

1991 SALMON FISHERIES MANAGEMENT PLAN
KOTZEBUE AREA

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Regional Informational Report ¹ No. 3N91-16

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April 1991

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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) occur 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 local people. 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 a combined average of 15,000 chum salmon annually 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 during a 4-year period, a canned and salt packed product was processed. The current 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 past 12 years (1979-1990) have ranged from 109,500 to 677,200 fish, the 11-year average being 313,570. Fishing effort during the same period has ranged from 160 to 199 fishermen, averaging 184 fishermen. During 1990, 163,263 chum and 32 chinook salmon were harvested by 153 fishermen. The total wholesale value of the harvest was \$440,049 and ranked as the second lowest value of the last 12 years. Chum Salmon brought roughly one-third the recent average price.

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, 4, and 5 year old fish. The 10 year average brood year return for 1979-1989 is 8.3% 3-year-olds, 59.1% 4-year-olds, 29.6% 5-year-olds, and 2.3% 6-year-olds. The number of fish on lower Kobuk River tributary spawning grounds peak by about August 15 while those of upper Kobuk River and Noatak River spawning grounds peak by 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. High spawning ground mortality may partially explain poor runs which follow good parent year escapements. Fry emerge from stream gravel primarily during May and June and out migrate to marine waters.

1991 Wild Stock Return

The outlook for the 1991 chum salmon run and harvest is based on the comparison of returning age classes during the 1990 season. During 1991, the 4-year-old age component of the run is expected to be well below average as is the 5-year-old component. Three-year-olds are expected to return at normal levels. The harvest is expected to fall within the range of 75,000 to 175,000 chum salmon.

1991 Hatchery Stock Return

The Sikusuilaq hatchery is still building its brood stock and does not expect to reach full production for several years. The 1990 hatchery contribution to the commercial catch is expected to be approximately 40,000 chum salmon. The hatchery stock is composed of the same age classes that compose the natural return but the size of each age class may vary dependent on the level of hatchery production during a given parent year. Because of increasing production in recent years the younger age classes will be more significant than the older age class fish in their catch contribution to the hatchery return since the hatchery has been expanding gradually over the years.

The 1991 season marks the first year that the hatchery production is not projected to fully utilized by the harvest in the commercial fishery and brood stock needs at the hatchery. Six thousand hatchery produced chum may return to the hatchery during the 1991 season in excess of basic stock needs.

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 and 3 display the 1979-1990 year averages of catch by period and 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 1979-1990 year data to account partially for increased fleet efficiency and to encompass the range of years when similar fishing schedules were in effect, thus providing the best available comparative base.

Age composition of catches will be closely monitored to determine the strength of age classes in the return. 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 the salmon population but are used as a means of comparing previous surveys both in season and in prior 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 the years management decisions and help project future salmon returns.

The Noatak Test Fishing project will be conducted similarly to the 1988 through 1990 projects. Test fishing will begin approximately July 17. With each years operation this project becomes more useful. This year the migration data gathered from the test catches will be used to assess run timing in season. The comparative size of the catch will be hard to evaluate since we have only two prior year's data to compare.

The Noatak sonar project will continue this season, preliminary work began during August of 1988. Site selection was made during the peak of the 1988 salmon migration. Assessment of salmon migration timing and movement patterns, along with development of river bottom profiles were the primary objective. For the sonar to be successful it is critical to cover as much of a cross sectional area of the river as possible with the sonar beam. The project will assess the feasibility of new sonar technology for enumerating migrating chum salmon in the Noatak River.

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 over harvest. The lower Kobuk run peaks 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 in commercial catch rates over a series of periods. During seasons

with poor returns, escapement needs will be protected by (1) reducing period length or (2) canceling some periods. 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 1991 season will begin Thursday, 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 20. Based on commercial catch rates, age composition, and catch per unit effort (CPUE), a decision will be made to adjust the length of periods 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 1979-1989 year averages, and the age class composition of the commercial catch.

The Board of Fisheries instituted two new regulations that effect Kotzebue commercial salmon fishermen. The Kobuk Lake boundary now extends perpendicular to shore for one mile on either side, extending the fishing area slightly (figure 1). The Board passed a state wide regulation requiring all nets to be marked with buoys that have only one 5 digit CFEC number on each buoy.

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, and 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 averages of peak spawning counts of specific index areas within major drainages. These escapement objectives: are subject to continued review, intended to evaluate escapement trends between years, and are not a total count of the salmon escapement. Systems which are flown annually with associated chum salmon escapement goals are as follows: Noatak River (mouth to Kelly Bar-80,000 chum), 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 funding is available.

TABLE 1. KOTZEBUE DISTRICT CHUM FISHERY INFORMATION 1981-1990

COMMERCIAL CATCH	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Chum (in thousands)	677.2	417.8	175.8	320.2	521.4	261.4	109.5	352.9	254.6	163.3
Number of permits	187	199	189	181	189	187	160	193	165	153
Average chum per permit	3,622	2,099	930	1,769	2,759	1,398	684	1,829	1,543	1,067
Est. value (in thousands)	\$3,247	\$1,962	\$421	\$1,149	\$2,137	\$933	\$515	\$2,605	\$614	\$438

ESCAPEMENT (in thousands)	1981	1982	1983	1984	1985	1986	1987	1988	1989 *4	1990*3
Noatak	116.4	20.7 *1	78.9	67.8	44 *1	37.2 *1	9.3 *3	45.9 *1		20.0
Upper Kobuk	8.6	14.7	33.7	10.6	6.2 *1	6 *1	8.2	13.2		8.0
Squirrel	9.8	7.7	6.1	5.5	6.2	5 *1	2.7	4.8 *1		5.0
Salmon	4.7	5.4 *2	1.7	1.5	2	2 *1	3.3	6.2		6.1
Tutuksuk	1.1	1.3	2.6	1.1	5.1	4.3	0.2 *3	3.1		3.0

ESCAPEMENT GOALS

Area	Goal
Noatak River (mouth to Kelly Bar)	80,000
Upper Kobuk (Kobuk Village to Beaver Creek)	10,000
Squirrel (entire)	11,500
Salmon (entire)	7,000
Tutuksuk (entire)	2,000

*1 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.

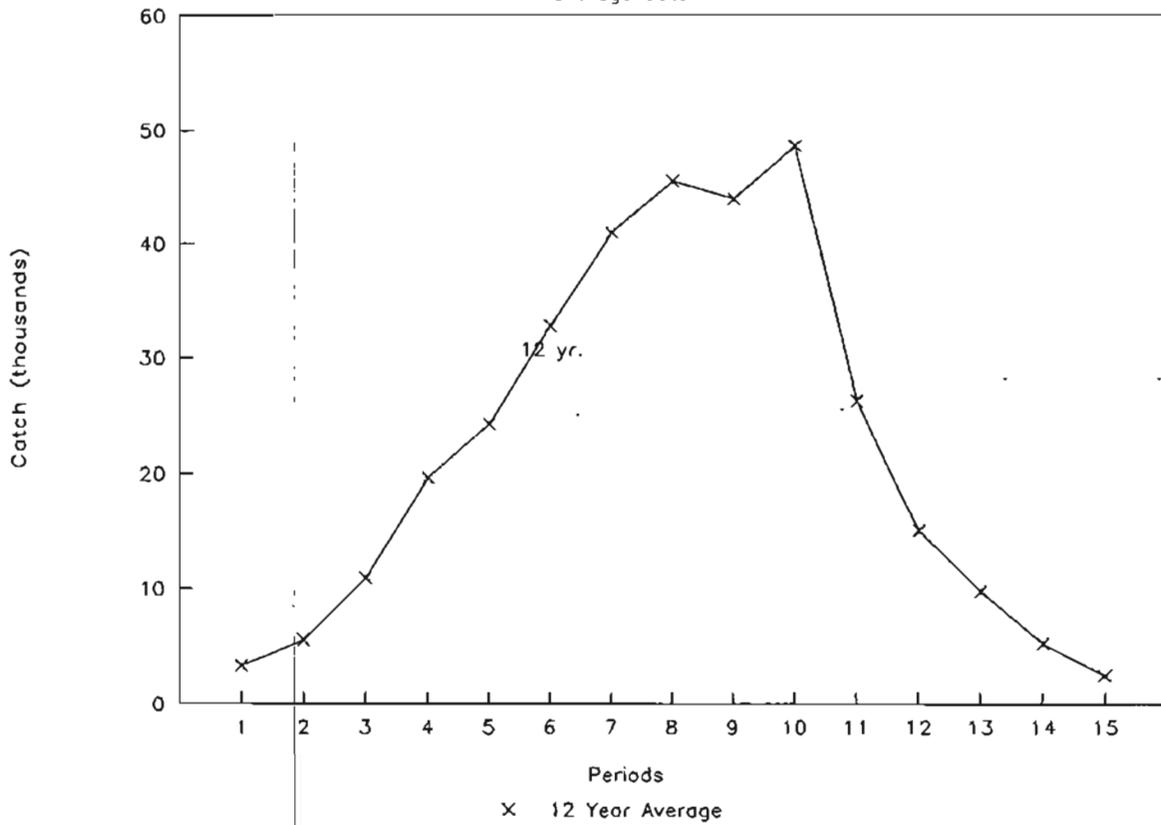
*2 Foot surveys.

*3 Partial survey and poor survey conditions.

*4 Aerial surveys not feasible due to unfavorable weather and water conditions.

Kotzebue Commercial Chum

average catch



Kotzebue Commercial Chum

average cpue

