Volume 4

1962-1963

STATE OF ALASKA

William A. Egan, Governor

ANNUAL REPORT OF PROGRESS, 1962 - 1963

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-4

SPORT FISH INVESTIGATIONS OF ALASKA

Alaska Department of Fish and Game

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Sport Fish Division

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INTRODUCTION

This report of progress consists of Job Segment Reports from the State of Alaska Federal Aid in Fish Restoration Project F-5-R-4, "Sport Fish Investigations of Alaska".

The project is composed of 25 separate studies designed to evaluate the various aspects of the State's recreational fishery resources. While some studies are of a more general nature and deal with gross investigational projects, others have been developed to evaluate specific problem areas. These include studies of king salmon, silver salmon, grayling and State Access requirements. The information gathered will provide the necessary background data for a better understanding of local management problems and development of future investigational studies.

The assembled progress reports may be considered fragmentary in many respects due to the continuing nature of the respective studies. The interpretations contained therein, therefore, are subject to re-evaluation as work progresses and additional information is acquired.

Volume 4 Report No. 2-D

JOB DOMPLETION REPORT

RESEARCH PROJECT SEGMENT

State: ALASKA Name: Sport Fish Investigations of Alaska

Project No: F-5-R-4 Title: Investigations of the Upper Southeast Alaska Salt Water Sport Fish Harvest.

Job No: 2-D

Period Covered: May 14, 1962 to October 30, 1962.

Abstract:

This investigation was reactivated on May 14, 1962, to determine the species and estimate the numbers of fish harvested from the salt water sport fishery in the Juneau area. Lack of public interest in all but the king and silver salmon stocks and occasional halibut has forced report emphases to these fish. Investigation of accumulated data indicates insufficient data on sport halibut catches to be included here.

During the 1962 fishing season 2,395 salmon were sampled for various fishery and biological data (excluding derby caught fish) representing the effort of 1,557 boat trips. Overall catch per boat trip for all species of salmon was 1.54. This figure includes the commercial strip fisherman as well as sport fishermen. It was determined that 45.7% of the boats were sampled. The expanded salmon catch is estimated to be 5,240 fish (1285 taken by sport anglers and 3,955 taken by commercial strip fishermen).

Recommendations:

That the study be continued.

That attempts be made to increase angler contacts by increasing the size of the creel census crews from two to possibly four men.

That independent studies on the life cycle of the king salmon associated with the Alaskan economy be pursued.

Objectives:

To obtain an estimate of the species and numbers of sport fishes harvested from salt water in the Juneau area.

To obtain an index of the sizes and age classes of these saltwater fishes.

Techniques Used.

The community of Juneau, with its expanding population is producing an ever increasing demand on the local saltwater resource. The intensified interest in the sport harvest can be realized by noting the annual increase of anglers participating in the local Salmon Derby.

Sport fishing effort in the Juneau Area is concentrated primarily on the saltwater salmon species due to limited fresh water sport fishing areas. With increasing angling pressure comes the need for more information concerning the proper management of this fishery. Of primary concern is obtaining a thorough knowledge of the utilization rates upon this fishery so that the formulation of a satisfactory management program may result.

A creel census program was conducted during the 1962 fishing season in an effort to supply this vital data.

Of concern is the steady decline of king salmon stocks in the waters of Southeastern Alaska. Commercial fishery

statistics indicate that the harvest of this species has demonstrated a severe reduction during recent years. Due to this declining fishery the investigation started in 1959 by the Alaska Department of Fish and Game, was continued in 1962. The behavior pattern of king salmon subjects immature individuals to considerable angling pressure during much of their saltwater life. Information concerning the effect of this long exposure to the sport fishery is needed to insure its proper management.

Background information from prior studies conducted by the Alaska Department of Fish and Game and other agencies were reviewed and utilized during the course of the surveys.

Boat landings and areas of intensive angling were surveyed in a manner procuring a maximum number of interviews.

Weather conditions and fish migration patterns were considered in the selection of sampling areas and in the timing of sampling.

Lengths, weights, scales, flesh color and sex were recorded from the catch where possible.

The location of each catch was determined as close as possible.

Information on fishing techniques and equipment was collected as a part of each interview.

Findings:

A total of 2,395 salmon of all species were sampled during the 1962 season (excluding derby fish) from 1,557 boat trips in the Juneau area. Calculation of these figures reveal a catch per boat trip (C.P.U.E.) of 1.54 for all species of salmon. This figure includes the commercial strip fisherman as defined below as well as the strictly sport fisherman (Table 1).

The total sport and commercial strip fishing effort was estimated at 9,219 man hours for the report period. Sport anglers fished a total of 6,451 man hours in comparison to 2,858 man hours for the commercial strip fisherman. The heaviest fishing pressure (64%) determined by the number of boats interviewed occurred during the weekends. This greater weekend fishing pressure is further emphasized in that the weekend angler spends longer hours in pursuit of his quarry (Figures 1 and 2).

Table 1. The Numbers of Fish, Boats and Catch per Boat During the 1962 Season, Juneau Area.

	Species	No. Fish	*CPUE
SPORT (1129 Boats)	King	229	0.19
	Coho	330	0.27
	Pink	16	0.01
	Chum	12	0.01
Total:		587	0.48
COMMERCIAL STRIP (338 Boats)	King	426	1.26
	Coho	1311	3.87
	Pink	52	0.15
	Chum	19	0.05
Total:		1808	5.34
COMBINED SPORT & COMMERCIAL STRIP (1557 Boats)	King	655	0.42
	Coho	1641	1.05
	Pink	68	0.04
	Chum	31	0.02
Total:		2395	1.54

* Catch Per Unit of Effort Boat Trips.

A total of 2,776 sport and 338 commercial strip anglers were contacted during the census period. This resulted in 2.3 anglers per boat for sport fishermen and 1.0 angler per boat for commercial strip anglers.

Figure 1. FISH PER BOAT DURING WEEKEND PERIODS.

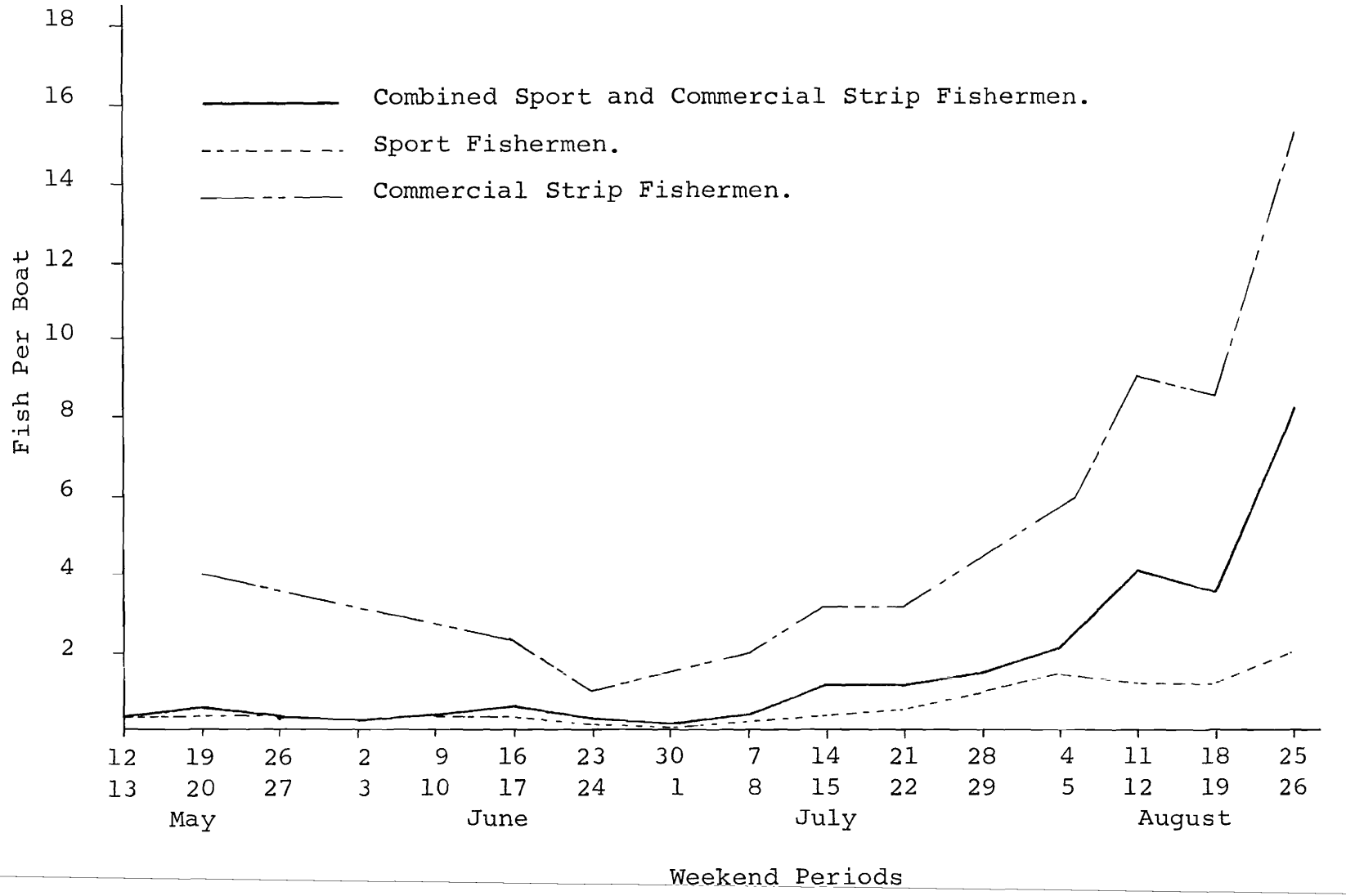
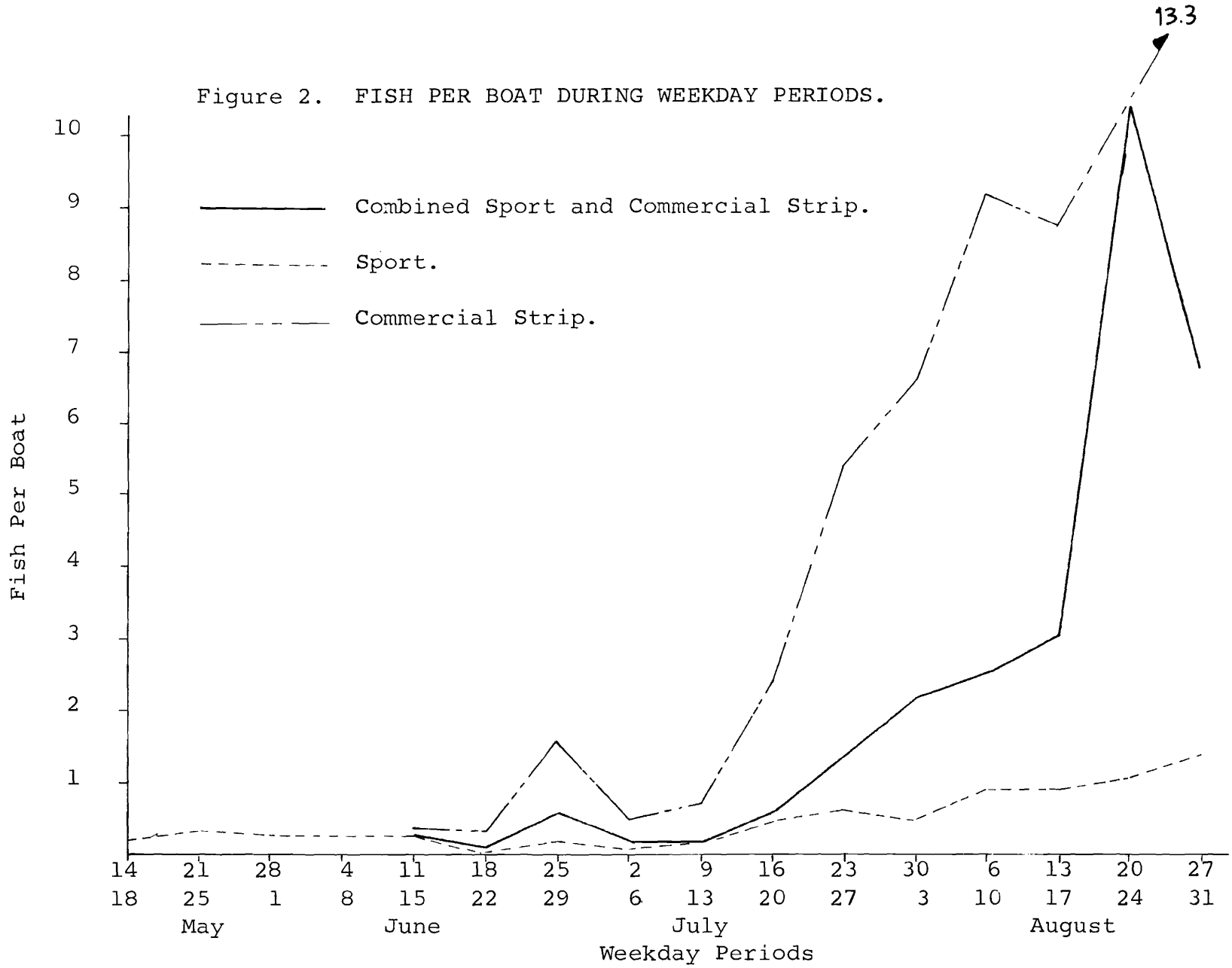


Figure 2. FISH PER BOAT DURING WEEKDAY PERIODS.



Commercial strip fishermen are defined as those fishermen who use pleasure type boats and sport tackle but who posses a commercial fishing license and may sell their fish. The possession of a commercial license allows the fisherman to use up to four fishing rods per boat while the sport fisherman is restricted to the use of only one fishing rod per person. The commercial strip fisherman is also exempt from the daily limit regulation on king salmon.

A comparison of the sport and commercial strip fisherman (C.P.U.E.) shows that the commercial fisherman had a catch per boat trip eleven times greater than the sport fisherman. Several reasons appear responsible for the larger catch by the commercial strip fisherman:

(a) They fished longer hours, spending 8.5 hours per boat trip as compared to 5.3 hours per boat trip for sport fisherman.

(b) They could use more than one rod.

(c) They were generally the more experienced fisherman.

The sport catch of king salmon (Oncorhynohus tshwytscha) based on 1,219 boats contacted was 229 fish. This resulted in an overall seasonal catch per boat trip of 0.19 for king salmon. A much greater success was achieved by the commercial strip fishermen who caught a total of 426 king salmon for a catch per boat trip of 1.26 for the season (Table 1).

The seasonal C.P.U.E. for the coho salmon (O. kisutch) was 0.27 fish for sport anglers while the commercial strip fisherman had a seasonal catch per boat trip of 3.87.

The combined C.P.U.E. for sport anglers and commercial strip fishermen for pin and chum salmon (O. Gorbuscha, and O. Keta) was 0.04 and 0.02 respectively.

Timing of the Various Species into the Fishery

Beginning in late April and running until late June, king salmon were the only species landed in the sport catch. At this time the coho salmon began to enter the catch. These species were followed in early July by both the pink and chum salmon (Figure 3).

The angler success for king salmon as measured by catch per boat trip indicated a rise in numbers of fish caught during the early part of May, with angler success remaining at a fairly stable level during the remainder of the month and throughout most of June. A rapid decline occurred during late June which was immediately followed by a gradual increase which reached a peak in late July. During the early months of the season the effort was conducted primarily on a mature stock of fish which passed through the fishery on their spawning migration. These fish were replaced by an immature feeding population during the remainder of the season.

The coho salmon entered the fishery in late June and showed a steady increase throughout the remainder of the study period (Figure 3). Angler success was found to be greatest for this species upon termination of the creel census.

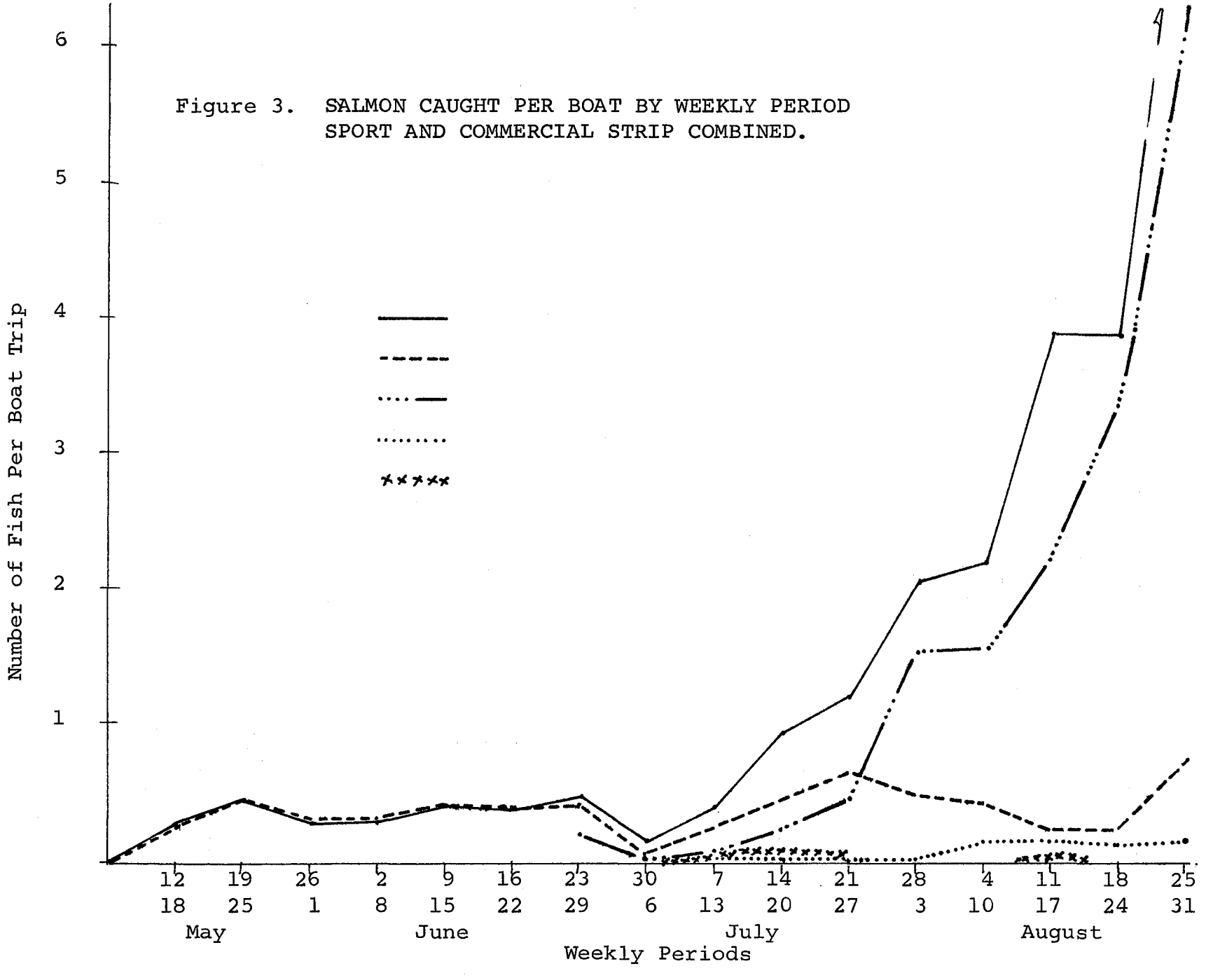
Pink and chum salmon, although present in the fishery from early July throughout the remainder of the season, did not contribute significantly to the total harvest (Figure 3).

The seasonal king salmon harvest of 655 fish was considerably below that recorded in 1960 when 1637 king salmon were taken. This season's take was also somewhat lower than the 837 recorded in 1961.

Before any attempt to evaluate the apparent decline of the species can be undertaken the study must be continued to include the entire life cycle of this fish.

The sport fishing regulations presently in effect in the Juneau waters limits the daily king salmon take

Figure 3. SALMON CAUGHT PER BOAT BY WEEKLY PERIOD
SPORT AND COMMERCIAL STRIP COMBINED.



to 50 pounds of salmon or three fish, whichever is least restrictive, provided that the king salmon are not less than 26 inches in total length. No size or possession limits are currently in effect on the other species of salmon. All freshwater streams in the immediate Juneau area are closed to all salmon fishing.

At present it is not felt that the sport fish harvest (229 fish in 1962) is the major cause of the king salmon decline.

Estimated Seasonal Harvest

A major problem encountered during the course of the study was the incomplete angler contact obtained at the principle boat landings. This problem resulted from the limited number of census clerks available to cover the numerous boat harbors and private moorages used by the Juneau area anglers. In an effort to determine the degree of sampling coverage the fishing areas were surveyed by airplane on Saturday and Sunday throughout the season. The aerial counts revealed a 45.7 per cent boat contact using the census methods employed. With this ratio coverage the expanded salmon catch in the Juneau area is estimated to be 5240 fish (1285 taken by sport anglers, 3955 taken by commercial strip fishermen).

The 733 salmon taken during the annual salmon derby were not used in obtaining the fore mentioned seasonal estimate because of the specialized nature of this fishery.

Other Species

Halibut (Hippoglossus stenolepis) are found in fairly abundant numbers in the Juneau area. A small segment of the angling public prefer these fish to salmon and fish explicitly for this species. Dolly Varden (Salvelinus malma), various species of rock fish (Scorpaenidae), ling cod (Ophiodon elongatus), and several species of greenling (Hexagrammidae) are occasionally taken by the sport fishermen while pursuing the more highly prized salmon.

Fishing Success by Area

The fishing waters most commonly utilized by the Juneau anglers were divided into 18 separate areas. Areas 1 and 2 were not fished by Juneau anglers while areas 3, 4, 5 and 9 received only light fishing pressure (Figure 4).

Areas 10, 11 and 12 received the heaviest pressure. These areas are close to the small boat harbors at Auke Bay and Tee Harbor, are easily accessible and produced a good C.P.U.E.

During the early portion of the season (May - June) the most heavily fished waters were located south of Juneau in areas 17 and 18 (Figure 14). At this time the harvest was composed primarily of a mature stock of king salmon apparently headed for spawning grounds located in the Taku River drainage. With the passing of these fish and the increase glacial turbidity of the water, fishing intensity shifted during the first of July to the more northerly areas adjacent to Shelter Island.

Success by Boat, Type, Gear and Method of Fishing

The closed 16-20 foot outboard powered boat proved to be very popular with the Juneau anglers (Table 2). A total of 1647 fish were caught by 1095 boats of this type for a C.P.U.E. of 1.50.

Large cabin boats with inboard power, although not as popular as the smaller boats, had a good C.P.U.E. of 2.49 for 144 boats interviewed.

Small open skiffs were used by many fishermen during the season but produced a much lower C.P.U.E. than the larger boats. This may be explained in part by the ability of the larger boats to stay out in bad weather and go farther afield. Fresh herring was superior to frozen herring as bait. The most popular and successful baid used was the strip cut fresh herring. Whole and plug cut herring were also used but with less success (Figure 5).

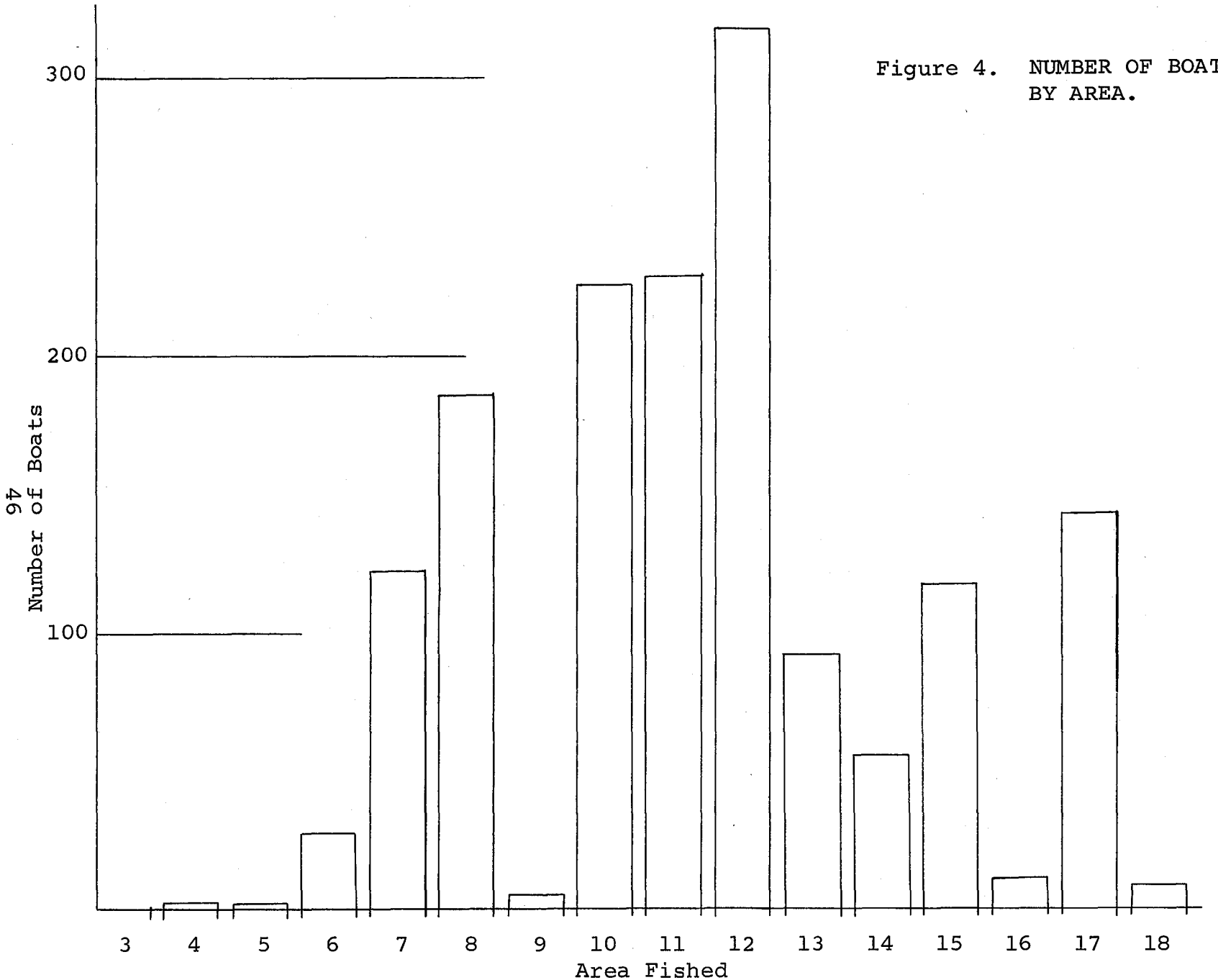


Figure 4. NUMBER OF BOATS BY AREA.

Table 2. Salmon Caught by Boat Type, Juneau Area, 1962.

	Open 20' Outboard	Open 20' Inboard	Cabin 16-20' Outboard	Cabin 16-20' Inboard	Large Cabin 20' Outboard	Large Cabin 20' Inboard
No. Boats	204	1	1095	22	65	144
King salmon	39	0	441	9	48	92
Coho salmon	89	25	1124	17	30	260
Pink salmon	0	0	58	0	1	4
Chum salmon	2	2	24	0	0	3
Total:	130	27	1647	26	79	359
C.P.U.E.	0.64		1.50	1.18	1.22	2.49

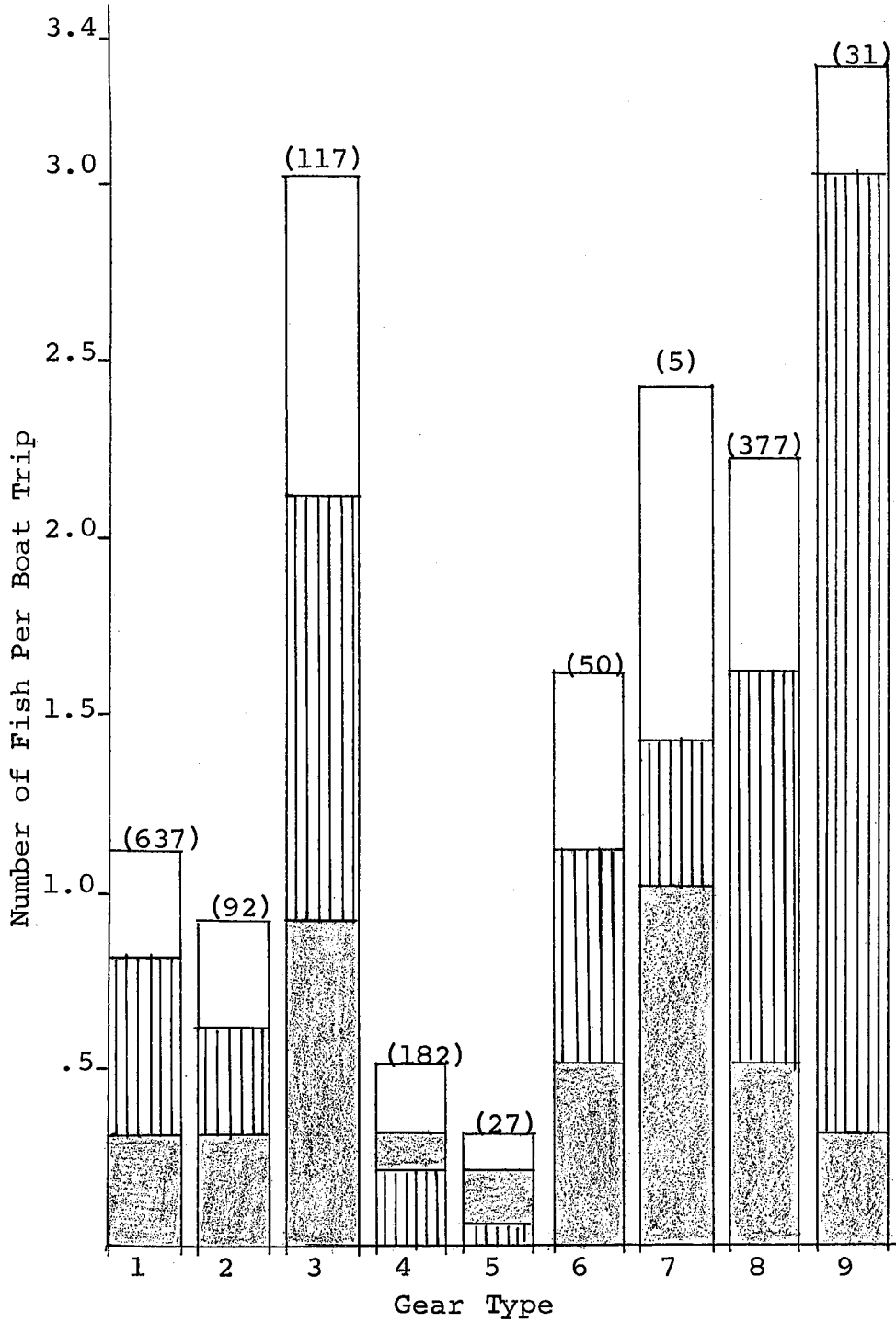


Figure 5. CATCH PER UNIT OF EFFORT BY GEAR TYPE. FIVE OR MORE BOATS. BOAT SAMPLE SIZE IN ( ).

GEAR TYPE

1. FRESH HERRING - WHOLE
2. FRESH HERRING - PLUG CUT
3. FRESH HERRING - STRIP CUT
4. FROZEN HERRING - WHOLE
5. FROZEN HERRING - PLUG CUT
6. FROZEN HERRING - STRIP CUT
7. PLUGS
8. OTHER
9. COMBINATION OF 1-6

TOTAL SALMON

KING

COHO

Artificial lures such as spoons, flashers and plugs were seldom used by the early season angler. But with the appearance of the coho salmon these lures were more frequently used although they never obtained the popularity and success of fresh herring.

The most popular method of fishing was trolling. Nearly 60 per cent of all king salmon and 75 per cent of all coho salmon were caught in this manner (Figure 6).

Sex Ratio

Female king salmon were more dominant in the catch with 62 per cent females and 38 per cent males (Table 3).

The information collected during the study indicated a greater number of male king salmon were caught during the early season. As the season progressed a higher percentage of females were taken (Figure 7). Perhaps this high ratio in favor of females may be explained by the precocious nature of the male king salmon. Recent studies on Alaskan salmon streams have revealed a high percentage of precocious males on the spawning grounds. The low male sex ratio in the saltwater fishery may be caused by the loss of these fish at a time when they are just reaching or have reached legal size. The increased number of male kings during the early season spawning migration would indicate that this is the case. The female king salmon do not generally reach maturity until after their fourth year; thus are present in the fishery for a greater period of time.

The overall catch of coho salmon showed almost equal distribution of sex with males being somewhat more dominant with 52 per cent (Table 3).

Pink and chum salmon entered the fishery in small numbers and the sex ratio of this small sample may not be indicative of the overall sex composition for these species (Table 3).

Figure 6. FISHING METHODS USED TO CATCH KING AND COHO SALMON.

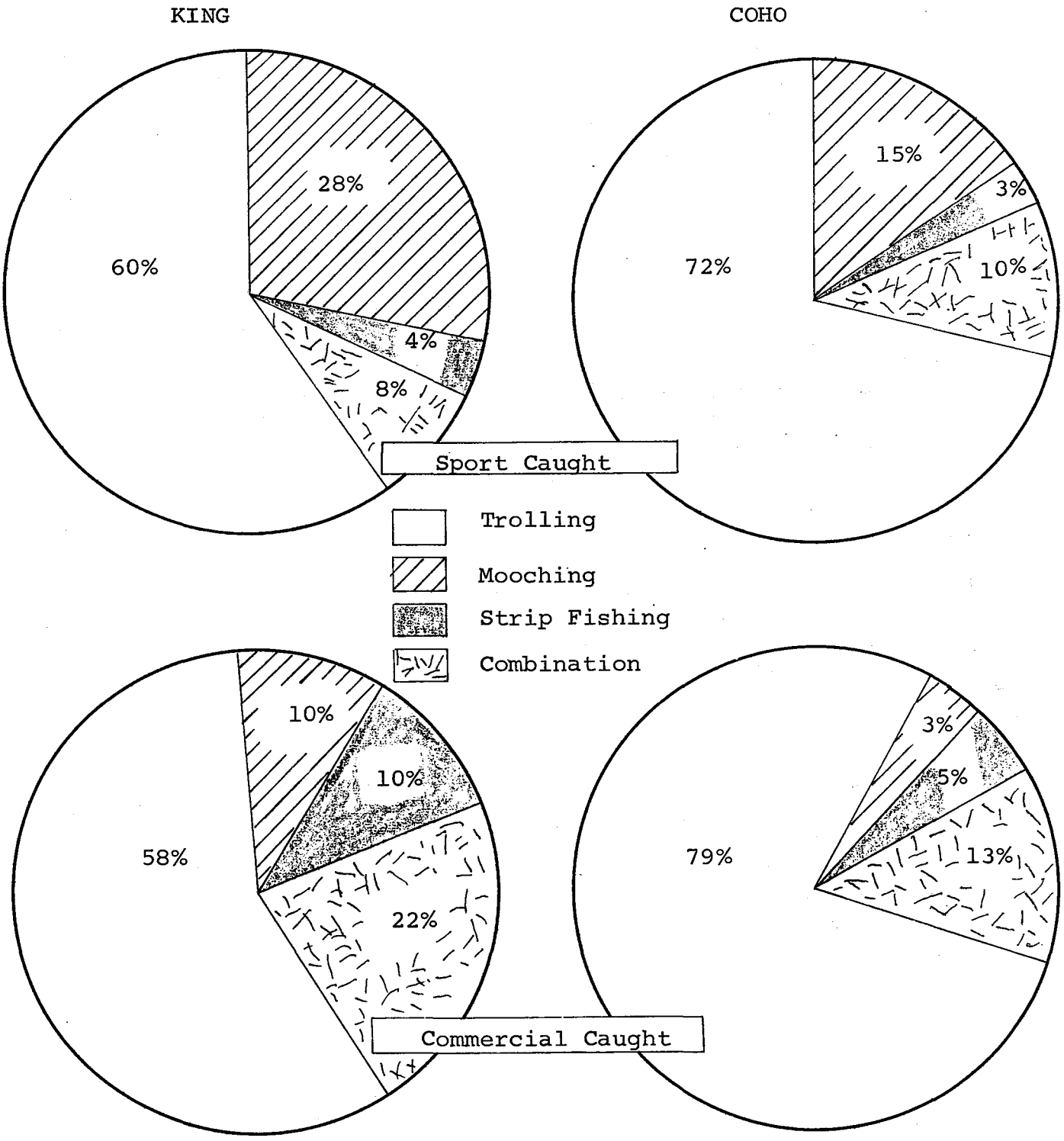


Figure 7. PER CENT MALE SALMON BY WEEKLY PERIODS.

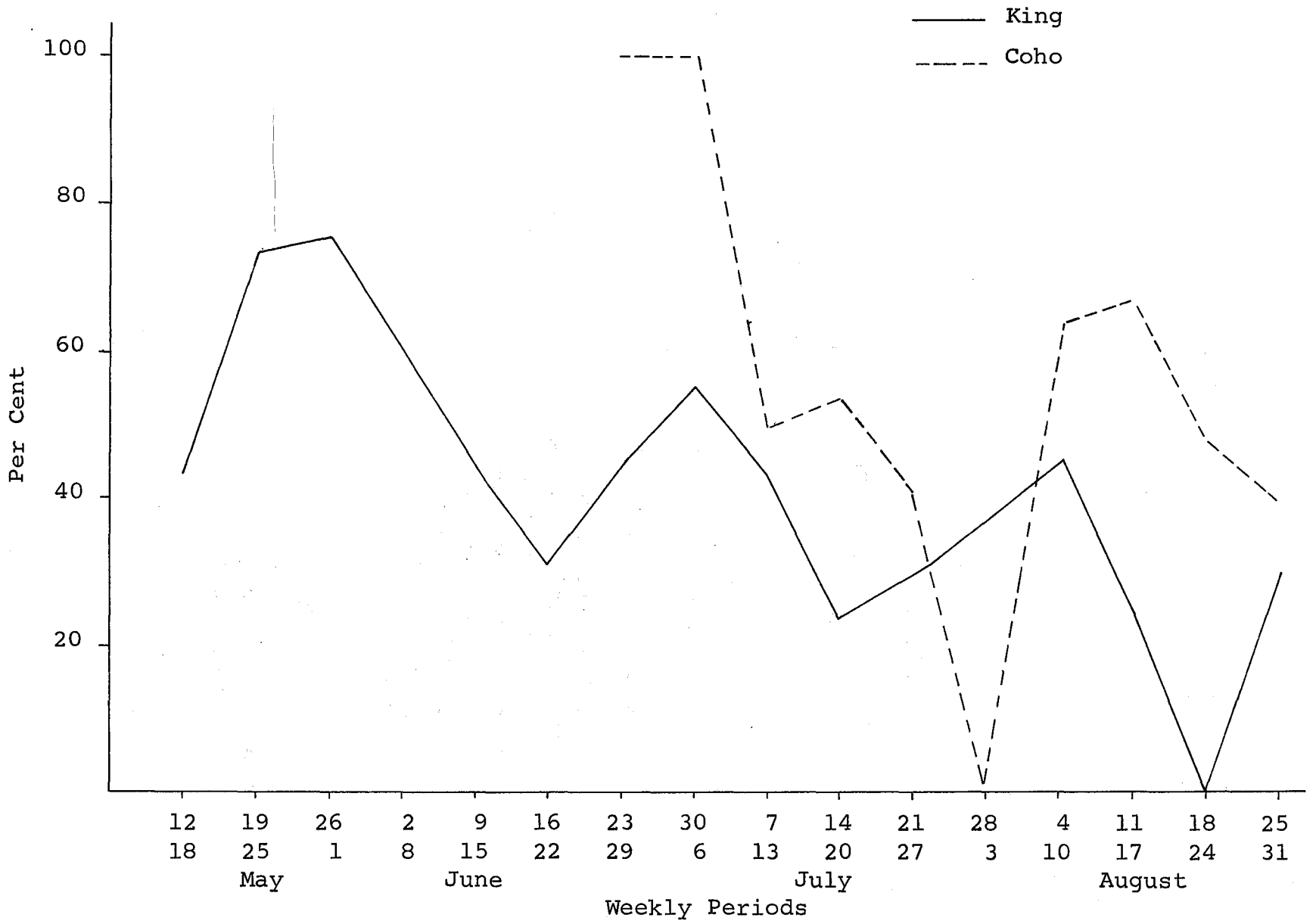


Table 3. Sex of Salmon by Species Taken by Sport and Commercial Strip Fishermen

Species	Total Fish	No. of Males	Per Cent Males	Per Cent Females
King	184	69	37	63
Coho	220	114	52	48
Pink	4	1	25	75
Chum	8	3	38	62

King Salmon - Flesh Color

Red-fleshed king salmon were more dominant in the catch in the Juneau area. Of the total, 61.6 per cent were red and 38.4 per cent were white.

Early and late in the season more white-fleshed kings were caught (Figure 8). However, in total numbers they did not approach the number of red-fleshed kings (Figure 9).

Fish Sizes and Age Classes

During the early stages of the fishing season large king salmon comprised the bulk of the harvest. As these fish passed through the fishery they were replaced by a smaller sized feeding population. The kings averaged the largest size during the peak of the spawning migration (Figure 10). Coho, pink and chum slamon enter the sport harvest only as mature fish and therefore their average size remains fairly stable throughout the season (Figure 10).

The average length for king salmon was 33.5 inches and a dressed weight of 15.6 pounds (Table 4).

The average length and dressed weights for coho, pink and chum are as follows:

coho 27.0 inches and 8.2 pounds; pink 24.5 inches and 5.1 pounds; chums 26.0 inches and 8.5 pounds (Table 4).

Figure 8. PER CENT RED FLESHED KING SALMON BY WEEKLY PERIODS

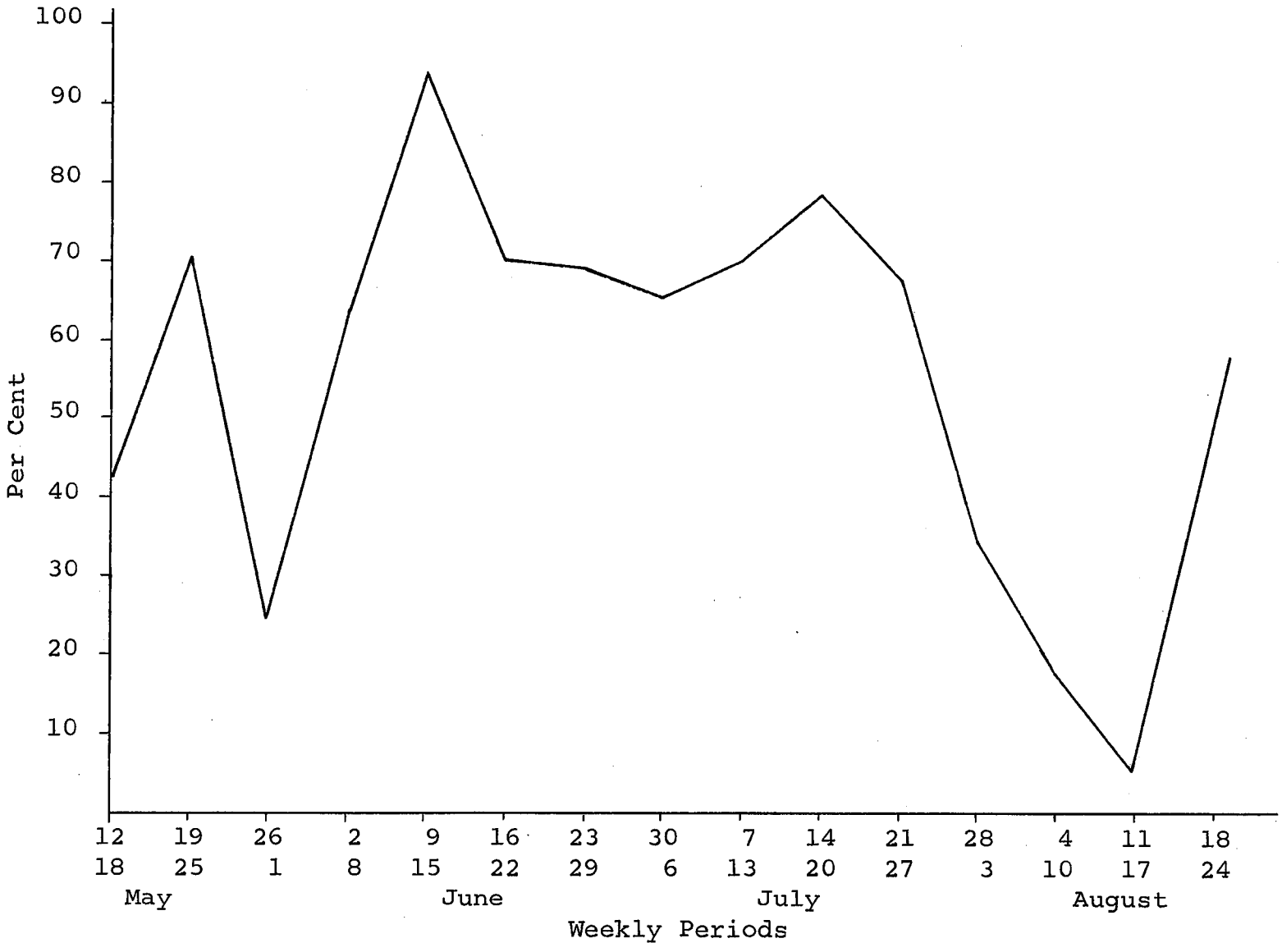


Figure 9. FLESH COLOR OF KING SALMON BY WEEKLY PERIODS

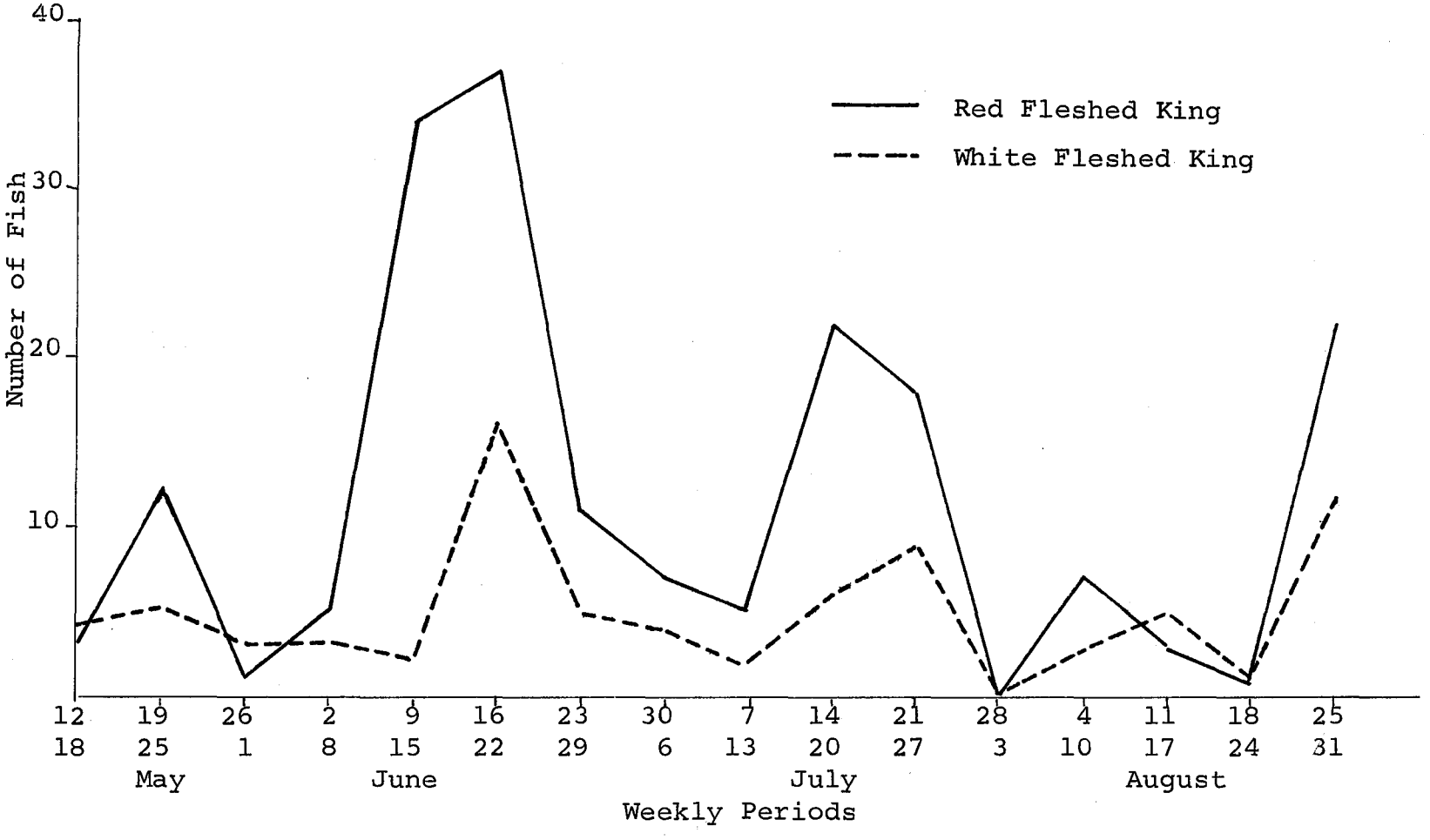


Figure 10. AVERAGE LENGTH OF SPORT AND COMMERCIAL STRIP SALMON BY WEEKLY PERIODS

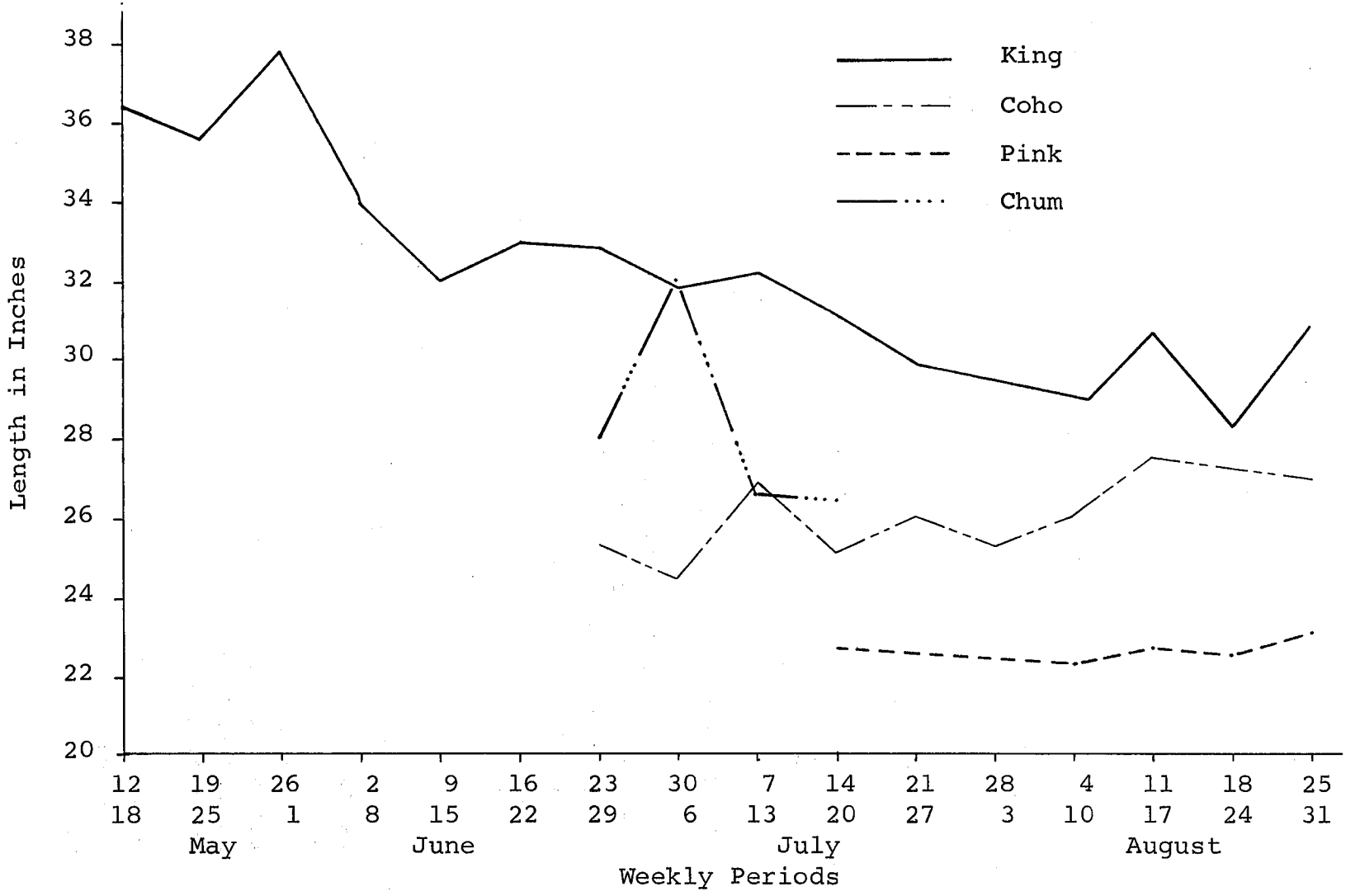


Table 4. Average Lengths and Weights of Salmon for the 1962 Fishing Season, Juneau Area.

Species	Average Length	Average Weight
King	33.5 inches	15.6 pounds
Coho	27.0 inches	8.2 pounds
Pink	24.5 inches	5.1 pounds
Chum	26.0 inches	8.8 pounds

Dressed weight for king salmon showed a steady decline throughout the season (Figure 11). This can be contributed to the absence of spawning size fish after the middle of July. Weights of the other species remained fairly stable throughout the season.

Areas 6, 8, 13 and 16 (see map Figure 14) produced the largest sized king salmon (Figures 12 and 13).

Preliminary work was completed on the reading of scale samples taken from the sport caught salmon. Results showed that these fish fall into the same age classes as had been found from scale sampling in previous years. A complete analysis of the scale samples will be completed at a later date.

1962 Juneau Salmon Derby Results

The annual Juneau Salmon Derby sponsored by the Territorial Sportsmen, Inc., was held on Friday, Saturday and Sunday, July 27, 28 and 29. The derby was conducted in areas 7-16 (Figure 14). The boundaries were marked by red shore markers and patrolled by derby officials. Derby contestants were required to comply with State sport fishing regulations.

Boats left the starting line at 8:00 A. M. and were required to return to the dock by 6:00 P. M. Upon returning to the official weigh-in stations at Auke Bay and Tee Harbor,

Figure 11. AVERAGE WEIGHT OF DRESSED SALMON BY WEEKLY PERIODS

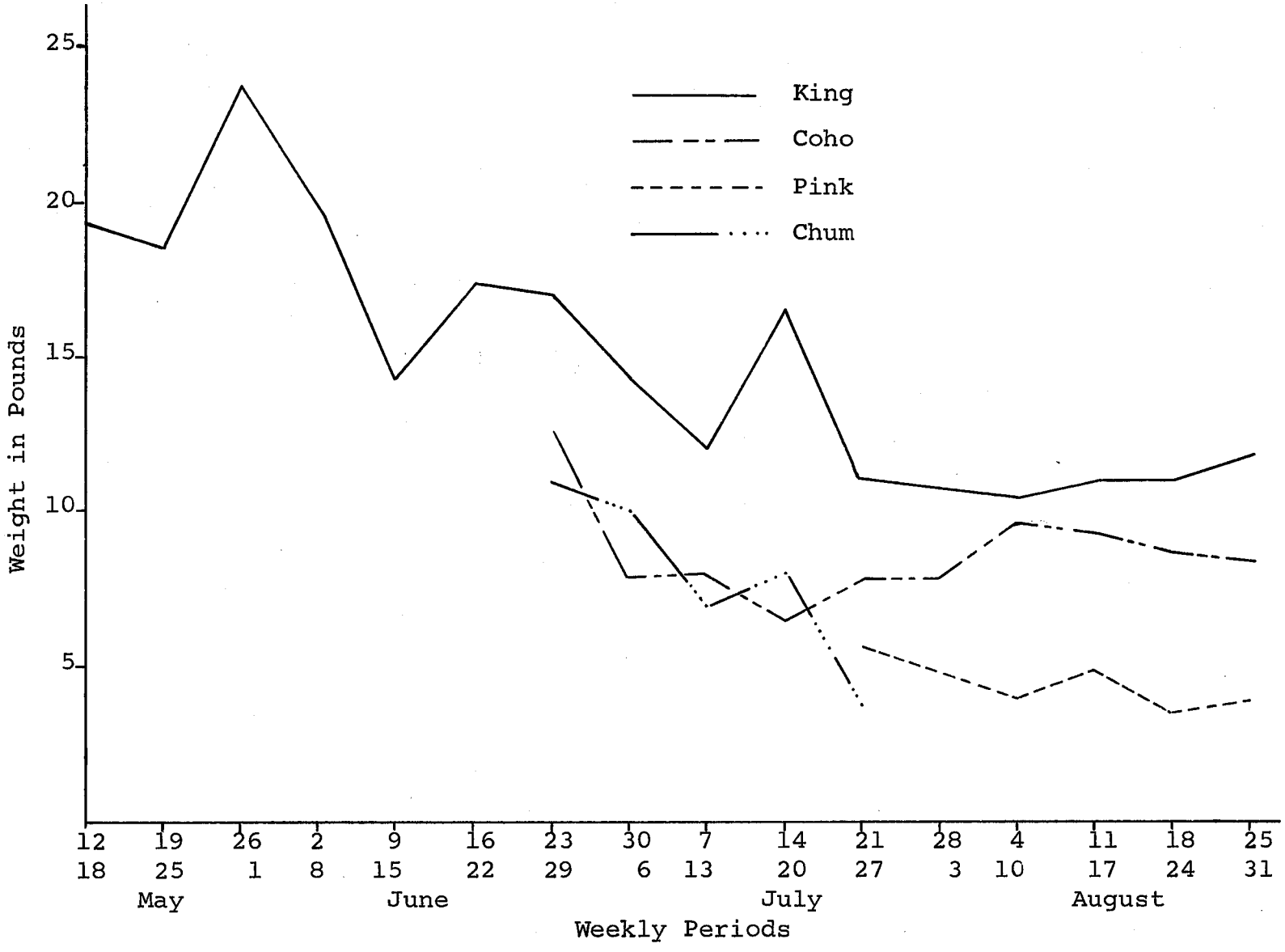


Figure 12. AVERAGE WEIGHT OF DRESSED SALMON BY AREA

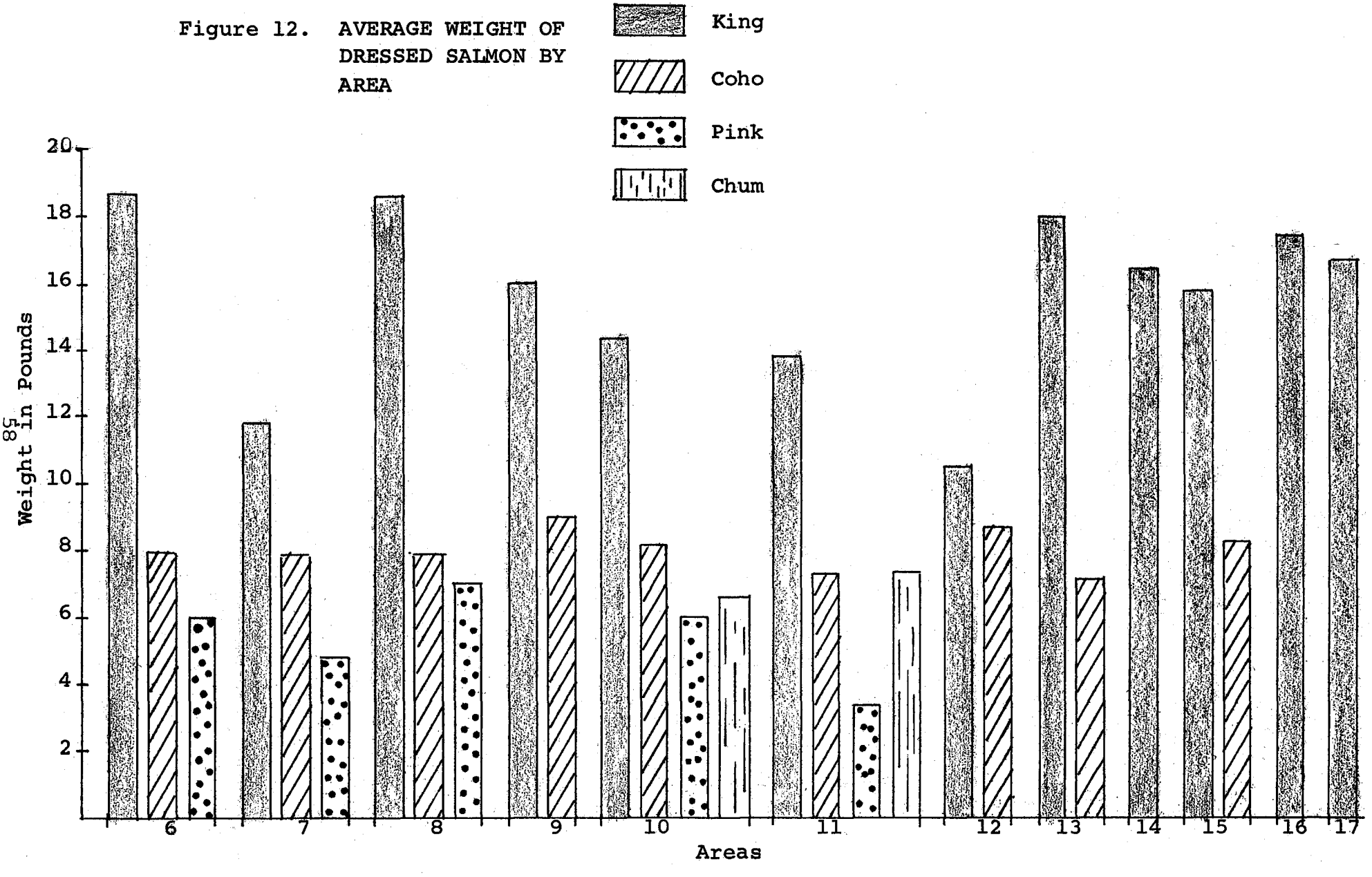
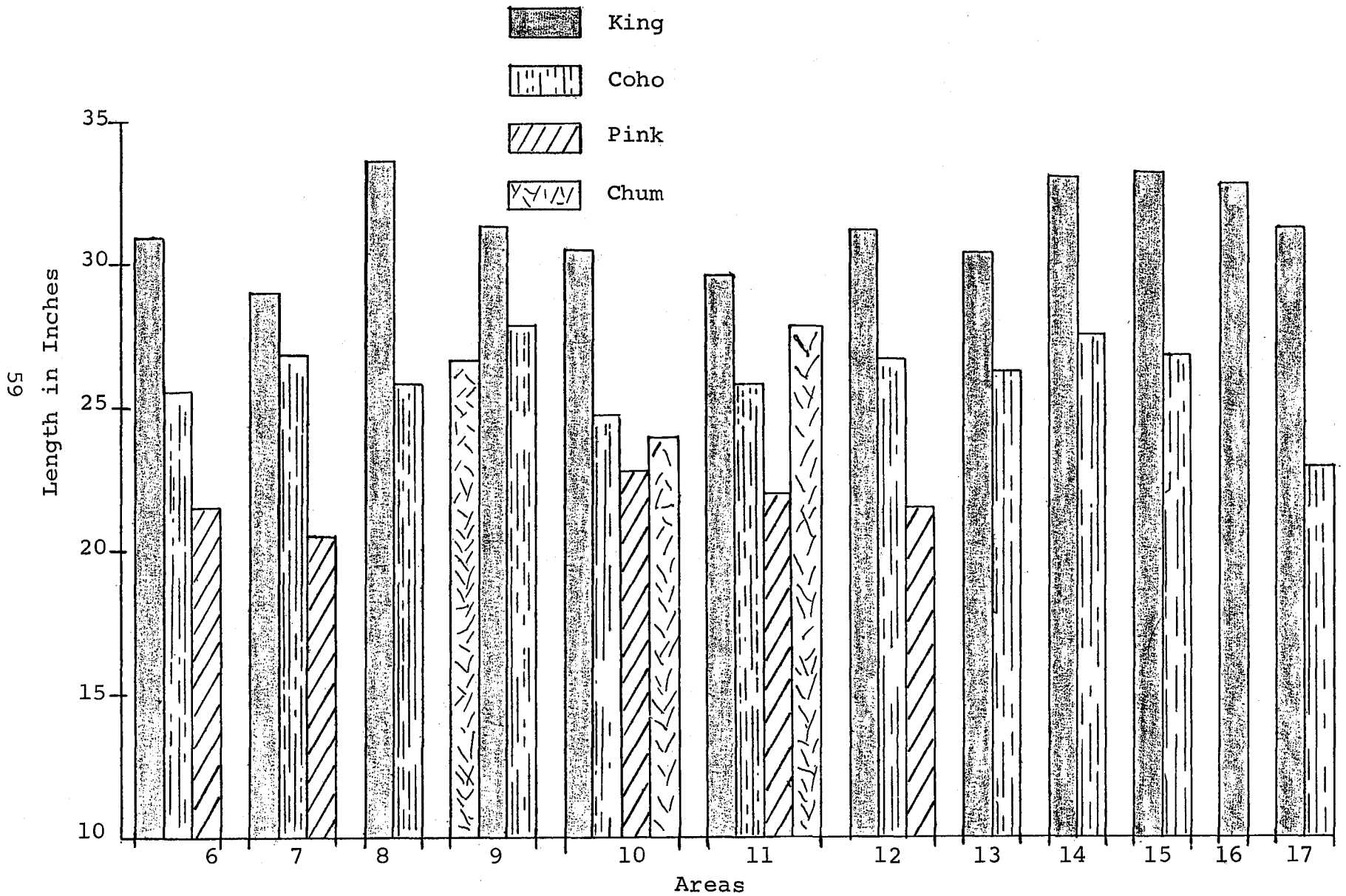


Figure 13. AVERAGE LENGTH OF SALMON BY AREA



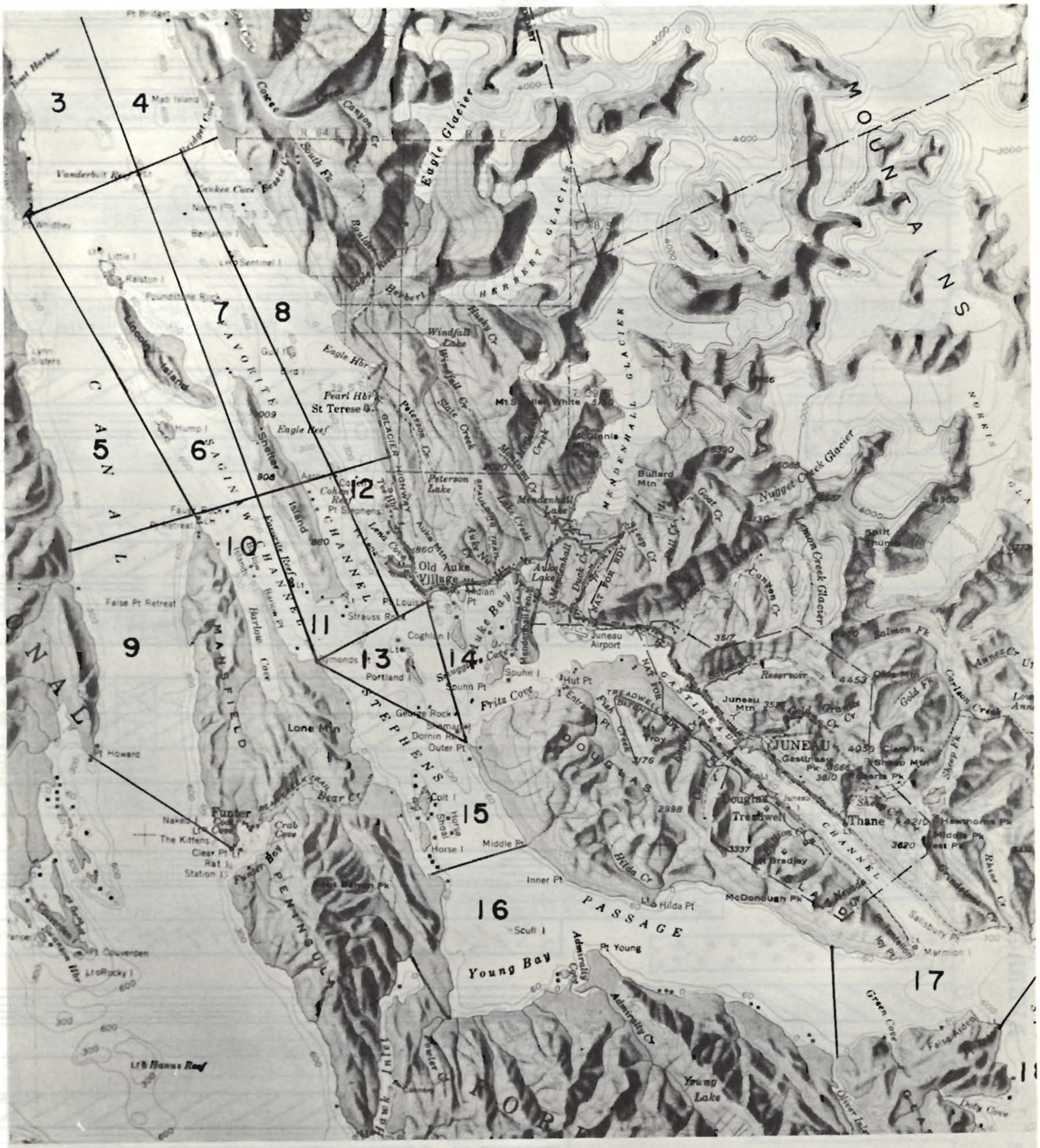


FIGURE 14 *Areas Covered During the 1962 Creel Census*

the salmon were sampled for species, weight, length, sex and color of flesh. Additional information concerning boat type, type of bait and method of fishing was obtained from the fishermen.

The results of the sampling are as follows:

A. Biological Factors:

A total of 226 king and 490 coho salmon were recorded during the three day derby. Of this total, 204 kings and 90 coho were sampled for various biological variables.

The king salmon averaged 29.5 inches in length and 13.9 pounds in weight (Table 5).

Coho salmon sampled during the derby averaged 26.5 inches in length and 9.3 pounds in weight (Table 5).

Flesh color of the king salmon was investigated during the derby and findings showed 73 per cent to be red and 27 per cent to be white (Table 6).

Sex composition was recorded for both king and coho salmon. It was found that female king salmon comprised 66 per cent of the total whereas only 34 per cent of the coho salmon were females.

B. Fishery Factors:

Approximately 2033 fishermen using 782 boats took part in the 1962 salmon derby.

The combined C.P.U.E. for coho salmon and king salmon was 0.35 for fishermen and 0.92 for boats (Table 7).

There were approximately 2.6 fishermen per boat and they spent an average of 5.8 hours a day fishing.

The type of boat used by the fishermen during the derby was recorded and it was found that the 16-20 foot cabin boat with outboard was the most popular (Table 7).

Table 5. King and Coho Salmon Weights and Lengths, 1962 Salmon Derby, Juneau Area.

	KING SALMON			COHO SALMON		
	Average Length	Average Weight	Sample Size*	Average Length	Average Weight	Sample Size*
Auke Bay	29.5	13.8	130	26.9	9.5	45
Tee Harbor	29.5	14.0	74	26.1	9.1	45
Total:	29.5	13.9	204	26.5	9.3	90

* Number of fish measured and weighed were taken from a sample of 226 king and 490 coho salmon.

Table 6. Flesh Color of King Salmon and Sex Composition of King and Coho Salmon, 1962 Salmon Derby, Juneau.

FLESH COLOR OF KING SALMON

	No. of Red	No. of White	TOTAL	Per Cent Red	Per Cent White
Auke Bay	78	35	113	69	31
Tee Harbor	59	15	74	80	20
TOTAL:	137	50	187	73	27

SEX COMPOSITION OF KING SALMON

	No. of Males	No. of Females	TOTAL	Per Cent Males	Per Cent Females
Auke Bay	43	76	119	36	64
Tee Harbor	22	52	74	30	70
TOTAL:	65	128	193	34	66

SEX COMPOSITION OF COHO SALMON

	No. of Males	No. of Females	TOTAL	Per Cent Males	Per Cent Females
Auke Bay	17	10	27	63	37
Tee Harbor	30	15	45	67	33
TOTAL:	47	25	72	65	35

Table 7. Catch Per Unit of Effort for King and Coho Salmon, 1962 Juneau Salmon Derby

	TEE HARBOR			AUKE BAY			TOTAL		
	King	Coho	TOTAL	King	Coho	TOTAL	King	Coho	TOTAL
CPUE for Fishermen	0.10	0.22	0.32	0.12	0.25	0.37	0.11	0.24	0.35
CPUE for Boats	0.26	0.58	0.84	0.31	0.66	0.97	0.29	0.63	0.92

Number of Boats by Type in Salmon Derby*

	Open Skiff	Small Cabin 16-20'	Large Cabin Over 20'
Tee Harbor	20	49	2
Auke Bay	14	60	7
TOTAL:	34	109	9

Number of Fishermen Per Boat Type for Salmon Derby*

	Open Skiff	Small Cabin 16-20'	Large Cabin Over 20'
Tee Harbor	2.6	2.5	3.5
Auke Bay	2.3	2.7	2.6
TOTAL:	2.5	2.6	3.1

* These totals were taken from a sample of 152 boats.

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Date: February 28, 1963.

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Successful anglers and collection of current biological data are an integral part of fishing research.