

# STATE OF ALASKA

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## DEPARTMENT OF FISH AND GAME

*Division of Commercial Fisheries*  
*Division of Sport Fish*

## MEMORANDUM

TO: Members  
Alaska Board of Fisheries

DATE: September 22, 2009

FROM: John Hilsinger, Director  
Division of Commercial Fisheries

SUBJECT: AYK Stock of Concern  
Recommendations

and

Charles Swanton, Director  
Division of Sport Fish

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The *Policy for the Management of Sustainable Salmon Fisheries* (SSFP; 5 AAC 39.222) directs the department to report to the Alaska Board of Fisheries (board) on the status of salmon stocks and identify any stocks that present a concern related to yield, management, or conservation during regular board meetings. This memorandum summarizes the results of the stock of concern evaluation for Arctic-Yukon-Kuskokwim (AYK) Region salmon stocks for the 2010 board regulatory cycle. The evaluation includes input from regional and area management staff from both fishery divisions.

In September 2000, the board designated nine AYK Region salmon stocks as stocks of concern, at either the management concern level or the yield concern level, based on the definitions provided in the SSFP (5 AAC 39.222(f)(21) and (42)). "Yield concern" means a concern arising from a chronic inability, despite the use of specific management measures, to maintain expected yields, or harvestable surpluses, above a stock's escapement needs; a yield concern is less severe than a management concern, which is less severe than a conservation concern (5 AAC 39.222(f)(42)). "Management concern" means a concern arising from a chronic inability, despite use of specific management measures, to maintain escapements for a salmon stock within the bounds of the sustainable escapement goal (SEG), biological escapement goal (BEG), optimal escapement goal (OEG), or other specified management objectives for the fishery; a management concern is not as severe as a conservation concern (5 AAC 39.222(f)(21)). "Conservation concern" means a concern arising from a chronic inability, despite the use of specific management measures, to maintain escapements for a stock above a sustained escapement threshold (SET); a conservation concern is more severe than a management concern (5 AAC 39.222(f)(6)).

In January 2004 and February 2007, the board made changes to the stock of concern designations based on recommendations by the Alaska Department of Fish and Game (department). In 2004, two stocks were removed and one stock was added (a total of eight stocks designated). In 2007, four stocks were removed from designation. Currently only two chum salmon stocks and two Chinook salmon stocks are listed as stocks of yield concern.

Based on this evaluation, **it is recommended that the four salmon stocks designated in 2007 as stocks of yield concern maintain their designations.** This evaluation also included a review of all other major salmon stocks in the region to determine if any meet the criteria to be listed as stocks of concern during the coming regulatory cycle. Based on this review, **it is also recommended that no additional stocks be listed for designation as stocks of concern.**

The table below summarizes the area, stock, and species designated by the board as stocks of concern, the level of concern for each stock, and recommendations to continue, change, or discontinue the stock of concern status for each stock. A more detailed description of the stock assessment and discussion of recommendations for each of the current stocks of concern are presented following the summary table.

All available 2009 data are preliminary; some 2009 data are unavailable because some fisheries and projects are still ongoing. All current stocks of concern were addressed through action plans at the February 2007 board meeting; therefore, action plans already exist for these stocks. Stock status, regulatory history, and management plans will be addressed at the full board meeting in January 2010. The escapement goal review for the AYK Region is nearly complete. Existing escapement goals were used to assess the stocks in this document unless stated otherwise and proposed changes in escapement goals will not affect the stock of concern recommendations of stocks presented.

<b>AYK Region Stocks of Concern Designations and Recommendations</b>					
<b>Area/Stock</b>	<b>Salmon Species</b>	<b>Level of Concern</b>			
		<b>September 2000</b>	<b>January 2004</b>	<b>February 2007 (Current Status)</b>	<b>October 2009 Recommendation</b>
<b>Norton Sound Area</b>					
Subdistrict 1	Chum	Management	Management	Changed to Yield	Continue
Subdistricts 2 and 3	Chum	Yield	Yield	Yield	Continue
Subdistricts 5 and 6	Chinook		Yield	Yield	Continue
<b>Yukon River Area</b>					
Yukon River	Chinook	Yield	Yield	Yield	Continue
Yukon River	Summer Chum	Management	Management	Discontinued	
Yukon River	Fall Chum	Yield	Yield	Discontinued	
Toklat River	Fall Chum	Management	Discontinued		
Fishing Branch River	Fall Chum	Management	Discontinued		
<b>Kuskokwim River Area</b>					
Kuskokwim River	Chinook	Yield	Yield	Discontinued	
Kuskokwim River	Chum	Yield	Yield	Discontinued	
<b>Number of Stocks</b>		9	8	4	4

## EVALUATION OF PRESENT STOCKS OF CONCERN

### **Norton Sound District**

Norton Sound District is comprised of six commercial fishing subdistricts (Figure 1). Most subdistricts have several rivers, in addition to marine waters, where subsistence fishing occurs and, except for the Nome Subdistrict, there are few restrictions. Commercial harvests of Chinook, chum, and coho salmon peaked in the mid-1980s to early 1990s (Figure 2). In the late 1990s, commercial harvests began to decrease as Chinook and chum salmon runs became weaker. In the early 2000s, coho salmon runs began to weaken, but over the last five years, 2005-2009, coho salmon runs have been at record levels in most areas of Norton Sound. Since 2003, very low salmon harvests in Norton Sound were primarily the result of a lack of market interest in chum and pink salmon, and low runs of chum salmon in Northern Norton Sound and Chinook salmon in Eastern Norton Sound. Generally, chum, pink, sockeye, and coho salmon abundance has greatly increased since 2003; however, chum salmon productivity in northern Norton Sound streams has remained substantially below optimal.

### **Norton Sound Subdistrict 1 (Nome) Chum Salmon**

#### Stock Assessment

Subdistrict 1 (Nome) chum salmon were classified as a stock of management concern in September 2000 because of their persistent low productivity since the mid-1980s (Figure 3, Table 1). Subsistence salmon management in Nome Subdistrict, the only Tier II subsistence fishery in the state, is the most restrictive in Alaska. From 2004-2008, subsistence chum salmon fishing was more liberal as chum salmon surpluses were well above the amounts necessary for subsistence (ANS). The 2009 chum salmon surplus was projected to exceed the ANS, but a near-record low early chum run led to a closure of the subsistence fishery in mid July. Even though there was a late surge of chum salmon into the subdistrict, the escapement was still 7% below the lower end of the BEG.

In 2001, the department recommended, and then later established, a chum salmon BEG of 23,000 to 35,000 chum salmon for all Nome Subdistrict chum salmon stocks. In January 2001, the board established OEG ranges for chum salmon on three rivers in the Nome Subdistrict: Nome, Snake, and Eldorado Rivers, in order to index the overall BEG. Chum salmon have been counted via a tower or a weir on these rivers since 1993, 1995, and 1997, respectively. The department also established SEG ranges based on aerial survey information on four other rivers (Bonanza, Flambeau, Sinuk, and Solomon Rivers) in the Nome Subdistrict. All board-established OEGs and department-established SEGs were set in conjunction with the overall Nome Subdistrict BEG and have been used to assess the overall escapement to Nome Subdistrict in relation to the BEG. The Nome Subdistrict BEG was achieved in all years from 2004-2008, but the combined escapement fell short of the lower end of the BEG in 2009 (Figure 3). During the past five years (2005-2009), the OEG has been attained three times in the Nome and Snake rivers, and four times in the Eldorado River (Figures 4-6).

Subsistence fishing was liberalized from Tier II to Tier I regulations during each of the past six years (2004-2009) during which time a majority of escapement goals were achieved. During the

most recent 5-year period (2005-2009), the average total chum salmon harvest, which is entirely subsistence harvest, continues to be well below the 3,430-5,716 chum salmon amounts necessary for subsistence (ANS) and the historical total harvest (combined subsistence and commercial harvests) of the 1980s and early 1990s (Figure 3).

### Stock of Concern Recommendation

Given that a majority of chum salmon escapement goals have been achieved during the past five years, there is not a chronic inability to meet escapement goals. However, the recent yield remains well below historical levels despite use of specific management measures. Based on this assessment, it is recommended that the designation of Norton Sound Subdistrict 1 chum salmon as a stock of yield concern be continued. Although the lower end of the Subdistrict 1 BEG of 23,000 salmon was not reached in 2009, an above average Nome Subdistrict chum salmon run is forecasted for 2010, and perhaps for 2011. Above average escapements occurred during 2006 and 2007 and chum salmon age data collected in 2009 showed record high percentages (15-17%) of age-3 chum salmon in Nome Subdistrict and other areas of Norton Sound. Such high percentages of age-3 chum salmon indicate good survival for the 2006 brood year and increased ocean productivity. Chum salmon surplus is therefore expected to provide for ANS and Tier II restrictions are not expected.

### **Norton Sound Subdistricts 2 and 3 (Golovin and Moses Point) Chum Salmon**

#### Stock Assessment

In 2000, the board classified chum salmon in Subdistrict 2 (Golovin) and Subdistrict 3 (Moses Point) as a stock of yield concern based on low harvest levels for the previous 5-year period (1995-1999) (Table 1; Figures 7-8). Although escapement was well above the threshold for commercial fishing in 2002 in the Moses Point Subdistrict (Figure 9), tendering problems prevented the buyer from purchasing salmon. The chum salmon run was very poor in 2005 and no commercial fishing was allowed in either subdistrict. There were chum salmon surpluses available in 2006, but commercial fishing did not occur due to a lack of market interest. In 2007, an above-average Moses Point Subdistrict chum salmon run and market interest led to resurgence in commercial salmon fishing directed at chum salmon in Subdistrict 3. The department limited commercial salmon fishing during the 2008 season to three 12-hour periods in Subdistrict 2 and two 12-hour periods in Subdistrict 3. Chum salmon escapements in 2009 were well below tower-based escapement goals at the Niukluk (SEG >30,000) and Kwiniuk Rivers (OEG 11,500-23,000). As a consequence, pink and chum salmon directed commercial fishing was not allowed in accordance with the Subdistricts 2 and 3 management plan. During the most recent 5-year period, subsistence fishing time has not been restricted. Exploitation rates on chum salmon are very low and restrictions on subsistence have shown to have little effect on achieving chum salmon escapement goals in Subdistricts 2 and 3.

In the Golovin Subdistrict, the department is planning to revise the Niukluk River tower-based SEG of >30,000 chum salmon to an SEG of >25,000. From 2005 through 2009, the SEG of >30,000 chum salmon was achieved only in 2007, but was within 1,000 fish of the goal in 2006 (Figure 10).

In 2001, the department recommended and later established, chum salmon BEGs for the Kwiniuk River of 10,000 to 20,000 chum salmon and 8,000 to 16,000 chum salmon for the Tubutulik River in the Moses Point Subdistrict. In January 2001, the board established OEG ranges for chum salmon in Kwiniuk River and Tubutulik River by adding an additional 15% to the BEG range to account for subsistence harvests that may occur above the tower site. Based on escapement counts from the Kwiniuk River counting-tower project, the OEG of 11,500 to 23,000 chum salmon has been achieved in three out of the five recent years (Figure 9). The OEG for the Tubutulik chum salmon stock is 9,200 to 18,400 chum salmon. However, Tubutulik River chum salmon escapement is assessed via aerial survey. It is difficult to determine if the OEG was achieved in most years because aerial surveys were not completed in three of the last five years due to poor weather conditions or lack of available aircraft.

### Stock of Concern Recommendation

Given the continued low yield of chum salmon despite use of specific management measures, the Norton Sound Subdistricts 2 and 3 chum salmon stock continues to meet the criteria of a stock of yield concern. Therefore, it is recommended that the designation of Norton Sound Subdistricts 2 and 3 chum salmon as a stock of yield concern be continued. For the 2010 chum salmon run, there was above average parent year escapement during 2006, but a below average escapement in 2005. Additionally, as in Nome Subdistrict, there was a record high 16% age-3 chum salmon collected from the chum salmon escapement at Niukluk and Kwiniuk rivers. Taken collectively, this information suggests that Golovin and Moses Point Subdistricts chum salmon runs in 2010 will be above average, which will easily provide for subsistence uses and commercial fishing is expected.

## **Norton Sound Subdistricts 5 (Shaktoolik) and 6 (Unalakleet) Chinook Salmon**

### Stock Assessment

In 2004, the board classified Chinook salmon in Subdistrict 5 (Shaktoolik) and Subdistrict 6 (Unalakleet) as a stock of yield concern based on low harvests during 1999-2003 compared to the historical average yield, as indicated by the 1989-1998 10-year average. The board continued this designation in 2007 based on continued low subsistence harvests and poor escapements during the 2004-2006 seasons. In an effort to further conserve Chinook salmon and restore the stock to historical yield levels, the board adopted a new management plan (5 AAC 04.395) that became effective during the 2008 fishing season. This new management plan includes a more restrictive subsistence fishing schedule and a 50% reduction in the daily and annual sport fish bag limits. Prior to 2007, subsistence fishing was open continuously in the marine waters and inriver subsistence fishing was only closed for 36 hours a week. For fish 20 inches or greater in length, the sport fishery daily bag limit was two and the annual possession limit was four. Under the newly adopted plan, subsistence fishing from June 15 to July 15 in the Unalakleet Subdistrict is limited to two 48-hour periods per week in the marine waters, and two 36-hour periods per week in the Unalakleet River. Similarly, the Unalakleet River sport fish bag limit for Chinook salmon, 20 inches or greater, was reduced to one Chinook salmon per day with an annual harvest limit of two. The intent of 5AAC 04.395 was to enhance Chinook salmon escapements by providing escapement windows between subsistence fishing periods and reducing subsistence and sport fish harvests.

Shaktoolik and Unalakleet Subdistricts have been managed as one fishery because past studies have shown salmon bound for these subdistricts intermingle in nearshore marine waters and that harvests in each subdistrict most likely contain fish bound for both rivers. There are two escapement assessment projects in Unalakleet Subdistrict. The department operates a test gillnet several miles upstream from the mouth of the Unalakleet River. Farther upstream on North River, a major tributary to Unalakleet River, a salmon escapement counting tower has been operated cooperatively by the department and Native Village of Unalakleet (NVU) (2007-2008) and Norton Sound Economic Development Corporation (2009). North River tower passage estimates have shown to be a reliable indicator of Chinook salmon abundance to the entire Unalakleet River drainage. Radiotelemetry studies have shown that North River accounts for approximately 40% of the drainage-wide Chinook salmon escapement.

The recent 5-year average (2005-2009) Unalakleet River Chinook salmon test fishery catch of 102 Chinook salmon is 42% above the long-term average (1985-2004) catch of 72 Chinook salmon (Figure 11). However, the North River tower-based SEG range of 1,200-2,600 Chinook salmon has only been reached in two of the previous five years; the goal was reached in 2007 and 2009, but only as a result of the restrictive subsistence fishing schedule and early closures to Chinook salmon subsistence and sport fisheries (Figure 12). A record-low 903 Chinook salmon were enumerated at the tower in 2008 despite the subsistence fishing schedule, mesh-size restrictions, and a July 5<sup>th</sup> closure to the subsistence and sport fisheries. There have been no commercial fishing periods targeting Chinook salmon since 2001, except for a small harvest in 2005.

Commercial Chinook salmon harvests for the two subdistricts combined (Table 2) averaged 5,543 per year for the historical period 1989-1998. This average declined to 38 fish for the recent five years (2004-2008) as Chinook runs became weaker (Figures 13-15). The average subsistence harvest of 2,125 Chinook salmon during the most recent five-year period (2004-2008) represents a decline of approximately 36% from the average subsistence harvest of 3,318 Chinook salmon taken during the 1994-1998 period (Table 2). Lack of subsistence harvest data, along with varying harvest collection methodologies, during the period prior to 1994 prohibits a more historic comparison.

#### Stock of Concern Recommendation

Managers have taken direct action on all fisheries in order to achieve the SEG for North River, which acts as an index for escapement throughout the Unalakleet drainage. Commercial harvests on this stock have been reduced by 99% from historic harvests and subsistence harvests have decreased since the mid to late 1990s. Production from this spawning stock remains very poor. Given the continued low yield of Chinook salmon despite use of specific management measures, the Norton Sound Subdistricts 5 and 6 Chinook salmon stock continues to meet the criteria of a stock of yield concern. Therefore, it is recommended that the designation of Norton Sound Subdistricts 5 and 6 Chinook salmon as a stock of yield concern be continued.

## Yukon River Chinook Salmon

### Stock Assessment

Yukon River Chinook salmon run size has been erratic since 1998. The board classified Yukon River Chinook salmon as a yield concern in 2000 based on low harvest levels for the previous three-year period (1998–2000) and anticipated low harvest in 2001. The board continued the classification as a yield concern in 2004 and 2007. While Chinook salmon run size increased in 2005 and 2006, lower returns have occurred since that time, primarily for Canadian-origin stocks.

Chinook salmon escapement goals were generally met throughout the Alaska portion of the Yukon River drainage the past five years (Table 3). Inseason management actions have contributed to success in achieving escapement goals. BEGs in the Chena and Salcha rivers have been met or exceeded since 2004. Assessment of aerial survey SEGs is more difficult because of missing years. Of the escapement observations for those stocks indexed by aerial surveys, SEGs in the East and West Fork Andreafsky rivers, Anvik, and Gisasa rivers have been met or exceeded in all years surveyed successfully since 2004. The Nulato River SEG has been met in all but one year since 2004. Historical Canadian Yukon River mainstem escapement estimates are based on a 3-area escapement index prior to 2002, Eagle sonar passage estimates (2005–2008), and radio telemetry project (2002–2004) (Figure 16). For 2008, an interim management escapement goal (IMEG) of >45,000 Chinook salmon across the Alaska-Canada border, estimated using Eagle Sonar, was established by the Yukon River Panel. This sonar-based escapement goal was not met in 2008. The IMEG continued as the standard for 2009 and preliminary Eagle Sonar estimates suggest that this goal was attained. Note: the IMEG would have been met in 2005 and 2006, but not in 2007.

The historical baseline for comparison with recent years' (since 2004) run strengths and harvests of Yukon River Chinook salmon is the 10-year period, from 1989 through 1998. The board used a similar ten-year time series in making its initial determination that the Yukon River Chinook salmon stock was a stock of yield concern. The most recent 5-year (2004–2008) average Chinook salmon harvest of approximately 87,800 fish is approximately 44% below the 10-year (1989–1998) average of 156,000 fish (Table 4, Figure 17). Although the subsistence harvests continue to remain stable near 50,000 Chinook salmon annually (ANS is 45,500–66,704), commercial harvests have decreased over 66% during the same time frame from an average of 101,000 annually (1989–1998) to the recent 5-year average (2004–2008) of 34,500 fish. In response to a meager outlook and poor runs prior to 2004, conservative management strategies were employed, and a small surplus of fish potentially available for commercial harvest was foregone in 2004. The 2005 and 2006 commercial harvests were within the range of available surplus and 32,000 and 46,000 Chinook salmon were harvested, respectively. The outlook for 2007 suggested a run that would provide surplus for commercial fishing and approximately 33,000 Chinook salmon were harvested. The 2007 run, however, did not materialize as projected and the Canadian escapement goal was not met. The Chinook salmon run in 2008 was particularly poor, so no directed commercial fishery occurred. Less than 5,000 fish were incidentally harvested during directed chum periods. In addition to these commercial restrictions in 2008, reduced fishing periods were implemented for the subsistence fishery.



Anticipating a poor Chinook salmon run for 2009, a reduced subsistence salmon fishing schedule was developed with input provided by fishermen throughout the drainage during several preseason meetings. Additionally, subsistence fishing periods were closed to coincide with the first part of the run, comprised of primarily Canadian-origin fish, beginning in District 1 and implemented chronologically with upriver migration timing. This action was an attempt to transfer harvest from the Canadian-origin stocks to the Alaska-origin stocks, for which escapement goals had been met in recent years. No Chinook salmon-directed commercial fishery occurred in 2009 and sale of incidentally caught Chinook salmon from the chum salmon-directed commercial fishery was not permitted during the summer season until July 16. A total of 287 Chinook salmon were sold after this date.

In summary, the average available harvest for the years 2004 through 2008 was substantially less than the average yield from 1989 through 1998. No directed commercial fishery occurred in 2008 and 2009; additionally, the commercial sale of incidentally caught Chinook salmon was prohibited until July 16 in 2009. Subsistence fishing restrictions were also implemented in 2008 and 2009. Subsistence harvest data are not yet available for 2009; however, due to the conservative management regime employed, it is expected that the 2009 subsistence harvest was less than that observed in previous years.

#### Stock of Concern Recommendation

Yukon River Chinook salmon escapements have generally been met, particularly for Alaska-origin stocks, since 2004. Given that the most recent 5-year average harvest remains approximately 44% below the historic long-term average despite use of specific management measures, the Yukon River Chinook salmon stock continues to meet the criteria of a stock of yield concern. Therefore, it is recommended that the designation of Yukon River Chinook salmon as a stock of yield concern be continued.

Table 1. Commercial and subsistence Chum salmon harvests by subdistrict, by year, Norton Sound District, 1961-2009.

Year <sup>a</sup>	Nome (1)		Golovin (2)		Moses Point (3)		Norton Bay (4)		Shaktoolik (5)		Unalakleet (6)		Combined Totals	
	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence
1961	0		0		0		0		24,746		23,586		48,332	
1962	0		68,720		50,683		24,380		8,718		30,283		182,784	
1963	0		49,850	9,319	46,274	8,316	12,469		19,153		27,003		154,749	
1964	1,194		58,301		28,568	348	5,916		35,272	5,412	19,611	6,726	148,862	12,486
1965	1,941	1,825	0	3,847	0	9,857	0	3,032	8,356	3,420	26,498	8,791	36,795	30,772
1966	581	1,762	29,791	3,520	24,741	5,409	0	3,612	8,292	4,183	16,840	3,387	80,245	21,873
1967	406	627	31,193	4,803	0	9,913	0	2,945	1,655	4,436	8,502		41,756	22,724
1968	102	621	10,011	1,744	17,908	2,527	0	1,872	2,504	1,915	14,865	2,982	45,390	11,661
1969	601	508	20,949	2,514	26,594	1,303	3,974	3,855	8,645	3,439	22,032	4,196	82,795	15,815
1970	960	458	20,566	2,614	29,726	6,960	0	3,500	15,753	2,016	40,029	7,214	107,034	22,762
1971	2,315	2,900	33,824	1,936	43,831	2,227	0	2,619	13,399	5,060	37,543	7,073	130,912	21,815
1972	2,643	315	27,097	2,028	30,919	2,070	7,799	2,022	12,022	3,399	20,440	4,132	100,920	13,966
1973	1,132	1,863	41,689	74	31,389	298	4,672	130	14,500	1,397	25,716	3,426	119,098	7,188
1974	10,431	183	30,173	205	55,276	1,723	3,826	900	26,391	358	36,170	588	162,267	3,957
1975	8,364	2,858	41,761	2,025	46,699	508	17,385	361	49,536	334	48,740	2,038	212,485	8,124
1976	7,620	1,705	30,219	1,128	10,890	1,548	7,161	236	15,798	269	24,268	2,832	95,956	7,718
1977	15,998	12,192	53,912	2,915	47,455	1,170	13,563	2,055	36,591	2,190	32,936	6,085	200,455	26,607
1978	8,782	4,295	41,462	1,061	44,595	1,229	21,973	1,060	35,388	1,170	37,079	3,442	189,279	12,257
1979	5,391	3,273	30,201	2,840	37,123	1,195	15,599	1,400	22,030	1,670	30,445	1,597	140,789	11,975
1980	13,922	5,983	52,609	4,057	14,755	1,393	7,855	1,132	27,453	1,827	64,198	5,230	180,792	19,622
1981	18,666	8,579	58,323	5,543	29,325	2,819	3,111	3,515	21,097	3,490	39,186	4,235	169,708	28,181
1982	13,447	4,831	51,970	1,868	40,030	3,537	7,128	2,485	26,240	1,165	44,520	4,694	183,335	18,580
1983	11,691	7,091	48,283		65,776		17,157		67,310		109,220	4,401	319,437	11,492
1984	3,744	4,883	54,153		9,477		3,442		32,309		43,317	3,348	146,442	8,231
1985	6,219	5,667	55,781	9,577	24,466	947	9,948		13,403	298	25,111	1,968	134,928	18,457
1986	8,160	8,085	69,725		20,668		1,994		16,126		30,239		146,912	8,085
1987	5,646	8,394	44,334		17,278		3,586		14,088		17,525		102,457	8,394
1988	1,628	5,952	33,348		18,585		7,521		21,521		25,363		107,966	5,952
1989	492	3,399	0		167		0		19,641		20,825	1,388	41,125	4,787
1990	0	4,246	15,993		3,723		0		21,748		23,659		65,123	4,246
1991	0	3,715	14,839		804	2,660	0		31,619		39,609		86,871	6,375
1992	881	1,684	1,002		6	1,260	1,787		27,867		52,547		84,090	2,944
1993	132	1,766	2,803		167	1,635	1,378		20,864		28,156		53,500	3,401
1994	66	1,673	111	1,337	414	3,476	0	4,581	5,411	1,221	12,288	3,325	18,290	15,613

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Year <sup>a</sup>	Nome (1)		Golovin (2)		Moses Point (3)		Norton Bay (4)		Shaktoolik (5)		Unalakleet (6)		Combined Totals	
	Commercial Subsistence		Commercial Subsistence		Commercial Subsistence		Commercial Subsistence		Commercial Subsistence		Commercial Subsistence		Commercial Subsistence	
1995	122	3,794	1,987	10,373	1,171	3,774	0	5,828	14,775	2,480	24,843	5,458	42,898	31,707
1996	3	2,287	0	2,867	0	2,319	0	4,161	3,237	4,425	7,369	4,227	10,609	20,286
1997	0	2,696	8,003	4,891	2,683	2,064	531	4,040	5,747	1,612	17,139	1,603	34,103	16,906
1998	0	964	723	1,893	2,311	1,376	0	6,192	7,080	1,034	6,210	3,038	16,324	14,497
1999	0	337	0	3,656	0	744	0	4,153	2,181	467	5,700	3,692	7,881	13,049
2000	0	535	164	1,155	535	1,173	0	4,714	2,751	2,412	2,700	3,000	6,150	12,989
2001	0	858	7094	3,291	681	898	0	4,445	1,819	1,553	1,512	2,918	11,106	13,963
2002	0	1,114	0	1,882	0	1,451	0	3,971	261	800	339	3,877	600	13,095
2003	0	565	0	1,477	0	1,687	0	3,397	485	587	3,075	1,785	3,560	9,498
2004	0	685	0	880	0	683	0	<sup>b</sup>	1,372	139	4,924	2,154	6,296	4,541
2005	0	803	0	1,852	0	598	0	<sup>b</sup>	791	202	3,192	2,660	3,983	6,115
2006	0	940	0	722	0	1,267	0	<sup>b</sup>	3,321	351	6,721	2,712	10,042	5,992
2007	0	2,938	0	4,217	4,567	2,334	0	<sup>b</sup>	6,076	465	11,788	2,057	22,431	12,011
2008	0	739	623	350	304	1,284	0	3,330	6,042	201	17,648	2,805	24,617	5,379
2009	0	134	43		460		1,860		10,915		20,006	1,685	33,284	1,819
5-year avg. <sup>c</sup>	0	1,221	125	1,604	974	1,233	0		3,520	272	8,855	2,478	13,474	6,808
10-year avg. <sup>d</sup>	0	951	788	1,948	609	1,212	0	4,002	2,510	718	5,760	2,766	9,667	9,663

<sup>a</sup> Subsistence harvests based on household surveys. The number of communities and households surveyed is unknown, and varied annually. Actual harvests were greater; total harvests were not estimated.

<sup>b</sup> Subsistence harvests based on permit reports for Nome and household surveys for other communities. The number of other communities and households surveyed is unknown, and varied annually. Actual harvests were greater; total harvests were not estimated.

<sup>c</sup> Subsistence harvests based on returned permits for Nome and expanded household survey estimates for other communities. Total harvest estimated.

<sup>d</sup> Subsistence harvests based on returned permits for Nome, permits required in Golovin (Golovin harvest includes any Nome permits) and Moses Pt Subdistrict beginning in 2004, and expanded household survey estimates for Shaktoolik and Unalakleet. Other communities were not surveyed.

Table 2. Commercial and subsistence Chinook salmon harvests by subdistrict, by year, Norton Sound District, 1961-2009.

Year <sup>a</sup>	Nome (1)		Golovin (2)		Moses Point (3)		Norton Bay (4)		Shaktoolik (5)		Unalakleet (6)		Combined Totals	
	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence
1961									140		5,160		5,300	0
1962			45		27		387		1,738		5,089		7,286	0
1963			40		15	5	137		480		5,941		6,613	5
1964	5		27		32		50		631	77	1,273	488	2,018	565
1965	1			2		16		4	127	31	1,321	521	1,449	574
1966	1	12	17	4	17	14		7	310	142	1,208	90	1,553	269
1967		11	10	3		39		12	43	262	1,751	490	1,804	817
1968		7	12	4	12	2		28	61	10	960	186	1,045	237
1969		2	28	2	29	9	26	59	33	40	2,276	324	2,392	436
1970			13	4	39	16		3	197	43	1,604	495	1,853	561
1971	11		37	7	95	16		5	284	87	2,166	911	2,593	1,026
1972	15	19	36	4	190	44	43	30	419	64	2,235	643	2,938	804
1973		14	70	1	134	2	28	1	289	51	1,397	323	1,918	392
1974	19	8	30	3	198	3	21		583	93	2,100	313	2,951	420
1975	2	2	17		16	2	68	1	651	18	1,638	163	2,392	186
1976	2	13	12		24	22	102	2	892	24	1,211	142	2,243	203
1977	8	35	26	3	96	22	158	14	1,521	49	2,691	723	4,500	846
1978	19	35	22	1	444	38	470	12	1,339	81	7,525	1,044	9,819	1,211
1979	9	11	75		1,035	16	856	12	2,377	62	6,354	640	10,706	741
1980	8	129	36	12	502	131	340	22	1,086	57	4,339	1,046	6,311	1,397
1981	4	35	23	8	198	32	63	7	1,484	8	6,157	869	7,929	959
1982	20	21	78	7	253	1	96	1	1,677	68	3,768	913	5,892	1,011
1983	23	74	52		254		215		2,742		7,022	1,868	10,308	1,942
1984	7	83	31						1,613		6,804	1,650	8,455	1,733
1985	21	56	193	12	816	67	528		5,312	298	12,621	1,397	19,491	1,830
1986	6	150	81		600		139		1,075		4,494		6,395	150
1987	3	200	166		907		544		2,214		3,246		7,080	200
1988	2	63	108		663		434		671		2,218		4,096	63
1989	2	24	0		62				1,241		4,402		5,707	24
1990	0	58	52		202		0		2,644		5,998	2,476	8,896	2,534
1991	0	83	49		161	312	0		1,324		4,534		6,068	395
1992	1	152	6		0	100	27		1,098		3,409		4,541	252
1993	0	52	1		3	368	267		2,756		5,944		8,971	420
1994	0	23	0	253	0	322	0	308	885	1,175	4,400	3,035	5,285	5,116

-continued-

Table 2. Page 2 of 2.

Year <sup>a</sup>	Nome (1)		Golovin (2)		Moses Point (3)		Norton Bay (4)		Shaktoolik (5)		Unalakleet (6)		Combined Totals	
	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence
1995	0	26	0	165	4	284	0	475	1,239	1,275	7,617	3,114	8,860	5,339
1996	0	9	0	86	0	417	0	295	1,340	1,114	3,644	3,023	4,984	4,944
1997	0	10	19	138	844	619	194	656	2,449	1,146	9,067	4,191	12,573	6,760
1998	0	15	1	184	105	414	0	684	910	982	6,413	4,066	7,429	6,345
1999	0	11	0	60	0	424	0	327	581	818	1,927	2,691	2,508	4,331
2000	0	7	0	169	10	248	0	397	160	440	582	2,429	752	3,690
2001	0	2	0	89	7	427	0	460	90	936	116	2,810	213	4,724
2002	0	4	0	69	0	565	0	557	1	1,230	4	2,367	5	4,792
2003	0	63	0	166	0	660	0	373	2	881	10	2,585	12	4,728
2004	0	100	0	164	0	412	0	<sup>b</sup>	0	943	0	2,829	0	4,448
2005	0	62	0	96	0	225	0	<sup>b</sup>	50	807	101	2,193	151	3,383
2006	0	24	0	136	0	179	0	<sup>b</sup>	0	382	11	2,537	11	3,258
2007	0	18	0	188	0	260	0	<sup>b</sup>	5	515	13	1,665	18	2,646
2008	0	39	0	146	0	269	7	187	6	422	65	1,402	78	2,278
2009	0		0		0		0		0	300	0	1,609	0	1,909
5-year avg. <sup>c</sup>	0	49	0	146	0	269	1	187	12	614	38	2,125	52	3,203
10-year avg. <sup>d</sup>	0	45	13	165	138	355	54	484	1,589	1,138	5,543	3,318	7,331	3,213

<sup>a</sup> Subsistence harvests based on household surveys. The number of communities and households surveyed is unknown and varied annually. Actual harvests were greater; total harvests were not estimated.

<sup>b</sup> Subsistence harvests based on permit reports for Nome and household surveys for other communities. The number of other communities and households surveyed is unknown and varied annually. Actual harvests were greater; total harvests were not estimated.

<sup>c</sup> Subsistence harvests based on returned permits for Nome and expanded household survey estimates for other communities. Total harvest estimated.

<sup>d</sup> Subsistence harvests based on returned permits for Nome, permits required in Golovin (Golovin harvest includes any Nome permits) and Moses Pt Subdistrict beginning in 2004, and expanded household survey estimates for Shaktoolik and Unalakleet. Other communities were not surveyed.

Table 3. Yukon River Chinook salmon historical escapements from selected tributaries. <sup>a</sup>

Year	Ground based projects		Aerial Surveys				
	Chena R.	Salcha R.	E. F. Andraefsky R.	W.F. Andraefsky	Anvik R.	Nulato R.	Gisasa R.
1980				1,500	1,330		951
1981							
1982			1,274	851			421
1983						1,006	572
1984				1,993			
1985			1,617	2,248	1,051	2,780	735
1986	9,065		1,954	3,158	1,118	2,974	1,346
1987	6,404	4,771	1,608	3,281	1,174	1,638	731
1988	3,346	4,562	1,020	1,448	1,805	1,775	797
1989	2,666	3,294	1,399	1,089			
1990	5,603	10,728	2,503	1,545	2,347		
1991	3,025	5,608	1,938	2,544		2,020	1,690
1992	5,230	7,862			1,536	579	910
1993	12,241	10,007	5,855	2,765	1,720	3,025	1,573
1994	11,877	18,399				1,795	2,775
1995	9,680	13,643	1,635	1,108	1,996	1,649	410
1996	7,153	7,570		624	839		
1997	13,390	18,514	1,140	1,510	3,979		
1998	4,745	5,027	1,027		709	1,053	
1999	6,485	9,198					
2000	4,694	4,595	1,018	427	1,721		
2001	9,696	13,328	1,065	570	1,420	1,884	1,298
2002	6,967	4,644	1,447	917	1,713	1,584	506
2003	8,739 <sup>b</sup>	15,500 <sup>b</sup>					
2004	9,645	15,761	2,879	1,317	3,679	1,321	731
2005	564 <sup>b</sup>	5,988	1,715	1,492	2,421	553	958
2006	2,936	10,679		824	1,876	1,292	843
2007	3,806	6,425	1,758	976	1,529	2,583	593
2008	3,212	2,731 <sup>b</sup>				922	
2009	5,253	12,788		1,678	832	2,260	515
5-Year Avg. (2005-2009)	3,802	8,970	1,737	1,243	1,665	1,522	727
BEGs	2,800 - 5,700	3,300- 6,500	SEGs 960 - 1,700	640 - 1,600	1,100 - 1,700	940 - 1,900	420 - 1,100

<sup>a</sup> Only acceptable surveys are included.

<sup>b</sup> Incomplete count; project was not operated or was inoperable for a large portion of the season due to water conditions.

Table 4. Alaskan catch of Yukon River Chinook salmon, 1961-2008.

Year	Commercial	Commercial Related <sup>a</sup>	Total	Subsistence <sup>b</sup>	Personal Use <sup>c</sup>	Test Fish Sales <sup>d</sup>	Sport Fish <sup>e</sup>	Total
1961	119,664	0	119,664	21,488				141,152
1962	94,734	0	94,734	11,110				105,844
1963	117,048	0	117,048	24,862				141,910
1964	93,587	0	93,587	16,231				109,818
1965	118,098	0	118,098	16,608				134,706
1966	93,315	0	93,315	11,572				104,887
1967	129,656	0	129,656	16,448				146,104
1968	106,526	0	106,526	12,106				118,632
1969	91,027	0	91,027	14,000				105,027
1970	79,145	0	79,145	13,874				93,019
1971	110,507	0	110,507	25,684				136,191
1972	92,840	0	92,840	20,258				113,098
1973	75,353	0	75,353	24,317				99,670
1974	98,089	0	98,089	19,964				118,053
1975	63,838	0	63,838	13,045				76,883
1976	87,776	0	87,776	17,806				105,582
1977	96,757	0	96,757	17,581			156	114,494
1978	99,168	0	99,168	30,785			523	130,476
1979	127,673	0	127,673	31,005			554	159,232
1980	153,985	0	153,985	42,724			956	197,665
1981	158,018	0	158,018	29,690			769	188,477
1982	123,644	0	123,644	28,158			1,006	152,808
1983	147,910	0	147,910	49,478			1,048	198,436
1984	119,904	0	119,904	42,428			351	162,683
1985	146,188	0	146,188	39,771			1,368	187,327
1986	99,970	0	99,970	45,238			796	146,004
1987	134,760	0	134,760 <sup>f</sup>	55,039	1,706		502	192,007
1988	100,364	0	100,364	45,495	2,125	1,081	944	150,009
1989	104,198	0	104,198	48,462	2,616	1,293	1,053	157,622
1990	95,247	413	95,660	48,587	2,594	2,048	544	149,433

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Table 4. Page 2 of 3.

Year	Commercial		Total	Subsistence <sup>b</sup>	Personal Use <sup>c</sup>	Test Fish Sales <sup>d</sup>	Sport Fish <sup>e</sup>	Total
	Commercial	Related <sup>a</sup>						
1991	104,878	1,538	106,416	46,773		689	773	154,651
1992	120,245	927	121,172	47,077		962	431	169,642
1993	93,550	560	94,110	63,915	426	1,572	1,695	161,718
1994	113,137	703	113,840	53,902		1,631	2,281	171,654
1995	122,728	1,324	124,052	50,620	399	2,152	2,525	179,748
1996	89,671	521	90,192	45,671	215	1,698	3,151	140,927
1997	112,841	769	113,610	57,117	313	2,811	1,913	175,764
1998	43,618	81	43,699	54,124	357	926	654	99,760
1999	69,275	288	69,563	53,305	331	1,205	1,023	125,427
2000	8,518		8,518	36,404	75	597	276	45,870
2001	<sup>g</sup>			55,819	122		679	56,620
2002	24,128		24,128	43,742	126	528	486	69,010
2003	40,438		40,438	56,959	204	680	2,719	101,000
2004	56,151		56,151	55,713	201	792	1,513	114,370
2005	32,029		32,029	53,409	138	296	483	86,355
2006	45,829		45,829	48,593	89	817	739	96,067
2007	<sup>f</sup> 33,634		33,634	55,156	136	849	960	90,735
2008	<sup>f</sup> 4,641		4,641	42,933	121	0	409	48,104
<u>Average</u>								
1989-1998	100,011	684	100,695	51,625	989	1,578	1,502	156,092
2004-2008	34,457		34,457	51,161	137	551	821	87,126
1999-2008	34,960 <sup>h</sup>		34,992 <sup>h</sup>	50,203	154	640 <sup>h</sup>	929	83,356

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Table 4. Page 3 of 3.

- <sup>a</sup> Production of salmon roe; including carcasses from subsistence caught fish. These data are only available since 1990. Includes harvest from the Coastal District and test fish harvest that were utilized for subsistence.
- <sup>b</sup> Prior to 1987, and 1990, 1991, and 1994 personal use was considered part of subsistence.
- <sup>c</sup> Includes only test fish that were sold commercially.
- <sup>d</sup> Sport fish harvest for the Alaskan portion of the Yukon River drainage. Most of this harvest is believed to have been taken within the Tanana River drainage (see Schultz et al. 1993: 1992 Yukon Area Annual Management Report).
- <sup>e</sup> Includes 653 and 2,136 Chinook salmon illegally sold in Districts 5 (Yukon River) and 6 (Tanana River), respectively.
- <sup>f</sup> Subsistence and personal use data are preliminary.
- <sup>g</sup> No commercial fishery was conducted.
- <sup>h</sup> Average does not include data from 2001 due to no commercial fishery being conducted.

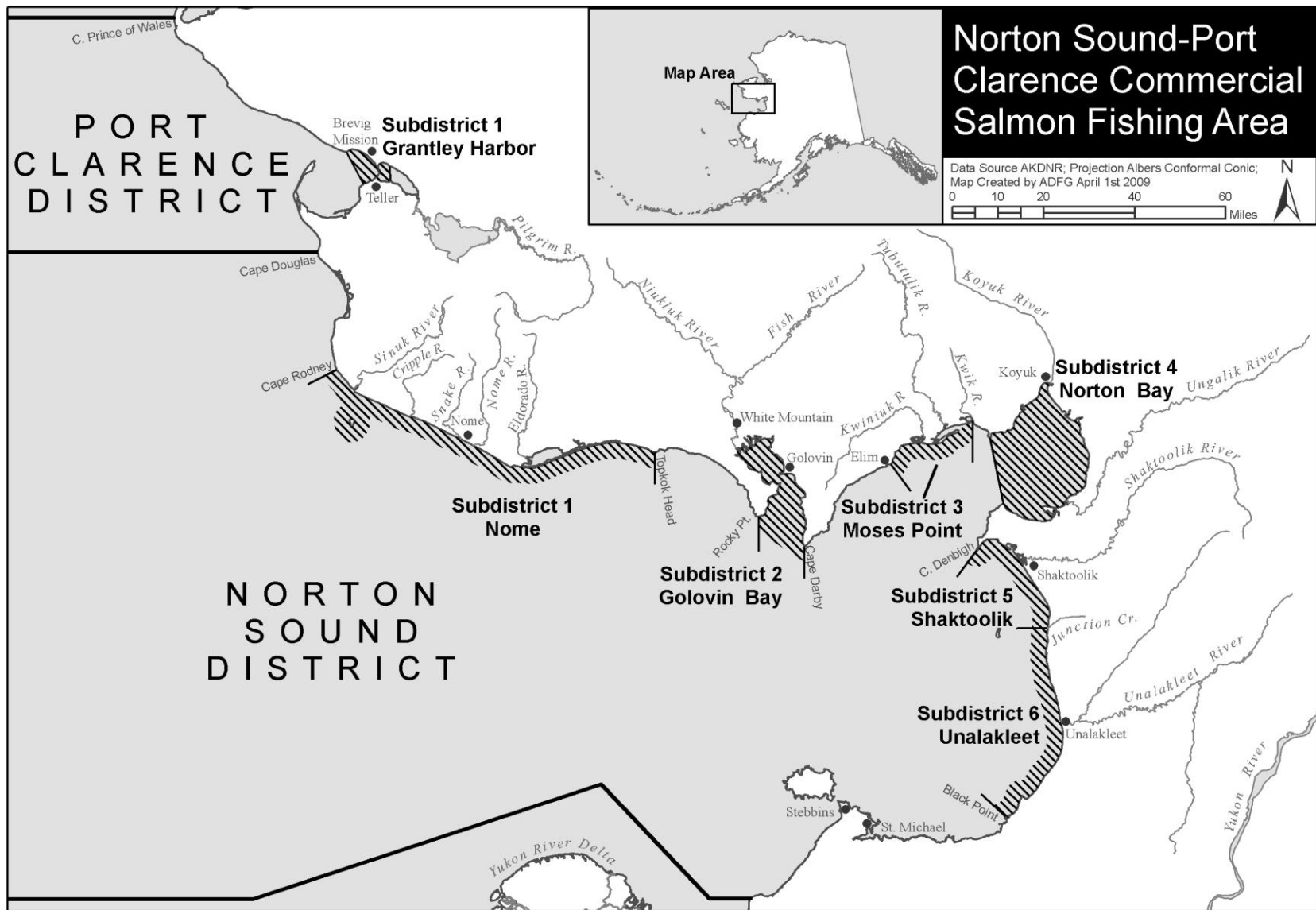


Figure 1. Norton Sound District commercial salmon fishing subdistricts.

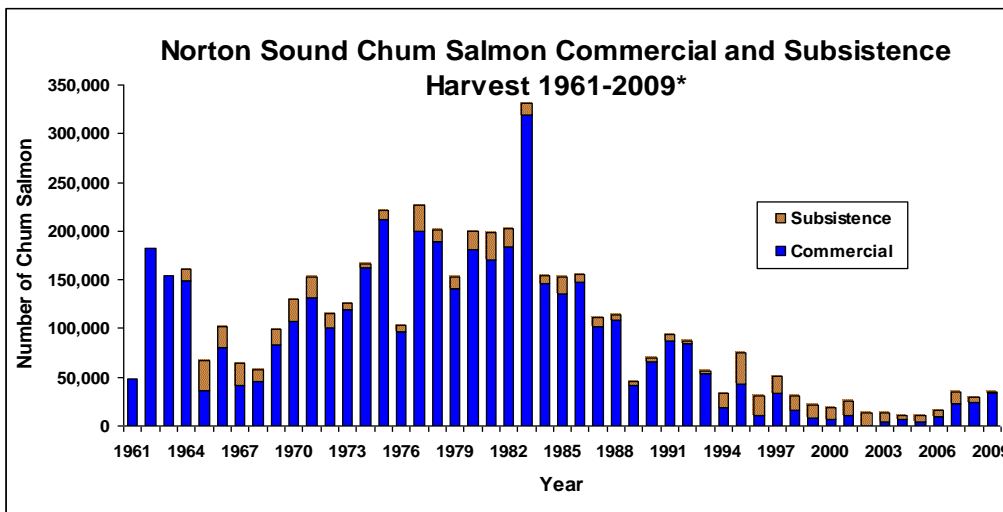
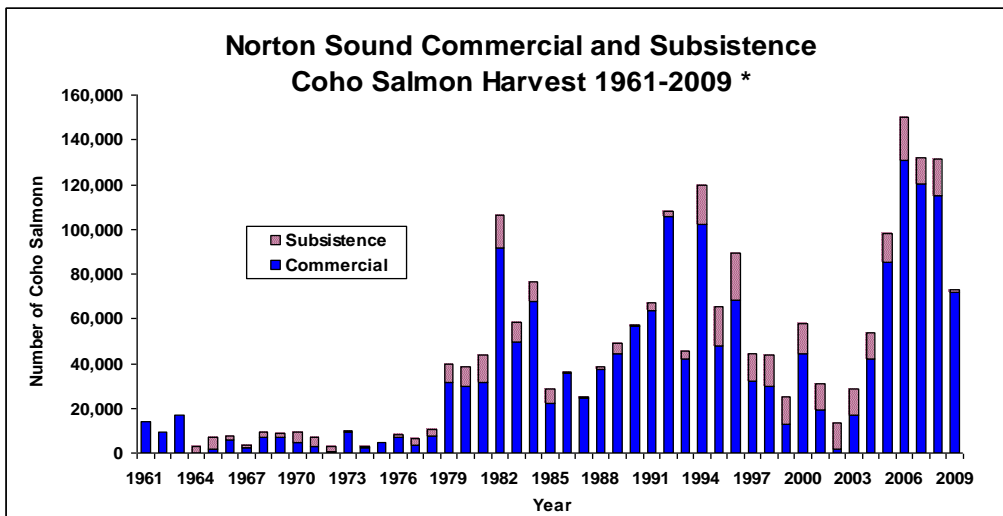
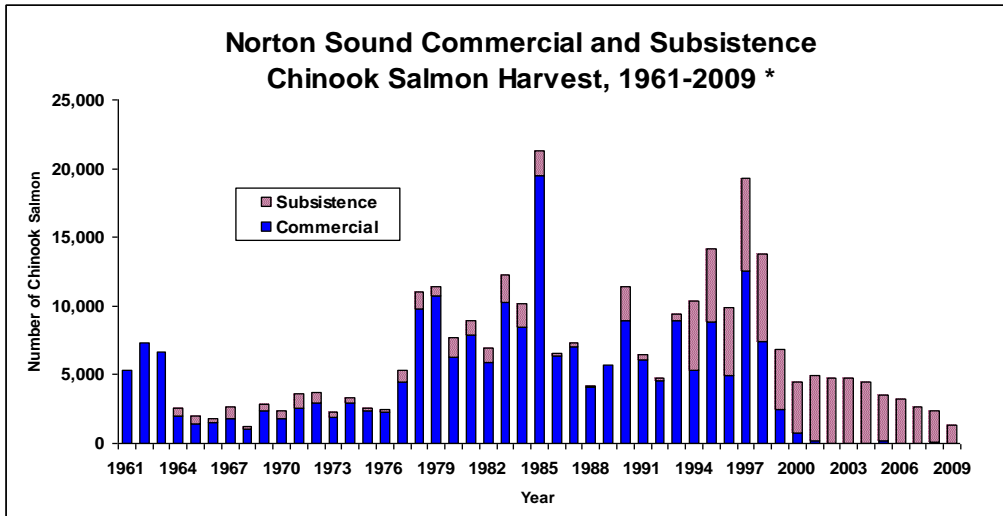
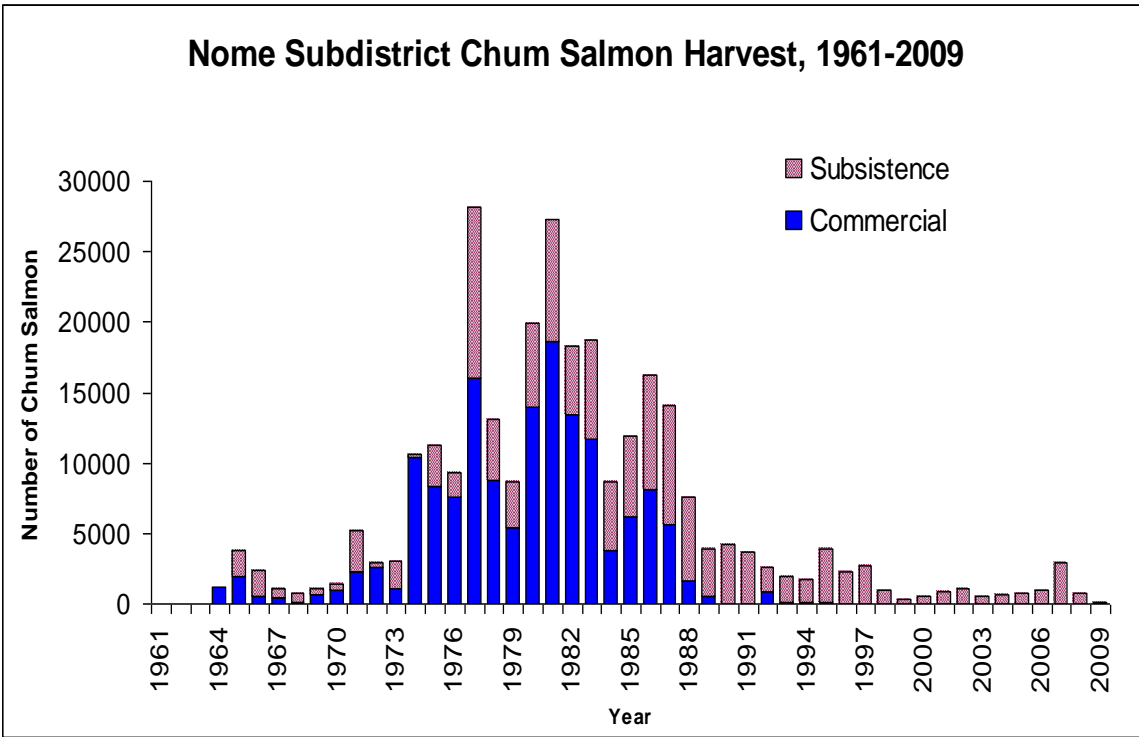


Figure 2. Norton Sound Chinook, chum, and coho salmon harvest, 1961-2009. Subsistence harvest data are unavailable for 2009.



Note: Subsistence harvest data incomplete prior to 1979.

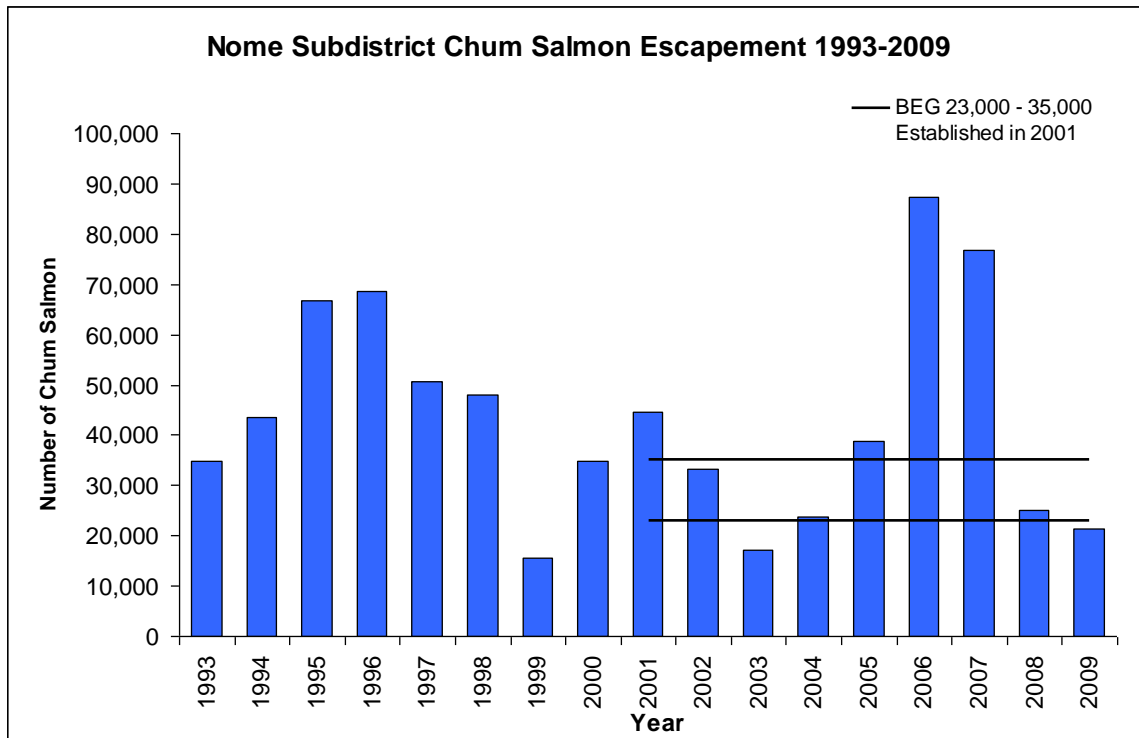


Figure 3. Nome Subdistrict chum salmon harvest (1961-2009) and escapement (1993-2009). Subsistence harvest data are unavailable for 2009.

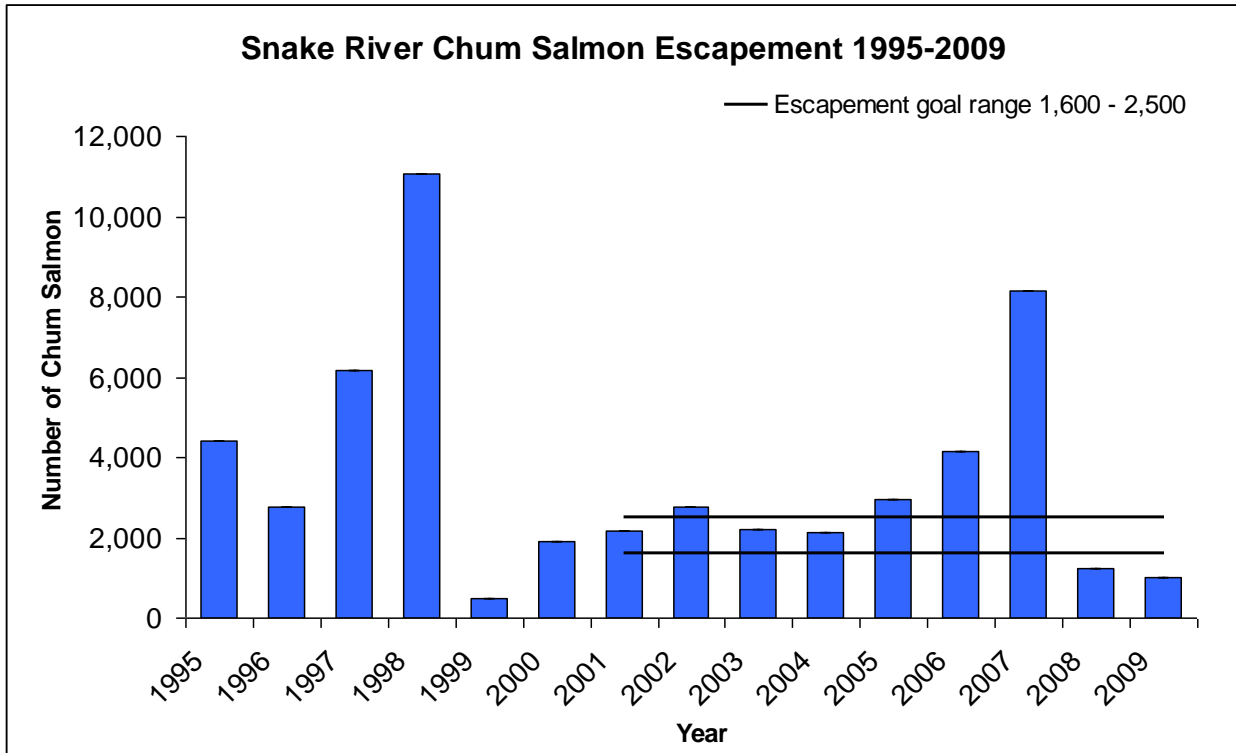


Figure 4. Snake River chum salmon escapement, 1995-2009.

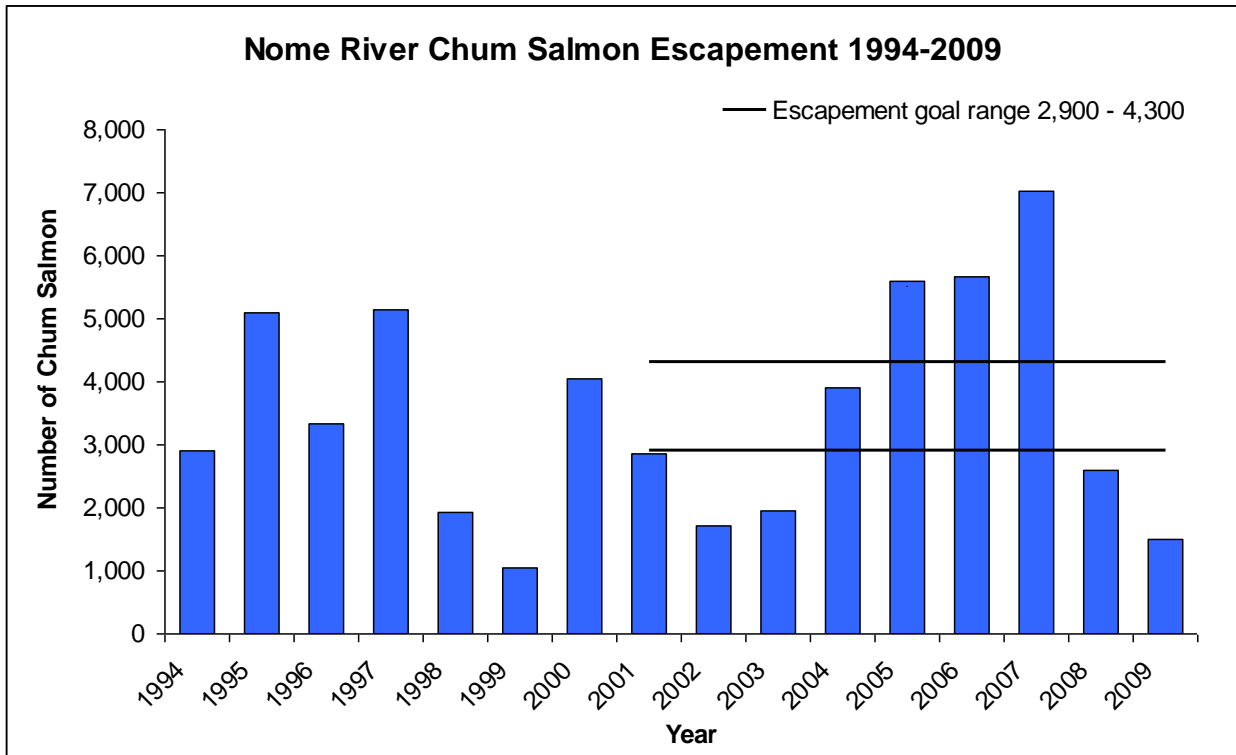


Figure 5. Nome River chum salmon escapement, 1994-2009.

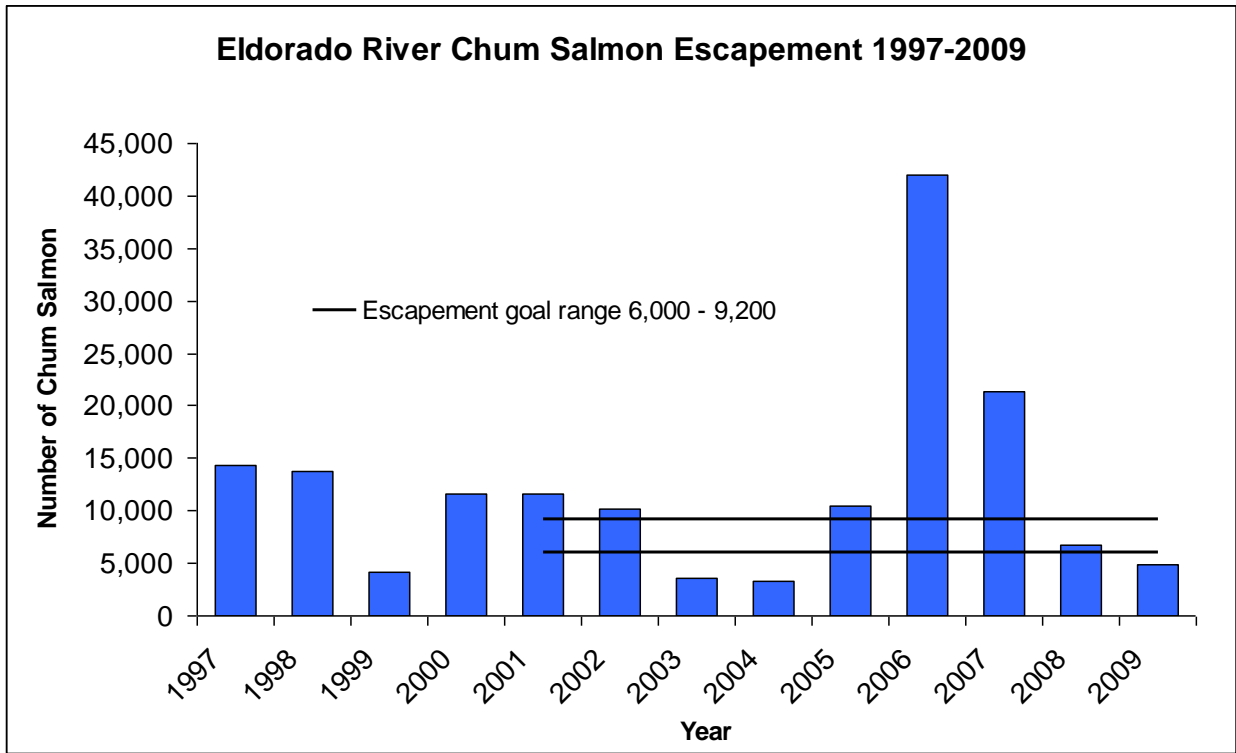


Figure 6. Eldorado River chum salmon escapement, 1997-2009.

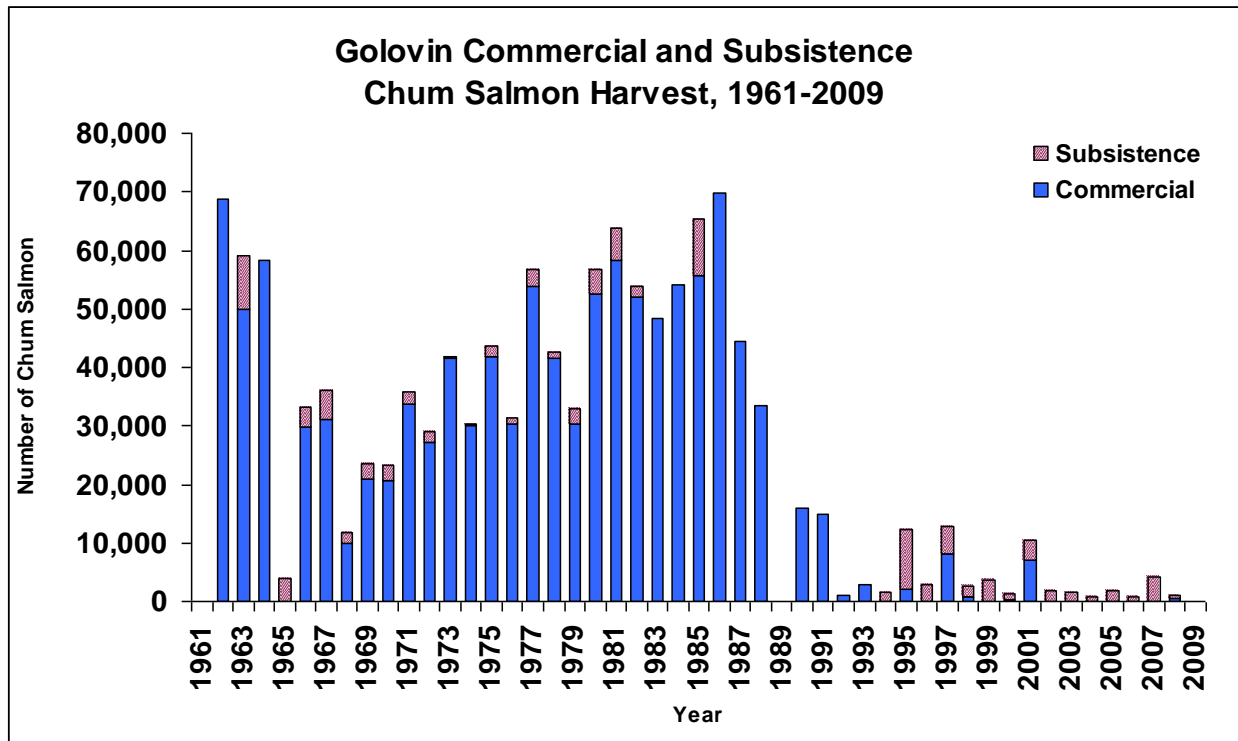


Figure 7. Golovin chum salmon harvest, 1961-2009. Subsistence harvest data are unavailable for 2009.



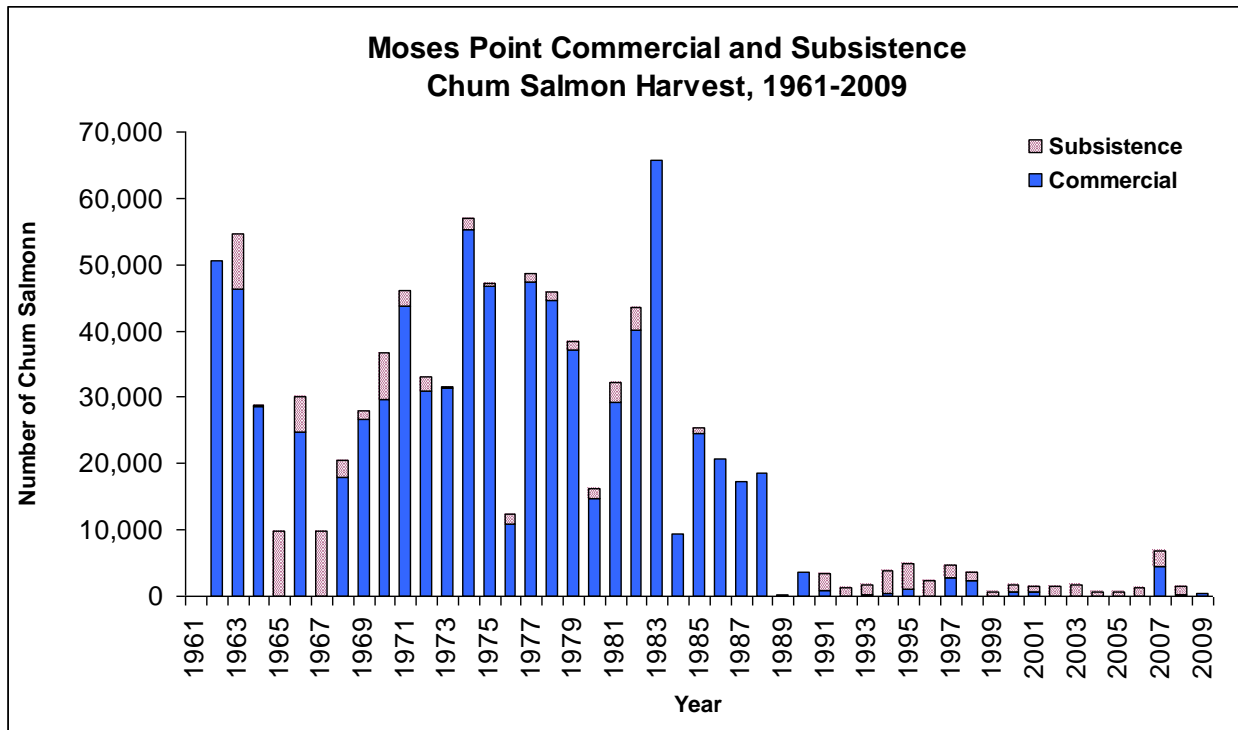


Figure 8. Moses Point chum salmon harvest, 1961-2009. Subsistence harvest data are unavailable for 2009.

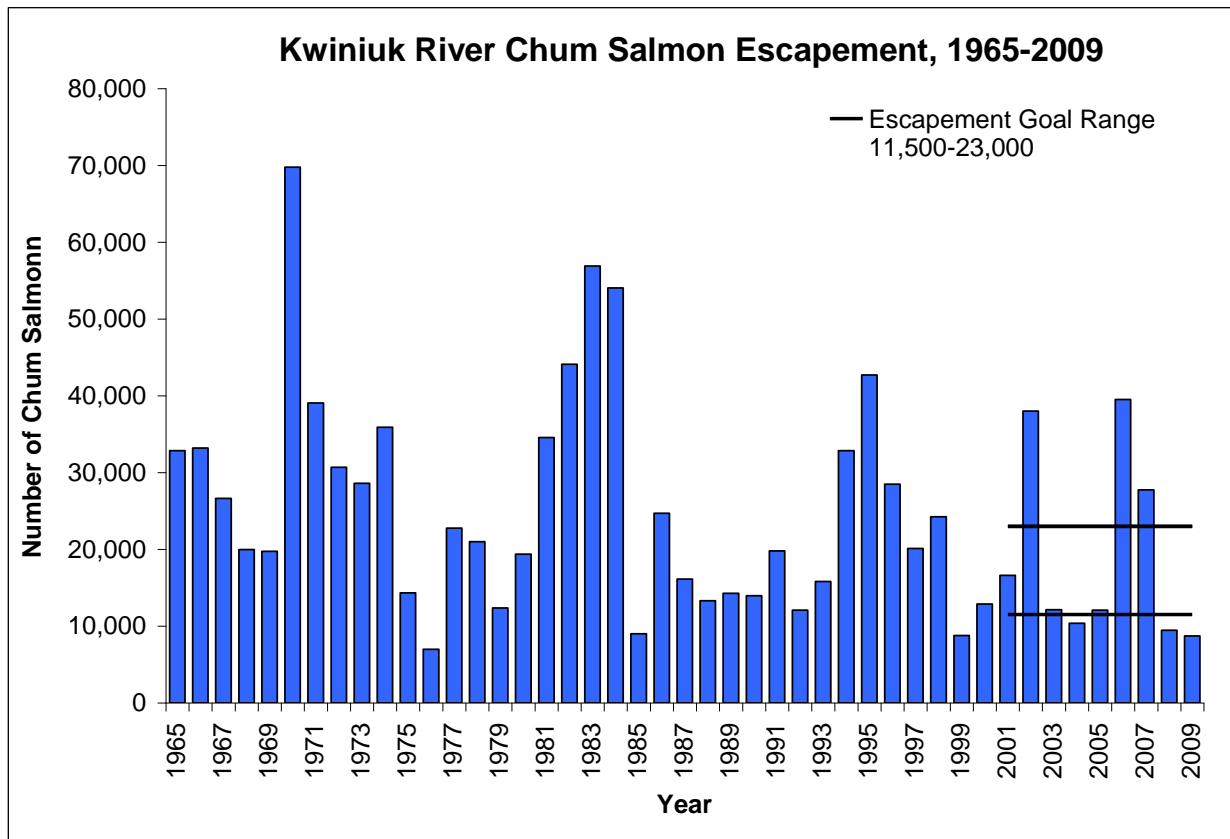


Figure 9. Kwiniuk River chum salmon escapement, 1965-2009.

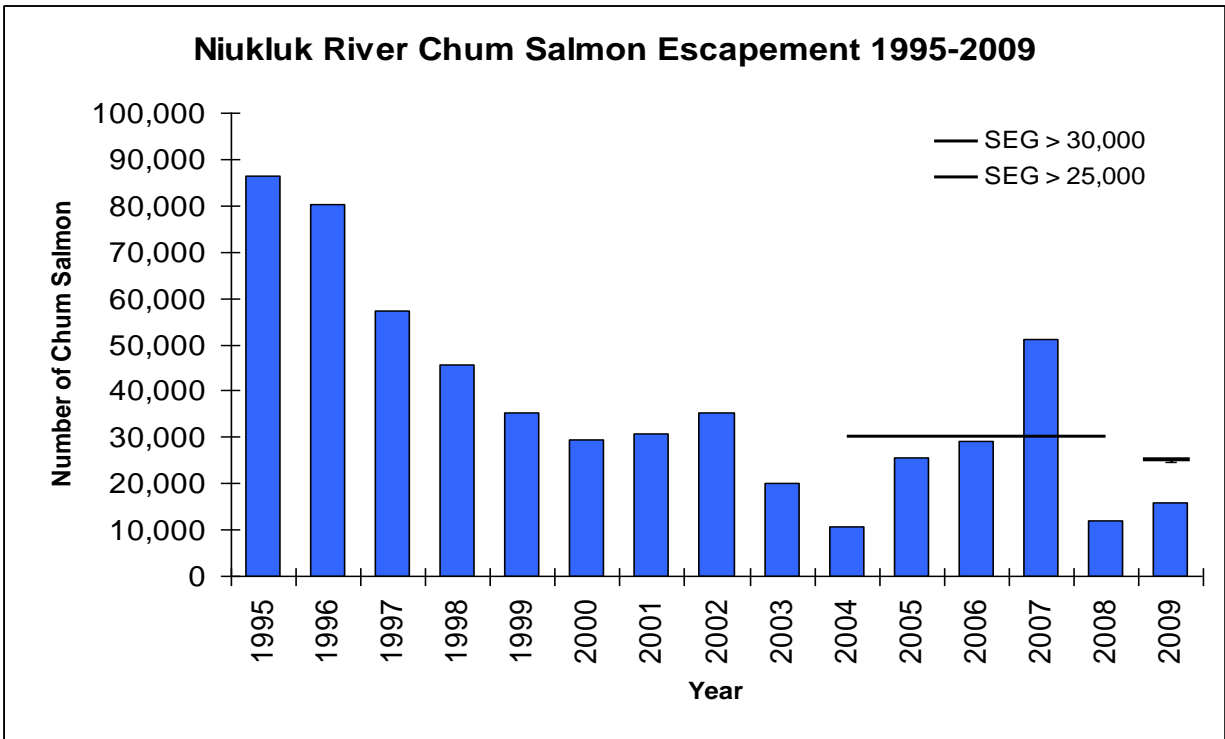


Figure 10. Niukluk River chum salmon escapement, 1995-2009.

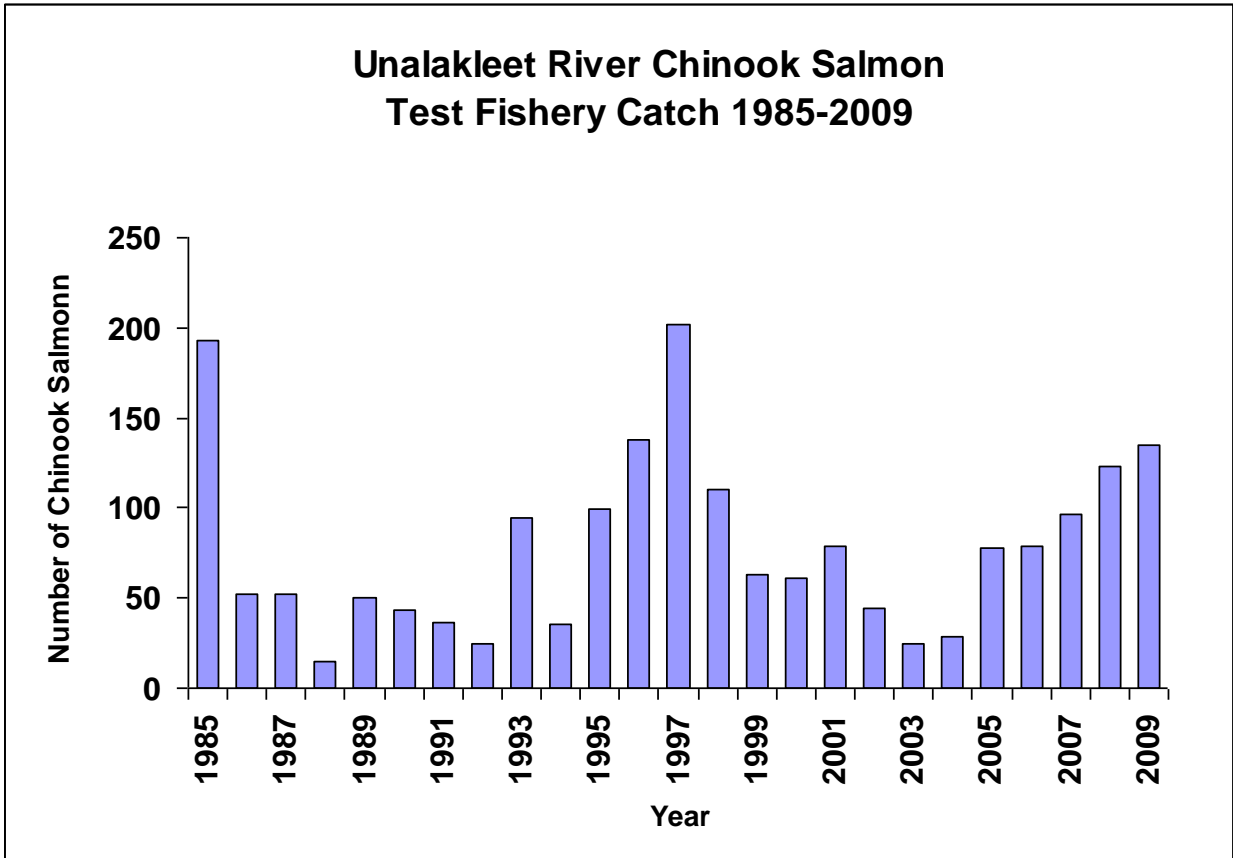


Figure 11. Unalakleet River Chinook salmon test fishery catch, 1985-2009.

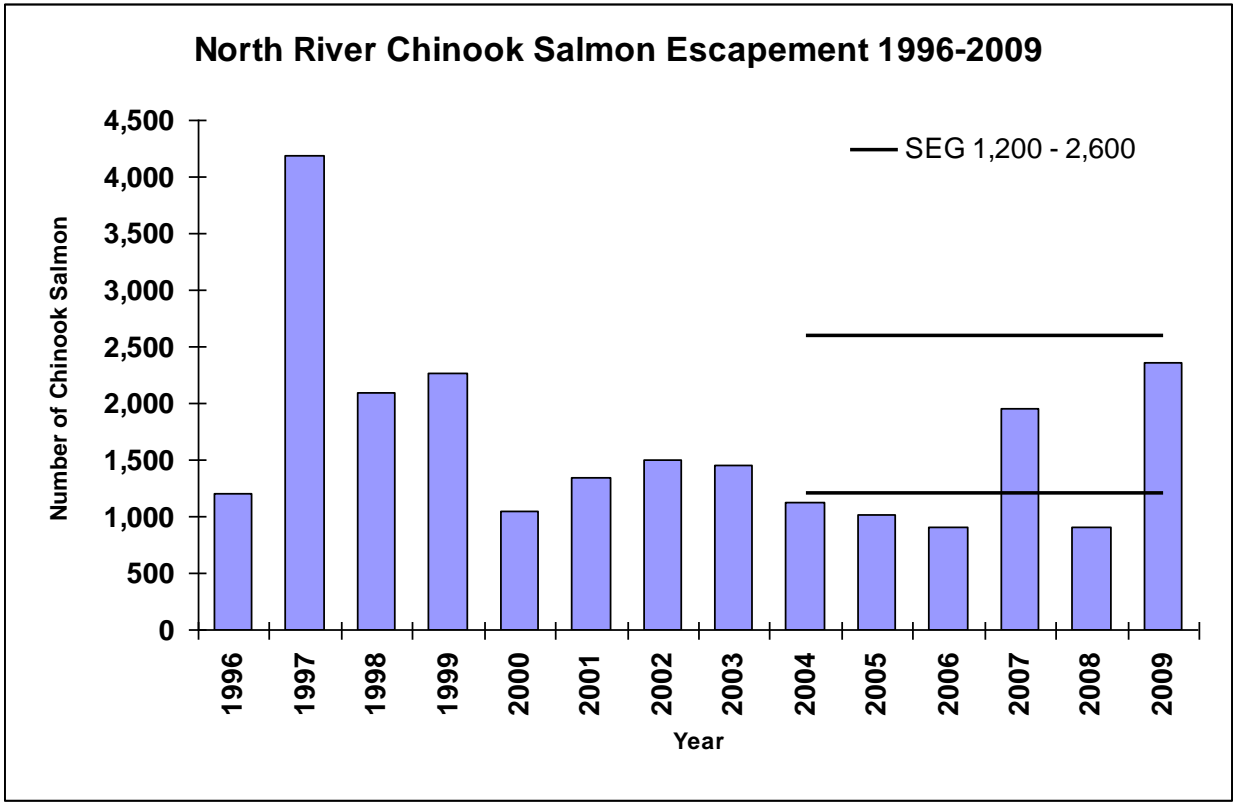
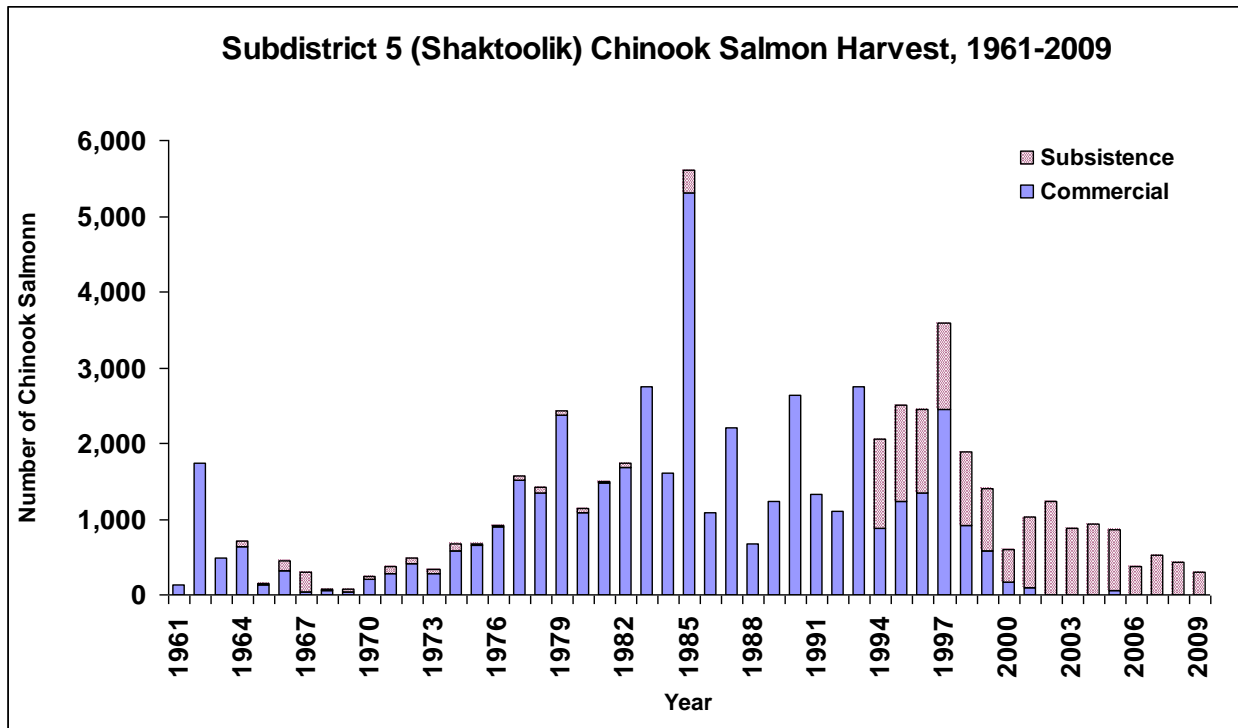
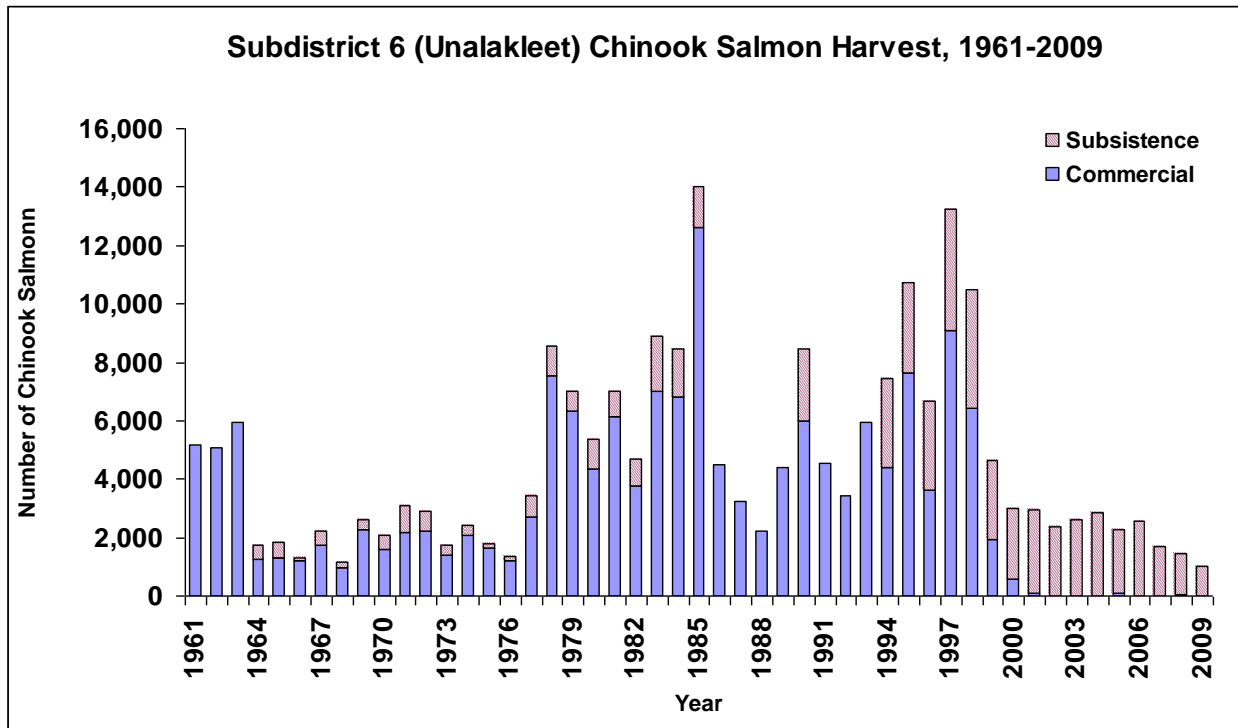


Figure 12. North River Chinook salmon escapement, 1996-2009.



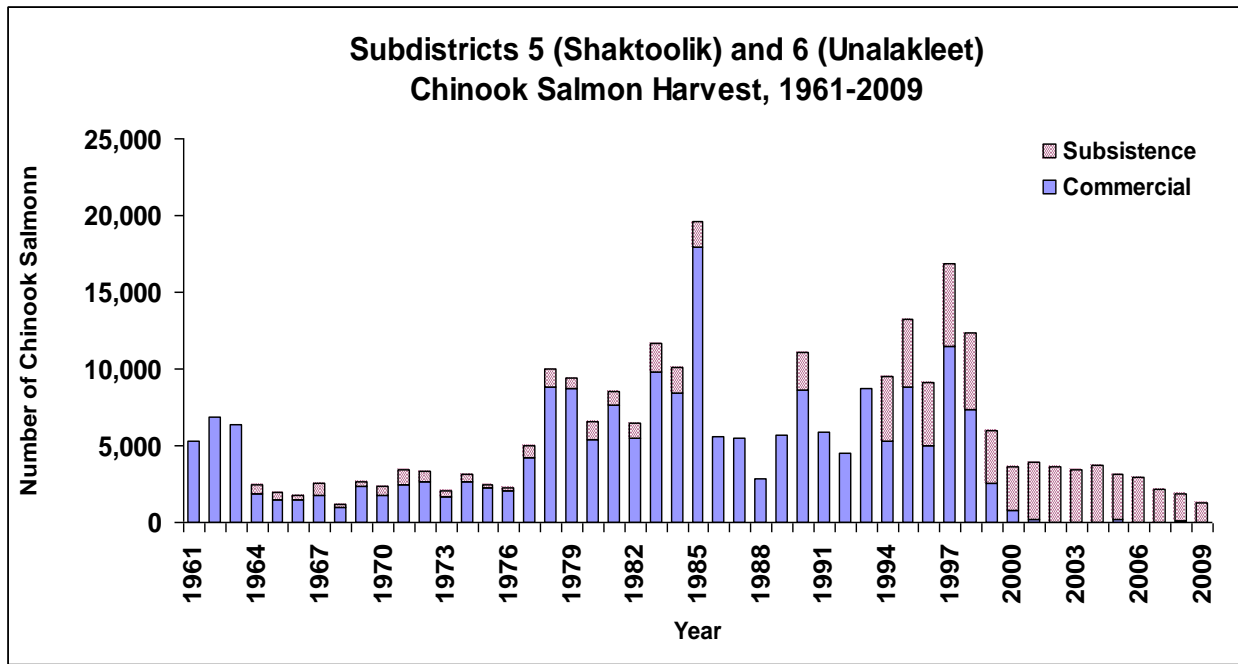
Note: Subsistence harvest not available for all years.

Figure 13. Shaktoolik Chinook salmon harvest, 1961-2009. Subsistence harvest data are incomplete for 2009.



Note: Subsistence harvest not available for all years.

Figure 14. Unalakleet Chinook salmon harvest, 1961-2009. Subsistence harvest data are incomplete for 2009.



Note: Subsistence harvest not available for all years.

Figure 15. Subdistricts 5 and 6 combined Chinook salmon harvest, 1961-2009. Subsistence harvest data are incomplete for 2009.



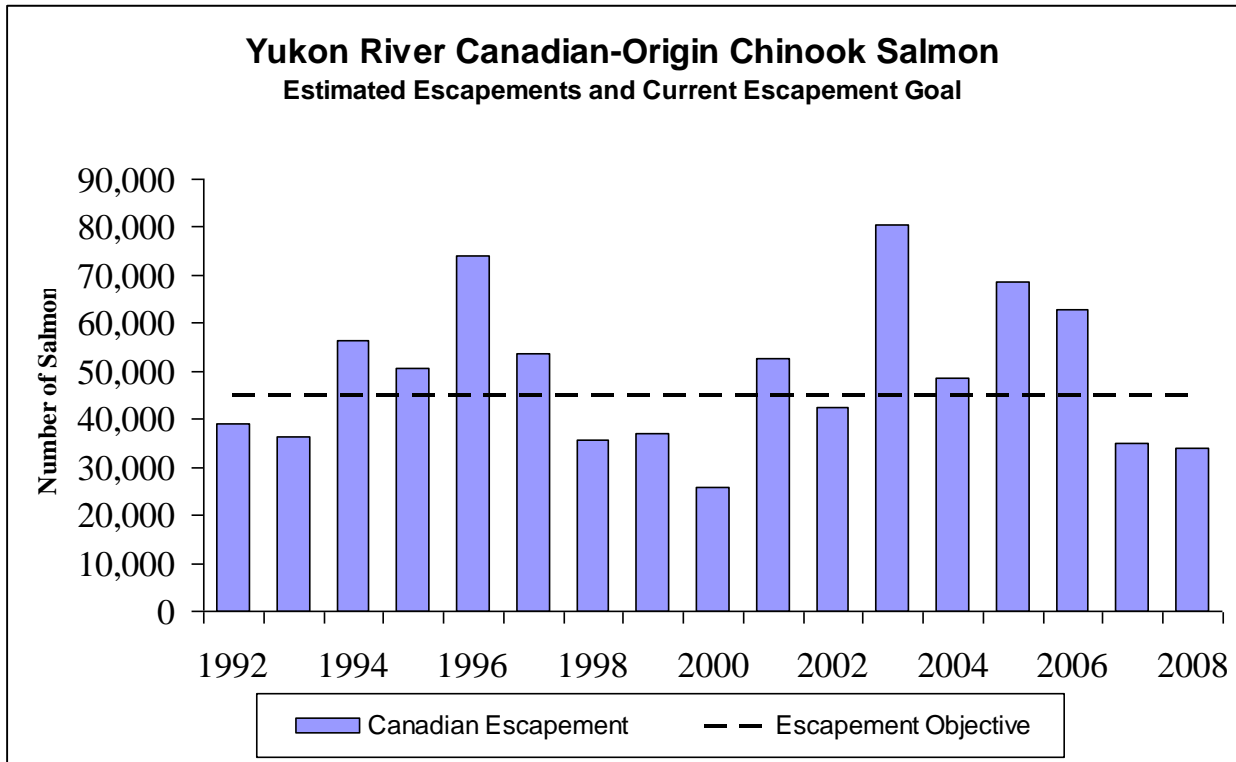


Figure 16. Canadian-Origin Yukon River Chinook salmon escapement estimate compared to the minimum objective of 45,000 set by the US-Canada Yukon River Panel in 2008. Canadian escapement estimates are based on a 3-Area escapement index, Eagle Sonar (2005-2007), and radio-telemetry (2002-2004).

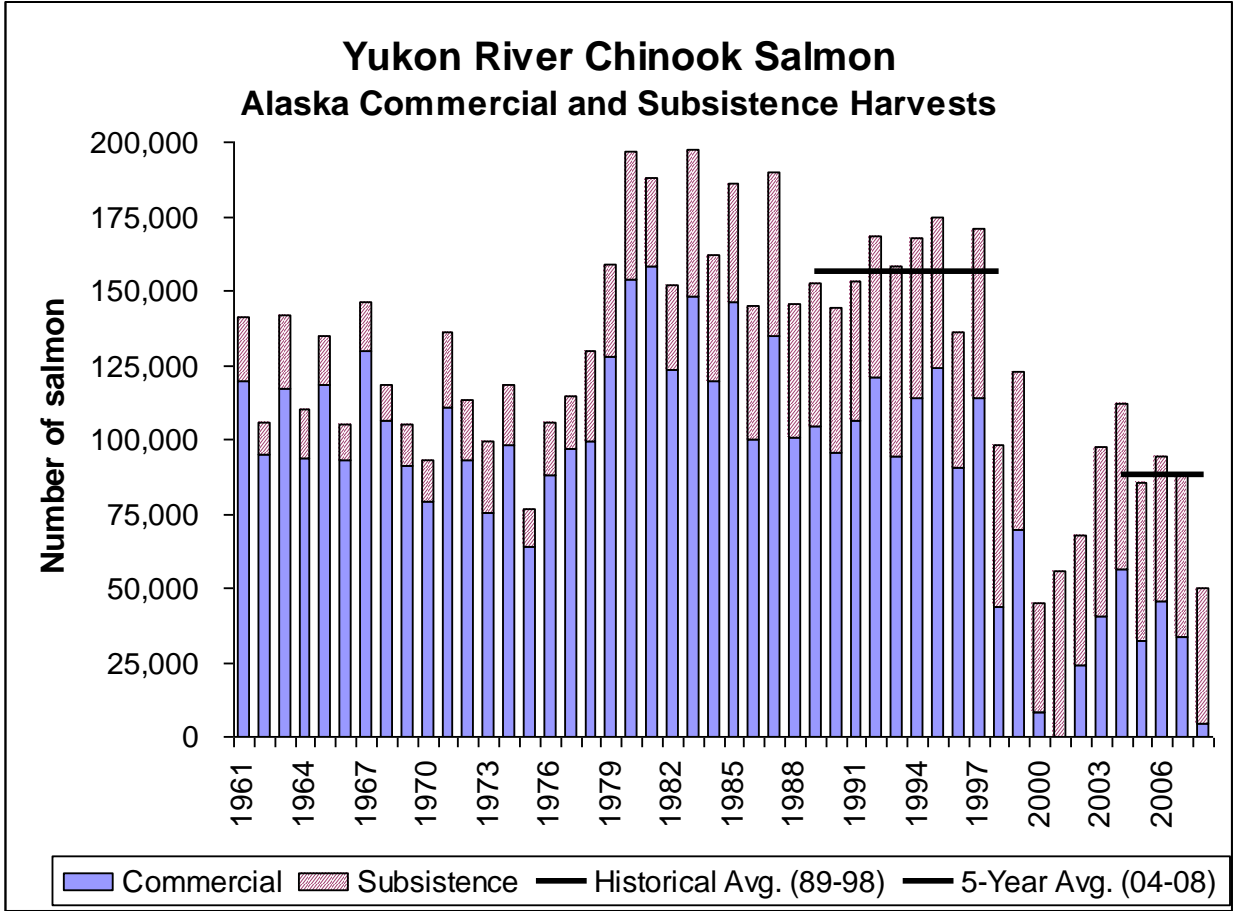


Figure 17. Yukon River Chinook salmon subsistence and commercial harvests compared to the historical baseline 1989-1998 average (156,092) and the recent 2004-2008 average (87,777).