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STATE OF ALASKA

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Sport Fish Division

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ANNUAL REPORT OF PROGRESS, 1961-1962

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-3

SPORT FISH INVESTIGATIONS OF ALASKA

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INTRODUCTION

This report of progress consists of the job completion reports from the State of Alaska Federal Aid in Fish Restoration Project F-5-R-3, "Sport Fish Investigations of Alaska."

The current project is composed of twenty separate studies and was designed to evaluate the various aspects of the State's recreational fishery resources. The information gathered will provide the necessary background data for better management practices and for the development of future studies. During the current segment, continued emphasis was placed on the overall inventory and cataloging of accessible waters, evaluation of catch data, and investigations on various species of fish.

As a result of several problems of immediate concern, several new studies were instigated during the report year. Data accumulated from these studies has helped solve some problems in projects already in progress.

The population of Alaska is increasing rapidly and this is being reflected in the ever increasing number of "No Trespassing" signs put up by individuals in the vicinity of population centers. Fortunately, much of Alaska's fishery waters are still in the public domain. The division's program of acquiring access to fishing waters continued at a much faster pace since being instigated in 1959. Emphasis is being placed on this job and the successful continuation of this activity will forstall many serious recreational use problems currently facing other states.

The enclosed progress reports are fragmentary in many respects and the interpretations contained therein are subject to re-evaluation as the work progresses.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT

State: ALASKA

Project No: F-5-R-3 Name: Sport Fish Investigations
of Alaska

Job No: 7-B-2 Title: Evaluation of the King
Salmon Sport Fisheries
on the Lower Kenai Pen-
insula.

Period Covered: July 1, 1961 to June 30, 1962

Abstract:

A creel census was conducted from May 20 to July 4 on the Anchor River to determine estimates of king salmon harvest and fishing effort. Salmon escapement information was obtained by aerial and foot surveys. Collection of scales provided data on age and growth. A description of the area and methods is presented. A brief review of the commercial fishery affecting the Anchor River is given and possible factors contributing to the apparent king salmon decline are discussed. Past work on anadromous fishes of the Anchor River by the Bureau of Sport Fisheries and Wildlife and the Alaska Department of Fish and Game provided background information for the current investigation.

Recommendations:

It is recommended that the king salmon sport fishing regulations now in effect on the Kenai Peninsula be continued until future investigations suggest modifications.

It is recommended that the creel census program and escapement enumeration on the Anchor River for king salmon be continued during the 1962-1963 segment.

Objectives:

To investigate and measure the sport fish population trends and fishing success, with emphasis on king salmon, in the major recreational fishing streams on the lower Kenai Peninsula.

To evaluate the effect of management procedures currently applied to these sport fishing waters.

To provide recommendations for management of king salmon in these waters and direct the course of **future** studies.

Techniques Used:

A creel census was conducted on the Anchor River from May 20 to July 4. Two census clerks were billeted in a housetrailer which also served as a checking station. The trailer was situated at the junction of the only road extending to the mouth of the Anchor River and the old road to Homer. This location was less than 100 yards from the Anchor River Forks, the upper limit of the open area, which made it necessary for nearly all anglers to pass the census station. A 16 hour period was sampled on the days selected for censusing. All weekends and holidays and one-half of the weekdays were censused. During a census period each vehicle leaving the area was stopped and asked the following questions: (1) number of anglers per car; (2) number of hours fished that day; (3) number of king salmon taken. All king salmon which had not been dressed were weighed, measured, sex determined and scales taken for age analysis. Each evening on census days a car count was made in the camping areas along the river to determine the number of overnight fishermen. A few anglers were observed fishing all night because of the extended daylight at this time of the year.

King salmon escapement counts were determined by aerial and foot surveys. A three mile section of the South Fork was counted by foot and correlated with aerial counts made a short time later over the same section and the entire stream.

Age analysis was determined by the Fish and Wildlife Service at the Auke Bay Laboratory.

Findings:

The Anchor River drains into Cook Inlet near the town of Anchor Point on the lower Kenai Peninsula. This stream is accessible by road from the greater population areas. The Anchor River is a meandering stream that drains 226 square miles of muskeg plateau. Two chief tributaries, the South and North Fork, meet two miles above its mouth and are about 30 and 15 miles in length, respectively. Vegetation lining the banks is mainly alder, willow and cottonwood. The water is slightly brown from humic materials. The mean annual stream flow for the past seven years was 280 c.f.s. High water levels peak in May with stream flows that average 915 c.f.s. Allin (1954, 1956, 1957) has described the area in greater detail.

The area of the stream open to salmon fishing in 1961 was the two mile section between the mouth and the confluence of the North and South Forks. The limit on king salmon was one per day over 20 inches. The season extended from May 7 to July 4.

King salmon (Oncorhynchus tshawytscha) are the most highly prized sport fish on the Kenai Peninsula. These fish are available primarily during late May and June and are fished chiefly in the Anchor River, Ninilchik River and Deep Creek. In the past, Stariski Creek and Crooked Creek (closed to sport fishing since 1960) were also fished during this period. Of these five lower Kenai Peninsula salmon streams, Anchor River is the largest and supports some of the heaviest angling pressure in Alaska. The data available, first collected in 1954, indicates a considerable increase in angling effort in the last seven years. The sport harvest has also increased but not in the same proportion. Commercial fishery statistics and reports of residents indicate that king salmon stocks are at a low level in Cook Inlet streams. Because of this declining fishery the investigation initiated in 1960 on harvest, angling effort and escapement of king salmon in the Anchor River was continued through 1961.

King salmon sport fishing season on the Kenai Peninsula opened May 7 but the creel census was not started until May 20. During the early part of the fishing season the Anchor River is high and turbid so most of the initial fishing effort is on the Ninilchik River which is also high but usually clear. The Anchor River king run this year followed the same pattern as in the past with the fish coming in rapidly during the last week in May and the first half of June then gradually tapering off until by the first of July the run is virtually over. The weekly distribution of catch and effort is presented in Figure 1 showing that harvest closely followed fishing effort. The total legal catch of king salmon was estimated at 1,012 fish (± 266 at the 95 per cent confidence level) and the total fishing effort at 6,165 man-days. Dunn (1960) estimated that 1,150 kings were taken by 5,300 man-days of effort in 1960. Allin (1954, 1956, 1957) estimated the harvest at 293 below the Forks in 1954, 900 for the system in 1956 and 335 in 1957. Fishing effort during this period was considerably less. Allin reported 3,000 man-days in 1954 and 5,800 in 1957; however, these figures represent the entire summer and include angling effort for other species.

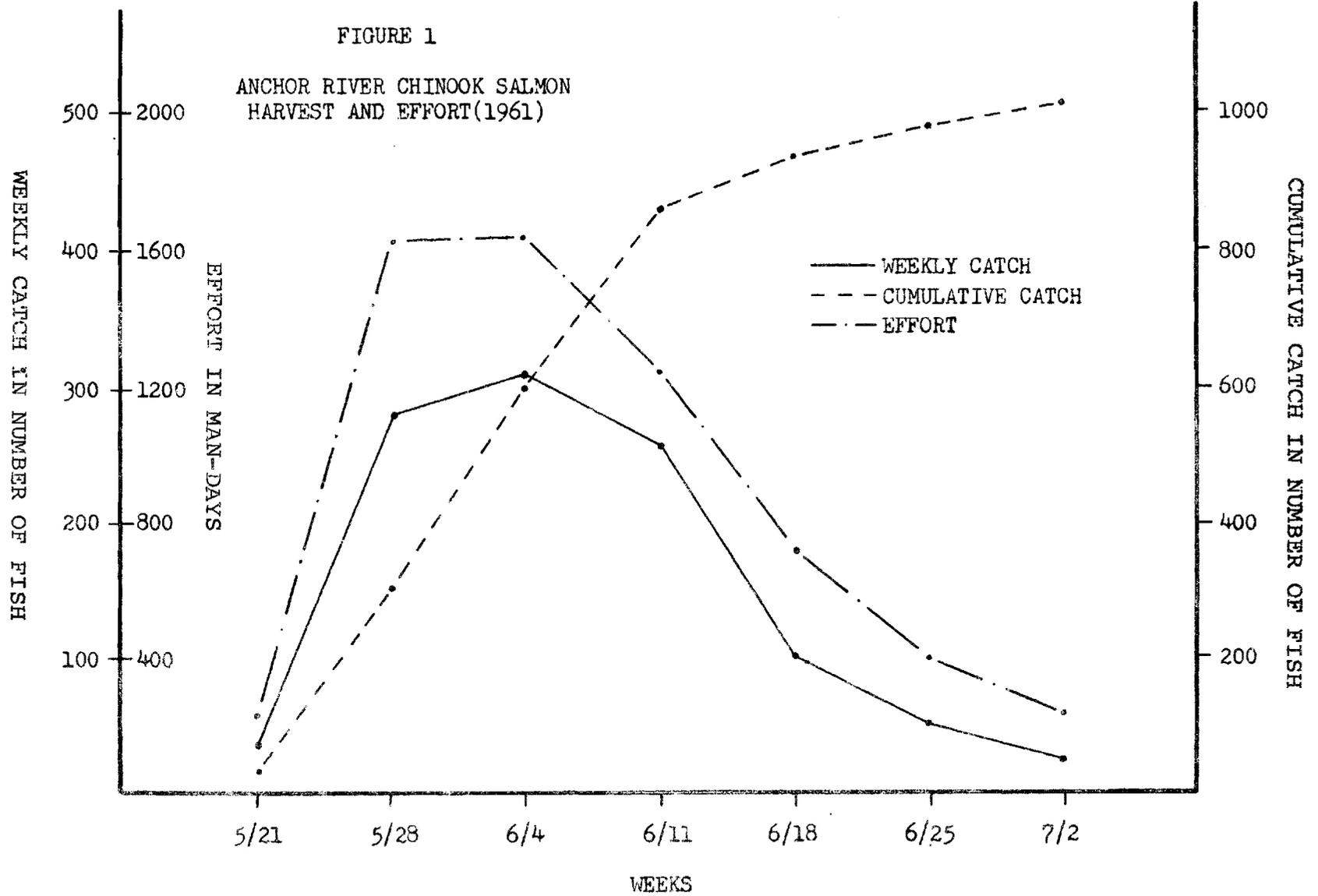
Fishing pressure on all weekends and holidays (3,132 man-days) was nearly equal to the total of the weekdays (3,033 man-days). The mean number of fishermen per car was 2.2. The catch per hour was 0.059.

King salmon escapement was based on three aerial and three foot surveys. A minimum spawning escapement of 850 fish was estimated. Aerial and foot surveys by Dunn in 1960 estimated escapement at 1,200 fish. Weir counts made by Allin showed the escapement above the Forks to be 2,700 in 1954 and 2,400 in 1957, but these fish were still subject to a sport fishery that was not measured. It should be noted that the lower escapement counts made by aerial and foot surveys when compared to weir counts probably reflect low accuracy in the survey method rather than the comparative abundance of fish. These surveys are done with the realization that they have value as an index and not a total count.

Age analysis was determined by the Fish and Wildlife Service for 104 king salmon scales collected from the

FIGURE 1

ANCHOR RIVER CHINOOK SALMON
HARVEST AND EFFORT (1961)



Anchor River during 1961. The most salient characteristic of this sample was the dominance of 6₂'s (64.4 per cent). The 1960 fish were primarily 5₂'s (76.0 per cent). Nearly all the scales examined showed two years of freshwater residence (97.2 per cent). Over 70% of the 1960 and 1961 catch and escapement was produced by 1954 parent stock. The age composition of the 1960-1961 Anchor River run is shown in Figure 2 and the length-frequency distribution presented in Figure 3 demonstrate the change in size. The mean weight for 56 king salmon males was 23.2 pounds and the mean weight for 51 females was 23.5.

There is some disagreement between sport and commercial interests as to where the responsibility lies for declining king salmon runs and which group has the greatest right to fish. This is complicated because these fish are important economically to a resort community like Anchor Point and to the commercial setnetters fishing the east side of Cook Inlet. Their value as a trophy fish to the sportsman is very high. It is imperative that any discussion of the king salmon sport fishery on the Kenai Peninsula streams must also take into account the existing commercial fishery. In attempting to evaluate the decline of king salmon stocks on the Peninsula streams several biological factors should be considered. To begin with, none of the destructive actions concomitant with spreading human populations are apparent. Logging, mining or other forms of pollution are virtually nonexistent. There has been no construction of dams or other barriers or evidence of stream dewatering although occasional dynamiting of ice jams has occurred. Road construction may have had some effect. Elimination of these factors, for the present, points to harvest as the most logical cause of the decline. This can best be depicted by the regression line in Figure 4 which shows a declining yield ($b = -7,347$) from 1952 to 1961 in the Cook Inlet commercial fishery. This has occurred despite increasing effort ($b = 12.06$) in units of gear being fished (1 unit = 105 fathoms of net). In 1961, set gillnets accounted for 93 per cent of the commercial king harvest while drift gillnets caught 6 per cent and purse seines captured 1 per cent. The decline in the Cook Inlet catch was well started before construction of the Homer road in the early fifties which brought steadily increasing sport fishing pressure to these streams. To protect this fishery

FIGURE 2
AGE COMPOSITION OF ANCHOR
RIVER KING SALMON - 1960-1961

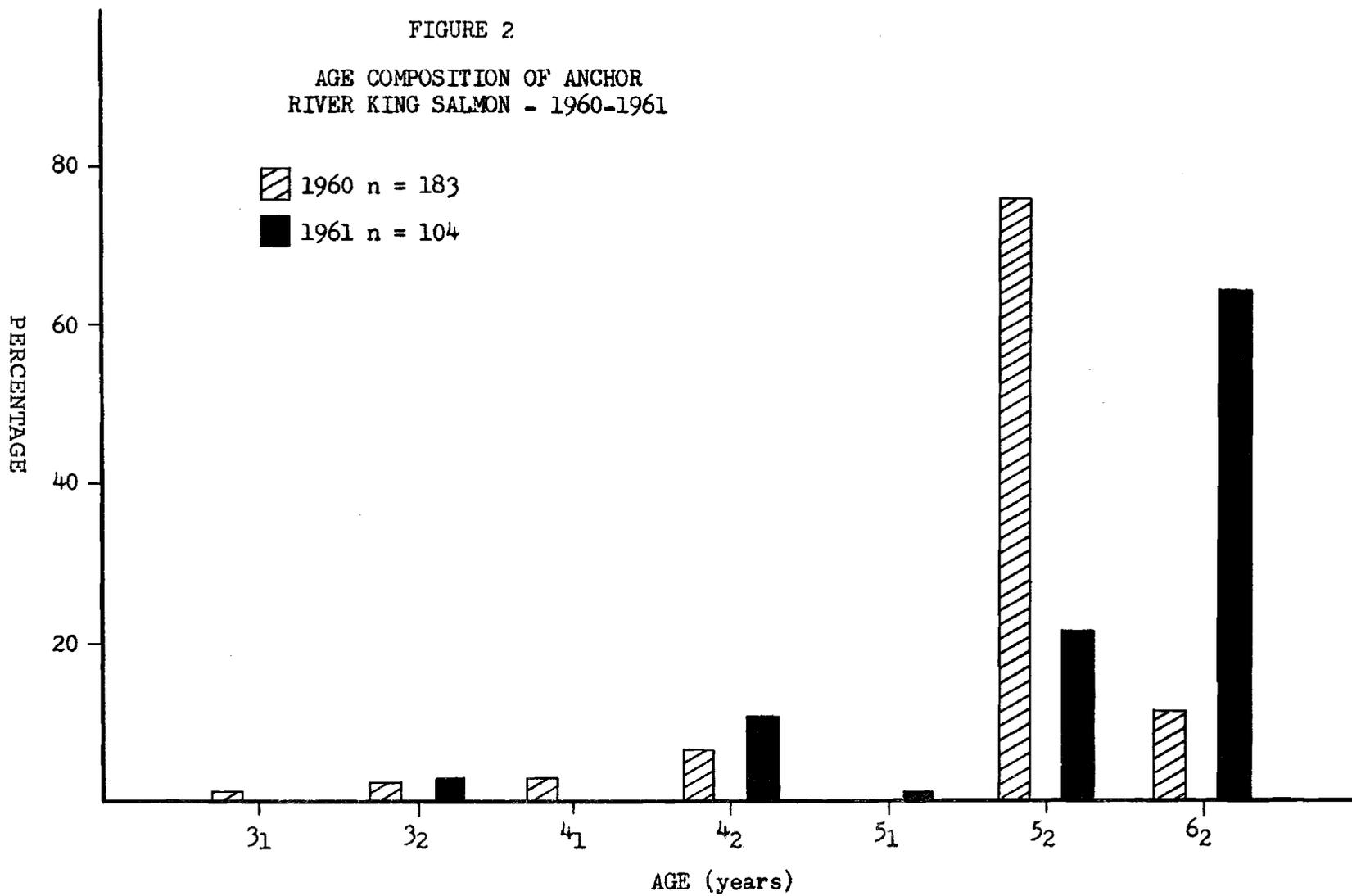
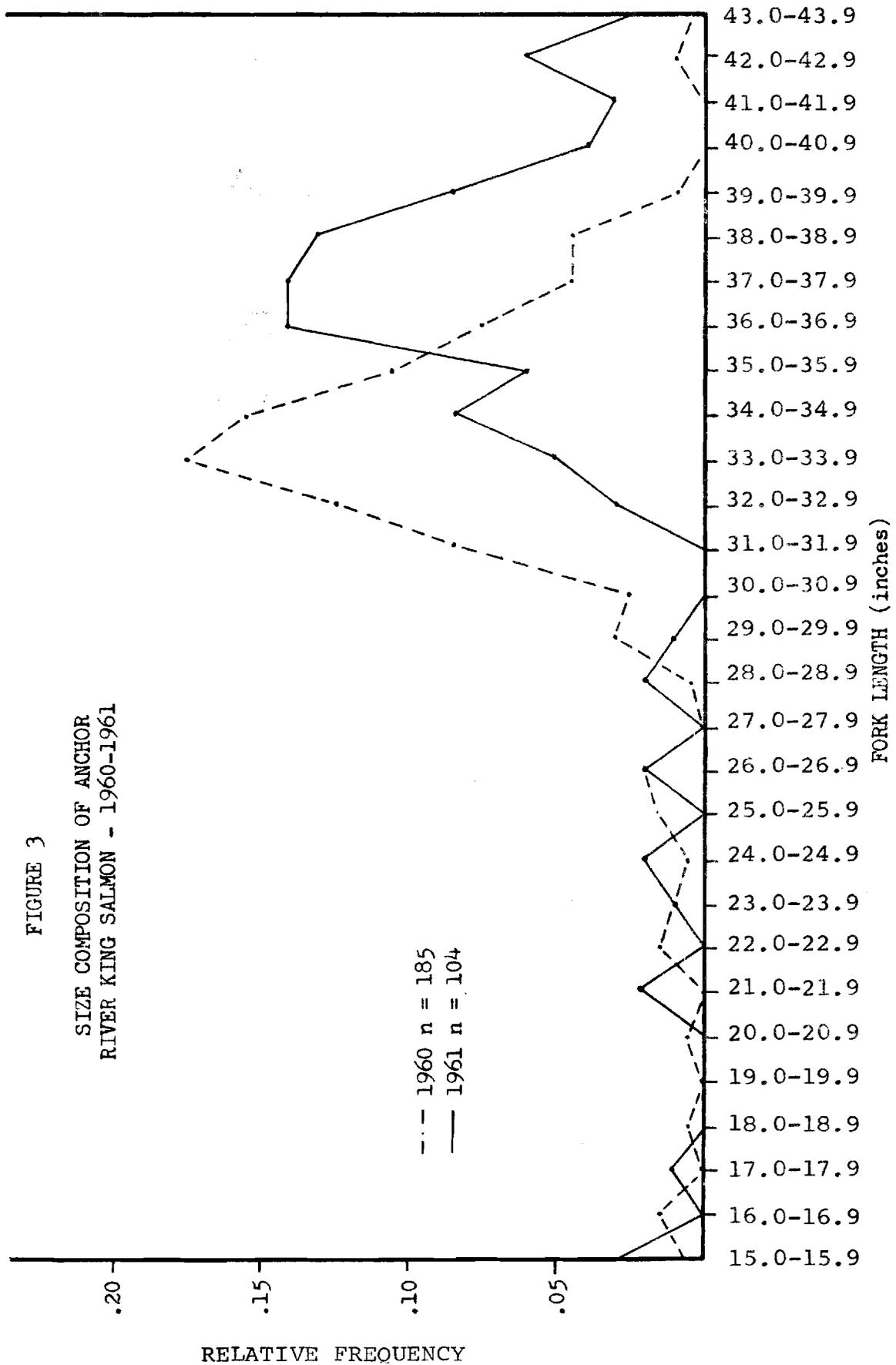


FIGURE 3

SIZE COMPOSITION OF ANCHOR
RIVER KING SALMON - 1960-1961



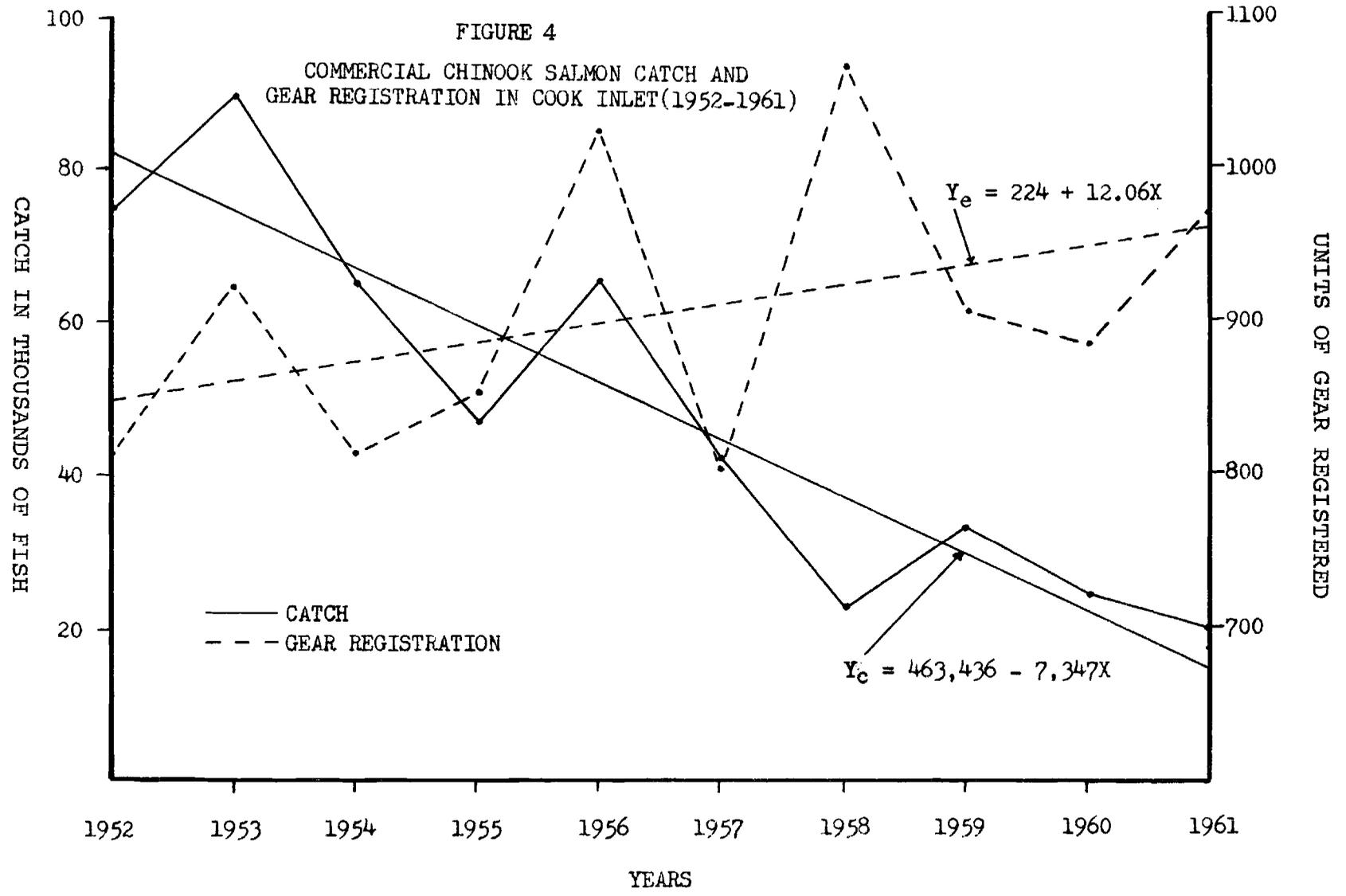


Table 1. The mean fork length (inches) and number of fish in each age group for 287 chinook salmon taken from the Anchor River in 1960 and 1961.

Age Group	Number of Fish	Fork Length
3 ₁	2	23.8
3 ₂	8	16.5
4 ₁	5	31.7
4 ₂	23	24.4
5 ₁	1	42.5
5 ₂	161	34.3
6 ₂	87	38.1

current management practices impose stringent restrictions on sportsmen. The season has been shortened; a one fish limit is now in effect; the Anchor River, Deep Creek and Ninilchik River are closed to salmon fishing at a point two miles upstream from their mouths and Stariski Creek and Crooked Creek were closed to salmon fishing in 1960. Commercial fishing has also been restricted. Fish traps were outlawed in 1958, setnets were eliminated on beaches south of Ninilchik and there have been later openings in the commercial fishing season. These measures have probably had some effect in reducing the harvest.

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