



## YUKON RIVER SUMMER CHUM SALMON STOCK STATUS AND ACTION PLAN

A Report to the Alaska Board of Fisheries

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## EXECUTIVE SUMMARY

### *Synopsis*

In response to the guidelines established in the Sustainable Salmon Fisheries Policy (SSFP) 5 AAC 39.222, the Alaska Board of Fisheries (Board) classified the Yukon River summer chum salmon as a stock of concern, specifically a management concern, at the September 2000 work session. An action plan was subsequently developed by the department and acted upon by the Board in January 2001. The SSFP directs ADF&G to assess salmon stocks in areas addressed during the 2003-2004 regulatory cycle to identify stocks of concern and in the case of Yukon River summer chum salmon, reassess the stock of concern status.

Based on definitions provided in SSFP 5 AAC 39.222(f)(21), the department recommended continuation of the classification as a stock of concern for the Yukon River summer chum salmon stock as a management concern at the September 2003 Board work session. The Yukon River summer chum salmon stock continues to meet the definition of a management concern based upon escapement goals generally not being met during the past five years, despite specific management actions taken to provide for escapement. Subsistence and commercial harvests from 1999 through 2003 were significantly below recent averages. Biological escapement goals were not met in the East Fork Andreafsky during the past five years except for 2001, which was undetermined, because high water prohibited weir operation for a large part of the season.

### *Stock Assessment Background*

Most Yukon River summer chum salmon spawn below and within the Tanana River drainage (Figure 1). Yukon River summer chum salmon run strength has continued to be poor to below average through the 2003 season with the 2000 and 2001 runs two of the worst on record. The biological escapement goals (BEGs) were not met in the East Fork Andreafsky during the past five years, except 2001, which was undetermined, because high water prohibited weir operation for a large part of the season (Table 1, Figure 2). The Anvik River BEG was not met in 2000, 2001, or 2003 (Table 1, Figure 3). In 2001, the Pilot Station sonar passage estimate for summer chum salmon was approximately 466,000 fish, similar to 2000 passage estimate of 458,000. In 2002, the summer chum salmon Pilot Station passage estimate improved to over twice the preceding two years with approximately 1,025,000 fish. Although the 2003 passage estimate was slightly larger than in 2002, BEGs were not achieved in the Anvik and East Fork Andreafsky Rivers and other monitored escapements were substantially below average (Table 1). The minimum drainage wide escapement target of 600,000 fish was established by the Board in 2001, in conjunction with the Yukon River Summer Chum Salmon Management Plan (5 AAC 05.361) was not met in 2000 and 2001. This in river escapement target was established to allow subsistence fishing opportunity below the number of salmon needed to achieve the lower end of the Anvik River BEG of 400,000.

Combined commercial and subsistence harvests show a substantial decrease in yield when comparing 1989-1998 average to the recent 5-year (1999-2003) period (Table 2, Figure 4). The 1989 to 1998 average harvest of approximately 656,000 fish is more than seven times the recent 5-year average harvest of approximately 90,000 fish. Most of this difference in harvest is because of poor runs since 1998. Although subsistence harvests have declined approximately 35%, commercial harvests have been reduced by 97% to meet escapement and subsistence

needs. In the past, summer chum salmon commercially harvested for roe fulfilled two functions because the fisher would utilize carcasses for subsistence. Because of the market decline for summer chum salmon roe, few fishers expend their time, money, and energy to deploy a fish wheel in the river to harvest summer chum salmon for subsistence.

Management of summer chum salmon has been conservative in recent years, similar to chinook salmon. Commercial harvest of summer chum salmon has been incidental to chinook salmon directed fishing since 1998, except for a limited directed harvest in District 6, a terminal harvest area on the Tanana River. in 2002 and 2003.

### **STOCK OF CONCERN RECOMENDATION**

Based on the definitions provided in the sustainable salmon policy of 5 AAC 39.222(f)(21), the department recommends continuation of the stock of concern classification as a management concern for Yukon River summer chum salmon stock. Summer chum salmon escapement goals were not met during the past five years, except for the Anvik River in 1999 and 2002, even though specific management actions were taken to provide for escapement. Subsistence and commercial harvests from 1999 through 2003 were significantly below recent averages.

#### *Outlook*

The preliminary outlook for 2004 is for below average abundance, similar to abundance observed in 2003. However, information from Bering Sea studies (BASIS) and trawl bycatch information indicates a higher abundance of all salmon species than last year. Depending on the origin of these salmon, the 2004 run may be near the historical average. The run in 2004 will be the result of the 1998 and 1999 brood years, which represent the beginning of a period of poor escapements and lower productivity. However, large runs have resulted from poor escapements in the past. The department manages all Yukon River fisheries based on **inseason** run strength assessment. Therefore, if the 2004 run is similar to the runs of 2002 and 2003, a small surplus may be available for a directed commercial summer chum fishery.

#### *Alaska Board of Fisheries Action*

In response to the guidelines established in the Sustainable Salmon Fisheries Policy, the Alaska Board of Fisheries, during the January 12–19, 2004 regulatory meeting, is anticipated to continue the stock of concern classification for the Yukon River summer chum salmon stock as a management **concern**.

### **ESCAPEMENT GOAL EVALUATION**

The department has undertaken a review of escapement goals for Yukon River summer chum salmon stocks where long-term escapement, catch, and age composition data exist that enable the development of **BEGs**, based on analysis of production consistent with the escapement goal policy. For summer chum salmon, escapements have traditionally been assessed by a combination of aerial and ground based techniques. Summer chum salmon escapement goals developed in 2000 (Clark 2001; Clark and Sandone 2001) were reviewed for this Board cycle with additional data. Only two summer chum salmon escapement goals have been established

within the Yukon River drainage, the East Fork Andreafsky and Anvik Rivers. A separate report details the escapement goal review for the AYK Region (ADFG 2004 *in prep*).

Utilizing additional data since the East Fork Andreafsky and Anvik **BEGs** were established for summer chum salmon resulted in no changes to the E.F. Andreafsky. Analysis of the Anvik River spawner-recruit data suggested that the goal should range from 350,000 to 700,000 (lowered from 400,000 to 800,000). Aerial survey based sustainable escapement goals (**SEGs**) for summer chum salmon were discontinued in 2001 based on the difficulty of observing summer chum salmon from the air and for inconsistencies associated with aerial survey methodology. Aerial survey summer chum salmon goals for the East and West Fork Andreafsky Rivers have been discontinued because of the poor success in assessing these spawning tributaries by air. Poor survey conditions have hampered aerial surveys coupled with inaccuracy of counting summer chum salmon by air. No weir exists on the West Fork Andreafsky, therefore, it serves no purpose to have a weir-based escapement goal for this spawning tributary.

List of Current and Proposed **BEGs** for Yukon River Summer Chum Salmon.

<b>Stream</b>	<b>Current Goal</b>	<b>Recommended Range</b>	<b>Type of Goal</b>
<b>EAST FORK ANDREAFSKY</b>	65,000-135,000	No Change	BEG
East Fork Andreafsky River (aerial)	35,000-70,000	Discontinue	BEG
West Fork Andreafsky River (weir)	65,000-135,000	Discontinue	<b>BEG</b>
West Fork Andreafsky River (aerial)	35,000-70,000	Discontinue	BEG
Anvik River Index (sonar)	400,000-800,000	350,000-700,000	BEG
Nulato River (weir)	53,000	Discontinue	BEG
Clear Creek and Caribou Creek (aerial)	17,000	Discontinue	BEG
Salcha River (aerial)	3,500	Discontinue	BEG

No sustainable escapement thresholds (SET) were developed for this stock because the recommendations for setting an SET suggest that it be estimated based on the lower ranges of historical escapement levels for which the stock has consistently demonstrated the ability to sustain itself. Because the lower escapement levels have been observed in recent years, returns from these escapements will not be known until at least 2006 (returns from the 2001 escapement).

## **MANAGEMENT ACTION PLAN OPTIONS FOR ADDRESSING STOCK OF CONCERN AS OUTLINED IN THE SUSTAINABLE FISHERIES POLICY**

### ***Yukon River Summer Chum Salmon Management Plan Review/Development***

#### **Current Stock Status**

In response to the guidelines established in the Sustainable Salmon Fisheries Policy (5 AAC 39.222), the department, during the September 2003 Board work session, recommended the continuation of the stock of concern classification for the Yukon River summer chum salmon as

a stock of management concern. The Board of Fisheries, after reviewing stock status information and public input during the January 2004 regulatory meeting, is anticipated to continue the stock of concern classification for Yukon River summer chum salmon as a stock of management concern. This determination is based on the inability, despite the use of specific management measures, to consistently maintain escapements for a salmon stock within the bounds of the BEGs during the last five years.

### C&T Use Finding and the Amount Necessary

In 1993, the Board of Fisheries made a positive finding for Customary and Traditional Use for all salmon in the Yukon-Northern Area. In 2001, the department recommended that the Board amend 5 AAC 01.236 to include a revised finding of the amount necessary for subsistence (ANS) for the Yukon Area using updated subsistence harvest data. After a thorough review of various options, the Board made a finding of ANS for the Yukon Area by species.

Chinook salmon	45,500 – <del>66,704</del>
Summer chum salmon	83,500 – 142,192
Fall chum salmon	89,500 – <del>167,100</del>
Coho salmon	20,500 – 51,980

The ANS range finding by species for the entire Yukon River uses the low subsistence harvest rounded to the nearest 500 fish and the actual high subsistence harvest estimate during the ten-year period of 1990 to 1999 using the table below. The department recommends no change to current ANS findings for summer chum salmon. Subsistence harvests after 1999 have been impacted by several poor runs and lack of commercial fishing opportunity, which have changed historical subsistence fishing patterns.

Year	Chinook	Summer Chum	Fall Chum	Coho	Total salmon
1990	48,587	115,609	167,900	43,460	375,556
1991	46,773	118,540	145,524	37,388	348,225
1992	47,077	142,192	107,808	51,980	349,057
1993	66,704	125,574	76,882	15,812	284,972
1994	55,388	124,807	123,565	41,775	345,535
1995	50,620	136,083	130,860	28,377	345,940
1996	45,669	124,735	129,258	30,404	330,066
1997	57,117	112,820	95,141	23,945	289,023
1998	54,124	87,366	62,901	18,121	222,512
1999	53,132	83,784	89,938	20,885	247,739
<b>Max 1990-99</b>	66,704	142,192	<b>167,900*</b>	<b>51,980*</b>	<b>375,556*</b>
<b>Min 1990-99</b>	45,669	83,784	<b>89,938*</b>	<b>20,885*</b>	<b>247,739*</b>
<b>Mean 1990-99</b>	52,519	117,151	<b>123,749*</b>	<b>34,777'</b>	<b>313,863*</b>

*\*Excluding harvests in 1993 and 1998 because regulations restricted subsistence harvests*

## *Habitat Factors Adversely Affecting the Stock*

Yukon River salmon stocks have generally remained healthy due primarily to undisturbed spawning, rearing, and migration habitat although there are some habitat issues adversely impacting the production of salmon in the Yukon River drainage. A detailed discussion of these issues is found in the Yukon River Comprehensive Salmon Plan for Alaska (Holder and Senecal-Albrecht, 1998). This plan discusses mining, logging, and flood control (with these topics briefly discussed below) as well as potential pollution and habitat changes related to urban development, rural sanitation, increased traffic along tributaries, and agriculture.

### **Mining**

The first habitat threats to salmon that were caused by human presence in the Yukon River drainage began in the early 1900s with mine **e**xploration and development. Mining activity was, and continues to be, an important economic industry within the drainage. Fortunately, most historical mining activity occurred on localized, discrete, headwater streams using manual labor, minimizing impacts on spawning habitat. However, in the 1920s mining practices expanded to include use of hydraulic mining and large scale dredges. Both of these mining practices disturbed extensive acreage, much of which remains un-reclaimed today. Hydraulic mining washed large quantities of overburden and fine sediment into downstream spawning and rearing habitats. A thorough discussion of mining activity and salmon presence in the Yukon River Area can be found in the report entitled "A History of Mining in the Yukon River Basin of Alaska" (Higgs, 1995). As is noted in the report, major mining activity has occurred on the following tributaries: the Iditarod, and Innoko River drainages in the Lower Yukon; American Creek, Eureka Creek, **M**inook Creek, and upper Sulatna River in the Middle Yukon; Birch Creek, Woodchopper Creek, Coal Creek, **N**ome Creek, Beaver Creek, and the Fortymile River in the Upper Yukon; Middle and South Forks of the Koyukuk River and Hogatza River in the Koyukuk River drainage; and Goldstream Creek, Chatanika River, Chena River, Livengood Creek, Salcha River, Goodpasture River, in the Tanana River drainage. Northern mining operations coped with short operating seasons, difficult transportation conditions, and high freight and labor costs. Both small and large mining operations exist today. However, more rigid enforcement of environmental regulations since the mid-1980s has resulted in mining operations, which are far less detrimental to fisheries habitat than in the past. Today, all mining operations must obtain numerous environmental permits prior to initiating or continuing mining activity. Wastewater discharge must comply with Alaska's Water Quality Standards and all mines permitted since October 14, 1991 must comply with Alaska's Mining Reclamation Regulations. Currently, there are one large hard rock mine operating and one in development; Fort **K**nox mine near Fairbanks and the Pogo Creek mine near the Goodpasture River, near Delta. Some of these mines are located in potential acid-generating deposits for which strict wastewater controls will be necessary.

Potential natural gas development in the Minto Flats area of the Tanana River drainage may impact habitat in this area.

### **Logging**

Logging has become a potential impact to fisheries habitat in the Tanana River drainage. With the transfer of large tracts of federal land into private native corporation and state ownership, logging activity is increasing to meet both local and export timber demands. Current concerns

relate to sufficient buffer or setback zones to protect tributaries from increased runoff, increased temperature fluctuations, loss of spawning and rearing habitat, increased siltation and turbidity, and other effects which can all be stabilized or moderated with sufficient streamside vegetation.

### Flood Control and Other Dams

Chena River Lakes Flood Control Project: ADF&G, YRDFA, and local sport and subsistence fishermen have raised concerns about the dam's effects on springtime emigration of salmon fry and immigration of adults. In flood years such as 1985, 1991, and 1992, the dam's gates were closed to slow the Chena River's flow to manageable levels. This caused the river to back up and spread throughout the willow and spruce brush in the Chena River valley floodway. In some of these flood event years, seagulls and other birds were seen feeding off salmon fry at several locations. Three locations noted were; above the dam in the backed up waters, below the dam's chutes where smolt were dumped via small waterfalls, and in pools of water above the dam when the flood waters receded. The exact effects of these events upon salmon returns are unknown.

Chatanika River (Davidson Ditch) Dam: The dam was severely damaged by the 1967 flood, with the top half destroyed and washed downstream. The remainder of the dam was removed with funding from YRDFA and BLM (Bureau of Land Management) in 2001. Prior to the removal, only two species of fish (Arctic grayling and sculpin) were documented above the dam (Al Townsend, ADF&G, Fairbanks, personal communication). Three species of salmon (chinook, chum, and coho salmon), three species of whitefish, sheefish, Arctic grayling, northern pike, burbot, suckers, and sculpin are documented in the Chatanika River downstream of the dam. Although no adult spawners have been observed utilizing the area above the dam, minnow trapping in the summer of 2002 found salmon fry above the dam site, indicating this area is now being utilized as rearing habitat.

### Habitat Projects Needed:

1. Continued monitoring of Illinois Creek Mine in the Innoko River drainage.
2. Continued restoration of Birch Creek and enhancements to allow fish passage in historical mining areas. Restoration of Birch Creek tributaries whose fish habitat still remains highly impaired due to mining. Much of this mining predated the 1991 Mining Reclamation Regulations.
3. Continued restoration of Nome Creek from damage due to historic mining.
4. Continued evaluation, and possibly implementation, of modifications to the Chena River Lakes Flood Control Project to reduce salmon mortality.
5. Continued monitoring of the bank stabilization project near Reka Roadhouse, a known fall chum salmon spawning area.
6. Survey and assessment of critical salmon spawning and rearing habitats in the Tanana River drainage. Continued restoration of Tanana River tributaries from historic mining damage.
7. Advanced identification of previously undocumented anadromous fish streams in the Yukon Watershed. An estimated 50% of all water bodies in the Yukon watershed have not been evaluated for distribution of anadromous species. An estimated 70% of the first and second order tributaries similarly have not been surveyed. Consequently these streams are not afforded legal protection under DNR's AS 16.05.870 permitting program.

### *Do New Or Expanding Fisheries On This Stock Exist?*

There are no new or expanding fisheries on this stock. However, Yukon River bound summer chum salmon are caught as bycatch in the Bering Sea groundfish fishery. Federal regulations

regarding customary trade to allow sales of subsistence fish caught in applicable waters may also result in the expansion of subsistence take on this stock.

### *Existing Management Plan*

5 AAC 05.362. YUKON RIVER SUMMER CHUM SALMON MANAGEMENT PLAN.

5 AAC 01.210. FISHING SEASONS AND PERIODS.

## **ACTION PLAN DEVELOPMENT**

### *Yukon River Summer Churn Salmon Action Plan Goal*

Reduce fishing mortality in order to meet spawning escapement goals, to provide the opportunity for subsistence users to harvest levels within the ANS range, and to reestablish historic range of harvest levels by other users.

### *Review of Management Action Plan*

Management of the Yukon River salmon fishery is complex due to the overlapping **multispecies** salmon runs, generally high efficiency of existing fisheries, allocation issues, and the immense size of the Yukon River drainage. Salmon entering the Yukon River may be more than 2,000 miles from their spawning grounds and it may take those salmon more than a month to traverse that distance. Accordingly, depending on location of the spawning grounds, some salmon stocks may be vulnerable to harvest for more than a month or more throughout the entire 2,000 mile length of the Yukon River.

### **Regulation Changes Adopted in January 2001**

In January 2001, after review of the management action plan options addressing this stock of concern, the Board modified the YUKON RIVER SUMMER CHUM SALMON MANAGEMENT PLAN 5 AAC 05.361.

The Board added wording to the Yukon River Summer Chum Salmon Management Plan regarding management objectives and data used to manage summer chum salmon fisheries. The Board established guidelines for managing summer chum salmon fisheries based on projected run size in season.

When the run size is projected to be less than 600,000 fish, directed summer chum salmon commercial, sport, personal use and subsistence fishing will be closed.

When projected run size is between 600,000 to 700,000 fish, directed commercial, sport, and personal use fishing will be closed and subsistence fishing will be managed to so that the drainage wide escapement shall be no less than 600,000 summer chum salmon. However, if a district, subdistrict or tributary is projected to meet it's escapement goal the commissioner may open a less restrictive subsistence summer chum salmon fishery in that district, **subdistrict** or portion of a district or subdistrict.

When the projected run size is 700,000 to 1,000,000 summer chum salmon, then the commissioner may open subsistence fishing schedule according to the management plan.

However, if a district, subdistrict or tributary is projected to meet its escapement goal the department may open a directed commercial, sport or personal use summer chum salmon fishery in that district, subdistrict or portion of a district or subdistrict.

When the projected run size is greater than 1,000,000 fish, directed summer chum salmon commercial fishing may open to harvest the available surplus.

All salmon caught by CFEC permit holders during commercial fishing periods in which salmon roe is sold shall be reported in numbers on fish tickets. Previously this was only required in Subdistrict 4-A.

Additionally, when the projected commercial harvest range is 0-400,000 summer chum salmon the Board provided the percentage of harvest allocated by district or subdistrict based on the low end of the established guideline harvest ranges:

Districts 1 and 2:.....	62.9%
District 3: .....	1.6%
Subdistrict 4-A:.....	28.2%
Subdistricts 4-B and 4-C:.....	3.9%
Districts 5:.....	0.4%
<b>District 6: .....</b>	<b>0.9%</b>

The Board adopted a fishing schedule for the subsistence salmon fisheries. The schedule will be implemented chronologically, consistent with migratory timing as the run progresses upstream. This schedule may be altered by emergency order if pre-season or in-season indicators suggest this is necessary.

#### YUKON AREA SUBSISTENCE FISHING SCHEDULE:

Coastal District; Koyukuk River drainage; Subdistrict 5-D: **7 days/week**

Districts 1 -3: two 36-hour periods/week

District 4; Subdistricts 5-B and C: two 48-hour periods/week

Subdistrict 5-A; District 6: two 42-hour periods/week

Old Minto Area: 5 days/week

#### Management Review

Conservative management strategies based on the management action plan adopted by the Board in 2001 contributed to success in increasing escapement. Beginning in 2001, the subsistence salmon fishing schedule adopted by the Board was implemented progressively upriver consistent with migratory timing. The migratory timing of summer chum salmon is such that the schedule is usually in place when the fish arrive in the river. The subsistence fishing schedule assisted in spreading subsistence opportunity among users. Based on an outlook for a very poor run in 2001, no commercial, sport, personal use fishing for summer chum salmon occurred. In-season management actions were taken near the middle of the chinook run to reduce subsistence fishing time to less than that provided by the regulatory schedule. Subsequently, the chinook run was judged to be large enough to provide for escapement and subsistence needs. However, in order to conserve summer chum salmon, subsistence gillnets were restricted to 8 inch or larger mesh size.

In 2002 when the **inseason** projection indicated that the 1,000,000 fish threshold to allow commercial fishing would be exceeded, the department began to inform fishers and **processors** of the potential for a directed summer chum salmon fishery. Unfortunately, because of the elapsed time since the last commercial fishing opportunity in the middle Yukon River area, fish wheels have become dilapidated, permits were not renewed, and considerable effort was needed to restore the processing infrastructure to operational status. In 2003, the preseason management strategy was to compare the summer chum run to the 2002 run and if it were similar, to approach management with the view that a small surplus for a directed commercial fishery would be available. The department spent considerable time and energy preseason attempting to inform fishers and processors of the potential for a fishery. These efforts to renew interest in a directed commercial summer chum fishery were unsuccessful primarily due to poor market conditions.

After directed commercial chinook fishing was allowed in 2002, an issue arose regarding whether the subsistence fishing schedule remains in effect or if previous subsistence fishing regulations were to be utilized once a surplus above escapement and subsistence needs was identified. Maintaining the subsistence fishing schedule in Districts 1, 2, and 3 and Subdistrict 4-A is problematic and inflexible for managers when subsistence and commercial fishing time is separated under other regulations. In March 2003, the Board of Fisheries addressed two **ACRs** regarding the subsistence fishing schedule, specifically whether the schedule can be terminated **inseason** based on run abundance and, if so, how that would be done based on the current regulations. The Board adopted a change such that when there is a sufficient **abundance** above escapement and subsistence needs, the subsistence fishing schedule may be terminated and subsistence fishing would revert to the pre-2001 subsistence fishing regulations.

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 because it supports a popular salmon sport fishery. However, most fishers in this area target chinook salmon. Based upon the stock of concern status, the Yukon River drainage sport fishing bag limit was reduced preseason by emergency order to one chinook or one chum salmon in 2001 through 2003.

In summary, summer chum salmon fisheries management has been very conservative the last three years, escapements have generally not be met since 1999, however, a small available surplus of summer chum salmon was unharvested in 2002 and possibly 2003.

## **ACTION PLAN ALTERNATIVES**

**ACTION 1.** Require subsistence fishing permits in all of Subdistrict 5-C.

### **Objective**

Currently, subsistence permits are required in areas with road access of which Rampart is soon to be included and since the school has closed in this community, many of the residents have become increasingly transient. The purpose for requiring permits is to collect accurate subsistence harvest information particularly in an area where potential fishers are difficult to find and survey post season.

### **Specific Action Recommended to Implement the Objective**

Require subsistence users to obtain a subsistence permit before harvesting salmon in all Subdistrict 5-C by extending the existing permit area from Hess Creek down to the lower boundary of Subdistrict 5-C (westernmost tip of Garnet Island). These permits can be requested and processed via mail, fax, and more recently, via **email**. Subsistence users in this area will not need to request an amount to harvest. The permit will be used to determine more accurately the subsistence harvests, and participation in this area. The permits provide documentation of fish harvested by species by day.

### **Cost/Benefit Analysis**

A more accurate assessment of subsistence harvests in an area of high exploitation will be available. Concern is expressed about diseased chinook salmon, and the additional harvest to compensate for these fish. Requiring permits will allow the department to better assess the needs of subsistence users in this area. This harvest information is necessary for fisheries management on both sides of the border and for salmon run reconstruction.

This requirement would create additional time necessary for subsistence users in Subdistrict 5-C to record **their** harvests on the permit, and take additional steps to obtain permits and to return their permits to **ADF&G**.

### **Subsistence Issues/Considerations:**

Subsistence fishers may be reluctant to describe their specific harvests. Previously, personal interviews were conducted to assess the subsistence harvest take and did not require maintaining records of their harvests. If permits were issued for this community the annual subsistence survey could be eliminated.

### **Performance Measures**

A measure of performance would be the reporting success of subsistence users in Subdistrict 5-C. A secondary performance measure would be the accuracy of the subsistence harvest in that area.

**ACTION 2.** When the subsistence salmon fishing schedule is in effect, require **gillnets** with greater than 4 inches stretch mesh size be removed from the water and fish wheels not be operated during subsistence salmon fishing closures.

### **Objective**

The purpose of this action is to reduce the harvest of salmon to provide for adequate spawning escapement while allowing the harvest of other species for subsistence needs. This action will improve enforceability of regulations and remove the necessity of using emergency order authority to accomplish this action.

### **Specific Action Recommended to Implement the Objective**

During subsistence salmon fishing schedule closures, require all salmon nets with a mesh size larger than four inches be removed from the water and fish wheels not be operated.

5 AAC 01.220. LAWFUL GEAR AND GEAR SPECIFICATIONS. **(4)**

**(4) during subsistence salmon fishing closures as provided under 5 AAC 01.210 (b), all salmon nets with a mesh size larger than four inches must be removed from the water and fish wheels may not be operated.**

### **Cost/Benefit Analysis**

Current subsistence regulations allow subsistence gear to be used to harvest non-salmon species during subsistence salmon fishing closures. During subsistence salmon fishing closures, emergency authority is necessary to implement mesh size and net length restrictions. This authority has been used previously, restricting mesh size to be no more than four-inches or less mesh size, and the length of the net to be no more than 60 feet. However, no regulation requires removal of **gillnets** greater than 4 inch mesh size completely from the water nor ceases operation of fish wheels for other species during such closures.

The proposed language change should not change the current subsistence harvest patterns, or be an additional expense for fishers wishing to harvest non-salmon species during closed subsistence salmon fishing periods.

### **Subsistence Issues/Considerations:**

Subsistence fishermen must remove larger mesh **gillnets** from the water during closures. A few fishers have attempted to leave the net in the water but tie the web to the float line.

### **Performance Measures**

A measure of performance would be meeting establishing summer chum salmon escapement goals and better enforceability of regulations. Harvest levels would be **determined** through postseason subsistence surveys. The department encourages fishermen to keep track of their subsistence salmon harvest on household subsistence catch calendars or subsistence fishing permits. **A** postseason analysis of subsistence salmon harvests and escapement monitoring projects will be conducted to determine if the objective was achieved.

## **Board of Fisheries Regulatory Proposals Addressing Yukon River Summer Chum Salmon Stock of Concern**

- Subsistence fishing schedule and fishing periods - proposal numbers: **132, 152, 153, 154, 155, 156,157, and 158.**
- Subsistence fishing **gillnet** gear – proposal number **160.**
- 9 Close spawning streams to all fishing – proposal number **165.**
- 9 **Commercial fishing** allocations –proposal numbers **166, 167, 168, and 170.**
- 9 **Commercial gear specifications** – proposal numbers **169, 171, and 172.**

## **RESEARCH PLAN**

### ***AYK-SSZ Research Plan***

The **AYK** Sustainable Salmon Initiative (AYK SSI) emerged as a collaborative response to recent sharp declines of chinook and chum salmon runs in the Yukon River, Kuskokwim River, and rivers draining into Norton Sound. Through this initiative, native regional organizations have joined with state and federal agencies to form an innovative partnership to **cooperatively** address salmon research and restoration needs. This partnership includes the **Association of Village Council Presidents (AVCP)**, the **Tanana Chiefs Conference (TCC)**, **Kawerak, Inc.**, **Bering Sea Fishermen's Association (BSFA)**, **Alaska Department of Fish and Game (ADF&G)**,

National Marine Fisheries Service (NMFS), US Fish & Wildlife Service (USFWS), plus additional native, governmental and nongovernmental ex-officio partner institutions.

In addition to funding high quality salmon research projects, the AYK SSI is undertaking the development of a comprehensive Research and Restoration Plan for AYK. This long range, strategic science plan, to be developed over the next two years, will identify major research themes, significant knowledge gaps and research questions, and will establish research priorities for the region. Pending development of a draft Research and Restoration Plan, the AYK SSI has identified a set of interim research priorities for 2004-05 that reflect the need to address pressing fisheries information needs while a longer range research plan is under development.

### *Current Programs*

Main river sonar, tributary sonar, weir, and counting tower projects are used to monitor spawning populations or major segments of those populations. Other information collected at ground based projects may include, but is not limited to, salmon sex and length composition, scales for age determination, samples for genetic stock identification, data on resident species, and information from the recovery of tagged fish in coordination with the mark-recapture and radio telemetry projects.

#### **Main River Sonar**

The main river sonar project located near Pilot Station (**RM 107**) estimates the summer chum salmon passage at Pilot Station. The Yukon River Summer Chum Salmon Management Plan is based on projected passage estimates at Pilot Station, with varying levels of management actions dependent on projected **inseason** passage estimate of summer chum salmon.

#### **Tributary Sonar**

The Anvik River is a major producer of summer chum salmon on the Yukon River with as much as 50% of the summer chum salmon run in a given year coming from the Anvik. Summer chum salmon have been monitored in the Anvik River since 1978. However, this long standing project, which has a BEG and provides managers **inseason** information, is in danger of being cut because of budget shortfalls. Other sources of funding are being pursued but the funding gap has not been filled yet.

#### **Weirs and Counting Towers**

Weirs or counting towers were operated on Henshaw and Kaltag Creeks, **Nulato**, Gisasa, Tozitna, Chatanika, Chena, and Salcha Rivers in 2003. High water was a problem that affected several of the weir and tower projects in 2003 during the summer chum salmon run. High water can be very detrimental to weir and tower operations and in 2003 was a factor in assessing the summer chum salmon run.

#### **Fish Wheels**

There are two fish wheel projects currently associated with the assessment of summer chum salmon. One is located at the mouth of the Tanana River and another is located further up the

Tanana system near Nenana. Both of these fish wheels provide indices of summer chum salmon abundance through analysis of catch per unit effort (CPUE) information. It is hoped these projects can be augmented by the addition of a mark and recapture project that will attempt to estimate the population of summer chum salmon in the Tanana River.

## LITERATURE CITED

- Alaska Department of Fish and Game 2004. In Prep. Escapment Goal Review of Select AYK Region Salmon Stocks. Regional Information Report no. **3A04-01** Alaska Department of Fish and Game, Commercial Fisheries Division, Anchorage.
- Clark, J.H. 2001. Biological Escapement Goals for the Andreafsky River Chum Salmon. Regional Information Report no. **3A01-07**. Alaska Department of Fish and Game, Division of Commercial Fisheries, Anchorage.
- Clark, J.H. and G.J. **Sandone** 2001. Biological Escapement Goals for the Anvik River Chum Salmon. Regional Information Report no. **3A01-06**. Alaska Department of Fish and Game, Division of Commercial Fisheries, Anchorage.
- Higgs, Andrew **S.** 1995. A history of mining in the Yukon River Basin of Alaska. Northern Land Use Research, Inc. Fairbanks, AK.
- Holder, R.R. and D. Senecal-Albrecht, compilers. 1998. Yukon River comprehensive salmon plan for Alaska. Alaska Department of Fish and Game. 162 pp.

Table 1. Yukon River summer chum salmon historical escapements 1980-2003, and Pilot Station sonar passage 1996-2003".

	E.F. Andraefsky (sonar. tower weir)	Pilot Station Sonar	Anvik R Sonar	Kaltag R. Tower	Nulato R. Tower	Gisasa R. Weir	Clear Crk. (tower or weir)	Salcha R. (tower or mark- recapture)	Chena R. (tower or mark- recapture)
1980			492,676						
1981	147,312		1,486,182						
1982	181,352		444,581						
1983	110,608		362,912						
1984	70,125		891,028						
1985			1,080,243						
1986	167,614		1,189,602						
1987	45,221		455,876						
1988	68,937		1,125,449						
1989			636,906						
1990			403,627						
1991			847,772						
1992			775,626						
1993			517,409						
1994	200,981		1,124,689	47,295	148,762	51,116		39,450	9,984
1995	172,148	3,708,695	1,339,418	77,193	236,890	136,886	116,735	30,784	3,519
1996	108,450	b	933,240	51,269	129,694	157,589	100,912	74,827	12,810
1997	51,139	1,458,424	609,118	48,018	157,975	31,800	76,454	35,741	9,439
1998	67,591	859,211	471,865	8,113	49,140	18,228		17,289	5,901
1999	32,229	1,024,519	437,631	5,339	30,076	9,920		23,221	9,165
2000	23,349	457,687	205,460	6,727	24,308	14,410	18,698	20,516	3,515
2001		466,183	227,451			17,633	3,674	19,671	4,773
2002	45,019	1,158,475	462,101	13,583	72,230	32,943	13,150	19,207	
2003	20,614	1,235,483	251,358	3,056	23,452	28,245	5,297		
9 yr. Avg.	87,613	1,296,085	645,664	32,192	106,134	52,281	54,937	31,190	7,388
BEGs <sup>c</sup>			400,000 -						
	65,000 - 135,000		800,000						

<sup>a</sup> Years with no data are years in which the project was not operated and was inoperable for a large portion of the season due to water conditions.

<sup>b</sup> Project operated for training purposes, no estimate of passage.

<sup>c</sup> BEGs for E.F. Andraefsky and Anvik Rivers only.

Table 2 Yukon River total summer chum salmon utilization 1961 to 2003 <sup>a</sup>.

Yukon Area Totals								
	Subsist	Comm	Comm- Related Commercial	Commercial	Personal ADF&G Use	Test Fish	Sport Fish	Total
1961	305,317	0	0	0				305,317
1962	261,856	0	0	0				261,856
1963	297,094	0	0	0				297,094
1964	361,080	0	0	0				361,080
1965	336,848	0	0	0				336,848
1966	154,508	0	0	0				154,508
1967	206,233	10,935	0	10,935				217,168
1968	133,880	14,470	0	14,470				148,350
1969	156,191	61,966	0	61,966				218,157
1970	166,504	137,006	0	137,006				303,510
1971	171,487	100,090	0	100,090				271,577
1972	108,006	135,668	0	135,668				243,674
1973	161,012	285,509	0	285,509				446,521
1974	227,811	589,892	0	589,892				817,703
1975	211,888	710,295	0	710,295				922,183
1976	186,872	600,894	0	600,894				787,766
1977	159,502	534,875	0	534,875			316	694,693
1978	171,383	1,052,226	25,761	1,077,987			451	1,249,821
1979	155,970	779,316	40,217	819,533			328	975,831
1980	167,705	928,609	139,106	1,067,715			483	1,235,903
1981	117,629	1,006,938	272,763	1,279,701			612	1,397,942
1982	117,413	461,403	255,610	717,013			780	835,206
1983	149,180	744,879	250,590	995,469			998	1,145,647
1984	166,630	588,597	277,443	866,040			585	1,033,255
1985	157,744	516,997	417,016	934,013			1,267	1,093,024
1986	182,337	721,469	467,381	1,188,850	0		895	1,372,082
1987	170,678	442,238	180,303	622,541	4,262		846	798,327
1988	196,599	1,148,650	468,032	1,620,269	2,225	3,587	1,037	1,820,130
1989	167,155	955,806	496,934	1,463,345	1,891	10,605	2,131	1,634,522
1990	115,609	302,625	214,552	525,440	1,827	8,263	472	643,348
1991	118,540	349,113	308,989	662,036	0	3,934	1,037	781,613
1992	125,497	332,313	211,264	545,544	0	1,967	1,308	672,349
1993	105,380	96,522	43,594	141,985	674	1,869	564	248,603
1994	132,494	80,284	178,457	261,953	0	3,212	350	394,797
1995	118,723	259,774	558,640	824,487	780	6,073	1,174	945,164
1996	102,503	147,127	535,106	689,542	905	7,309	1,854	794,804
1997	97,109	95,242	133,010	230,842	391	2,590	475	328,817
1998	86,004	28,611	187	31,817	84	3,019	488	118,393
1999	70,323	29,389	24	30,249	382	836		100,954
2000	64,895	6,624	0	7,272	0	648		72,167
2001	58,385	0	0	0	0	0		58,385
2002	87,800	13,548	20	13,785		217		101,585
2003	70,360	9255	0	9,255	a	a		79,615

<sup>a</sup> Harvest numbers for 2003 unavailable.

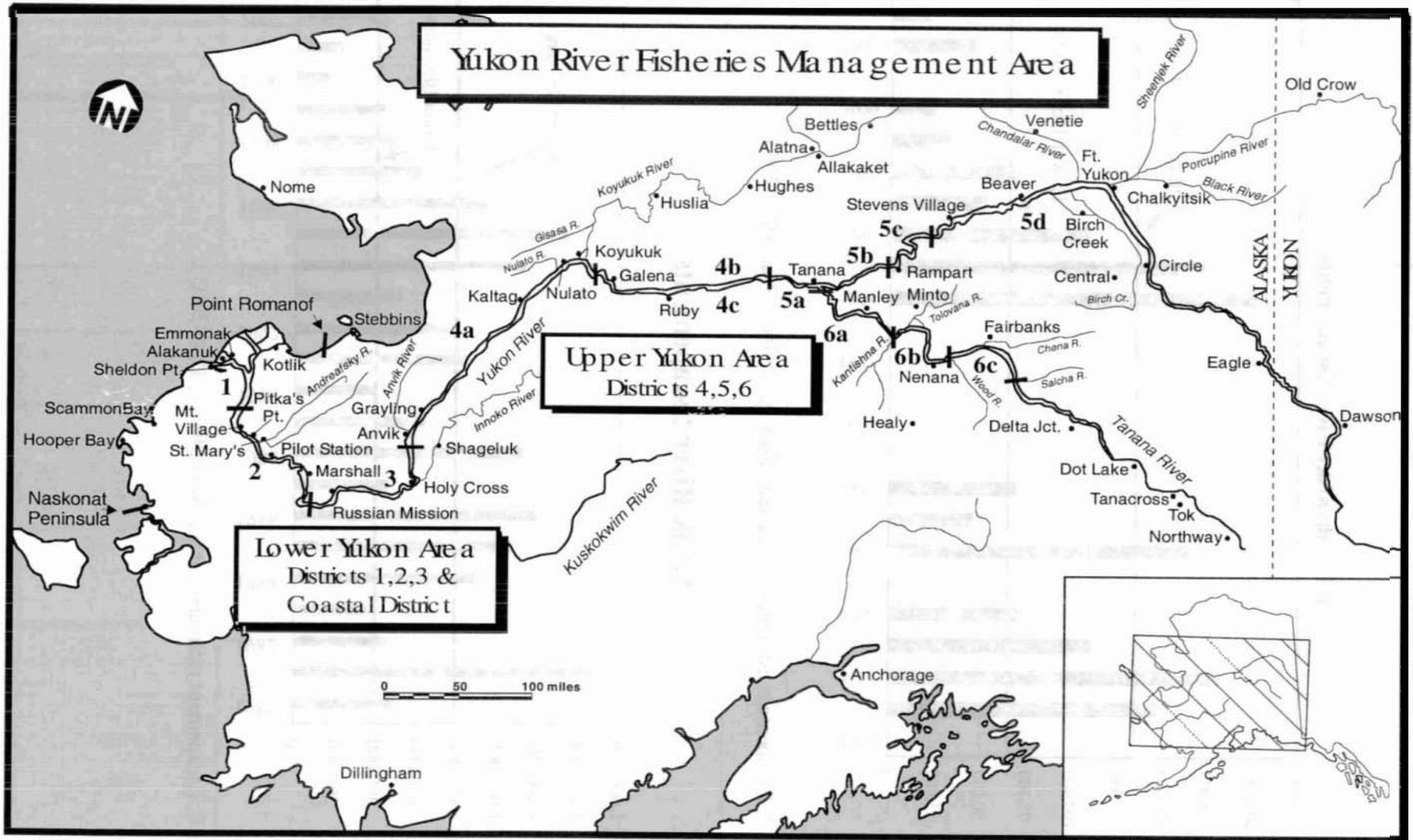


Figure 1. Alaska portion of the Yukon River drainage showing communities and fishing districts.

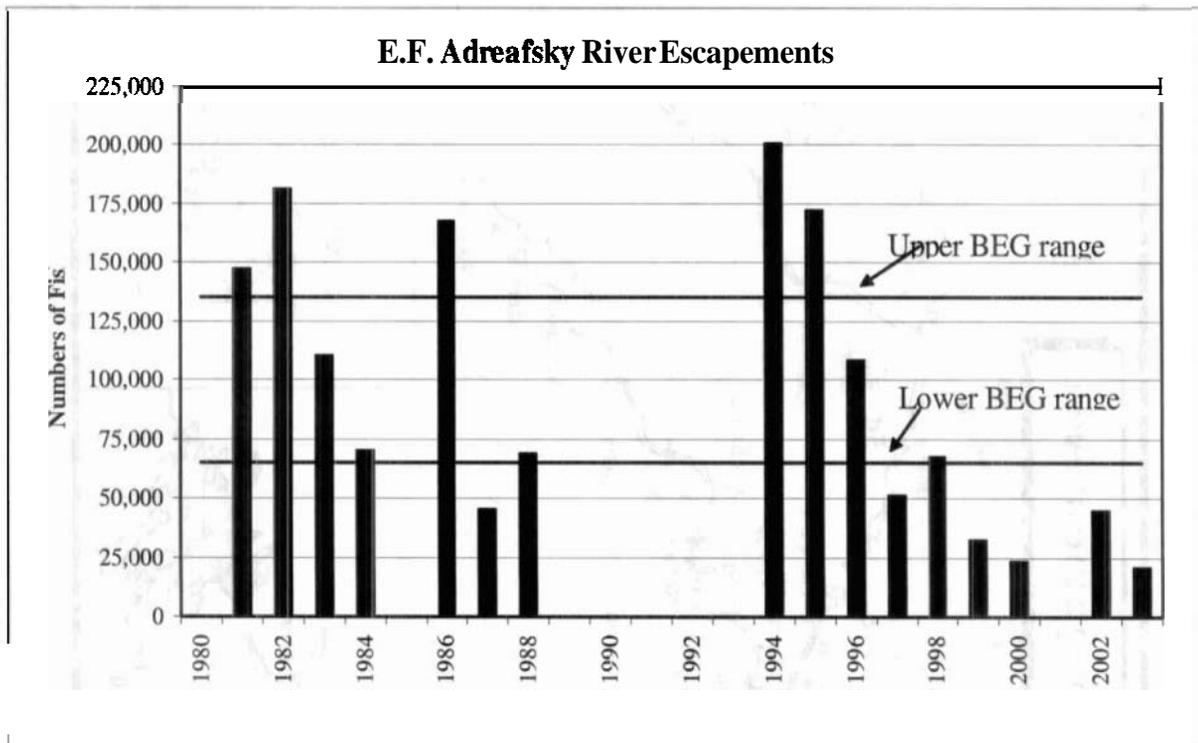


Figure 2. Escapement estimates for the East Fork Andreafsky Weir 1980-2003.

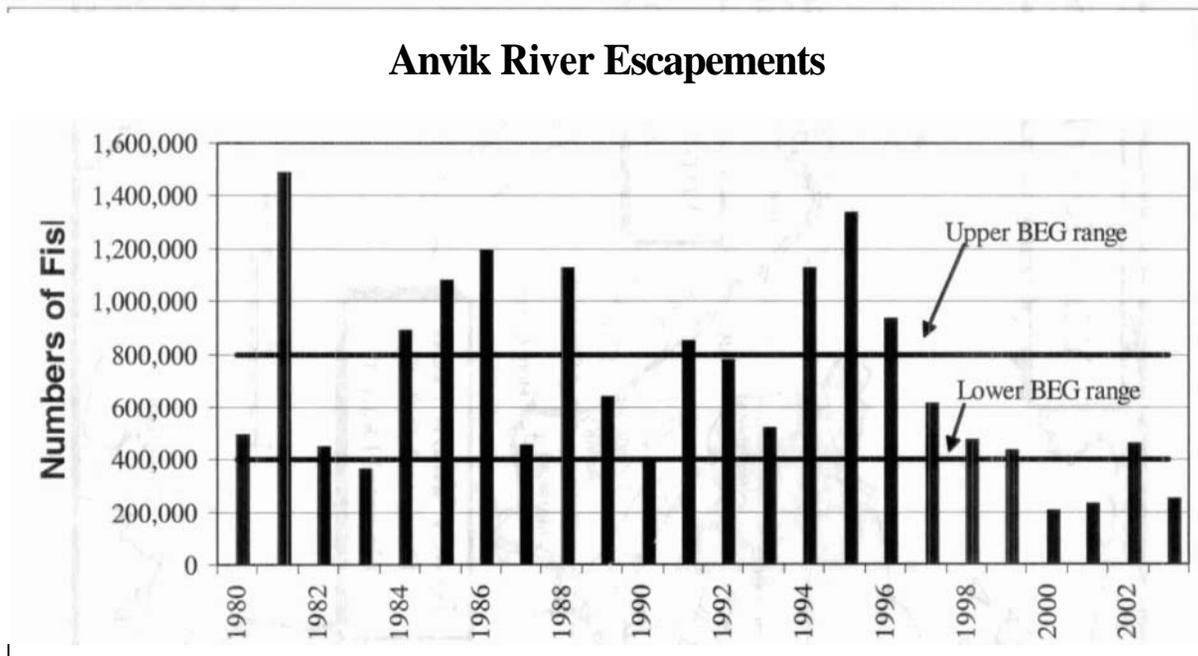


Figure 3. Escapement estimates for the Anvik River, 1980-2003.

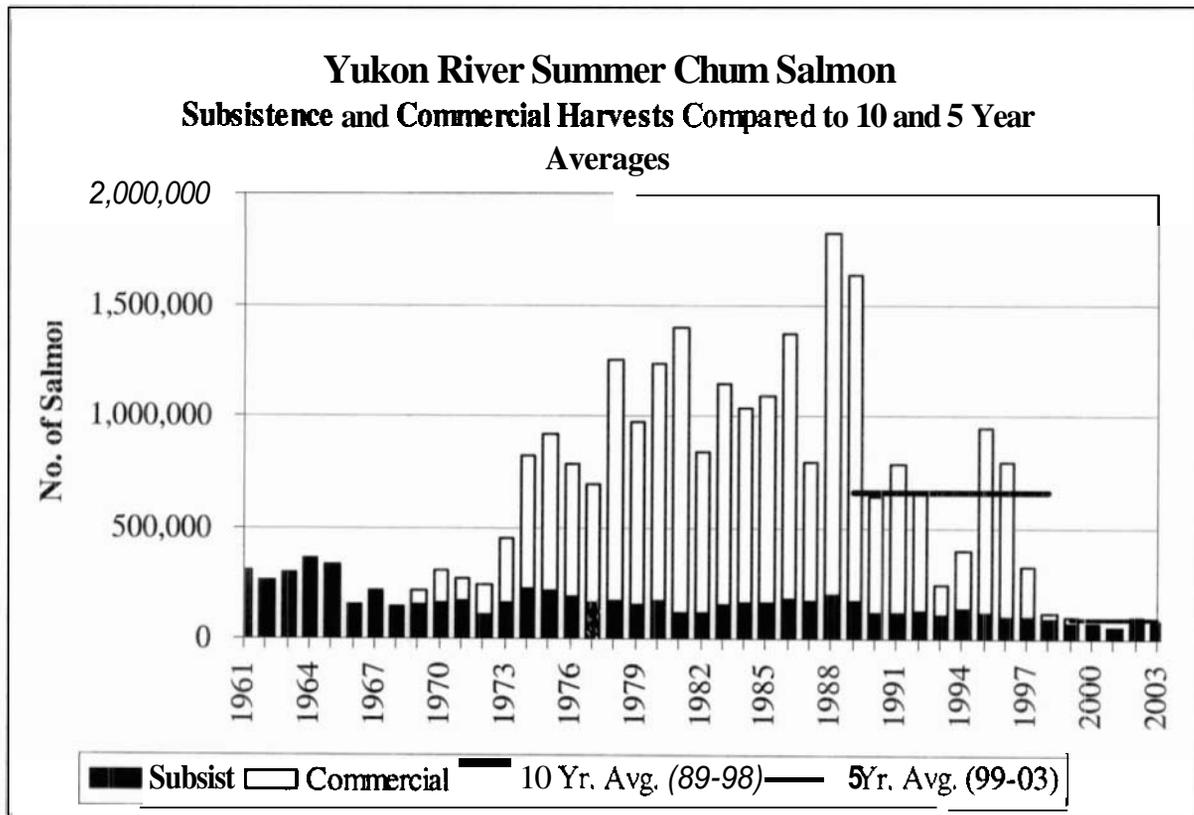


Figure 4. Yukon River summer chum salmon subsistence and commercial harvests compared to the 1989-1998 average (656,000) and the 1999-2003 average (90,000)