

Volume 21

Study G-I-Q-A

STATE OF ALASKA

Jay S. Hammond, Governor

Annual Performance Report for

HARVEST ESTIMATES OF SELECTED FISHERIES
THROUGHOUT SOUTHEAST ALASKA

by

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TABLE OF CONTENTS

STUDY NO. G-I	INVENTORY AND CATALOGING	Page
Job No. G-I-Q-A	Harvest Estimates of Selected Fisheries Throughout Southeast Alaska By: Donald L. Siedelman	
Abstract		1
Objectives		1
Background		2
Recommendations		2
Management		2
Techniques Used		2
Findings		4
Chinook Salmon Shakers		6
Ketchikan King Salmon Derby		8
Seasonal Coho Salmon		15
Literature Cited		15

LIST OF FIGURES

Figure 1.	The Ketchikan marine recreational fishing area, excluding the Yes Bay and Bell Island fishing areas . . .	3
Figure 2.	Angler effort expended on Ketchikan King Salmon Derby Days 1964-1979	10
Figure 3.	King Salmon Catch Per Unit of Effort by Ketchikan Derby Fishermen 1960-1979	12
Figure 4.	King Salmon Harvest during Ketchikan King Salmon Derby Days 1964-1979	13

LIST OF TABLES

Table 1.	Bi-Weekly Effort, Catch and CPUE by Species for the Ketchikan Marine Creel Census Program during 1979	5
Table 2.	Comparative Methods Used for Computing CPUE for the Ketchikan Marine Creel Census Program during 1979 . .	7
Table 3.	Chinook Salmon Summary of Creel Census Data from Ketchikan Special Derby Days, 1960-1979	9
Table 4.	Analysis of Trends of Sport Caught Coho Salmon from the Ketchikan Marine Creel Census Program 1967-1979	14

Job No. G-I-Q-B Harvest Estimates of Selected Fisheries
Throughout Southeast Alaska
By: Mark W. Schwan

Abstract		16
Juneau Area - Marine		16
Juneau - Roadside		18
Haines Area Sport Fishery		18

RESEARCH PROJECT SEGMENT

State: ALASKA Name: Sport Fish Investigations
of Alaska

Project No.: F-9-12

Study No.: G-I-Q Study Title: INVENTORY & CATALOGING

Job No.: G-I-Q-A Job Title: Harvest Estimates of
Selected Fisheries
Throughout Southeast Alaska

Period Covered: July 1, 1979 to June 30, 1980

ABSTRACT

The Ketchikan Marine Harvest Program was conducted May 15 through August 31, 1979. Technicians interviewed 6,095 anglers who fished 35,164 hours to harvest 585 chinook, 266 coho, 858 pink, 12 chum and 1 sockeye salmon. Also caught were 386 halibut, 51 trout and char and 2,450 fish of other species.

The Ketchikan harvest data were weighted and expanded by applying the State Wide Harvest Program's man days (22,841) to the Ketchikan area average derby angler trip (6.74 hours) and seasonal creel census (5.29 hours). The estimated angler effort expended in the Ketchikan area was 126,956 hours to catch 6,120 salmon. An estimated 2,006 chinook, 1,016 coho and 3,098 pink salmon were harvested. The estimated harvest for "shaker" chinook salmon was 7,744, halibut was 1,397, trout and char were 190, and 8,887 fish of other species.

The Ketchikan King Salmon Derby (May 26-28, June 2,3,9 and 10) angler effort was estimated at 28,480 hours from 4,108 anglers who harvested 627 chinook salmon.

The coho salmon CPUE of .008 fish per hour was amongst the lowest on record and resulted in an expanded harvest of only 1,016.

OBJECTIVES

1. Determine the saltwater boating angler effort and catch in the Ketchikan area sport fishery.

BACKGROUND

Increased angler pressure in the saltwater areas surrounding Ketchikan has been a center of user group conflicts and allocation problems between commercial and sport fishermen. These problems, combined with low stock levels have facilitated continual sport fishing changes in salmon bag and size limits, closed waters and fishing seasons. Hatchery production to date has not been able to meet the increased recreational requirements.

The Ketchikan Marine Creel Census Program is a continuing program which commenced in 1960. These programs have been periodically conducted to monitor effects of regulatory and harvest level changes and harvest rates.

RECOMMENDATIONS

To continue the Ketchikan Marine Creel Census Program and to develop a data base for determining long term sport fishery trends.

Expand the Marine Creel Census Program by approximately 15 days from August 30 to September 15 to determine the total coho salmon harvest and angler effort.

Management

The Ketchikan saltwater fishery should be continued under the present regulatory measures.

The marine harvest program should be expanded to include monitoring of boating ramps and docks south of Ketchikan to obtain angler use data from the Boca de Quadra and Smeaton Bay sport fishing areas. Collecting angler harvest information from these ramps for these areas will provide base line data needed to answer potential fishery conflicts in relationship to the proposed molybdenum mine and mining activities.

TECHNIQUES USED

The Ketchikan Marine Creel Census was conducted from May 15 through August 31, 1979 (Figure 1). During each week, 3 weekdays and both weekend days were sampled.

Anglers were interviewed as they returned to Clover Pass Resort, Bar Harbor, and Knudson Cove boating facilities. As in previous studies, each party contacted was interviewed to determine the number of anglers aboard, the time spent fishing, the number and species of fish kept, and whether or not the fish were tagged. In addition, anglers were interviewed to determine the numbers of chinook salmon less than 711 mm (28 inches), "shakers", which were caught and released. The estimated conditions of the released fish were also noted.

Angler's fishing effort was divided between salmon and bottom fishing. Each day was sampled on one of two chosen shifts randomly selected for weekdays. Two of the 3 weekdays would be sampled in the evening and one in

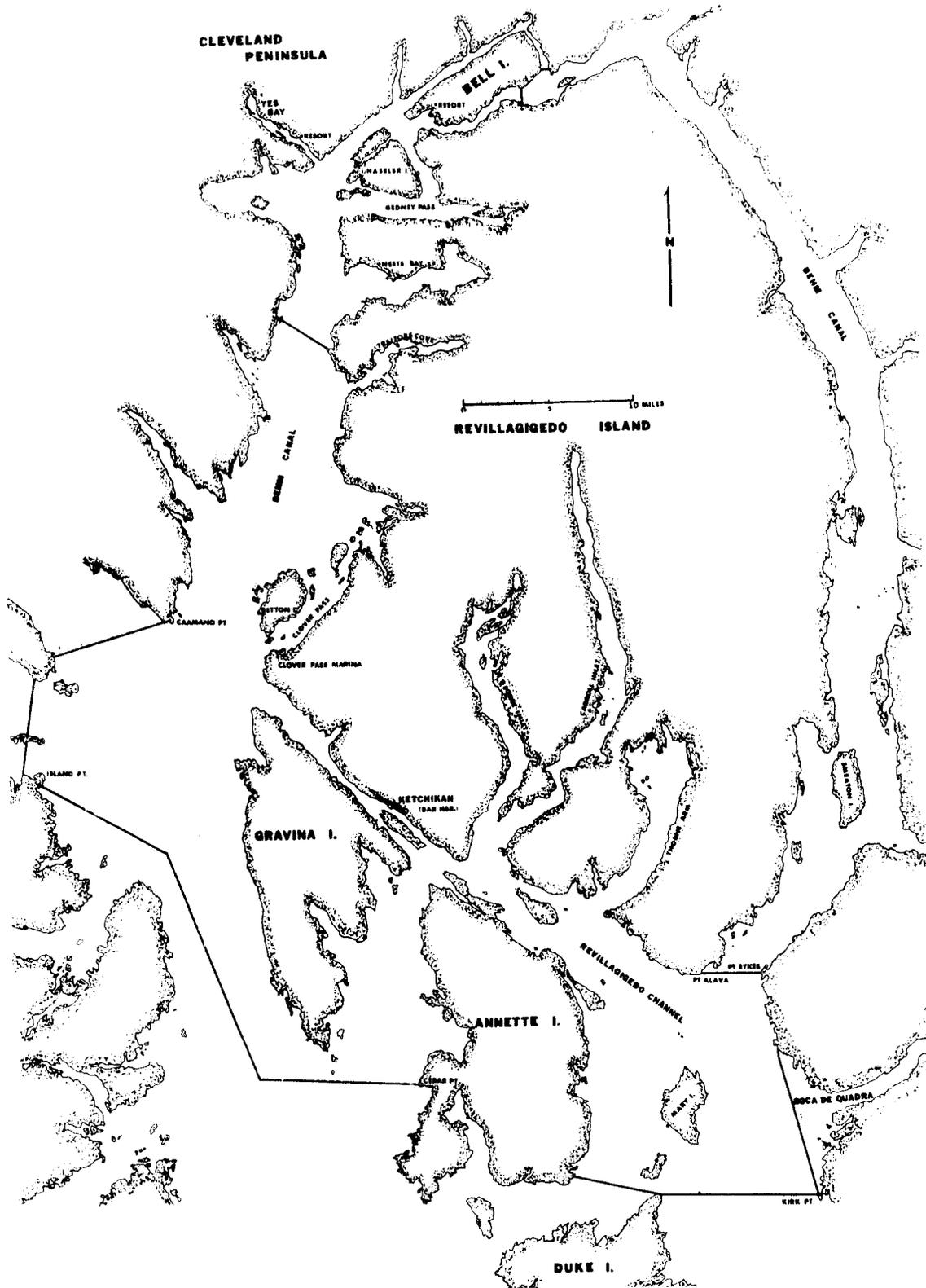


Figure 1. The Ketchikan marine recreational fishing area, excluding the Yes Bay and Bell Island fishing areas during 1979.

the morning. Both weekend days were sampled; 1 day covering a morning period and 1 day in the evening time frame.

The shifts were adjusted to compensate for changing daylight hours and budgetary considerations. Shift changes by date were as follows:

<u>DATES</u>	<u>MORNING SHIFT</u>	<u>EVENING SHIFT</u>
May 15 - June 30	0800 - 1400	1400 - 2300
July 1 - July 30	0930 - 1400	1400 - 2330
Aug. 1 - Aug. 12	0900 - 1400	1400 - 2300
Aug. 13 - Aug. 31	0830 - 1400	1400 - 2230

Standard statistical sampling estimation techniques as found in Cochran 1977 were used to compute the CPUE from the Ketchikan Marine Creel Census Program. Estimation techniques as described in Mills 1979 were used to compute total effort.

A greater effort to sample during the Ketchikan King Salmon Special Derby Days was made, as in previous years. Technicians sampled from 0800 - 2200 on May 26, 27; June 2, 9 and 0800 - 2300 hours on May 28; June 3 and 10.

Scale and gonad samples were taken from each chinook salmon examined. Both testes lobes were collected from male chinook salmon, and a sample of each female chinook salmon egg skein was collected. These samples, along with physical measurement data, were forwarded to the chinook salmon studies project leader for his information.

An estimate of the total catch and effort for the Ketchikan area was not made in 1979 by the same method used in previous years. The total seasonal Ketchikan marine salmon harvest was therefore estimated by multi-plying the estimated Ketchikan Marine Harvest Study seasonal CPUE times the State Wide Harvest Questionnaire seasonal angler effort.

The total estimated angler hours expended in the Ketchikan area was determined by applying the mean total angler hours expended by each angler in the Ketchikan Marine Harvest Study Program to the State Wide Harvest Study Questionnaire total angler days.

FINDINGS

Technicians interviewed 6,095 anglers who reported fishing 35,164 hours. The angler harvest was 585 chinook, 266 coho, 858 pinks, 12 chums, 1 sock-eye salmon, 386 halibut, 51 trout and char, and 2,450 fish of miscellaneous species (Table 1).

The total Ketchikan saltwater boat effort was weighted and expanded by applying the State Wide Harvest Program man days (22,841) for the Ketchikan area to the Ketchikan Saltwater Creel Census program average angler trip for Derby days (6.74 hours) and seasonal creel census days (5.29 hours). The estimated angler effort expended in the Ketchikan area was 126,956 hours to catch 6,120 salmon. An estimated 2,006 chinook, 1,016 coho and

Table 1. Bi-Weekly Effort, Catch and CPUE by Species for the Ketchikan Marine Creel Census Program during 1979.

PERIOD	Bi-Weekly Periods									Total
	1* 5/15-5/26	2* 5/27-6/9	3* 6/10-6/23	*** Derby	4 6/24-7/7	5 7/8-7/21	6 7/22-8/4	7 8/5-8/18	8 8/19-8/31	
Boats	114	150	248	868	272	286	289	259	224	2,713
Anglers	240	324	544	2,019	596	679	656	591	446	6,095
Total Hours	1,131	1,630	2,973	13,603	3,544	3,338	2,998	3,217	2,730	35,164
Salmon Hours	1,018	1,449	2,419	13,024	2,811	2,601	2,404	2,359	1,653	29,737
Bottom Hours	113	181	554	579	733	737	594	858	1,077	5,427
Total Salmon**	28	54	73	304	129	236	484	221	164	1,698
CPUE	.025	.033	.025	.022	.036	.071	.161	.069	.060	.048
Chinook	28	54	67	302	55	21	30	9	15	585
CPUE	.025	.033	.023	.022	.016	.006	.010	.003	.005	.017
Shakers	91	195	204	1,123	122	64	84	78	184	2,145
CPUE	.080	.120	.069	.083	.034	.019	.028	.024	.067	.061
Coho	-0-	-0-	5	2	18	37	64	54	86	266
CPUE	-	-	.002	.000	.005	.011	.021	.017	.032	.008
Pinks	-0-	-0-	1	-0-	55	176	413	149	64	858
CPUE	-	-	-	-	.016	.053	.138	.046	.023	.024
Chums	0	0	0	0	1	1	5	0	5	12
CPUE	-	-	-	-	.000	.000	.002	-	.002	.000
Reds	0	0	0	0	0	0	0	0	1	1
CPUE	-	-	-	-	-	-	-	-	.000	.000
Other	63	109	233	327	354	342	366	345	311	2,450
CPUE	.056	.067	.078	.024	.100	.102	.122	.107	.114	.070
Halibut	4	12	44	66	45	47	61	46	61	386
CPUE	.004	.007	.015	.005	.013	.014	.020	.014	.002	.011
Trout & Char	1	0	22	4	4	5	0	11	4	51
CPUE	.001	-	.007	.000	.001	.001	-	.003	.001	.001

* Derby data excluded

** Total Salmon, excluding Shakers

*** Derby Days - May 26-28; June 2,3,9 and 10

3,098 pink salmon were harvested. The harvest estimate for "shaker" chinook salmon was 7,744, halibut 1,397, trout and char 190, and other fish (rock fish, cod, etc.) was 8,887.

The expanded angler effort of 126,956 hours was the third largest effort since 1967 and was exceeded only by the effort estimates for 1971 (148,718) and 1977 (204,974) (Table 1). This was the first season that the Ketchikan Marine program was tied into the State Wide Harvest Program.

The CPUE effort is calculated by two methods in this study (Table 2). The first, is to use "salmon hours" for chinook, coho, pinks, chums and sockeye and "bottom hours" for halibut, trout and char, and miscellaneous fish. This yields a more accurate estimate of CPUE for each species, and also reveals what percentage of angler effort is expended against these two broad fishing categories. This method does disregard the fact that some bottom fish are caught incidental to the salmon catch. The other method used in previous years, used total hours for the basis for computing the CPUE (Table 2).

The first method yielded more accurate catch statistics especially for bottom fish. Anglers spent an average of 85% of their time fishing for salmon during the season. This varied from a high of 96% during the derby to a low of 61% by late August.

Chinook Salmon Shakers

A sample of 2,713 fishermen interviewed reported catching and releasing 2,143 undersized chinook salmon (shakers). Starting June 17, 1979, a program was instituted to ascertain the condition of these released fish. Anglers were asked to categorize the condition of the shakers as follows:

- a) ALIVE Fish was shaken off the hook without being landed in the boat. The fish was not hooked deeply and is thought to have a good chance of survival.
- b) FAIR The fish was landed in a net or landed in the boat prior to release. The fish was not hooked deeply, but due to handling, is thought to have a reduced chance of survival.
- c) CRITICAL The fish was hooked deeply, bleeding from the gills, has been gaffed, or stunned prior to release. The fish has a poor or no chance of survival.
- d) NO DATA ON RELEASED FISH

Data were collected from 592 shakers. Of the released fish, 41% were classified as "alive", 38% "fair", 16% "critical" and "no data" on 5%. Assuming that all of the "critical" fish and one-half of the "fair" fish died subsequent to being released, this would suggest that approximately 35% of the caught and released shakers suffered mortalities due to hooking or handling injuries. By assigning the 35% mortality factor to the 2,145 reported released shakers, a total mortality of 750 chinook salmon would be expected. This is 165 more than the legal size chinook harvested (585) by censused anglers.

Table 2. Comparative Methods Used for Computating CPUE for the Ketchikan Marine Creel Census Program during 1979.

SPECIES	NUMBER CAUGHT	CPUE	
		SALMON OR BOTTOM HOURS	TOTAL HOURS
Chinook	585	.020*	.017
Shakers	2,145	.072*	.061
Coho	266	.009*	.008
Pinks	858	.029*	.024
Chums	12	.000*	.000
Reds	1	.000*	.000
Trout and Char	51	.001*	.001
Other Species	2,450	.082**	.070
Halibut	386	.013**	.011

* Fish/salmon hour
 ** Fish/bottom hour

Ketchikan King Salmon Derby

The 1979 Ketchikan King Salmon Derby ran 7 days (3 consecutive weekends), May 26, 27, 28, June 2, 3, and 9 and 10. As in previous years, an intensified effort was made to census this event.

Anglers made an estimated 4,108 trips and fished 28,480 hours to catch 627 chinook. This is a significant drop in effort over the 1977 estimates of 7,848 angler trips and 58,042 angler hours to catch 1,152 chinook salmon (Table 3 and Figure 2). Some reasons for this apparent drop in effort may be:

- 1) Inclement weather on 3 derby days in 1979 compared to relatively good weather except for one day in 1977.
- 2) Inflated estimates may have resulted in 1977 by including into the data boats observed during the aerial survey that were not actually fishing.
- 3) Increased fuel cost or it's non-availability.

A comparison was made between this year's and previous years' derbys for elucidating trends in the total sport fishery and chinook salmon availability. The derbys provide unique data in sport fishery harvesting statistics in that:

- 1) Angler participation and fishing pressure is at a seasonal maximum during the derby.
- 2) Derby is always held on Memorial Day weekend and during 1 or both following weekends.
- 3) Derby dates usually coincide with the area's peak chinook salmon abundance.
- 4) Anglers compete for various prize categories by fishing in a similar manner and in a defined zone.
- 5) The angler's main objective during the derby is to catch large chinook salmon. Their objectives are more varied at other times during the season.
- 6) Creel programs have historically focused on the derby because of its importance to the sport fishery.
- 7) Unlike the seasonal catch statistics, derby data have consistently included both sport and sport/commercial (hand and power troller) fishermen.

A comparative derby analysis was done by summarizing all the raw data which were available. For the years raw data were not available (1960, 1965-67, 1972, and 1973), the summaries presented in the D-J reports were used. Some interpolation of the D-J summaries was necessary in cases where the derby information was not presented separately from the seasonal data.

Table 3. Chinook Salmon Summary of Creel Census Data from Ketchikan Special Derby Days, 1960 - 1979

	Year												
	1960	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1977	1979
	Analysis Codes												
	1,2	3	1,2	4	4	3	3	3	3	4	4	3,5	3,5,6
Censused Boats	657	109	-	83	189	189	259	290	195	-	-	936	868
Estimated Boats	-	164	-	334	694	945	933	790	1,125	-	-	3,370	1,771
Censused Anglers	1,442	255	938	169	207	457	655	680	519			2,180	2,019
Estimated Anglers	-	383	1,407	681	760	2,285	2,360	1,425	2,995	-	-	7,848	4,108
Censused Hours	1,180	2,307	-	1,323	1,583	3,709	5,056	6,064	4,729			16,123	13,603
Estimated Hours	-	3,461	-	5,335	5,814	18,545	18,220	11,642	27,286	-	-	58,042	28,480
Censused Chinook	84	111	169	57	55	133	157	143	138			320	1,425
CPUE Chinook J28"	-	.033	-	-	-	.027	.023	.022	.019	-	-	.020	.022
Estimated Chinook	-	167	253	230	202	665	565	427	796	-	-	-	2,978
CPUE	.071	.048		.043	.035	.036	.031	.024	.029	.028	.029	-	.105
%Chinook J28"	-	68%	65%	-	-	76%	73%	92%	64%	-	-	100%	21%

Analysis Codes:

- 1) From D-J Report of Derby.
- 2) Reliability questionable due to sampling procedure or data workup.
- 3) Computed from raw data.
- 4) Estimate made by using bi-weekly summaries from the D-J reports. Data includes non-derby fishermen and days.
- 5) Minimum king salmon length was 28 inches.
- 6) Expanded data derived from State Wide Harvest Questionnaire.

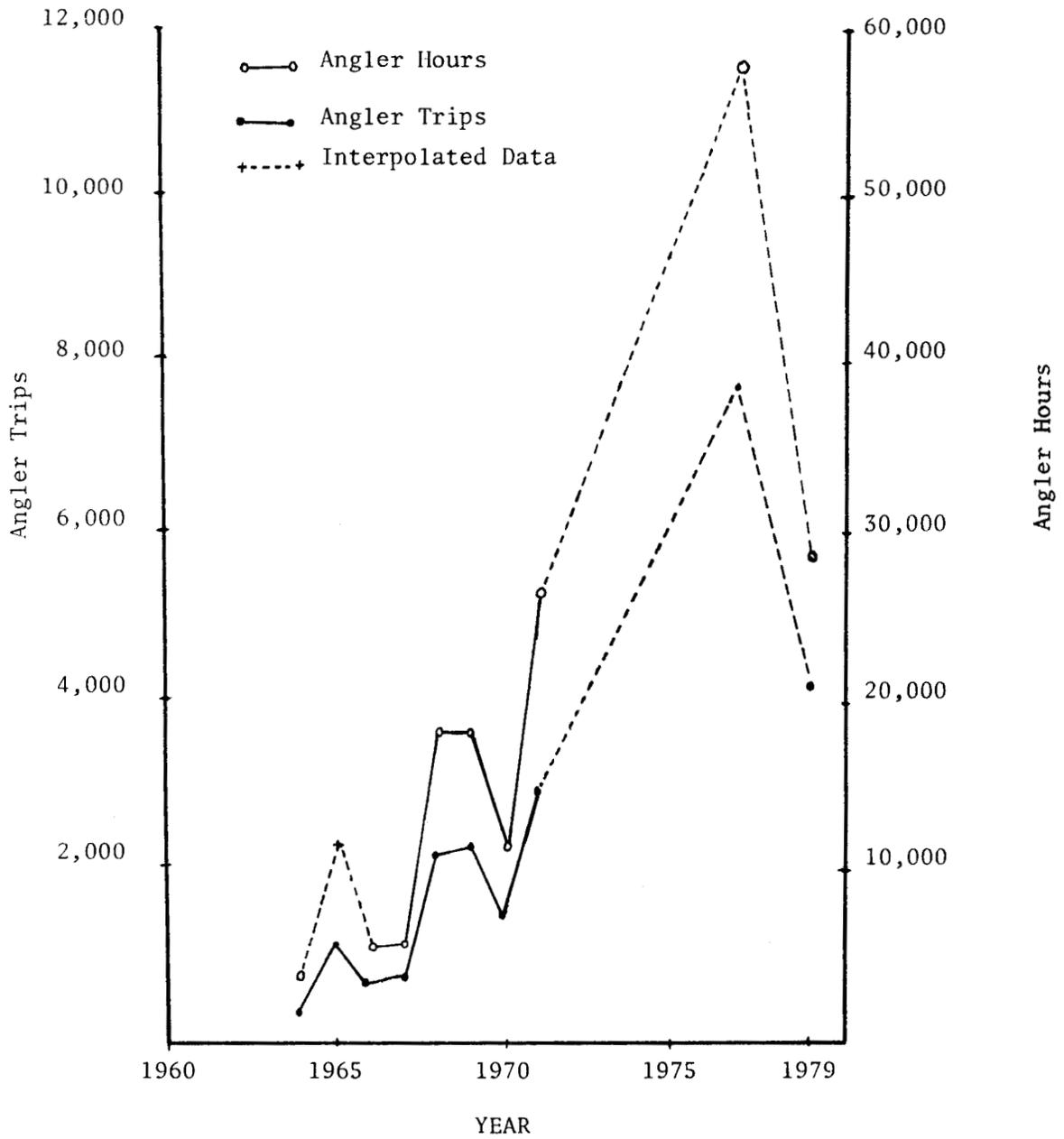


Figure 2 . Angler effort expended on Ketchikan King Salmon Derby Days 1964-1979.

Though creel census programs were conducted in 1972 and 1973, usable estimates of derby boats, anglers, and fishermen could not be derived from the D-J reports and related raw data were unavailable. The calculations of CPUE, however, were usable since these figures were derived directly from angler harvest statistics, not the expanded summaries. Four significant trends are evident in the data (Table 3):

- 1) Angler participation has increased dramatically since 1960, though not in a steady manner.
- 2) The number of chinook salmon taken has correspondingly increased.
- 3) The catch per unit effort has declined.
- 4) Increased fishing pressure has adversely affected the fishing quality.

These trends are presented graphically in Figures 2-4.

Figure 2 shows the estimated angler hours and angler trips during each annual derby. The high fluctuations in angler effort are caused by a multitude of factors including: weather, advertising, gasoline shortages and other intangibles which determine whether or not an angler decides to fish the derby. The trend is for increased angler participation in the derby.

The estimated number of legal chinook salmon, (greater than 28 inches or 711 mm), and the total harvest of salmon is shown in Figure 3. Since 1977, a 711 mm minimum size restriction on chinook required anglers to release these smaller fish, thus reducing the actual fish harvest to larger chinook.

In Figure 4, the CPUE for chinook greater than 711 mm and for the total number of chinook harvested is shown separately. The data indicated a definite decrease in the CPUE for chinook since the early 1960's except for the 1979 "shaker" CPUE. Even though an increase in CPUE is noted in chinook larger than 711 mm there is a decrease in the CPUE when looking at the total chinook entering the angler bag. The arrow between the points (1973, .029 and 1977, .020) shows the CPUE for chinook that actually entered the angler's bag. This low CPUE led some anglers since 1977 to remark that "the bottom has fallen out of the Ketchikan sport fishery".

The lower CPUE since 1977 in the chinook salmon fishery can be attributed to the regulation requiring all chinook salmon less than 711 mm to be released. The slight increase in the harvest of chinook salmon larger than 711 mm could be attributed to fishermen forced to fish longer in order to harvest a larger chinook salmon; this was not the case prior to 1977. If anglers were able to keep "shakers", the chinook salmon CPUE would have been one of the largest since 1960 and this in turn might have dropped the harvest on larger chinook salmon.

The Ketchikan harvest rates are still lower than the harvest levels established in the Statewide Salmon Plan.

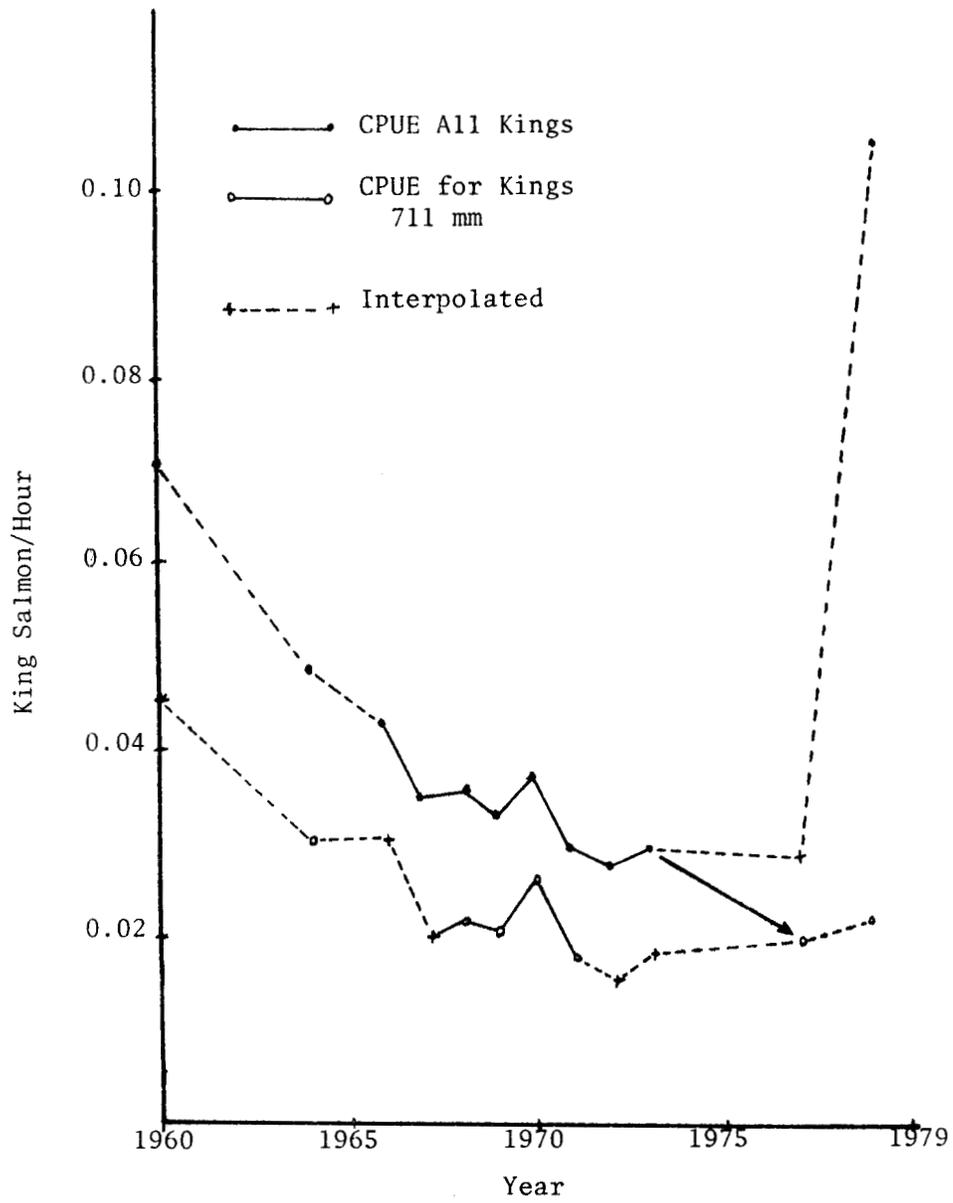


Figure 3 . King Salmon Catch Per Unit of Effort by Ketchikan Derby Fishermen 1960-1979.

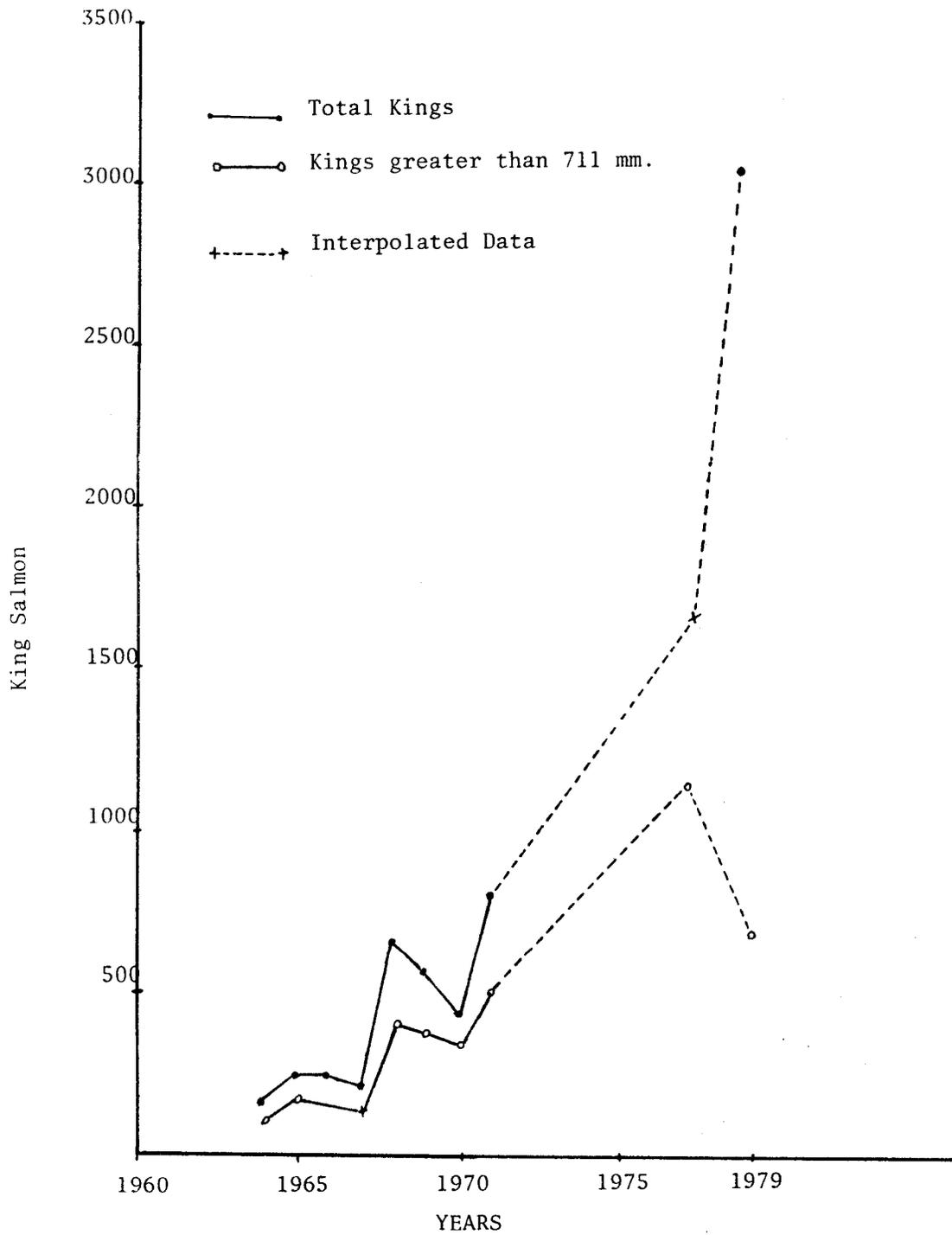


Figure 4 . King Salmon Harvest during Ketchikan King Salmon Derby Days 1964-1979.

Table 4. Analysis of Trends of Sport Caught Coho Salmon from the Ketchikan Marine Creel Census Program 1967 - 1979

Annual Catch Estimates

	1967	1968	1969	1970	1971	1972	1973	1977	1979
Dates	5/15- 8/20	5/20- 8/25	5/19- 8/24	5/25- 8/30	5/17- 9/5	5/22- 6/4*	5/14- 9/2	5/15- 9/3	5/15- 8/31
Boats	4,089	3,319	4,151	1,488	6,764	-	7,924	15,453	10,152
Anglers	7,281	8,259	10,378	3,486	17,130	1,967	19,925	36,906	22,841
Hours	55,737	57,008	70,954	26,127	148,718	17,175	52,877	205,974	126,956
Coho	86	1,303	153	127	828	405	1,075	1,459	1,016
CPUE	.002	.023	.002	.005	.006	.024	.020	.007	.008

Largest Bi-weekly CPUE*

Dates	8/7- 8/20	7/15- 7/28	8/11- 8/24	7/16- 7/19	8/9- 8/22	7/31- 8/13	7/9- 7/22	8/21- 9/3	8/19- 8/31
Boats	18	23	19	33	25	12	29	106	224
Anglers	50	57	44	76	67	30	76	217	446
Hours	281	282	210	467	356	127	368	951	2,730
Coho	6	36	10	25	23	95	40	50	86
CPUE	.021	.128	.048	.054	.065	.748	.109	.053	.032

* Information from raw data summary and not expanded.

Data returned from the Ketchikan Salmon Derby Committee permit, indicated 128 chinook salmon and 1 halibut were entered into the derby for prizes. The 128 chinook salmon entered is 20.4% of the estimated 627 chinook salmon caught during the derby.

Ticket validations by derby weekend were as follows: May 26-28 - 519; June 2-3 - 525; and June 9-10 - 521. The total number of validated tickets was 1,565. This includes tickets purchased for a family or an individual. Each person is not required to purchase a ticket.

Seasonal Coho Salmon

The coho salmon fishermen experienced a poor catch success in 1979 compared to previous years (Table 4). For the seasonal totals, anglers censused 35,164 hours catching 266 coho. This is a seasonal average of .008 fish/hour, compared to averages of .023 fish/hour during the good coho years of 1968, 1972 and 1973.

Looking at the highest CPUE for coho of any given bi-weekly period for the years 1967-1973, 1977 and 1979; 1979 were rates second to lowest with a catch success of .032 fish/hour from August 12 through August 31. This compares with an average good year of .164 fish/hour.

Due to an apparent low return of coho salmon to southeast Alaska, the Alaska Department of Fish and Game through Emergency regulatory control, reduced the coho salmon sport bag and possession limit to two. This regulation was formulated during August and became effective 12:01 A.M. September 7, 1979 and extended through December 31, 1979.

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