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SALMON BOF RPT #23

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

KOTZEBUE DISTRICT
SALMON REPORT
to the
ALASKA BOARD OF FISHERIES
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Kotzebue District Office: P.O. Box 686, Kotzebue, Alaska 99752

Area Management Biologist - Leonard Schwarz (stationed in Nome)

Assistant Management Biologist - Joe Dinnocenzo

Project Biologist - Brian Bigler

Clerk Typist - Judy Stein

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BACKGROUND

District Boundaries and Legal Gear

The Kotzebue District includes all waters from Cape Prince of Wales north to Point Hope. All commercial fishing effort occurs in marine waters near the village of Kotzebue (Figure 1). Commercial fishermen can legally operate set gill nets of up to 150 fathoms. Open skiffs powered by outboard motors are used to operate the fishing gear and deliver the fish to buyers.

Management Objectives and Strategies

The Division of Commercial Fisheries of the Alaska Department of Fish and Game is responsible for the management of commercial and subsistence fisheries in the Kotzebue area. The main objective of the Department's program is to manage both fisheries on a sustained yield basis in accordance with policies set forth by the Alaska Board of Fisheries, including assignment of subsistence as the highest priority among beneficial uses of the resource.

Chum salmon is the target species for both the commercial and subsistence salmon fisheries. Although a noticeable increase of pink salmon has occurred over the last several years, over 99% of the total salmon harvest is comprised of chum salmon. King, red, and coho salmon occur in small numbers.

Department tagging studies have indicated that the bulk of the chum salmon returning to the Kotzebue District are bound for the Kobuk and Noatak Rivers. Consequently, commercial fishing is limited to an area near Kotzebue to prevent establishment of a cape fishery which would intercept salmon bound for other streams.

The majority of the Kobuk River run occurs in the commercial fishery during July while the Noatak River run is dominant during August. Since the Kobuk River run is less abundant and sustains greater subsistence harvest, the July commercial fishery is generally restricted to two - 24 hour periods a week. Fishing time is usually increased to at least two - 36 hour periods a week in August. Further adjustments in fishing time are often made based on comparative catch and escapement data which are indicative of run strength.

Escapement data is obtained through aerial surveys of all major spawning areas, a counting tower of the Squirrel River and a side scan sonar project operated in the lower Noatak River.

The commercial fishing season closes by regulation on August 31 when the chum run has substantially decreased and the arctic char run is beginning. There is no closed season, closed periods or harvest limits for subsistence salmon fishing except that commercial fishermen during the commercial fishing season may only subsistence fish during open commercial periods.

STATUS OF FISHERY AND STOCKS

There was an early commercial salmon fishery during 1914-1918 and the recent fishery has occurred each year since 1962. Chum salmon harvests averaged about 85,000 fish during 1962-1972, but harvests increased to an average of

365,000 during 1973-1982 (Table 1). Chum salmon harvests during the last 10 years have fluctuated widely (from 111,000 to 677,000) which can be expected from a population which inhabits the northern extreme of the species' range. Fishing effort increased drastically during the 1973-1975 period and has since stabilized at about 180 fishermen (Table 2).

Subsistence harvests have been documented by the department since 1962 and have ranged from 10,000 to 70,000 chum salmon. These harvest figures are considered minimum estimates since not all fishermen are contacted during household surveys. During the first 10 years of surveys (1962-1971) the average documented catch was 34,000 with the average catch per fishermen averaging 354 chum. During the next 10 years (1972-1981), the average documented subsistence catch dropped to 17,000 fish with the average catch per fishermen dropping to 183 chum even though the five largest runs on record occurred during this time. These data indicate that subsistence use of chum salmon has declined over the last 10 years (Table 1).

Escapements have been documented in the Noatak and Kobuk River systems since 1962. Aerial surveys have been used as the main assessment technique and have many associated drawbacks. Surveys are prevented in some years by poor weather or turbid waters. Over the past decade, escapements have gone from record levels (1973-1975), to very low levels (1976-1979), and back to record levels (1980-1982) (Table 2). Average chum salmon escapements, as documented by aerial survey made under good conditions, are considered 80,000 in the Noatak River and 20,000 in the Squirrel, Salmon, Tutsuksuk tributaries of the lower Kobuk River.

SEASON SUMMARY Commercial Fishery

Kotzebue commercial salmon fishermen harvested 417,790 chum during the 1982 season. This was the fourth largest catch on record and 40% above the recent 5 year average (Table 1). According to the Commercial Fisheries Entry Commission, there are a total of 223 salmon permits in existence in this district. A total of 199 fishermen actually made landings during the 1982 fishery, 13 above the recent 10 year average.

Commercial fishermen earned approximately \$1,961,518 for this season's catch, excluding bonuses. This is only 60 percent of the value of last year's record catch, but the second most valuable catch on record. The average fisherman earned \$9,850. The average price/pound was \$.51 and the average weight was 9.3 pounds per chum salmon (Table 3).

The commercial fishery opens by regulation on July 10, but to allow for the normal scheduling of commercial fishing periods and the collection of comparable catch statistics, the first period of the 1982 season was opened on July 8. Initially, fishing periods were set at two 24 hour periods a week. Fishing time was increased to two 36 hour fishing periods/week on August 2 and to two 48 hour periods/week on August 4. Each increase in allowed fishing time was justified by comparative catch statistics which indicated an above average run. On August 30, the last fishing period was decreased to 24 hours to allow commercial fishing during the remaining daylight hours of the season; however, there was no fishing effort because the last buyer ceased operations on August 28.

Subsistence Fishery

Subsistence salmon fishermen were interviewed throughout the area resulting in a reported harvest of 30,133 chum salmon by 204 fishermen. The department put considerable effort into the 1982 surveys and the number of fishermen contacted was an all time record. The reported harvest of 30,133 fish was the largest since 1969; however, a record number of people were contacted and this figure is not comparable to previous years. The average catch of 148 chum/fishermen is a more comparable figure and was 20% below the 10 year average of 184 chum/fishermen.

Escapement

An average Kobuk River escapement was documented by aerial surveys in 1982 (Table 2). Smaller than average peak aerial survey counts in the lower Kobuk tributaries (Salmon and Squirrel Rivers) were offset by above average counts in the upper Kobuk River. For the first time a counting tower project was operated on the Squirrel River and a resultant count of 9500 chums obtained. The tower count compared favorably to a peak aerial survey count of 7,690.

For the third consecutive season, two sonar units were operated from each bank of the lower Noatak River in an attempt to enumerate the total spawning population in this system. There have been problems to date in establishing the accuracy of the sonar count due to the presence of other species (pink salmon, char, whitefish) in the counts and unknown numbers of mid-stream migrants that are beyond sonar range. Although total escapement data is not available, a minimum estimate of 92,000 chum salmon were counted by sonar in 1982. An above average peak aerial survey count of 11,600 chums was obtained for the Kelly River, a Noatak River tributary. Aerial surveys of the main river were severely limited by inclement weather and turbid waters. The limited escapement data available coupled with the relatively high catch per unit effort in the commercial fishery are indicators that at least an average escapement was obtained for the Noatak River during 1982.

KOTZEBUE SOUND DISTRICT OUTLOOK FOR 1983

The forecast for the 1983 chum salmon run into the Kotzebue Sound Commercial fishing district is very similar in technique to that used in 1981 and 1982. Both methods are based on similarities in survivorship between age classes, but the 1983 forecast is based on survivorship from total escapement to returning adults.

With a 16 year data base the regressions generated from three/four and four/five year old survivorship are highly significant. The projected 1983 chum return of 528,800 is considered to be of average magnitude. The returning three age classes will be the progeny from the 1978, 1979 and 1980 brood years. Escapements in 1978 and 1979 were both low and will probably result in poor returns of four and five year old fish, respectively. The three year old portion of the 1983 returns are the result of a very strong escapement in 1980. The total return in 1983 is expected to be comprised of 119,300 three year olds, 299,500 four year olds and 110,000 five year old chum salmon.

If the projected 1983 chum return of 528,800 salmon is accurate and escapement goals are met, a commercial harvest of approximately 300,000 salmon can be expected. This harvest would be slightly above the recent 5 year average, but slightly below the recent 10 year average.

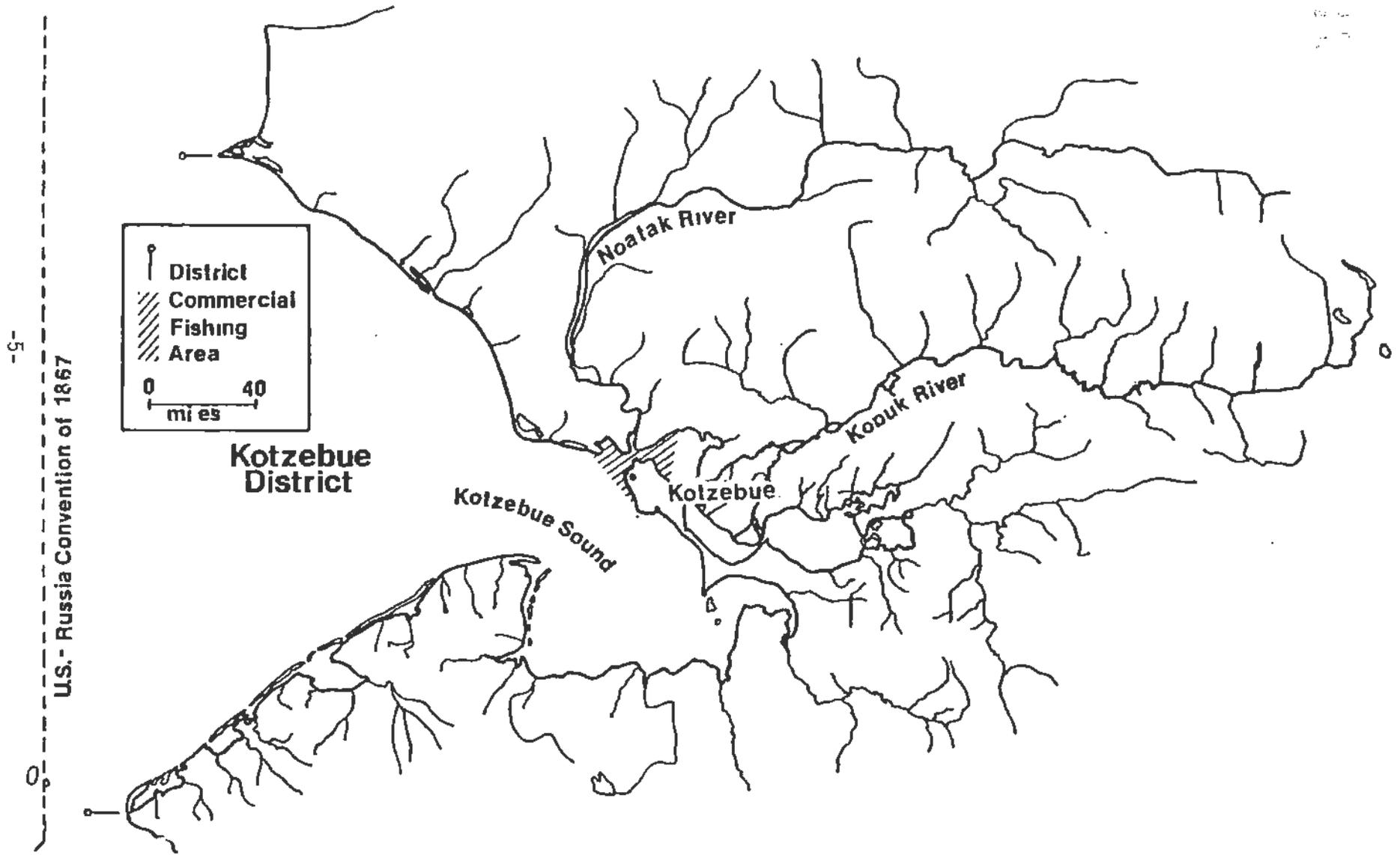


Figure 1. Kotzebue Area.

Table 1. Commercial and subsistence salmon catches, Kotzebue
1914-1982.

| Year | Commercial catch | | | Harvest | Subsistence chum catch | | Combined Catches |
|----------------|-----------------------------|-----------------|---------|---------|-------------------------|--------------------------|------------------|
| | <u>1/</u> Chum <u>2/</u> | Other <u>3/</u> | Total | | # fishermen interviewed | Avg. catch/ Fishermen | |
| 1914 | 8,550 | | 8,550 | | | | |
| 1915 | 4,750 | | 4,750 | | | | |
| 1916 | 19,000 | | 19,000 | | | | |
| 1917 | 44,612 | | 44,612 | | | | |
| 1918 | 27,407 | | 27,407 | | | | |
| 1957 | | | | 298,430 | | | |
| 1962 | 129,948 | 127 | 130,075 | 70,283 | 81 | 868 | 200,358 |
| 1963 | 54,445 | 143 | 54,588 | 31,069 | 67 | 464 | 85,657 |
| 1964 | 76,499 | 5 | 76,504 | 29,762 | 58 | 513 | 106,266 |
| 1965 | 40,034 | | 40,034 | 30,500 | 89 | 343 | 70,534 |
| 1966 | 30,764 | 1 | 30,765 | 35,588 | 121 | 294 | 66,353 |
| 1967 | 29,400 | | 29,400 | 40,108 | 135 | 297 | 69,508 |
| 1968 | 30,384 <u>5/</u> | | 30,384 | 20,814 | 65 | 126 | 51,198 |
| 1969 | 59,335 | 48 | 59,383 | 29,812 | 99 | 301 | 89,195 |
| 1970 | 159,664 | | 159,664 | 28,486 | 164 | 174 | 188,150 |
| 1971 | 154,956 | 1 | 154,957 | 23,959 | 152 | 158 | 178,916 |
| 1972 | 169,664 | 3 | 169,667 | 11,085 | 96 | 115 | 180,752 |
| 1973 | 375,432 | 5 | 375,437 | 18,942 | 101 | 188 | 394,379 |
| 1974 | 634,479 <u>6/</u> | 48 | 634,527 | 26,729 | 88 | 304 | 661,256 |
| 1975 | 563,682 <u>7/</u> | 36 | 563,718 | 27,605 | 95 | 291 | 591,323 |
| 1976 | 159,796 | 2 | 159,798 | 15,765 | 91 | 173 | 175,563 |
| 1977 | 195,895 | | 195,895 | 9,752 | 83 | 117 | 205,647 |
| 1978 | 111,533 | 7007 | 118,540 | 12,864 | 85 | 151 | 131,404 |
| 1979 | 141,623 | 910 | 142,533 | 14,605 | 97 | 151 | 157,138 |
| 1980 | 367,284 | 1654 | 368,938 | 10,945 | 111 | 98 | 379,883 |
| 1981 | 677,239 | 237 | 677,476 | 17,766 | 71 | 250 | 695,242 |
| 1982 | 417,790 | 3,503 | 421,293 | 30,133 | 204 | 148 | |
| 5 year avg. | 298,715 | | 300,676 | 13,186 | | 153 | 313,863 |
| 10 yr. avg. | 339,663 | | 340,653 | 16,606 | | 199 | 357,259 |

1/ There was no commercial fishing during 1919-1961

2/ Catches for 1914-1918 from pack data only; numbers of chums estimated at 9.5 per case (#48) and 34 per barrel.

3/ Mostly pinks, but includes chinook salmon and sockeye salmon.

4/ Estimated mean annual catches prior to 1957 (study by Raleigh).

5/ Corrected from 1968 annual report due to addition of late catches.

6/ Includes 6,567 chum salmon harvested from Deering experimental fishery.

7/ Includes 10,704 chum salmon harvested from Deering experimental fishery.

Table 2. Comparative chum salmon catch, effort, and escapement data, Kotzebue district, 1962-1982.

| | Average 1962-73 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|--------------------------------------------------|--------------------|---------|---------|---------|----------------------|---------|---------------------|---------|---------|----------------------|
| Commercial Catch | 119,000 | 627,900 | 553,000 | 159,800 | 195,900 | 111,500 | 141,600 | 367,300 | 677,200 | 417,790 |
| # of Fishermen Fishing | 68 | 174 | 258 | 219 | 222 | 208 | 181 | 176 | 187 | 199 |
| Noatak River ^{2/} Escapement | 74,200 | 130,000 | 96,500 | 44,500 | 11,000 ^{5/} | 37,500 | 19,700 | 164,500 | 166,400 | 20,682 ^{5/} |
| Lower ^{3/} Kobuk River Escapement | 13,500 | 62,000 | 40,500 | 8,000 | 1,800 ^{5/} | 4,000 | 2,000 ^{5/} | 21,942 | 14,563 | 8,930 |
| Upper ^{4/} Kobuk River Escapement | 8,700 | 27,300 | 10,400 | 1,800 | <u>6/</u> | 2,000 | 2,000 | 11,500 | 8,600 | 13,674 |

1/ Does not include data from Deering experimental fishery.

2/ Reflects aerial survey counts in the main Noatak River only.

3/ Reflects aerial survey counts in the Squirrel and Salmon Rivers, which are the major index tributaries to the Lower Kobuk River.

4/ Reflects aerial survey counts in the main Kobuk River above the village of Kobuk.

5/ Poor survey conditions or incomplete survey.

6/ Not surveyed.

Table 3. Dollar value estimates of Kotzebue district commercial fishery, 1962-1982

| Year | Gross Value of catch to fishermen | Avg. round weight | <u>Chum</u> Avg. price |
|--------------------|-----------------------------------|-------------------|---------------------------|
| 1962 | \$45,500.00 | - | \$0.35 ^{4/} |
| 1963 | 9,140.00 | - | 0.35 ^{4/} |
| 1964 | 34,660.00 | 8.3 | 0.45 ^{4/} |
| 1965 | 18,000.00 | 9.0 | 0.45 ^{4/} |
| 1966 | 25,000.00 | 10.1 | 0.11 |
| 1967 | 28,700.00 | 9.3 | 0.11 |
| 1968 | 46,000.00 | 9.7 | 0.14 |
| 1969 | 71,000.00 | 7.5 | 0.15 |
| 1970 | 186,000.00 | 8.1 | 0.15 |
| 1971 | 200,000.00 | 8.1 | 0.16 |
| 1972 | 260,000.00 | 9.1 | 0.17 |
| 1973 | 925,000.00 | 9.1 | 0.25 |
| 1974 ^{2/} | 1,822,784.00 | 8.5 | 0.34 |
| 1975 ^{3/} | 1,365,648.00 | 8.6 | 0.28 |
| 1976 | 580,375.00 | 8.9 | 0.41 |
| 1977 | 1,033,950.00 | 9.6 | 0.56 |
| 1978 | 575,260.00 | 9.1 | 0.57 |
| 1979 | 990,263.00 | 8.8 | 0.80 |
| 1980 | 1,446,633.00 | 8.6 | 0.46 |
| 1981 | 3,246,793.00 | 9.1 | 0.53 |
| 1982 | 1,961,518.00 | 9.3 | 0.51 |

1/ Some estimates between 1962 and 1981 include only chum value, which in all figures represents over 99% of the total value. Figures after 1981 represent the chum value as well as incidental species such as other species of salmon, char and whitefish.

2/ Includes \$9,193 from the experimental commercial fishery at Deering.

3/ Includes \$17,776 from the experimental commercial fishery at Deering.

4/ Price per fish.