

1988 SALMON FISHERIES MANAGEMENT PLAN  
KOTZEBUE AREA

Regional Informational Report <sup>1</sup> No. 3N88-22

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Division of Commercial Fisheries, AYK Region

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<sup>1</sup> The Regional Informational Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate needs for up-to-date information, reports in this series may contain preliminary data.

## FISHERY BACKGROUND

The Kotzebue District includes all waters from Cape Prince of Wales to Point Hope. Chum salmon are the most abundant anadromous fish within this district. However, other salmon species (chinook, pink, coho, and sockeye) are available in lesser numbers as are char and sheefish.

### Subsistence Fishery:

Fishing has long been an important food gathering activity for people of Kotzebue area drainages. Remnants of fishing spears have been found within the area which date back as far as 1250 A.D. The subsistence fishery is still very important to the people of this area. A recent study of subsistence needs in Kotzebue found that the estimated 1986 chum salmon catch by Kotzebue residents was 35,000. Villages on the Noatak and Kobuk Rivers harvested an average of 15,000 chum total over the past five years. By adding these two estimates an annual subsistence harvest of 50,000 chum salmon by Kotzebue area residents would seem reasonable. Reported harvest figures are considered to be minimal since not all communities or fishermen were contacted.

### Commercial Fishery:

Commercial salmon fishing in the Kotzebue District dates back to 1914, when for a 4-year period, a canned and salt packed product was processed. The current day, chum salmon directed, commercial fishery was initiated in 1962 and occurs in ocean waters near Kotzebue (Figure 1). Commercial fishermen operate set gill nets primarily out of open skiffs powered by outboard motors. Buyers generally fly freshly caught, iced salmon out of the district either in the round or partially processed (gilled and gutted).

Commercial chum salmon harvests during the last 7 years have ranged from 109,500 to 677,200 fish, the 7-year average being 354,800. Fishing effort during the same period has ranged from 160 to 199 fishermen. During 1987, 109,467 fish were harvested by 187 fishermen, the lowest harvest since 1969. Total wholesale value of the harvest, \$0.5 million ranks the second lowest in the last 15 years.

## Fishery Outlook

### Status of Stocks:

Chum salmon abundance fluctuates greatly between years as noted by commercial harvests and escapements (Table 1). Although relative strength of parent-year escapements play an important role in the magnitude of chum salmon returns, other factors significantly affect the success of year classes. Such factors may include fresh water mortality of salmon eggs and fry due to temperature and water level fluctuations, and harvest of Kotzebue origin salmon by foreign and domestic interception fisheries.

Enumeration surveys of the Noatak and Kobuk River systems have shown that of the two systems the Noatak system produces more salmon. Noatak River bound chum salmon pass through the commercial fishery primarily during August. Kobuk River bound chum salmon are of two components: (1) stocks bound for lower Kobuk River tributaries, which pass through the commercial fishery during July, and (2) stocks bound for the upper Kobuk River, which pass through the commercial fishery during August intermixed with Noatak bound fish.

Chum salmon returning to the Kotzebue area are primarily 3 to 5 year old fish. The seven year average brood year return for 1979-1985 is 14% 3-year-olds, 63% 4-year-olds, 22% 5-year-olds, and 1% 6-year-olds. The number of fish on lower Kobuk River tributary spawning grounds peak about August 15 while those of upper Kobuk River and Noatak River spawning grounds peak about September 1. Salmon deposit eggs in stream gravel where egg to salmon fry development occurs through the winter. If water levels during spawning are above normal winter freezing of eggs and fry may occur, greatly increasing freshwater mortality. Such mortality may partially explain poor runs which follow good parent year escapements. Fry emerge from stream gravel primarily during May and June and outmigrate to marine waters.

### 1988 Wild Stock Return:

Chum salmon catches in the Kotzebue District are expected to be slightly below average to average during the 1988 season. This outlook is based on the comparison of individual age classes and the returns of these fish in subsequent years. It has been found that the number of chum salmon in an age class is a good indicator of the number of chum salmon returning during the following year. During 1987 the return of four year olds was one of the poorest returns on record, so it follows that the 1988 5 year old return will be far below average. The 1987 three year

old return was near average, so the 1988 four year old return is expected to be near normal. Assuming the 1988 three year old return is near average the total 1988 return should be significantly better than the 1987 return.

#### 1988 Hatchery Stock Return:

The Sikusuilaq hatchery is still building its brood stock and does not expect to reach full production for several years. The 1988 hatchery contribution to the commercial catch is expected to be roughly 15,000 chum salmon roughly twice the 1987 contribution. The hatchery stock is composed of the same age classes that compose the natural return but the size of each age class is most dependent on the level of hatchery production during a given parent year. For that reason the younger age classes will be more significant than the older ones in their catch contribution to the hatchery return since the hatchery has been expanding gradually over the years.

#### Management Objectives and Strategies

Primary fishery management objectives are to provide adequate chum salmon escapement through the commercial fishery to ensure: (1) sustained runs by allowing adequate natural escapement, and (2) meeting subsistence harvest needs. Fishery management will be dependent on comparing period and cumulative season catch rates to prior years. Figures 2, 3 and 4 display the recent seven year averages of catch by period, CPUE by period and cumulative CPUE by period. A comparison of catch rates over the history of the fishery showed a close relationship to escapement. The comparative data base will be limited to the recent 7-year data to account partially for increased fleet efficiency and to encompass a range of weak and strong runs, thus providing the best available comparative base.

Age composition of catches will be closely monitored to determine if an age class failure occurs. Older salmon tend to migrate into freshwater first; a fact that affects catch rate as the season progresses and affects the fishery managers evaluation of the catch statistics. Weak 5 and 6 year old age classes will tend to depress early season catches.

Aerial surveys will be attempted beginning in Mid-July on the Kobuk River tributaries. Aerial surveys are not a direct count or estimate of salmon population but are used as a means of comparison to previous surveys both inseason and in previous

years. Surveys will be attempted until mid-September. Aerial surveys are usually made too late to effect present year fisheries decisions but do provide useful information in critiquing a years management decisions and help calculate future salmon returns.

The Noatak Test Fishing project will be slightly expanded during 1988. Test fishing will begin a week earlier. With each years operation this project becomes more useful. This year the migration data gathered from the test catches will be used primarily to consider run timing inseason. Passage rate or the size of the catch will be hard to evaluate since we have only one year's data to compare with, but will figure heavily in comparisons made in future years.

With the funding of the Noatak sonar, preliminary work will begin during August of 1988. Site selection will be made during the peak of the salmon migration. Besides migration timing and movement patterns, river bottom profiles will be a primary consideration. For the sonar to be successful it is critical to ensonify or cover as much of a cross sectional area of the river as possible.

The Kotzebue District fishery generally occurs on a twice weekly schedule. July fishing periods will be 24 hours in duration to protect the lower Kobuk River run from overharvest. The lower Kobuk run is strongest in July and supports the area's greatest subsistence harvest. During August when the more abundant Noatak River stock is dominant, fishing time is generally increased to two 36-hour periods per week or more if returns are large. Further adjustments in fishing time are based on trends of commercial catch rates over a series of periods. During seasons of poor returns fishing time within periods will be reduced or fishing periods will be canceled. The Kotzebue commercial fishing fleet appears to be very effective at capturing the majority of the fish in the district during any given period.

The first open commercial fishing period of the 1988 season will begin Monday, July 11 to allow for normal period scheduling. Initial fishing periods will be from 6:00 p.m. Monday to 6:00 p.m. Tuesday and from 6:00 p.m. Thursday to 6:00 p.m. Friday. This fishing schedule will continue at least through July 19. Based on commercial catch rates, age composition, and catch per unit effort (CPUE) a decision will be made to adjust fishing time for the next week. In order to maintain the catch rate index used to manage the fishery, the fishing periods will not be shortened by more than 12 hours. Management decisions will be based primarily on comparisons of commercial catch rates to the previous 7-year averages, and the age class composition of the commercial catch.

Commercial salmon fishermen should be aware of the boundary changes coming into effect this season. The former Cape Blossom boundary has been moved south to the creek at Riley Wreck opening about 6 miles of beach. Also there is a new subdistrict at the Noatak River mouth. This subdistrict will be closed during below average fishing seasons, as the 1988 season is anticipated to be. Should the run come in stronger than expected and appear normal then the period length would probably be extended before the new subdistrict 2 were opened. If the run was well above average then both period length extensions and opening of subdistrict 2 would occur.

New net regulations will go into effect during 1989, next year. Fishermen replacing nets may want to consider the new net specifications. All filaments making up the net twine must be of equal size. The twine should be made of 6 filaments of at least 0.2mm each or at least 30 filaments.

The Department plans to continue the meetings with the Kotzebue Fishermen's Association as management concerns develop. The Noatak test fishing project and contact with the Kobuk River subsistence fishermen will also be maintained. These two projects will not be primary indices used in making management decisions since they have not operated for enough years to have developed a data base for comparison.

### Escapement Objectives

Aerial survey enumerations of salmon within rivers are utilized: (1) to evaluate initial run strength while salmon are traveling to the spawning grounds, and (2) to document peak salmon abundance on the spawning grounds as an index to total escapement. These enumeration techniques are best initiated during times of low river water levels, good water clarity with good sunlight penetration. Unfortunately, these conditions are not always available.

One of the primary fishery management strategies is to provide for minimum escapement levels within each river system. These minimum escapement levels are based on historic average of peak spawning counts of specific index areas within major drainages. These escapement objectives are subject to continual review and are intended to evaluate escapement trends between years and are not a total count of the salmon escapement. Systems which are flown annually with associated goals are as follows: Noatak River (mouth to Kelly Bar-80,000), Squirrel River (entire-11,500), Salmon River (entire-7,000), Tutuksuk River (entire-2,000), and upper Kobuk River (Kobuk Village to Beaver Creek-10,000). Other systems are flown as possible based on available funding.

Table 1. Kotzebue District fishery information 1981-1987.

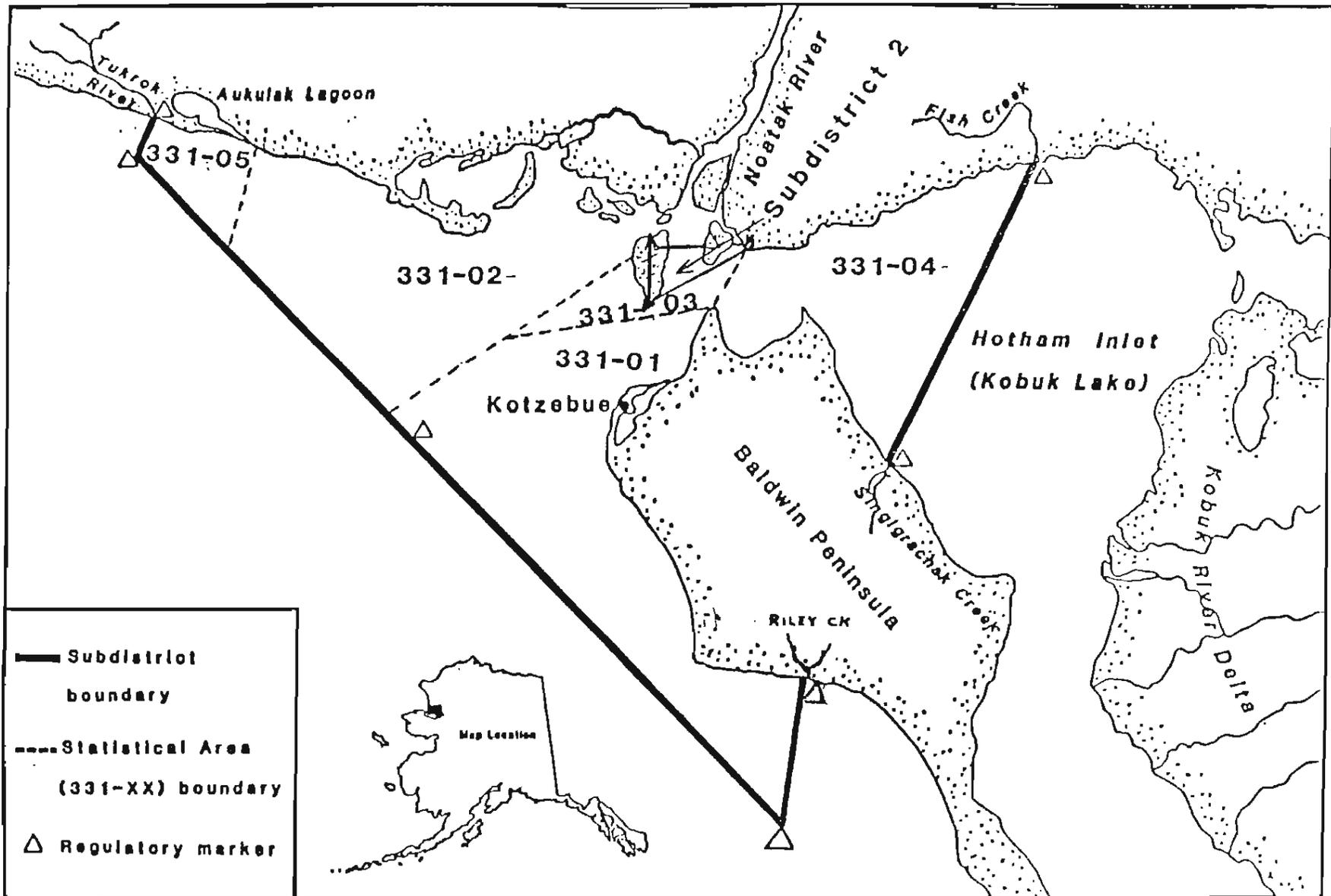
	1981	1982	1983	1984	1985	1986	1987
<b>Commercial</b>							
Catch							
(thousands of fish)	677.2	417.8	175.8	320.2	521.4	261.4	109.5
No. Fishermen	187	199	189	181	189	187	160
Av. Catch per Fisherman	3,622	2,099	930	1,769	2,759	1,398	684
Est. Value (thousands)	3,247	1,962	421	1,149	2,137	933	515
<b>Escapements 1/</b>							
(thousands of fish)							
Noatak	116.4	20.7 2/	79.8	67.8	44.0 2/	37.2 2/	38.0 4/
Upper Kobuk	8.6	14.7	33.7	10.6	6.2 2/	6.0 2/	8.2
Squirrel	9.8	7.7	6.1	5.5	6.2	5.0 2/	2.7
Salmon	4.7	5.4 3/	1.7	1.5	2.0	2.0 2/	3.3
Tutuksuk	1.1	1.3	2.6	1.1	5.1	4.3	0.2

1/ Escapement goals are: Noatak River (mouth to Kelly Bar - 80,000), Squirrel River (entire - 11,500), Salmon River (entire - 7,000), Tutuksuk (entire - 2,000) and upper Kobuk River (Kobuk Village to Beaver Creek - 10,000).

2/ Low escapement estimates due to poor survey conditions during peak spawning. Estimate achieved either under poor survey conditions (high turbid water) or before or after peak spawning.

3/ Foot surveys.

4/ Incomplete survey, estimated value based on tributaries historical contribution.



Kotzebue Sound Commercial Salmon District; existing subdistrict 1 boundaries.

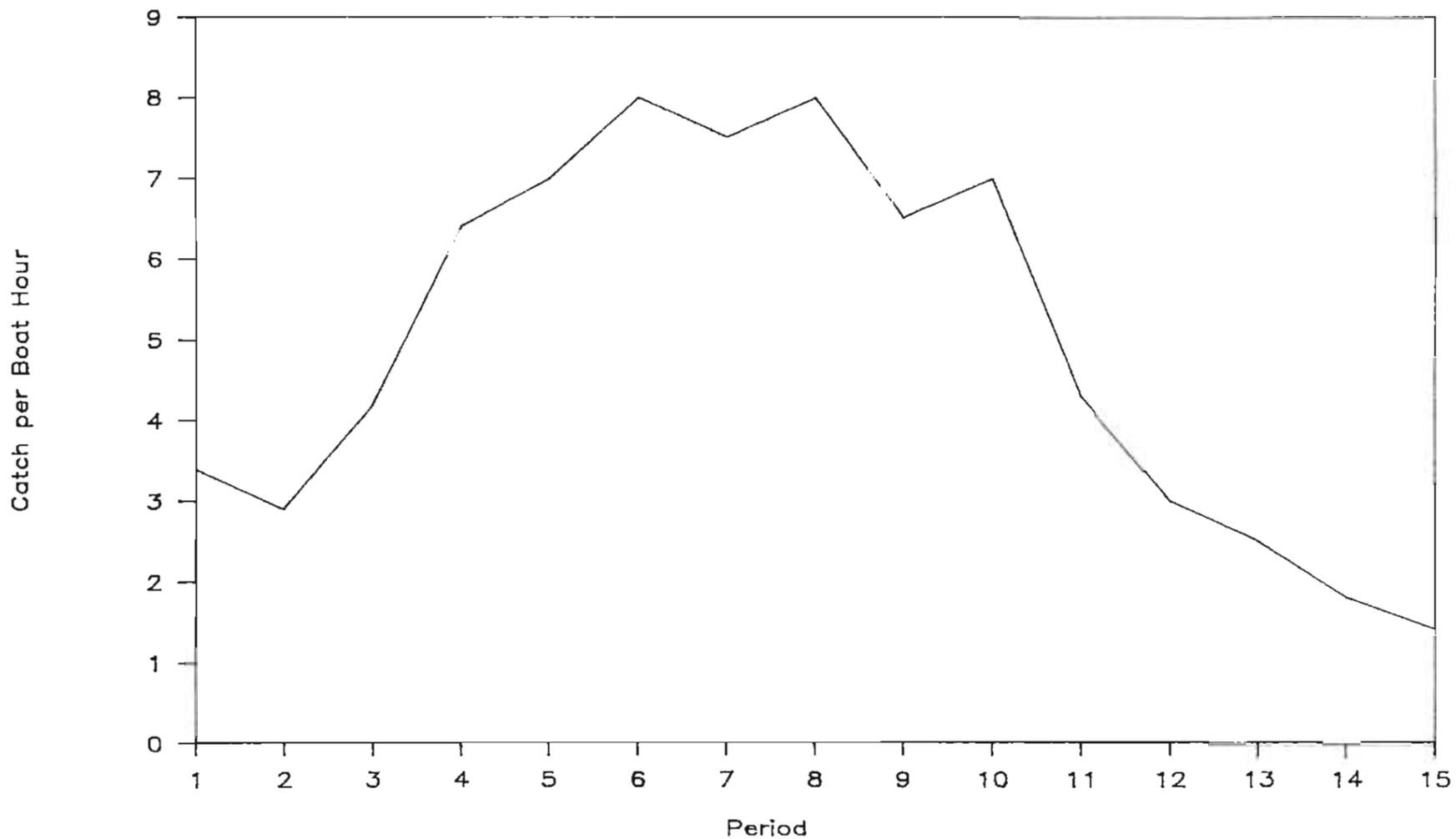


Figure 2. Average catch per boat hour by fishing period for chum salmon taken in the Kotzebue commercial fishery, 1981-1987.

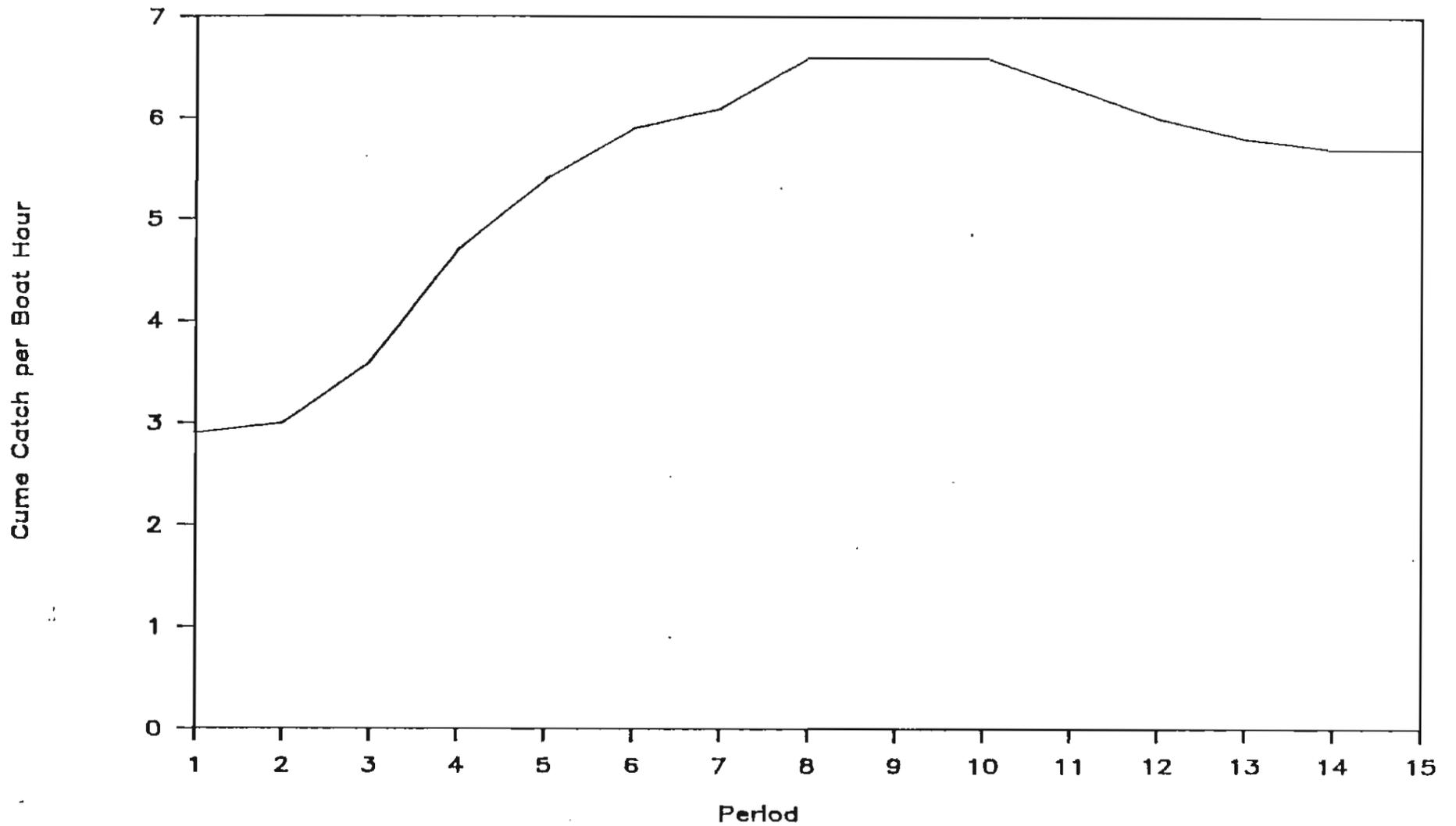


Figure 3. Cumulative catch per boat hour by fishing period for chum salmon taken in the Kotzebue commercial fishery, 1981-1987.

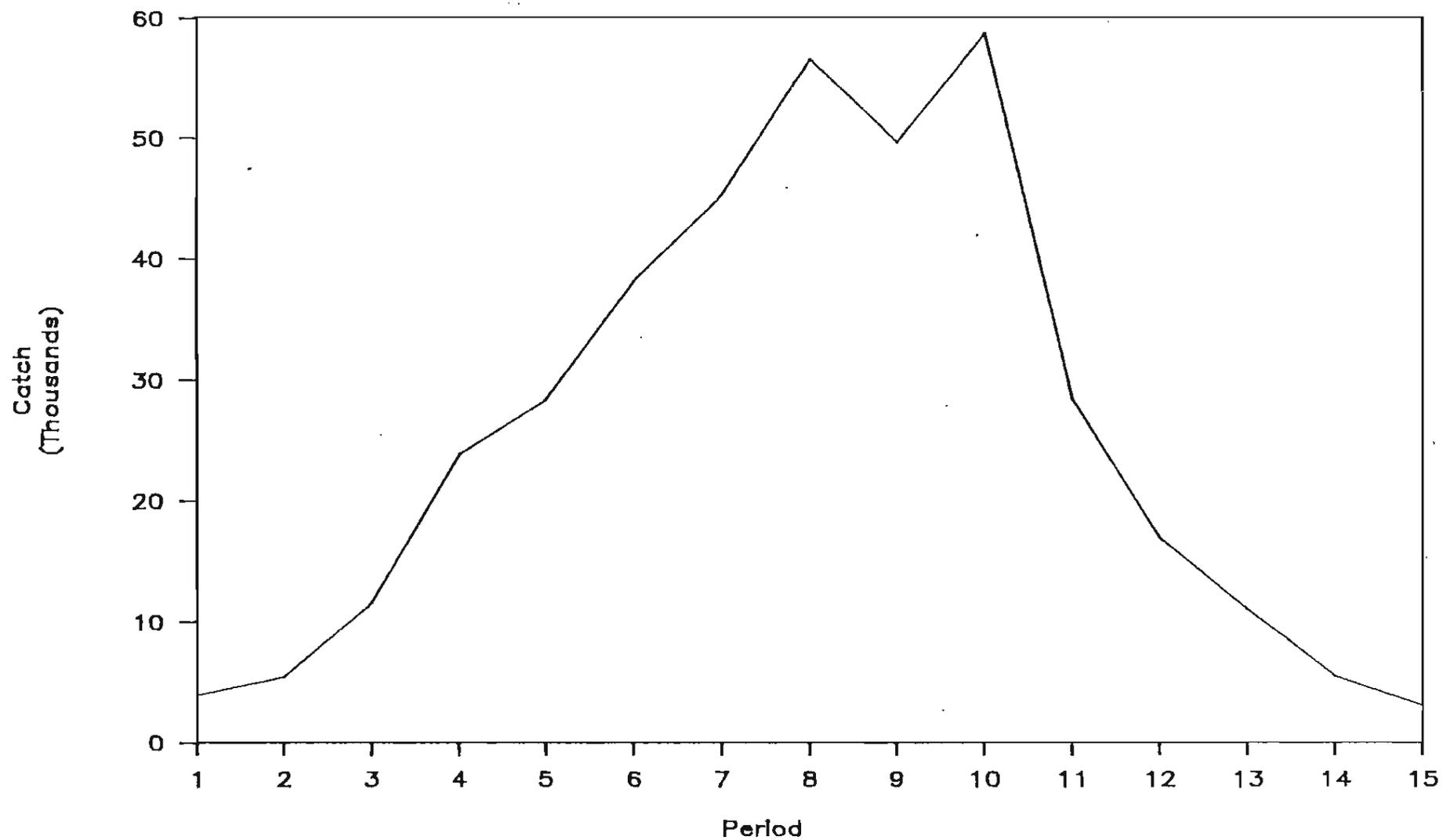


Figure 4. Total period catch by fish period for chum salmon taken in the Kotzebue fishery, 1981-1987.