

ARCTIC-YUKON-KUSKOKWIM REGION
SALMON FISHERY REPORT

A REPORT TO THE
ALASKA BOARD OF FISHERIES

NOVEMBER 1979

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

INTRODUCTION

The Arctic-Yukon-Kuskokwim region is that portion of the state north of the Alaska Range and the Bristol Bay drainage. It includes all of the drainages of the Bering Sea and the Arctic Ocean from Cape Newenham to the U.S.-Canadian border. In addition, it includes the following Bering Sea Islands: Nunivak, St. Lawrence and St. Matthew. This is the largest management region in the state comprising over 400,000 square miles, which is equal to the combined areas of California, Oregon, Washington and Idaho. The region is subdivided into several management areas or districts as indicated in Figure 1.

There are approximately 30,000-40,000 Eskimo and Indian people in the region, the majority of whom reside in excess of 110 small villages scattered along the coast and the major river systems. Nearly all of these native people are dependent to varying degrees on the fish and game resources for their livelihood.

REGIONAL SUMMARY

Commercial Fishery

A harvest of 2.5 million salmon was made in the region during 1979. King, red and coho salmon catches were the largest ever recorded. Catches of chum and pink salmon were slightly larger than the recent five year average. The 1979 harvest represented 25.0 million pounds (round weight) of salmon. Fishermen earnings totaled a record \$12.7 million. The vast majority of commercial fishermen are Eskimo and Indian residents of the region.

Commercial harvests in the region have increased about thirty times since 1960. Recent increases have been largely due to development of chum salmon fisheries in the Yukon River, Kuskokwim River and Kotzebue areas.

The 1979 commercial catches made in each management area are shown below:

| <u>Area</u> | <u>King</u> | <u>Red</u> | <u>Coho</u> | <u>Pink</u> | <u>Chum</u> | <u>Total</u> |
|-----------------------------|-------------------|------------------|-------------------|-------------------|---------------------|---------------------|
| Kuskokwim | 53,314 | 39,463 | 308,683 | 574 | 297,167 | 699,201 |
| Yukon | 129,049 | - | 17,082 | - | 1,165,980 | 1,312,111 |
| Norton Sound | 10,706 | 57 | 31,438 | 167,411 | 140,789 | 350,401 |
| Kotzebue | - | - | - | 910 | 141,623 | 142,533 |
| Totals | <u>193,069</u> | <u>39,520</u> | <u>357,203</u> | <u>168,895</u> | <u>1,745,559</u> | <u>2,504,246</u> |
| Previous Season Record | 170,700 (1978) | 29,000 (1974) | 305,300 (1977) | 395,300 (1978) | 1,984,600 (1975) | 2,732,700 (1978) |
| 5 Year Average (1974-78) | 139,100 | 18,700 | 205,000 | 162,800 | 1,694,100 | 2,219,700 |

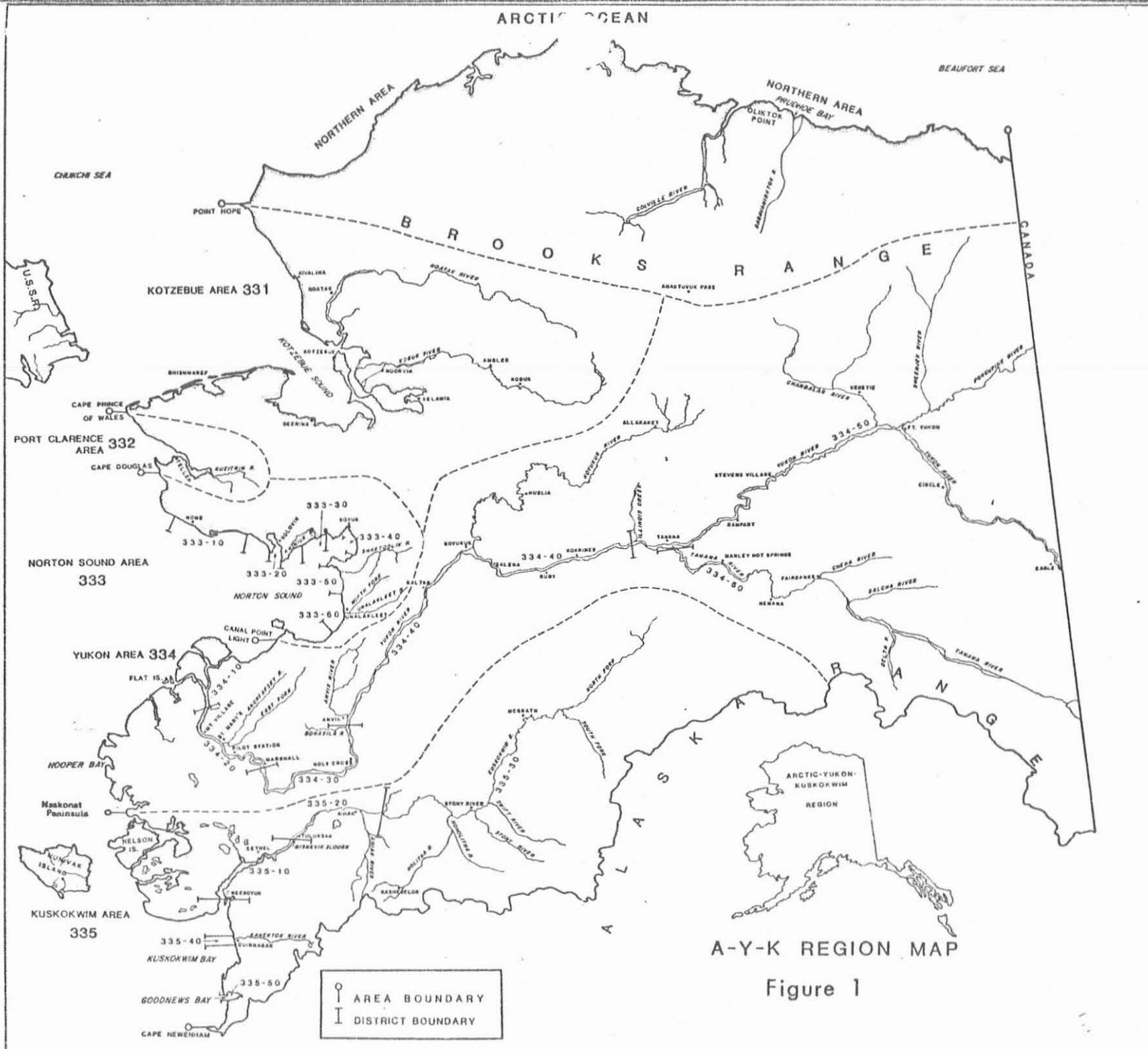
Subsistence Fishery

Subsistence harvest information prior to 1960 is incomplete or entirely lacking for many years, but there are also records indicating that in excess of two million salmon annually were taken during the early 1900's.

About 1930 the airplane began replacing the sled dog as a mail carrier, and this started the gradual decline of the subsistence salmon fishery. This decline was accelerated during the 1966-73 period as increased welfare payments and employment opportunities, including commercial fishing activities, became available to the native people. Another very important factor tending to affect subsistence fishing effort during this period was the increased use of snow vehicles which replaced sled dogs at a faster rate than did the airplane. Since considerable numbers of salmon and other fish are fed to sled dogs, fewer fish were required for subsistence purposes as the canine population declined. The decline in subsistence fishing was not related necessarily to fish abundance, but mainly reflects decreases in effort and dependence due to

a changing way of life. Coincidental with the legislation allowing subsistence salmon roe sales in 1974-77, catches during this period increased substantially compared to the relatively small subsistence catches made the four years prior to roe sales.

Subsistence catch data for 1979 is preliminary at this time since a few late catch reports are still being received. The projected 1979 harvest should approximate 575,000 salmon, similar to the 1978 catch. The recent average annual subsistence harvest recorded during the 1974-78 period was 619,000 salmon.



A-Y-K REGION MAP

Figure 1

Kuskokwim Area

This area includes all waters of the Kuskokwim River drainage and all waters from Cape Newenham north to Naskonat Peninsula. Commercial salmon fishing is allowed along 165 miles of the lower Kuskokwim River and in the Quinhagak and Goodnews Bay subdistricts located along the coast (Figure 2).

The 1979 Kuskokwim area commercial salmon harvest of 699,200 fish was the largest catch ever recorded. Species composition was 53,300 king, 39,500 red, 308,700 coho, 600 pink and 297,200 chum salmon. The red and coho salmon catches were at record levels. Table 1 presents annual commercial catches since 1960 for the Kuskokwim River, Quinhagak and Goodnews Bay subdistricts.

A total of 811 C.F.E.C. permits were issued in 1979. Commercial fishermen earned approximately \$3,683,000 for their catch.

Kuskokwim River

King Salmon: In 1979 the combined Kuskokwim River commercial and subsistence catch totaled 93,300 fish (Table 2). The commercial harvest of 39,000 kings was 22 percent above the recent five year average. The majority of comparative catch and escapement data indicate that the 1979 king salmon run was above average compared to recent years. Fishing time for the 1979 commercial king salmon season totaled 12 hours. Fishing time for the commercial fleet has been restricted during recent years (with the exception of 1978) due to increases in fishing effort (Table 3), gear efficiency and competition among fishermen as a result of better prices for their catch. The current commercial harvest goal for the lower Kuskokwim River is 25 thousand king salmon, but largely due to fleet efficiency recent catches have exceeded this figure; however, recent year king salmon runs have been on the increase and adequate escapement levels have been achieved.

Chum Salmon: Although the commercial chum salmon fishery has increased tremendously since its inception in 1971, the subsistence fishery is still of prime importance. Commercial and subsistence effort and catches have increased greatly in recent years, resulting in the institution of a combined harvest goal in subdistrict 335-10 of approximately 400,000 fish for the 1979 season. This season's chum salmon run was judged average in magnitude based on comparative catch data and limited escapement information. The commercial harvest of 261,900 fish, the largest on record, was attributed to increased fishing effort, up 15 percent since 1977 (Table 3). Due to an exceptionally early run of chums, the season was opened four days prior to the stated opening date. Commercial fishermen were allowed a total of 30 hours of fishing this season, compared to the 30 hours allowed in 1977 and 48 hours in 1978.

When commercial catches are added to subsistence catches, the total utilization of 417,000 was the third largest documented chum salmon catch since 1960 (Table 4).

Coho Salmon: The run this year was also judged above average in magnitude. The commercial coho salmon catch of 219,000 fish was 29 percent above the previous five year average. Commercial coho salmon fishing effort was the largest on record with 613 fishermen participating (Table 3). Because of the increase in effort, fishing time was reduced to two 6 hour periods per week in subdistrict 335-10.

Subsistence Fishery: The Kuskokwim River subsistence king salmon harvest of 54,400 kings was 17 percent above the 5-year average catch of 45,000 fish. The subsistence chum salmon harvest of 155,100 was below the recent 5-year average catch of 201,200.

Escapement: Water levels in 1979 were above normal in most portions of the Kuskokwim district. Aerial surveys of streams where water conditions were not turbid indicated average to above average escapements of king salmon. Ignatti Weir on the Holitna River produced good counts of king and chum salmon. Table 5 presents comparative king salmon index counts.

Quinhagak and Goodnews Bay

These two fisheries are located south of the Kuskokwim River (Figure 2). Fishermen in these subdistricts are restricted to the use of gill nets of less than 6-inch stretched mesh. A total of 14,300 kings, 38,400 reds, 89,600 cohos, 500 pinks and 35,300 chums, totaling 178,100 fish were harvested in these two subdistricts during 1979 (Table 1). Harvest of red and coho salmon were above average.

Although information is limited, escapements for all species appeared to be at least average.

Outlook for 1980

Based on brood year escapement data, the return of king salmon to the Kuskokwim River in 1980 would normally be expected to be below average to average in magnitude. However, apparent good survival of fish from 1974 brood (large return of age 5₂ fish in 1979), and decreased interception by Japanese high seas fishery could result in an improved return for 1980. Limited comparative brood year escapement data is available for Kuskokwim River chum and coho stocks, however comparative commercial catch data indicate an average return of these species in 1980.

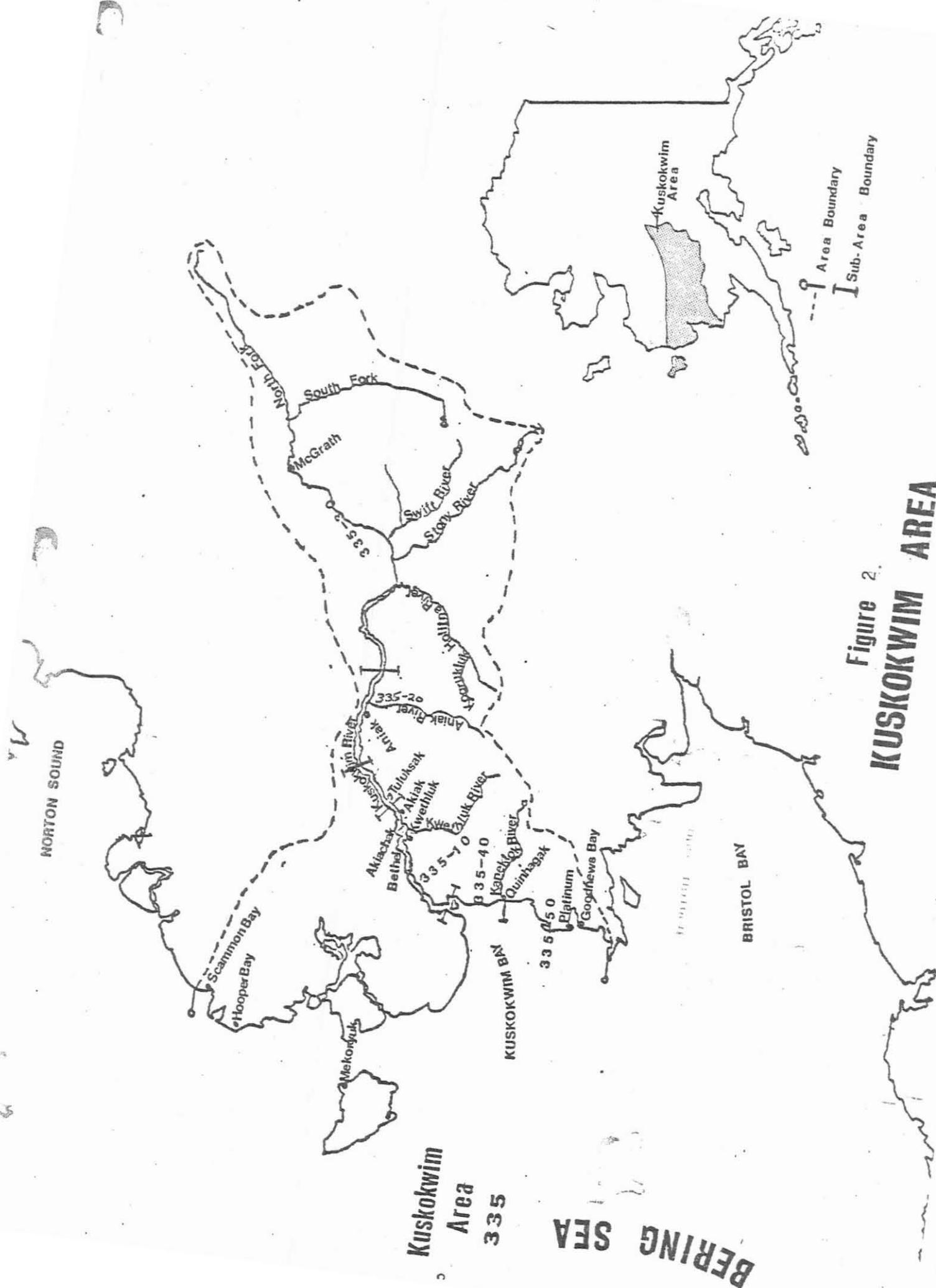


Figure 2.
KUSKOKWIM AREA

**Kuskokwim
 Area
 335**

BERING SEA

Table 1. Kuskokwim district commercial catches by drainage, 1960-1979.

| Kuskokwim River ^{1/} | King | Red | Coho | Pink | Chum | Total |
|-------------------------------|--------|-------|---------|-------|---------|---------|
| 1960 | 5,969 | 0 | 2,498 | 0 | | 8,467 |
| 1961 | 18,918 | 0 | 5,044 | 0 | | 23,962 |
| 1962 | 15,341 | 0 | 12,432 | 0 | | 27,773 |
| 1963 | 12,016 | 0 | 15,660 | 0 | | 27,676 |
| 1964 | 17,149 | 0 | 28,613 | 0 | | 45,762 |
| 1965 | 21,989 | 0 | 12,191 | 0 | | 34,180 |
| 1966 | 25,545 | 0 | 22,985 | 0 | | 48,530 |
| 1967 | 29,986 | 0 | 56,313 | 0 | 148 | 86,447 |
| 1968 | 34,278 | 0 | 127,306 | 0 | 187 | 161,771 |
| 1969 | 43,997 | 322 | 83,765 | 0 | 7,165 | 135,249 |
| 1970 | 39,290 | 117 | 38,601 | 44 | 1,664 | 79,716 |
| 1971 | 40,274 | 2,606 | 5,253 | 0 | 68,914 | 117,047 |
| 1972 | 39,454 | 102 | 22,579 | 8 | 78,619 | 140,762 |
| 1973 | 32,838 | 369 | 130,876 | 33 | 148,746 | 312,862 |
| 1974 | 18,664 | 136 | 147,269 | 37 | 171,887 | 337,984 |
| 1975 ^{4/} | 21,720 | 23 | 81,945 | 10 | 181,840 | 285,538 |
| 1976 | 30,735 | 2,971 | 88,501 | 133 | 177,864 | 300,204 |
| 1977 | 35,830 | 9,379 | 241,364 | 203 | 248,721 | 535,451 |
| 1978 | 45,641 | 733 | 213,393 | 5,832 | 248,656 | 514,255 |
| 1979 | 38,966 | 1,054 | 219,060 | 78 | 261,874 | 521,032 |
| Previous 5 yr Average | 30,518 | 3,136 | 154,494 | 1,243 | 205,749 | 395,140 |

| Quinhagak (Kanektok River) ^{2/} | King | Red | Coho | Pink | Chum | Total |
|---|--------|--------|--------|--------|--------|---------|
| 1960 | 0 | 5,649 | 3,000 | 0 | 0 | 8,649 |
| 1961 | 4,328 | 2,308 | 46 | 90 | 18,864 | 25,636 |
| 1962 | 5,526 | 10,313 | 0 | 4,340 | 45,707 | 65,886 |
| 1963 | 6,555 | 0 | 0 | 0 | 0 | 6,555 |
| 1964 | 4,081 | 13,422 | 379 | 939 | 707 | 19,528 |
| 1965 | 2,976 | 1,886 | 0 | 0 | 4,242 | 9,104 |
| 1966 | 278 | 1,030 | 0 | 268 | 2,610 | 4,186 |
| 1967 | 0 | 652 | 1,926 | 0 | 8,087 | 10,665 |
| 1968 | 8,879 | 5,884 | 21,511 | 75,818 | 19,497 | 131,589 |
| 1969 | 16,802 | 3,784 | 15,077 | 953 | 38,206 | 74,822 |
| 1970 | 18,629 | 5,393 | 16,850 | 15,195 | 46,556 | 102,623 |
| 1971 | 4,185 | 3,118 | 2,982 | 13 | 30,208 | 40,506 |
| 1972 | 15,880 | 3,286 | 376 | 1,878 | 17,247 | 38,667 |
| 1973 | 14,993 | 2,783 | 16,515 | 277 | 19,680 | 54,248 |
| 1974 | 8,704 | 19,510 | 10,979 | 43,642 | 15,298 | 98,133 |
| 1975 ^{4/} | 3,928 | 8,584 | 10,742 | 486 | 35,233 | 58,973 |
| 1976 | 14,110 | 6,090 | 13,777 | 31,412 | 43,659 | 109,048 |
| 1977 | 19,090 | 5,519 | 9,028 | 202 | 43,707 | 77,546 |
| 1978 | 12,335 | 7,589 | 20,114 | 47,033 | 24,798 | 111,869 |
| 1979 | 11,144 | 18,828 | 47,525 | 295 | 25,995 | 103,787 |
| Previous 5 yr Average | 11,633 | 9,458 | 12,928 | 24,555 | 32,539 | 90,913 |

| Goodnews Bay (Goodnews River) ^{3/} | King | Red | Coho | Pink | Chum | Total |
|--|-------|--------|--------|--------|--------|--------|
| 1968 | | | 5,485 | | | 5,485 |
| 1969 | 3,978 | 6,256 | 11,631 | 298 | 5,006 | 27,169 |
| 1970 | 7,163 | 7,144 | 6,974 | 12,189 | 12,346 | 45,630 |
| 1971 | 477 | 330 | 1,771 | 0 | 301 | 2,879 |
| 1972 | 264 | 924 | 925 | 66 | 1,331 | 3,510 |
| 1973 | 3,543 | 2,072 | 5,017 | 324 | 15,781 | 26,737 |
| 1974 | 3,302 | 9,357 | 21,340 | 16,373 | 8,942 | 59,314 |
| 1975 ^{4/} | 2,151 | 8,928 | 17,127 | 403 | 6,459 | 35,068 |
| 1976 | 4,417 | 5,575 | 9,852 | 8,453 | 10,354 | 38,651 |
| 1977 | 3,336 | 3,723 | 13,335 | 29 | 6,531 | 26,954 |
| 1978 | 5,218 | 5,412 | 13,764 | 9,103 | 8,590 | 42,087 |
| 1979 | 3,204 | 19,581 | 42,098 | 201 | 9,298 | 74,382 |
| Previous 5 yr Average | 3,685 | 6,599 | 15,084 | 6,872 | 8,175 | 40,415 |

^{1/} Includes subdistricts 335-10, 335-20 and 335-30. Commercial fishing in 335-30 has been prohibited since 1966.

^{2/} Subdistrict 335-40.

^{3/} Subdistrict 335-50 and includes Chagvan Bay.

^{4/} Final catch data used.

Table 2. Total utilization of Kuskokwim River king salmon, 1960-1979.

| Year | Commercial Catch <u>1/</u> | Subsistence Catch <u>2/</u> | Total Utilization |
|---------------------------|-------------------------------|--------------------------------|-------------------|
| 1960 | 5,969 | 20,361 | 26,330 |
| 1961 | 18,918 | 30,910 | 49,828 |
| 1962 | 15,341 | 14,642 | 29,983 |
| 1963 | 12,016 | 37,246 | 49,262 |
| 1964 | 17,149 | 29,017 | 46,166 |
| 1965 | 21,989 | 27,143 | 49,132 |
| 1966 | 25,545 | 49,606 | 75,151 |
| 1967 | 29,986 | 57,875 | 87,861 |
| 1968 | 34,278 | 30,230 | 64,508 |
| 1969 | 43,997 | 40,138 | 84,135 |
| 1970 | 39,290 | 69,204 | 108,494 |
| 1971 | 40,274 | 42,926 | 83,200 |
| 1972 | 39,454 | 40,145 | 79,599 |
| 1973 | 32,838 | 38,526 | 71,365 |
| 1974 | 18,664 | 26,665 | 45,329 |
| 1975 | 21,720 | 47,784 | 69,504 |
| 1976 | 30,735 | 57,917 | 88,652 |
| 1977 | 35,830 | 55,339 | 91,169 |
| 1978 | 45,641 | 37,049 | 82,661 |
| 1979 | 38,966 | 54,381 | 93,347 |
| Previous 5 yr. average | 30,518 | 44,951 | 75,463 |

1/ Subdistricts 335-10, 335-20 and 335-30

2/ Catches are expanded and include all villages surveyed each year.

Table 3. Kuskokwim River commercial effort data, 1965-79 1/

| Year | King Season | Chum Season | Coho Season |
|------|-------------|-------------|-------------|
| 1965 | 195 | | |
| 1966 | 210 | | 107 |
| 1967 | 233 | | 147 |
| 1968 | 303 | | 242 |
| 1969 | 329 | | 231 |
| 1970 | 361 | | 266 |
| 1971 | 418 | 216 | 83 |
| 1972 | 405 | 176 | 245 |
| 1973 | 456 | 341 | 411 |
| 1974 | 606 | 467 | 516 |
| 1975 | 472 | 540 | 533 |
| 1976 | 561 | 517 | 516 |
| 1977 | 563 | 522 | 572 |
| 1978 | 615 | 617 | 597 |
| 1979 | 591 | 617 | 613 |

1/ Number of actual fishing vessels.

Table 4. Total utilization of Kuskokwim River chum salmon, 1960-1979.

| Year | Commercial Catch <u>1/</u> | Subsistence Catch <u>2/3/</u> | Total Utilization |
|---------------------------|-------------------------------|----------------------------------|-------------------|
| 1960 | | 327,297 | 327,297 |
| 1961 | | 185,447 | 185,447 |
| 1962 | | 165,626 | 165,626 |
| 1963 | | 141,550 | 141,550 |
| 1964 | | 189,660 | 189,660 |
| 1965 | | 283,459 | 283,459 |
| 1966 | | 174,660 | 174,660 |
| 1967 | 148 | 205,263 | 205,411 |
| 1968 | 187 | 260,023 | 260,210 |
| 1969 | 7,165 | 198,628 | 205,793 |
| 1970 | 1,664 | 245,550 | 247,214 |
| 1971 | 68,914 | 116,391 | 185,305 |
| 1972 | 78,619 | 120,316 | 198,935 |
| 1973 | 148,746 | 179,259 | 328,005 |
| 1974 | 171,887 | 277,170 | 449,057 |
| 1975 | 181,840 | 176,389 | 358,229 |
| 1976 | 177,864 | 223,792 | 401,656 |
| 1977 | 248,721 | 210,294 | 458,915 |
| 1978 | 248,656 | 118,341 | 368,071 |
| 1979 | 261,874 | 155,118 | 416,992 |
| Previous 5 yr. average | 205,794 | 201,198 | 406,992 |

1/ Subdistricts 335-10 and 335-20.

2/ Catches are expanded and include all villages surveyed each year, 335-10, 335-20 and 335-30

3/ Includes small numbers of red and coho salmon.

Table 5. Index counts of Kuskokwim River king salmon spawning escapements, 1965-1979 ^{1/}

| Year | Aerial Surveys | | | | Counting Tower | Ignatti Weir |
|--------------------|-------------------|-------------------------------|-------------------|-------------------|---------------------|---------------------|
| | Kisaralik River | Aniak River (Above Salmon R.) | Chukowan River | Kogrukluk River | Kogrukluk River | Holitna River |
| 1965 | 194 ^{2/} | - | - | - | - | - |
| 1966 | 204 ^{2/} | 485 | 986 | 1,645 | - | - |
| 1967 | - | 758 ^{2/} | - | 1,033 | - | - |
| 1968 | 487 | 783 | 1,260 | 2,180 | - | - |
| 1969 | - | 537 | - | - | 2,980 | - |
| 1970 | 531 | 592 | 1,118 | 1,598 | 3,815 | - |
| 1971 | - | 144 ^{2/} | - | 636 ^{2/} | - | - |
| 1972 | - | 93 ^{2/} | 163 ^{2/} | 476 ^{2/} | 1,934 | - |
| 1973 | 152 | 200 ^{2/} | 229 | 610 ^{2/} | 1,725 | - |
| 1974 | 4 ^{2/} | 15 ^{2/} | 43 ^{2/} | - | 3,410 | - |
| 1975 | 129 ^{2/} | 145 | 667 | 1,062 | 1,970 | - |
| 1976 | 873 | 281 | 727 | 518 | 2,900 | 5,507 |
| 1977 | - | 21 ^{3/} | - | 1,342 | 1,988 ^{4/} | 1,385 ^{4/} |
| 1978 ^{6/} | 2,417 | - | 1,064 | - | 7,405 | 13,132 |
| 1979 | - | - | - | - | ^{5/} | 10,125 |

^{1/} ADF&G Annual Management Report, Kuskokwim area, 1978.

^{2/} Surveys rated poor.

^{3/} Survey only uppermost 5 miles of River.

^{4/} Poor counting conditions - probably only a minimum count.

^{5/} Project terminated 1978.

^{6/} Weather prevented aerial assessment.

Yukon Area

Commercial Fishery: The Yukon area includes all waters of the Yukon River drainage in Alaska and all waters from Naskonat Peninsula north to Canal Point light. Commercial salmon fishing is allowed along 1,400 river miles in six subdistricts managed under various regulations (Figure 3).

The 1979 commercial harvest of 1,312,100 salmon was the second largest in history and exceeded the previous 5-year average of 1,050,200. Species composition of the 1979 catch was 129,000 kings; 17,100 cohos and 1,166,000 chums. The king and chum salmon catch was the second largest ever recorded. Table 6 presents annual commercial catches by subdistrict since 1960.

In the lower Yukon area a total of 726 CFEC gillnet permits (including transfers) were issued while in the upper Yukon area 74 gillnet and 170 fishwheel permits were issued. Fishing effort has apparently stabilized at current levels due to implementation of the Limited Entry Program. Commercial fishermen earned approximately \$7,612,000 for their catches in 1979.

King Salmon: The 1979 Yukon River commercial king salmon catch was the second largest on record and greatly exceeded the previous 5-year average of 88,900 fish. Catch and escapement data indicate that the magnitude of the run was above average.

Chum Salmon: The 1979 commercial chum salmon catch was the second largest in history and exceeded the previous 5-year average by 222,300 fish. The large chum salmon catch this year was attributed to an above average run of fall chums.

Subsistence utilization of summer chums, which are more abundant than the fall run, has generally decreased in recent years, due to a

decline in effort and dependence. In order to encourage greater commercial harvesting of summer chums, regulations have been relaxed. In 1979, a total of 803,500 summer chums was commercially harvested in the Yukon area, mostly in subdistricts 1, 2 and 4 where 92 percent of the catch was taken. The 1979 Yukon area summer chum salmon catch was the second highest on record and exceeded the recent 5 year average of 704,900. Because of the rapid growth of the king and summer chum salmon fishery in section 4-B of subdistrict 4, section 5-B of subdistrict 5 and subdistrict 6 the staff is proposing a reduction in fishing time from 5 to 4 days a week in order to provide for more balanced escapements (proposal #74).

A record total of 370,800 fall chums was harvested in the Yukon area in 1979. The 1979 commercial catch exceeded by 132,000 the recent five year average of 238,800 fish. Catch and escapement data indicate the run was above average in magnitude. The large 1979 fall chum catch resulted from a more flexible management of the commercial fishery. The prior 250,000 catch quota was replaced by a guideline harvest level range of 147,500 to 322,500 fish (Department proposal adopted by the Board at its December, 1978 meeting).

Coho Salmon: The 1979 commercial catch was similar to the previous 5-year average of 17,600 fish. Cohos are generally of minor importance and are taken incidentally to the more abundant fall chum salmon.

Upper Yukon Barter Problems: During the fall chum fishery processors and fishermen in the upper Yukon subdistricts became aware that barter of subsistence fish had been legalized by the legislature. The upper Yukon area biologist and fishery technicians stationed in Manley and Nenana received numerous inquiries as to the nature and extent of limitations imposed on barter by the legislature. Responses by the Department to the public stated that the subsistence law as written did not preclude buyers

from bartering subsistence caught fish with the caveat that any barter must be of a "limited and non-commercial nature."

On September 5, three days after the close of the commercial fishing season in subdistrict 5, a local buyer/processor was charged by Fish and Wildlife Protection officers with purchase of approximately 720 subsistence caught chum salmon. The buyer's contention is that the fish were bartered rather than purchased. This case is presently pending adjudication.

Although unfortunate the above mentioned case presents a good example of a situation which if not rectified, threatens the orderly management of the Yukon and possibly other fisheries of Alaska.

While it is neither the desire of the staff nor in the best interest of the State to prohibit or restrict those traditional forms and levels of barter, it is incumbent upon the State to impose restrictions which prevent the development of a quasi-commercial fishing based on barter. The staff has submitted proposals #4, 8 and 391 and proposed amendments, which if adopted, would stabilize the situation without imposing undue hardship.

Subsistence Fishery: Yukon River subsistence catches tabulated to date total 25,500 king and 215,800 other salmon, primarily chums, compared to the recent 5 year average of 21,700 king and 290,700 other salmon (Table 7).

Escapement: King salmon escapements in most index spawning areas ranged from average to above average (Table 8). Record escapements were documented in the Nulato River, Gisasa River, Salcha River and Nisutlin River (Canada). The Whitehorse Dam fishway count of 1,150 kings was exceeded only by the 1962 escapement.

Summer chum escapements were below average to average throughout the drainage. Table 9 presents comparable escapement data in various

index streams. In the Anvik and Andreaafsky River systems, the major summer chum salmon producers, estimated escapements totaled 455,700 chums. Throughout the Yukon River drainage a total of 525,400 summer chums were documented in selected escapement surveys.

During the past eight years the Department has conducted intensive surveys of fall chum and coho salmon spawners in the upper Yukon River drainage (Table 10). In 1979, escapements of fall chums were considered average to above average. In the Toklat River a record escapement of 172,000 fall chums was observed. Also record escapements were observed in the upper Tanana River drainage. Escapements in the Porcupine River system were considered above average, but below the magnitude of the 1975 brood year escapement levels.

Tanana River drainage coho salmon escapements were considered above average in magnitude.

Outlook for 1980

Based on parent year catch and escapement information the magnitude of the Yukon River king salmon run in 1980 is expected to be average to above average in magnitude. Summer and fall chum salmon runs in 1980 are expected to be average in magnitude.

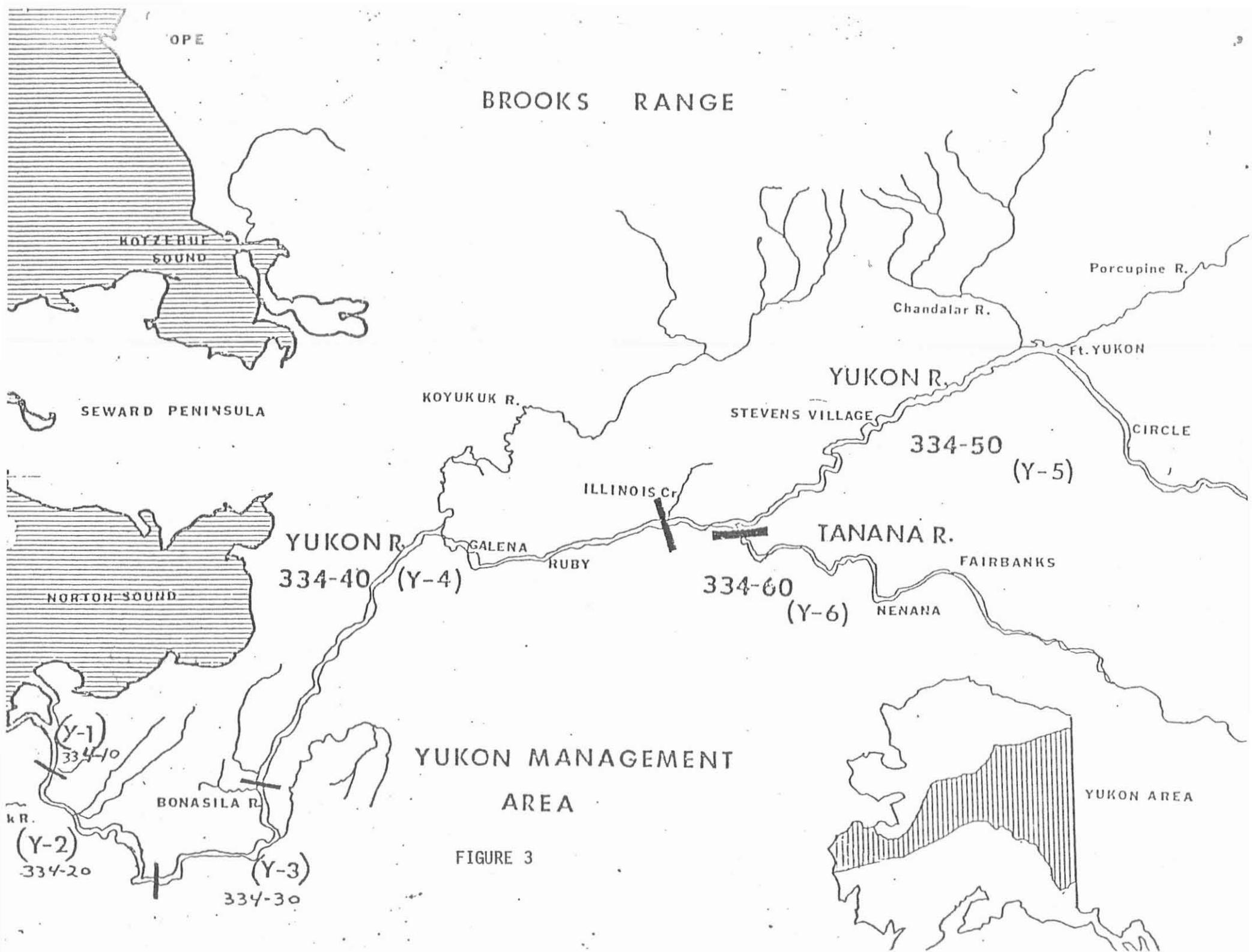


FIGURE 3

KING SALMON

| Year | Lower Yukon Area | | | | Upper Yukon Area | | | | Totals |
|------|------------------|--------|--------|-----------|------------------|--------|--------|-----------|---------|
| | 334-10 | 334-20 | 334-30 | Subtotals | 334-40 | 334-50 | 334-60 | Subtotals | |
| 1960 | 50,713 | 15,994 | - | 66,707 | - | - | - | 884 | 67,591 |
| 1961 | 84,463 | 29,028 | 4,965 | 118,456 | - | - | - | 1,804 | 120,260 |
| 1962 | 67,099 | 22,224 | 4,687 | 94,010 | - | - | - | 724 | 94,734 |
| 1963 | 85,004 | 24,211 | 6,976 | 116,191 | - | - | - | 803 | 116,994 |
| 1964 | 67,555 | 20,246 | 4,705 | 92,506 | - | - | - | 1,081 | 93,587 |
| 1965 | 89,268 | 23,763 | 3,204 | 116,235 | - | - | - | 1,863 | 118,098 |
| 1966 | 70,788 | 16,927 | 3,612 | 91,327 | - | - | - | 1,988 | 93,315 |
| 1967 | 104,350 | 20,289 | 3,618 | 128,257 | - | - | - | 1,449 | 129,706 |
| 1968 | 79,465 | 21,392 | 4,543 | 105,400 | - | - | - | 1,126 | 106,526 |
| 1969 | 70,862 | 14,799 | 3,577 | 89,238 | - | - | - | 985 | 90,223 |
| 1970 | 57,681 | 17,210 | 3,712 | 78,603 | - | - | - | 1,666 | 80,269 |
| 1971 | 86,042 | 19,226 | 3,490 | 108,758 | - | - | - | 1,749 | 110,507 |
| 1972 | 70,052 | 17,855 | 3,841 | 91,748 | - | - | - | 1,092 | 92,840 |
| 1973 | 56,981 | 13,859 | 3,204 | 74,044 | - | - | - | 1,309 | 75,353 |
| 1974 | 71,680 | 17,947 | 3,471 | 93,098 | 685 | 2,663 | 1,473 | 4,821 | 97,919 |
| 1975 | 44,585 | 11,187 | 4,207 | 59,979 | 389 | 2,872 | 500 | 3,761 | 63,740 |
| 1976 | 62,632 | 17,413 | 4,239 | 84,284 | 385 | 2,900 | 1,102 | 4,367 | 88,671 |
| 1977 | 69,456 | 16,781 | 3,943 | 90,180 | 959 | 4,257 | 1,008 | 6,234 | 96,414 |
| 1978 | 57,890 | 32,335 | 2,917 | 93,142 | 701 | 3,115 | 644 | 4,460 | 97,602 |
| 1979 | 76,269 | 41,357 | 5,108 | 122,734 | 1,969 | 3,520 | 826 | 6,315 | 129,049 |

COHO SALMON

| Year | Lower Yukon Area | | | | Upper Yukon Area | | | | Totals |
|------|------------------|--------|--------|-----------|------------------|--------|--------|-----------|--------|
| | 334-10 | 334-20 | 334-30 | Subtotals | 334-40 | 334-50 | 334-60 | Subtotals | |
| 1960 | - | - | - | - | - | - | - | - | - |
| 1961 | 2,855 | - | - | 2,855 | - | - | - | - | 2,855 |
| 1962 | 22,926 | - | - | 22,926 | - | - | - | - | 22,926 |
| 1963 | 5,572 1/ | - | - | 5,572 | - | - | - | - | 5,572 |
| 1964 | 2,446 | - | - | 2,446 | - | - | - | - | 2,446 |
| 1965 | 350 | - | - | 350 | - | - | - | - | 350 |
| 1966 | 19,254 | - | - | 19,254 | - | - | - | - | 19,254 |
| 1967 | 9,925 | - | 1,122 | 11,047 | - | - | - | - | 11,047 |
| 1968 | 13,153 | - | 150 | 13,303 | - | - | - | - | 13,303 |
| 1969 | 14,041 | - | 845 | 14,886 | - | - | - | 95 | 14,981 |
| 1970 | 12,245 | - | - | 12,245 | - | - | - | - | 12,245 |
| 1971 | 12,165 | - | - | 12,165 | - | - | - | 38 | 12,203 |
| 1972 | 21,705 | 506 | - | 22,211 | - | - | - | 22 | 22,233 |
| 1973 | 34,860 | 1,781 | - | 36,641 | - | - | - | - | 36,641 |
| 1974 | 13,728 | 176 | - | 13,904 | - | 909 | 1,427 | 2,336 | 16,240 |
| 1975 | 2,288 | - | - | 2,288 | - | 5 | 53 | 58 | 2,346 |
| 1976 | 4,084 | 17 | - | 4,101 | - | - | 1,096 | 1,096 | 5,197 |
| 1977 | 30,588 | 5,312 | 521 | 36,421 | - | - | 1,284 | 1,284 | 37,705 |
| 1978 | 16,262 | 5,835 | 758 | 22,855 | 32 | 7 | 3,066 | 3,105 | 25,960 |
| 1979 | 11,244 | 2,920 | - | 14,164 | 155 | - | 2,763 | 2,918 | 17,082 |

CHUM SALMON

| Year | Lower Yukon Area | | | | Upper Yukon Area | | | | Totals |
|------|------------------|------------|--------|-----------|------------------|--------|--------|-----------|-----------|
| | 334-10 | 334-20 | 334-30 | Subtotals | 334-40 | 334-50 | 334-60 | Subtotals | |
| 1960 | - | - | - | - | - | - | - | - | - |
| 1961 | 42,577 1/ | - | - | 42,577 | - | - | - | - | 42,577 |
| 1962 | 53,160 1/ | - | - | 53,160 | - | - | - | - | 53,160 |
| 1963 | - | - | - | - | - | - | - | - | - |
| 1964 | 8,347 | - | - | 8,347 | - | - | - | - | 8,347 |
| 1965 | 22,936 | - | - | 22,936 | - | - | - | 381 | 23,317 |
| 1966 | 69,836 | - | 1,209 | 71,045 | - | - | - | - | 71,045 |
| 1967 | 46,148 | 1,425 | 1,880 | 49,453 | - | - | - | - | 49,453 |
| 1968 | 62,852 1/ | 1,407 | 3,136 | 67,395 | - | - | - | - | 67,395 |
| 1969 | 184,411 | 5,024 | 1,722 | 191,157 | - | - | - | 703 | 191,860 |
| 1970 | 320,138 | 22,394 | 3,285 | 346,357 | - | - | - | 907 | 347,264 |
| 1971 | 282,461 | 6,112 | 50 | 288,623 | - | - | - | 1,061 | 289,684 |
| 1972 | 250,945 | 33,805 | 1,840 | 286,590 | - | - | - | 1,254 | 287,844 |
| 1973 | 395,431 1/ | 109,138 1/ | 463 | 505,032 | - | - | - | 13,003 | 518,035 |
| 1974 | 641,663 | 127,644 | 2,273 | 771,580 | 37,079 | 30,382 | 40,202 | 107,663 | 879,243 |
| 1975 | 576,607 | 150,259 | 5,590 | 732,456 | 178,720 | 40,209 | 33,474 | 252,403 | 984,859 |
| 1976 | 382,216 | 120,959 | 14,504 | 517,679 | 213,019 | 6,247 | 24,564 | 243,830 | 761,509 |
| 1977 | 385,972 | 159,051 | 19,310 | 564,333 | 183,565 | 26,848 | 22,951 | 233,364 | 797,697 |
| 1978 | 523,557 | 277,086 | 38,728 | 839,371 | 375,617 | 25,907 | 47,934 | 449,458 | 1,288,829 |
| 1979 | 491,475 | 270,979 | 69,395 | 831,849 | 222,653 | 57,282 | 54,196 | 334,131 | 1,165,980 |

TOTAL SALMON

| Year | Lower Yukon Area | | | | Upper Yukon Area | | | | Totals |
|------|------------------|------------|--------|-----------|------------------|--------|--------|-----------|-----------|
| | 334-10 | 334-20 | 334-30 | Subtotals | 334-40 | 334-50 | 334-60 | Subtotals | |
| 1960 | 50,713 | 15,994 | - | 66,707 | - | - | - | 884 | 67,591 |
| 1961 | 129,895 | 29,028 | 4,965 | 163,888 | - | - | - | 1,804 | 165,692 |
| 1962 | 143,185 | 22,224 | 4,687 | 170,096 | - | - | - | 724 | 170,820 |
| 1963 | 90,576 | 24,211 | 6,976 | 121,763 | - | - | - | 803 | 122,566 |
| 1964 | 78,348 | 20,246 | 4,705 | 103,299 | - | - | - | 1,081 | 104,380 |
| 1965 | 112,554 | 23,763 | 3,204 | 139,521 | - | - | - | 2,244 | 141,765 |
| 1966 | 159,878 | 16,927 | 4,821 | 181,626 | - | - | - | 1,988 | 183,614 |
| 1967 | 160,423 | 21,714 | 6,620 | 188,757 | - | - | - | 1,449 | 190,206 |
| 1968 | 155,470 | 22,799 | 7,829 | 186,098 | - | - | - | 1,126 | 187,224 |
| 1969 | 269,314 | 19,823 | 6,144 | 295,281 | - | - | - | 1,783 | 297,064 |
| 1970 | 390,064 | 39,604 | 6,997 | 436,665 | - | - | - | 2,573 | 439,238 |
| 1971 | 380,668 | 25,338 | 3,540 | 409,546 | - | - | - | 2,848 | 412,394 |
| 1972 | 342,702 | 52,166 | 5,681 | 400,549 | - | - | - | 2,368 | 402,917 |
| 1973 | 487,272 1/ | 124,778 1/ | 3,667 | 615,717 | - | - | - | 14,312 | 630,029 |
| 1974 | 727,071 | 145,767 | 5,774 | 878,612 | 37,764 | 33,954 | 43,102 | 114,820 | 993,402 |
| 1975 | 623,480 | 161,446 | 9,797 | 794,723 | 179,109 | 43,086 | 34,027 | 256,222 | 1,050,945 |
| 1976 | 448,932 | 138,389 | 18,743 | 606,064 | 213,404 | 9,147 | 26,762 | 249,313 | 855,377 |
| 1977 | 486,016 | 181,144 | 23,744 | 690,934 | 184,524 | 31,115 | 25,243 | 240,882 | 931,816 |
| 1978 | 597,709 | 315,256 | 42,403 | 955,368 | 376,350 | 29,029 | 51,644 | 457,023 | 1,412,391 |
| 1979 | 578,988 | 315,256 | 74,503 | 968,747 | 224,777 | 60,802 | 57,785 | 343,364 | 1,312,111 |

Table 7. Yukon River comparative subsistence catch and effort data, 1961-1979: (numbers per fishing family are in parenthesis).

| Year | Total Catch | | Equivalent Catch 1/ | | Mean Equivalent Catch per Family | |
|---------|-------------|-----------------|---------------------|-----------------|----------------------------------|--------------|
| | King Salmon | Other Salmon 2/ | King Salmon | Other Salmon 2/ | King Salmon | Other Salmon |
| 1961 | 31,864 | 405,632 | 20,117 | 403,765 | 32 | 647 |
| 1962 | 21,610 | 356,754 | 10,217 | 325,244 | 18 | 577 |
| 1963 | 32,790 | 408,381 | 23,919 | 376,440 | 40 | 625 |
| 1964 | 22,877 | 485,630 | 14,847 | 458,609 | 25 | 762 |
| 1965 | 19,723 | 458,379 | 16,499 | 430,949 | 30 | 788 |
| 1966 | 14,272 | 214,236 | 11,507 | 204,913 | 23 | 416 |
| 1967 | 19,661 | 288,595 | 16,306 | 256,956 | 35 | 546 |
| 1968 | 15,006 | 189,607 | 11,883 | 170,552 | 25 | 358 |
| 1969 | 15,000 | 213,725 | 13,916 | 195,476 | 30 | 426 |
| 1970 | 15,794 | 223,237 | 13,474 | 199,163 | 34 | 498 |
| 1971 | 27,953 | 228,849 | 24,058 | 191,011 | 48 | 383 |
| 1972 | 21,868 | 151,008 | 19,314 | 129,343 | 46 | 311 |
| 1973 | 26,459 | 219,275 | 23,530 | 198,054 | 44 | 374 |
| 1974 | 23,137 | 323,834 | 19,014 | 284,977 | 38 | 580 |
| 1975 | 15,466 | 300,379 | 12,600 | 262,741 | 21 | 448 |
| 1976 | 19,329 | 262,624 | 16,196 | 235,056 | 25 | 358 |
| 1977 | 20,388 | 267,127 | 15,740 | 235,401 | 27 | 408 |
| 1978 | 30,297 | 299,791 | 25,496 | 255,447 | 36 | 360 |
| 1979 4/ | 25,538 | 215,800 | 23,263 | 192,055 | 35 | 285 |

| Year | Fishing Families surveyed | People in fishing families 1/ | Snowmachines 1/ | Sled dogs 1/ | Gear operated 1/ | |
|---------|---------------------------|-------------------------------|-----------------|--------------|------------------|------------|
| | | | | | Gill nets | Fishwheels |
| 1961 | 624 | 3,626 (5.8) | | 4,806 (7.7) | 577 | 169 |
| 1962 | 564 | 3,279 (5.8) | | 3,848 (6.8) | 613 | 138 |
| 1963 | 602 | 4,154 (6.9) | | 4,214 (7.0) | 716 | 156 |
| 1964 | 602 | 3,612 (6.0) | | 4,003 (6.6) | 840 | 155 |
| 1965 | 547 | 3,993 (7.3) | | 3,993 (7.3) | 645 | 127 |
| 1966 | 492 | 3,149 (6.4) | | 3,112 (6.3) | 582 | 116 |
| 1967 | 471 | 2,779 (5.9) | 192 (0.4) | 2,752 (5.8) | 530 | 86 |
| 1968 | 476 | 3,094 (6.5) | 262 (0.6) | 2,719 (5.7) | 565 | 71 |
| 1969 | 459 | 2,984 (6.5) | 349 (0.8) | 2,448 (5.3) | 930 | 63 |
| 1970 | 400 | 2,680 (6.7) | 346 (0.9) | 2,214 (5.5) | 647 | 55 |
| 1971 | 499 | 3,244 (6.5) | 460 (0.9) | 2,226 (4.5) | 795 | 63 |
| 1972 | 416 | 2,621 (6.3) | 438 (1.0) | 1,589 (3.8) | 755 | 59 |
| 1973 | 530 | 3,339 (6.3) | 571 (1.1) | 2,375 (4.5) | 991 | 83 |
| 1974 | 491 | 3,093 (6.3) | 534 (1.1) | 2,105 (4.3) | 668 | 90 |
| 1975 | 587 | 3,698 (6.3) | 762 (1.3) | 2,585 (4.4) | 1,119 | 126 |
| 1976 | 657 | 4,139 (6.3) | 882 (1.3) | 3,401 (5.2) | 1,071 | 154 |
| 1977 | 577 | 3,635 (7.3) | 785 (1.4) | 3,413 (5.9) | 755 | 164 |
| 1978 | 711 | 3,929 (5.5) | 843 (1.2) | 3,722 (5.2) | 943 | 178 |
| 1979 4/ | 674 | 3,614 (5.4) | 861 (1.3) | 2,918 (4.3) | 1,041 | 112 |

1/ Data from villages surveyed each year since 1961: Mouth to Fort Yukon and Tanana River (does not include Fairbanks area)

2/ Mostly chum salmon, some pinks and cohos.

3/ Total king and other salmon catches have been corrected.

4/ Preliminary.

Table 8. Comparative Yukon River drainage king salmon escapement estimates 1959-1979 ^{1/}

| Year | Andreafsky River (East Fork) | Andreafsky River (West Fork) | Nulato River | Anvik River |
|------|---------------------------------|---------------------------------|--------------|---------------------|
| 1960 | 1,020 | 1,220 | 756 | 1,950 |
| 1961 | 1,003 | | 543 | 1,226 |
| 1962 | 675 ^{2/} | 762 ^{2/} | | |
| 1963 | | | | |
| 1964 | 867 | 705 | | |
| 1965 | | 355 ^{2/} | | 650 ^{2/} |
| 1966 | 361 | 303 | | 638 |
| 1967 | | 276 ^{2/} | | 336 ^{2/} |
| 1968 | 380 | 383 | | 297 ^{2/} |
| 1969 | 231 ^{2/} | 274 ^{2/} | | 296 ^{2/} |
| 1970 | 665 | 574 ^{2/} | | 368 ^{2/} |
| 1971 | 1,904 | 1,284 | | |
| 1972 | 798 | 582 ^{2/} | | 1,172 ^{4/} |
| 1973 | 825 | 788 | | 613 ^{4/} |
| 1974 | | 285 | 78 | 506 ^{5/} |
| 1975 | 993 | 421 | 204 | 720 ^{6/} |
| 1976 | 818 | 643 | 648 | 1,155 ^{6/} |
| 1977 | 2,008 | 1,499 | 487 | 1,354 ^{6/} |
| 1978 | 2,487 | 1,062 | 920 | 1,281 ^{6/} |
| 1979 | 1,180 | 1,134 | 1,507 | 1,131 ^{4/} |

| Year | Chena River | Salcha River | Nisutlin River (Sidney-100 Mi. Cr.) | Whitehorse Dam Fishway |
|------|---------------------|-------------------|--|------------------------|
| 1959 | | | | 1,054 |
| 1960 | 132 | 1,660 | | 660 |
| 1961 | | 2,878 | | 1,068 |
| 1962 | | 937 | | 1,500 |
| 1963 | | | | 484 |
| 1964 | | 450 | | 587 |
| 1965 | | 408 | | 903 |
| 1966 | | 800 | | 563 |
| 1967 | | | | 533 |
| 1968 | | 735 | 407 | 407 |
| 1969 | | 461 ^{2/} | 105 | 334 |
| 1970 | | 1,882 | 615 | 625 |
| 1971 | 193 ^{2/7/} | 159 ^{2/} | 640 ^{3/} | 856 |
| 1972 | 138 ^{2/7/} | 1,193 | 317 | 392 |
| 1973 | 21 | 249 | 36 ^{2/} | 228 |
| 1974 | 1,035 ^{7/} | 1,857 | 48 ^{2/} | 273 |
| 1975 | 316 ^{7/} | 1,055 | 249 | 313 |
| 1976 | 531 | 1,691 | 102 | 120 |
| 1977 | 563 | 1,202 | 77 | 277 |
| 1978 | 1,726 | 3,499 | 375 | 670 |
| 1979 | 1,159 | 4,769 | 713 | 1,150 |

^{1/} With exception of Whitehorse fishway counts, the data was obtained from aerial surveys which were made only of the main stem of each river listed.

^{2/} Incomplete survey or poor survey conditions resulting in a very minimal count.

^{3/} Environment Canada - Fisheries Service survey.

^{4/} Combination tower counts and aerial survey estimates.

^{5/} Tower count.

^{6/} Combination aerial and boat surveys.

^{7/} Boat surveys.

Table 9. Comparative Yukon River drainage summer chum salmon aerial survey escapement estimates, 1958-1979.

| Year | SUMMER CHUMS | | | |
|------|---------------------------------|---------------------------------|---------------------|-----------------|
| | Andreafsky River (East Fork) | Andreafsky River (West Fork) | Anvik River | Salcha River |
| 1958 | | | 100-200,000 | |
| 1959 | | | 200,000 | |
| 1960 | 3,830 | | 11,110 | 670 |
| 1961 | 8,110 | | | 1,152 |
| 1962 | 18,040 | 19,530 | 20,600 | 1,161 |
| 1963 | | | | |
| 1964 | | 12,810 | 12-14,000 <u>1/</u> | 250 <u>1/</u> |
| 1965 | | 14,670 <u>1/</u> | 100,000 | 2,375 |
| 1966 | 25,619 | 18,145 | 37,500 | 2,200 |
| 1967 | | 14,495 <u>2/</u> | 116,000 | |
| 1968 | 17,600 <u>2/</u> | 74,600 <u>2/</u> | 51,580 <u>1/</u> | 3,790 |
| 1969 | 119,000 | 159,500 | | 425 <u>1/</u> |
| 1970 | 84,090 | 91,710 <u>1/</u> | 232,780 | 7,879 |
| 1971 | 98,095 | 71,745 | | 306 <u>1/</u> |
| 1972 | 41,460 | 25,573 | 245,857 <u>3/</u> | 947 <u>1/</u> |
| 1973 | 10,149 <u>1/</u> | 51,835 | 86,665 <u>3/</u> | 290 |
| 1974 | 3,215 <u>1/</u> | 33,258 | 201,277 <u>4/</u> | 8,040 <u>5/</u> |
| 1975 | 223,485 | 235,954 | 845,485 | 7,573 |
| 1976 | 105,347 | 118,420 | 406,166 <u>3/</u> | 6,474 |
| 1977 | 112,722 | 63,120 | 262,754 | 677 |
| 1978 | 127,050 | 57,321 | 251,399 <u>3/</u> | 5,405 |
| 1979 | 66,471 | 43,391 | 345,827 <u>6/</u> | 3,060 |

- 1/ Poor or incomplete survey.
2/ Includes some pinks.
3/ Combined tower and aerial survey estimates.
4/ Tower counts.
5/ Combined aerial and boat surveys.
6/ Combined sonar count and aerial survey.

Table 10. Comparative Yukon River drainage fall chum salmon aerial survey escapement estimates, 1971-1979 1/

| | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|--|--------------------|---------------|---------------|----------------|----------------|---------------|----------------|---------------|----------------|
| <u>TANANA RIVER DRAINAGE</u> | | | | | | | | | |
| Bear Paw River | - | - | 1,530 | 2,996 | 1,657 | - | - | - | - |
| Toklat River drainage | - | 1,000 2/ | 6,957 | 34,310 | 42,418 | 35,224 | 25,000 | 35,000 | 107,593 |
| Upper Toklat River 3/ | - | - | - | - | 35,867 | 2,000 2/ | - | - | 64,540 |
| Lower Toklat River | - | - | - | - | - | - | - | - | - |
| Subtotal Toklat R. drainage | - | - | 6,957 | 34,310 | 78,285 | 37,224 | 25,000 | 35,000 | 172,133 |
| <u>UPPER TANANA RIVER DRAINAGE</u> | | | | | | | | | |
| Benchmark #735 Slough | - | 5,255 | 127 2/ | 1,450 | - | 336 | 1,270 | 1,705 | 2,714 |
| Delta River | - | 3,650 | 7,971 | 4,010 | 3,946 7/ | 5,526 | 17,925 | 10,051 | 8,125 |
| Upper Tanana River 4/ | - | 8,350 | 5,635 | 4,567 | - | 4,979 | 3,725 | 5,700 | 20,820 |
| Bluff Cabin Slough | - | 6,040 | 3,450 | 4,840 | 5,000 2/ | 3,197 | 6,491 | 5,340 | 6,875 |
| Delta Clearwater Slough (1 Mile Slough) | - | - | 1,720 | 1,235 | 745 2/ | 1,552 | 1,900 | 475 | 3,850 |
| Subtotal Upper Tanana R. drainage | - | 23,295 | 18,903 | 16,102 | 9,691 | 15,590 | 31,311 | 23,271 | 42,384 |
| <u>CHANDALAR RIVER</u> | - | - | - | 17,455 | 6,345 2/ | 58 2/ | 4,183 | - | - |
| <u>PORCUPINE RIVER DRAINAGE</u> | | | | | | | | | |
| Sheenjok River | - | - | 1,175 | 40,507 | 78,060 | 12,023 | 20,506 | 14,610 | 41,140 |
| Fishing Branch River (Yukon Terr) | 250,300,000 | 35,125 5/ | 15,987 6/ | 32,525 6/ | 353,282 6/ | 13,450 | 32,500 | 15,000 | 44,080 |
| Subtotal Porcupine R. drainage | 250-300,000 | 35,125 | 17,162 | 73,032 | 431,342 | 25,473 | 53,006 | 29,610 | 85,220 |
| TOTAL | 250-300,000 | 59,420 | 44,552 | 143,895 | 527,320 | 78,345 | 113,500 | 87,881 | 299,737 |

1/ All surveys rated fair-good unless rated otherwise. Only peak estimates listed.

2/ Poor or incomplete survey; very minimal and/or rough estimate.

3/ Includes following areas: Toklat River in vicinity of roadhouse, Shushana River and Geiger Creek.

4/ Richardson Highway Bridge to Blue Creek.

5/ Combined tagging population estimate and weir count.

6/ Weir count.

7/ Foot survey.

Norton Sound Area

This area includes all waters from Canal Point Light north to Cape Douglas. It is subdivided into six subdistricts, each containing at least one major salmon spawning stream (Figure 4). Commercial fishing is conducted with set gill nets, primarily near stream mouths. It is assumed that the majority of salmon captured commercially in each subdistrict are bound for streams within that subdistrict; however, this assumption is only now being studied by stock separation programs.

The commercial salmon harvest of 350,400 fish was the second largest on record and included 10,700 king, 31,400 coho, 167,400 pink and 140,800 chum salmon. The king and coho salmon harvests were the largest ever documented.

A total of 181 fishing vessels participated in the commercial fishery in 1979, which was slightly below 1978 levels. CFEC gillnet permits issued in 1979 totaled 204. Commercial fishermen earned approximately \$875,000 for their catch.

Subsistence fishermen caught a reported 46,000 salmon in 1979, which represents an 34% increase above the recent 5-year annual average harvest. A large portion of this catch and increase was pink salmon.

High, turbid water conditions and poor weather hampered assessments of escapements; however, escapements of all salmon species were generally at least average in all subdistricts except subdistrict 3 (Moses Point). Chum salmon escapements in this subdistrict have been below average for three of the last four years. Proposal #71, designed to improve management in this subdistrict, by regulating fishing time by emergency order instead of a fixed fishing schedule, has been submitted for Board consideration.

Outlook for 1980

Below average chum salmon escapements were documented in the 1976

parent year, while escapements to the Kwiniuk River in subdistrict 3 were the lowest ever documented. Similar run magnitudes of chum salmon can be expected in 1980. Parent year pink salmon escapements in 1978 were the greatest on record, which may indicate similar returns in 1980.

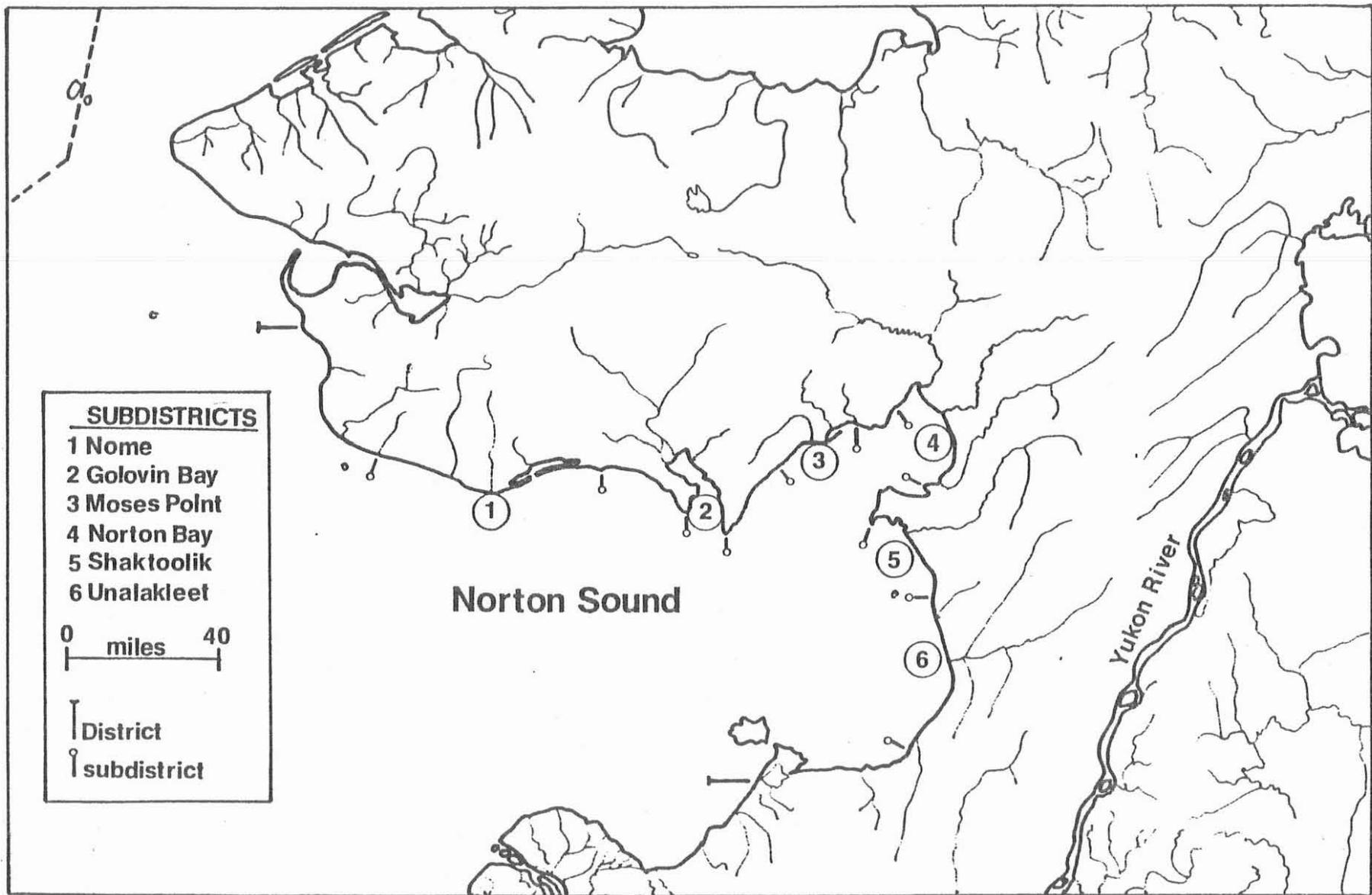


Figure 4. Norton Sound district and subdistricts

Table 11. Commercial and subsistence salmon catches by species by subdistrict, Norton Sound district, 1961-1979.

| Year | Chinook | Coho | Commercial | | | Subsistence | | | | | Combined | | | | |
|---------------------------|--------------------|--------|------------|---------|---------|-------------|-------|--------|----------------------|--------|----------|--------|---------|---------|---------|
| | | | Pink | Chum | Total | Chinook | Coho | Pink | Chum | Total | Chinook | Coho | Pink | Chum | Total |
| <u>ALL SUBDISTRICTS</u> | | | | | | | | | | | | | | | |
| 1961 | 5,300 | 13,807 | 34,332 | 48,332 | 101,711 | - | - | - | - | - | 5,300 | 13,807 | 34,237 | 48,332 | 101,711 |
| 1962 | 7,286 | 9,156 | 33,187 | 182,784 | 232,431 | - | - | - | - | - | 7,286 | 9,156 | 33,187 | 182,784 | 232,431 |
| 1963 | 6,613 | 16,765 | 55,625 | 154,789 | 233,863 | 5 | 118 | 16,607 | 17,635 | 34,365 | 6,618 | 96,883 | 72,232 | 172,424 | 268,228 |
| 1964 | 2,018 | 98 | 13,567 | 148,862 | 164,671 | 565 | 2,567 | 9,225 | 12,486 | 24,843 | 2,583 | 2,665 | 22,792 | 161,348 | 189,514 |
| 1965 | 1,449 | 2,030 | 220 | 36,795 | 40,524 | 574 | 4,812 | 19,131 | 30,772 | 55,289 | 2,023 | 6,847 | 19,351 | 67,567 | 95,813 |
| 1966 | 1,553 ¹ | 5,755 | 12,778 | 80,245 | 100,345 | 269 | 2,210 | 14,335 | 21,873 | 38,687 | 1,822 | 7,965 | 27,113 | 102,118 | 139,032 |
| 1967 | 1,804 | 2,379 | 28,879 | 41,756 | 74,818 | 817 | 1,222 | 17,516 | 22,724 | 42,279 | 2,621 | 3,601 | 46,395 | 64,480 | 117,097 |
| 1968 | 1,045 | 6,885 | 71,179 | 45,300 | 124,499 | 237 | 2,391 | 36,912 | 11,661 | 51,201 | 1,282 | 9,276 | 108,091 | 57,051 | 175,700 |
| 1969 | 2,392 | 6,836 | 86,949 | 82,795 | 178,972 | 436 | 2,191 | 18,562 | 15,615 | 36,804 | 2,828 | 9,027 | 105,511 | 98,410 | 215,776 |
| 1970 | 1,853 | 4,423 | 64,908 | 107,034 | 178,218 | 561 | 4,675 | 26,127 | 22,763 | 54,126 | 2,414 | 9,098 | 91,035 | 129,797 | 232,374 |
| 1971 | 2,593 | 3,127 | 4,895 | 131,362 | 141,977 | 1026 | 4,097 | 10,863 | 21,815 ^{1/} | 37,801 | 3,619 | 7,224 | 15,758 | 153,177 | 179,778 |
| 1972 | 2,938 | 454 | 45,182 | 100,920 | 149,494 | 804 | 2,319 | 14,158 | 13,966 ^{2/} | 31,247 | 3,742 | 2,773 | 59,340 | 114,886 | 180,741 |
| 1973 | 1,918 | 9,282 | 46,499 | 119,093 | 176,797 | 392 | 520 | 14,770 | 7,185 | 22,867 | 2,310 | 9,802 | 61,269 | 126,283 | 199,664 |
| 1974 | 2,981 | 2,092 | 148,519 | 162,267 | 315,829 | 420 | 1,064 | 16,426 | 3,958 | 21,868 | 3,371 | 3,156 | 164,945 | 166,825 | 337,697 |
| 1975 | 2,393 | 4,593 | 32,388 | 212,485 | 251,861 | 186 | 192 | 15,803 | 8,124 ^{3/} | 24,305 | 2,579 | 4,785 | 48,191 | 220,609 | 276,166 |
| 1976 | 2,248 | 6,934 | 87,916 | 95,956 | 193,060 | 203 | 1,004 | 18,048 | 7,718 | 26,973 | 2,446 | 7,938 | 105,958 | 103,674 | 219,987 |
| 1977 | 4,500 | 3,690 | 48,675 | 200,455 | 257,325 | 846 | 2,530 | 14,296 | 26,607 | 44,279 | 5,346 | 6,220 | 62,971 | 227,062 | 301,604 |
| 1978 | 9,819 | 7,335 | 325,503 | 189,279 | 531,948 | 1211 | 2,981 | 35,281 | 12,257 | 51,730 | 11,030 | 10,316 | 360,784 | 201,536 | 583,678 |
| 1979 | 10,706 | 31,438 | 167,411 | 140,789 | 350,344 | 747 | 8,487 | 25,247 | 11,975 | 46,446 | 11,453 | 39,925 | 192,658 | 152,764 | 396,800 |
| 5 yr avg ^{4/} | 4,388 | 4,929 | 128,600 | 172,088 | 310,005 | 573 | 1,554 | 19,971 | 11,733 | 34,431 | 4,954 | 6,483 | 149,870 | 183,941 | 345,248 |

1/ Includes 197 recorded sockeye salmon in all subdistricts.

2/ Includes 93 recorded sockeye salmon in all subdistricts.

3/ Includes all recorded sockeye salmon in all subdistricts

4/ 1974 - 1978

5/ 1969 - 1978

6/ May include sockeye salmon, usually less than 100

Table 12. Comparative aerial surveys of Norton Sound streams, 1961-79.

| YEAR | CHUM | PINK | PINK AND CHUM ^{1/} |
|---------------------------|--------|---------|-----------------------------|
| Nome (Subdistrict 1) | | | |
| <u>NOME RIVER</u> | | | |
| 1960 | - | 410 | |
| 1963 | 126 | 3,719 | |
| 1964 | - | - | 480 |
| 1965 | 294 | - | |
| 1971 | 75 | 7,755 | |
| 1973 | 710 | 14,960 | |
| 1974 | 854 | 17,830 | |
| 1975 | 975 | 3,405 | |
| 1976 | 1,200 | 6,700 | |
| 1977 | 3,046 | 1,726 | |
| 1978 | 5,242 | 34,900 | |
| 1979 | - | - | 750 |
| Golovin (Subdistrict 2) | | | |
| <u>NIUKLUK RIVER</u> | | | |
| 1962 | - | - | 27,879 |
| 1964 | 13,687 | 4,103 | |
| 1966 | 21,300 | 8,600 | 4,700 |
| 1967 | 20,546 | - | |
| 1968 | - | - | 85,125 |
| 1969 | 10,240 | 92,650 | |
| 1970 | 7,300 | 60,300 | |
| 1971 | 22,605 | 8,370 | |
| 1972 | 10,500 | 22,600 | |
| 1973 | 15,156 | 14,326 | |
| 1974 | 8,720 | 8,915 | |
| 1975 | 16,453 | 10,089 | |
| 1976 | 4,134 | 7,190 | |
| 1977 | 10,456 | 1,921 | |
| 1978 | 14,365 | 208,300 | |
| 1979 | 8,213 | 29,100 | |
| Moses Pt. (Subdistrict 3) | | | |
| <u>KWINIUK RIVER</u> | | | |
| 1965 | 26,634 | 8,301 | |
| 1966 | 32,786 | 10,629 | |
| 1967 | 24,444 | 3,508 | |
| 1968 | 18,813 | 126,764 | |
| 1969 | 19,687 | 56,683 | |
| 1970 | 68,004 | 235,135 | |
| 1971 | 38,679 | 16,634 | |
| 1972 | 30,686 | 62,461 | |
| 1973 | 28,617 | 38,426 | |
| 1974 | 35,899 | 40,816 | |
| 1975 | 14,344 | 57,317 | |

Table 12. (Cont.) Comparative aerial surveys of Norton Sound streams, 1961-79.

| YEAR | CHUM | PINK | PINK AND CHUM ^{1/} |
|----------------------------|--------|---------------------|-----------------------------|
| 1976 | 6,466 | 28,087 | |
| 1977 | 22,757 | 46,234 | |
| 1978 | 14,408 | 75,993 | |
| 1979 | 12,355 | 167,492 | |
| Shaktoolik (Subdistrict 5) | | | |
| <u>SHAKTOOLIK RIVER</u> | | | |
| 1961 | | | 10,300 |
| 1962 | | | 36,417 |
| 1963 | | | 29,987 |
| 1964 | | | 16,327 |
| 1966 | | | 4,060 |
| 1975 | 16,601 | 37,971 | |
| 1976 | 1,736 | 12,175 | |
| 1977 | 20,899 | 7,602 | |
| 1978 | 19,972 | 203,303 | |
| 1979 | 4,350 | 40,450 | |
| Unalakleet (Subdistrict 6) | | | |
| <u>UNALAKLEET RIVER</u> | | | |
| 1961 | | | 50,260 |
| 1962 | | | 46,838 |
| 1963 | | | 19,305 |
| 1964 | | | 28,214 |
| 1966 | | | 5,200 |
| 1968 | | | 112,812 |
| 1970 | 950 | 95,075 | |
| 1972 | 7,852 | 12,450 | |
| 1975 | 10,501 | 16,750 | |
| 1976 | | | 38,325 |
| 1977 | 16,038 | 18,170 | |
| 1978 | 28,600 | 491,706 | |
| 1979 | 570 | 1,700 ^{2/} | |

^{1/} Not distinguished by species.

^{2/} Poor survey.

Kotzebue Area

This area includes all waters from Cape Prince of Wales north to Point Hope (Figure 5). The major salmon species in this area are chum salmon, bound primarily for the Kobuk and Noatak rivers. The Kobuk River run arrives in the district first, soon after ice break-up, and is followed by the Noatak River run. The Kobuk River run peaks during the third week of July, while the Noatak River run peaks during the second week of August. These fish are used not only within the commercial fishery in Kotzebue Sound, but also by five subsistence villages on the Kobuk River and one on the Noatak River.

Commercial Fishery: The chum salmon harvest of 141,600 fish was 72% below the recent 5-year average annual catch of 333,100 fish (Table 13). A total of 181 fishermen participated in the commercial fishery in 1979, which was below 1978 levels. Two hundred-ten C.F.E.C. gillnet permits were issued in 1979. Commercial fishermen earned approximately \$990,000 for their catch.

Kotzebue commercial chum salmon catches averaged about 85,000 fish during 1962-1972, but due to exceptionally large runs increased to an average of 524,500 fish in 1973-75, during which time fishing effort increased sharply (Table 14). Harvests and escapements made during 1976-78 were more similar to pre-1973 levels, but fishing effort has remained high. As a result several new regulations and a revised management strategy for the 1979 season were implemented. This season comparative commercial catch data did not indicate above average Kobuk River chum returns. Consequently, the fishing schedule was maintained at two 24-hour periods per week during July to protect this run. Commercial fishing time was increased to two 36-hour periods per week during August as the Noatak River run entered the fishery. However, run strength decreased, which

resulted in a brief closure and then an abbreviated fishing schedule for the remainder of the season.

Subsistence Fishery: Subsistence fishermen caught a reported 18,000 chum salmon in 1979, the largest catch since 1975.

Escapement: High, turbid water conditions and poor weather hampered aerial survey assessment of Noatak and Kobuk River escapements for the second consecutive year. The feasibility of using a side scan sonar system for obtaining improved Noatak River escapement data was explored for the first time this season. A single unit was operated from the east bank of the lower river and a partial count of 29,000 salmon obtained. Based on a combination of aerial survey, boat survey and sonar data, a minimum escapement range of 40,000-62,000 chum salmon was calculated for the Noatak River. This estimate may not be comparable with previous annual escapements listed in Table 14 which were obtained only by aerial survey. Interviews with subsistence fishermen indicated a somewhat improved escapement for the Kobuk River compared to 1978 based on fishing success. Plans are being made to operate two sonar units in the Noatak River next year to obtain a more accurate escapement estimate.

Outlook for 1980

Chum salmon escapements of the 1976 brood year to the Noatak and Kobuk rivers were below average. The return in 1980 may therefore be of similar magnitude. It should be noted however, that Kotzebue chum salmon stocks inhabit the northernmost part of the range for this species and may be subject to large fluctuations in returns.

U.S.- Russia Convention of 1867

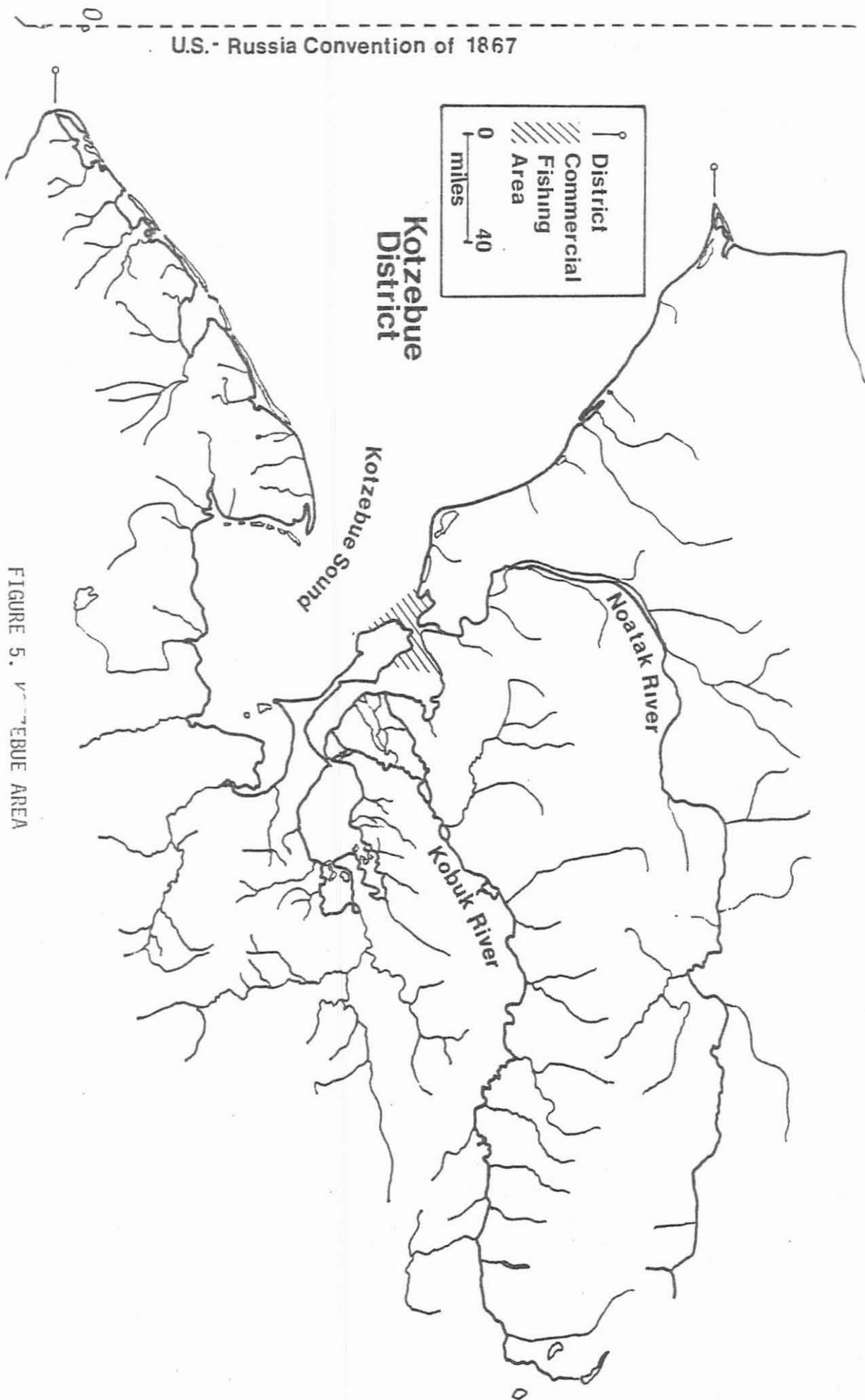


FIGURE 5. KOTZEBUE AREA

Table 13. Commercial and subsistence salmon catches, Kotzebue district, 1914 -1979

| Year ^{1/} | Commercial catch | | | Subsistence | Combined Catches |
|--------------------|-----------------------|---------------------|---------|----------------------|------------------|
| | Chum | Other ^{3/} | Total | Chum | |
| 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 ^{4/} | | | | 298,430 | |
| 1962 | 129,948 | 127 | 130,075 | 20,283 | 200,358 |
| 1963 | 54,445 | 143 | 54,588 | 31,069 | 85,657 |
| 1964 | 76,499 | 5 | 76,504 | 29,762 | 106,266 |
| 1965 | 40,034 | | 40,034 | 30,500 | 70,534 |
| 1966 | 30,764 | 1 | 30,765 | 35,588 | 66,353 |
| 1967 | 29,400 | | 29,400 | 40,108 | 69,508 |
| 1968 | 30,384 ^{5/} | | 30,384 | 20,814 | 51,198 |
| 1969 | 59,335 | 48 | 59,383 | 29,812 | 89,195 |
| 1970 | 159,664 | | 159,664 | 28,486 | 188,150 |
| 1971 | 154,956 | 1 | 154,957 | 23,959 | 178,916 |
| 1972 | 169,664 | 3 | 169,667 | 11,085 | 180,752 |
| 1973 | 375,432 | 5 | 375,437 | 18,942 | 394,379 |
| 1974 | 634,479 ^{6/} | 48 | 634,527 | 26,729 | 661,256 |
| 1975 | 563,682 ^{7/} | 36 | 563,718 | 27,605 | 591,323 |
| 1976 | 159,796 | 2 | 159,798 | 15,765 | 175,563 |
| 1977 | 195,895 | | 195,895 | 9,752 | 205,647 |
| 1978 | 111,494 | 7,007 | 118,501 | 12,864 | 131,365 |
| 1979 | 141,623 | 910 | 142,533 | 18,000 ^{8/} | 160,533 |

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 king salmon and real salmon.

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

5/ Corrected from 1963 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.

8/ Preliminary.

Table 14. Comparative chum salmon catch, effort, and escapement data, Kotzebue district, 1962-1979.

| | <u>Average 1962-72</u> | <u>1973</u> | <u>1974</u> | <u>1975</u> | <u>1976</u> | <u>1977</u> | <u>1978</u> | <u>1979</u> |
|---------------------------------------|----------------------------|-------------|-----------------------|-----------------------|-------------|---------------------|-------------|---------------|
| Commercial Catch | 85,000 | 375,400 | 627,900 ^{1/} | 553,000 ^{1/} | 159,800 | 195,900 | 111,500 | 141,600 |
| Licensed Commercial Boats | 62 | 136 | 174 | 258 | 219 | 222 | 208 | 181 |
| Noatak River Escapement ^{2/} | 78,000 | 32,000 | 130,000 | 96,500 | 44,500 | 11,000 | 37,500 | 17,800 |
| Noatak River Test Fishing (Catch/hr) | | | | 2.8 | 2.7 | 1.8 | 0.2 | |
| Kobuk River Escapement ^{2/} | 13,000 | 19,000 | 62,000 | 40,500 | 8,000 | ^{3/} 4,000 | | ^{3/} |

^{1/} Does not include data from Deering experimental fishery.

^{2/} Peak aerial survey counts, Kobuk River data includes only Squirrel and Salmon Rivers.

^{3/} No estimate due to poor aerial survey conditions.