

YUKON AREA COMMERCIAL AND SUBSISTENCE SALMON FISHERIES
1989 MANAGEMENT PLAN

By

Alaska Department of Fish and Game
Division of Commercial Fisheries
Arctic-Yukon-Kuskokwim Region

Regional Information Report¹ No. 3F89-12

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April 1989

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INTRODUCTION

This management plan was developed to inform fishermen, processors, and other interested persons about the status of the 1989 Yukon River salmon runs and Department strategies that may be used to regulate the various salmon fisheries.

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 Yukon area. The overall objective of the Department's research and management program is to manage the various salmon runs for optimum sustained yield.

The subsistence fishery is subject to few restrictions except in areas where intensive commercial fisheries occur. A majority of the commercial fishermen take salmon for both commercial, subsistence and personal-use purposes. Therefore, in order to enforce commercial fishing regulations, it is necessary to place some restrictions on the subsistence fishery.

As a result of the recently amended subsistence law which limits subsistence hunting and fishing to rural Alaska residents, the Board created personal-use salmon fisheries for the Yukon and Tanana River drainages. This action will allow continued participation in salmon fisheries by residents of non-rural communities. These fisheries will be regulated much the same as are subsistence fisheries, except that salmon taken for personal-use may be used only for human consumption and bait. In addition, personal-use fishermen are required to secure a fishing permit from the local ADF&G office and to possess a resident sport fishing license.

Management is made difficult by the complexity of the salmon runs and fisheries and by the huge size of the drainage (330,000 mi²). Since most of the commercial fisheries have only recently expanded, there are limited escapement and return data on which to fully evaluate the effects of increased commercial harvests. Salmon fisheries are scattered over 1,400 rivermiles harvest mixed stocks of migrating fish usually several weeks (migration time) and hundreds of miles from their spawning grounds. Because the Yukon River commercial fishery is a mixed-stock fishery (one in which from numerous spawning streams are co-mingled) some tributary populations may be under- or over-harvested in relation to their actual abundance. Spawning escapements and return data indicate that important stocks of chinook and fall chum salmon have been overharvested in recent years. Based on current knowledge, it is impossible to manage most stocks independently, and there is concern that some small spawning populations may be reduced to very low levels.

The management of the Yukon River salmon runs require a conservative approach as a large portion of the subsistence harvest is taken upstream of major commercial fisheries, and escapement data are not available until fish reach spawning grounds. Fishery management is complicated by variable run timing of mixed stocks, increased effort and efficiency of the commercial fishery, and harvest allocation complexities which include the need to provide for subsistence harvests. Primary management tools are

guideline harvest ranges established by the Alaska Board of Fisheries a emergency orders (management orders), which are used to open and close t commercial fishing seasons, establish fishing period frequency and duration, and establish mesh size restrictions.

STATUS OF STOCKS AND FISHERY

Chinook Salmon

The Yukon River commercial salmon fishery in Alaska dates back to 1918. Commercial chinook salmon catches have ranged from 64,000 to 158,000 fish since 1961 (Table 1), and the recent 5-year average (1984-1988) is 120,500 fish (lower river districts 114,000, upper river districts 6,100). The majority of the commercial harvest occurs in Districts 1 and 2 (Figure 1). In addition to the Alaskan catch, the commercial fishery at Dawson (Yukon Territory) harvests an average of 11,500 chinook salmon annually (1984-1988) (Table 3). Throughout the Yukon River drainage the recent 5-year average subsistence chinook salmon harvest is approximately 53,000 fish (45,400 U.S., 7,300 Canadian) (Tables 2 and 3).

Spawning populations of chinook salmon are widely distributed throughout the drainage and have been documented in the Archuelinguk River located 80 miles from the mouth of the Yukon River and as far upstream as the headwaters of the drainage in the Yukon Territory of Canada, nearly 2,000 miles from the mouth.

Yukon River chinook salmon runs during the 1972-1976 period gener- declined in magnitude based on comparative catch and available escape data. Recorded escapements during 1977-1981 were above average in most index streams and in some instances surpassed levels observed during the early 1960's prior to maximum development of the fisheries. Information available since the spring of 1986, gained through scale pattern analysis and tagging studies, indicate that middle and upper river chinook salmon stocks have undergone unacceptably high harvest rates in recent years. Exploitation rates cannot be accurately estimated at this time for lower and middle river chinook salmon stocks due to the lack of reliable total population estimates. However, through utilization of aerial survey enumeration techniques, it appears that middle river stocks have been overexploited during some years and that lower river stocks have not been overharvested in recent years. Chinook salmon bound for upper river spawning areas have had harvest rates estimated between 78% and 91% in recent years. Based on studies in other areas, harvest rates in excess of 67% will likely result in a serious decline in chinook salmon abundance; this situation must be offset by reduced harvest during years of low returns to ensure stocks are sustained.

Chinook salmon of western Alaska origin have been intercepted yearly by the Japanese mothership and land-based gillnet fisheries. Yukon River chinook salmon composed the majority of western Alaska stocks taken in the Bering Sea mothership catches. These catches have averaged 27,000 fish during the 1983-1987 period.

Also, the expanding domestic and joint venture trawl fleets in the North Pacific and Bering Sea waters are known to take chinook and chum salmon, which represent an additional potential threat to these same stocks. There is some question whether accurate monitoring of incidental salmon catches is occurring.

Summer Chum Salmon

Prior to the mid-1960's, summer chum salmon were used primarily for subsistence purposes, mostly for sled dog food. As the snow machine replaced the sled dog, subsistence fishing for summer chum salmon declined. Beginning in 1967, commercial fishing regulations affecting summer chum salmon were gradually liberalized. As a result of regulation changes (e.g., mesh size specifications and earlier openings of the fishing seasons), increased fishing effort and processing capacity, and the development of Japanese markets and upper Yukon area roe-directed fisheries, the Yukon River summer chum salmon commercial harvest has increased sharply. Only 11,000 summer chum salmon were taken commercially in 1967, while a record 1,152,237 fish in-the-round and 256,535 pounds of roe were harvested in 1988. The recent 5-year average commercial harvest is 684,308 fish in-the-round and 213,209 pounds of roe (Table 1). The majority of the commercial harvest takes place in Districts 1, 2, and 4. District 4 supports what has been primarily a salmon roe fishery. Approximately 253,000 summer chum salmon are taken annually (1984-1988 average) for subsistence use throughout the drainage (Table 2).

Summer chum and chinook salmon exhibit similar run timing and enter the lower river during June and early July. The Andreafsky and Anvik Rivers are the primary summer chum salmon-producing rivers. Escapement of over one million summer chum salmon in the Anvik River has occurred three times since sonar enumeration within this drainage began in 1979. The Koyukuk and Tanana Rivers are also key summer chum salmon-producing systems; however, the magnitude of the escapements to those systems is much lower than to the Anvik River. Documented harvests and escapements yield minimum population estimates ranging from 1.2 to 5.6 million fish annually. With the exception of 1987, Yukon River summer chum salmon escapements have been good in recent years.

Guideline harvest ranges for summer chum salmon have not yet been established and management of that run is based on in-season assessment of run strength.

Fall Chum Salmon

Because of their good quality (bright, silvery appearance, large size, robust appearance, and high oil content) which is related to their upriver spawning destinations, fall chum salmon are in great demand and are commercially harvested in all fishing districts. The 1984-1988 average commercial harvest in Alaska is 149,879 fish (Table 1), while in the Yukon Territory of Canada approximately 28,199 have been taken annually (Table 3). Fall chum salmon are of greater importance for subsistence than summer chum salmon upstream of the mouth of the Koyukuk River where it is

estimated that fall chum salmon compose 60%-75% of the total subsistence harvest. Approximately 218,000 fall chum salmon have been taken annually, (1984-1988 average) for subsistence throughout the drainage (Tables 2 and 3).

Fall chum salmon enter the lower Yukon River from mid-July through early September. Major spawning areas are located in the Tanana River (Toklat River, Delta River, and the upper Tanana River near Big Delta), the Porcupine River (Sheenjek and Fishing Branch Rivers), and upper Yukon River (Kluane and in mainstem Yukon River) drainages. Tagging studies near Galena and Ruby indicated that the early run (mid-July through early August) of fall chum salmon may be bound primarily for the Porcupine River system and Yukon Territory systems. The later segment of the fall chum salmon run (mid-August through early September), although likely mixed with other stocks, is believed to be destined primarily for the Tanana River drainage. Stock identification studies using protein genetics and scale patterns are presently underway to improve our understanding of fall chum salmon timing by spawning stock in the lower fishery.

In response to the poor escapements documented in 1982, the Board of Fisheries reduced fishing time and enacted season closures. Despite these new fishing restrictions, escapement objectives were not achieved in most systems in 1983 or 1984. A relatively large return in 1985 with restricted fishing periods in place resulted in improved escapements. Additional regulatory restrictions were adopted by the Board prior to the 1986 season to reduce the risk of overharvesting anticipated weak returns. These regulatory restrictions included reducing guideline harvest ranges in districts, a July 15 closure in the lower Yukon area, and provided an emergency order establishment of commercial fishing periods in Districts 4, 5, and 6.

Prior to the 1986 season, the Alaska Board of Fisheries established a restrictive guideline harvest range (0-160,000) in anticipation of weak returns in 1986, 1987 and 1988. This regulation remains in force, however, the Department is empowered to allow harvests to exceed the established range if such action is warranted by run strength. Given the Department's expectation of run strength in 1989, it is anticipated that the allowable harvest will exceed the existing guideline harvest range and will range between 145,000 and 320,000.

It should be noted that because of shortcomings inherent in available run assessment techniques, a tendency in some years to allow overharvest, and a possible trend towards increasing subsistence harvests, that the 1989 fall chum fishery, in all districts, will be managed in a conservative fashion.

Coho Salmon

This species is of minor importance in both the commercial and subsistence fisheries and is taken incidental to the more numerous fall chum salmon. The Alaskan commercial catch since 1961 has ranged from 350 to 82,000 fish and the 1984-1988 average is approximately 55,000 fish (Table 1). The commercial harvest of coho salmon is dependent upon the timing of the chum salmon fishing season. Annual subsistence catches throughout drainage are approximately 54,000.

Coho salmon begin entering the lower Yukon River about 2 weeks later than fall chum salmon and the run peaks during late August. Spawning occurs discontinuously throughout the drainage with the largest spawning concentrations documented in the tributaries of the upper Tanana River drainage.

OUTLOOK FOR 1989

Chinook Salmon

The majority of chinook salmon returning to the Yukon River are 6-year old fish, however 5 and 7-year old fish make a significant contribution to the run. Spawning ground escapements in 1983, the primary brood year (age 6 in 1989), were judged to be variable but average in overall magnitude. Survival and production of the 1983 brood year is apparently average based on the finding of a normal contribution of 5-year old fish to the 1988 commercial catch. It is expected that the 1989 return of 5-year olds (1984 brood year) will be above average based on about average escapements during 1984 and the above average number of 4-year old fish in the 1988 commercial catch. The return of 7-year old fish (1982 year class) is expected to be below average. The return of this year class in 1987 as 5-year-olds, and in 1988 as 6-year-olds was below average. Overall, the 1989 chinook salmon return is anticipated to be average in strength. The commercial harvest in Alaska (Districts 1-6) is expected to total 90,000 to 110,000 chinook salmon (85,000-103,000 fish in the lower Yukon area, 5,000-7,000 fish in the upper Yukon area).

Summer Chum Salmon

Summer chum salmon return primarily as 4-year old fish, although substantial 5-year old returns often result from brood years with high survival rates. The return of 4-year old fish in 1989 will be dependent on production from the 1985 brood year and survival of the resulting cohort. Based on available catch and escapement data, the magnitude of the 1985 summer chum salmon run was judged above average in abundance. In addition, the return of 5-year old fish in 1989 is expected to be above average in strength based on the above average return of 4-year old fish in 1988. The Anvik River summer chum salmon stock is expected to be the primary contributor to the 1989 return. In summary, based on evaluation of brood year run size data and assuming average survival, it is expected that the Yukon River summer chum salmon return in 1989 will be above average in magnitude. The commercial harvest is expected to be similar to the 1988 harvest (900,000-1,000,000 fish and 250,000 pounds of roe).

Fall Chum Salmon

Similar to summer chum salmon, fall chum salmon return primarily as 4-year old fish. Escapements in 1985, (the brood year which will produce the majority of the 1989 run) ranged from below objective levels in some systems to above average levels in other streams. The contribution of age 3 fall chum salmon in the 1988 return was at least average which, combined with available escapement data, suggests an at least average return in 1989. The return of 5-year old fish (1984 brood year) is expected to be below average based on both the contribution of age 4 fall chum salmon in

the 1988 harvest and below average escapements in 1984. In summary, based on evaluation of brood year escapements and assuming average survival rates, an average return of fall chum salmon is expected in 1989. A commercial harvest between 145,500 and 320,500 fish is anticipated (120,000-220,000 fall chum salmon in the lower Yukon area and, 25,500-100,500 fall chum and coho salmon combined in the upper Yukon area).

Coho Salmon

Coho salmon return primarily as 4-year old fish. Comprehensive escapement information for coho salmon is lacking, but escapement surveys in the Tanana River system indicated average run strength in 1985. The commercial harvest is expected to be 50,000-90,000 fish and will be dependent on the timing and frequency of fishing periods allowed for fall chum salmon.

Regulations

The following regulations were adopted by the Alaska Board of Fisheries at its special spring hearing:

Commercial/Subsistence Fishing

For the Tanana River, District 6, the Alaska Board of Fisheries adopted regulations and a management plan at a special meeting held in May-June 1988 at Fairbanks. Regulations adopted specified: a reduction in allowable commercial and subsistence fishing time from two 48-hour periods per week to two 42-hour periods per week; that there be no more than one 42-hour commercial period per week during the fall season; that subsistence/personal use permits will be required in subdistricts 6-A and 6-B, and that Tanana River processors be required to secure permits before operating. In addition, a June 20 opening and August 10 closing dates were established. Instructions were given to the staff that the District 6 fisheries would be managed on the basis of existing guideline harvest ranges and that these catch limits may be exceeded only if it can be determined that doing so would not jeopardize escapement and subsistence harvest requirements. These regulations and management plan were adopted recognizing the need for flexibility and for discretionary use of emergency order authority.

Management Strategy, Lower Yukon Area (Districts 1, 2 & 3)

Chinook and Summer Chum Salmon

Sustained yield management of the chinook and summer chum salmon runs is made difficult by the overlapping run timing of these species. The harvest of summer chum salmon, for example, can be largely a function of management strategies and actions applied to the chinook salmon fishery. In Districts 1 and 2, the chinook and summer chum salmon harvests are managed by field announcement to schedule season openings and closures, fishing periods and gillnet mesh size restrictions. The Alaska Board of Fisheries has established a chinook salmon guideline harvest range of 60,000 to 120,000 fish in Districts 1 and 2, and 1,800 to 2,200 in District 3. No guideline harvest range has yet been established for summer chum salmon.

Commercial Fishing Season

The directed commercial chinook salmon fishery will open by emergency order when increasing subsistence and/or test-net catches have occurred over a 7- to 10-day period. This strategy of allowing for the early portion of the run to build, prior to commercial fishing, provides for uninterrupted subsistence fishing in the lower Yukon, and provides for passage of a portion of the early run segment out of the lower Yukon districts prior to commercial harvest. The fish that pass out of the lower districts are bound primarily for middle and upper river areas and are subject to intensive harvest pressure along the entire course of their migration.

Fishing Periods

Fishing periods for nets with unrestricted mesh size (for the directed chinook salmon fishery) will be 12 hours in duration. In District 1, fishing periods will begin at 6:00 p.m. on Mondays or Thursdays and continue until 6:00 a.m. the following day. In Districts 2 and 3, unrestricted mesh size fishing periods will begin at 6:00 p.m. Wednesdays or Sundays and continue until 6:00 a.m. the following day. District 3 fishing periods will occur simultaneous to District 2 fishing periods. However, due primarily to the lower chinook salmon guideline harvest range in District 3 and the requirement to allow fish to pass through the district prior to initiation of a commercial fishery, the season will open after District 2 and will probably close prior to District 2.

If run strength and harvest develops as anticipated, the use of unrestricted mesh size gillnets will cease when the combined Districts 1 and 2 harvest approaches 60,000 chinook salmon. The harvest of chinook salmon in gillnets restricted to 6-inch maximum mesh size averaged 23,000 fish during 1984-1988, with a record small mesh catch of 39,500 chinook salmon during 1988. It is expected that the districts 1 and 2 total commercial harvest of chinook salmon from the unrestricted and restricted mesh size periods will be between 83,000 and 103,000 fish.

Special summer chum salmon directed fishing periods will be implemented if the return: 1) is judged to be at least average in strength, and 2) occurs with similar timing to the chinook salmon return. These fishing periods will be 6 to 12 hours in duration prior to or during the chinook salmon directed season. Following the chinook salmon directed fishery, 6-inch maximum mesh size fishing periods will be 12 to 24 hours in duration depending on the strength of the later portion of the summer chum salmon return.

During recent years, summer chum salmon escapements to the Andrafsky River have been below objective levels. Summer chum salmon escapements to the Andrafsky River will be monitored in-season. The closed water marker, at the confluence of the south bank of Andrafsky River and the Yukon River, will be moved downstream during the season if the passage rate of summer chum salmon to the Andrafsky River does not indicate an optimum number of fish will reach the spawning grounds.

Fall Chum Salmon

The Department will monitor in-season estimators of abundance (lower Yukon test fishery, Yukon sonar, the middle Yukon test fishwheel, and subsistence catches) in order to assess run strength. These indicators of run strength, in combination with the pre-season projection, will constitute the basis for decisions regarding management of these stocks.

The commercial fishing season will close no later than July 15 in Districts 1, 2 and 3 in order to assess fall chum run size and to provide for passage of a portion of the early run segment out of the lower Yukon area. During the closure, daily test fishing catches, subsistence catches and Pilot Station sonar counts will be carefully monitored to assess the run. If run strength as indicated by available data is poor, the season will remain closed. It is expected, however, that the run will be sufficiently strong to support commercial fishing and that the season will reopen after approximately 7-10 days of season closure.

If the return of fall chum is judged large enough to satisfy spawning ground and subsistence fishing requirements, the commercial fishery will reopen by emergency order. After the initial fishing period, subsequent openings will be based on evaluation of catch, run strength and escapement data (past the Pilot Station sonar). The harvest is expected to range from 120,000 to 220,000 fall chum salmon and, if run strength develops as anticipated, will likely approximate 170,000 fish.

Period length will likely be 12 hours in all areas of the lower Yukon. Fishermen will be required to register for the setnet only area as during recent years. Fishing periods in the setnet only area will probably be scheduled to occur during nighttime hours, while fishing periods in the gillnet area will be scheduled for daylight hours.

Coho Salmon

Coho and fall chum salmon runs overlap to a considerable extent but the peak of the coho salmon run usually occurs later in the season. Because of this overlap, and because of the overriding importance of the fall chum run, the harvest of coho salmon will be a function of management strategies directed towards fall chum salmon.

Management Strategy, Upper Yukon Area (Districts 4, 5 and 6)

Chinook and Summer Chum Salmon

As in the lower Yukon area, the chinook and summer chum salmon runs in the upper Yukon area exhibit similar run timing. The upper Yukon area commercial fishery is limited to a combined 5,550-6,950 chinook salmon guideline harvest range which is apportioned to the three districts. As in the lower Yukon, the summer chum fisheries in the upper Yukon districts will be based on in-season assessment of run strength.

Weekly commercial and subsistence fishing time is split into two 42 48-hour fishing periods per week in most areas of the upper Yukon area. Split fishing periods help spread the harvest over a greater portion of the

run and afford additional protection to smaller stocks which are more susceptible to overharvest than the larger, more productive stocks. This strategy may currently be less effective than when first applied (in the early 1980's) because of recent increases in fleet efficiency. Also, split periods allow the Department additional time to collect and evaluate catch data between periods.

The commercial fishing season in District 4 will open by emergency order between June 10 and June 25. If the lower end of the District 4 chinook salmon guideline harvest range (2,250-2,850 fish) is taken before July 10, the commercial fishing season will be closed by emergency order. The season may be reopened for summer chum salmon during the period July 10 to July 31 for fishing with gillnets of 6-inch or smaller mesh nets and fishwheels. This restriction would minimize additional harvest of large chinook salmon and still allow continued commercial fishing for the more abundant summer chum salmon.

In District 5, chinook salmon are mostly taken with gillnets for both commercial and subsistence purposes. Summer chum salmon are usually not abundant and are mainly retained for subsistence purposes. There are four subdistricts within the district, with several having separate guideline harvest ranges. The overall guideline harvest range for the district is 2,700-3,300 chinook salmon. When the mid-point of the chinook salmon guideline harvest range is taken, the appropriate subdistrict(s) will be closed until the fall season.

In order to more closely monitor the harvest of chinook salmon in Subdistrict 5-D, commercial fishing time will likely be reduced from the existing 7-day-per-week schedule by emergency order.

In keeping with the regulations described elsewhere in this plan, the Tanana River fishery will be managed on the basis of existing guideline harvest ranges. The Tanana River chinook and summer chum salmon fisheries are in relatively close proximity to the major spawning areas and this factor may, in some years, allow management of the Tanana River fisheries on the basis of estimated spawning ground escapement. This situation is in contrast to most other Yukon area fisheries where commercial and subsistence fishery management decisions are based on estimates of abundance made when fish are still hundreds of miles away from spawning streams.

The guideline harvest range for District 6 is 600-800 chinook salmon. When escapement goals for the Salcha and Chena Rivers have been achieved or are projected to be achieved, the chinook harvest may exceed the guideline harvest range due to incidental catches during the summer chum commercial fishery. Depending on chinook salmon run timing and the abundance of summer chum salmon, a reopening of the commercial summer chum salmon season may follow a closure once the majority of the chinook salmon run has passed through the fishery.

The opening of the commercial fishing season in District 6 may be delayed by emergency order as it was in 1988 in an attempt to satisfy Chena and Salcha River chinook salmon escapement objectives from the early portion of

the run and to avoid a prolonged mid-season closure if and when the chinook guideline harvest range is taken.

Fall Chum and Coho Salmon

Fall chum and coho salmon are normally present in the middle and upper Yukon districts (4, 5 & 6) from mid-August through early October. As in the lower Yukon, the commercial seasons will be managed on the basis of fishing periods established by emergency order and an expectation of a harvest ranging from 25,500 to 100,500 fall chum and coho salmon combined for the three upriver districts. If the run is determined to be of average strength in all districts, the harvest will likely approximate 63,000 fish, the combined mid-point of the upriver districts.

Decisions regarding season opening and closing dates, harvest levels and period length, will be made on the basis of in-season data available from test fisheries, sonar counts, subsistence catch rates and comparative commercial catch data. Although upriver abundance estimates will be supplemented by run strength and timing data from the lower Yukon, management decisions will be made independent of those made in and for the lower river fisheries.

District 4

Regulations do not provide for commercial harvest of fall chum salmon in Subdistrict 4-A and the season in that area closes on August 1. In Subdistricts 4-B and 4-C, the commercial fishing season for summer chum salmon will close by emergency order on or about August 1. This action will be taken in order to provide protection to the early portion of the fall chum salmon run and to allow the Department time to assess that component of the fall run before any commercial harvest is allowed. The commercial fishing season will be reopened by emergency order only if run strength is estimated to exceed escapement and subsistence needs.

Because catch rates (even in years of high abundance) are generally low in this district, it is expected that the two 48-hour periods per week will be allowed and that if run strength develops as anticipated, that the harvest will approximate 25,000 fall chum and coho salmon.

District 5

In most years, the chinook salmon fishery in District 5 closes by emergency order in early to mid-July. The season will remain closed in District 5 following the closure of the summer fishery until fall run chum salmon are well distributed throughout Subdistricts 5-A, 5-B, and 5-C. Run strength will be evaluated based on test fishery catches, local subsistence catch rates, and indices of run strength from the lower river area. Probable fishing period length will be 24 hours and, if the run develops as expected, a harvest of approximately 22,000 fall chum and coho salmon will be allowed for subdistricts 5-A, 5-B, 5-C. A separate guideline harvest range exists for Subdistrict 5-D, given the expectation of an average run it is probable that a harvest of roughly 3,000 fish will occur in the portion of the district. As with the chinook fishery in this subdistrict,

it is likely that fishing time will be reduced from the current 7-day-per-week period to allow better evaluation of catch rates and more precise timing of closures.

District 6

In the Tanana River District 6, the summer chum salmon fishery will have closed on or about August 10. Given normal run timing, it is likely fall chum salmon will not appear in appreciable numbers until early September.

In accordance with recently adopted regulations and management plan, the fishery will be regulated by emergency order and no more than one 42-hour commercial fishing period per week will be allowed. Run size will be evaluated on the basis of test fishery catches, comparative commercial catch rates, subsistence fishery catch rates and many other data which may become available. If it is estimated that the upper end of the fall chum/coho guideline harvest range can be exceeded without jeopardizing escapement or subsistence needs, the commercial harvest may be allowed to exceed the established upper limit.

Coho Salmon

Coho salmon are not abundant in either the District 4 or 5 fisheries. They do, however, contribute significantly to both the commercial and subsistence harvest in District 6. As in the lower Yukon districts, the migratory timing of coho salmon is somewhat later but overlaps greatly with that of fall chums. For that reason, the commercial harvest of this species is considered incidental to that of fall chums and the magnitude of the coho harvest is a function of the timing, frequency, and duration of periods established for the more numerous and (collectively) more valuable fall chums.

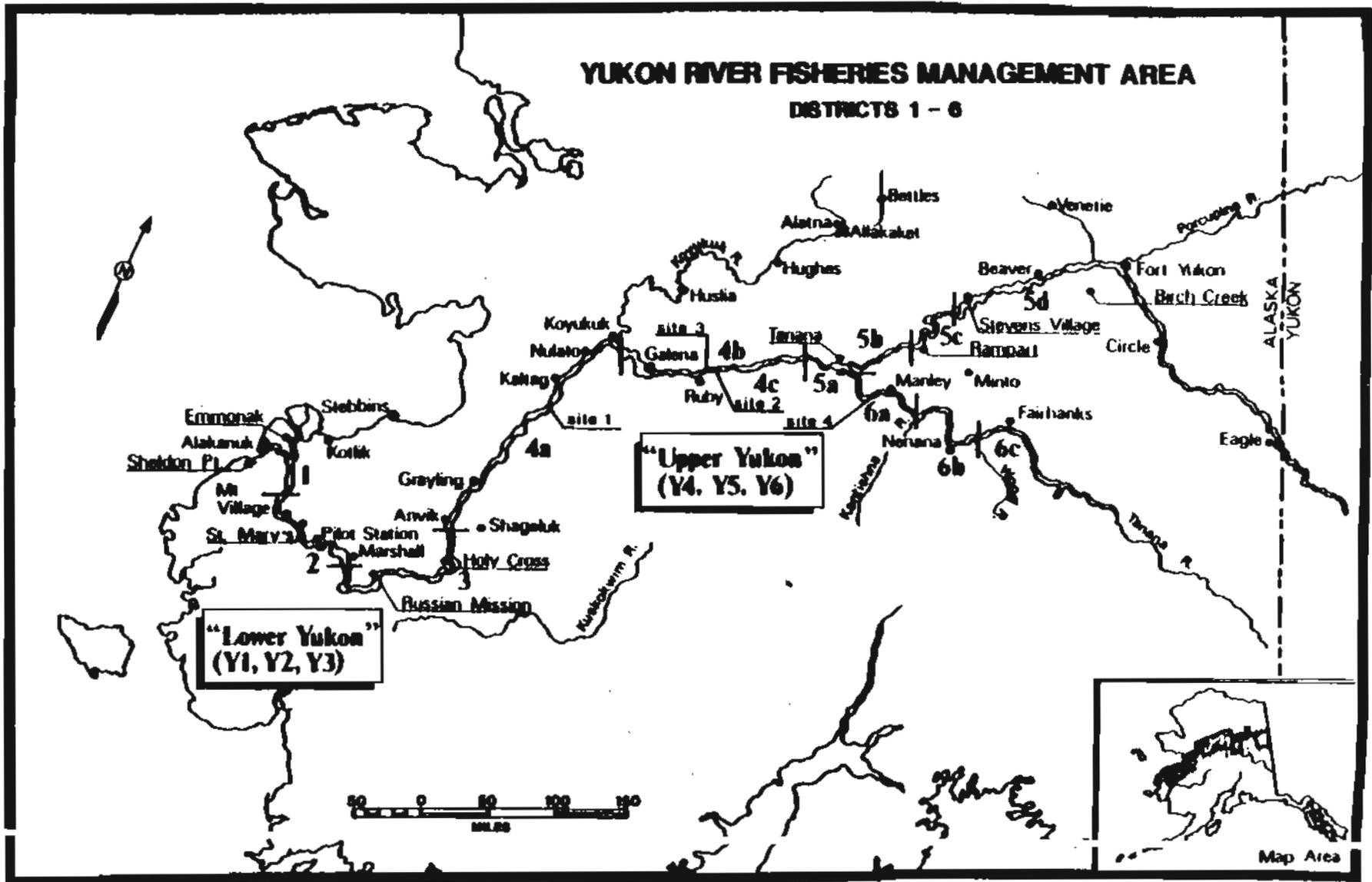


Figure 1. Map of Yukon River Fisheries Management Area (Districts 1-6).

Table 1. Alaskan commercial sales of Yukon River salmon, 1961-1988. a

Year	Chinook	Summer Chum		Fall Chum		Coho
		Numbers	Roe	Numbers	Roe	
1961	119,664	-	-	42,461	-	2,855
1962	94,734	-	-	53,116	-	22,926
1963	117,048	-	-	0	-	5,572
1964	93,587	-	-	8,347	-	2,446
1965	118,098	-	-	23,317	-	350
1966	93,315	-	-	71,045	-	19,254
1967	129,656	10,935	-	38,274	-	11,047
1968	106,526	14,470	-	52,925	-	13,303
1969	91,027	61,966	-	131,310	-	15,093
1970	79,145	137,006	-	209,595	-	13,188
1971	110,507	100,090	-	189,594	-	12,203
1972	92,840	135,668	-	152,176	-	22,233
1973	75,353	285,509	-	232,090	-	36,641
1974	98,089	589,892	-	289,776	-	16,777
1975	63,838	710,295	-	275,009	-	2,546
1976	87,776	600,894	-	156,390	-	5,184
1977	96,757	534,875	-	257,986	-	38,863
1978	99,168	1,052,226	25,761	236,383	10,628	26,152
1979	127,673	779,316	40,217	359,946	18,466	17,165
1980	153,985	928,609	139,106	293,430	5,020	8,745
1981	158,018	1,006,938	189,068	466,451	11,285	23,680
1982	123,644	461,403	152,819	224,187	805	37,176
1983	147,910	744,879	149,999	302,598	5,064	13,320
1984	119,904	588,597	167,224	208,232	2,328	81,940
1985	146,188	516,997	248,625	267,744	2,525	57,672
1986	99,970	721,469	271,691	139,442	577	47,255
1987	134,760 b	442,238	121,968	0	0	0
1988 c	101,421	1,152,237	256,535	133,975	3,227	86,612
<hr/>						
5 Yr Avg						
1984-88	120,449	684,308	213,209	149,879	1,731	54,696
Alaska						
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5 Yr Avg						
1984-88	114,272	625,336	0	104,903	0	47,515
Lower Yukon						
<hr/>						
5 Yr Avg						
1984-88	6,177	58,972	213,209	44,976	1,731	7,181
Upper Yukon						

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.

b Includes illegal sales of fish in Districts 5 and 6.

c Does not include 26,988 fall chum and 13,295 coho salmon sold in District 6 as part of a new test fishing project.

Table 2. Alaskan subsistence catch of Yukon River salmon, 1961-1988.

Year	Chinook	Summer Chum a	Fall Chum a,b	Coho a,b	Total
1961	21,488	305,317	101,772	9,192	437,769
1962	11,110	261,856	87,285	9,480	369,731
1963	24,862	297,094	99,031	27,699	448,686
1964	16,231	361,080	120,360	12,187	509,858
1965	16,608	336,848	112,283	11,789	477,528
1966	11,572	154,508	51,503	13,192	230,775
1967	16,448	206,233	68,744	17,164	308,589
1968	12,106	133,880	44,627	11,613	202,226
1969	14,000	156,191	52,063	7,776	230,030
1970	13,874	166,504	55,501	3,966	239,845
1971	25,684	171,487	57,162	16,912	271,245
1972	20,258	108,006	36,002	7,532	171,798
1973	24,317	161,012	53,670	10,236	249,235
1974	19,964	227,811	93,776	11,646	353,197
1975	13,045	211,888	86,591	20,708	332,232
1976	17,806	186,872	72,327	5,241	282,246
1977	17,581	159,502	82,771	16,333	276,187
1978	30,297	197,144	94,867	7,787	330,095
1979	31,005	196,187	233,347	9,794	470,333
1980	42,724	272,398	172,657	20,158	507,937
1981	29,690	208,284	188,525	21,228	447,727
1982	28,158	260,969	132,897	35,894	457,918
1983	49,478	240,386	192,928	23,895	506,687
1984	42,428	230,747	174,823	49,020	497,018
1985	39,771	264,828	206,472	32,264	543,335
1986	45,238	290,825	164,043	34,468	534,574
1987	53,124	275,914	361,663 c	84,894 c	775,595
1988 d	46,559	204,923	159,703	69,138	480,323
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5 Yr Avg 1984-88 Alaska	45,424	253,447	213,341	53,957	566,169
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5 Yr Avg 1984-88 Lower Yukon	15,234	65,725	24,898	12,401	118,258
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5 Yr Avg 1984-88 Upper Yukon	30,190	187,722	188,443	41,556	447,911

- a Catches estimated for 1961-1976 since catches of salmon other than chinook salmon were not differentiated by species until 1977.
- b Minimum estimates for 1961-1978 because surveys were typically conducted well before the end of the fishing season.
- c Includes estimates of catches from illegal salmon and salmon roe sales in Districts 5 and 6.
- d Preliminary data.

Table 3. Canadian catch of Yukon River chinook and fall chum salmon, 1961-1988.

Year	Chinook			Fall Chum		
	Commercial	Non-Commercial a	Total	Commercial	Non-Commercial a,b	Total
1961	3,446	9,800	13,246	3,276	5,800	9,076
1962	4,037	9,900	13,937	936	8,500	9,436
1963	2,283	7,794	10,077	2,196	25,500	27,696
1964	3,208	4,200	7,408	1,929	10,258	12,187
1965	2,265	3,115	5,380	2,071	9,718	11,789
1966	1,942	2,510	4,452	3,157	10,035	13,192
1967	2,187	2,963	5,150	3,343	13,618	16,961
1968	2,212	2,830	5,042	453	11,180	11,633
1969	1,640	984	2,624	2,279	5,497	7,776
1970	2,611	2,052	4,663	2,479	1,232	3,711
1971	3,178	3,269	6,447	1,761	15,150	16,911
1972	1,769	3,960	5,729	2,532	5,000	7,532
1973	2,199	2,323	4,522	2,806	7,329	10,135
1974	1,808	3,823	5,631	2,544	9,102	11,646
1975	3,000	3,000	6,000	2,500	18,100	20,600
1976	3,500	1,525	5,025	1,000	4,200	5,200
1977	4,720	2,807	7,527	3,990	8,489	12,479
1978	2,975	2,906	5,881	3,356	6,210	9,566
1979	6,175	4,200	10,375	9,084	13,000	22,084
1980	9,500	13,046	22,546	9,000	13,218	22,218
1981	8,593	9,216	17,809	15,260	7,021	22,281
1982	8,640	8,268	16,908	11,312	4,779	16,091
1983	13,027	5,625	18,652	25,990	3,500	29,490
1984	9,885	6,610	16,495	22,932	6,335	29,267
1985	12,573	6,428	19,001	35,746	5,519	41,265
1986	10,797	9,267	20,064	11,464	3,072	14,536
1987	10,864	6,500	17,364	40,591	3,889	44,480
1988 c	13,217	7,560	20,777	30,263	3,302	33,565
5 Yr Avg 1984-88	11,467	7,273	18,740	28,199	4,423	32,623

a Indian Food Fish and Domestic fisheries combined.

b Includes small numbers of coho salmon taken at Old Crow.

c Preliminary estimates.

