THE HARVEST AND USE OF COPPER RIVER SALMON
A BACKGROUND REPORT

by
James A. Fall
and
Lee Stratton

Technical Paper Number 96

Prepared for

Alaska Department of Fish and Game
Division of Subsistence
Anchorage, Alaska

February 1984

THE HARVEST AND USE OF COPPER RIVER SALMON
A BACKGROUND REPORT

by JAMES A. FALL and LEE STRATTON

ABSTRACT

This report summarizes the available information about the harvest and use of Copper River salmon. The data are drawn from recent Alaska Department of Fish and Game, Division of Subsistence research and from management reports prepared by the Division of Commercial Fisheries. This information may be used by the Board of Fisheries, advisory committee members, and the public to assess proposed changes to the Copper River Subsistence Salmon Management Plan.

Presently, salmon may be taken for subsistence purposes in the Copper River with dipnets near Chitina, and with fishwheels from Chitina upriver to Slana, a distance of about 120 river miles. Any Alaska resident may obtain a subsistence permit. Participation in these fisheries has increased rapidly, from 4,078 permits issued in 1981, to 7,540 permits in 1983. About 92 percent of the permits in 1983 were for the dipnet fishery. The estimated subsistence harvest has increased from about 69,000 salmon in 1981 to over 118,000 salmon in 1983; most of this catch was sockeye. In 1983, 67 percent of the catch was taken with dipnets. This rapid growth was unanticipated by the management plan. It can be attributed largely to increased participation by non-Copper Basin residents, most of whom fish with dipnets.

The monetary economy of Copper Basin communities has remained marginal compared with that of Alaska's urban centers. Wage employment opportunities are limited, and many are seasonal or part-time. Average household incomes in the Copper Basin are low. Many Basin households follow an economic strategy that combines seasonal wage employment with local

fishing and hunting.

Division research has documented an extensive use of wild fish and game resources by residents of Copper Basin communities. Mean household harvests for each community, in pounds dressed weight, demonstrate that a large number of Basin households harvest these resources in substantial quantities. For example, during a 12 month study period in 1982-83 about 60 percent of a large sample of Basin households hunted moose; the average harvest of fish and game resources for these moose-hunting households was 558 pounds. Households using fishwheels had an average fish and game harvest of 644 pounds.

Most Copper Basin residents who harvest Copper River salmon use fishwheels. The number of Basin subsistence permit holders has remained fairly stable over the last three years; 409 in 1981 (83 percent fishwheel permits), and 397 in 1983 (83 percent fishwheel permits). Salmon harvests by local residents have also remained steady: returned permits in 1981 reported a harvest of 18,662 fish, while the 1983 reported harvest was about 20,359 salmon.

Overall, Basin residents have a lengthy history of use of Copper River salmon; 50 percent of a sample of Basin fishwheel operators in 1982 had used wheels for more than 20 years. Many operated wheels from long-standing camps located in "clusters" along the river. Large portions of the catch were smoked or dried. Basin fishermen harvested other fish and game resources, mostly within the Basin. Only about 11 percent used other salmon fisheries in 1982. Salmon was a widely shared resource in Copper Basin communities in 1983.

Most non-Basin participants in the Copper River subsistence fishery use dipnets. A survey of dipnetters in 1982 found that 72 percent had participated in the fishery for less than five years. These fishermen

harvested other fish and game resources outside the Copper Basin, and over one third used other salmon fisheries in 1982.

Other than the Copper Basin itself, several communities of the Upper Tanana River region are the only areas of the state in which Copper River fishwheel permittees outnumber dipnet permittees. Residents of the Upper Tanana area have historical ties to the upper Copper River and its resources which have been documented since 1885.

In summary, research has shown that notable differences exist between Basin residents and most non-Basin residents in terms of use of wild resources. The pattern of resource use by Basin residents is molded in part by the histories and socioeconomic systems of Basin communities. Fish and game harvests remain central to the economy and way of life of many Copper Basin households and communities. Because of their abundance, predictability, and accessibility, Copper River salmon play a critical role in these harvest patterns.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

This report summarizes the available information about the present day harvest and use of Copper River salmon, and describes the role that salmon plays in the economy and way of life of the residents of communities which use this resource. Data are drawn from several recent research projects conducted by the Division of Subsistence, Alaska Department of Fish and Game, as well as from management reports prepared by the Division of Commercial Fisheries. This information may be used by the Board of Fisheries, advisory committee members, and the public to understand the Copper River subsistence salmon fishery, and to assess proposed changes to the Copper River Subsistence Salmon Management Plan (5 AAC 01.647).

Long isolated from Euro-American penetration by rugged mountains and swift-flowing rivers, southcentral Alaska's Copper Basin (Figure 1) became an important transportation corridor in the late 1890s. Thousands of prospectors passed through the region on their way to the Klondike goldfields in 1898-1899; following them came the development of trails, highways, and a railroad, connecting the Copper River Basin to the major population centers of Alaska and the rest of the North American continent. But economic development came in spurts, with periods of "booms" and "busts." Today, the region remains economically marginal. For many Basin residents, the key to their continued residency in the Basin is an economic strategy which combines seasonal wage employment with the harvesting of local fish and wildlife resources.

Although roads have not brought a diversified economy to the Basin, they have provided access to its natural resources for residents of growing urban centers of Alaska, such as Anchorage and Fairbanks. As a consequence, demand for these resources has grown, and regulations

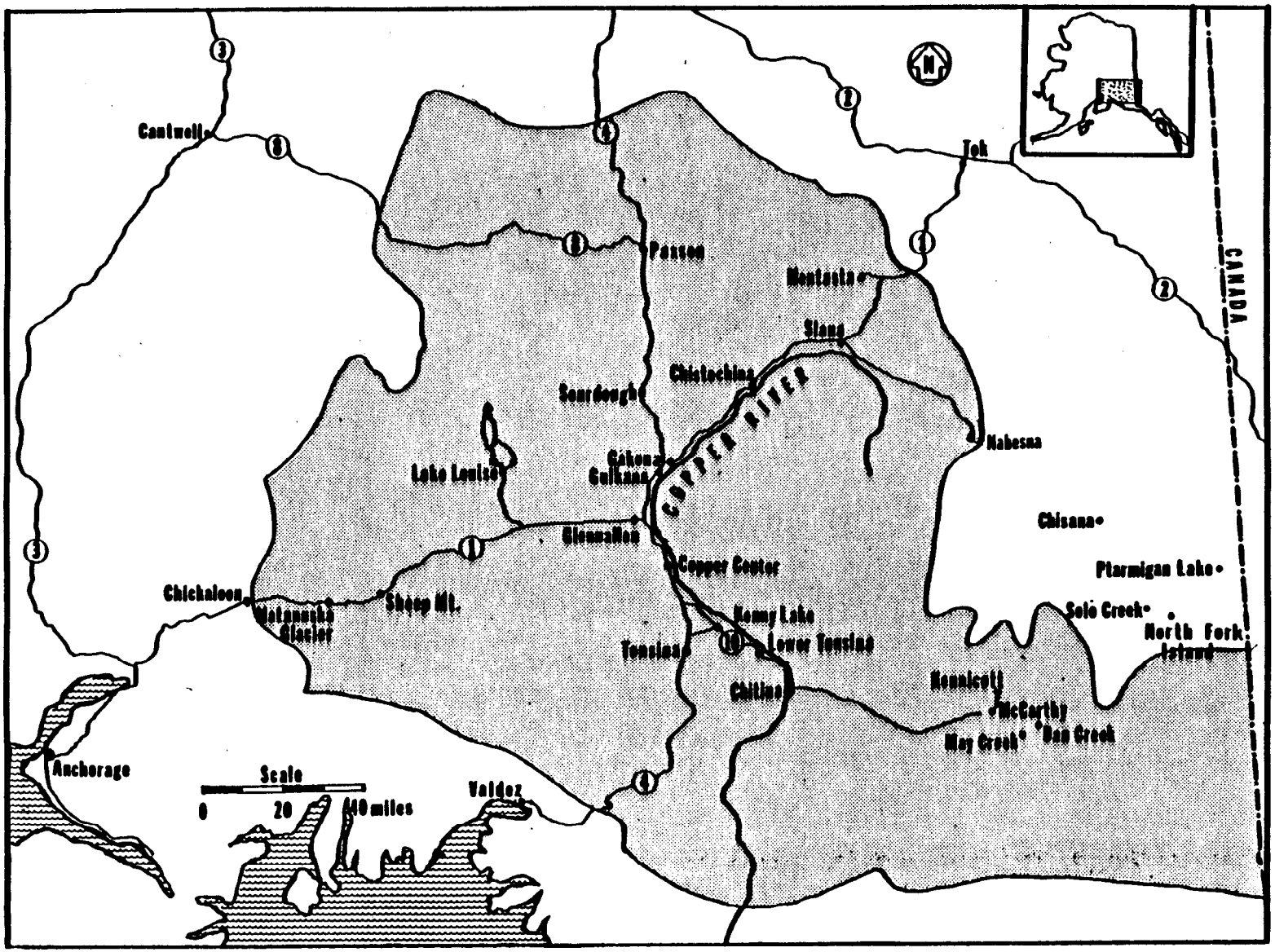


Figure 1. The Copper River Basin, as defined in the Copper River subsistence salmon management plan.

governing their harvest have become more restrictive over time. Examples include the imposition of a drawing permit system for hunting the Nelchina caribou herd, and the requirement that hunters within Game Managment Unit 13 take only bull moose with an antler spread of at least 36 inches or three brow tines on at least one of the antlers.

Faced with growing subsistence, recreational, and commercial demand for Copper River salmon, the Board of Fisheries in 1980 adopted the Copper River Subsistence Salmon Management Plan. The Plan provides a mechanism for allocating salmon to each user group, while maintaining adequate escapement for spawning purposes. Under the Plan, subsistence fishermen, who may fish with either a dipnet or a fishwheel, are assigned one of four classes of permits, based upon place of residency, income, age, and past use of the fishery (Appendix A). Any Alaska resident may obtain a permit, but in times of projected low escapements, Copper Basin residents are given a preference over non-Basin residents. A Copper Basin resident is defined in the management plan as:

> An Alaska resident..., who for the preceding 12 consecutive months has maintained his place of residence and voting residence (if applicable) in Game Management Units 11, 13-A, 13-B, 13-C, and 13-D as described in 5 AAC 90.010 and the Jacksina River drainage to its confluence with the Nabesna River and who does not maintain a permanent residence or voting residence elsewhere.

In this report, the "Copper Basin" refers to the area defined in the management plan, which includes areas outside the drainage of the Copper River itself.

Current regulations allow the use of dipnets in the Copper River from the Chitina-McCarthy Road Bridge to a point about five miles downstream. Fishwheels may be operated in the portion of the Copper River from the bridge at Chitina up to the confluence with the Slana River, near the community of Slana, a distance of approximately 120 river miles.

A commercial fishery using gillnets operates near the mouth of the Copper River in the Gulf of Alaska.

Since 1980, participation in the fishwheel and, especially, the dipnet fisheries on the Copper River has continued to grow at rates unanticipated by the management plan. Harvests have increased as well (Table 1). Much of this growth can be attributed to increased participation by non-Copper Basin residents in these fisheries.

The data summarized below reveal significant differences between Copper Basin residents and others who use the fishery in terms of choice of gear, history of participation in the fishery, preservation techniques, use of other natural resources, and patterns of wage employment. Also, available data suggest that the use of Copper River salmon continues to play an important role in the economy and way of life of many Basin residents and communities.

SOURCES

The Alaska Department of Fish and Game, Division of Commercial Fisheries, has managed the Copper River salmon fisheries since 1960. The dipnet and fishwheel subsistence fisheries have been monitored with a permit system since that time. Data on levels of harvest by gear type, numbers of permits issued, residency of permit holders, and timing of harvest effort are available in the Commercial Fisheries Division's annual management reports to the Board of Fisheries.

The Division of Subsistence, Alaska Department of Fish and Game, has conducted several research projects focusing on the patterns of harvest and use of Copper Basin resources. These efforts have been in response to Board of Fisheries and Board of Game requests for information about

TABLE 1. PARTICIPATION IN COPPER RIVER SUBSISTENCE FISHERY, AND HARVESTS BY GEAR TYPE 1948-1983.

YEAR	REPORTED CATCH		PERMITS ISSUED			CATCH BY SPECIES			ESTIMATED
	DIP NET	FISHWHEEL	DIP NET	FISHWHEEL	TOTAL	SOCKEYE	CHINOOK	COHO	TOTAL CATCH
1948		5,100							
1949		5,500							
1952		2,136	Species Combined, and Gear			1,601	535		
1954		3,145	Combined			3,057	88		
1955		2,086				1,767	319		
1957		7,753				7,241	281	108	
1958		13,263				12,909	354		
1960	1.179	5,660	32	26	58	6,739	136	25	8,803
1961	1,777	12,419	307	59	366	15,472	388	550	18,206
1962	3.203	11,101	435	117	552	14,543	848	381	18,486
1963	2,124	12,395	514	110	624	14,055	464	558	18,287
1964	4,133	7,749	794	158	952	11,915	725	103	16,340
1965	7,215	5,813	982	115	1,097	12,760	644	52	16,818
1966	7,452	9,188	1,132	110	1,242	16,718	555		21,896
1967	6,146	8,360	1,166	125	1,291	14,457	419		19,007
1968	8,040	6,071	1,235	112	1,347	14,819	644	233	20,283
1969	18,054	6,220	1,415	113	1,528	27,604	719	224	29,266
1970	22,700	9,886	3,220	267	3,487	36,500	427	554	42,757
1971	28,115	9,370	4,168	374[a]	4,542	37,517	1,363	363	48,449
1972	18,996	7,854	3,485	205	3,690	26,850	1,501	248[b]	32,468
1973	16,407	10,943	3,840	305	4,145	27,350	1,856	51[c]	29,428
1974	15,143	7,657	3,305	288	3,593	22,800	1,141	163[d]	26,001
1975	7,694	5,626	2,452	350	2,802	13,320	1,705		15,357
1976	12,130	8,321	2,512	451	2,963	20,451	2,017	17	23,623
1977	22,612	12,751	3,526	540	4,066	35,363	2,171	454	41,815
1978	12,569	6,638	3,313	392	3,705	19,207	2,050	633	22,029
1979	11,887	10 251	2,730	470	3,200	22,138	2,372	705	30,963
1980	14,661	9,716	2,804	399	3,203	21,437	2,256	636	35,081
1981	28,872	26,924	3,555	523	4,078	53,008	1,913	849	68,746
1982	62,614	38,120	5,475	615	6,090	96,799	2,532	1,246	110,006
1983[f]	72,257	35,971	6,910	630	7,540	e	e	e	118,000

[a] Last use of Dip Net/Fishwheel Combination permits.
[b] First issue of permits at Chitina
[c] Last year permits were denied fishermen who failed to return their previous year permits.
[d] Issue of permits at Chitina and Glennallen only.
[e] Complete data on catch by species for 1983 not available as of 2/8/84.
[f] Preliminary totals, based on returns as of 2/84.

Source: Randall, et al, 1983:35; Roberson 1984:personal communication.

these resource uses. In 1979, questionnaires were mailed to all holders of Copper River subsistence fishing permits. Also, some permit holders residing in the Basin were interviewed at their homes. The resultant report (Stickney and Cunningham 1979) was based on a sample of 704 permit holders, 105 of whom were Basin residents. The report contained an analysis of responses to questions on resource uses, employment patterns, and household characteristics, according to place of residence.

In 1982, Division personnel conducted indepth interviews on site with non-random samples of 93 dipnetters and 81 fishwheel operators. Fifteen of the dipnetters (16 percent) and 56 of the fishwheel operators (69 percent) were Basin residents. The results of this research were used to describe the fishwheel and dipnet fisheries, and to compare and contrast Basin participants in the Copper River fishery with non-Basin participants. The report based on this research (Stratton 1982b) contains detailed descriptions of fishing sites, fishing techniques, other resource-related activities engaged in by the samples, and case studies of dipnetters and fishwheel users. Most of the findings supported the conclusions of the previous research.

In addition, the Division has conducted several studies focusing on the uses and users of the Nelchina Caribou herd, which ranges throughout much of the Copper Basin (Stanek 1981; Stratton 1982a, 1983). These reports, too, describe the harvest and use of resources, as well as contrast local use patterns of Copper Basin resources with those of non-Basin participants in the Nelchina caribou hunt.

In 1983, at the request of the Board of Fisheries, Division staff conducted additional research in the Copper Basin aimed at understanding the full range of resource uses in Basin communities and the role these uses play in the local economy and way of life of Basin residents. A

survey was administered to a sample of 431 households in 19 Copper Basin communities and three communities (Cantwell, Chickaloon, and the North Wrangell Mountains) outside the Basin. A random sample of households was selected in the larger communities, while 100 percent of the households was the target for the smaller communities. Some of the results of this recent research have been used in the preparation of this report. A more complete description and analysis of these data will appear in a forthcoming Division technical paper (Stratton and Georgette 1984).

COPPER BASIN OVERVIEW

Physical and Biological Environment

Flowing 287 miles south from its source in the Wrangell Mountains, the Copper River drains an area of 24,000 square miles before cutting through the coastal Chugach Mountains and emptying into the Gulf of Alaska near the town of Cordova. The river is laden with glacial silt. Its major tributaries include the Chitina, Tonsina, Klutina, Tazlina, Gulkana, Gakona, Sanford, Chistochina, and Slana rivers.

The Basin is surrounded on all sides by massive mountains; the Alaska Range rises on the north, the Chugach Mountains bound the Basin on the west and south, and the Wrangell Mountains form a barrier to the east. Tundra, along with rock and ice, covers the mountains above 4000 feet. Below the tundra grow dwarf birch and willow, which give way at lower elevations to forests of white and black spruce, balsam poplar, aspen, and birch. The continental climate of the Basin is characterized by great extremes of temperature, with cold, dry winters, and warm summers (Hanable 1982:6-9).

The wildlife of the Basin is varied. Two major caribou herds, the

Nelchina and the Mentasta, roam the northern and western Basin. Dall sheep and mountain goats are found in the mountains. Moose, brown and black bear, and a typical assemblage of boreal forest small game and furbearers are also present in the area. Beginning in June, sockeye (red) and chinook (king) salmon ascend the Copper River to spawn, followed in August and September by small runs of coho (silver) salmon and steelhead trout. Freshwater fish present in Basin rivers and lakes include rainbow and lake trout, grayling, whitefish, and burbot (Selkregg 1974).

History

The aboriginal inhabitants of the Copper River Basin, the Athabaskan-speaking Ahtna Indians, have probably occupied this region for at least the last thousand years (Workman 1976). In the 19th century, the Ahtna were organized into a number of small bands, each with its distinctive dialect, fishing sites, and hunting grounds. Totally dependent upon wild resource harvests for survival, each band followed a seasonal round which included fishing for salmon each summer with funnel traps and spears in clear water streams, and with weirs, willow dip nets, and dipnetting platforms in the Copper River itself. Fishwheels were introduced to the Copper River fishery around 1910 and rapidly replaced the aboriginal fishing technology. The salmon were preserved, mostly by drying, and stored in caches at each permanent village, located near the fishing sites. In fall, hunting for large and small game took place from mountain hunting camps. People remained at their villages throughout a portion of the winter, supplementing their stored foods with ice fishing, but when supplies ran low in later winter and spring, families left the village to hunt for game. Certainly, sockeye and chinook salmon were the

most important food for the Ahtna, for the risk of starvation was great if adequate supplies of this seasonally abundant resource were not prepared each summer (de Laguna and McClellan 1981).

In 1783, the Russians, under Nagaev, discovered the mouth of the Copper River. Repeated Russian attempts to explore the Copper River valley were largely failures. Although the Athna became involved in the fur trade during the Russian era of Alaskan history, the influence of the Russians on the Copper Basin was not great. The effects of European-introduced diseases were more important, since they included a severe reduction of the Indian population of the Basin in the 19th and early 20th centuries (de Laguna and McClellan 1981:643).

In 1885, Lt. Henry Allen of the United States Army led the first successful non-Native expedition through the Copper Basin to the Tanana River Valley. Arriving at Batzulneta's Village near present day Slana in early June 1885, Allen encountered Indians from the Tanana River, who had crossed the mountains through well-established trade routes to fish for salmon with their upper Ahtna relatives (Hanable 1982:46). The Upper Tanana Indians had long-standing traditions of trade, intermarriage, and cooperative fishing with the Ahtna of the upper Copper River (e.g. McKennan 1959:27-28,35; Guedon 1974).

In 1898 and 1899, thousands of prospectors bound for the Klondike goldfields passed through the Copper Valley. Hundreds overwintered at the present site of Copper Center. Beginning in 1899, a trail was constructed from Valdez into the Copper River Valley. By 1905, this forerunner of the Richardson Highway was open to travel to Fairbanks by horse-drawn wagons. By 1927, the highway was open to automobile traffic. Many of today's Basin communities grew around road houses along this route. Former Native villages were abandoned as the Ahtna were drawn to the

roadhouses as sources of imported trade goods and temporary wage employment. The presence of schools and missions also attracted people to these centers. Development of the Kennecott copper mines in the early 1900s resulted in the construction of the Copper River and Northwestern Railway between the mines and Cordova, and the growth of the community of Chitina. Both the mines and the railway were abandoned by 1938 (de Laguna and McClellan 1981:643; Hanable 1982:65).

American involvement in World War II resulted in the construction of the Glenn Highway between Anchorage and the Basin. Also, the Richardson Highway was linked with the new Alaska Highway, which ran through Canada to the rest of the United States. Again, this "boom" period was followed by a period of reduced economic activity. Statehood in 1959 brought a growth in the service and government sectors of the local economy. The population of the Basin gradually rose as newcomers arrived, some because of wage employment opportunities; others were attracted by the Basin's natural resources and way of life. The construction of the Trans-Alaska Pipeline in the early 1970s again brought renewed opportunities for wage employment, and more newcomers arrived in the region. This growth spurt, too, was temporary, although many who had first moved or returned to the Basin during the Pipeline's construction chose to remain and seek other means of livelihood. In part, wage employment opportunities have arisen in local businesses serving the tourists, hunters, and fishermen who visit from other parts of Alaska, as well as other states and foreign countries. The several highways crossing the region have made the Basin reasonably accessible to these groups (Stratton and Georgette 1984).

Current Socioeconomic Characteristics

In 1983, the year-round population of the Copper Basin was approximately 2,960 in 977 households (Table 2). About 23 percent of these were Native households. Almost all of the Basin's population lives along the Basin's roads and highways. Service centers have developed in Glennallen and at Copper Center; these are also the population centers of the Basin. Other community centers occur at major highway intersections, at former roadhouse sites, and at Native villages. However, many of the Basin's households reside along the major highways outside any recognizable service center.

In 1983, wage employment opportunities in the Basin were largely limited to jobs in government, construction, travel/service, and Native corporations. Many of these jobs were seasonal or part time (Stratton and Georgette 1984; cf. Stickney and Cunningham 1979:18; Logsdon 1977). Division of Subsistence research in 1982 (Stratton 1983:22) found that of Basin residents holding Nelchina caribou subsistence hunting permits, only 20 percent held full-time, year-round jobs. Over 35 percent were employed seasonally or part-time, year-round. Almost 11 percent were unemployed, and over 17 percent were retired. In contrast, 63 percent of the non-Basin residents holding Nelchina permits, the majority of whom reside in urban centers, reported full-time, year-round employment. Only 15 percent held seasonal or part-time work. Less than 4 percent were unemployed and 4 percent were retired. The mean household income for the Basin caribou hunters was $16,200 in 1982; non-Basin residents reported a mean 1982 household income of $41,500 (Stratton 1983:21).

Research in 1983 (Stratton and Georgette 1984) also revealed that many Basin household heads held seasonal wage employment during 1982-83.

TABLE 2. ESTIMATED POPULATION OF COPPER BASIN COMMUNITIES, SUMMER 1983.

Community	Estimated Number of Households	Mean Household Size	Estimated Population
Chistochina	27	2.4	65
Chitina	24	1.8	43
Copper Center	129	3.4	439
Gakona	24	3.3	79
East Glenn Highway	65	2.8	182
Glennallen	269	3.2	861
Gulkana	41	2.8	115
Kenny Lake	68	3.2	218
Lake Louise	15	2.6	39
Lower Tonsina	9	3.9	35
Matanuska Glacier	65	2.8	182
McCarthy Road	18	2.9	52
Mentasta	19	3.5	67
Nabesna Road	10	3.7	37
North Richardson Hwy	16	2.0	32
Paxson/Sourdough	9	3.0	27
Sheep Mountain	19	3.1	59
Slana	17	2.5	43
South Wrangell Mtns	18	2.0	36
Upper Tonsina Area	76	3.0	228
Tok Road	39	3.1	121
Total	977		2,960

Source: Stratton and Georgette 1984.

Table 3 reports the mean number of months employed during a 12 month study period in 1982-83 for household heads in 19 study communities. Generally, households in or near service centers such as Glennallen (mean 10.9 months) were more likely to hold year-round jobs than were households in smaller communities in the Basin, such as Chistochina (5.1 months) or McCarthy Road (4.7 months). Given these patterns of wage employment, it is not surprising that many Basin households engage in wild resource harvests to provide economic security in an economically marginal and undiversified region.

Table 4 reports data on the length of residency within the Basin of Basin residents. Each number represents the mean number of years living in the Basin for the longest resident member of the sampled households of each community. Generally, communities closest to the Copper River and those which have a substantial number of Native households have the highest means. These data demonstrate that many Basin households have a long history of local residency.

THE USES OF FISH AND WILDLIFE WITHIN COPPER BASIN COMMUNITIES

Previous Division research has documented an extensive use of wild fish and game resources by residents of Copper Basin communities. For example, in response to a mailed questionnaire sent to holders of Nelchina caribou subsistence permits, most of whom were Basin residents, 80 percent reported that they regularly used caribou; 92 percent regularly used moose; 30 percent, black bear; 50 percent waterfowl; 67 percent, small game; 93 percent, salmon; 37 percent, whitefish; and 78 percent, other fish. All of these participation rates were higher than those reported by non-Basin residents who hunted Nelchina caribou in 1982 (Stratton

TABLE 3. MEAN NUMBER OF MONTHS EMPLOYED, HOUSEHOLD HEAD, COPPER BASIN COMMUNITIES 1982-83.[1]

Community	Sample Size	Mean Number of Months Employed
Chistochina	22	5.1
Chitina	23	6.6
Copper Center	26	7.9
Gakona	22	8.3
East Glenn Highway	15	6.0
Glennallen	50	10.9
Gulkana	32	8.0
Kenny Lake	12	7.1
Lake Louise	10	9.5
Lower Tonsina	8	2.9
Matanuska Glacier	29	7.0
McCarthy Road	13	4.7
Mentasta	18	4.2
Nabesna Road	8	4.1
Paxson/Sourdough	10	10.1
Sheep Mountain	9	10.4
Slana	16	8.8
South Wrangells	15	3.9
Upper Tonsina Area	15	7.6

[1] Data are for a 12 month study period in 1982-83.

Source: Stratton and Georgette 1984.

TABLE 4. MEAN YEARS OF RESIDENCY IN THE COPPER BASIN.

Community	n	Years
Chistochina	22	28.2
Chitina	23	21.2
Copper Center	27	32.8
Gakona	23	16.5
East Glenn Highway	15	18.6
Glennallen	51	14.4
Gulkana	34	23.8
Kenny Lake	12	11.5
Lake Louise	12	11.8
Lower Tonsina	8	31.7
Matanuska Glacier	30	10.0
McCarthy Road	13	13.7
Mentasta	18	41.3
Nabesna Road	8	32.8
Paxson/Sourdough	10	13.3
Sheep Mountain	9	10.4
Slana	16	17.5
South Wrangells	15	10.1
Upper Tonsina Area	15	13.3

Source: Stratton and Georgette 1984.

1983:18-19). On the average, Basin households reported that 66 percent of their household's fish and meat was derived from wild fish and game harvests; the corresponding figure for non-Basin households was 48 percent (Stratton 1983:17).

Research with Copper Basin fishwheel users in 1982 revealed similar patterns. Almost 84 percent of a sample of 56 local fishermen reported that they had hunted game within the last 12 months; 61 percent had taken fish other than salmon; 61 percent picked berries; and 30 percent had trapped furbearers. Almost all of these activities took place within the Copper River Basin (Stratton 1982b:27-28).

A survey conducted with 365 households in 19 Copper Basin communities in 1983 revealed a diversity of wild resource uses among Basin residents. Most households were found to harvest and use wild resources, although annual household harvests ranged from a few pounds to thousands of pounds of wild food. Mean household harvests for each community (Table 5), demonstrate that a large number of Basin households harvest fish, game, and plant resources in substantial quantities.

Several factors seem to be associated with high levels of resource harvest within Copper Basin communities. For example, 58 percent of the interviewed Basin households hunted moose during the 12 month study period in 1982-83. While most of these households did not harvest a moose, the mean harvest of all wild resources for this group was 558 pounds, compared with a mean of 139 pounds for those households not attempting to harvest this species. Similarly, sampled households which held a subsistence permit for hunting Nelchina caribou during the study period (21 percent of the sample) harvested a mean of 646 pounds of wild resources; households not holding a Nelchina subsistence permit harvested a mean of 310 pounds (Figure 2). Thus, participation in big game hunting

TABLE 5. MEAN HOUSEHOLD HARVESTS OF WILD RESOURCES IN POUNDS BY RESOURCE CATEGORY, COPPER BASIN COMMUNITIES 1982-83.

Community	Fish		Big Game		Small Game		Plants		Mean Household Harvest	Per Capita Harvest
	Lbs	Percent of Total	Lbs	Percent of Total	Lbs	Percent of Total	Lbs	Percent of Total		
Chistochina	140	45	116	37	20	6	26	12	313	122
Chitina	221	64	77	22	21	6	24	7	343	102
Copper Center	316	82	42	11	8	2	18	5	384	114
Gakona	425	69	145	24	26	4	19	3	615	196
East Glenn Highway	227	57	115	29	25	6	28	7	395	141
Glennallen	123	54	90	40	5	2	9	4	227	67
Gulkana	210	63	93	28	15	5	15	5	333	110
Kenny Lake	109	44	110	44	12	5	18	7	249	75
Lake Louise	238	52	130	28	21	5	68	15	457	171
Lower Tonsina	323	69	74	16	37	8	34	7	468	121
Matanuska Glacier	95	33	155	53	10	3	30	10	290	97
McCarthy Road	154	40	80	21	128	33	23	6	385	139
Mentasta	92	23	219	56	27	7	56	14	394	109
Nabesna Road	654	52	517	41	63	5	18	1	1,252	282
Paxson/Sourdough	123	37	159	48	31	9	20	6	333	132
Sheep Mountain	136	61	75	33	5	2	8	4	224	72
Slana	336	49	296	44	13	2	35	5	680	253
South Wrangell Mtns.	113	28	226	56	45	11	17	4	401	188
Upper Tonsina Area	178	58	94	31	14	5	19	6	305	101

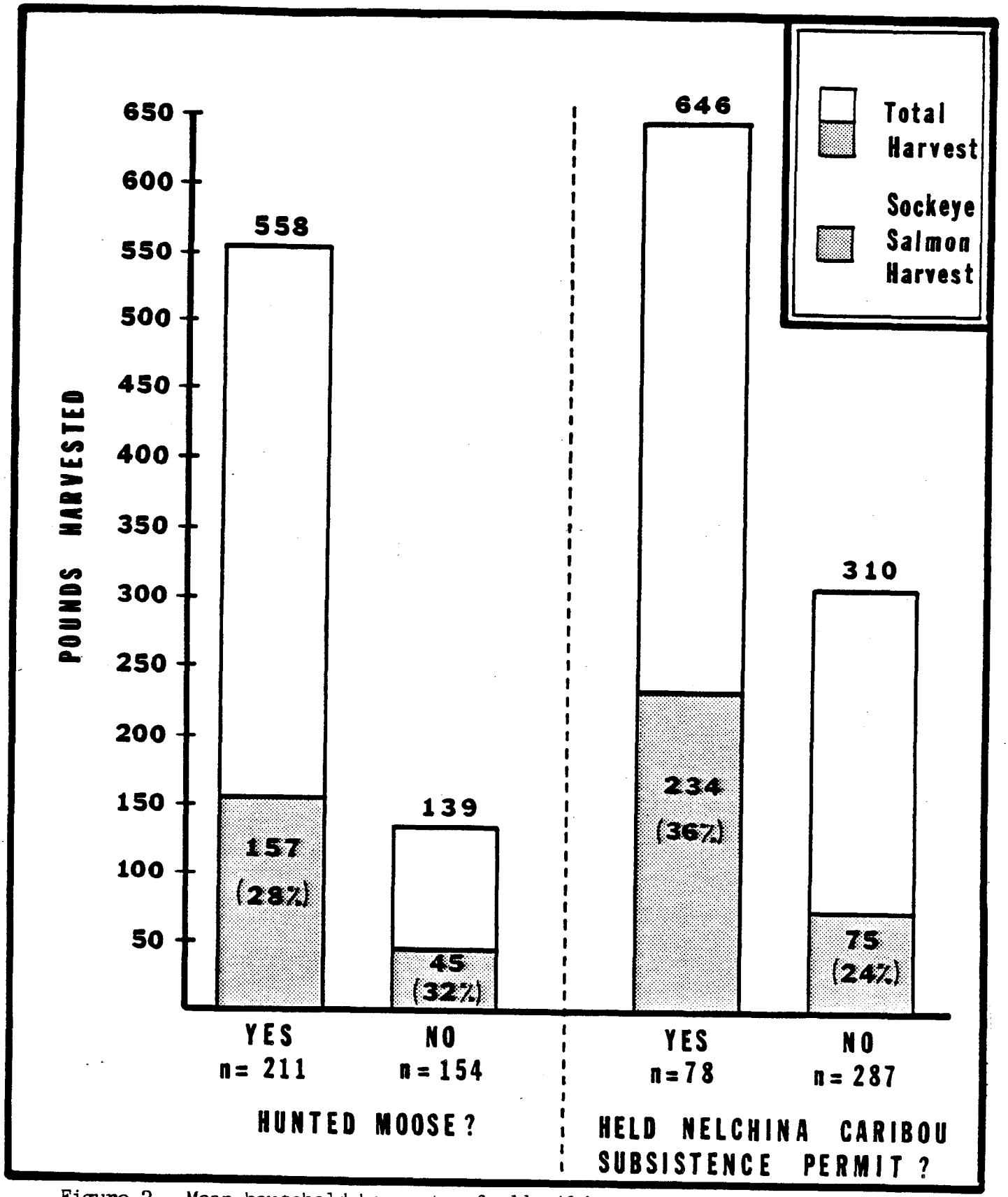


Figure 2. Mean household harvests of all wild resources and of sockeye salmon, in pounds dressed weight, for moose-hunting households and households holding Nelchina caribou subsistence permits, Copper Basin, June 1982 - May 1983.

appeared to be associated with relatively high levels of resource harvest. Large portions of Basin communities engaged in hunting moose and caribou during the study period.

Another factor associated with high levels of resource harvesting by Basin households was involvement in Copper River subsistence fisheries. As shown in Figure 3, households using fishwheels during the study period (36 percent of the sample) harvested a mean of 644 pounds of resources. Basin households using dipnets (7 percent) harvested a mean of 276 pounds. The mean harvest for those households not harvesting salmon with a fishwheel or dipnet (57 percent) was 226 pounds during the study period.

As depicted in Figure 4, the number of months engaged in monetary employment may also have been related to harvest levels within Copper Basin communities. Households headed by individuals employed 1-11 months harvested a mean of 465 pounds of wild resources, compared with a mean of 338 pounds for those employed 12 months, and 318 pounds for those with no monetary employment during the study period. This suggests that Copper Basin households with seasonally-employed members harvested more resources than those with year-round employment or those that were unemployed (cf. Mills et al 1984). As noted earlier in Table 3, many Basin households hold seasonal wage-producing jobs. These, and other relationships, will be explored further in a comprehensive report on resource uses in the Copper Basin (Stratton and Georgette 1984).

Also, Table 5 shows that during the study period, fish provided the majority of the wild resource harvests of most Basin communities. For example, 63 percent of the mean household resource harvest by Gulkana residents was composed of fish, while 28 percent was large and small game. In Copper Center, fish accounted for 82 percent of the mean household harvest. For communities adjacent to the Copper River, the bulk of

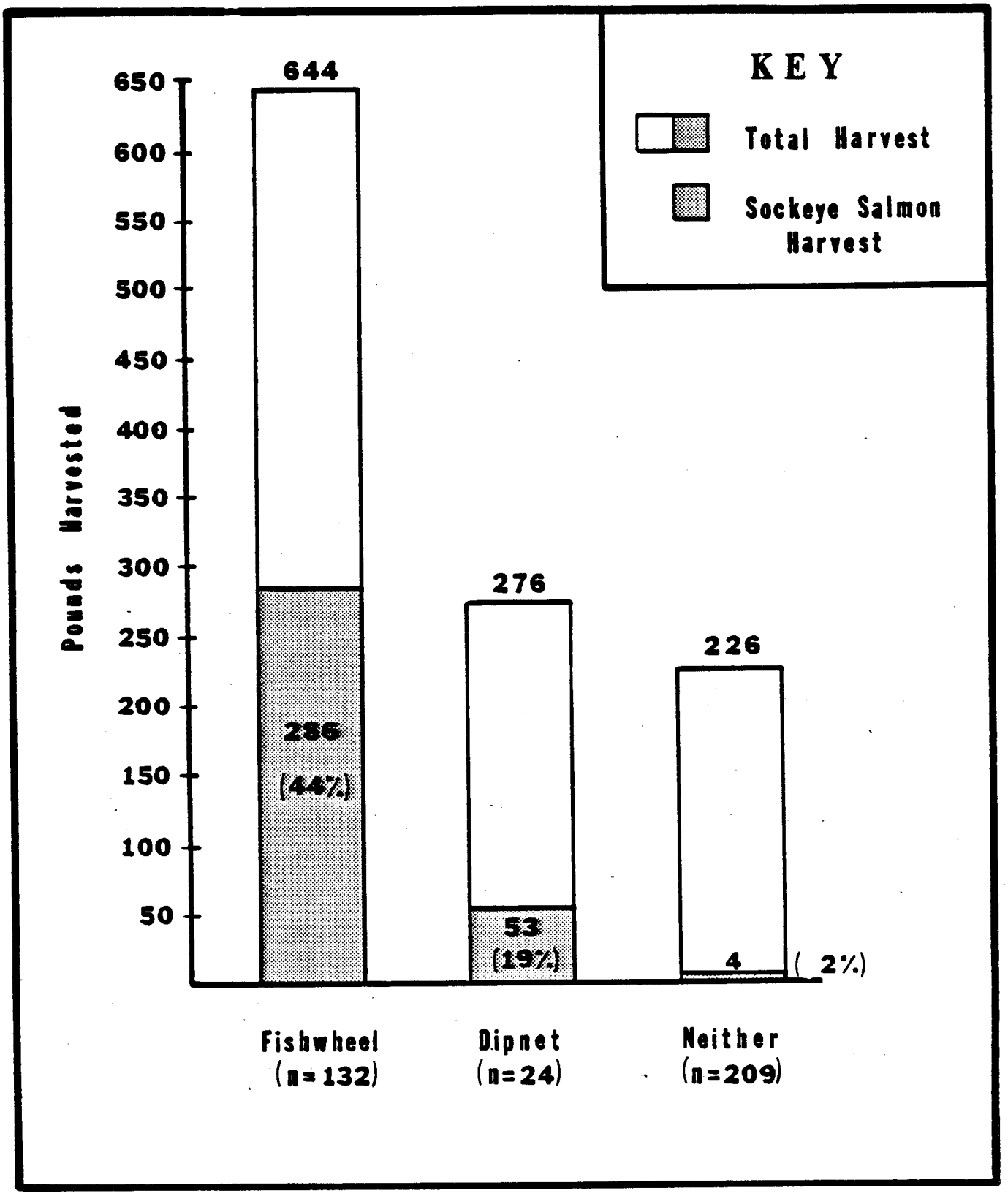


Figure 3. Mean household harvests of all wild resources and of sockeye salmon, in pounds dressed weight, for Copper Basin households using fishwheels and dipnets, June 1982 - May 1983.

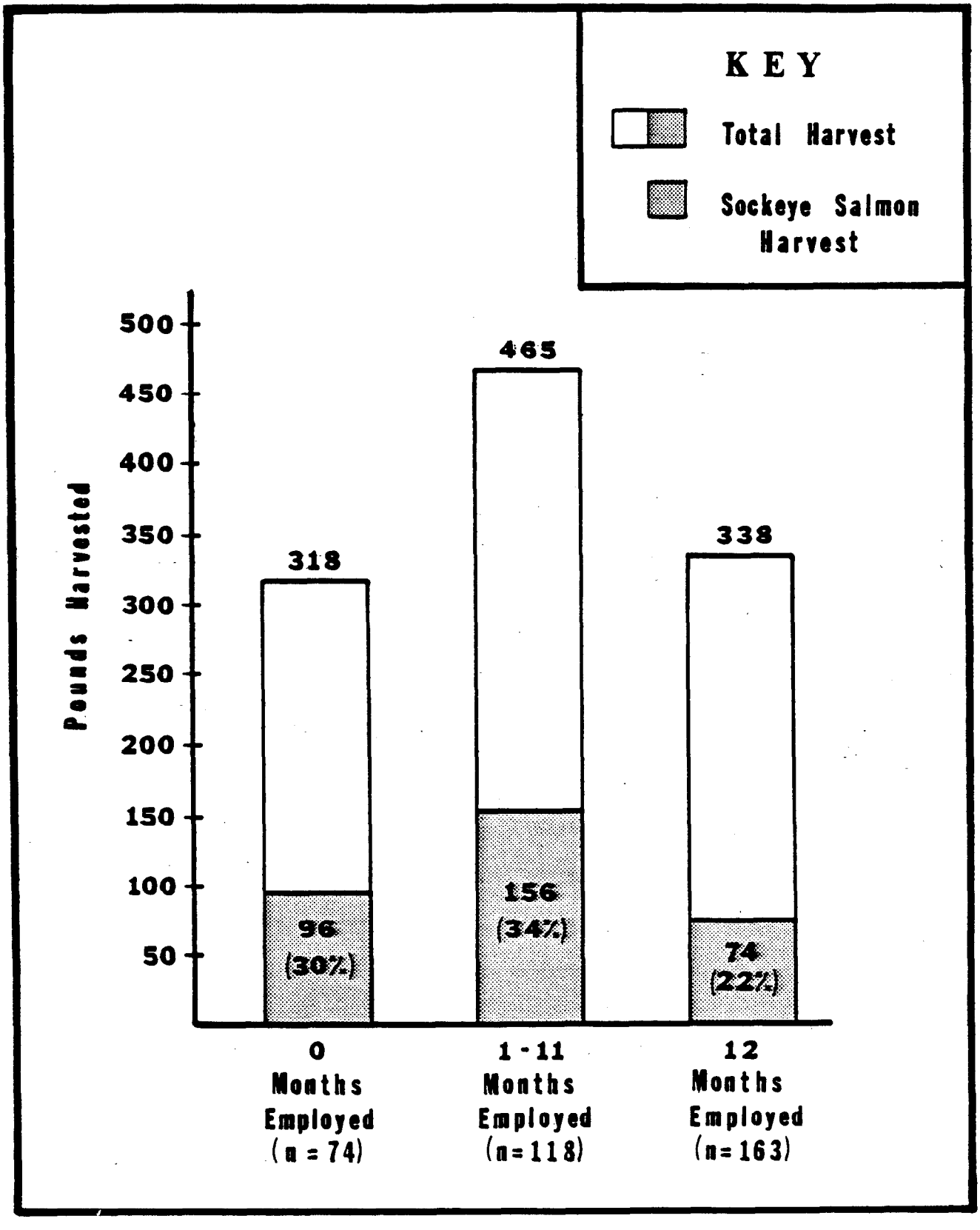


Figure 4. Mean household harvests of all wild resources and of sockeye salmon in pounds dressed weight, by number of months employed, Copper Basin households, June 1982 - May 1983.

the fish caught was salmon, mostly sockeye (see next section). Game harvests were generally found to be highest in communities in the northern portion of the Basin, such as Mentasta (219 pounds; 56 percent of the harvest), Slana (296 pounds, 44 percent of the harvest), and along the Nabesna Road (517 pounds, 41 percent of the total). In part, this more common harvest of game was due to the greater accessibility of big game populations, particularly caribou and sheep, to these northern communities. Also, a significant portion of the population of these communities was engaged in such resource-related income-producing activities as trapping and guiding, which seemed to be associated with an increase in a community's mean household harvest of wild foods (Stratton and Georgette 1984).

Generally, the resources taken in large quantities by Basin communities during the study period were those that were near to residences, reasonably accessible, and fairly abundant. For example, declining populations of game, particularly moose and caribou, along with growing harvest pressures on these resources, have led in recent years to more restrictive hunting regulations. With the Board of Game's adoption of regulations providing for subsistence hunting of caribou by Basin residents in 1980, harvests of this species have increased (Stratton and Georgette 1984).

It is evident, however, that fish, especially salmon, continue to be the most commonly harvested and used wild resource in the vast majority of Basin communities. Salmon have been a fairly reliable resource, and are seasonally abundant. Given adequate gear, knowledge of fishing techniques, access, and favorable river conditions, they can be taken in large numbers. Good fishing sites are reasonably accessible to Basin residents. The patterns of this use will be described in the following section.

CONTEMPORARY USES OF COPPER RIVER SALMON

Patterns of Harvest and Use of Copper River Salmon by Copper Basin Residents

Gear Type

Copper Basin residents harvest salmon predominantly with fishwheels. In 1981, about 83 percent of the 409 Basin households which held subsistence fishing permits used fishwheels. In 1982, 79 percent, and in 1983, 83 percent, operated fishwheels. The remainder of the permit holders fished with dipnets (Figure 5). The number of Basin households harvesting salmon with fishwheels or dipnets has remained stable over the last three years, in contrast with the 135 percent increase in the overall number of Copper River subsistence fishing permits issued during the same period (Figure 6).

Division of Subsistence research has found that a large portion of all households in Copper Basin communities participate in the fishwheel fishery (Table 6). For example, almost 60 percent of a random sample of Copper Center households harvested salmon with fishwheels during a study period spanning 12 months in 1982-83. Only 7 percent of the Copper Center sample took salmon with rod and reel, and none used dipnets. Most communities bordering the Copper River from Chitina to Slana displayed similar patterns. Conversely, residents of Basin communities more distant from the river, such as Lake Louise, Paxson/Sourdough, and Sheep Mountain, harvested most of their salmon with rod and reel under sport fishing regulations.

In part, the efficiency of fishwheels for harvesting salmon over other gear types explains the preference local residents exhibit for fishwheels. Building a fishwheel requires knowledge about construction

Figure 5. Local Participation in Copper River Subsistence Salmon Fishery, 1981-83.

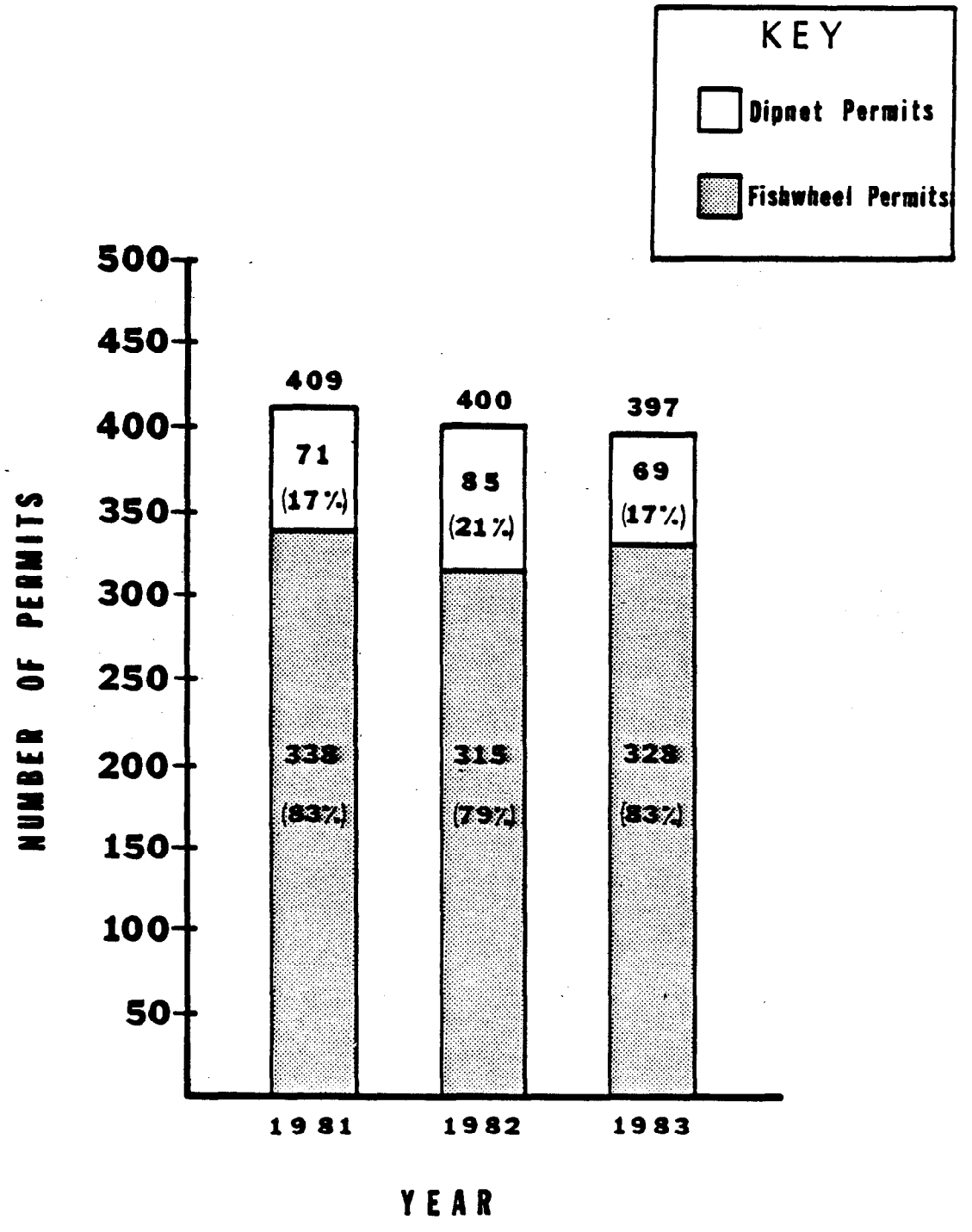


Figure 6. Number of Permits Issued, Copper River Subsistence Salmon Fishery 1963-83

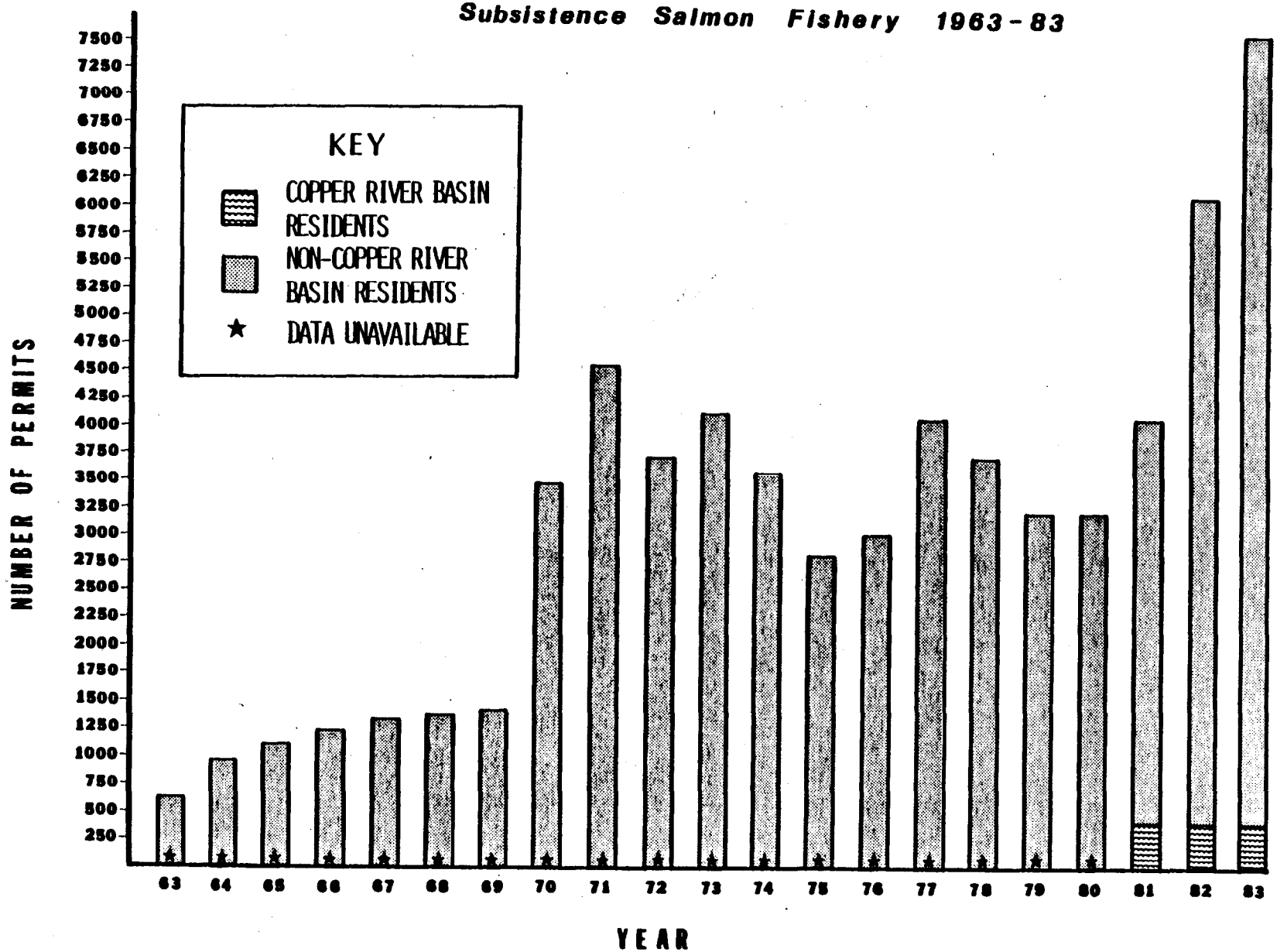


TABLE 6. SALMON HARVEST AND USE BY COPPER BASIN COMMUNITIES, JUNE 1982 - MAY 1983.

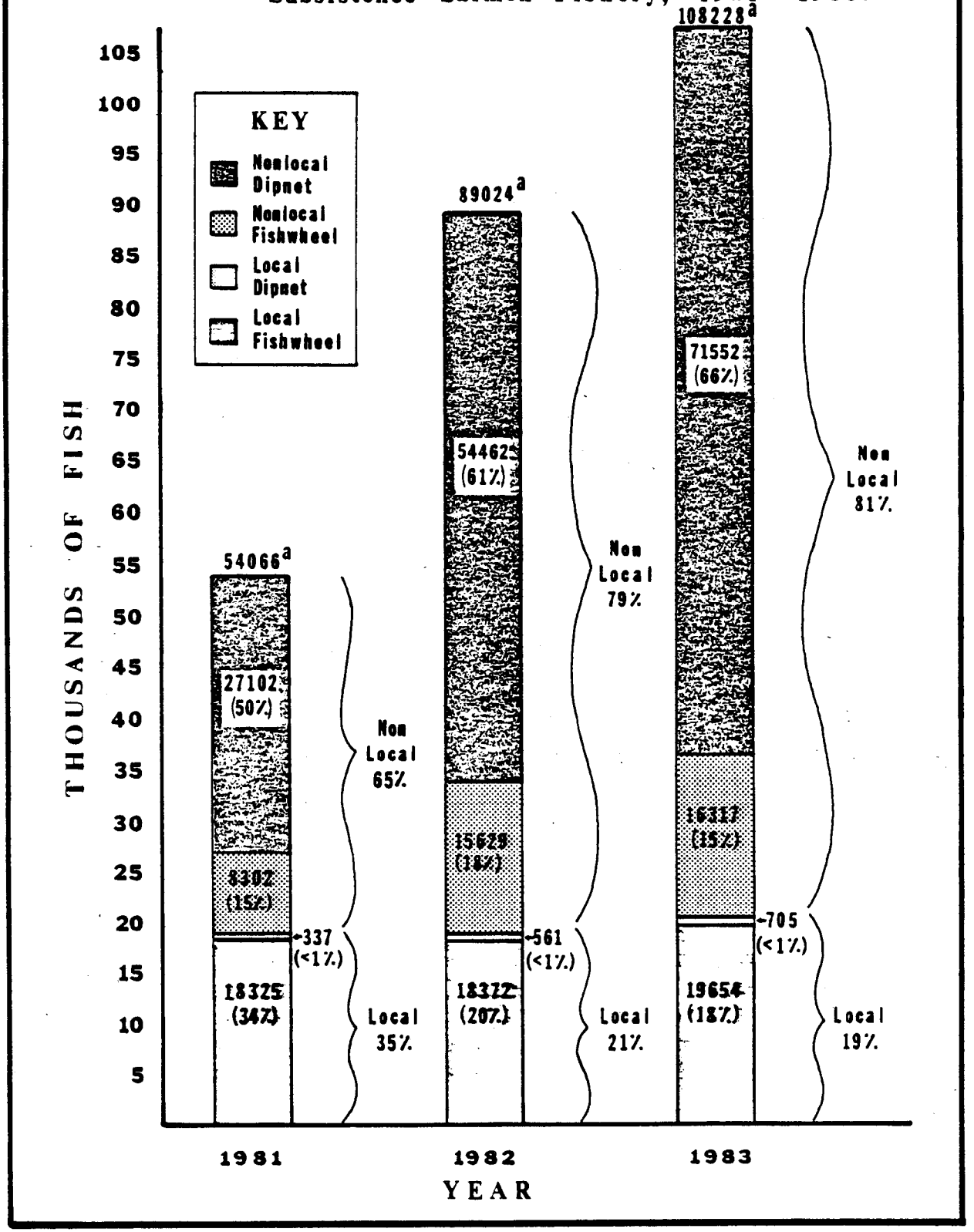
Community	n	Percent Harvesting Salmon	Percent Using Salmon	Mean Number Harvested Per Household	Mean Number Used Per Household	Percent Of Total Harvest Composed Of Salmon	Percent Using Fishwheel	Percent Using Dipnet	Percent Using Rod & Reel	Percent Using Other
Chistochina	22	27.3	81.8	24.5	44.3	36.9	22.7	-	4.6	-
Chitina	23	47.8	87.0	39.3	35.0	60.5	43.5	4.4	-	-
Copper Center	27	66 7	85.2	49.4	53.4	61.4	59.3	-	7.4	-
Gakona	23	87.0	100.0	64.6	67.8	54.8	65.2	4.4	26.1	4.4
East Glenn Highway	15	53.3	86.7	25.4	41.9	33.7	33.3	6.7	26.7	-
Glennallen	51	58.8	92.2	19.2	20.7	43.5	37.3	5.9	21.6	-
Gulkana	36	75.0	86.1	28.3	27.4	51.2	52.8	-	27.8	2.8
Kenny Lake	12	91.7	91.7	18.9	22.4	39.9	75.0	16.7	16.7	-
Lake Louise	13	61.5	84.6	3.4	6.3	6.1	-	15.4	53.9	-
Lower Tonsina	8	87.5	100.0	62.5	63.8	60.3	37.5	50.0	-	-
McCarthy Road	13	30.8	92.3	28.3	41.0	36.8	30.8	7.7	-	-
Matanuska Glacier	30	43.3	76.7	9.7	15.4	16.7	3.3	6.5	23.3	10.0
Mentasta	19	15.8	94.7	15.1	35.7	18.2	36,8	5.3	-	5.3
Nabesna Road	8	50.0	100.0	81.5	88.6	28.1	62.5	-	12.5	-
Paxson	10	60.0	90.0	6.3	10.6	14.3	30.0	-	60.0	-
Sheep Mountain	9	44.4	77.8	10.2	12.0	42.7	-	11.1	22.2	11.1
Slana	16	75.0	100.0	65.2	50.3	42.0	75.0	-	-	-
South Wrangell Mtns	15	46.7	100.0	18.1	21.5	22.4	26.7	6.7	13.3	6.7
Upper Tonsina Area	15	53.3	80.0	31.8	33.7	48.4	40.0	20.0	13.3	-

techniques, and a relatively high initial investment of time and money in constructing the wheel and installing it at a fishing site. However, once operating, a fishwheel is capable of harvesting salmon rapidly in a fairly short amount of time, under favorable water and run conditions. Local residents, many of whom have lived in the area for years, are likely to know of the best fishing sites and access routes; through networks of relatives and friends, they may also gain permission to place a wheel on privately-owned land or share the use of a fishwheel. Also, those fishermen living closest to the river are best able to maintain their wheels and care for their catch, in contrast to those residing far from the river who cannot tend their wheels from their own homes. While Table 6 reveals a portion of some communities fishing with rod and reel, this is often in addition to operating a fishwheel and may be practiced more for its recreational qualities rather than as a source of large quantities of fish. The few Basin residents who utilize dipnets do so because they lack the time to invest in building and maintaining a fishwheel; opt to harvest a few salmon quickly using inexpensive gear; or have temporarily lost their access to the fishwheels they have used in the past (Stratton 1982b:54-55).

Levels of harvest and use

In 1983, the reported harvest for all fishwheel permittees was approximately 35,971 salmon; the 328 Copper Basin fishwheel users harvested about 55 percent of this total (Figure 7). As Figure 7 shows, the salmon catch taken by Basin residents' fishwheels has remained fairly stable over the last three years. During the same time, the total harvest reported by all subsistence permit holders has increased by over 200 percent.

Figure 7. Number of Salmon Harvested, Copper River Subsistence Salmon Fishery, 1981 - 1983.



[a] These totals are preliminary reported harvests from returned permits only.

Source: Roberson 1984: personal communication.

Also in 1983, the 6,910 dipnetters at Chitina took 72,257 salmon. Basin residents held an estimated 69 dipnetting permits or about one percent of the total. Table 7 gives the average catch per returned permit in 1983 by type of permit and area of residency.

The mean number of salmon caught per Copper Basin household by community for a 12 month study period in 1982-83 was shown previously in Table 6. The mean number of salmon harvested per household varied widely between communities. Generally, the number of salmon harvested and the portion of the total harvest composed of salmon were higher for communities bordering the Copper River.

The relationship between a community's proximity to the Copper River and its harvest of Copper River salmon is most clearly illustrated by examining the harvest data for sockeye salmon (Table 8) because most sockeye harvested by the sampled households were taken with fishwheels. Figure 8 shows that the portion of the mean household harvest for each study community composed of sockeye salmon was greatest for those communities adjacent to the Copper River. Also, Figure 9 shows that households in communities closest to the Copper River took the most sockeyes.

Table 8 also shows that in most communities the percentage of households harvesting sockeye salmon is exceeded by the percentage of households using sockeye salmon. This suggests that households that harvest sockeyes share portions of their catch with non-harvesting households.

Fishing Periods, Locations, and Processing Activities

By regulation, fishing with fishwheels and dipnets opens June 1 and closes on September 30. Most sockeye and chinook salmon taken with fish-

TABLE 7. AVERAGE CATCH PER RETURNED PERMIT, COPPER RIVER SUBSISTENCE FISHERY, 1983[a]

		Basin Residents			Non-Basin Residents		
Gear Type	Allocation	Number of Permits	Average Catch	Total Reported Harvest	Number of Permits	Average Catch	Total Reported Harvest
Dip Net	15	25	7.7	192	1,105	6.4	7,094
	30	34	14.1	481	4,435	13.8	61,406
Fishwheel	15	17	11.7	199	6	12.7	76
	60-160	132	44.4	5,862	143	39.3	5,625
	200	36	59.6	2,144	21	64.2	1,348
	500	45	191.2	8,605	44	136.8	6,018
Total		289		17,483	5,754		81,567

[a] Based upon permit returns through November 28, 1983.

Source: Adapted from Roberson 1983:11,12.

TABLE 8. SOCKEYE SALMON HARVEST AND USE BY COPPER BASIN COMMUNITIES, JUNE 1982 - MAY 1983.

Community	n	Percent Harvesting Sockeye Salmon	Percent Using Sockeye Salmon	Mean Number Sockeye Salmon Harvested Per Household	Mean Number Sockeye Salmon Used Per Household	Percent of Total Harvest Composed Of Sockeye Salmon
Chistochina	22	22.7	77.3	23.8	42.6	32.2
Chitina	23	47.8	87.9	34.8	29.6	42.7
Copper Center	27	63.0	77.8	42.1	45.4	46.2
Gakona	23	73.9	95.7	53.6	59.6	36.7
East Glenn Hwy	15	46.7	86.7	23.5	39.5	25.1
Glennallen	51	45.1	70.6	16.5	17.6	30.6
Gulkana	36	61.1	69.4	24.4	24.4	32.1
Kenny Lake	12	83.3	91.7	17.5	19.4	29.6
Lake Louise	13	30.8	53.9	2.1	2.9	1.9
Lower Tonsina	8	87.5	100.0	58.4	59.6	52.4
McCarthy Road	15	30.8	84.6	27.6	38.9	28.6
Matanuska Glacier	30	33.3	63.3	6.2	11.3	8.6
Mentasta	19	15.8	84.2	14.4	33.4	14.5
Nabesna Road	8	50.0	100.0	81.3	86.9	27.7
Paxson/Sourdough	10	20.0	60.0	3.4	7.3	4.3
Sheep Mountain	9	33.3	44.4	4.1	5.6	7.8
Slana	16	75.0	87.5	63.0	48.0	39.0
South Wrangell Mtns	15	40.0	93.3	16.0	18.7	16.8
Upper Tonsina Area	15	53.3	66.7	29.8	30.9	41.3

Source: Stratton and Georgette 1984.

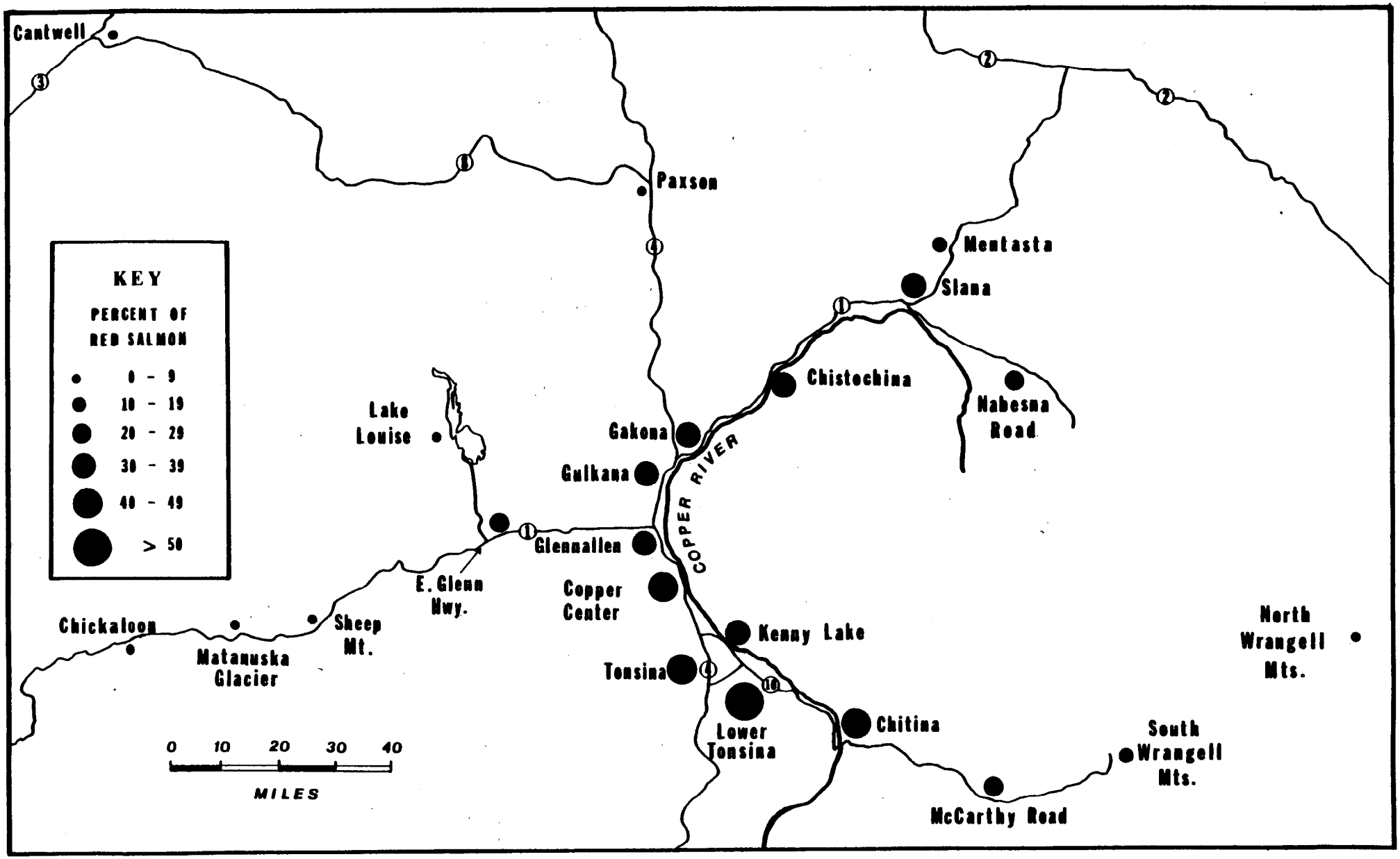


Figure 8. Harvests of Sockeye Salmon, Copper Basin Communities, Expressed as a Percentage of Mean Household Harvests of All Wild Resources, June 1982 - May 1983.

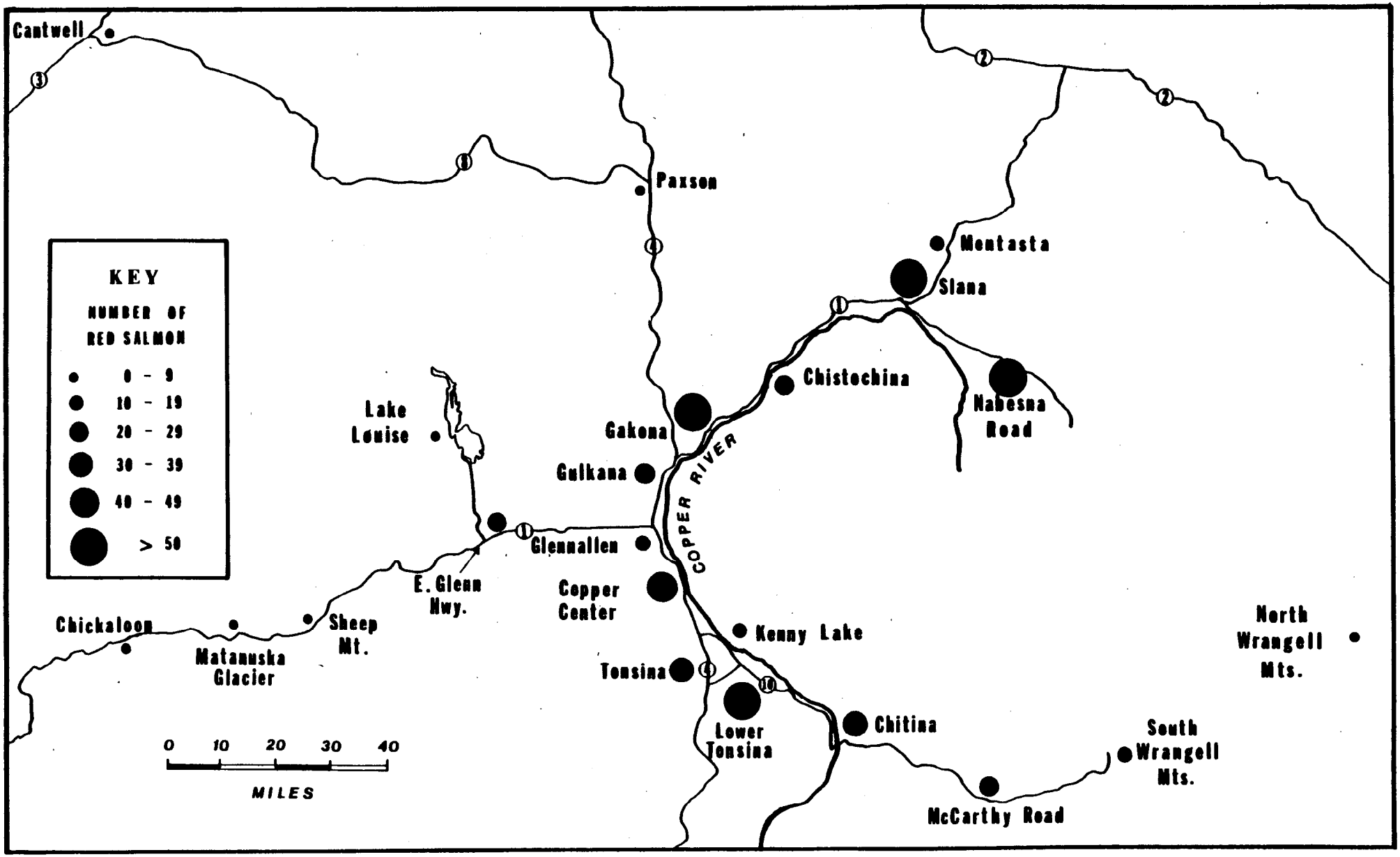
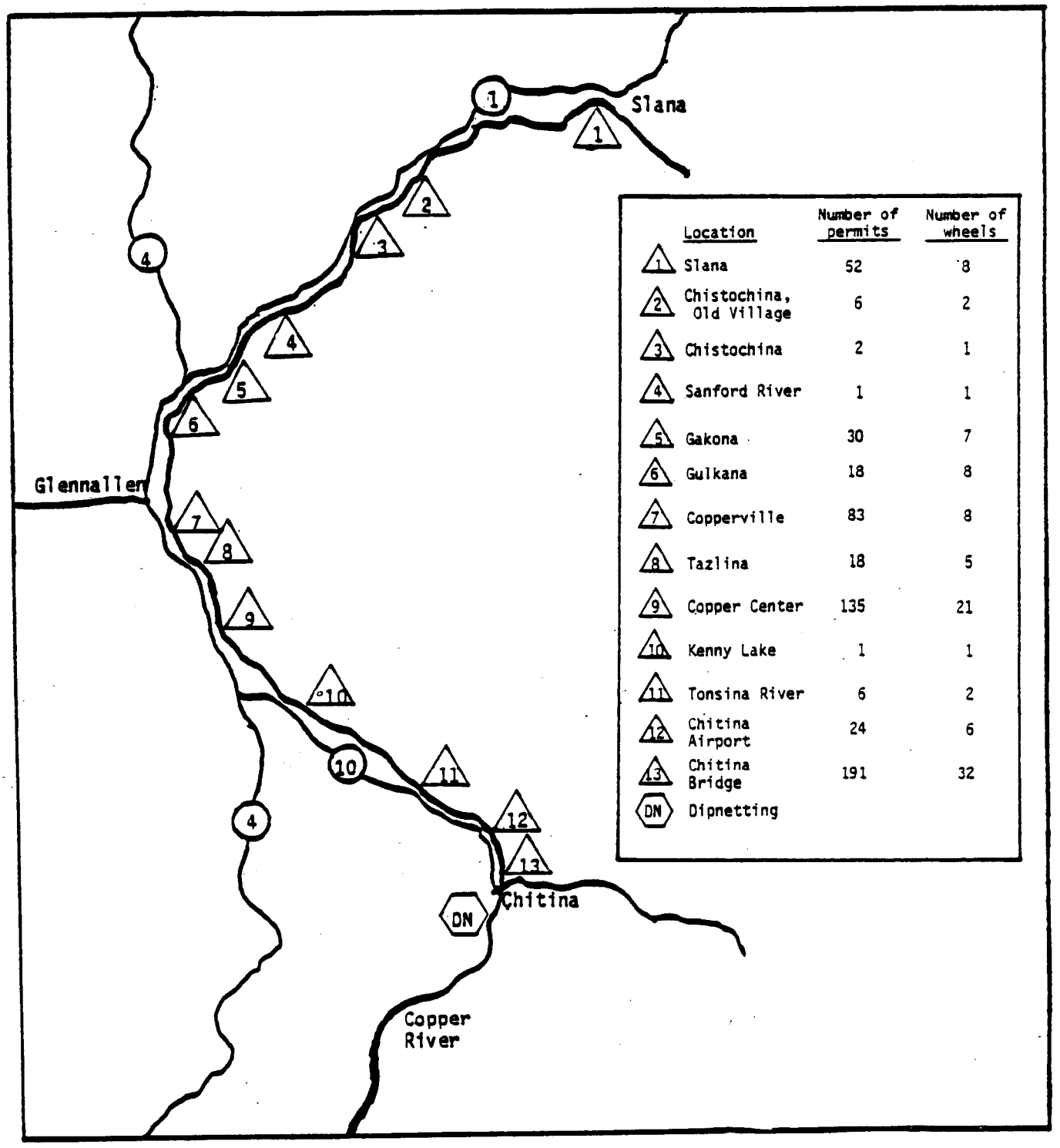


Figure 9. Mean Number of Sockeye Salmon Harvested Per Household, Copper Basin Communities, June 1982 - May 1983.

wheels are caught in June and early July, although sockeye salmon continue to be harvested in small numbers into September. The small harvest of coho salmon occurs in late August through September (Roberson 1982:12). Generally, owners of fishwheels operate them during the peak period of sockeye salmon availability; fishers who utilize a relative's or friend's wheel often run it after the owners have completed their harvest (Stratton 1982b:17).

Fishwheel owners normally place their wheels in the same general area each year. Many fishwheels are operated from private property. Other wheels are placed from sites that are recognized by long term Basin residents as "belonging" to certain families. This right to use a particular site appears to be inherited through lines of kinship (Reckord 1983:102). In 1982, about 104 fishwheels were operated in 13 distinct areas along the Copper River (Figure 10). Ten "clusters," areas having more than one fishwheel, were identified; three other areas had one wheel each. The clusters occurred at these locations for a combination of reasons, including ease of access, proximity to communities, and a history of past use (Stratton 1982b:13).

In 1982, long term Basin residents tended to operate their fishwheels from camps with permanent facilities for processing the salmon. Fishers using the "Old Village" subcluster of ten wheels within the Copper Center cluster provide an example of this technique. Other Basin residents transported their catch to their permanent residences, where processing and storage occurred. Among Basin residents, fishing groups tended to be composed of relatives. For example, of the sample of 56 local fishwheel users, 73 percent reported fishing only with relatives, 16 percent fished only with friends, 4 percent fished with friends and relatives, and 7 percent fished alone (Stratton 1982b:20).



	Location	Number of permits	Number of wheels
1	Slana	52	8
2	Chistochina, Old Village	6	2
3	Chistochina	2	1
4	Sanford River	1	1
5	Gakona	30	7
6	Gulkana	18	8
7	Copperville	83	8
8	Tazlina	18	5
9	Copper Center	135	21
10	Kenny Lake	1	1
11	Tonsina River	6	2
12	Chitina Airport	24	6
13	Chitina Bridge	191	32
DN	Dipnetting		

Figure 10. Estimated number of permits and fishwheels at 1982 Copper River fishwheel sites.

Source: adapted from Stratton 1982b:8,14.

In 1982, most Basin fishwheel operators used a combination of methods to preserve their salmon catch, including canning (63 percent), freezing (59 percent), smoking (52 percent), drying (45 percent), kippering (13 percent), and salting (11 percent) (Figure 11). Basin residents were much more likely to dry their salmon than were non-local fishwheel operators. Drying requires a great deal of time, special storage conditions, and knowledge of how to prepare the product. This preservation method was most common among those fishwheel users with the longest history of involvement in the fishery (Stratton 1982:68). About 30 percent of the sample of Basin fishwheel operators in 1982 used salmon roe and heads (Stratton 1982:24).

Characteristics of Basin Residents Who Use Copper River Salmon

Research conducted in 1982 by the Division found that many Basin fishwheel operators had a long history of involvement in the fishery, especially when compared with non-local fishwheel users (Figure 12). For example, only 5 percent of the local fishers reported that they were using a wheel for the first time, compared with 15 percent of the non-local residents. Over 50 percent of the Basin fishwheel operators had used fishwheels for over 20 years, compared with 15 percent of the non-local residents who reported histories of involvement of that length. Local people were most likely to have begun participating in the fishery as children with their parents, aunts, or uncles. Others had learned about operating a fishwheel from friends. Very few had used a dipnet prior to their use of a fishwheel (Stratton 1982:67).

Another characteristic of the sample of Basin residents who used fishwheels was their high level of use of other fish and game resources (Figure 13). In 1982, almost all of these activities took place within

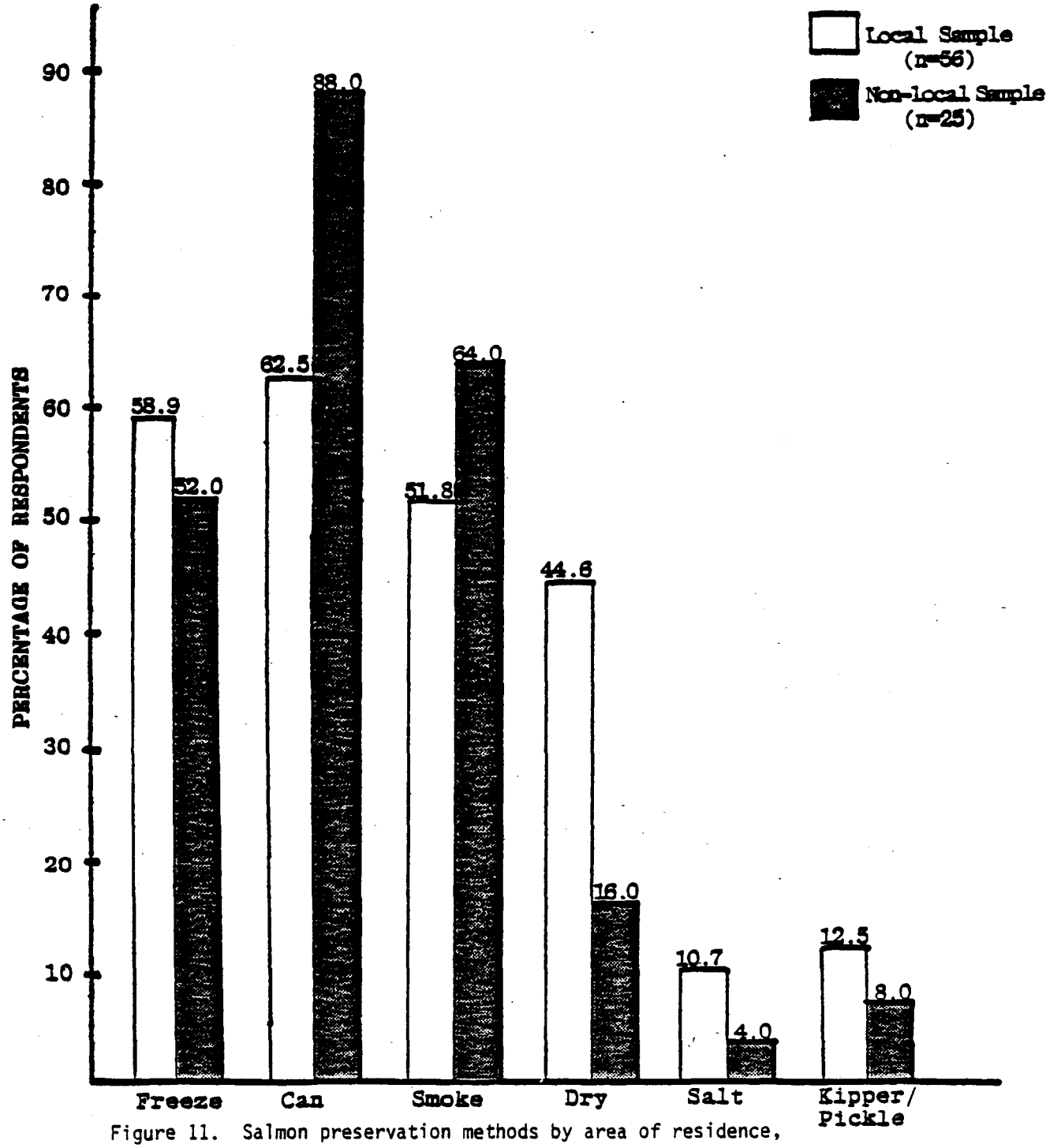


Figure 11. Salmon preservation methods by area of residence, fishwheel sample, 1982.*

* Categories are not mutually exclusive

Source: Stratton 1982b:22.

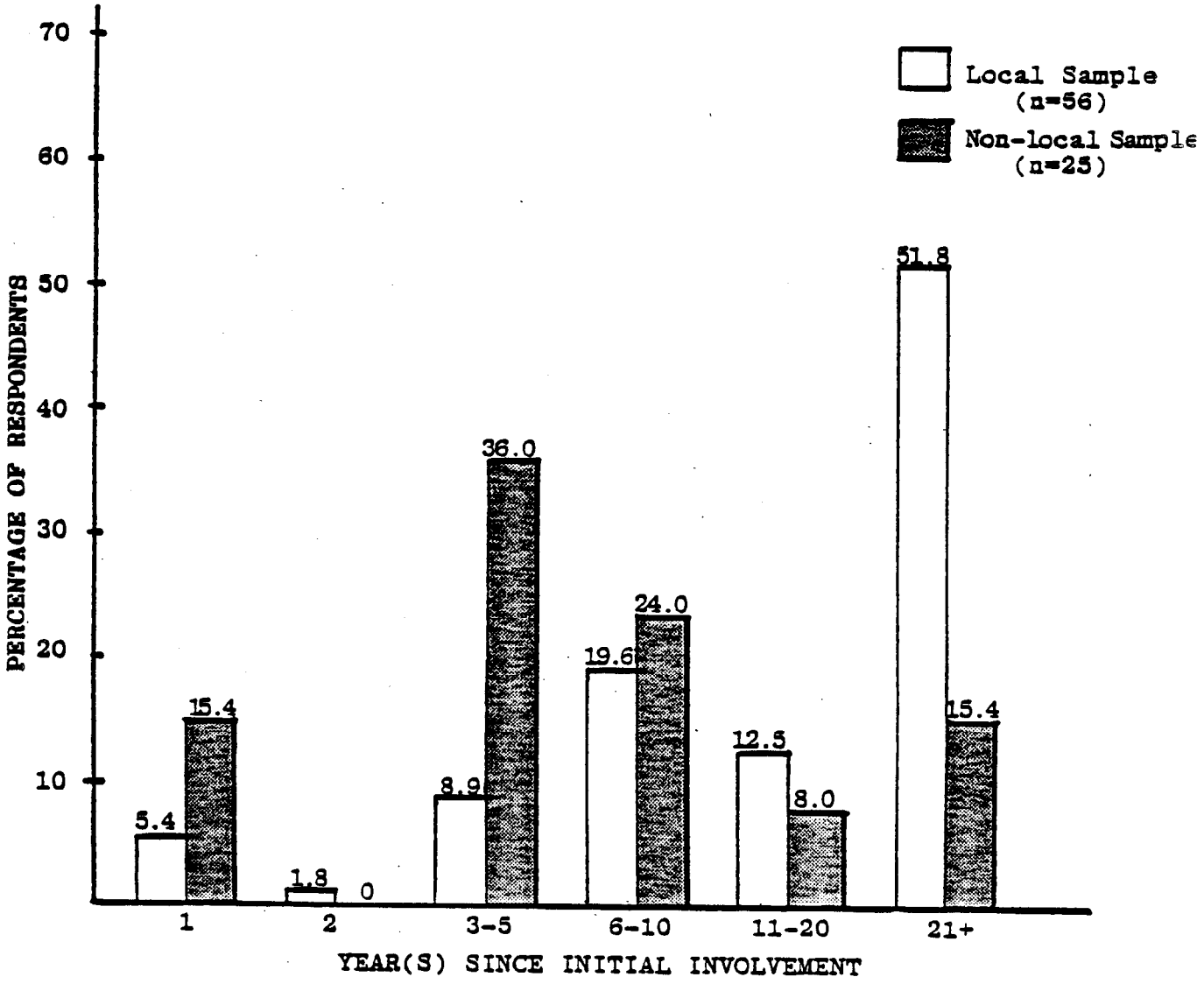


Figure 12. History of involvement in the Copper River fiswheel fishery by residency, fishwheel sample, 1982.

Source: Stratton 1982b:16.

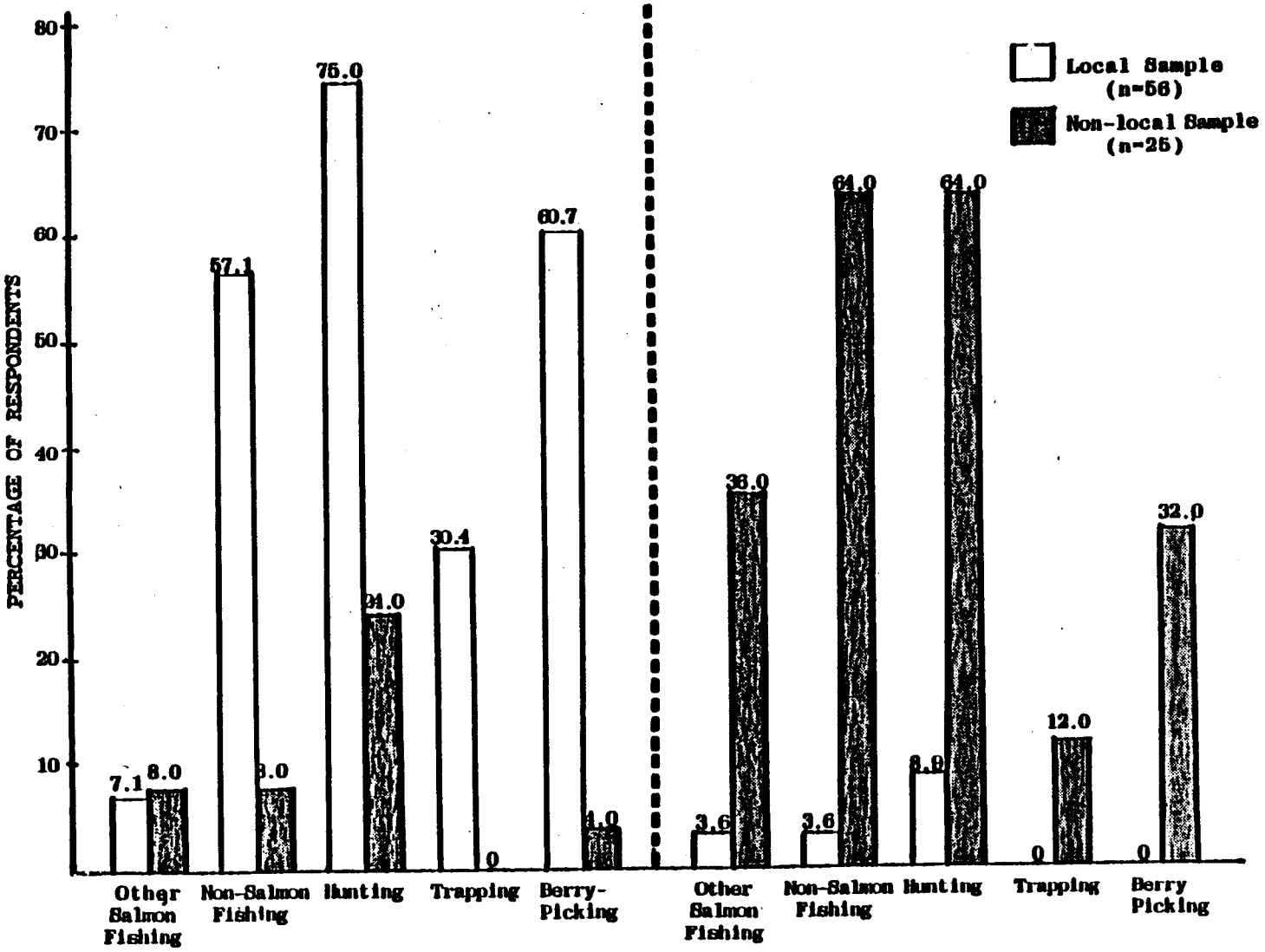


Figure 13. Resource harvesting activities and areas by residency, fishwheel sample, 1982.*

* Categories are not mutually exclusive.

Source: Stratton 1982b:28.

the Copper River Basin. However, only 11 percent participated in other salmon fisheries. Basin residents who used dipnets to harvest salmon in 1982 also engaged in several other resource harvest activities, again mostly within the Basin (Stratton 1982b:62).

Patterns of Harvest and Use of Copper River Salmon by Non-Basin Residents

Gear Type

The vast majority of non-Basin residents harvesting Copper River salmon use dipnets. Of the 7,144 Copper River subsistence permits issued to non-Basin residents in 1983, 6,842 (96 percent) were dipnet permits. Only 302 (4 percent) of the non-Basin participants held fishwheel permits. Overall, about 99 percent of all dipnetters and 48 percent of all fishwheel users resided outside the Copper Basin in 1983.

A comparison of Tables 9 and 10 demonstrates that this pattern of choice of gear type occurs within most non-Basin communities and geographic areas that use Copper River salmon. For example, 32 Fairbanks households fished with fishwheels in 1983, while 2,470 fished with dipnets; thus 99 percent of the Fairbanks fishers participated in the dipnet fishery. About 95 percent of the Anchorage participants, 95 percent of the Delta Junction participants, and 91 percent of the participants from Valdez fished with dipnets in 1983.

Several factors help explain the preference non-Basin residents display for dipnets over fishwheels. As noted earlier, using a fishwheel requires a large investment of time and money, plus knowledge and skill to construct the wheel. The wheel must be transported a long distance from the place of residency to the fishing site on the Copper River. Success in operating the wheel results from familiarity with the river and the salmon runs, as well as access to a suitable fishwheel site, most of

TABLE 9. RESIDENCES OF COPPER RIVER FISHWHEEL PERMITHOLDERS, 1983.

Community	Basin	Non-Basin	Total	Percent
Anchorage[a]		127	127	20.2
Chicken		4	4	0.6
Chitina	23		23	3.7
Copper Center[b]	100		100	15.9
Delta Junction		13	13	2.1
Dot Lake		3	3	0.5
Fairbanks[c]		32	32	5.1
Gakona[d]	60		60	9.5
Glennallen[e]	117		117	18.6
Kenai Peninsula[f]		7	7	1.1
Mentasta	1		1	0.2
Military[g]		2	2	0.3
Northway		3	3	0.5
Palmer/Wasilla[h]	18[i]	52	70	11.1
Paxson	2		2	0.3
Slana	7		7	1.1
Tok		37	37	5.9
Valdez		14	14	2.2
Other[j]		8	8	1.3
	328 (52.1)	302 (47.9)	630	100.2

[a] Includes Chugiak, Eagle River.
[b] Includes Kenny Lake, Upper Tonsina, and Lower Tonsina.
[c] Includes College, and North Pole.
[d] Includes Gulkana, and Chistochina.
[e] Includes Tazlina, Copperville, and some Copper Center residents.
[f] Includes Kenai, Homer, Ninilchik, Soldotna, and Sterling.
[g] Includes Elmendorf AFB and Fort Richardson.
[h] Includes Palmer, Sutton, Wasilla and Willow.
[i] Estimated number of Copper Basin residents.
[j] Includes Bettles, Boundary, Cantwell, Healy, Juneau, and King Salmon.

Source: Division of Commercial Fisheries, 1983.

TABLE 10. RESIDENCES OF COPPER RIVER DIPNET PERMITHOLDERS, 1983.

	Community	# of permits	Percent
	Anchorage[a]	2,431	35.2
	Cantwell	3	-
	Central	1	-
*	Chitina	10	0.1
	Clear/Anderson[b]	21	0.3
*	Copper Center	32	0.5
	Cordova	2	-
	Delta Junction	256	3.7
	Dot Lake	5	0.1
	Fairbanks[c]	2,470	35.7
*	Gakona	3	-
*	Glennallen	24	0.4
	Healy[d]	8	0.1
	Kenai Peninsula[e]	23	0.3
	Military[f]	967	14.0
	Northway	1	-
	Palmer/Wasilla[g]	438	6.3
	Sutton	6	0.1
	Talkeetna[h]	5	0.1
	Tok	16	0.2
	Valdez	150	2.2
	Northern Alaska[i]	13	0.2
	Southeastern Alaska[j]	4	0.1
	Western Alaska[k]	8	0.1
	No Address	7	0.1
	Out of State	7	0.1
		6,911	100.0

*denotes Copper Basin residents

[a] Includes Chugiak, Eagle River, Girdwood, and Indian.
[b] Includes Anderson and Nenana.
[c] Includes College, Ester, North Pole, Murphy Dome, Salcha, and Two Rivers.
[d] Includes McKinley Park.
[e] Includes Anchor Point, Clam Gulch, Cooper Landing, Homer, Kenai Seward, Soldotna, and Sterling.
[f] Includes Eielson AFB, Elmendorf AFB, Ft. Greely, Ft. Richardson, and Fort Wainwright.
[g] Includes Big Lake, Houston, Willow; also some Glenn Highway residents in the Copper Basin.
[h] Includes Peters Creek and Gold Creek.
[i] Includes Barrow, Eureka, Galena, Huslia, Kotzebue, Nome, Selawik, and Venetie.
[j] Includes Juneau, Sitka, and Wrangell.
[k] Includes Atka, Bethel, Chevak, McGrath, Napakiak, Pilot Station, St. Paul, and Unalaska.

Source: Division of Commercial Fisheries, 1983.

which are accessed only over private property or, because of former use, already occupied by Basin residents. At the close of the season, the wheel must be removed from the river and stored, or the owner risks its loss over the winter months.

It is not surprising, then, that many of the non-local fishwheel permit holders operate a fishwheel owned by a friend or relative who is a Basin resident. Others, who own wheels, report that they first learned of their operation and construction at Chitina, where they had gone for dipnetting (Stratton 1982b:17). In contrast, fishing with a dipnet requires a small investment in equipment. The open fishing area is accessible by highway vehicle. Knowledge of this fishery spreads by word of mouth, and many participants decide to travel to Chitina after they learn of a strong run and the likelihood of catching a substantial number of salmon during a short visit to the area.

Other than the Copper Basin itself, the Upper Tanana River region is the only other part of the State which contains communities with more residents who operate Copper River fishwheels than fish with dipnets at Chitina. In 1983, for example, 43 households in the communities of Dot Lake, Northway, and Tok held Copper River fishwheel permits, while 22 fished with dipnets. Thus, about 66 percent of the participants in the Copper River subsistence fishery from these communities fished with fishwheels. This preference is understandable in that Slana, the northernmost portion of the Copper River open by regulation to fishwheel use, is geographically closer to the Upper Tanana area than either the dipnet fishery at Chitina or the gillnet fisheries on the Yukon and lower Tanana Rivers. As stated in the history section, residents of the Upper Tanana area also have historical ties to the upper Copper River and its resources which have been documented since 1885.

Levels of Harvest and Use

In 1983, the average catch of non-resident dipnetters who received the household allocation of 30 salmon and returned their permits was 13.8 fish (Table 7). For the individual permittees allocated 15 salmon, the average catch was 6.4 fish. Non-Basin dipnetters reported a total harvest of 71,552 salmon for 1983 (Figure 7). In the same year non-Basin fishwheel users received allocations ranging from 15 to 500 salmon, based on household size and monetary income. For the returned permits, the average catches were: 12.7 fish for those receiving allocations of 15 salmon; 39.3 fish for those holding permits for 60-160 salmon; 64.2 for permits for 200 salmon; and 136.8 salmon for holders of permits with a 500 fish limit (Table 7). These harvest levels were similar to the average catches by Basin permit holders. The total reported harvest by non-Basin fishwheel users was 16,317 salmon (Figure 7). Thus, of the reported 87,869 Copper River salmon harvested by non-Basin subsistence fishermen, 81 percent was taken with dipnets.

Fishing Periods, Locations, and Harvest Activities

Although dipnetting at Chitina occurs throughout the open season, most of the fishing effort and catch occurs in June and early July (Roberson 1982:12). By regulation, dipnetting is confined to about a five mile stretch of river below the bridge at Chitina. Of an opportunistic sample of 85 dipnetters in 1982, about 20 percent of those interviewed planned to spend a day or less fishing; 33 percent planned to spend one weekend; another 33 percent planned one trip of 3-5 days. The remaining 17 percent planned to make more than one trip to Chitina. Many of those who remained overnight used campers or motor homes (Stratton 1983b:56).

Freezing was used as a method of preservation by 74 percent of those interviewed; 46 percent smoked some of their catch, and 39 percent canned fish (Stratton 1982b:57). For a more detailed description of dipnetting activities, along with several case studies of participants in this fishery, see Stratton (1982b).

Non-Basin fishwheel operators placed their wheels in several locations in 1982, or shared the use of wheels owned by local residents. However, fishwheel use by non-Basin residents was concentrated at two fishwheel "clusters", Chitina and Slana. In 1982, about 20 fishwheels were operated at Chitina, and one third of all Copper River fishwheel permittees fished there. Of these, 70 percent, or 134 permittees, were non-local residents. In fact, 45 percent of all non-local fishwheel users in 1982 fished at Chitina. Chitina is a favored site for these fishwheel users in that it is quite accessible, and there are camping areas available. Also, it is possible that the visibility and general knowledge about fishwheel use at Chitina have also contributed to the popularity of this area for non-locals, many of whom first learned about fishwheel use while dipnetting there (Stratton 1983b:30,32).

The other concentration of fishwheel use of non-Basin residents occurs at Slana, at the northern end of the fishery. About 8 wheels operated there in 1982. Of the 52 permittees fishing at Slana, 37 (71 percent) were non-Basin residents. At least 25 of these permittees (48 percent) were from Tok, 65 miles north of Slana. Residents of Dot Lake also fished at Slana or at Chistochina (Stratton 1983b:47-48).

Characteristics of Non-Basin Participants in Copper River Fisheries

Before proceeding with generalizations about the non-local fishwheel

and dipnet permittees, it is important to note that non-Basin residents who harvest Copper River salmon are a diverse group, who live in many parts of the state and have fished the Copper River for a wide range of years. The following discussion, based largely on interviews with a small non-randomly selected sample, describes characteristics that were typical of this interviewed group. Many of these traits were also characteristic of the a large sample of non-Basin residents holding Copper River subsistence permits surveyed in 1979 (Stickney and Cunningham 1979). However, small, distinctive subgroups of non-Basin fishermen are perhaps not adequately portrayed in this brief summary.

In 1982, research conducted with a sample of dipnet fishermen found that 41 percent were participating in the fishery for the first time (cf. Stickney and Cunningham 1979:8). About 72 percent had fished with dipnets for 5 years or less; and 15 percent had used dipnets in the Copper River for more than 10 years (Figure 14). Many respondents said that since their first involvement in the dipnet fishery, there had been intervening years when they did not participate. Reasons they gave included wage employment, absence from the state, use of another salmon fishery, or adequate supplies of salmon from the past year's harvest. Many dipnetters first learned of the fishery through friends; military respondents mentioned the "grapevine on base" as their source of information (Stratton 1982b:54).

Non-Basin fishwheel users also tended to report a shorter history of involvement in Copper River fisheries than did Basin fishermen (Figure 12). For example, 52 percent of the 1982 sample of non-local fishwheel users had participated in the fishery for five years or less. Fifteen percent had fished with fishwheels for more than 20 years.

An exception to the general pattern of a short history of participation

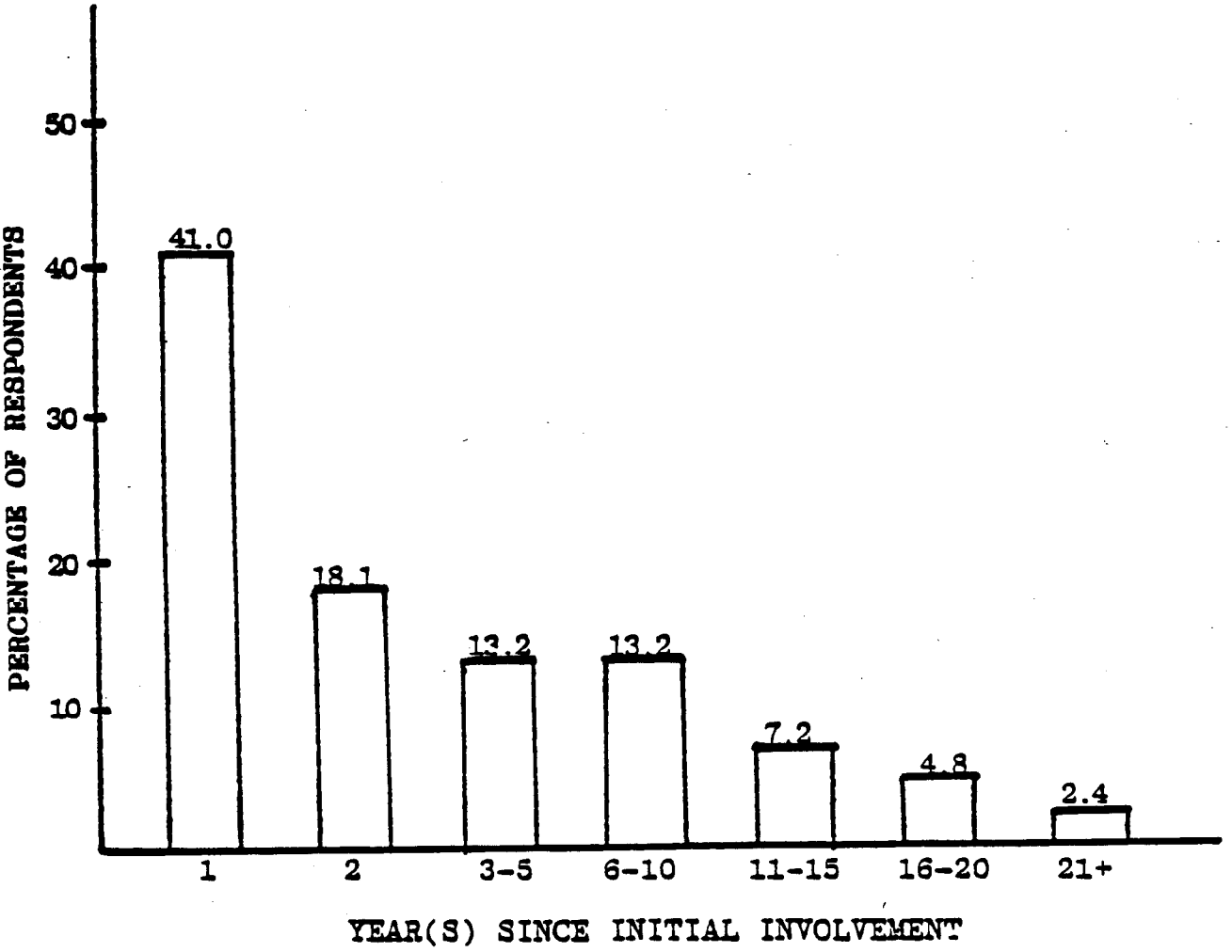


Figure 14. History of initial involvement in the Copper River dipnet fishery, 1982 (n=83).

Source: Stratton 1982b:55.

in the Copper River fishery by residents of non-Basin communities occurs in communities of the Upper Tanana River area. As noted earlier, harvest and use of Copper River salmon by residents of this area can be traced to the 19th century and before. In addition, some former residents of the abandoned village of Batzulnetas now reside in Upper Tanana communities such as Dot Lake. They return annually to the Copper River to fish for salmon either at Slana or Chistochina (Stratton 1982b:48; Martin 1983:80-85).

In 1982, relatively high percentages of the non-local dipnet and fishwheel samples reported using other wild resources (Figures 13 and 15). Other than their harvest of Copper River salmon, most non-local participants in these fisheries took other resources outside the Copper Basin (cf. Stickney and Cunningham 1979:16). Over 37 percent of these dipnetters and 44 percent of these fishwheel users reported participation in other salmon fisheries (cf. Stickney and Cunningham 1979:13). In 1979, non-local Copper River fishermen reported more full-time wage employment, more employed household members, and higher monetary incomes than did Basin residents (Stickney and Cunningham 1979:10-11).

CONCLUSIONS

Beginning in the 1890s, the Copper Basin has served as a transportation corridor. Rapid spurts of economic growth have been followed by periods of slack. Today, the monetary sector of the economy is largely confined to government services, tourism, and construction. Wage employment is predominately seasonal, and mean household incomes are low in comparison with those of urban centers in Alaska. A common economic pattern of many households combines seasonal or part-time wage employment with the harvesting of local fish and game resources.

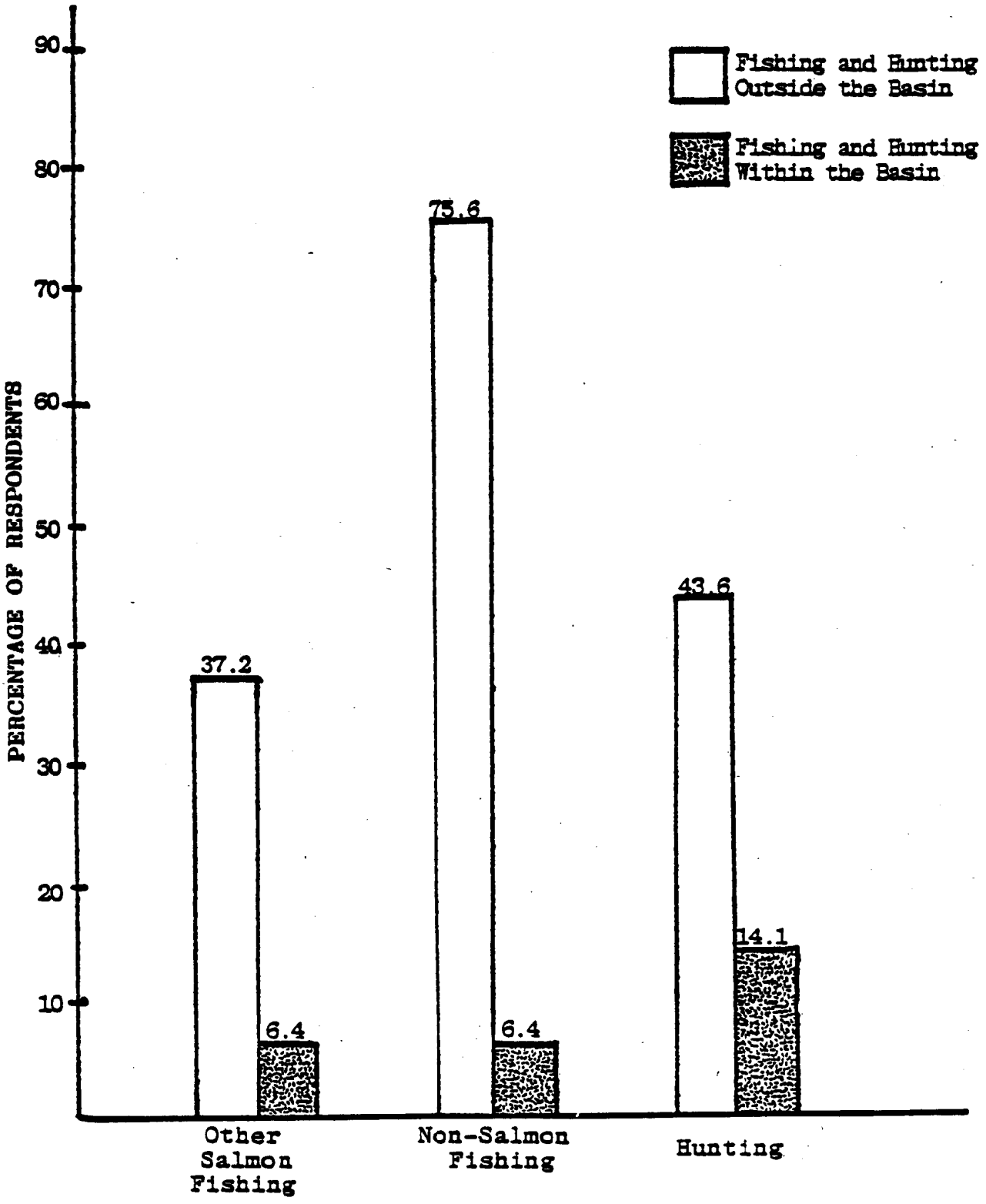


Figure 15. Resource harvesting activities and areas, non-local dipnetters, 1982 (n=78).*

* Categories are not mutually exclusive.

Source: Stratton 1982b:61.

The region's population is diverse, with many individuals and families having moved into the region in the last two decades. However, a substantial portion of the Copper Basin's population is composed of long-term or life-long residents. They have a lengthy history of harvesting and using the region's wild resources.

The highways connecting the Copper Basin to other parts of Alaska provide access to the Basin's fish and wildlife resources for residents of the state's growing urban centers. Increased access has been associated with increased use of the Basin's resources. A consequence of this increasing harvest and use has been a tightening of many fish and game regulations. But salmon, because of their relative abundance, continue to be harvested in large numbers by both local and non-local residents. In recent years, a tremendous growth in the number of non-local subsistence permittees has been largely responsible for a rapid increase in the harvest of salmon in the Copper River. This level of harvest was not anticipated by the current management plan for the river. Further regulatory changes have been proposed in response to this increasing harvest.

Permit data and the results of research by the Division of Subsistence during the past five years can be used to describe the patterns of use of Copper River salmon by both Basin residents and non-Basin residents. Since before statehood, most Basin residents who harvested Copper River salmon have used fishwheels. In 1982, over 50 percent of a sample of Basin fishwheel operators reported that they had used this gear type for more than 20 years. In 1983, as many as 75 percent of the households of communities near the River reported that they engaged in this activity. They operated their wheels regularly at traditional locations. The use of wheels and fishing sites and the salmon themselves were shared among friends and, especially, relatives. Harvests were substantial, and much

of the catch was preserved by smoking and drying.

Salmon comprised a large portion of many Basin households' supplies of fish and game. Also, survey results in 1982 found that most of the fishing and hunting by Basin households took place within the Basin. Few Basin households participated in salmon fisheries other than that of the Copper River.

Permit data demonstrate that most non-Basin participants in the Copper River subsistence fishery use dipnets. In 1982, a survey of a non-random sample of these dipnetters found that most have participated in the fishery for less than five years. About 4 percent of the non-Basin permittees operated fishwheels in 1983. Only 15 percent of the non-Basin permittees surveyed had a history of involvement in the fishery of more than 20 years.

Non-Basin participants in these fisheries reported harvest of other fish and game resources, but largely harvested outside the Basin. In addition, over 37 percent of the non-Basin dipnetters and 44 percent of the non-Basin fishwheel users surveyed in 1982 used salmon fisheries outside the Basin. Surveyed non-Basin residents were more likely than Basin residents to hold full-time, year round employment; they generally reported higher monetary incomes than did local resource users. However, several communities within the upper Tanana region, which have historic ties to the Copper River fishery, differ from the broad patterns of other non-Basin residents who use Copper River salmon.

In summary, research has shown that notable differences exist between Basin residents and most non-Basin residents in terms of use of wild resources. The pattern of resource use by Basin residents is molded in part by the socioeconomic systems of Basin communities. Fish and game harvests remain central to the economies and way of life of many Copper Basin households and communities, and Copper River salmon play a critical role in these use patterns. Salmon have remained important to Basin

residents because of their abundant numbers, the predictability of the runs, and the accessiblity of good fishing sites, as well as the long history of harvest and use of salmon in Basin communities.

REFERENCES CITED

de Laguna, Frederica and Catharine McClellan
1981 Ahtna. In Handbook of North American Indians, Volume 6: Subarctic, June Helm, ed., pp. 641-663. Washington: Smithsonian Institution.

Division of Commercial Fisheries
1983 Unpublished permit data. Anchorage.

Guedon, Marie-Francoise
1974 People of Tetlin, Why are you Singing? National Museum of Man Mercury Series No. 9. Ottawa: National Museums of Canada.

Hanable, William S.
1982 Alaska's Copper River: The 18th and 19th Century. Anchorage: The Alaska Historical Society.

Logsdon, C.L. et al
1977 Copper River - Wrangells: Socioeconomic Overview. Fairbanks: Institute of Social and Economic Research, University of Alaska.

Martin, Gayle
1983 Use of Natural Resources by the Residents of Dot Lake, Alaska. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 19. Juneau.

McKennan, Robert
1959 The Upper Tanana Indians. Yale University Publications in Anthropology No. 55. New Haven: Yale University Press.

Mills, Dave, Gabriel George, Matthew Kookesh, and Valerie Sumida
1984 Salmon Use by the Residents of the Chilkat and Chilkoot River Drainages, 1983. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 95. Juneau.

Reckord, Holly
1983 That's the Way We Live: Subsistence in the Wrangell-St. Elias Park and Preserve. Occasional Paper No. 34, Cooperative Park Studies Unit, University of Alaska, Fairbanks.

Randall, Richard, Peter Fridgen, Michael McCurdy, and Kenneth Roberson
1983 Prince William Sound Area Annual Finfish Management Report 1982. Alaska Department of Fish and Game, Division of Commercial Fisheries. Cordova.

Roberson, Ken
1983 Copper River Subsistence Salmon Fishery Management and Research, December 1983. Alaska Department of Fish and Game, Division of Commercial Fisheries, Glennallen.

Selkregg, Lidia
1974 Alaska Regional Profiles: Southcentral Region. Fairbanks: University of Alaska Arctic Environment Information and Data Center.

Stanek, Ron
1981 Nelchina Caribou User Group Assessment. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 28. Juneau.

Stickney, Alice and Paul Cunningham
1979 Report on the Survey of Permitholders in the Copper River Subsistence Fishery 1979. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 36. Juneau.

Stratton, Lee
1982a Patterns of Use of the Nelchina Caribou Herd. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 38. Juneau.

1982b The Dipnet and Fishwheel Fisheries of the Copper River, 1982. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 37. Juneau.

1983 Copper Basin Caribou Use: A Research Update. Department of Fish and Game, Division of Subsistence, Technical Paper No. 75. Juneau.

Stratton, Lee and Susan Georgette
1984 Unpublished manuscript. Alaska Department of Fish and Game, Division of Subsistence, Anchorage.

Workman, William
1976 Ahtna Archeology: A Preliminary Statement. Paper Presented at the 9th Annual Conference of the University of Calgary Archaeology Association.

(c) For purposes of this section a community is generally considered to be several households of full time residents who all reside in a specific geographic area because of common interests.

Authority: AS 16.05.251(b)

ARTICLE 12.
PRINCE WILLIAM SOUND AREA.

5 AAC 01.600. DESCRIPTION OF THE PRINCE WILLIAM SOUND AREA. The Prince William Sound area includes all waters of Alaska between the longitude of Cape Fairfield and the longitude of Cape Suckling.

Authority: AS 16.05.251(a) (2) and (b)

5 AAC 01.605. DESCRIPTION OF DISTRICTS AND SUBDISTRICTS. The Upper Copper River district consists of all waters of the main Copper River from the confluence of the Slana River downstream to an east-west line crossing the Copper River at the confluence of the unnamed stream located approximately 1-1/4 mile below the U.S.G.S. gauging cable across the Copper River, as designated by Alaska Department of Fish and Game regulatory markers:

(1) the Chitina subdistrict consists of all waters of the main Copper River from the downstream edge of the Chitina-McCarthy Road Bridge downstream to an east-west line crossing the Copper River at the confluence of the unnamed stream located approximately 1-1/4 mile below the U.S.G.S. gauging cable across the Copper River, as designated by the Alaska Department of Fish and Game regulatory markers;

(2) the Glennallen subdistrict consists of all waters of the main Copper River from the confluence of the Slana River downstream to the downstream edge of the Chitina-McCarthy Road Bridge.

Authority: AS 16.05.251(a) (2) and (b)

5 AAC 01.610. FISHING SEASONS. (a) Unless restricted in this section and sec. 625 of this chapter, or unless restricted under the terms of a subsistence fishing permit, fish may be taken at any time in the Prince William Sound area.

(b) In the Chitina and Glennallen subdistricts of the Upper Copper River district, salmon may only be taken from June 1 through September 30.

(c) Repealed / /83.

(d) Herrring spawn on kelp may be taken only during the open commercial herring spawn on kelp season.

Authority: AS 16.05.251

5 AAC 01.620. LAWFUL GEAR AND GEAR SPECIFICATIONS. (a) Fish may be taken by gear listed in sec. 10(a) of this chapter unless restricted in this section or under the terms of a subsistence fishing permit.

(b) Salmon may only be taken by the following types of gear:

(1) in the Glennallen subdistrict by fishwheel;

(2) in the Chitina subdistrict by dip net;

(3) in saltwater by gill net and seine.

(c) Fishwheels used for subsistence fishing may not be rented, leased, or otherwise used for personal gain. Subsistence fishwheels must be removed from the water at the end of the permit period. Each permittee may operate only one fishwheel at any one time. No person may set or operate a fishwheel within 75 feet of another fishwheel. No fishwheel may have more than two baskets.

(d) Halibut may be taken only by a single hand-held line with not more than two hooks attached to it.

(e) The permit holder (permittee) must personally operate the fishwheel or dip net. A subsistence fishwheel or dip net permit may not be loaned or transferred except as permitted under sec. 15(8) of this chapter.

(f) Herring spawn on kelp may be taken only by a hand-held unpowered blade-cutting device. Kelp plant blades must be cut at least four inches above the stipe (stem). The provisions of this subsection do not apply to *Fucus* species.

Authority: AS 16.05.251

5 AAC 01.625. WATERS CLOSED TO SUBSISTENCE FISHING. (a) All tributaries of the Copper River and the main Copper River upstream of the Slana River confluence and downstream of an east-west line crossing the Copper River at the confluence of the unnamed stream located approximately 1-1/4 mile below the U.S.G.S. gauging cable across the Copper River as designated by ADF&G regulatory markers are closed to the taking of salmon.

(b) Crosswind Lake is closed to all subsistence fishing.

(c) Salmon may not be taken in any area closed to commercial salmon fishing unless permitted in secs. 610-645 of this chapter.

Authority: AS 16.05.251(a) (2), (7), (10) and (b)

5 AAC 01.630. SUBSISTENCE FISHING PERMITS. (a) Except as provided in this section, fish other than salmon and freshwater fish species may be taken for subsistence purposes without a subsistence fishing permit.

(b) Salmon and freshwater fish species may be taken only under authority of a subsistence fishing permit. Only one subsistence salmon permit may be issued for fishing in either or both of the Glennallen and Chitina subdistricts. The total annual possession limit for each permit, unless modified by 5 AAC 01.647, is as follows:

(1) dip nets: Chitina subdistrict;

(A) 15 salmon for a permit issued to an individual not a member of a household under (1)(B) of this subsection;

(B) 30 salmon for a permit issued to the head of a household,

(2) fishwheels: Glennallen subdistrict;

(A) if the gross family income for the previous year is more than $12,000;

(i) 15 salmon for a household with one person;

(ii) 60 salmon for a household with two persons;

(iii) 10 salmon for each additional person in a household over those specified in (A) (ii) of this subparagraph;

(B) if the gross family income for the previous year is less than $12,000;

(i) 200 salmon for a permit issued to an individual not a member of a household under (2)(B)(ii) of this subsection;

(ii) 500 salmon for a permit issued to the head of a household.

(c) No commercial fisherman may hold a subsistence fishing permit during the commercial salmon net fishing season in salmon net registration area E.

(d) Only one subsistence fishing permit will be issued to each household per year.

Authority: AS 16.05.251(a) (2), (3), (4), (7), (10), (12) and (b)

5 AAC 01.645. SUBSISTENCE BAG AND POSSESSION LIMITS. (a) Possession limits for salmon in the Chitina and Glennallen subdistricts are as described in sec. 630(b) of this chapter except when modified by sec. 647 of this chapter.

(b) In locations open to commercial salmon fishing and in conformance with commercial salmon fishing regulations, the annual subsistence salmon limit is as follows:

(1) 15 salmon for a household of one person;

(2) 30 salmon for a household of two persons;

(3) 10 salmon for each additional person in a household over those specified in (2) of this subsection;

(4) no more than five king salmon may be taken per permit.

(c) The daily bag and possession limit for halibut is two. No person may possess sport taken and subsistence taken halibut on the same day.

Authority: AS 16.05.251(a) (2), (3), (7), (10), and (b)

5 AAC 01.647. COPPER RIVER SUBSISTENCE SALMON MANAGEMENT PLAN. (a) The purpose of this plan is to ensure an adequate escapement of salmon into the Copper River system and to provide management guidelines for equitable allocation of the harvestable resource.

(b) The following are directives pertaining to the management of Copper River System salmon:

(1) this policy governs only those salmon which pass the department sonar counters located at the Million Dollar Bridge;

(2) the department will manage the Copper River commercial fishery to attain a total escapement into the Copper River of 350,000 salmon to ensure that an adequate escapement reaches the spawning grounds and provide for a sport and subsistence harvest of any surplus. The desired weekly escapements are shown in Table 1;

(3) the department will manage the subsistence fishery on the Copper River consistent with AS 16.05.251(b) and to ensure adequate escapement by restricting the subsistence harvest to the levels shown in Table 2 based on escapement as determined by sonar evaluations and any other appropriate means;

(4) the department will prepare application forms to obtain information necessary to determine what persons are qualified to receive subsistence permits described in (c) of this section.

PRINCE WILLIAM SOUND AREA

TABLE 1. EXPECTED WEEKLY ESCAPEMENT BY WEEK BASED UPON PERCENT OF AVERAGE WEEKLY SOCKEYE SALMON CATCH FROM THE COPPER RIVER DISTRICT TO PRODUCE 350,000 DESIRED ESCAPEMENT AND 250,000 MINIMUM ESCAPEMENT

Dates	Week	Average Catch	Years	Percent	Cumulative Percent	Minimum Escapement	Cumulative Escapement	Expected Average Escapement	Cumulative Expected Average Escapement	Minimum Expected Seven Escapement (Cumulative)	Average Expected Seven Escapement (Cumulative)
May 16-20	20	32,662	(9)	6.7	6.7	11,730	11,730	16,660	16,660	*	*
21-27	21	103,866	(15)	14.0	19.5	37,000	68,730	36,790	68,230	11,730	16,660
28- 3	22	144,633	(16)	20.9	40.4	58,230	104,000	73,140	141,370	68,230	68,230
June 4-10	23	132,303	(16)	19.1	59.5	47,630	144,630	66,040	208,110	104,000	141,370
11-17	24	76,753	(16)	11.1	70.6	27,230	174,460	38,040	247,030	140,630	208,110
18-24	25	61,680	(16)	8.8	79.3	22,230	200,830	31,240	278,280	174,460	247,030
25- 1	26	48,830	(17)	7.0	86.5	17,500	226,130	24,490	302,680	200,830	278,190
July 2- 8	27	33,367	(16)	4.8	91.3	12,000	238,130	16,790	319,470	226,130	302,680
9-15	28	27,034	(16)	3.9	95.2	9,730	247,900	13,640	333,110	238,130	319,470
16-22	29	16,615	(15)	2.4	97.6	6,000	253,900	8,390	341,500	247,900	333,110
23-29	30	10,439	(15)	1.5	99.1	3,730	257,630	5,240	346,740	253,900	341,500
30- 5	31	6,660	(17)	0.7	99.8	1,730	259,360	3,440	350,180	257,630	346,740
Aug. 6-12	32	1,626	(17)	0.2	100.0	300	259,900	600	350,870	259,400	350,180
13-19	33	200	(13)	0.06		100	250,000	130	250,000	259,900	350,870
										250,000	
AVERAGE		503,364				250,000		350,000*	350,000**		350,000***

* Escapement applied.
** 50,000 - 90,000 additional spawners required for Copper River Delta spawning areas.
*** Actual escapement requires subtraction of subsistence and sport fishery take.

TABLE 2. COPPER RIVER SUBSISTENCE FISHERY ALLOCATION PLAN

Projected Escapement	Allowable Harvest	Permittees 1/	Level of Participation
Less than 150,000	3-5,000	Class A 2/	3 days/week
150-300,000	8-10,000	Class A Class B and C	3 days/week 2 days/week (Saturday-Sunday)
300-350,000	11-15,000	Class A Class B	3 days/week 2 days/week (Saturday-Sunday)
350-500,000	18-20,000	Class A Class B	3 days/week 3 days/week (Friday-Sunday)
500-550,000	23-25,000	Class A Class B	3 days/week 5 days/week (Thursday-Sunday)
More than 550,000		Unrestricted	

1/ No distinction is drawn to gear type
2/ Class A permits are estimated to be approximately 25-30 permits.

(c) Subsistence permits may be issued to persons who show the greatest level of need for subsistence salmon on the basis of customary and direct dependence upon the resource as the mainstay of one's livelihood, local residency and availability of alternative resources. The criteria for the various classes of subsistence permits are as follows:

(1) a Class A permit may be issued to any person who satisfies all the following criteria:

(A) 55 years of age or older;

(B) annual income of no more than the amount specified in sec. 630(b)(2)(B) of this chapter;

(C) use of a fishwheel to take subsistence fish in the Copper River during ten of the last twelve years; and

PRINCE WILLIAM SOUND AREA

(D) a Copper River Basin resident, defined for the purposes of this section as an Alaska resident as defined in AS 16.05.940(14), who for the preceding 12 consecutive months has maintained his place of residence and voting residence (if applicable) in Game Management Units 11, 13-A, 13-B, 13-C, and 13-D as described in 5 AAC 90.010 and the Jacksina River drainage to its confluence with the Nabesna River and who does not maintain a permanent residence or voting residence elsewhere;

(2) a Class B permit may be issued to any person who qualifies as a Copper River Basin resident under (c)(1)(D) of this section;

(3) a Class C permit may be issued to any Alaska resident who applies to and is determined by the commissioner or his authorized delegate as a person who satisfies all the following criteria:

(A) a household size of three persons or more;

(B) a household having one or more persons over 55 years old;

(C) a household having no more than one full time employed person;

(D) participation in the Copper River subsistence fishery during eight of the last 10 years; and

(E) an annual household income of not more than $10,000;

(4) a Class D permit may be issued to any Alaska resident as defined by AS 16.05.940(14).

(d) Permits may be issued or modified as follows:

(1) when escapements of less than 300,000 are projected, the face value (number of fish allowed per permit) of permits as described in sec. 630 of this chapter may be reduced to ensure that all permittees will be allowed to fish;

(2) when escapement projections improve significantly during the season, face values of permits may be increased up to full value as described in sec. 630 of this chapter;

(3) permits must be returned to the department no later than October 31 or a permit for the following year may be denied as provided in sec. 015(c) of this chapter;

(4) during closed fishing periods, the department's Chitina permit issuing station may be closed or operated at reduced hours to reduce manpower costs.

(e) When sonar counts prior to June 1 indicate less than 250,000 projected escapement, the subsistence season opening may be delayed up to 10 days to allow more accurate assessment of run strength and confirm appropriate allowable harvest allocations.

(f) When the Copper River dip net subsistence fishery is closed to the taking of

sockeye salmon, it may be opened to the taking of chinook salmon between June 1 through July 10, up to seven days per week.

(g) If the Copper River subsistence fishery is closed or restricted because of an inadequate escapement of sockeye and chinook salmon, the fishery may be reopened September 1 for the taking of coho salmon, which constitute the majority of the salmon at that time. By September 1 the escapement of sockeye and chinook salmon has essentially passed through the area. Also, by this time the subsistence fishery effort has decreased and consitutes less than five percent of the total effort on the fishery.

(h) When projected sockeye salmon escapements to the upper Copper River fall below 250,000, spoit fishing for sockeye salmon will be closed.

Authority: AS 16.05.060
AS 16.05.251(a) (2), (3), (4), (7), (11), (12) and (b)

ARTICLE 13.
YAKUTAT AREA.

5 AAC 01.650. DESCRIPTION OF THE YAKUTAT AREA. The Yakutat area includes all waters of Alaska between the longitude of Cape Suckling and the longitude of Cape Fairweather.

Authority: AS 16.05.251(a) (2) and (b)

5 AAC 01.660. FISHING SEASONS. (a) Unless restricted in this section and sec. 675 of this chapter, or unless restricted under the terms of a subsistence fishing permit, fish may be taken at any time in the Yakutat area.

(b) Salmon may not be taken during the period commencing 48 hours before an opening until 48 hours after the closure of an open commercial salmon net fishing season. This applies to each river or bay fishery individually.

(c) Repealed / /83.

Authority: AS 16.05.251

5 AAC 01.670. LAWFUL GEAR AND GEAR SPECIFICATIONS. (a) Fish may be taken by gear listed in sec. 10(a) of this chapter, unless restricted in this section or under the terms of a subsistence fishing permit.

(b) Halibut may be taken only by a single hand held line with not more than two hooks attached to it.

Authority: AS 16.05.251(a) (2), (4), (7), (12) and (b)

5 AAC 01.680. SUBSISTENCE FISHING PERMITS. Salmon, trout and char may only be taken under authority of a subsistence fishing permit.

Authority: AS 16.05.251(a) (2), (7), (10), (12) and (b)

5 AAC 01.690. MARKING OF SUBSISTENCE TAKEN SALMON. Subsistence fishermen must remove the dorsal fin from subsistence caught salmon when taken.

Authority: AS 16.05.251(a) (2), (4), (5), (7) and(b)

5 AAC 01.695. SUBSISTENCE BAG AND POSSESSION LIMITS. The daily bag and possession limit for halibut is two. No person may possess sport taken and subsistence taken halibut on the same day.

Authority: AS 16.05.251(a) (3), (7), (10) and (b)

ARTICLE 14.
SOUTHEASTERN ALASKA AREA.

5 AAC 01.700. DESCRIPTION OF THE SOUTHEASTERN ALASKA AREA. The Southeastern Alaska area includes all waters between a line projecting southwest from the westernmost tip of Cape Fairweather and Dixon Entrance.

Authority: AS 16.05.251(a) (2) and (b)

5 AAC 01.705. DESCRIPTION OF DISTRICTS AND SECTIONS. Districts and sections are as described in 5 AAC 33.200.

Authority: AS 16.05.251(a) (2) and (b)

5 AAC 01.710. FISHING SEASONS. (a) Unless restricted in this section, 5 AAC 01.725, or under the terms of a subsistence fishing permit, fish may be taken in the Southeastern Alaska area at any time.

(b) Repealed / /83.

(c) Herring may be taken at any time except that vessels licensed as commercial fishing vessels may not be used to take herring for personal use in any district that is open for commercial herring fishing for 72 hours before, during and 72 hours after any open commercial herring fishing period for that district when the vessel has aboard it any person holding a Southeastern Alaska area winter bait herring or herring sac roe interim-use or entry permit.

(d) Coho salmon may be taken from Salt Lake and Mitchell Bay from August 1 through October 31.

Authority: AS 16.05.251

5 AAC 01.720. LAWFUL GEAR AND GEAR SPECIFICATIONS. Fish may be 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:

(1) in district 13, Redoubt Bay, gill net or seine gear may not be used to take salmon in any waters of the bay closed to commercial salmon fishing;

(2) set gill nets may not be used to take salmon except in the mainstream and side channels, but not the tributaries, of the Chilkat River from the latitude of Zimovia Point to one mile upstream of Wells Bridge;

(3) halibut may be taken only by a single handheld line with not more than two hooks attached to it;

(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).

Authority: AS 16.05.251(a) (2), (4), (7) and (b)