

Informational Leaflet 53

FISHERY AND BIOLOGICAL ASPECTS OF THE SOUTHEASTERN ALASKA SALMON DERBIES FOR 1959, 1960 AND 1961

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FISHERY AND BIOLOGICAL ASPECTS OF THE SOUTHEASTERN ALASKA
SALMON DERBIES FOR 1959, 1960, and 1961¹

Introduction:

Three major and two minor salmon derbies are conducted in Southeastern Alaska each year. Of the three major derbies, the Juneau Derby was sampled for fishery and biological data in 1959, 1960, and 1961 and the Ketchikan Derby was investigated in 1960 and 1961. Additional information was also obtained from the Sitka Derby and from the smaller Craig-Klawock Derby in 1960 and 1961. No information was obtained on the Wrangell Derby.

Objectives:

The salmon derbies were studied to determine the degree of king salmon harvest for this specialized fishery. Fishery dependent variables, such as fishing effort, boat size, number of fishermen, etc., and biological data on fish size, age and sex ratios, etc., were studied to provide knowledge on this type of sport fishery.

Procedure:

The larger salmon derbies at Juneau and Ketchikan were intensively sampled. A sampling crew was assigned to each official weighing station to collect the data and, in addition, usually participated as official derby judges. The Juneau and Ketchikan derbies each had two official derby stations. The Juneau Derby had three official days of fishing (Friday, Saturday, and Sunday) while the Ketchikan Derby had four days of fishing (two consecutive weekends). The fishing hours for both derbies were generally from 8:00 a.m. to 6:00 p.m. or 10 hours in duration.

King salmon were sampled as they were turned in for official entry and if time permitted, coho salmon were also sampled. Other species of salmon were not plentiful in the catch and were not sampled. Information on length, weight, sex, flesh color, and age (by scale determination) was obtained.

Depending on the circumstances, the enumeration of fishery variables, i.e., numbers and types of boats, number of fishermen and number of fish caught, were derived in one or more of the following ways: (1) direct count where possible; (2) number of fishermen derby tickets validated; (3) number of fish "entered" in contest; (4) number of fish turned in for door prize drawing; and (5) by calculation, e.g., number of fishermen equals number of boats times the average number of people per boat.

¹ This investigation was conducted with Federal Aid in Fish Restoration Funds under Project F-5-R-1 (1959-1960); F-5-R-2 (1960-1961) and F-5-R-3 (1961-1962).

The number and types of boats utilized in the Juneau and Ketchikan derbies were visually classified into one of four size categories and counted as they left or returned to the four official derby stations. The method of enumeration and classification depended on the arrangement and organizational procedures of the derby stations. The classification was largely subjective since no measurements were taken and size was just estimated. Type I consisted of open skiffs; Type II, small cabin or convertible tops approximately 16 to 18 feet in length; Type III, larger cabin boats less than 24 to 26 feet; and Type IV, yachts, trollers, and other large boats.

A count of the number of fishermen per boat type was also obtained when possible in order that an average number of fishermen per boat type could be utilized in calculating fishing effort when this variable was not obtainable by other methods.

An analysis of the time spent fishing by both the unsuccessful and successful Ketchikan king salmon fishermen was conducted at the Mountain Point station in 1960 and 1961 and the Clover Pass station in 1961. The boats returning to the derby stations in this area were spread out over a long period of time, which enabled most of the fishermen to be interviewed. Most of the returning fishermen were extensively interviewed for the desired fishery information and excellent cooperation was obtained from the fishermen.

It was not possible to obtain a count of all fish caught but not entered in the derby, because some of the boats (largely unsuccessful) docked at nonsampled locations. In addition, the count of boats and fishermen was incomplete because some boats departed from the derby stations later in the day, after counting was discontinued. Although these sources of error were not large, the numbers listed should be considered as approximations and not true values. Information on the Sitka and Craig-Klawock derbies was obtained from the official derby records and were not sampled.

Findings:

Fishery Factors

Fishing Success

A total of 1,325 king salmon was sampled from 1,471 kings landed in the five Juneau and Ketchikan derbies studied. Table 1 lists the number of kings sampled by place of landing. A progressive decline resulted in both the fishing effort (both fishermen and boats) and catch in the three years that the Ketchikan and Juneau derbies were studied (Tables 2, 3, and 4). The Juneau king salmon catch per fishermen for the years 1959, 1960, and 1961 was 0.17, 0.10, and 0.08 respectively (Table 2). The Ketchikan king salmon catch per fishermen for 1960 and 1961 was 0.14 and 0.10.

When the catch per unit effort (CPUE) for king salmon was compared for all of the derbies from which information was available, it indicated that all of the derbies enjoyed about the same level of success with the exception of the Craig-Klawock Derby which had a higher level of success in 1960 (Table 3). The Sitka Derby was the only derby that did not show a decrease in fishing success in the

YEAR	Type of Sample	JUNEAU			KETCHIKAN		
		Tee Harbor	Auke Bay	Total			
1959	No. kings landed	261	338	599			
	Length sample	255	209	464			
	Weight sample	205	169	374			
	Sex sample	246	---	246			
	Total kings sampled	256	211	467			
	Total coho	---	---	362*			
	Other species of salmon	---	---	---			
	Total Fish	---	---	1461**	Clover Pass	Mt. Point	Total
	1960	No. kings landed	146	215	361	113	88
Length sample		146	212	358	99	88	187
Weight sample		145	213	358	91	88	179
Sex sample		137	82	219	89	84	173
Total kings sampled		146	215	361	99	88	187
Total coho		250	400	650	6	--	6
Other salmon species		4	15	19	--	--	---
Total Fish		400	630	1030	119	88	207
1961	No. kings landed	82	139	221	52	37	89
	Length sample	82	139	221	45	37	82
	Weight sample	82	138	220	44	37	81
	Sex sample	80	121	201	48	36	84
	Total kings sampled	82	139	221	50	37	87
	Total coho	256	295	551	---	---	---
	Other species of salmon	9	13	22	---	---	---
	Total Fish	347	447	794	52	37	89

Table 1. Number of King Salmon Landed and Sampled by Derby Station During the Juneau and Ketchikan Salmon Derbies.

*Derived by subtraction of total kings from total fish. Includes a few of the other species of salmon.

** Based on number of fish turned in for prizes and non-entry drawing. All other numbers are direct counts.

Table 2. The Catch per Unit Effort for Fishermen and Boats in the Juneau and Ketchikan Salmon Derbies.

YEAR	Type of Salmon	JUNEAU					KETCHIKAN				
		No. Fish	No. Men	No. Boats	C.P.U.E.		No. Fish	No. Men	No. Boats	C.P.U.E.	
					Men	Boats				Men	Boats
1959	Total* Salmon	1461	3511	1438	0.42	1.02			NOT SAMPLED		
	King Salmon	599	3511	1438	0.17	0.42					
1960	Total Salmon	1030	3479	1197	0.30	0.86	207	1442	657	0.14	0.32
	King Salmon	361	3479	1197	0.10	0.30	201	1442	657	0.14	0.31
1961	Total Salmon	794	2818	1102	0.28	0.72	89	898	440	0.10	0.20
	King Salmon	221	2818	1102	0.08	0.20	89	898	440	0.10	0.20

* Coho Salmon Constituted the Chief Species in the Juneau Derbies.

Table 3. Southeastern Alaska King Salmon Derby Statistics.

Location and Dates	Number of Boats	Number of Fishermen	Number of Kings	Average weight (lbs.-ozs.)	C.P.U.E. (Boats)	C.P.U.E. (Fishermen)
Juneau-1959	1438	3511	599	15-14	0.42	0.17
Juneau-1960	1197	3479	361	13-12	0.30	0.10
Juneau-1961	1102	2818	221	13- 7	0.20	0.08
Ketchikan-1960	657	1452	201	20- 6	0.31	0.14
Ketchikan-1961	440	898	89	19- 7	0.20	0.10
Juneau - Ketchikan Total	4834	12158	1471	16- 9	0.29	0.12
Sitka-1960*	218	550	70	27- 0	0.32	0.13
Sitka-1961*	312	800	103	24- 0	0.33	0.13
Craig- Klawock-1960*	12	30	14	29-0	1.17	0.47

* Number of boats were derived by using the average fishermen per boat in Juneau and Ketchikan derbies. Total fishermen and fish came from derby records.

Table 4. The Catch per Unit Effort by Place of Landing for the Juneau and Ketchikan Derbies

YEAR	TYPE OF SALMON	JUNEAU									
		Tee Harbor					Auke Bay				
		NO. FISH	NO. MEN	NO. BOATS	C.P.U.E.		NO. FISH	NO. MEN	NO. BOATS	C.P.U.E.	
					MEN	BOATS				MEN	BOATS
1959	Kings	261	1347	650	.19	.40	388	2164	788	.18	.49
	Total Salmon	Were not separated by station - Total Salmon entered in Derby only									
1960	Kings	146	1401	492	.10	.30	215	2078	705	.10	.30
	Total Salmon	400	1401	492	.29	.81	630	2078	705	.30	.89
1961	Kings	82	1298	494	.06	.17	139	1520	608	.09	.23
	Total Salmon	347	1298	494	.27	.70	447	1520	608	.29	.74
		KETCHIKAN									
		Clover Pass					Mountain Point				
1960	Kings	113	827	378	.14	.30	88	615	279	.14	.32
	Total Salmon	119	827	378	.14	.31	88	615	279	.14	.32
1961	Kings	52	633	316	.08	.16	37	265	124	.14	.30
	Total Salmon	52	633	316	.08	.16	37	265	124	.14	.30

two years it was studied (1960 and 1961). Both of these latter derbies were probably biased, however, since the number of fish recorded were usually those fish that were entered in the contest. Since these derbies were not studied by a sampling crew, the number of fish that were not entered but were taken home because they were too small for prizes was not determined.

The catch per unit effort based on the catch of total salmon also showed a decline in success (Table 2). The other species of salmon were almost entirely coho salmon which in fact outnumbered the king salmon in the Juneau derbies. Almost all of the salmon landed in the Ketchikan Derby were kings because this derby took place before the coho entered the fishery (early part of June). The Juneau Derby provided better fishing than the Ketchikan Derby when all species of salmon were considered. This result was due largely to the availability of coho salmon during the Juneau Derby and their absence from the Ketchikan Derby. If king salmon fishing success is considered alone, the Ketchikan Derby was superior to the Juneau Derby.

There were not great differences in fishing success when the catch was compared by place of landing in the Juneau derbies (Table 4). There was, however, a consistent trend for the Auke Bay fishermen to register slightly higher CPUE values than the fishermen fishing out of the Tee Harbor station. In Juneau, fishermen from the two official checking stations utilize the same fishing grounds, with a tendency for fishermen originating from Tee Harbor to fish more to the north than the fishermen originating from Auke Bay. In 1961, the Mountain Point area in Ketchikan evidenced a higher success than the Clover Pass station in fishing for kings, with CPUE values almost double the Clover Pass values. However, in 1960 the two stations showed very little difference in the amount of fishing success. The two stations are separated geographically (North and South ends of Tongass Narrows) and represent two different fishing areas with no overlapping of common fishing waters.

The unsuccessful fishermen in the Ketchikan Derby spent an average of 5.8 hours a day in 1960 and 7.0 hours a day in 1961 in their attempts to catch king salmon (Table 5). The successful anglers also spent 5.8 hours in 1960, but fished a little longer (7.9 hours) than the unsuccessful fishermen in 1961. The successful fishermen fished an average of 4.1 hours in 1960 before he boated his first king salmon. A little more time was required in 1961 with an average of 4.7 hours needed to catch the first fish. The increase in time fished in 1961 was largely a result of better weather conditions and the scarcity of fish. This was also reflected in the smaller total catch.

Boat Size and Type

The small boat, 16 to 18 feet in length, that provided protection from the weather by means of a small cabin or convertible canvas top (Type II) was the most popular boat in the derbies. In 1961 the Tee Harbor site had 49 percent utilization of this craft and in 1960, 54 percent of the total Juneau Derby fleet consisted of this type of boat (Table 6). Next in popularity was the open skiff (Type I) which accounted for 30 percent of the Juneau boats in 1960. In 1959 these two classifications of boats comprised 91 percent of the entire Juneau fleet. The Ketchikan Derby boats were similar to the Juneau boats in type usage with a little more popularity being given to the open skiffs (40 percent of the fleet in 1960 and 1961). The larger cabin cruisers under 24 to 26 feet in length (Type III)

Table 5. The Average Number of Hours Fished by the Successful and Unsuccessful Ketchikan Fishermen.*

YEAR	STATION	SUCCESSFUL FISHERMEN							UNSUCCESSFUL FISHERMEN			COMBINED GROUPS		
		No. Boats	No. Men	No. Fish	Average Hours Fished	Average Hrs. to Catch 1st Fish	C.P.U.E.		No. Boats	No. Men	Average Hours Fished	No. Boats	No. Men	Average Hours Fished
							Boats	Men						
1960	Mt. Point	78	161	84	5.8	4.1	1.1	.52	121	254	5.8	199	415	5.8
1961	Mt. Point	31	65	36	6.7	5.2	1.2	.55	90	194	6.6	121	259	6.7
	Clover Pass	45	94	51	9.1	4.1	1.1	.54	269	535	7.3	314	629	8.2
TOTAL 1961		76	159	87	7.9	4.7	1.1	.55	359	729	7.0	435	888	7.5
TOTAL		154	320	171	7.2	4.5	1.1	.53	480	983	6.6	634	1303	6.9

* Includes Boat Running Time.

YEAR	* BOAT TYPE	JUNEAU								KETCHIKAN									
		Tee Harbor		Auks Bay		Total		Clover Pass								Mt. Point		Total	
		No. Boats	% Boats	No. Boats	% Boats	No. Boats	% Boats	No. Boats	% Boats							No. Boats	% Boats	No. Boats	% Boats
1959	I	252	39																
	II	359	55	697	88	1308	91												
	III	28	4																
	IV	11	2	91	12	130	9												
	Total	650	100	788	100	1438	100												
1960	I	151	31	212	30	363	30	155	41	109	39	264	40						
	II	281	57	366	52	647	54	169	45	116	42	285	43						
	III	42	9	78	11	120	10	49	13	52	19	101	15						
	IV	18	4	49	7	67	6	5	1	2	1	7	1						
	Total	492	101	705	100	1197	100	378	100	279	101	657	99						
1961	I	90	38	-	-	90	38	114	36	101	46	215	40						
	II	114	49	-	-	114	49	190	60	88	40	278	51						
	III																		
	IV	31	13	-	-	31	13	15	5	32	14	47	9						
	Total	235	100	-	-	235	100	319	101	221	100	540	100						

Table 6. The Size and Percentage utilization of Boats in the Juneau and Ketchikan Salmon Derbies.

* See Section on Boat Type in Procedure for Classification.

and the large (Type IV) yachts and work boats (troller, gill netter, etc.) were not utilized to any great extent in any of the fishing derbies. The combined contributions of these two types of boats amounted to only 16 percent of the entire Juneau and Ketchikan fleets in 1960 and were further reduced in importance in 1959 and 1961.

A consistent value was obtained for the average number of fishermen for each boat type in the Ketchikan derbies (Table 7). The overall average was 2.0 fishermen for Type I (open skiff), 2.1 for Type II (small cabin), and 2.5 for the combined larger Type III and IV boats. The Juneau derbies showed more variability between years and a larger overall average value with 2.4, 2.8, and 3.8 fishermen per boat, respectively, in the above boat types.

Data was obtained on the numbers of men and women anglers at one of the official landing stations in both the Juneau and Ketchikan derbies. The overall composition was largely composed of men with an average of 2.8 men in Ketchikan and 2.4 men in Juneau for each woman angler. Men appeared to be the more serious fishermen, i.e., as the boat size and comfort increased the man to woman disparity decreased. For example, the man to woman ratio was only 1.6 in Ketchikan and 2.0 in Juneau in the larger Type III and IV boats while the corresponding values for open skiffs was 3.6 and 2.7, respectively. A combined value of 2.6 men for each woman angler was obtained for Southeastern Alaska, regardless of boat type.

Biological Factors

Fish Size

The size of the king salmon caught during the derbies was very consistent during the years of this study. Juneau kings averaged 75.7 cms in length in 1959, 73.1 cms in 1960, and 73.5 cms in 1961 for a three-year average of 74.1 cms (Table 8). The Ketchikan kings were larger than the Juneau fish averaging 84.7 cms in 1960 and 84.6 cms in 1961.

The three-year average weight for Juneau kings was 14 pounds 6 ounces and the two-year average weight for Ketchikan kings was 19 pounds 13 ounces. As previously mentioned, the fish landed in the Sitka and Craig-Klawock derbies (see Table 3) were thought to be biased toward larger fish, as they largely represented only those kings that were entered for derby prizes. Although these derbies cannot be directly compared to the Juneau and Ketchikan derbies in fish size, they probably do represent a larger size difference because of known size differences between "inside" (Juneau-Ketchikan) and "outside" (Sitka-Craig) waters.

The two official weighing stations in both the Juneau and Ketchikan derbies showed a size difference for king salmon with the Tee Harbor station in Juneau and the Clover Pass station in Ketchikan receiving the larger fish. The size difference was approximately a pound in Juneau and three to six pounds in Ketchikan.

The larger fish from the Ketchikan derbies resulted from a difference in the degree of maturity of the salmon stock, which in turn was a result of the timing of the derbies. Only a few of the fish landed in Juneau were adult spawners,

TABLE 7. THE AVERAGE NUMBER OF FISHERMEN AND THE NUMBER OF MEN AND WOMEN ANGLERS BY BOAT TYPE.

YEAR	BOAT TYPE	JUNEAU			KETCHIKAN			Average Number of Men and Women by Boat Type			AREA
		Average Fishermen per Boat			Average Fishermen per Boat			No. ♂ Boat	No. ♀ Boat	No. ♂ each ♀	
		Tee Harbor	Auke Bay	Total	Mt. Point	Clover Pass	Total				
1959	I+II	-	2.7	2.7							
	III+IV	-	4.4	4.4							
1960	I	2.5	2.5	2.5	2.0	2.0	2.0	1.5	0.4	3.6	
	II	2.8	2.6	2.7	2.2	2.2	2.2	1.7	0.6	2.8	
	III+IV	4.4	4.4	4.4	2.6	2.6	2.6	1.6	1.0	1.6	
	Total	2.8	2.9	2.9	2.2	2.2	2.2	1.6	0.6	2.8	
1961	I	2.3	2.6	2.5	2.0	1.8	1.9	1.7	0.6	2.7	
	II	2.7	2.8	2.8	2.2	2.0	2.1	1.9	0.8	2.3	
	III+IV	3.2	2.8	3.0	2.6	2.3	2.4	2.1	1.1	2.0	
	Total	2.6	2.7	2.7	2.2	2.0	2.2	1.8	0.8	2.4	
Total	I	2.4	2.6	2.5	2.0	1.9	2.0	1.6	0.5	3.2	
	II	2.8	2.7	2.8	2.2	2.0	2.1	1.8	0.7	2.6	
	III+IV	3.8	3.6	3.7	2.6	2.4	2.5	1.9	1.1	1.8	
	Total	2.7	2.8	2.8	2.2	2.1	2.2	1.8	0.7	2.6	

Table 8. The Length and Weight of Juneau and Ketchikan Derby King Salmon.

Year	Juneau			Ketchikan		
	Area	Length (cms.)	Weight (lbs.Ozs.)	Area	Length (cms.)	Weight (lbs.Ozs.)
1959	Tee Harbor	76.1	16-4	Clover Pass	NOT	
	Auke Bay	75.2	15-9	Mt. Point	SAMPLED	
	Total	75.7	15-14	Total		
1960	Tee Harbor	75.1	14- 7	Clover Pass	86.4	21-15
	Auke Bay	71.7	13- 4	Mt. Point	82.9	18-13
	Total	73.1	13-12	Total	84.7	20- 6
1961	Tee Harbor	75.3	14- 4	Clover Pass	87.9	22- 5
	Auke Bay	72.5	12-15	Mt. Point	80.5	16- 1
	Total	73.5	13- 7	Total	84.6	19- 7
Total	Tee Harbor	75.5	15- 0	Clover Pass	87.2	22- 2
	Auke Bay	73.1	13-15	Mt. Point	81.7	17- 7
	Total	74.1	14- 6	Total	84.7	19-13

whereas, the Ketchikan fish were largely mature. Juneau fish were caught (late July-early August) after the spring spawning migration had passed through the area, while the Ketchikan Derby was held during the time of this migration (first part of June). The Juneau Derby was largely conducted on feeding populations of immature king salmon while the Ketchikan Derby exploited a mixture of mature and immature fish.

Sex Ratio

A sex ratio of 1.5 female per male salmon was obtained during all three years of the Juneau derbies (Table 9). This observation compared favorably to the sex ratios obtained during a two-year Southeastern Alaska seasonal king salmon sport fishery investigation, where sex ratios of 1.3 and 1.4 females per each male king were obtained in 1960 and 1961. The sex ratio was more variable between years, but still relatively unequal in the Ketchikan derbies with 1.4 and 1.1 females per male in 1960 and 1961. The overall average for all five derbies investigated was 1.4 females for every male salmon landed.

The reason for the predominance of females over male kings in the derby catches was not apparent. Whether the female population was greater than the males at the time of the derby fisheries or whether the females took the lure more readily was not determined. A possible explanation of this unequal sex ratio could be the large numbers of male king salmon for any given brood year that mature early (jacks) and enter the spawning streams. These fish, therefore, are not available to the sport fishery which chiefly exploits the older age groups. At the time this study was being conducted a 26-inch size limit was in effect on sport caught king salmon in Southeastern Alaska.

Flesh Color

The color of the flesh (classified as either red or white) was studied in the Ketchikan and Juneau derbies. In Ketchikan, 3.8 reds for each white king occurred in 1960 and 3.1 reds for each white king was obtained in 1961 (Table 9). In Juneau, a less extreme red-to-white ratio of 1.3 reds for every white king was obtained in 1961, the only year this factor was investigated.

The derby results, showing a greater percentage of red fleshed kings over white fleshed fish, were substantiated by the seasonal Southeastern Alaska sport fishery program where 71.5 percent of the kings were reds in 1960 and 67.9 percent were reds in 1961.

The red color condition in king salmon has been esthetically and economically more desirable than the white fleshed kings. Consequently, the above ratios in favor of more red-fleshed kings were a desirable result in the sport fishery.

Fish Age

Analysis of the king salmon scales that were obtained in the Ketchikan and Juneau derbies substantiated the differences found in the size and degree of maturity of the kings caught in the two derbies. Juneau fish showed a larger percentage of two (34 percent) and three (60 percent) ocean annulus kings while the Ketchikan fish showed a larger percentage of the three (51 percent) and four (25 percent)

Table 9. The Sex and Flesh Color of Juneau and Ketchikan Derby King Salmon.

YEAR	JUNEAU			KETCHIKAN		
	Area	Sex Ratio*	Flesh** Color Ratio	Area	Sex Ratio	Flesh Color Ratio
1959	Tee Harbor	1.5		Clover Pass	NOT	
	Auke Bay	-		Mt. Point		SAMPLED
	Total	1.5		Total		
1960	Tee Harbor	1.4		Clover Pass	1.5	4.2
	Auke Bay	1.6		Mt. Point	1.2	3.3
	Total	1.5		Total	1.4	3.8
1961	Tee Harbor	1.2	1.1	Clover Pass	0.9	2.9
	Auke Bay	1.7	1.4	Mt. Point	1.4	3.6
	Total	1.5	1.3	Total	1.1	3.1
Total	Tee Harbor	1.4	1.1	Clover Pass	1.2	3.6
	Auke Bay	1.7	1.4	Mt. Point	1.3	3.5
	Total	1.5	1.3	Total	1.3	3.5

* No. of ♀ per each ♂

** No. red per. each white.

ocean annulus fish. A more complete analysis of fish age appears in another report*.

Coho Salmon

The success in angling for coho salmon in the Juneau Derby did not show the progressive decline that the king salmon displayed. Although during 1960 and 1961 the catch per fisherman was less than the 1959 level (0.25), both CPUE's remained at the same level with values of 0.19 and 0.20 in the latter two years (Table 10).

The average coho size was very consistent for the three years that they were sampled. The three-year average weight was 10 pounds 6 ounces and the average length was 67.5 cms.

Unlike the female-dominated sex ratio obtained with the king salmon, the coho displayed a reversal of the above unequal sex ratio; with an average of 1.7 males for each female landed.

All of the coho sampled were considered mature fish (in their last summer before entering the spawning streams in late summer and fall).

Summary:

1. Two major salmon derbies (Ketchikan and Juneau) of the five annual Southeastern Alaska derbies were thoroughly investigated for a variety of fishery and biological factors in 1959, 1960, and 1961. Additional information was obtained on two other derbies (Sitka and Craig-Klawock) by means of derby records, but these derbies were not directly investigated by a sampling crew.
2. There was a progressive decline in both the fishing effort and in the catch of king salmon in the three years that the derbies were studied.
3. All the derbies in Southeastern Alaska enjoyed about the same level of success with the exceptions of the Craig-Klawock Derby which in 1960 probably displayed a higher level of success.
4. The Juneau Derby provided better fishing success on the combined species of salmon (largely coho); however, the Ketchikan Derby was more successful for king salmon alone.
5. Successful anglers in Ketchikan spent a daily average of 4.1 hours in 1960 and 4.7 hours in 1961 to catch their first salmon. The increased time effort in 1961 was reflected in the decreased abundance of salmon.
6. The small cabin cruiser or convertible top boats 16 to 18 feet in length were the most utilized boats in the derbies. The open skiffs were next in popu-

*Finger, Gary and Robert Armstrong. 1965. The age composition of king salmon caught on sport gear in Southeastern Alaska. Alaska Department of Fish and Game Informational Leaflet (in press).

Table 10. Juneau Salmon Derby Statistics for Coho Salmon.

Area	Year	No. Fish	C.P.U.E.		Length (cms.)	Weight (lbs.-ozs.)	Sex Ratio (No. ♂ per ♀)
			Fisher- men	Boats			
TEE HARBOR	1959	-	-	-	68.4	10-13	1.8
	1960	250	.18	.51	65.9	10- 5	1.2
	1961	256	.20	.52	68.1	10- 6	1.7
	Total	506	.19	.52	67.5	10- 8	1.6
AUKE BAY	1959	-	-	-	-	-	-
	1960	400	.19	.57	67.1	10- 5	1.5
	1961	295	.19	.49	67.0	9- 8	1.9
	Total	695	.19	.53	67.1	10- 4	1.7
TOTAL	1959	862	.25	.60	68.4	10-13	1.8
	1960	650	.19	.54	66.5	10- 5	1.4
	1961	551	.20	.50	67.6	9-15	1.8
	Total	2063	.21	.55	67.5	10- 6	1.7

larity with the large cabin cruisers, yachts, and work boats only of minor importance.

7. The king salmon landed in the Ketchikan Derby were larger than the Juneau kings. The former averaged 84.7 cms in length and 19 pounds 13 ounces in weight while the latter fish averaged 74.1 cms and 14 pounds 6 ounces. Size of fish was related to the time of the derbies.
8. An overall value of 1.4 female king salmon for each male caught was obtained for the five derbies investigated.
9. Red-fleshed kings predominated in the derby catches. The Ketchikan area provided a higher red to white ratio than the Juneau area.
10. Scale analysis for age determination confirmed the reason for larger Ketchikan king salmon in that a higher percentage of older age groups was represented in this fishery than was found in the Juneau derbies.
11. Coho salmon in Juneau averaged 10 pounds 6 ounces and 67.5 cms in length and did not show the progressive decline in CPUE that the king salmon displayed.
12. All of the coho were mature fish (in last summer of growth) when they were available to the sport fishery.
13. The coho sex ratio was the reversal of that found in king salmon with 1.7 males for each female landed.

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