

YUKON AREA COMMERCIAL AND SUBSISTENCE SALMON FISHERIES 1994 MANAGEMENT PLAN



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SALMON FISHERIES 1994 MANAGEMENT PLAN**

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INTRODUCTION

This management plan informs fishermen, processors, and other interested persons of the outlook for the 1994 Yukon River salmon runs and the strategies that may be used to manage the various salmon fisheries. The Commercial Fisheries Management and Development Division of the Alaska Department of Fish and Game is responsible for the management of commercial and subsistence fisheries in the Yukon Area. Five species of Pacific salmon occur in the Yukon River, with chum salmon being the most abundant. The chum salmon return is made up of an early (summer chum) run and a later (fall chum) run.

The Yukon Area includes all waters of the Yukon River drainage in Alaska and coastal waters from Canal Point Light, near Cape Stephens, to the Naskonat Peninsula. For management purposes, the area is divided into seven districts and 10 subdistricts (Figure 1). Commercial fishing occurs along the entire 1,200 mile length of the Yukon River in Alaska, and in the lower 225 miles of the Tanana River. The Coastal District of the Yukon Area is only open to subsistence fishing. The Lower Yukon Area (Districts 1, 2, and 3) includes the coastal waters of the delta and that portion of the drainage from the mouth to Old Paradise Village (river mile 301). The Upper Yukon Area (Districts 4, 5, and 6) is the Alaskan portion of the drainage upstream of Old Paradise Village. Commercial, Aboriginal, and Domestic fisheries also occur in Canada, with fishery management activities conducted by the Canadian Department of Fisheries and Oceans (DFO).

OUTLOOK FOR 1994 AND STOCK STATUS

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. In general, spawning ground escapements in 1987, 1988, and 1989, the primary brood years producing this year's return, were judged to be average in magnitude. Overall, the 1994 chinook salmon run is anticipated to be near average in strength. The commercial harvest in Alaska is expected to total 88,000-99,000 chinook salmon (82,000-92,000 fish in the Lower Yukon Area and 6,000-7,000 fish in the Upper Yukon Area). If a very poor summer chum salmon run occurs, the chinook salmon harvest could be substantially lower due to management actions taken to conserve summer chum salmon.

Commercial chinook salmon catches in the Alaskan portion of the Yukon River drainage have shown a decreasing trend. The recent 5-year (1989-1993) average commercial harvest was 104,700 fish compared to the previous 5-year (1984-1988) average of 120,400 chinook salmon (Appendix A.2).

The recent 5-year average chinook salmon subsistence harvest in Alaska was 50,800 chinook salmon (Appendix A.6). Total Canadian harvests have averaged 18,700 chinook salmon annually (1989-1993) (Appendix A.7).

Stock identification studies indicate that approximately 57% of the chinook salmon harvest in the Alaskan portion of the drainage is spawned in Canada. Efforts to increase spawning escapements in the Canadian mainstem Yukon River have resulted in greater spawning escapements during the past five years compared to the period of 1985 to 1987 (Appendix A.9). Aerial survey escapement data indicate that spawning escapement goals for middle river stocks (primarily Tanana River drainage) have not been met during some recent years (Appendix A.8). However, escapement goals for lower river stocks (Yukon River drainage below the Koyukuk River) have generally been achieved in recent years.

Summer Chum Salmon

Summer chum salmon return primarily as 4-year-old fish. The summer chum salmon spawning escapement to the Anvik River in 1990 of 403,600 summer chums was below the minimum escapement goal of 500,000. Aerial survey conditions were poor for assessing escapements to other spawning areas in 1990, but the available information suggests that escapements were likely below the goals. The return of 5-year-old fish in 1994 is expected to be very poor based upon the poor return of 4-year-old fish in 1993. In summary, based on evaluation of parent year escapements in 1990 and assuming a poor return of age-5 fish, the run outlook for Yukon River summer chum would normally be for a below average run for 1994. However, if the production failure apparent for Yukon River summer chum salmon from the 1989 brood year occurs for the 1990 brood year, the outlook for 1994 would change from below average to critically low. In such a case, conservative management actions may be necessary to assure adequate escapements, including no directed summer chum commercial fishery and additional restrictions or possible closures of commercial, sport, personal use, and subsistence fisheries.

The recent 5-year average (1989-1993) estimated commercial harvest was 659,800 summer chum salmon, which was a 37% decrease from the previous 5-year average of 1,046,300 salmon (Appendix A.3). Approximately 214,200 summer chum salmon are taken annually (1989-1993 average) for subsistence use throughout the drainage (Appendix A.6). Summer chum salmon used for subsistence includes the reported use of carcasses related to commercial roe fisheries.

Summer chum salmon primarily spawn in tributaries from the mouth of the Yukon River to the Tanana River drainage. Escapements in the Anvik River, the largest single producer of summer chums, were above the escapement goal in 1991-1993. However, spawning escapements to other Yukon River tributaries, based on limited aerial survey information, generally appear to have been below desired levels since 1990. A decrease in productivity has been apparent in returns since 1989.

Fall Chum Salmon

The average annual age composition of returning Yukon River fall chum salmon is approximately 70% age-4 fish, 20% age-5 and 10% age-3 and age-6 fish. Escapements in 1990, the brood year for returning age-4 fish in 1994, varied throughout the drainage. In that year only escapement goals in the Toklat and Sheenjek Rivers were achieved. The contribution of age-3 fall chum salmon in the 1993 return was estimated to be the lowest on record which, when combined with escapement data for 1990, suggests a below average return of age-4 fish in 1994. Further, the return of age-5 fall chum salmon in 1994 is expected to be well below average based upon the widespread failure of that year class as age-4 fish in 1993. Based upon estimated spawner-return relationships and age composition data, the 1994 projected return of Yukon River fall chum salmon is 605,000. This projection includes an estimated 112,000 age-5 shortfall from the 1989 brood year. Taking into account spawning escapement requirements, Alaskan subsistence and Canadian harvests, together with the need to rebuild Toklat and Canadian fall chum salmon stocks, no commercial fishing opportunities in Alaska are anticipated in 1994. Additionally, if the production failure apparent for the 1989 brood year occurs for the 1990 brood year, the outlook for 1994 would change to critically low. In such a case, conservative management actions may be necessary to assure adequate escapements, including additional restrictions or possible closures to sport, personal use, and subsistence fisheries.

Commercial fall chum salmon catches have shown a decreasing trend. The recent 5-year average commercial harvest in Alaska of 138,900 fish is a reduction of approximately 8% compared to the previous 5-year average of 151,600 fall chum salmon (Appendix A.4). The recent 5-year average reported fall chum salmon subsistence harvest in Alaska was 144,000 fish (Appendix A.6). Since 1989, combined Canadian fall chum salmon harvests have averaged 25,700 fish annually (1989-1993) (Table 7).

There has been concern for the health of fall chum salmon stocks since the mid-1980s because spawning escapements were far below desired levels during several years (Appendix A.11). Additional regulatory restrictions adopted by the Board of Fisheries resulted in generally improved spawning escapements. However, spawning populations in the Toklat River, Fishing Branch River, and the Yukon River mainstem in Canada have shown less improvement than other spawning areas. No commercial fishing was allowed in the Alaskan portion of the drainage in 1987 and 1993; and only a limited commercial fishery was allowed in Subdistricts 6-B and 6-C in 1992. It appears that production from the 1988 and 1989 brood years was very poor. Continued conservative management actions in 1994 will be necessary to rebuild fall chum salmon stocks.

Coho Salmon

Coho salmon primarily return at age-4. Limited coho salmon escapement surveys in the Tanana River drainage for the brood year 1990 suggested average to below average escapements were realized. Assuming average survival, an average to below average return is anticipated for 1994. Harvest of coho salmon in 1994 will be largely dependent upon the abundance of fall chum salmon and accompanying management strategies to harvest that species. Commercial harvest of coho salmon in 1994 is not anticipated.

Commercial coho salmon catches in the Yukon River drainage in Alaska averaged 48,700 fish during the recent five year period (1989-1993) (Appendix A.5). The recent 5-year average coho salmon subsistence harvest in Alaska was 39,300 fish (Appendix A.6).

Coho salmon escapement assessment is very limited in the Yukon River drainage due to funding limitations and difficult survey conditions. Most of the available information has been collected from the Tanana River drainage (Appendix A.12). In general, coho salmon escapements have increased during the past decade.

U.S./Canada Treaty Negotiations

Negotiations were initiated in 1985 between the U.S. and Canada regarding a Yukon River salmon treaty. Substantial progress has been made to date on several issues, but some important issues remain to be settled.

A six-year stabilization program, ending after the 1995 season, has been agreed to for chinook salmon in the mainstem Yukon River in Canada. The objective of the program is to stabilize the stock by achieving a spawning escapement of 18,000 or more chinook salmon for each year through 1995. This stabilization spawning objective was established to prevent any further decrease in chinook salmon escapements. During the stabilization period, Canada will manage all of its chinook salmon fisheries on the mainstem Yukon River within a guideline harvest range of 16,800 in years of weak returns to 19,800 in years of strong returns.

The management agencies are to develop a chinook salmon rebuilding program to begin in 1996 for the purpose of achieving a more optimal spawning escapement level in the future. The Joint Technical Committee (JTC), made up of Canadian and Alaskan fisheries biologists, has recommended a spawning escapement goal of 33,000 to 43,000 chinook salmon as the long term goal of a rebuilding program.

Both countries have tentatively agreed to a twelve-year rebuilding program, ending after the 2001 season, for fall chum salmon in the mainstem Yukon River in Canada. The objective of the program

is to rebuild the stock by achieving a spawning escapement of 80,000 or more fall chum salmon for all brood years by the year 2001. The program will endeavor to rebuild the stronger brood years in one cycle and the weaker brood years in three cycles in equal increments.

During the rebuilding program, Canada will manage all fall chum salmon fisheries on the mainstem Yukon River in Canada within a guideline harvest range of 23,600 in years of weak returns to 32,600 in years of strong returns. The U.S. will endeavor to deliver to the Canadian border on the mainstem Yukon River, the number of chum salmon necessary to meet the spawning escapement goal for that year in the rebuilding program, and provide for a harvest in Canada within the guideline harvest range. The specific border passage range agreed to for 1994 is 84,600-112,600 fall chum salmon.

The two countries have agreed not to initiate new fisheries on the Porcupine River for an eight-year period and to consider rebuilding and improving management of Canadian Porcupine River fall chum stocks.

SALMON MANAGEMENT STRATEGY FOR 1994

Management of the Yukon River commercial salmon fishery is complex because of the difficulty in determining run size, harvesting of mixed stocks, increasing efficiency of the commercial fleet, and allocation issues. The overall goal of the department's research and management program is to manage the various salmon runs for maximum sustained yield under the policies set forth by the Alaska Board of Fisheries. However, escapement levels required to produce maximum sustained yields cannot be determined at this time due to the lack of an adequate database. Current escapement goals in the Yukon River drainage are based on historic escapement trends in key spawning index areas which are surveyed or counted annually. In most cases, the average historic escapement level for each index area is considered a minimum escapement goal to be met or exceeded each season.

Subsistence fishing occurs throughout most of the Yukon Area. Subsistence use has the highest priority among beneficial uses of the resource. A majority of the commercial fishermen take salmon for both commercial and subsistence purposes. In order to enforce commercial fishing regulations, it is necessary to place some restrictions on the subsistence fishery. However, throughout the fishing season, substantially more fishing time is allowed for subsistence than for commercial purposes.

Due to the mixed stock nature of the fishery, some tributary populations may be under- or over harvested in relation to their actual abundance. Based on current knowledge, it is impossible to manage individual stocks independently. Primary management tools are guideline harvest ranges, established by the Alaska Board of Fisheries (Appendix A.1), and emergency orders, which are used to open and close the commercial fishing seasons, establish fishing period frequency and duration, and establish mesh size restrictions. In general, the department attempts to manage the commercial

fisheries such that each district's harvest is proportionately similar within their respective guideline harvest ranges.

New Regulations

An Alaska Board of Fisheries meeting was held in Anchorage in March 1994 to develop regulations to rebuild and conserve A-Y-K chum salmon runs. The regulations that were adopted affecting the Yukon Area are presented in Appendix B. In February 1993, the Board of Fisheries adopted regulations that created the Fairbanks Non-Subsistence Area. However, subsequent court decisions have made this area designation obsolete. The Joint Board of Fisheries and Game met on April 28 to develop regulations concerning the Fairbanks non-subsistence use area. Regulatory changes resulting from this meeting will be addressed in a separate news release.

Commercial Fishery Reporting Requirements

All processors and buyers of salmon are required to register with the department prior to purchasing salmon in the Yukon Area. Processors and buyers in Districts 1, 2, and 3 must register with the ADF&G office in Emmonak. Processors and buyers in Districts 4, 5, and 6 must register with the ADF&G office in Fairbanks. Reporting salmon purchases in a timely manner is essential for the management of these fisheries. Registered salmon buyers are required to provide a verbal report of their salmon purchases within 18 hours following the closure of a commercial fishing period. Buyers may report verbal harvest information in the Upper Yukon Area by calling a 24-hour recording at 452-4387. Buyers are also required to mail or deliver fish tickets to the department within 24 hours following the closure of a commercial fishing period in the Lower Yukon Area and within 36 hours in the Upper Yukon Area. If there is incomplete reporting, the department may delay commercial fishing until the needed harvest reports are received. In addition, it is very important for buyers to accurately report the location of salmon harvests on fish tickets by statistical area.

State law requires that a fish ticket recording the purchase of salmon must include the current price paid per pound for each species of salmon purchased. In addition, a fish processor/buyer is required to prominently post the current price paid for salmon at each location where salmon are purchased.

A reporting requirement adopted by the Board of Fisheries in February 1992, requires commercial fishermen to report the number of salmon harvested during commercial fishing periods and not sold on an ADF&G fish ticket. Fishermen are reminded to comply with this reporting requirement in 1994.

Chinook and Summer Chum Salmon Season

A major failure of western Alaska chum salmon returns occurred in 1993. In the Yukon River, the contribution of age-4 fish to the run was very low indicating below normal survival. Conservative management is necessary in order to maintain and rebuild summer chum salmon stocks. Because of the projection of a below average to critically low summer chum salmon run in 1994, the department will manage the Yukon River summer chum salmon run conservatively to reduce the mortality of summer chums. The summer chum salmon run will be assessed inseason with the first management priority to achieve spawning escapement goals. To the extent that escapement goals are achieved and there is a harvestable surplus identified, the subsistence fishery has priority. No directed commercial fishing for summer chum salmon will be allowed until it can be determined that a harvestable surplus above escapement and subsistence needs exists. Directed chinook salmon commercial fishing periods will be regulated to reduce summer chum salmon mortality by adjusting the length and frequency of fishing periods and by regulating gill net mesh size to 8 inch or larger. The commercial harvest of chinook salmon may be lower than anticipated preseason due to management actions necessary to conserve summer chums.

Chinook Salmon

A commercial harvest of 88,000 to 98,000 chinook salmon, near the midpoint of the guideline harvest range, is expected to be available for harvest in the Alaskan portion of the drainage in 1994. However, if major fishing restrictions are necessary for summer chum conservation, the chinook salmon commercial harvest may be 10,000 to 30,000 fish less than projected. It is likely that the subsistence harvest of chinook salmon will increase, if subsistence fishing for summer chum salmon is restricted.

The commercial chinook salmon fishery will be managed so as to impact summer chums as little as possible by timing of periods and regulating gillnet mesh size. Initially, commercial fishing periods will only be allowed with gillnets of 8 inch or greater mesh size by emergency order, and fishing time may be reduced. If summer chum salmon abundance is judged to be very poor, it may be necessary to request fishermen to use incidental summer chum harvests for subsistence purposes. If it is projected that summer chum salmon escapement goals will not be met and subsistence restrictions are implemented, the commercial fishing season may be closed.

Summer Chum Salmon

The department will assess the summer chum salmon run inseason using the main river sonar project located near Pilot Station at river-mile 123, test fisheries near the mouth, subsistence catch reports, commercial catch data, estimated age composition, and the Anvik River sonar escapement project.

For the 1994 season, the recommended escapement target is 1.0 million summer chum salmon for spawning stocks above Pilot Station. The desired distribution is as follows: 500,000 fish to Anvik River and 500,000 fish to non-Anvik tributaries above Pilot Station. The Anvik River has a biological escapement goal of 500,000 summer chum salmon. The department is considering a two cycle rebuilding approach for the overall spawning escapement for non-Anvik stocks above Pilot Station. The first cycle rebuilding goal would be to obtain a spawning escapement of 400,000 fish and the second cycle goal would be to obtain a spawning escapement of 500,000 fish above Pilot Station.

A total run size estimate of 1.1 million summer chums above Pilot Station is necessary to provide for escapement (900,000 fish) and subsistence catches (200,000 fish). A total run size estimate of 1,250,000 summer chums above Pilot Station is necessary to provide for escapement (500,000 fish for Anvik River and 500,000 fish for non-Anvik areas), subsistence catches (200,000 fish), and incidental harvests during the chinook salmon directed commercial fishery (50,000 fish) prior to allowing a directed commercial fishery for summer chum salmon.

The Anvik River sonar escapement estimate will be compared to the Pilot Station sonar estimate inseason. This comparison will be made to assess the distribution of spawners is appropriate such that the minimum escapement goal of 500,000 will be achieved in the Anvik River and that escapements to non-Anvik River tributaries will be adequate.

Summer chum salmon run timing is quite variable. Management of the early portion of the summer chum run will be based upon the assumption that the run will be below average, and that this run size will meet escapement and subsistence needs. It is anticipated that a good inseason projection of total passage by the Pilot Station sonar will be possible between June 21 and June 27 (the average 25% and 50% point of the run). A total run projection above Pilot Station of below 900,000 summer chums will result in closure of personal use and sport fisheries, restricting subsistence fishing gear to 8 inch or greater and 4 inch or less mesh size gillnets, allowing the use of fish wheels with live boxes only, and requiring fish wheel operators to release chum salmon unharmed. Subsistence fishing time would likely be reduced. Additionally, subsistence fishing restrictions along the coast of the Yukon Area may be implemented. These management actions would protect most of the chum salmon escapement while still allowing the subsistence fishery for resident fish and chinook salmon. If subsistence fishing restrictions are unsuccessful, partial or total closures of the subsistence fishery would be initiated.

If the total run above Pilot Station is projected to be between 900,000 and 1,150,000 summer chums, subsistence fishing restrictions would primarily entail reductions in fishing time with chum salmon directed gear. It may be possible to allow additional subsistence fishing time with gear restrictions. Depending on the escapement estimates from other projects, gear restrictions may be limited to just certain areas.

If a surplus of summer chum salmon is available for a directed summer chum salmon commercial fishery, the harvest will be allocated by district/subdistrict based upon the percentages of the present guideline harvest ranges established by the Board (Table 1).

Districts 1, 2, and 3

Fishermen are reminded that a regulation adopted in March 1993 requires identification of a vessel used by a commercial salmon permit holder to take salmon during the open commercial fishing season in Districts 1, 2, and 3. A vessel must display in permanent symbols at least 12 inches high and 1 inch wide that contrast with the background either the ADF&G vessel license plate number or the fishermen's 5 digit CFEC permit serial number and the letter which follows on both sides of the hull or cabin.

The directed commercial chinook salmon fishery will open by emergency order on a staggered basis beginning with District 1, when increasing subsistence and/or test-net catches of chinook salmon have occurred over a 7 to 10 day period. This strategy of allowing the early portion of the run to build, prior to commercial fishing, provides for uninterrupted subsistence fishing in the Lower Yukon Area, and allows passage of a portion of the early run segment out of the lower river districts. 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.

Initially, chinook salmon directed fishing periods are anticipated to be restricted to 8 inch or larger mesh size gillnets and to be no more than 12 hours in duration. In District 1, fishing periods are expected to begin at 6:00 p.m. on Mondays and Thursdays. It is expected that fishing periods, in Districts 2 and 3, will begin at 6:00 p.m. Wednesdays and Sundays. However, District 3 fishing periods may vary from this schedule, because it has a separate guideline harvest range. Since Districts 1 and 2 have combined guideline harvest ranges, the overall harvest level will determine when the directed chinook salmon fishery and commercial salmon season end. It may not be possible to allow an equal amount of fishing time for each district.

Normally, the use of large mesh size gillnets would cease when the combined Districts 1 and 2 harvest approaches 60,000-70,000 chinook salmon and fishing periods restricted to six inch maximum mesh size gillnets would be established. If summer chum salmon abundance is large enough to allow a directed fishery, six inch maximum mesh size fishing periods are anticipated to be 6 to 12 hours in duration. However, it is not anticipated that summer chum salmon directed fishing periods will be allowed in 1994. Because of concerns for the incidental harvest of summer chum salmon and the targeting of only larger chinook salmon with large mesh size gillnets, it is expected that the total commercial harvest of chinook salmon will be approximately 80,000 or less fish for Districts 1 and 2 combined. It is anticipated that the combined incidental harvest of summer chum salmon in Districts 1 and 2 will be no more than 35,000 fish, if summer chum run size is similar to 1993. The harvest is expected to range between 1,800 and 2,000 chinook salmon in District 3. If the abundance of summer chum salmon is projected to not meet escapement and subsistence needs, the commercial fishery may be closed.

The USF&WS is planning to operate a weir on the East Fork of the Andreafsky River in 1994. Historical escapement information obtained from sonar and tower projects operated on this river will be used to project the 1994 spawning escapement inseason. The assessment of spawning escapement

in the East Fork Andreafsky River will be used to regulate the size of the area closed to commercial fishing near the mouth of the Andreafsky River. Waters within 1000 feet of the north bank of the Yukon River from the mouth of Andreafsky River to Old Andreafsky may be closed to commercial fishing depending on assessment of escapement on the East Fork Andreafsky River.

District 4

Because of the below average summer chum salmon projection, the department anticipates that the commercial salmon season in Subdistricts 4-B and 4-C may open as early as Sunday, June 19. This strategy will allow the harvest of chinook salmon and reduce the harvest of later running chum salmon.

Past regulations provided two 48-hour commercial and subsistence fishing periods per week in District 4, beginning at 6:00 p.m. Sunday and 6:00 p.m. Wednesday. It is anticipated that Subdistricts 4-B and 4-C will initially be placed on a schedule of two 48-hour periods per week. If subsistence fishermen are unable to meet their subsistence needs due to the commercial fishing schedule, additional subsistence only fishing time will be allowed.

Historical commercial harvest data from Subdistrict 4-A indicates that few chinook salmon are sold in this area. Therefore, a chinook salmon directed commercial fishery will be difficult to implement without impacting summer chum salmon stocks, unless it can be determined that summer chum salmon are present in low numbers. If a surplus of summer chum salmon is identified, it is anticipated that the initial directed commercial fishing period would be allowed in Subdistrict 4-A. Any commercial periods in Subdistrict 4-A are anticipated to begin at 6:00 p.m. Monday and/or 6:00 p.m. Thursday and to be no more than 12 hours in duration.

The District 4 chinook salmon guideline harvest range is 2,250 to 2,850 fish. Based on preseason projections, the department will manage for the quarter-point to mid-point of the chinook salmon guideline harvest range. The early season is expected to close in District 4 when the targeted chinook salmon harvest is reached. Based on the preseason projection, the incidental harvest of summer chum is expected to be well below the lower end of the guideline harvest ranges.

The department is working with fishermen to develop a management plan for a commercial fishery within the Anvik River for future years in which surplus fish may be available. In 1994, the department in cooperation with Bering Sea Fishermen's Association, will be collecting information regarding the potential area to be opened to commercial fishing, allowable gear type, incidental harvest of other species, and efficiency of the fishery by allowing test fishing with seines and dipnets.

District 5

The District 5 commercial salmon fishing season will open by emergency order once the chinook salmon run is distributed throughout the area. Assessment of run abundance and timing from downstream commercial fishing districts, along with subsistence catch reports, will provide information to determine the season opening. It is anticipated that fishing periods during the early season in Subdistricts 5-A, 5-B, and 5-C will initially be 36 or 24 hours in duration.

For Subdistrict 5-D, the department will use emergency order authority to reduce the Subdistrict 5-D commercial fishing schedule to 36- or 24-hour periods. This will allow the department to monitor and maintain the harvest within the guideline harvest range.

Subdistricts 5-A, 5-B, and 5-C have a guideline harvest range of 2,400 to 2,800 chinook salmon and Subdistrict 5-D has a guideline harvest range of 300 to 500 chinook salmon. Based on the preseason projection, the department will be managing the harvest within the chinook salmon guideline harvest ranges. In years with average returns and normal run timing, the first commercial fishing period in Subdistricts 5-A, 5-B, and 5-C should occur between June 25 and July 5. In Subdistrict 5-D, the first commercial fishing period in years with average returns and normal run timing should occur between July 1 and July 10. It is anticipated that the early season in District 5 will close once the harvest of chinook salmon is within the guideline harvest range.

There are very few summer chum salmon present in Subdistricts 5-B, 5-C, and 5-D. Therefore, no management actions to conserve summer chum salmon will be necessary in those subdistricts. Subdistrict 5-A will be managed in a similar manner as Subdistrict 6-A, should any summer chum salmon conservation actions be necessary.

District 6

In the spring of 1988, the Board of Fisheries held a special session in Fairbanks to discuss and evaluate the fishery management plan for the Tanana River. At this meeting, the Board of Fisheries instructed the department to continue to manage District 6 on the basis of guideline harvest ranges. However, the Board of Fisheries did direct the department to manage for a different level within the guideline harvest ranges or, in some years, exceed the upper end of the guideline harvest level when it can be determined that additional commercial fishing will not jeopardize achieving escapement goals or meeting subsistence needs.

Currently, the Tanana River inseason run strength and timing indicators are limited. These include test fish wheel catches near the villages of Manley Hot Springs, aerial surveys, and the performance of the commercial and subsistence fisheries. In addition, chinook salmon escapement information collected by Sport Fish Division through tagging or tower counting projects on the Chena and Salcha Rivers may be used for inseason run assessment. The test fisheries provide run timing, species

composition, and information regarding whether the salmon run is building or dropping off in numbers inseason. However, the test fisheries appear to be less useful in determining the magnitude of the run due to inter-annual variability in fish wheel location and efficiency. During the 1994 season, the Manley test fish wheel will operate during the entire season with a "live box." No sales of salmon are expected from the Manley test fish wheel. Aerial assessment of spawning escapement areas depends on favorable weather and water conditions. Due to the limited management tools available, the department will be conservative in the management of District 6.

It is anticipated that the opening of the District 6 commercial fishing season will be in early to mid-July and possibly earlier than in recent years. The purpose of opening the season earlier is to allow the harvest of chinook salmon prior to the increase in abundance of later running summer chum salmon. All subdistricts will open at the same time. During the early season in District 6, and unless altered by emergency order, there will be up to two 42-hour commercial fishing periods per week, from 6:00 p.m. Friday until 12:00 noon Sunday, and from 6:00 p.m. Monday until 12:00 noon Wednesday. If the preseason projections are confirmed, the early season is expected to close once the mid-point of the chinook salmon guideline harvest range of 700 chinook salmon is exceeded.

Fall Chum and Coho Salmon Season

Fall Chum Salmon

During the March 1994 Board of Fisheries meeting, the Board adopted the Yukon River Drainage Fall Chum Salmon Management Plan (Appendix B). The purpose of the plan is to ensure adequate escapement of fall chum salmon into the Yukon River drainage and to provide management guidelines to the department. The overall objective is to provide a minimum of 400,000 fall chum salmon for drainage wide escapement in order to increase the likelihood of achieving individual spawning stock escapement goals and rebuilding needs throughout the drainage. Considerations for the Toklat River and the Canadian mainstem Yukon River rebuilding plans may result in adjustments to the recommended management actions.

The projection for the 1994 Yukon River fall chum salmon return is not encouraging for fall season commercial activities. The 1994 preseason projection is 605,000 fall chum salmon, which should provide for Alaskan subsistence harvests and still meet escapement and rebuilding needs. However, there are some indications that the 1994 projection may be high. The number of 3-year-olds observed in the 1993 return was the lowest on record. This raises concern that the production from the 1990 parent-year may not be as high as predicted. The current projection does not take into account the performance of 3-year-olds in 1993 for predicting the corresponding 4-year-old return in 1994. Fall chum salmon return primarily as 4- or 5-year-olds. If the production from the 1990 brood year is

poor, some level of subsistence restrictions, or possible closures, may be necessary in 1994 to meet escapement needs.

The management plan directs that, at a projected run size of 400,000 fall chum salmon or less, there would be a total closure of the fall chum salmon directed subsistence, personal-use, sport, and commercial fisheries throughout the drainage and adjacent coastal waters. Depending on the level of available harvestable surplus above 400,000 fall chum salmon, various events would occur (Table 2). For example, at a run size projection of 400,000 to 475,000 fish, the department could allow up to one 24-hour subsistence fishing period per week. With an inseason run assessment of 475,001 to 550,000 fish, additional subsistence fishing opportunities would be allowed. At a 550,000 to 600,000 fall chum salmon run size estimate, near normal levels of subsistence harvests under a five-day-a-week schedule would be expected. At a run size projection of greater than 600,000 fish, normal subsistence fishing schedules would occur, and Alaska personal-use and sport fishing opportunities would be considered.

Further, a total run size of at least 650,000 fall chum salmon is needed prior to allowing commercial fishing activities. A run size of 650,000 fish should provide for a commercial harvestable surplus of approximately 50,000 fall chum salmon. A minimum commercial harvestable surplus of 50,000 fish is needed to provide for an orderly commercial fishery. Allowable commercial harvest will be distributed by district or subdistrict proportional to the established guideline harvest range. Commercial harvest levels below the low end of the guideline harvest range will be distributed by district or subdistrict proportional to the mid-point of the guideline harvest range.

In the event there is a commercial fall season, District 1 commercial fishermen will be required to register for the Set Net Only Area prior to the opening of the fall commercial fishing season. Commercial fishing period durations will likely be 12 hours in the Set Net Only Area of District 1, and 6 hours in the remainder of the Lower Yukon Area. Commercial fishing periods in the Set Net Only Area will probably be scheduled to occur overnight, while fishing periods in the remainder of the Lower Yukon Area will probably be scheduled for daylight hours.

The department will assess the 1994 Yukon River fall chum salmon return inseason by primarily using the main river sonar project (Figure 1) located near Pilot Station. Information from test fisheries, subsistence catch statistics, age composition information, and preliminary information from the various escapement monitoring projects spread throughout the drainage will also be used in assessing the 1994 return, inseason.

As the department monitors the return, the run size projection may be adjusted upwards or downwards. Depending upon where the revised projection falls within these ranges would determine the recommended management actions the department would take at that time. Table 3 depicts possible action dates for the fall season fishery. It should be around these action dates that fishermen could expect possible changes in their fishing schedules based on the revised run size projection. Prior to August 1, the preseason projection along with the observed performance of the summer chum salmon run will be used in determining the estimated fall chum salmon run size. On the average, by August 1, 25% of the fall chum salmon run would have passed by the Pilot Station sonar site;

by August 9, approximately 50%; and by August 17, approximately 75% of the run would have passed the sonar site. These dates are based on average run timing and may be adjusted to take into account earlier or later run timing.

Toklat River Fall Chum Salmon Rebuilding Plan

During the March 1994 Board of Fisheries meeting, the board adopted the 1994 Toklat River Fall Chum Salmon Rebuilding Management Plan. The rebuilding plan closes the waters of the Toklat River but provides a limited subsistence salmon fishery on the Kantishna River. A special Kantishna River subsistence salmon fishing permit is required to participate in this fishery. Permits are available at the Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division's office in Fairbanks. Located in Appendix B is the regulation adopted by the Board of Fisheries for the 1994 season.

Coho Salmon

A slightly later but overlapping coho salmon run complicates the fall season salmon management program. Coho salmon escapement assessment is very limited in the Yukon River drainage due to funding limitations and survey conditions at that time of year. Fall chum salmon is the primary species of management concern during the fall season. Consequently, commercial harvest of coho salmon is a function of the timing, frequency, and duration of the periods established for the more numerous fall chum salmon. Because of the poor outlook on fall chum salmon, commercial harvest of coho salmon in 1994 is not anticipated.

Given the department's concern that the 1994 projection for the Yukon River fall chum salmon return may be overly optimistic, it is possible that some subsistence salmon fishing restrictions or total subsistence salmon fishing closures may be necessary in 1994 to conserve fall chum salmon. To take advantage of the coho salmon's later run timing, these fall chum salmon subsistence fishing restrictions may be reduced to allow additional subsistence coho salmon harvest after the vast majority of fall chum salmon have passed through the fishery. Liberalization of the subsistence fishing restrictions would only occur if it is determined that there is a harvestable surplus of coho salmon available.

Subsistence Fishery

Fishermen are reminded to keep track of their subsistence fish on their subsistence catch calendar or fishing permit. If you do not receive a calendar in the mail and would like to receive one, contact the ADF&G office in Emmonak or Fairbanks. Fishermen should remain informed of any changes in fishing regulations inseason due to the serious conservation concerns for summer chum and fall chum salmon in 1994.

Districts 1-3 and Subdistrict 4-A

In Districts 1, 2, and 3, and Subdistrict 4-A, salmon may be taken by subsistence fishermen seven days per week until 24 hours prior to the opening of the commercial fishing season. The Board of Fisheries adopted a new subsistence regulations in 1993 and 1994 specifically designed to eliminate the sale of subsistence caught fish during commercial openings. These regulations separate the subsistence and commercial fishing periods in Districts 1, 2, and 3, and Subdistrict 4-A. During the commercial season, subsistence fishing will only be allowed between commercial periods. Subsistence fishing will open 12 hours after the close of a commercial period and will terminate 18 hours before the start of the next scheduled commercial opening.

In Districts 1, 2, and 3, no person may possess chinook salmon taken for subsistence purposes, unless the dorsal fin has been **immediately** removed. This regulation requires subsistence fishermen to remove the dorsal fin (big one on the back) of chinook salmon immediately upon landing. A person may not sell or purchase salmon from which the dorsal fin has been removed.

Subdistricts 4-B and 4-C

Subsistence salmon fishing is allowed seven days per week before the opening of the Subdistrict 4-B and 4-C commercial season. Subsistence salmon fishing is prohibited 24 hours before the opening and 24 hours after the closure of the commercial salmon season. Beginning 24 hours after the closure of the commercial salmon season, subsistence fishermen may take salmon seven days per week.

Once the Subdistrict 4-B and 4-C commercial salmon season opens, managers will attempt to have the subsistence fishing schedule coincide with allowable commercial periods. During the commercial salmon season, subsistence fishing time in Subdistricts 4-B and 4-C is anticipated to continue as two 48-hour periods per week, unless altered by emergency order. Additionally, for any commercial salmon fishing closures of greater than five days in duration during the commercial salmon season, subsistence fishermen may take salmon from 6:00 p.m. Sunday until 6:00 p.m. Friday.

District 5

District 5 subsistence fishermen may take salmon seven days per week before the opening of the commercial salmon season. Subsistence fishermen may not take salmon 24 hours before the opening and 24 hours after the closure of the commercial salmon season. Once the commercial fishing season opens in Subdistricts 5-A, 5-B, and 5-C, it is anticipated that subsistence fishing periods will coincide with the commercial fishing schedule.

For any commercial salmon fishing closures of greater than five days in duration during the commercial season and following the closure of the commercial season in Subdistricts 5-A, 5-B, and 5-C, subsistence fishermen may take salmon from 6:00 p.m. Tuesday until 6:00 p.m. Sunday. In Subdistrict 5-D, subsistence fishermen may take salmon seven days per week throughout the season.

In portions of District 5, regulation requires subsistence fishermen to obtain subsistence salmon fishing permits. Permit areas include the Yukon River bridge area from Hess Creek to the Dall River and the Yukon River drainage upstream of Fort Yukon to the Canadian border. Permits can be obtained from the ADF&G office in Fairbanks. Regulations require all permit holders to report harvest information at the end of the fishing season.

District 6

Regulations require salmon fishermen in District 6 to obtain subsistence permits. Permits can be obtained from the ADF&G office in Fairbanks. Subsistence permit holders fishing in Subdistrict 6-C and the upper portion of Subdistrict 6-B are required to report the number of salmon taken to the department each week. Permit holders can report their weekly catch by record-a-phone at 452-7466. All other Tanana River subsistence permit holders are required to report harvest information at the end of the fishing season by returning their expired permit to the Department of Fish and Game office in Fairbanks. District 6 subsistence fishermen may take salmon from 6:00 p.m. Monday until 12:00 noon Wednesday, and from 6:00 p.m. Friday until 12:00 noon Sunday, unless altered by emergency order.

Personal Use Fishery

In 1992, the legislature passed a subsistence law during a special session which divided the state into subsistence or non-subsistence zones. The only non-subsistence zone in the Yukon Area which the Boards of Fisheries and Game created was the Fairbanks Non-Subsistence Use Zone, which basically matched the border of the Fairbanks North Star Borough. In October 1993, a Superior Court ruled that this 1992 subsistence law was unconstitutional. The state was immediately granted a stay, which had allowed for status quo fishing regulations to remain in effect until April 11, 1994 when the Alaska Supreme Court vacated the State's motion for a stay. Since subsistence regulations pertaining

to the Fairbanks Non-subsistence Use Zone had been repealed, the department and the Joint Board of Fisheries and Game are working to pass emergency regulations for the affected Fairbanks area.

Sport Fisheries

In general, sport fish salmon harvests in the Yukon Area are relatively minor compared to commercial and subsistence harvests. The Tanana River drainage is the exception, as it supports a popular sport fishery. In 1988, the Board of Fisheries established a guideline harvest range of 300-700 chinook salmon for the Salcha River recreational fishery. In 1990, the Board established a guideline harvest range of 300-600 chinook salmon for the Chena River recreational fishery.

Table 1. Recommended management actions for a range of summer chum salmon run size estimates in the Yukon River drainage in 1994. ^a							
Projected Run Size Estimate Above Pilot Station	Projected Escapement Above Pilot Station Sonar		Subsistence Harvest Goal	Recommended Management Actions			
	Anvik	Non-Anvik		Subsistence	Personal Use	Sport	Commercial
Preseason projection below average to critically low	500,000	400,000	Normal Harvest	No restrictions	No restrictions	No restrictions	Mesh size Restrictions ^c No targeted Chum Fishery (up to 50,000)
Inseason Less than 900,000	500,000	400,000	0	Mesh size restrictions ^b	Closure	Closure	Mesh size Restrictions ^c No targeted Chum Fishery (up to 50,000)
Inseason 900,000 to 1,150,000	500,000	400,000	up to 200,000	Up to Two 24-hour periods per week	Closure	Closure	Mesh size Restrictions ^c No targeted Chum Fishery (up to 50,000)
Inseason Greater than 1,250,000	500,000	500,000	200,000 or more	Normal Fishing Schedule	Up to Two 48-hour fishing periods per week	Retention allowed	Targeted commercial chum fishing allowed ^d

- ^a For all Yukon River districts except for subdistricts 5-B, 5-C, and 5-D. **Very few** summer chums are found in this portion of the river.
- ^b 4 inch or less and 8 inch or greater mesh size and only fishwheels with **live boxes** would be used to reduce the chum harvest.
- ^c Specify minimum mesh size of 8 inches in directed chinook salmon fishery.
- ^d Commercial harvest allowed on surplus greater than 1,250,000 distributed as follows:
- 1) Districts 1 and 2: 62.6%
 - 2) District 3: 1.5%
 - 3) Subdistrict 4A: 28.3%
 - 4) Subdistricts 4B and 4C: 4.0%
 - 5) District 5: 0.3%
 - 6) District 6: 3.3%

Table 2. Recommended management actions for a given fall chum salmon run size estimate, Alaskan portion of the Yukon River drainage, 1994.

Run Size Estimate (Point Estimate)	Recommended Management Action ^a				Subsistence Harvest Goal
	Subsistence	Personal-Use	Sport	Commercial	
Less Than 400,000	Closure	Closure	Closure	Closure	0
400,000 to 475,000	Up to One 24-Hour Period Per Week	Closure	Closure	Closure	Less Than 50,000
475,001 to 550,000	Up to Two 24-Hour Periods Per Week	Closure	Closure	Closure	Less Than 100,000
550,001 to 600,000	Up to 5 Days A Week	Closure	Closure	Closure	Near Normal Harvest
Greater Than 600,000	Normal Fishing Schedule	Up to Two 42-Hour Periods Per Week	Retention Allowed	Commercial Fishing Allowed ^b	Normal Harvest

^a Considerations for the Toklat and Canadian Mainstem rebuilding plans may reduce the recommended management actions

^b A harvestable surplus of at least 50,000 (total run size of 650,000) is needed to provide for an orderly commercial fishery.

Table 3. Anticipated action dates in management of fall chum salmon, Yukon Area, 1994. a

Action Points	Action Dates at Pilot Station Sonar	Run Timing Estimates				
		Districts 1, 2, and 3 b	District 4 c	Subdistricts 5-B and C d	Subdistrict 5-D e	Subdistrict 5-A and District 6 f
Preseason Projection	July 18	July 15	August 1	August 10	August 15	August 20
One-Quarter Point of the Run	August 1	August 1	August 16	August 26	September 2	September 6
Mid-Point of the Run	August 9	August 9	August 24	September 3	September 9	September 13
Three-Quarter Point of the Run	August 17	August 17	September 1	September 11	September 16	September 18
Final Inseason Run Size Estimate	August 31	August 31	September 15	September 20	September 25	September 30

a Dates listed are to be considered estimates in years with average run timing, and may be adjusted inseason to take in account earlier or later run timing.

b Pilot Station sonar historical run timing information is applied to all of Districts 1, 2, and 3.

c Assumes a District 4 lag time of 15 days from Pilot Station Sonar.

d Assumes a Subdistricts 5-B and 5-C lag time of 25 days from Pilot Station Sonar.

e Historical run timing information for DFO Test Fish Wheel minus 5 days is used for Subdistrict 5-D.

f Historical run timing information for Nenana Test Fish Wheel is used for District 6.

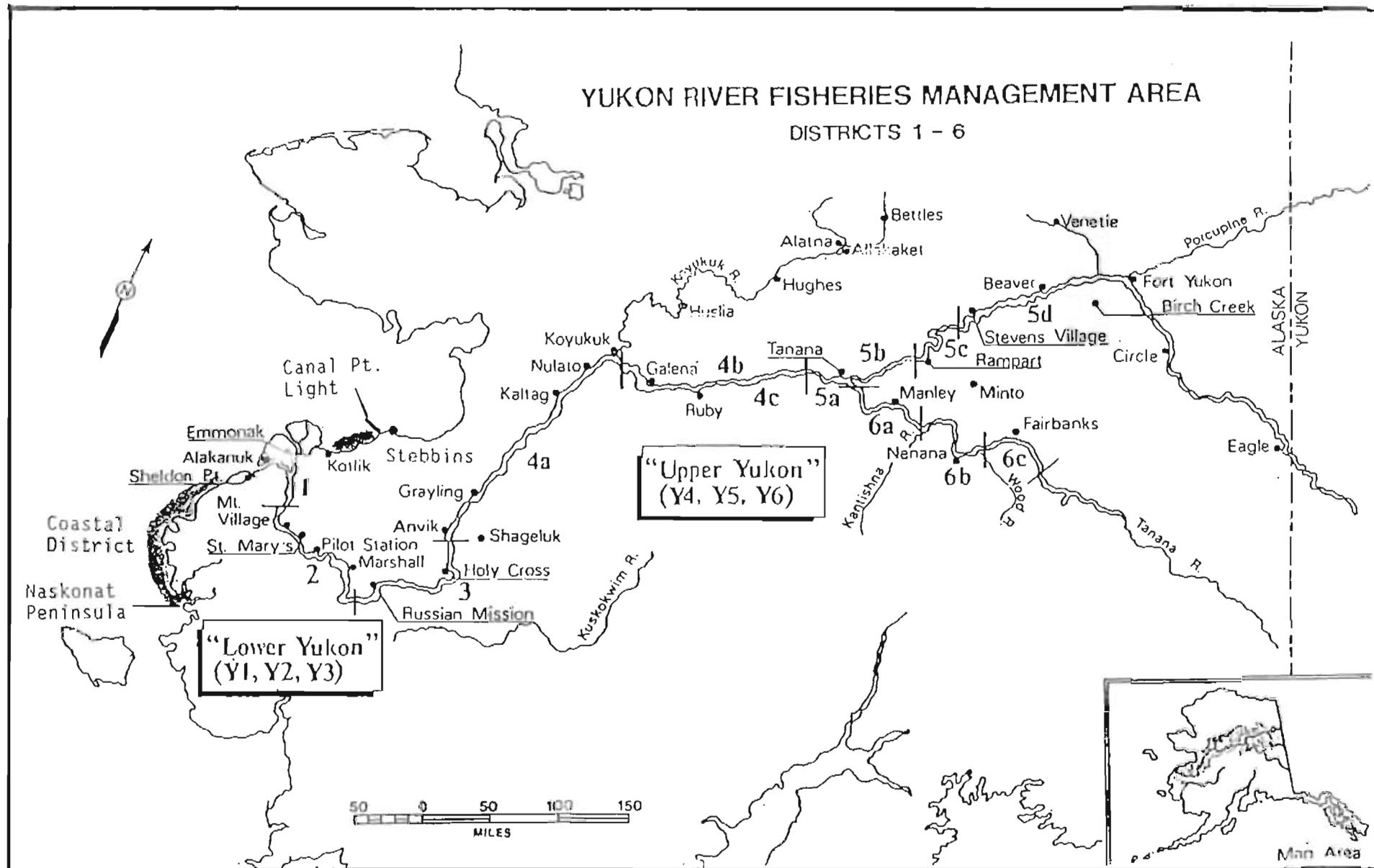


Figure 1. Yukon River management area, Districts 1 - 6. Alaska.

Appendix A.1. Guideline harvest ranges and mid-points for Alaskan and Canadian commercial harvests of Yukon River chinook, summer chum, and fall chum salmon.

Chinook Salmon						
Alaskan Management District or Country	Guideline Harvest Range					
	Lower		Mid-Point		Upper	
	Numbers	Percent	Numbers	Percent	Numbers	Percent
1 and 2	60,000	78.5	90,000	82.7	120,000	85.0
3	1,800	2.4	2,000	1.8	2,200	1.6
4	2,250	2.9	2,550	2.3	2,850	2.0
5A,B,C	2,400	3.1	2,600	2.4	2,800	2.0
5D	300	0.4	400	0.4	500	0.4
6	600	0.8	700	0.6	800	0.6
YT, Canada ^a	9,100	11.9	10,600	9.7	12,100	8.6
Total	76,450	100.0	108,850	100.0	141,250	100.0

Summer Chum Salmon						
Alaskan Management District	Guideline Harvest Range					
	Lower		Mid-Point		Upper	
	Numbers	Percent	Numbers	Percent	Numbers	Percent
1 and 2	251,000	62.8	503,000	62.9	755,000	62.9
3	6,000	1.5	12,500	1.6	19,000	1.6
4A ^b	113,000	28.3	225,500	28.2	338,000	28.2
4B,C	16,000	4.0	31,500	3.9	47,000	3.9
5	1,000	0.3	2,000	0.3	3,000	0.3
6	13,000	3.3	25,500	3.2	38,000	3.2
Total	400,000	100.0	800,000	100.0	1,200,000	100.0

Fall Chum Salmon						
Alaskan Management District or Country	Guideline Harvest Range					
	Lower		Mid-Point		Upper	
	Numbers	Percent	Numbers	Percent	Numbers	Percent
1, 2, and 3	60,000	64.1	140,000	63.1	220,000	62.8
4B,C	5,000	5.3	22,500	10.1	40,000	11.4
5A,B,C	4,000	4.3	20,000	9.0	36,000	10.3
5D	1,000	1.1	2,500	1.1	4,000	1.1
6	2,750	2.9	11,625	5.2	20,500	5.9
YT, Canada ^a	20,900	22.3	25,400	11.4	29,900	8.5
Total	93,650	100.0	222,025	100.0	350,400	100.0

^a Includes only the mainstem Yukon River fisheries in Canada. Varies annually dependent on Indian Food fishery demand. Overall guideline harvest range for all Canadian fisheries are 16,800 to 19,800 for chinook salmon and 23,600 to 32,600 for fall chum salmon.

^b Or the equivalent roe poundage of 61,000 to 183,000 pounds or some combination of fish and pounds of roe.

^c The fall chum guideline harvest range was changed for only the 1993 season by the BOF.

Appendix A.2. Commercial chinook salmon sales and harvest by district, Yukon River drainage in Alaska, 1961-1993. a

Year	Lower Yukon Area b				Upper Yukon Area									Subtotal Estimated Harvest	Alaska Total	
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4			Dist. 5			Dist. 6					
					Numbers	Roe	Estimated Harvest ^c	Numbers	Roe	Estimated Harvest ^c	Numbers	Roe	Estimated Harvest ^c			
1961	84,466	29,026	4,368	117,860	-	-	-	-	-	-	-	-	-	-	1,804	119,664
1962	67,099	22,224	4,687	94,010	-	-	-	-	-	-	-	-	-	-	724	94,734
1963	85,004	24,221	7,020	116,245	-	-	-	-	-	-	-	-	-	-	803	117,048
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	20,239	3,618	128,207	-	-	-	-	-	-	-	-	-	-	1,449	129,656
1968	79,465	21,392	4,543	105,400	-	-	-	-	-	-	-	-	-	-	1,126	106,526
1969	71,688	14,756	3,595	90,039	-	-	-	-	-	-	-	-	-	-	988	91,027
1970	56,648	17,141	3,705	77,494	-	-	-	-	-	-	-	-	-	-	1,651	79,145
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	71,840	17,948	3,460	93,268	685	-	685	2,663	-	2,663	1,473	-	1,473	-	4,821	98,089
1975	44,585	11,315	4,177	60,077	389	-	389	2,872	-	2,872	500	-	500	-	3,761	63,838
1976	62,410	16,556	4,148	83,114	409	-	409	3,151	-	3,151	1,102	-	1,102	-	4,662	87,776
1977	69,915	16,722	3,965	90,602	985	-	985	4,162	-	4,162	1,008	-	1,008	-	6,155	96,757
1978	59,006	32,924	2,916	94,846	608	-	608	3,079	-	3,079	635	-	635	-	4,322	99,168
1979	75,007	41,498	5,018	121,523	1,982	-	1,989	3,389	-	3,389	772	-	772	-	6,150	127,673
1980	90,382	50,004	5,240	145,626	1,521	-	1,521	4,891	-	4,891	1,947	-	1,947	-	8,359	153,985
1981	99,506	45,781	4,023	149,310	1,347	-	1,347	6,374	-	6,374	987	-	987	-	8,708	158,018
1982	74,450	39,132	2,609	116,191	1,087	-	1,087	5,385	-	5,385	981	-	981	-	7,453	123,644
1983	95,457	43,229	4,106	142,792	601	-	601	3,606	-	3,606	911	-	911	-	5,118	147,910
1984	74,671	36,697	3,039	114,407	961	-	961	3,669	-	3,669	867	-	867	-	5,497	119,904
1985	90,011	48,365	2,588	140,964	664	-	664	3,418	-	3,418	1,142	-	1,142	-	5,224	146,188
1986	53,035	41,849	901	95,785	502	-	502	2,733	-	2,733	950	-	950	-	4,185	99,970
1987	76,643	47,458	2,039	126,140	1,524	-	1,524	3,758 d	-	3,758	3,338 e	-	3,338	-	8,620	134,760
1988	57,109	35,188	1,767	94,064	3,159	-	3,159	3,436	-	3,436	762	-	762	-	7,357	101,421
1989	62,364 f	33,225	1,645	97,234	2,790	-	2,790	3,288	-	3,288	1,741	-	1,741	-	7,817	105,051
1990	52,262 g	33,213	2,341	87,816	3,936	8	3,538	3,353	47	3,365	1,757	1,676	2,156	-	9,059	96,875
1991	56,332 h	39,260 h	2,344	97,936	2,446	2,222	3,582	3,810	62	3,826	686	1,545	1,072	-	8,480	106,416
1992	74,212 i	38,139 i	1,819	114,170	1,651	2,273	2,394	3,852	7	3,855	572	884	752	-	7,001	121,171
1993	49,286	37,293	1,501	88,080	1,349	701	1,577	3,008	0	3,008	1,113	1,313	1,445	-	6,030	94,110
5 Yr Avg 1984-88	70,294	41,911	2,067	114,272	1,362	-	1,362	3,403	-	3,403	1,412	-	1,412	-	6,177	120,449
5 Yr Avg 1989-93	58,891	36,226	1,930	97,047	2,354	-	2,776	3,462	-	3,468	1,174	-	1,433	-	7,677	104,725

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
 b Includes department test fish sales in the Lower Yukon Area prior to 1991.
 c The estimated harvest is the number of fish sold in the round plus the estimated number of females to produce the roe sold.
 d Includes illegal sales of 653 chinook salmon.
 e Includes illegal sales of 2,136 chinook salmon.
 f Includes unlawful purchases of 3,211 chinook salmon.
 g Includes unlawful purchases of 1,101 chinook salmon.
 h Includes unlawful purchases of 2,711 chinook salmon in District 1 and 264 chinook salmon in District 2.
 i Includes unlawful purchases of 1,218 chinook salmon in District 1 and 207 chinook salmon in District 2.

Appendix A. 3. Commercial summer chum salmon sales and harvest by district, Yukon River drainage in Alaska, 1967-1993. a

Year	Upper Yukon Area														Alaska Total Harvest
	Lower Yukon Area b				District 4			District 5			District 6			Subtotal Estimated Harvest	
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Numbers	Roe	Estimated Harvest c	Numbers	Roe	Estimated Harvest d	Numbers	Roe	Estimated Harvest d		
1967	9,453	1,425	57	10,935	-	-	-	-	-	-	-	-	-	0	10,935
1968	12,995	1,407	68	14,470	-	-	-	-	-	-	-	-	-	0	14,470
1969	56,866	5,080	0	61,966	-	-	-	-	-	-	-	-	-	0	61,966
1970	117,357	19,649	0	137,006	-	-	-	-	-	-	-	-	-	0	137,006
1971	93,928	6,112	50	100,090	-	-	-	-	-	-	-	-	-	0	100,090
1972	114,234	20,907	527	135,668	-	-	-	-	-	-	-	-	-	0	135,668
1973	221,644	63,402	463	285,509	-	-	-	-	-	-	-	-	-	0	285,509
1974	466,004	74,152	1,721	541,877	27,866	-	27,866	6,831	-	6,831	13,318	-	13,318	48,015	589,892
1975	418,323	99,139	0	517,462	165,054	-	165,054	12,997	-	12,997	14,782	-	14,782	192,833	710,295
1976	273,204	99,190	9,802	382,196	211,307	-	211,307	774	-	774	6,617	-	6,617	218,698	600,894
1977	250,652	105,679	3,412	359,743	169,541	-	169,541	1,274	-	1,274	4,317	-	4,317	175,132	534,875
1978	393,785	227,548	27,003	648,336	364,184	16,920	381,104	4,892	605	5,497	34,814	8,236	43,050	429,651	1,077,987
1979	369,934	172,838	40,015	582,787	169,430	35,317	204,747	8,608	1,009	9,617	18,491	3,891	22,382	236,746	819,533
1980	391,252	308,704	44,782	744,738	147,560	135,824	283,384	456	0	456	35,855	3,282	39,137	322,977	1,067,715
1981	507,158	351,878	54,471	913,507	59,718	187,032	330,445	1,226	49	1,285	32,477	1,997	34,464	366,194	1,279,701
1982	249,516	182,344	4,086	435,946	3,647	151,281	257,719	213	21	234	21,597	1,517	23,114	281,067	717,013
1983	451,164	248,092	14,600	713,856	6,672	148,125	255,388	42	1,856	1,898	24,309	18	24,327	281,613	995,469
1984	292,676	236,931	1,087	530,694	1,009	166,842	278,070	645	47	692	56,249	335	56,584	335,346	866,040
1985	247,486	188,099	1,792	437,377	12,007	247,085	427,483	700	0	700	66,913	1,540	68,453	496,636	934,013
1986	381,127	288,427	442	669,996	300	269,545	465,535	690	0	690	50,483	2,146	52,629	518,854	1,188,850
1987	222,898	174,876	3,501	401,275	29,991	121,474	209,800	362	44	406	10,610	450	11,060	221,266	622,541
1988	648,198	425,172	13,965	1,087,335	24,051	254,526	490,074	722	363	1,085	40,129	1,646	41,775	532,934	1,620,269
1989	547,781 e	343,962	7,578	899,321	18,554	283,305	510,244	154	373	527	42,115	4,871	46,986	597,757	1,457,078
1990	148,911	132,507	643	282,061	12,364	105,723	211,061	11	594	671	12,360 g	3,059	14,788	226,520	508,581
1991	140,470 f	175,149	8,912	324,531	6,381	137,232	301,124	4	28	35	18,197	4,716	23,893	325,052	649,583
1992	177,329 h	147,129 h	65	324,523	2,659	110,809	211,396	102	295	430	5,029	1,892	7,228	219,054	543,577
1993	73,659	19,332	463	93,454	27	22,447	42,957	0	0	0	3,041	515	3,705	46,662	140,116
5 Yr Avg 1984-88	358,477	262,701	4,157	625,335	13,472	211,894	374,192	624	91	715	44,877	1,223	46,100	421,007	1,046,343
5 Yr Avg 1989-93	217,630	163,616	3,532	384,778	7,997	131,903	255,356	54	258	333	16,148	3,011	19,320	275,009	659,787

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe (may include small amounts of chinook salmon roe).

b Includes department test fish sales in the Lower Yukon Area prior to 1991.

c Estimated harvest is the estimated number of males and females harvested to produce the roe sold. It is assumed that summer chum salmon sold in the round were primarily male salmon that are estimated in roe expansion.

d Estimated harvest is the number of fish sold in the round plus the estimated number of females to produce roe sold.

e Includes unlawful purchases of 150 summer chum salmon in District 1.

f Includes unlawful purchases of 1,023 summer chum salmon in District 1.

g Includes 1,276 female summer chum salmon sold with roe extracted and sold separately. The estimated harvest of females to produce roe sold is decreased by a similar amount.

h Includes unlawful purchases of 31 chum salmon in District 1 and 91 chum salmon in District 2.

Appendix A.4. Commercial fall chum salmon sales by district, Yukon River drainage in Alaska, 1961-1993. a

Year	Upper Yukon Area															Alaska Total Harvest
	Lower Yukon Area b				District 4			District 5			District 6			Subtotal ^d		
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Numbers	Roe c	Estimated Harvest d	Numbers	Roe c	Estimated Harvest d	Numbers	Roe c	Estimated Harvest d	Roe c	Estimated Harvest d	
1961	42,461	-	-	42,461	-	-	-	-	-	-	-	-	-	0	0	42,461
1962	53,116	-	-	53,116	-	-	-	-	-	-	-	-	-	0	0	53,116
1963	-	-	-	0	-	-	-	-	-	-	-	-	-	0	0	0
1964	8,347	-	-	8,347	-	-	-	-	-	-	-	-	-	0	0	8,347
1965	22,936	-	-	22,936	-	-	-	-	-	-	-	-	-	0	381	23,317
1966	69,836	-	1,209	71,045	-	-	-	-	-	-	-	-	-	0	0	71,045
1967	36,451	-	1,823	38,274	-	-	-	-	-	-	-	-	-	0	0	38,274
1968	49,657	-	3,068	52,925	-	-	-	-	-	-	-	-	-	0	0	52,925
1969	128,866	-	1,722	130,588	-	-	-	-	-	-	-	-	-	0	722	131,310
1970	200,306	4,858	3,285	208,449	-	-	-	-	-	-	-	-	-	0	1,146	209,595
1971	188,533	-	-	188,533	-	-	-	-	-	-	-	-	-	0	1,061	189,594
1972	136,711	12,898	1,313	150,922	-	-	-	-	-	-	-	-	-	0	1,264	152,176
1973	173,783	45,304	-	219,087	-	-	-	-	-	-	-	-	-	0	13,003	232,090
1974	176,036	53,540	552	230,128	9,213	-	9,213	23,951	-	23,951	26,884	-	26,884	0	59,648	289,776
1975	158,183	51,666	5,590	215,439	13,666	-	13,666	27,212	-	27,212	18,692	-	18,692	0	59,570	275,009
1976	105,851	21,212	4,250	131,313	1,742	-	1,742	5,387	-	5,387	17,948	-	17,948	0	25,077	156,390
1977	131,758	51,994	15,851	199,603	13,980	-	13,980	25,730	-	25,730	18,673	-	18,673	0	58,383	257,986
1978	127,947	51,646	11,527	191,120	10,989	1,721	12,709	21,016	5,220	26,236	13,259	3,687	16,946	10,628	55,891	247,011
1979	109,406	94,042	25,955	229,403	48,899	3,199	52,098	47,459	8,097	55,556	34,185	7,170	41,355	18,466	149,009	378,412
1980	106,829	83,881	13,519	204,229	27,978	4,347	32,325	41,771	605	42,376	19,452	68	19,520	5,020	94,221	298,450
1981	167,834	154,893	19,043	341,760	12,082	1,311	13,393	86,620	6,955	93,575	25,989	3,019	29,008	11,285	135,976	477,736
1982	97,454	86,581	5,815	199,880	3,894	167	4,061	13,593	42	13,635	6,820	596	7,416	805	25,112	224,992
1983	124,371	85,645	10,018	220,034	4,482	1,963	6,445	43,993	0	43,993	34,089	3,101	37,190	5,064	87,628	307,662
1984	78,751	70,803	6,429	155,983	7,625	2,215	9,840	24,060	57	24,117	20,564	56	20,620	2,328	54,577	210,560
1985	129,948	40,490	5,164	175,602	24,452	2,525	26,977	25,338	0	25,338	42,352	0	42,352	2,525	94,867	270,269
1986	59,352	51,307	2,793	113,452	2,045	0	2,045	22,053	395	22,448	1,892	182	2,074	577	26,567	140,019
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	45,529	31,861	2,090	79,480	15,662	1,421	17,083	16,989	0	16,989	21,844	1,806	23,650	3,227	57,722	137,202
1989	77,876	97,906	15,332	191,114	11,776	3,407	15,183	18,215	3,989	22,204	49,090	7,353	56,443	14,749	93,830	284,944
1990	27,337	37,173	3,715	68,225	4,989	2,351	8,166	7,778	1,058	8,976	44,066 e	7,535	50,974	10,944	68,116	136,341
1991	59,724	102,628	9,213	171,565	3,737	1,616	6,091	27,355	3,625	32,114	28,195	14,154	44,448	19,395	82,653	254,218
1992	0	0	0	0	0	0	0	0	0	0	15,721	2,806	19,022	2,806	19,022	19,022
1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 Yr Ave 1984-88	62,716	38,892	3,295	104,903	9,957	1,232	11,189	17,688	90	17,778	17,330	409	17,739	1,731	46,707	151,610
5 Yr Ave 1989-93	32,967	47,541	5,652	86,181	4,100	1,475	5,898	10,670	1,734	12,659	27,414	6,370	34,177	9,579	52,724	136,905

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

b Includes department test fish sales in the Lower Yukon Area prior to 1991.

c May include small amounts of coho salmon roe.

d Estimated harvest is the number of fish sold in the round plus the estimated number of females to produce roe sold.

e Includes 884 female fall chum salmon sold with roe extracted and sold separately.

Appendix A.5. Commercial coho salmon sales and harvest by district, Yukon River drainage in Alaska, 1961-1993. a

Year	Upper Yukon Area											
	Lower Yukon Area b				Dist. 6							Total Harvest
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Number	Roe	Estimated Harvest c	Subtotal		
1961	2,855	-	-	2,855	-	-	-	-	-	0	2,855	
1962	22,926	-	-	22,926	-	-	-	-	-	0	22,926	
1963	5,572	-	-	5,572	-	-	-	-	-	0	5,572	
1964	2,446	-	-	2,446	-	-	-	-	-	0	2,446	
1965	350	-	-	350	-	-	-	-	-	0	350	
1966	19,254	-	-	19,254	-	-	-	-	-	0	19,254	
1967	9,925	0	1,122	11,047	-	-	-	-	-	0	11,047	
1968	13,153	0	150	13,303	-	-	-	-	-	0	13,303	
1969	13,989	0	1,009	14,998	-	-	-	-	-	95	15,093	
1970	12,632	0	0	12,632	-	-	-	-	-	556	13,188	
1971	12,165	0	0	12,165	-	-	-	-	-	38	12,203	
1972	21,705	506	0	22,211	-	-	-	-	-	22	22,233	
1973	34,860	1,781	0	36,641	-	-	-	-	-	0	36,641	
1974	13,713	176	0	13,889	0	1,409	1,479	-	1,479	2,888	16,777	
1975	2,288	200	0	2,488	0	5	53	-	53	58	2,546	
1976	4,064	17	0	4,081	0	0	1,103	-	1,103	1,103	5,184	
1977	31,720	5,319	538	37,577	0	2	1,284	-	1,284	1,286	38,863	
1978	16,460	5,835	758	23,053	32	1	3,066	-	3,066	3,099	26,152	
1979	11,369	2,850	0	14,219	155	0	2,791	-	2,791	2,946	17,165	
1980	4,829	2,660	0	7,489	30	0	1,226	-	1,226	1,256	8,745	
1981	13,129	7,848	419	21,396	0	0	2,284	-	2,284	2,284	23,680	
1982	15,115	14,179	87	29,381	15	0	7,780	-	7,780	7,795	37,176	
1983	4,595	2,557	0	7,152	0	0	6,168	-	6,168	6,168	13,320	
1984	29,472	43,064	621	73,157	1,095	0	7,688	-	7,688	8,783	81,940	
1985	27,676	17,125	171	44,972	938	0	11,762	-	11,762	12,700	57,672	
1986	24,824	21,197	793	46,814	0	0	441	-	441	441	47,255	
1987	0	0	0	0	0	0	0	-	0	0	0	
1988	36,435	34,776	1,419	72,630	2	8	13,972	-	13,972	13,982	86,612	
1989	24,672	38,522	3,988	67,182	3	84	16,084	-	16,084	16,171	83,353	
1990	13,354	16,435	918	30,707	0	0	11,549	4,042	14,804	14,804	45,511	
1991	54,095	40,898	1,905	96,898	14	0	6,268	4,299	9,774	9,788	106,686	
1992	0	0	0	0	0	0	6,556	1,680	7,979	7,979	7,979	
1993	0	0	0	0	0	0	0	0	0	0	0	
5 Yr Ave												
1984-88	23,681	23,232	601	47,515	407	2	6,773	-	6,773	7,181	54,696	
5 Yr Ave												
1989-93	18,424	19,171	1,362	38,957	3	17	8,091	-	9,728	9,748	48,706	

a Sales reported in numbers of fish sold in the round and pounds of roe. Coho salmon roe sales not separated from fall chum salmon until 1990.

b Includes department test fish sales prior to 1991.

c Estimated harvest is the number of fish sold in the round plus the estimated number of females to produce the roe sold.

d Includes 438 female coho salmon sold with roe extracted and sold separately.

Appendix A.6. Subsistence and personal use salmon catch in the Yukon River drainage in Alaska, 1961-1993. ^{a,b}

Year	Chinook	Summer chum		Fall Chum ^c		Coho ^c	Total
		Reported	Estimated Use ^e	Reported	Estimated Use ^e		
1961	21,488	305,317	305,317	101,772	101,772	9,192	437,769
1962	11,110	261,856	261,856	87,285	87,285	9,480	369,731
1963	24,862	297,094	297,094	99,031	99,031	27,699	448,686
1964	16,231	361,080	361,080	120,360	120,360	12,187	509,858
1965	16,608	336,848	336,848	112,283	112,283	11,789	477,528
1966	11,572	154,508	154,508	51,503	51,503	13,192	230,775
1967	16,448	206,233	206,233	68,744	68,744	17,164	308,589
1968	12,106	133,880	133,880	44,627	44,627	11,613	202,226
1969	14,000	156,191	156,191	52,063	52,063	7,776	230,030
1970	13,874	166,504	166,504	55,501	55,501	3,966	239,845
1971	25,684	171,487	171,487	57,162	57,162	16,912	271,245
1972	20,258	108,006	108,006	36,002	36,002	7,532	171,798
1973	24,317	161,012	161,012	53,670	53,670	10,236	249,235
1974	19,964	227,811	227,811	93,776	93,776	11,646	353,197
1975	13,045	211,888	211,888	86,591	86,591	20,708	332,232
1976	17,806	186,872	186,872	72,327	72,327	5,241	282,246
1977	17,581	159,502	159,502	82,771	82,771	16,333	276,187
1978	30,297	188,303	197,144	84,239	94,867	7,787	330,095
1979	31,005	191,287	196,187	214,881	233,347	9,794	470,333
1980	42,724	167,705	272,398	167,637	172,657	20,158	507,937
1981	29,690	117,629	208,284	177,240	188,525	21,228	447,727
1982	28,158	117,413	260,969	132,092	132,987	35,894	458,008
1983	49,478	149,180	240,386	187,864	192,928	23,895	506,687
1984	42,428	166,630	230,747	172,495	174,823	49,020	497,018
1985	39,771	157,744	264,828	203,947	206,472	32,264	543,335
1986	45,238	182,337	290,825	163,466	164,043	34,468	534,574
1987	53,124	179,202	275,914	361,663 ^d	361,663	84,894 ⁱ	775,595
1988	46,590	203,802	311,724	160,352	159,703	70,285	588,302
1989	47,213	169,547	249,582	214,361	224,046	42,241	563,082
1990	52,550	118,831	201,839	182,774	188,941	48,971	492,301
1991	45,621	118,509	275,673	138,411	168,990	37,388	527,672
1992	45,626	125,497	231,853	107,602	111,109	51,921	440,509
1993	62,912	105,416	111,965	76,860	76,860	15,772	449,785
5 Yr. Ave 1984-1988	45,430	177,943	274,808	212,385	213,341	54,186	587,765
5 Yr. Ave 1989-1993	50,784	127,560	214,182	144,002	153,989	39,259	494,670

- ^a Includes personal use catches beginning in 1987 and ending in June 1990. Does not include usage of salmon from commercial related harvest to produce roe sales.
- ^b Catches estimated for 1961-1976. Catches of salmon other than chinook salmon were not differentiated by species until 1977.
- ^c Minimum estimates for 1961-1978 because surveys were typically conducted before the end of the season.
- ^d Includes illegal sales involving an additional estimated 115,829 fall chum and 36,291 coho salmon in Districts 5 and 6.
- ^e Includes salmon harvested solely for subsistence, plus an estimated of the number of salmon carcasses harvested for the commercial production of salmon roe and used for subsistence.

Appendix A.7. Canadian catch of Yukon River drainage chinook and fall chum salmon, 1961-1993. ^a

Year	Chinook			Fall Chum		
	Commercial	Non-Commercial ^{b,c}	Total	Commercial	Non-Commercial ^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	13,346	22,846	9,000	13,218	22,218
1981	8,593	9,516	18,109	15,260	7,021	22,281
1982	8,640	8,568	17,208	11,312	4,779	16,091
1983	13,027	5,925	18,952	25,990	3,500	29,490
1984	9,885	6,910	16,795	22,932	6,335	29,267
1985	12,573	6,728	19,301	35,746	5,519	41,265
1986	10,797	9,567	20,364	11,464	3,079	14,543
1987	10,864	6,750	17,614	40,591	3,889	44,480
1988	13,217	8,210	21,427	30,263	3,302	33,565
1989	9,789	8,155	17,944	17,549	5,471	23,020
1990	11,324	7,914	19,238	27,537	6,085	33,622
1991	10,906	9,701	20,607	31,404	4,014	35,418
1992	10,877	7,176	18,053	18,576	2,239	20,815
1993 ^d	10,350	6,261	16,611	7,762	6,328	14,090
5 Yr Avg 1989-93	10,649	7,841	18,491	20,566	4,827	25,393

^a Catch in numbers of fish.^b Aboriginal Fishery, including the Porcupine River, Domestic, and Sport fisheries harvests combined.^c Sport fish harvest unknown prior to 1980.^d 1993 data is preliminary.

Appendix A. Chinook salmon escapement counts for selected Alaskan spawning stocks in the Yukon River drainage, 1961-1993.

Year	Andreasky River		Anvik River		Nulato River		Chena River	Salcha River		
	East Fork	West Fork	River	Index Area	North Fork	South Fork		Chena River	Index Area	River
1961	1,003		1,226		376	167	266		2,878	
1962	675	762							937	
1963							61			
1964	867	705					137		450	
1965		344	650						408	
1966	351	303	638						800	
1967		276	336							
1968	380	383	310						739	
1969	274	231	296						451	
1970	666	574	368				6		1,662	
1971	1,904	1,662					193		158	
1972	798	582	1,198				138		1,193	1,034
1973	825	788	613				21		391	352
1974		285	471		55	23	161	1,016	959	1,857
1975	993	301	730		123	81	385	316	262	1,055
1976	818	643	1,053		471	177	332	531	498	1,641
1977	2,008	1,499	1,371		286	201	255	563		1,202
1978	2,487	1,062	1,324		498	422	45	1,726		3,499
1979	1,180	1,134	1,484		1,093	414	484	1,159		4,789
1980	958	1,500	1,330	1,192	954	369	951	2,541		6,757
1981	2,146	231	807	577		791		600		1,237
1982	1,274	651					421	2,073		2,534
1983			653	376	528	480	572	2,553	2,336	1,991
1984	1,573	1,993	641	574				501	494	1,031
1985	1,617	2,248	1,051	720	1,600	1,180	735	2,553	2,262	2,035
1986	1,954	3,158	1,118	918	1,452	1,522	1,346	9,065	2,031	1,935
1987	1,608	3,281	1,174	879	1,145	493	731	6,404	1,312	1,209
1988	1,020	1,448	1,805	1,449	1,061	714	797	3,346	1,966	1,780
1989	1,399	1,089	442	212				2,666	1,280	1,185
1990	2,503	1,545	2,347	1,595	568	430	884	5,603	1,436	1,402
1991	1,938	2,544	875	625	767	1,253	1,690	3,025	1,277	1,277
1992	1,030	2,002	1,536	931	348	231	910	5,230	825	799
1993	5,855	2,768	1,720	1,326	1,644	1,181	1,573	12,241	2,943	2,660
E.O.	>1,500	>1,400	>1,300	>500	>800	>500	>600		>1,700	

1 Data obtained by aerial survey unless otherwise noted. Only peak counts are listed. Survey rating is fair to good, unless otherwise noted. Latest table revision: January 25, 1994.
 2 From 1961-1970, river count data are from aerial surveys of various segments of the mainstem Anvik River. From 1972-1979, counting tower operated; mainstem aerial survey counts below the tower were added to tower counts. From 1980-present, aerial survey counts for the river are best available minimal estimates for the entire Anvik River drainage. Index area counts are from the mainstem Anvik River between the Yellow River and McDonald Creek.
 3 Includes mainstem counts below the confluence of the North and South Forks, unless otherwise noted.
 4 Chena River index area for assessing the escapement objective is from Moose Creek Dam to Middle Fork River.
 5 Salcha River index area for assessing the escapement objective is from the TAPS crossing to Caribou Creek.
 6 Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.
 7 Boat survey.
 8 Data unavailable for index area. Calculated from historic (1972-91) average ratio of index area counts to total river counts (0.90:1.0).
 9 Mainstem counts below the confluence of the North and South Forks Nulato River included in the South Fork counts.
 10 Preliminary.
 11 Interim escapement objectives. Established March, 1992.
 12 Interim escapement objective for the entire Anvik River drainage is 1,300 salmon. Interim escapement objective for mainstem Anvik River between the Yellow River and McDonald Creek is 500 salmon.

Appendix A.9. Chinook salmon escapement counts for selected spawning areas in the Canadian portion of the Yukon River drainage, 1961-1993. ^a

Year	Tincup Creek	Tatchun River	Little Salmon River	Big Salmon River	Nisutlin River ^z	Ross River ^z	Wolf River ^z	Whitehorse Fishways	Canada Mainstem Tagging Estimate ^o
1961								1,068	
1962								1,500	
1963								483	
1964								595	
1965								903	
1966		7 ^x						563	
1967								533	
1968			173 ^x	857 ^x	407 ^x	104 ^x		414	
1969			120	286	105			334	
1970		100		670	615		71 ^z	625	
1971		130	275	275	650		750	856	
1972		80	126	415	237		13	391	
1973		99	27 ^x	75 ^x	36 ^x			224	
1974		192		70 ^x	48 ^x			273	
1975		175		153 ^x	249		40 ^x	313	
1976		52		86 ^x	102			121	
1977		150	408	316 ^x	77			277	
1978		200	330	524	375			725	
1979		150	489 ^x	632	713		183 ^x	1,184	
1980		222	286 ^x	1,436	975		377	1,383	
1981		133	670	2,411	1,626	949	395	1,555	
1982		73	403	758	578	155	104	473	19,790
1983	100	264	101 ^x	540	701	43 ^{x,z}	95	905	28,989
1984	150	153	434	1,044	832	151 ^x	124	1,042	27,616 ^m
1985	210	190	255	801	409	23 ^x	110	508	10,730
1986	228	155	54 ^x	745	459 ^x	72 ^x	109	557	16,415
1987	100	159	468	891	183	180 ^x	35	327	13,260
1988	204	152	368	765	267	242	66	405	23,118
1989	88	100	862	1,662	695	433 ^p	146	549	25,201
1990	83	643	665	1,806	652	457 ^x	188	1,407	37,699
1991			326	1,040		250	201 ^r	1,266	20,743
1992	73	106	494	617	241	423	110 ^r	758	25,497
1993 ^s		183	184	572	339	400	168 ^r	668	28,578
E.O.									33,000-43,000 ^q

^a Data obtained by aerial survey unless otherwise noted. Only peak counts are listed. Survey rating is fair to good, unless otherwise noted. Latest table revision: December 3, 1993.

^b All foot surveys except 1978 (boat survey) and 1986 (aerial survey).

^c For 1968, 1970, and 1971 counts are from mainstem Big Salmon River. For all other years counts are from the mainstem Big Salmon River between Big Salmon Lake and the vicinity of Souch Creek.

^d One Hundred Mile Creek to Sidney Creek.

^e Big Timber Creek to Lewis Lake.

^f Wolf Lake to Red River.

^g Includes 50, 90, 292, 506, 243, 288 fin-clipped hatchery-origin salmon in 1988, 1989, 1990, 1991, 1992, and 1993, respectively.

^h Estimated total spawning escapement excluding Porcupine River (estimated border escapement minus the Canadian catch).

ⁱ Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.

^j Estimate derived by dividing the annual 5-area (Whitehorse Fishway, Big Salmon, Nisutlin, Wolf, Tatchun) count by the average proportion of the annual 5-area index count to the estimated spawning escapements from the DFO tagging study for years 1982, 1983, and 1985-1989.

^k Information on area surveyed is unavailable.

^l Counts are for Big Timber Creek to Sheldon Lake.

^m Counts are for Wolf Lake to Fish Lake outlet.

ⁿ Preliminary.

^o Interim escapement objective. Stabilization escapement objective for years 1990 - 1995 is 18,000 salmon.

Appendix A.10. Summer chum salmon escapement counts for selected spawning areas in the Yukon River drainage, 1973-1993.

Year	Andreasky River,			Anvik River,		Rodo River,	Nulato River,		Gisasa River,	Hogatza River, (Clear and Caribou Crs)	Tozilna River,	Chena River,	Saicha River,
	East Fork		West Fork	Tower & Aerial	Sonar		South Fork	North Fork					
	Aerial	Sonar or Tower											
1973	10,149 _a		51,835	86,665 _a								79 _a	
1974	3,215 _a		33,578	201,277		16,137	29,016	29,334	22,022		1,923	4,349	3,510
1975	223,485		235,954	845,485		25,335	51,215	87,280	56,904	22,355	3,512	1,670	7,573
1976	195,347		118,420	496,166		38,258	9,230 _a	30,771	21,342	20,744	725 _a	685	6,474
1977	112,722		63,120	262,854		16,118	11,385	58,275	2,204 _a	10,734	761 _a	610	677 _a
1978	127,050		57,321	251,339		17,845	12,821	41,659	9,280 _a	5,102	2,262	1,609	5,405
1979	68,471		43,391	81,830 _a	280,537		1,506	35,598	10,962	14,221		1,025 _a	3,060
1980	36,823 _a		114,759		492,676		3,702 _a	11,244 _a	10,388	19,786	580	338	4,140
1981	81,555	147,312 _r			1,486,182			14,348				3,500	8,500
1982	7,501 _a	181,352 _r	7,267 _a		444,581						874	1,509	3,756
1983		110,608 _r			362,912		1,263 _a	19,749	2,356 _a	28,141	1,604	1,097	716 _a
1984	95,200 _a	70,125 _r	238,565		891,028							1,861	9,810
1985	66,146		52,750		1,080,243	24,576	10,494	19,344	13,232	22,566	1,030	1,005	3,178
1986	83,931	167,614 _r	99,373		1,189,602		16,848	47,417	12,111		1,778	1,509	8,028
1987	6,687 _a	45,221 _r	35,535		455,876		4,094	7,163	2,123	5,669 _a		333	3,657
1988	43,056	68,937 _r	45,432		1,125,449	13,872	15,132	26,951	9,284	6,890	2,983	432	2,889 _a
1989	21,480 _a				636,906							714 _a	1,574 _a
1990	11,519 _a		20,426 _a		403,627	1,941 _a	3,196 _a	1,419 _a	450 _a	2,177 _a	36	100 _a	450 _a
1991	31,886		46,657		847,772	3,977	13,150	12,491	7,003	9,947	93	10 _a	154 _a
1992	11,308 _a		37,808 _a		775,625	4,465	5,322	12,358	9,300	2,986	794	848 _a	3,222
1993 _p	10,935 _a		9,111 _a		517,409	7,867	5,486	7,698	1,581		970	168	212
E.O. _j	>109,000		>116,000		>500,000 _k			>53,000 _m		>17,000 _n			>3,500

0 Data obtained by aerial survey unless otherwise noted. Only peak counts are listed. Latest table revision January 11, 1994.

_a From 1972-1979, counting tower operated; mainstem aerial survey counts below the tower were added to tower counts.

_b Includes mainstem counts below the confluence of the North and South Forks, unless otherwise noted.

_c Incomplete survey and/or poor survey timing or conditions resulted in minimal or inaccurate count.

_r Sonar count.

_s Tower count.

_t Mainstem counts below the confluence of the North and South Forks Nulato River included in the South Fork counts.

_j Interim escapement objective.

_k The Anvik River Escapement Objective was rounded upward to 500,000 from 487,000 in March, 1992.

_l Interim escapement objective for North Fork Nulato River only.

_m Consists of Clear and Caribou Creeks interim escapement objectives of 9,000 and 8,000, respectively.

_p Preliminary.

Appendix A.11 Fall chum salmon escapement counts for selected spawning areas in the Alaskan and Canadian portions of the Yukon River drainage, 1971-1993.

Year	Alaska				Canada					
	Toklat River ₁	Delta River ₂	Chandalar River ₃	Sheenjek River ₄	Fishing Branch River ₅	Mainstem Yukon River Index ₆	Kodlen River ₇	Kluane River ₈	Teslin River ₉	Mainstem Tagging Estimate ₁₀
1971					312,800					
1972					35,125			198		
1973					15,989	383		2,500		
1974	41,798	5,915		89,966	32,525			400		
1975	82,285	3,734		173,371	353,282	7,671		362		
1976	52,981	6,312		26,354	36,584			20		
1977	34,887	16,876		45,544	88,400			3,555		
1978	37,001	11,136		32,448	40,800			0		
1979	158,338	8,355		91,372	119,898			4,640		
1980	26,346	5,137		28,933	56,268			3,150		
1981	15,623	23,508		74,588	57,388			25,806		
1982	3,624	4,235		31,421	15,901	1,020		5,378		31,958
1983	21,869	7,705		49,392	27,200	7,580		8,578		90,875
1984	16,758	12,411		27,130	15,150	2,800	1,300	7,200	200	56,633
1985	22,750	17,278		152,768	68,016	10,760	1,195	7,538	358	62,010
1986	17,978	6,703	59,313	83,197	31,723	825	14	16,688	213	87,990
1987	22,117	21,180	52,416	140,086	48,956	6,115	50	12,000		80,776
1988	13,436	18,024	33,619	40,866	23,597	1,530	0	6,960	140	36,788
1989	30,421	21,342	69,161	79,118	43,834	8,320	40	3,060	210	35,750
1990	34,739	8,992	78,631	62,200	35,000	3,651	1	4,680	739	51,755
1991	13,487	32,905		86,496	37,733	2,428	53	11,675	468	78,461
1992	14,070	8,893		78,808	22,517	4,438	4	3,339	450	49,082
1993	27,830	19,857		43,000	28,798	2,620	0	4,610	556	29,743
E.O.	> 83,000	> 11,000		> 64,000	50,000 - 120,000					> 80,000

- 1. Latest table revision December 6, 1993.
- 2. Total escapement estimates using Delta River migratory time density curve and percentage of live salmon present by survey date in upper Toklat River area.
- 3. Total escapement estimates made from migratory time density curve (see Barton 1986), unless otherwise indicated.
- 4. Side-scan sonar estimate.
- 5. From 1981-1985 sonar operations were initiated between August 29 and September 2. From 1986-1990 sonar operations were initiated between August 17 and August 25. For 1991 and 1992 sonar operations were initiated on August 9.
- 6. Within the Canadian Porcupine River drainage. Total escapement estimated using weir to aerial survey expansion factor of 2.72, unless otherwise indicated.
- 7. Aerial survey count unless otherwise indicated.
- 8. Tatchun Creek to Fort Selkirk.
- 9. Duke River to end of spawning sloughs below Swede Johnston Creek.
- 10. Boswell Creek area (5km below to 5km above confluence).
- 11. Excludes Fishing Branch River escapement (estimated border passage minus Canadian removal).
- 12. Weir installed on September 22. Estimate consists of a weir count of 17,190 after September 22, and a tagging passage estimate of 17,935 prior to weir installation.
- 13. Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.
- 14. Foot survey.
- 15. Weir count.
- 16. Total escapement estimates using sonar to aerial survey expansion factor of 2.221.
- 17. Population estimate from replicate foot surveys and stream life data.
- 18. Initial aerial survey count was doubled before applying the weir/aerial expansion factor of 2.72 since only half of the spawning area was surveyed.
- 19. Boat survey.
- 20. Total index area not surveyed. Survey included the mainstem Yukon River between Yukon Crossing to 30 km below Fort Selkirk.
- 21. Escapement estimate based on mark-recapture program unavailable. Estimate based on assumed average exploitation rate.
- 22. Does not include a passage estimate of 20,000 salmon prior to initiation of sonar-monitoring operations.
- 23. Does not include a passage estimate of 15,550 salmon prior to initiation of sonar-monitoring operations.
- 24. Weir was not operated. Although only 7,541 chum salmon were counted on a single survey flown October 26, a population estimate of approximately 27,000 fish was made through date of survey, based upon historic average aerial-to-weir expansion of 28%. Actual population of spawners was reported by DFO as between 30,000 - 40,000 fish in view of aerial survey timing.
- 25. Preliminary.
- 26. Interim escapement objective.
- 27. Based on escapement estimates for years 1974-1990.

Appendix A.12. Coho salmon escapement counts for selected spawning areas in the Yukon River drainage, 1972-1993.

Year	Andreafsky River		Kantishna River			Nenana River Drainage				Delta Clearwater River _u	Clearwater Lake and Outlet	Richardson Clearwater River
	East Fork	West Fork	Anvik River	Geiger Creek	Barton Creek	Lost Slough	Nenana Mainstem	Wood Creek	17-Mile Slough			
1972										630	417	454 _b
1973										3,322	551 _d	375 _d
1974						1,388			27	3,954 _e	580	652 _d
1975						943			956	5,100	1,575 _{af}	4 _b
1976			467 _b	25 _j		118			281	1,920	1,500 _{af}	80 _b
1977			81 _b	60		524		310 _j	1,167	4,793	730 _{af}	327
1978						350		300 _j	466	4,798	570 _{af}	
1979						227			1,987	8,970	1,016 _{af}	372
1980				3 _j		499		1,603 _j	592	3,946	1,545 _{af}	611
1981	1,657 _k					274		849 _{ka}	1,005	8,563 _m	469 _b	550
1982				81 _j				1,436 _{ka}		8,365 _m		
1983				42 _j		766		1,042 _k	103	8,019 _m	253	88
1984				20		2,677		8,826 _k		11,061	1,368	428
1985				42		1,584		4,470 _k	2,081	5,358	750	
1986				5 _j	496	794		1,664 _k	218 _{af}	10,857	3,577	146 _b
1987				1,175 _j		2,511		2,367 _k	3,802	22,300	4,225 _{af}	
1988	1,913	830	1,203	159 _j	437	348		2,046 _k		21,600	825 _{af}	
1989				155 _j	12 _b			412 _k	824 _b	11,000	1,600 _{af}	483
1990				211 _j		688	1,308		15 _b	8,325	2,375 _{af}	
1991				427 _j	467 _b	564	447		52	23,900	3,150 _{af}	
1992				77 _j	55 _b	372			490	3,983	229 _{af}	500 _d
1993 _i				138 _j	141			666 _{ka}		10,875	3,525 _{af}	
E.O. _a										>9,000		

_a Only peak counts presented. Survey rating is fair to good, unless otherwise noted. Latest table revision: November 10, 1993.

_b Mainstem Nenana River between confluences of Lost Slough and Teklanika River.

_c Surveyed by F.R.E.D.

_d Surveyed by Sport Fish Division.

_e Boat survey.

_f Aerial survey.

_g Poor survey.

_h Foot survey.

_i Weir count.

_j Expanded estimate based on partial survey counts and historic distribution of spawners from 1977-1980.

_k Coho weir was operated at the mouth of Clear Creek (Shores Landing).

_l Weir project terminated on October 4. Weir normally operated until mid to late October.

_m Preliminary.

_n Interim escapement objective established March, 1993.

Appendix B. Regulation Changes Adopted by the Alaska Board of Fisheries in March, 1994.

Following the failure of the 1993 chum salmon runs in Western Alaska, state biologists and the Board of Fisheries identified several options for conserving and rebuilding chum stocks region wide. These proposals represented an aggressive effort by the department and fishermen to protect and conserve chum salmon for future use. On March 22-28, 1994 the Alaska Board of Fisheries adopted new commercial and subsistence fishing regulations intended to conserve chum salmon. The new regulations affecting the Yukon Area are listed below.

Subsistence Regulations

5 AAC 01.210 Fishing Seasons and Periods.

During the commercial fishing season, Subdistrict 4-A was included in the subsistence fishing schedule with Districts 1, 2, and 3, to separate the commercial and subsistence fishing periods.

In Districts 1, 2, 3, and Subdistrict 4-A salmon may not be taken for subsistence

- (1) during the 24 hours immediately before the opening of the commercial salmon fishing season; and
- (2) 18 hours immediately before, during, and 12 hours after each weekly fishing period of the commercial fishing season.

Since, subsistence and commercial fishing times are now separated in Subdistrict 4-A, the following language was deleted from the regulations because it is no longer applicable.

(b) (2) (A) in Subdistrict 4-A from June 15 through August 1, salmon may not be taken from 6:00 p.m. Sunday until 6:00 p.m. Tuesday and from 6:00 p.m. Wednesday until 6:00 p.m. Friday.

5 AAC 01.220. Lawful Gear and Gear Specifications.

New regulations allow fishermen to target non-salmon species and salmon species other than chum salmon, while protecting chum salmon.

(f) (1) (5) only gillnets of four inch mesh or less or eight inch mesh or greater may be used during periods established by emergency order for the conservation of chum salmon; the length of a gillnet of four inch or less mesh, will be established by emergency order.

(f) (1) (6) during fishing periods established by emergency order for the conservation of chum salmon, fish wheels may be operated only as follows:

(A) a live box must be constructed so that it contains no less than 45 cubic feet of water volume while in operation;

(B) while in operation, a livebox must be checked at least once every 12 hours, and all chum salmon caught must be returned alive to the water;

(C) for the purpose of this subsection, a "livebox" is a submerged container, attached to the fish wheel, that will keep fish caught by the fish wheel alive.

5 AAC 01.249. The 1994 Yukon River Drainage Fall Chum Salmon Management Plan.

This management plan is to ensure adequate escapement of fall chum salmon into the Yukon River drainage and to provide management guidelines to the department. The plan will be in effect from July 16 through December 31 each year as follows:

- (1) when the projected run size is less than 400,000 chum salmon, the department shall close the commercial, sport, personal-use, and subsistence directed chum salmon fisheries;
- (2) when the projected run size is from 400,000 to 475,000, the department may open a subsistence fishery of up to 24 hours of fishing per week;
- (3) when the projected run size is from 475,001 to 550,000 chum salmon, the department may open a subsistence fishery of up to 48 hours of fishing per week;
- (4) when the projected run size is from 550,001 to 600,000 chum salmon, the department may open a subsistence fishery of up to 120 hours of fishing per week;
- (5) when the projected run size is greater than 600,000 chum salmon, the department may open the subsistence fishery to the fishing seasons and periods specified in 5 AAC 01.210 and 5 AAC 05.367, open a personal-use fishery of up to 84 hours of fishing per week, and a sport fishery to allow for the retention of chum salmon; and
- (6) when the projected run size is greater than 650,000 chum salmon, the department may allow for a commercial fishery with the harvest distributed by district or subdistrict proportional to the established guideline harvest range; harvest levels below the

low end of the guideline harvest range will be distributed by district or subdistrict proportional to the mid-point of the guideline harvest range.

5 AAC 01.248. The 1994 Toklat River Fall Chum Salmon Rebuilding Management Plan.

- (a) The Board of Fisheries finds that a comprehensive long-term management plan is necessary to promote sustained yield of Toklat River fall chum salmon stocks. The lack of complete resource information concerning the Toklat River fall chum salmon stock limits the ability of the board to develop a long-term management approach at this time. The Yukon River Drainage Fisheries Association presented to the board a Toklat River Fall Chum Salmon Rebuilding Management Plan which contained recommended management actions that will aid in the rebuilding effort of the Toklat River fall chum salmon stock. The objective of the plan is to achieve the minimum escapement objective of 33,000 fall chum salmon on the Toklat River spawning grounds. To accomplish this objective, the department shall implement the following provisions:
 - (1) from August 15 through May 15, the Toklat River drainage is closed to sport, personal use, and subsistence fishing;
 - (2) in the Kantishna River, the following subsistence permit requirements apply:
 - (A) from August 15 through December 31, the subsistence salmon harvest limit in the Kantishna River is 2,000 chum salmon;
 - (B) from August 15 through December 31, the annual possession limit for the holder of a Kantishna River subsistence salmon fishing permit is 450 chum salmon; until the fishery harvest limit is reached, permits for additional salmon may be issued by the department;
 - (C) salmon may be taken only by set gillnet or fish wheel; after August 15, once the allowable fishery harvest limit of 2,000 chum salmon is reached, only fish wheel equipped with liveboxes may be operated as follows:
 - (i) a livebox must be constructed so that it contains no less than 45 cubic feet of water volume while in operation;

- (ii) while in operation, a livebox must be checked at least once every 12 hours, and all chum salmon caught must be returned alive to the water;
 - (iii) for the purpose of this subsection, a "livebox" is a submerged container, attached to the fish wheel, that will keep fish caught by the fish wheel alive;
 - (3) the fishery management strategy is to allow a commercial harvest that is lower than the maximum harvest level that could be supported by the Yukon River fall chum salmon return;
 - (4) in Subdistricts 5-A and 6-A, during the commercial fall chum salmon season there may not be more than one 24-hour commercial period per week;
 - (5) in Subdistrict 5-A, following the commercial salmon season closure, salmon may be taken by subsistence fishing from 6:00 p.m. Tuesday until 6:00 p.m. Sunday.
- (b) The provisions of this section supersede corresponding commercial, sport, personal use, and subsistence regulations in 5 AAC.

Commercial Regulations

5 AAC 05.200. Fishing Districts and Subdistricts.

The Board adopted language that incorporated the coastal areas of the Yukon Area which are not included in District 1 as a district for management purposes. This portion of the coastal Yukon Area may have subsistence fishing restrictions established for the conservation of summer and fall chum salmon returning to the Yukon River.

- (h) Coastal District: all waters between the latitude of the westernmost point of the Naskonat Peninsula and the latitude of Canal Point Light, not included in (a) - (f) of this section.

5 AAC 05.331. Gillnet Specifications and Operations.

This new regulation allows the department to establish commercial fishing periods with a minimum mesh size of 8 inches to target chinook salmon while protecting chum salmon.

(g) Notwithstanding (b) - (d) of this section, when determined by the department for the conservation of chum salmon, in District 1 through 6 salmon may be taken only with gillnets of eight inch or greater mesh during periods established by emergency order.

5 AAC 05.331. Closed Waters

This new language identifies when the department will move the regulatory markers at the mouth of the Andrafsky River farther downstream towards the mainstem Yukon River.

(4) waters of the Andrafsky River upstream of a line from department regulatory markers placed on each side of the river at its mouth; the boundary markers may be moved if the department determines there are conservation concerns for chum salmon;

5 AAC 05.368. Anvik River Chum Salmon Fishery Management Plan.

The Board established the Anvik River chum salmon management plan in order to allow a fishery in the mouth of the Anvik River which will allow a harvest of surplus Anvik River summer chum salmon and conserve summer chum stocks that are bound for other tributaries. The department plans on evaluating this fishery and reporting back to the Board in November 1994.

The department shall manage the Anvik River chum salmon fishery in accordance with the following guidelines:

- (1) the department may open a portion of the Anvik River by emergency order to take chum salmon after the department projects that the escapement objective of 500,000 or more chum salmon will be achieved;
- (2) only beach seine and dip nets may be used to take chum salmon in any portion of the Anvik River opened under (1) of this section;
- (3) any king salmon taken must be returned to the water alive;
- (4) a buyer or processor must purchase chum salmon taken from the Anvik River in the round.

5 AAC 39.225. Arctic-Yukon-Kuskokwim Region Chum Salmon Rebuilding Management Plan.

(a) This management plan is to foster sustained yield management to rebuild Arctic-Yukon-Kuskokwim Region chum salmon stocks. The board has identified conservation concerns for several Arctic-Yukon-Kuskokwim Region chum salmon stocks that have been depressed in recent years, and special conservation action will be needed to ensure sustained yield for these stocks.

(b) The guiding principles for this management plan are as follows:

(1) savings of chum salmon, resulting from regulatory actions in a fishery to reduce the interception of chum salmon, should be allowed to pass through subsequent fisheries to the spawning areas as needed to maintain sustained yield for future years;

(2) any regulatory action designed to conserve chum salmon should consider a companion provision to promote opportunity for full utilization of other species;

(3) the board and department should work toward reducing the bycatch of chum salmon originating in the Arctic-Yukon-Kuskokwim Region in ocean trawl fisheries.

(c) The regulatory provisions for the rebuilding Arctic-Yukon-Kuskokwim Region chum salmon stocks are set out in 5 AAC 01, 03, 04, 05, 07, and 09.