. The majority of permit holders (62 percent) held commercial fisheries limited entry permits: 91 percent of these were hand troll permits, 2 were power troll permits, and 1 was a purse seine permit. As shown in Table 5, a substantial portion of households that participated in the subsistence coho permit fishery, also participated in the subsistence sockeye, chum, and pink fisheries (Table 5).

TABLE 5

COHO PERMIT HOLDERS PARTICIPATION IN OTHER SUBSISTENCE FISHERIES  
(1981 n=46; 1982 n=28)

	<u>1981</u>		<u>1982</u>	
	Number	Percent	Number	Percent
Sockeye	31	67.4	20	71.4
Chum	11	23.9	11	39.3
Pink	15	32.6	6	21.4

1982 Annual cash incomes for sampled permit households ranged from 0 to \$30,000 with 84 percent of the incomes between 0 and \$15,000. The surveyed nonpermit households were similar to permit households and displayed a wide range of employment characteristics, income, and household memberships.

#### Fishing Methods

Beach seines were used by all of the sampled permit holders in 1981 and 1982. In addition to beach seines, 24 percent of the permit holders used gaff hooks, and 16 percent used rod and reel. The number of people in a

beach seine crew ranged from two to six. Crew composition was almost equally distributed among family members and friends (Table 6).

TABLE 6  
CREW COMPOSITION  
(n=45)

	Family	Friends	Both Family and Friends	No Response
Number	13	12	15	5
Percent	28.9	26.7	33.3	11.1

Gaffs continue to be used in the Salt Lake fishery, but the beach seine has replaced the fish trap as a means of taking large numbers of fish in a short period of time. Beach seines are made from regular purse seine web, generally 3 3/4 inch to 4 inch mesh. The nets range between 20 and 70 fathoms in length and 50 to 100 mesh in depth. According to the survey, 70 percent of the people in the coho fishery either owned or shared a beach seine within the extended family. The remainder borrowed from friends. Some people stored their nets at Salt Lake, usually covering them over with brush. These nets are used by other Angoon residents after receiving permission from the owner.

There are two basic ways to make a set. The first requires a minimum of two people and a skiff. One end is held fast on the beach, while the other end is tied off to the skiff. The skiff tows the seine around the school of fish, and brings the skiff end of the net to shore. The seine is pulled onto shore, the fish removed, cleaned, and usually taken to Angoon to be processed. A second common method involves two skiffs. Each skiff carries one end of the seine encircling the salmon. The skiffs return to shore, the net is hauled in, and the fish removed.

Angoon residents make the trip to Salt Lake when the tide is high and outboard powered skiffs can pass over the Falls at the lake entrance. To travel to the lake, set the net, harvest the fish and return to Angoon takes a minimum of six hours, or one tide change. Occasionally people remain overnight depending on the success of the effort and how extensively the fish are processed at the fishing site.

The time required to participate in the Salt Lake coho fishery is determined by the tide which controls lake access. Boats with outboard motors can enter the lake only at high tide and the shortest trip up to the lake takes one tidal change. Once in the lake, the time required to complete a fishing trip varies depending on success of the set, number of people participating, and the extent to which fish are processed on site. Of 51 respondents, 41 percent indicated a typical trip from Angoon to Salt Lake fell within the 0 - 6 hour range, 35 percent indicated 6 - 12 hours and 24 percent indicated over 12 hours or an overnight trip.

At least 15 Salt Lake beach seine sites were identified (Figure 3). Bearskin Cove, also known as Coho Cove, was used by 48 percent of those surveyed. A range of two to nine groups used the remaining sites. All fishing sites were strategically located at places where fish gather. For example, people fish off points on peninsulas, near mouths of fresh water streams, in deep holes found near shores of bays, and in narrow passages where eddies create places for fish to school.

The subsistence coho season is open by regulation from August 1 through October 31. In 1981 and 1982, September was the month showing the most

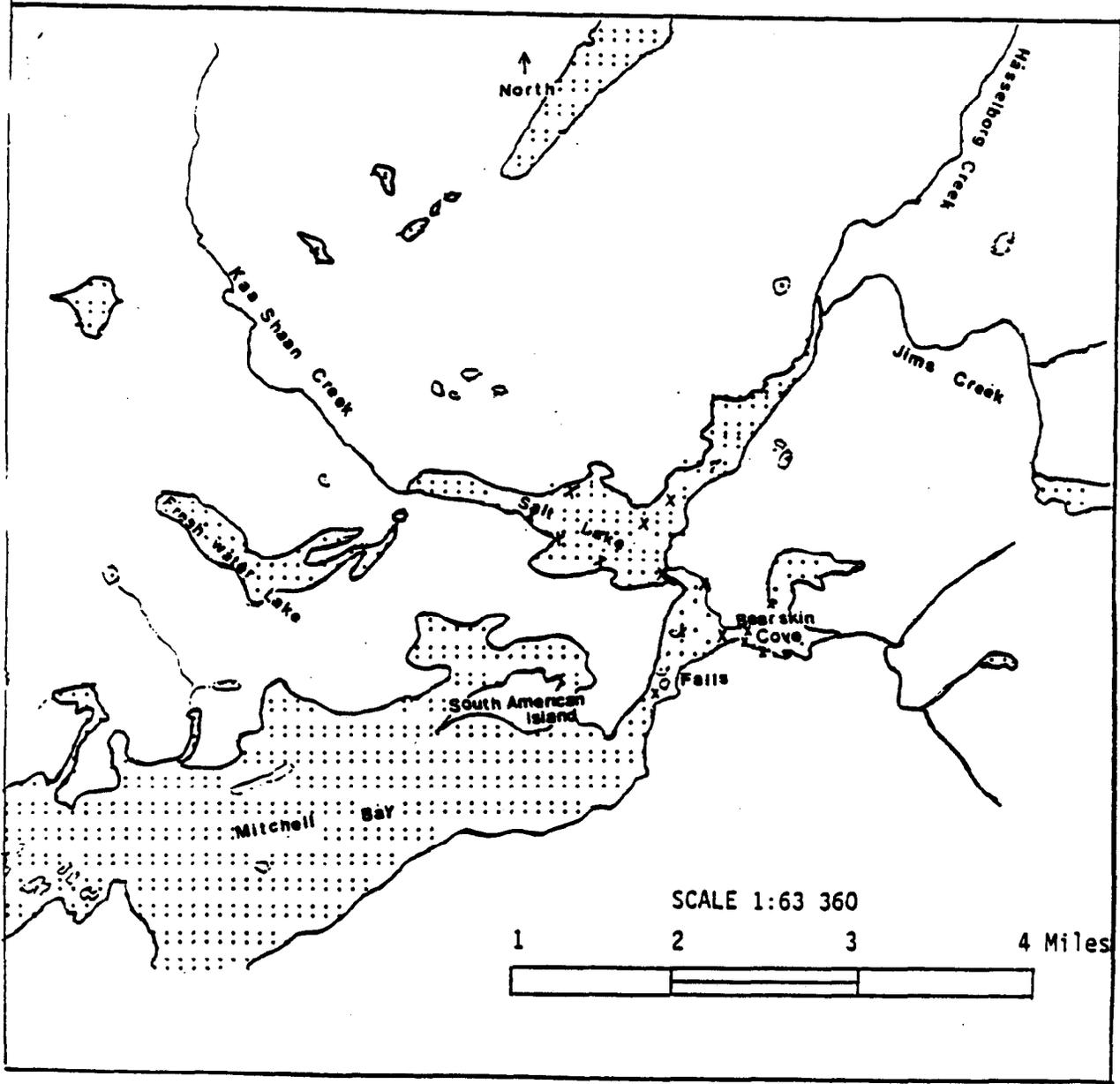


Fig. 3. Coho fishing sites in Salt Lake, 1981 and 1982.

intensive use, the same month the commercial troll fishery closed (Table 7).

TABLE 7  
 BEGINNING MONTHS COHO FISHERY, SALT LAKE, 1981 AND 1982  
 (n=45)

	Number	Percent
August	17	37.8
September	19	42.2
October	9	20.0

Harvest Levels

Levels of permit use were extrapolated from the number of permit holders who travelled to Salt Lake to fish for coho. Sixty-two percent of the surveyed permit holders did not use their permits (Table 8). Of the 36 surveyed 1981 permit holders, 21 did not use their permits (58 percent), while of the 17 surveyed 1982 permit holders, eight did not use their permits (47 percent). When asked why they did not use their permits, several reasons were indicated (Table 9).

TABLE 8  
 PERMIT HOLDERS TRAVELING TO SALT LAKE TO FISH COHO

		<u>Traveled to Salt Lake</u>		
		<u>yes</u>	<u>no</u>	<u>no response</u>
1981 (n=36)	Number	10	21	5
	Percent	27.8	58.3	13.9
1982 (n=17)	Number	9	8	0
	Percent	52.9	47.1	0

TABLE 9  
 REASONS FOR NONUSE OF PERMITS, 1981 and 1982  
 (PERCENT AND NUMBER OF SURVEY RESPONDENTS NOT FISHING\*)

	1981 (n=21)		1982 (n=8)	
	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>
no time	38.1	8	50.0	4
equipment problems	33.3	7	12.5	1
no help	14.3	3	12.5	1
illness	0	0	12.5	1
alternative source of fish	4.8	1	12.5	1
permit limit	9.5	2	0	0

\*Categories are not mutually exclusive

In 1981, of the ten permit holders who traveled to Salt Lake to fish for coho, eight (80 percent) were successful. In 1982, of the nine permit holders who traveled to Salt Lake, eight (89 percent) were successful. Only one permit holder fished successfully in both years.

According to survey results, the reported coho catch was approximately 1,260 fish in 1981 and 418 fish in 1982. These figures include all reported catches by the 59 people surveyed, but figures may be low due to people's reluctance to report catches above the amount allowed by the permit.

Survey results concerning past harvest data indicated that 17 percent of the 59 people surveyed had fished in Salt Lake between 1971 and 1980. Harvest ranges varied between 400 in 1971, to 2,500 in 1975 (Figure 4).

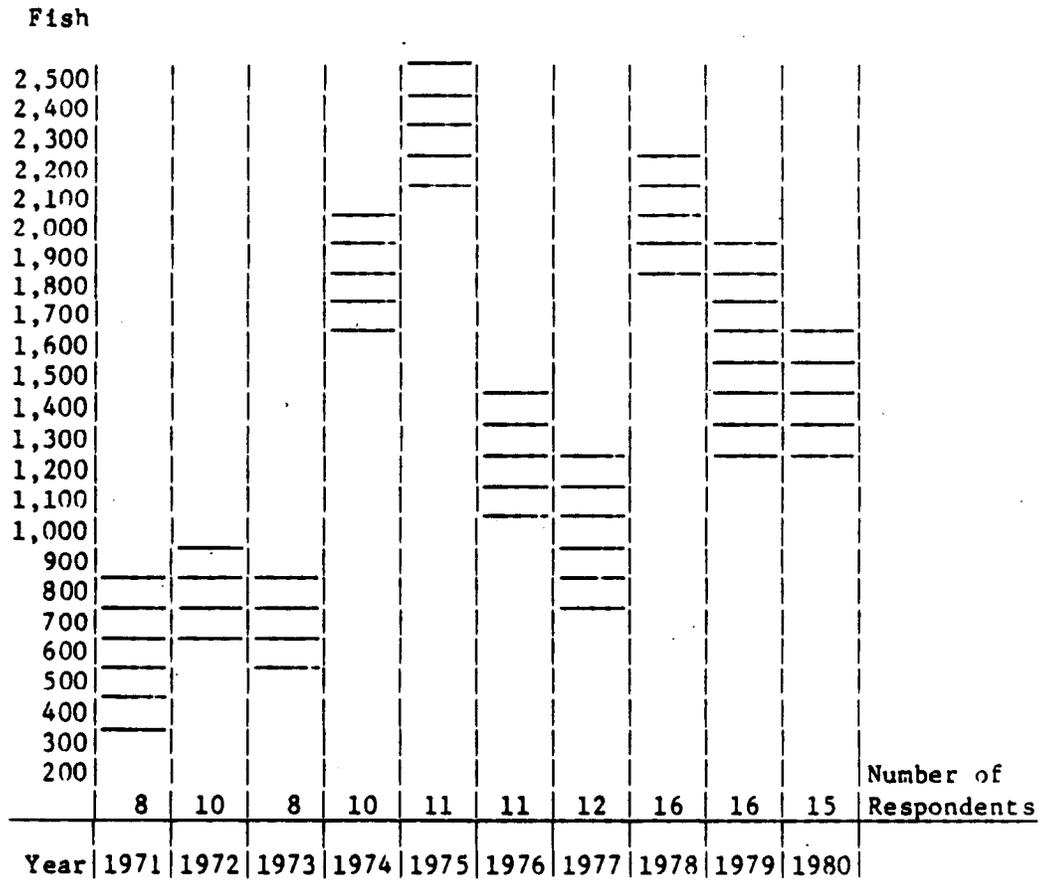


Fig. 4. Reported ranges of coho harvests at Salt Lake, 1971 through 1980 from a sample of fishermen -- 1981 and 1982 figures under the permit and quota system are included in the text

Households were asked what number of cohos would be adequate to meet their needs. Survey results indicated respondents perceived a need for coho catches ranging from 20 to 200 per household (Figure 5).

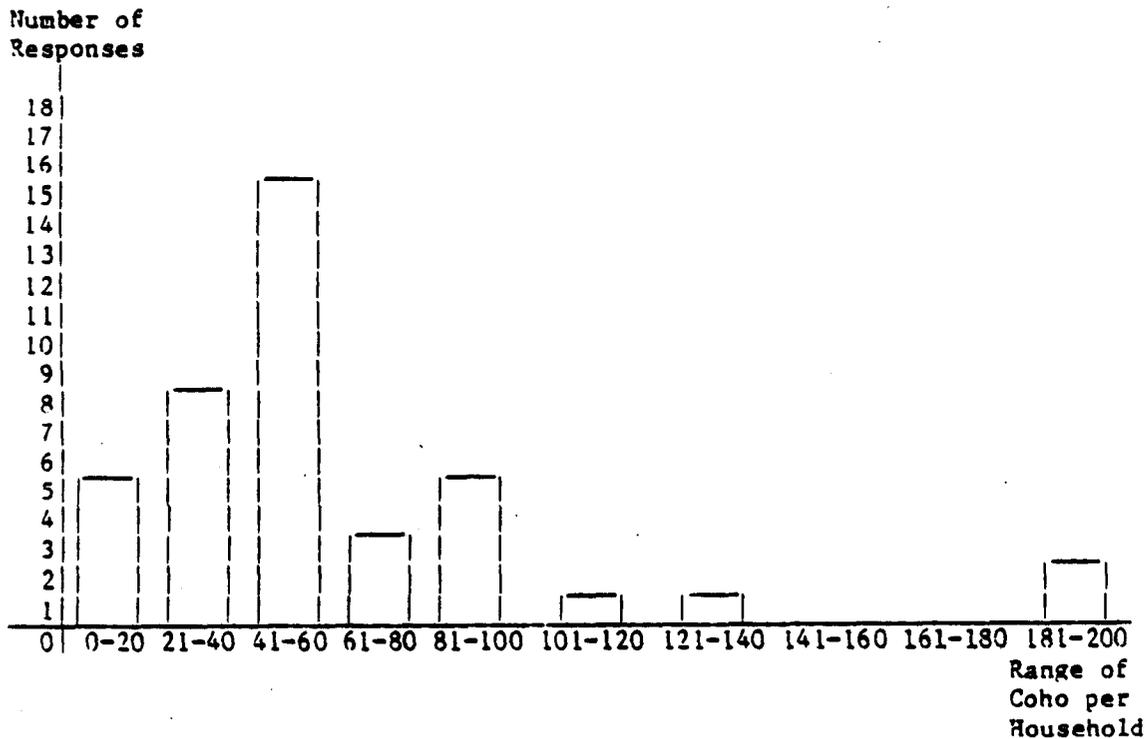


Fig. 5. Survey respondents' estimates of coho requirement per household

Distribution Patterns

Preliminary research results indicate that coho harvested by fishing households were distributed extensively throughout the community in 1981 and 1982. Eighty-nine percent of the 59 people who responded to the survey, indicated they shared their subsistence fish. A substantial portion shared more than half of their fish with people outside their households. The first level of sharing occurred between crew members. A second level of

distribution occurred between crew members and community members. At this second level, cohos reached most households in the community. Five people traded or bartered their fish for other food items, such as herring eggs and seal oil.

The following are three examples of distribution patterns taken from three of the larger catches in 1978, and 1981.

#### Case 1

In 1978, Fisherman A helped catch approximately 400 coho in Salt Lake. He fished with five other people and when the catch was divided, he received approximately 50 fish. He gave these fish to his mother who lived in a different household. She processed and distributed the fish. The immediate family received the largest portion of the catch, the grandmother, who lived in Sitka, receiving 20. Remaining fish were donated to Head Start, Alaska Native Brotherhood/Alaska Native Sisterhood, and potlatches. Fisherman A's family also put up approximately 30 sockeye and 50 chum in 1978. Forty of these fish were dried, smoked, and distributed to aunts, uncles and friends. Fish heads, tails, and eggs were generally processed into Tlingit dishes shared with the immediate family.

#### Case 2

In 1981, Fisherman B helped harvest 280 coho from Salt Lake. He fished with two other people and each received approximately 93 fish from the total catch. Fisherman B gave his fish to his mother, who lived in a different household, in exchange for 20 smoked fish she had already prepared.

The mother processed 73 of the coho by smoking and jarring. She distributed many of these fish to other family members, including relatives in other communities. A portion of the total went to non-fishing community members, such as elders and widows. Some of the processed coho was traded for other wild resource products including halibut, seal, and seal oil. In addition, some fish was donated to several community organizations and potlatches. After processing 20 coho also were given back to Fisherman B.

### Case 3

In 1981, Fisherman C helped harvest 300 coho from Salt Lake. These fish were caught during three trips to the lake. Fisherman C's whole household, including spouse and three children, helped set the net to capture the coho. Fisherman C distributed the fish among family members, including a mother-in-law, several aunts, and three related widows who received 10-30 fresh coho apiece. Approximately 140 fish were processed by Fisherman C. Ten to 20 of the processed fish were donated to potlatches and five to ten given to community organizations. Four out-of-town relatives received a total of 20 fish. Fisherman C reported that the household consumes 20 to 30 dried coho per year and uses 10 fresh packed fish during the winter. Head, tails and eggs were also processed. Heads were made into a Tlingit dish called K'ink, eggs fermented into a cheese-like food called Ka haak', and tails smoked. Considered delicacies, these products were shared with close friends and relatives.

In each of these three examples, coho were distributed first to the crew which caught the fish and second to family members and dependents. Lastly, fish were donated to community organizations and potlatches which enabled

a large portion of the community an opportunity to enjoy a portion of the harvest.

### Case Studies

Three households representing examples of people who participate in the Salt Lake coho fishery are presented below. The case studies include one household with a long history of involvement in the Salt Lake coho fishery, a commercial fisherman who also subsistence fishes for coho in Salt Lake, and a household new to the Salt Lake fishery.

#### Case 1

The household consists of a single male, age 82, a member of the Teikweidee clan. He lives on a fixed income of \$3,000, and a large harvest of wild resources. He grew up in the Salt Lake area and fished using the coho fish trap at the falls on Hasselborg River with his uncle. Although he lives alone, he has four children and two grandchildren in Angoon who visit with him and share his harvest of wild foods. He used to go regularly to fish at Salt Lake, but he did not harvest coho in Salt Lake in 1981 or 1982. People gave him coho from the lake those two years. Although people bring him fish because he's an elder, he also fishes locally for himself reportedly in part to maintain his health. He relies on wild resources for most of his food, reporting "I don't eat anything that comes out of a can."

#### Case 2

This household consists of a couple in their mid-forties with six children,

five of whom attend school out of Angoon. The husband is a member of the Kaagwaantaan clan while his wife is a member of Aan xaa kee taan clan. The husband has a full-time salaried job, and the wife works in the winter for wages. They commercial fish together in the summer and estimate one percent of their commercial catch is used for home consumption. The husband also participates in a number of different subsistence permit fisheries and has fished in Hood Bay, Chaik Bay, Sitkoh Bay, Basket Bay, and Salt Lake. Salt Lake is a preferred fishing location because it is accessible and his father fished there. He had a subsistence permit to fish coho in 1981 and 1982, but he did not fish in 1981 because the permit limit was only six fish. "It wasn't worth it to go and get six fish," he reported. He did fish in 1982, keeping some for household consumption and sharing other fish with community members.

### Case 3

This household includes a married couple and their two children. The husband works full-time for wages and the wife has a part-time job. Their income averages about \$10,000 a year. He does not have a limited entry permit to commercial fish, but he talked of wanting to buy a hand troll permit and boat. He first fished in the Salt Lake in 1978 and fished again the following year. He applied for a Salt Lake coho permit in 1981, but unable to fish that year because his job had just started. He did not apply for a permit in 1982 for reasons of time conflicts. When he does fish Salt Lake; travel and labor cost associated with Salt Lake fishing are split with his brother. Reportedly, he taught himself how and when to fish the area. While traveling at Salt Lake in 1982, he encountered 30 visitors. He reports that increasing numbers of outsiders discourages

his use of the area. He would like to have 75 coho a year for winter use, although the limit in 1982 was 20 per permit.

#### Other Fisheries Harvesting Salt Lake Coho

The Salt Lake subsistence permit fishery is restricted to coho salmon. Although sockeye, pink and chum also run into the lake, Angoon residents generally harvest these species elsewhere. Subsistence fishermen are not the only users catching Salt Lake coho. A sport fishery of undetermined size harvests coho from Salt Lake and a commercial troll fishery operating in the waters outside Kootznahoo Inlet harvests fish from Salt Lake coho stocks.

Sport fishing regulations allow a daily bag limit of six coho and six in possession. Neither the actual number of people who visit the lake nor the total sport fishery coho catch is presently known. In the summer of 1982, two United States Forest Service Wilderness Rangers sporadically monitored visitor use in the Salt Lake area from June to September, spending an average of four days at the Lake each month. The rangers encountered approximately 68 people, 59 of these were visitors. The largest number of encounters in a single day equalled 21 people in three separate groups (Castillo 1982). Because Admiralty Island is a National Monument within Tongass National Forest, the Forest Service is planning on monitoring visitor use of the Salt Lake and Mitchell Bay area during the summer of 1983.

An increase in sport fishing in Salt Lake is expected as a result of Admiralty Island's designation as a national monument. National Monument status may draw attention to island resources and result in increased use by

nonresidents of the area. A potential increase in visitor sport fishing in the Salt Lake is a concern reported by some Angoon residents. Mechanisms to manage use of Mitchell Bay/Salt Lake area have been written into the Admiralty Island Management Plan.

The Division of Sport Fisheries included Salt Lake on a mailout survey for the first time in 1981. Information extrapolated from the survey indicates that out of 554 possible fishing days, 76 coho salmon were harvested (Mills 1982). According to sport fish biologists these figures are probably low (Mark Schwan, personal communication).

The commercial coho fishery in Chatham Strait is considered a mixed stock fishery. Coho caught commercially just outside Kootznahoo Inlet could be destined to return to Favorite Bay, Hood Bay, Chaik Bay, the Salt Lake system, or to the numerous other streams in the area. The Salt Lake system is thought to be the largest coho system on the island. However, presently it is impossible to determine what percent of the total coho commercial catch at Kootznahoo Inlet is destined for Salt Lake (Donald Ingledue, personal communication).

Commercial salmon fishing is economically important to Angoon residents. Commercial fishing provides Angoon fishermen with cash income, and supplies the community with fish for domestic use either indirectly through use of boat and gear, or directly by providing fish from commercial catches. The community of Angoon has four seine permits, seven power troll permits, and approximately 68 hand troll permits (Alaska Department of Fish and Game 1982a).

There are two commercial fisheries harvesting Salt Lake coho stock: the troll fishery and purse seine fishery. The troll fishery brings in the majority of the coho catch sold in Angoon. Coho season starts June 15 and continues through September 20, with provisions for a ten day closure to protect fish stocks (5 AAC 33.350 and 5 AAC 33.365). The purse seine fishery incidentally harvests coho while targeting pink salmon. Fishing periods are determined by emergency openings as prescribed by the Department of Fish and Game.

Coho sold to buyers in Angoon are generally caught in Fishing Districts 12, 13-C, and, to a limited extent, District 9 (Figure 6). Approximately 80,000 pounds of cohos were sold in Angoon during the 1982 fishing season, comprising 18 percent of the total coho harvest in District 12.

Biological information on Salt Lake coho stocks is limited. During the last two years, escapement data gathered by the Division of Commercial Fisheries indicates 1982 escapement may be lower than 1981 (Table 10). There are no biological data identifying the extent of the Salt Lake stock coho harvest by the commercial fishing fleet. Therefore, the effect of the commercial harvest on Salt Lake coho is presently unknown.

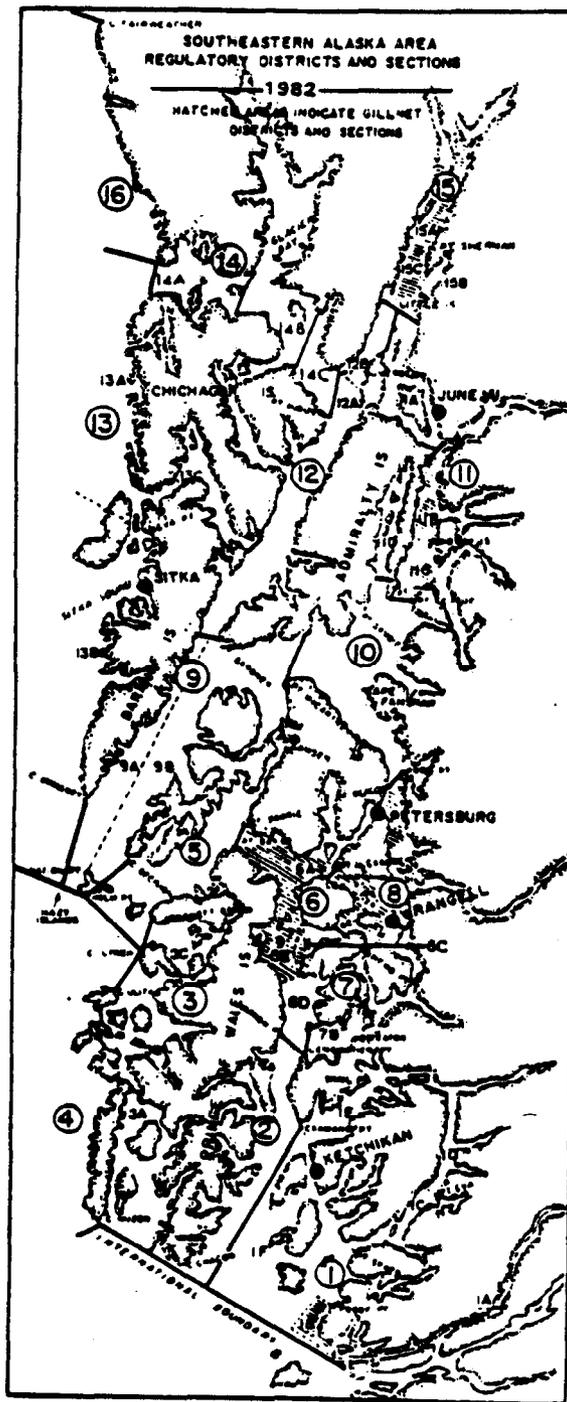


Fig. 6. Regulatory fishing districts, Southeast Alaska.

TABLE 10  
SALT LAKE COHO ESCAPEMENT

<u>Stream</u>	<u>Date</u>	<u>1981</u> <u>Coho Count</u>	<u>Date</u>	<u>1982</u> <u>Coho Count</u>
Fresh water Outlet	9-25	20	9-03	3
	10-05	13		
	10-16	226		
Hasselborg	8-17	3	8-08	0
	9-01	30	9-03	200
	9-25	55	9-17	50
	10-05	90	9-22	150
	10-16	2000		
Jims Creek	10-16	391	9-03	30
Gabriel Creek	10-16	1075		no survey

Source: Alaska Department of Fish and Game 1982d

## DISCUSSION

During the nineteenth and twentieth centuries, Angoon residents have fished for coho in Salt Lake. Historically, resource use in Salt Lake was regulated by the clan owners of the area. Currently, informal social controls through family and community pressure continue to manage the area. Residents have expressed concern about proper management of the Salt Lake coho fishery.

The Salt Lake fishery was not provided for by state regulation until 1981 when a regulation was adopted which set a 500 coho harvest limit and established a permit system for residents (Appendix A). The permit system has only been in effect for two years and as result, Angoon residents and the system are still in a period of adjustment. For example, the first year permits were available a relatively larger number of people received permits than actually fished as compared to the number of people who obtained permits and fished in 1982.

Salt Lake coho are harvested by beach seine. This technique engages minimum crew of two people, and often a harvest is large enough for several households. Traditionally, as today, coho taken by a few fishermen are distributed to a large number of households. As in other rural subsistence economies, the efforts of a few parties feed the greater community (Rehnke 1982; Foster 1982; Wolfe 1982).

Harvest levels from the past ten years have been estimated from a sample of community residents. Since 1974, harvest ranges have been between 400

and 2,500 fish. The estimated harvest for 1981 was 1,260 fish and for 1982 was 418 fish. The low harvest level in 1982 may be partially attributed to poor fishing success on the part of a few fishermen which discouraged others from participating.

People surveyed expressed mixed feelings about the coho harvest limit. Some respondents felt the present limit did not consider variations in coho population from year to year. Although many people stated the present limit was too low; there were also concerns that an increased limit might jeopardize Salt Lake coho stocks. A number of people suggested household coho needs could be satisfied at other coho fishing sites such as Klanaku, Hood, and Chaik bays.

## REFERENCES

Alaska Consultants, Inc.

1976 City of Angoon Comprehensive Development Plan Anchorage: n.p.

Alaska Department of Fish and Game

1982a Limited Entry Permits, Angoon. Computer printout; Juneau: Division of Limited Entry.

1982b Subsistence fishing permits, Angoon. Computer printout; Juneau: Division of Commercial Fisheries.

1982c Commercial harvest of salmon, District 112, 1969-1982. Computer printout; Juneau: Division of Commercial Fisheries.

1982d Stream Escapement Data. Computer printout; Juneau: Division of Commercial Fisheries.

Castillo, Helen

1982 Letter dated November 14, from United States Forest Service, Monument Manager to Kathryn Cohen, Department of Fish and Game, Division of Subsistence. On file at Division of Subsistence, Southeast Regional Office, Juneau.

de Laguna, Frederica

1960 The Story of a Tlingit Community. Bureau of American Ethnology Bulletin 172. Washington: United States Government Printing Office.

Environmental Services

1982 Community Profile for the City of Angoon. Prepared for Alaska Department of Community and Regional Affairs. Anchorage: n.p.

Hall, Janet

1981 Angoon Subsistence Coho Fishery, An Interim Report. Alaska Department of Fish and Game, Subsistence Division. Juneau: m.s.

Inglehue, Donald

1982 Alaska Department of Fish and Game, Commercial Fish Division, personal communication to Gabriel George, Division of Subsistence. December, Juneau.

Joseph, Charlie

1982 Personal communication to Matthew Kookesh, Division of Subsistence. November, Angoon.

Langdon, Stephen John

1977 Technology, Ecology, and Economy: Fishing Systems in Southeast Alaska. Ph. D. Dissertation. Stanford University, California. Ann Arbor Michigan: University Microfilms.

Oswald, Erling O.

1981 An Overview of Fisheries in Southeast Alaska; Juneau, Alaska:  
Sealaska Corporation.

Powers, Richard L.

1972 Public Involvement and Admiralty Island, Alaska: Effects of  
Interest Groups on Natural Resource Allocations. M.A. Thesis,  
University of Alaska, Juneau.

Schwan, Mark

1982 Alaska Department of Fish and Game, Division of Sport Fish,  
personal communication to Gabriel George, Division of Subsistence,  
December, Juneau.

APPENDIX A

The Salt Lake Subsistence permit coho fishery was created by regulation in January 1981. The Board adopted the following regulations:

5 AAC 01.710. Fishing Seasons.

"(d) coho salmon may be taken from Salt Lake above the falls at the head of Mitchell Bay from August 1 until an annual harvest limit of 500 coho salmon has been taken or through October 31 if the annual harvest limit has not been taken."

5 AAC 01.730. Subsistence Fishing Permits

"(d) Subsistence salmon fishing permits for the fishery provided for in 5 AAC 01.071 (d) will be issued only to those persons domiciled in Angoon and only one permit will be issued for a household. The number of coho salmon that may be taken on a permit will be specified by the department after it has assessed the level of effort that will be involved in the fishery."

5 AAC 01.720. Lawful Gear and Gear Specifications.

Fish maybe taken by gear listed in 5 AAC 01.010  
"(a) except as may be restricted under the terms of a subsistence Fishing permit and except as follows:  
(4) beach seines and gaffs only may be used to take coho salmon during the season and in the area described in 5 AAC 01.710 (d)."

Proposal 202, submitted by the Alaska Native Brotherhood Grand Camp for consideration at the January 1983 Board of Fisheries meeting, requests the area available for subsistence coho fishing be extended and the harvest limit be increased. The proposal follows; brackets indicate language to be removed:

5 AAC 01.710. Fishing Seasons

"(d) coho salmon may be taken from Salt Lake [ABOVE THE FALLS AT THE HEAD OF] in Mitchell Bay from August until an annual limit of 1,000 [500] coho salmon has been taken or through October 31 if the annual harvest limit is not taken.

The justification for this proposed change submitted as part of the proposal states:

Justification: By stating above the falls has the effect of restricting elders and other disabled or partially disabled persons from harvesting cohos. Raising the number to 1,000 and allowing an extension could be accomplished by departmental determination of the harvest take. There are over 500 persons that reside in Angoon/adjacent to Mitchell Bay.





2) Estimated Household Gross Income Range 1981

0 - 3,000 _____	10,001 - 15,000 _____
3,001 - 6,000 _____	15,001 - 20,000 _____
6,001 - 10,000 _____	20,001 - 30,000 _____
	31,001 - and above _____

3) Did you have a subsistence coho permit for the Salt Lake in

1981 \_\_\_\_\_ fish caught \_\_\_\_\_

1982 \_\_\_\_\_ fish caught \_\_\_\_\_

4) If you had a permit and did not use it  
in 1982, why?

in 1981, why?

5) Did you feel that the limit was adequate?    YES \_\_\_\_\_    NO \_\_\_\_\_  
why or why not ?

6) If not, what would you suggest would be appropriate ? \_\_\_\_\_

7) what years did you fish for coho in Salt Lake:

1982 _____	1981 _____	1980 _____	1979 _____
1978 _____	1977 _____	1976 _____	1975 _____
1974 _____	1973 _____	1972 _____	1971 _____
pre-1971 _____			

Estimate the fish caught during years you fished.

0 - 25	100 - 125
25 - 50	125 - 150
50 - 75	150 - 175
75 - 100	175 - ?

- 8) When did you first fish for coho in the Salt Lake? \_\_\_\_\_
- 9) What is your estimate of the number of coho returning to the Salt Lake  
in good years \_\_\_\_\_  
in average years \_\_\_\_\_  
in poor years \_\_\_\_\_
- (a) 0 to 1,000    (b) 1,000 to 2,000    (c) 2,000 to 3,000    (d) 3,000 to 4,000  
(e) 4,000 to 5,000    (f) 5,000 to 6,000    (g) 6,000 to 7,000    (h) 7,000 to ?
- 10) what route do you take to get to the Salt Lake area? (use map)
- 11) Where do you fish for coho in the Salt Lake area and what years? (use map)
- 12) What determines the area where you fish ?

13) How do you fish the Salt Lake for coho?

14) When do you fish for coho in the Salt Lake?

15) Who do you fish with in the Salt Lake?

Relationship to you?

16) Whose nets do you use?

Relationship to you?

17) Whose boat(s) do you use?

Relationship to you?

18) What other gear do you use in the Salt Lake coho fishery ?

19) Do you share your gear?

What and with whom?

Relationship to you?

20) In 1981, how many times did you travel to the Salt Lake to harvest coho?

In 1982?

21) How long does it take to complete one fishing trip at the Salt Lake, for coho?

0 - 6 hrs \_\_\_\_\_ overnight \_\_\_\_\_

6 - 12 hrs \_\_\_\_\_ other \_\_\_\_\_

What determines the time required for a fishing trip ?

22) Who taught you to fish for coho in Salt Lake ?

\_\_\_\_\_ family members in household

\_\_\_\_\_ family members outside of household

\_\_\_\_\_ friends \_\_\_\_\_ self-taught

\_\_\_\_\_ other (specify) \_\_\_\_\_

23) Have you taught others to fish for coho in Salt Lake ? yes \_\_\_\_\_ no \_\_\_\_\_

Relationship to you \_\_\_\_\_

24) Do you share your subsistence caught salmon with others not in your household?    yes \_\_\_\_\_    no \_\_\_\_\_

	all	most	half	some	none
immediate family					
maternal clan					
paternal clan					
friends					
others(specify)					

25) If you fish with a number of other people, how is the catch divided among the crew?

26) Who prepares the fish?

27) How are the coho prepared ?

27) How does your household use subsistence caught coho?

	all	most	half	some	none
household consumption					
share					
trade/barter					
other (specify)					

28) If you trade or barter, for what goods and services ?

traded \_\_\_\_\_ for \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

29) Which years has your household fished for subsistence salmon ?

	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	before
king													
coho													
sockeye													
dog													
pink/humpy													

30) When was the first time you subsistence fished for salmon?

31) Is there anything else you would like include in this survey?