

**ALASKA DEPARTMENT OF FISH AND GAME  
DIVISION OF COMMERCIAL FISHERIES  
NEWS RELEASE**



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**2011 Yukon River Fall Season Summary**

**Introduction**

This informational packet provides a summary of the 2011 Yukon Area fall season including fall chum and coho salmon harvests and escapement. All reported harvest and project results are preliminary and subject to modification.

The fall season for the Yukon Area begins by regulation on July 16 and continues until run assessment projects cease operations in late September and early October. For management purposes, the Yukon Area is divided into districts, subdistricts, and drainages (Figure 1).

The Yukon Area fall season salmon fisheries are managed according to:

- *5 AAC 01.249. Yukon River Drainage Fall Chum Salmon Management Plan,*
- *5 AAC 05.369., Yukon River Coho Salmon Management Plan,*
- *5 ACC 05.367. Tanana River Salmon Management Plan.*

The *Yukon River Fall Chum Salmon Management Plan* establishes a threshold of 500,000 fall chum salmon required to allow a directed commercial harvest (Table 1). The fall chum salmon management plan also incorporates the U.S./Canada treaty obligation for border passage and provides necessary guidelines for escapement and prioritizes uses. Incremental provisions are included that allow varying levels of subsistence salmon fishing balanced with requirements to attain escapement objectives. The intent of the plan is to align management objectives with the established SEGs or Biological Escapement Goals (BEG)s, provide flexibility in managing subsistence harvest when the stocks are low, and bolster salmon escapement as run abundance increases. The pulsed entry pattern of fall chum salmon into the Yukon River drainage, and the run size disparity between fall chum with overlapping coho salmon run, adds complexity to fall season management.

The *Yukon River Coho Salmon Management Plan* has provisions to allow a late season harvest of coho salmon if the department determines there is a harvestable surplus above escapement needs and those necessary for subsistence uses. Additionally, the department must determine that a directed coho salmon commercial fishery will not have a significant impact on escapement or allocation of fall chum salmon.

Management decisions occurring between the summer/fall season transition (July 16) and early to mid-August are influenced primarily on a preseason projection derived from the historical relationship between summer chum and fall chum salmon run sizes. Subsequent management decisions are based on run size projections derived from daily passage estimates from Pilot Station sonar. Additional lower river index projects, including the cooperative drift gillnet test fisheries located at Emmonak (operated by ADF&G) and Mountain Village (operated by Asacarsarmiut Traditional Council), provide run timing information and a measure of relative abundance. Relationships in run timing and run strength from the various index projects, as well as subsistence fishing reports, are compared for consistency with the Pilot Station sonar estimates as a method to check that projects appear to be operating correctly.

### **Fall Season Outlook**

The fall chum salmon forecast for 2011 was a point estimate of 737,000 fish with a range of 605,000 fish to 870,000 fish. The preseason projection, derived from a historical relationship between summer and fall chum salmon runs, was 790,000 fish. Based on the preseason projection, it was anticipated that the 2011 fall chum salmon run size would be sufficient for escapement and subsistence uses, and support a commercial harvest. The 2011 coho salmon run was anticipated to be average based on escapements observed in 2007. The commercial harvest was expected to be between 10,000 to 70,000 fish.

### **Fall Season Overview**

The fall season began by regulation on July 16. Subsistence fishing in Districts 1, 2, 3, and Subdistrict 5-D were open 7 days a week, 24 hours a day, while District 4 and Subdistricts 5-A, 5-B, and 5-C were on a 5 days a week schedule. A limited commercial harvest was allowed in Districts 1 and 2 during the transition time between the summer and fall seasons. By the last week of July, run assessment indicated that the 2011 run was below average, and no commercial fishing occurred during that time.

The first and largest pulse of fall chum salmon entered Yukon River on July 30 (Figure 2). Run assessment indicated that there was a surplus available for commercial harvest and commercial fishing in Districts 1 and 2 continued through the remainder of the season. Fall chum salmon continued to enter Yukon River over four additional pulses through September 7 (Figure 2), and projections indicated a surplus of fall chum salmon for commercial harvest. Attempts were made to align commercial openings with pulses as they entered the river. In between pulses, commercial openings occurred on a set schedule. Limited commercial fishing also occurred in Subdistricts 5-B and 5-C in early August, and in District 6 in September.

Subsistence fishing was liberalized to 7 days a week, 24 hours a day on August 30 in District 4, on September 12 in Subdistricts 5-A, 5-B, and 5-C, and on October 1 in District 6.

Coho salmon were harvested incidentally in fall chum salmon directed commercial openings. Three commercial openings in District 1 in September targeted coho salmon (Figure 3).

### **Commercial Fishing Summary**

There were a total of 31 commercial periods in 2011 (Table 2) with majority of commercial fishing occurring in the lower river districts. The 2011 total commercial harvest for the Yukon River fall season in the Alaskan portion of the drainage was 238,979 fall chum and 76,303 coho salmon. Both harvests were above their respective most recent 5-year (2006-2010) and 10-year (2001-2010) averages (Tables 4 and 5). The fall chum salmon harvest was the largest since 1995 and the coho salmon harvest was the largest since 1991. All salmon were sold in the round and no salmon roe was sold separately. In District 6 one buyer selectively purchased male salmon. The exvessel value of the total harvest was \$2,122,649 (Table 5); \$1,643,689 for fall chum and \$478,960 for coho salmon. All values were above their 2003-2010 averages. A total of 410 individual permit holders participated in the 2011 fall chum and coho salmon fishery (Table 6); 403 in Districts 1 and 2 combined and 7 in Districts 4, 5, and 6 combined. Participation in all districts was above historical averages.

### **Subsistence/Personal Use Fishing Summary**

A comprehensive estimate of the 2011 subsistence harvest based on household surveys and permit harvest information for salmon and non-salmon species is not available at this time, but it is anticipated to be available by late spring of 2011.

### **Salmon Escapement**

Total run size, based on an adjusted Pilot Station sonar abundance estimate and the addition of estimated commercial and subsistence harvests downstream of the sonar site, including test fisheries), was 951,000 fall chum salmon. Based on the location of the project, at river mile 123, the abundance estimate includes Koyukuk River drainage stocks.

Calculating total run size post season is based on individually monitored spawning escapements including estimated U.S. and Canadian harvests. Escapements were monitored in the Chandalar, Sheenjek, and the Canadian mainstem rivers using sonar, and in Fishing Branch River with a weir. Assessment of Tanana River stocks is based on either genetic apportionment of Pilot Station counts (both summer and fall Tanana River stocks passing after July 19) or the Delta River escapement and its relationship to the Tanana River mark-recapture estimates. In 2011, estimating run size based on the various projects resulted in a preliminary estimate of 1 million fall chum salmon. Estimates of run size derived from individual projects are typically higher than those based at Pilot Station sonar in part because of 1) apportionment of small stocks and 2) advancement of technologies used to enumerate fish in the upriver monitoring projects. Drainagewide escapement of fall chum salmon is estimated to be between 620,000 and 740,000 which exceeds the upper end of the BEG range of 300,000 to 600,000.

Fall chum salmon escapement into the Tanana River drainage was still being assessed at the time of this writing (Table 7) although it is anticipated goals will be met. The fall chum salmon escapement of 300,000 into Chandalar River exceeded the upper end of the BEG range of 74,000 to 152,000 fish, while the escapement of 98,000 fish into Sheenjek River was within the BEG

range of 50,000 to 104,000 fish. The fall chum salmon passage of 200,000 fish into Canada exceeded the interim goal range of 70,000 to 104,000 fish.

In 2011, the proportion of age-3 fish (0.8%) was below average (3%), age-4 (71%) fish was below average (65%), age-5 (28%) fish was near average (27%), and age-6 (0.4%) was near average of (0.8%) based on weighted averages from samples collected at the Lower Yukon Test Fishery for the years 1977 to 2010. Females contributed 57% to the samples and were near average (59%).

There are few coho salmon spawning escapement assessment projects in the Yukon River drainage because of funding limitations. The sonar at Pilot Station was operated a week longer than usual, through September 7 (since 2008), with an estimated passage of 119,000 coho salmon which is below the historical average of 146,000 fish (Table 8). The Delta Clearwater River (DCR) has the only established escapement goal for coho salmon, a SEG of 5,200–17,000 fish. Fall season surveys for the DCR, Nenana, Kantishna drainages as well as the south bank of the Tanana River from Fairbanks to Delta Junction have not been completed at this time.

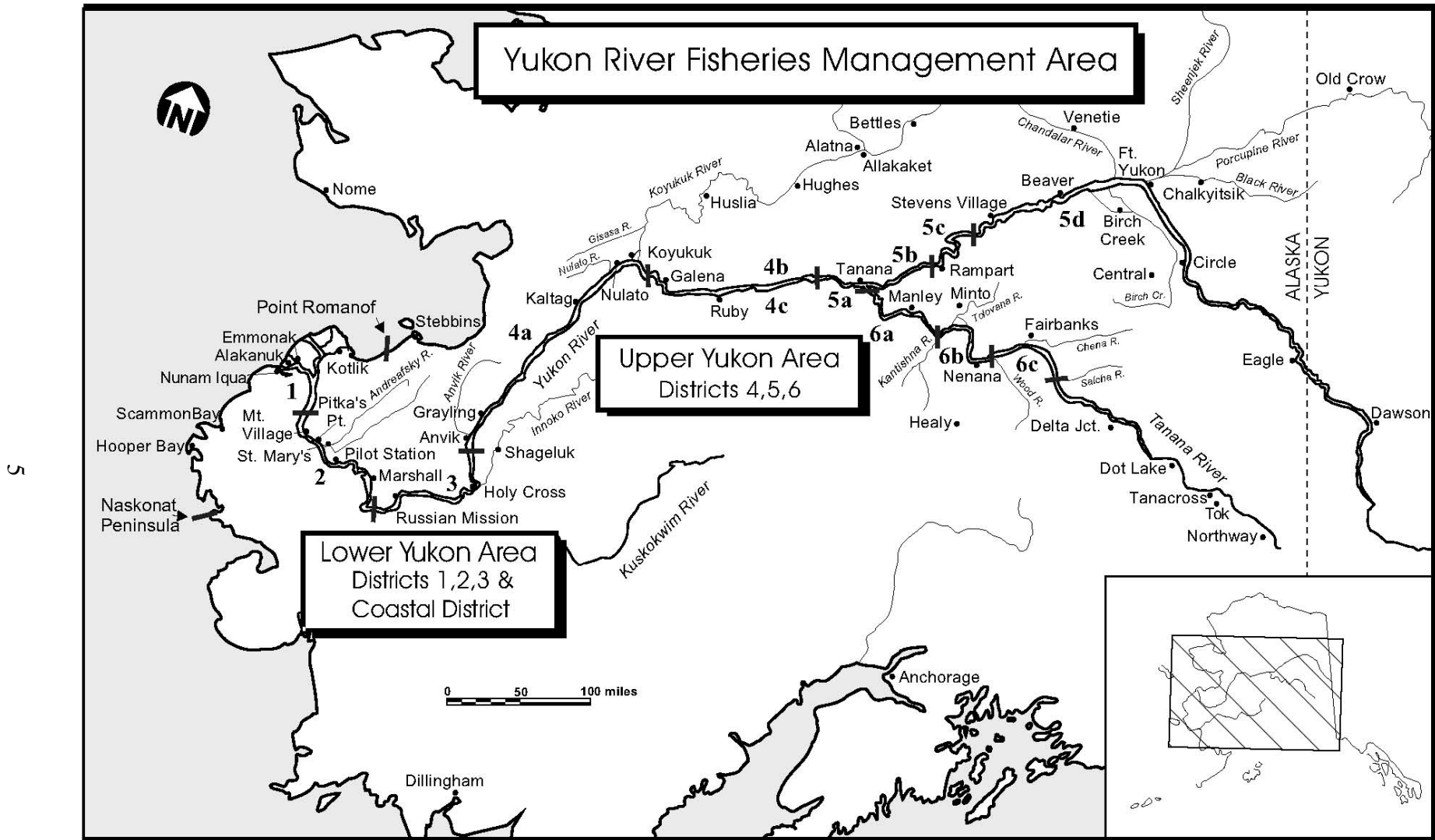


Figure 1. Alaskan portion of the Yukon River drainage showing fishing districts and communities.

**Table 1. The 2010 Yukon River Drainage Fall Chum Salmon Management Plan, 5AAC 01.249.**

Run Size Estimate <sup>b</sup> (Point Estimate)	Recommended Management Action <sup>a</sup> Fall Chum Salmon Directed Fisheries				Targeted Drainagewide Escapement
	Commercial	Personal Use	Sport	Subsistence	
300,000 or Less	Closure	Closure	Closure	Closure <sup>c</sup>	300,000
300,001 to 500,000	Closure	Closure <sup>c</sup>	Closure <sup>c</sup>	Possible Restrictions <sup>c,d</sup>	to
Greater Than 500,001	Open <sup>e</sup>	Open	Open	Pre-2001 Fishing Schedules	600,000

<sup>a</sup> Considerations for the Canadian mainstem rebuilding plan may require more restrictive management actions. <sup>b</sup> The department will use the best available data, including preseason projections, mainstem river sonar passage estimates, test fisheries indices, subsistence and commercial fishing reports, and passage estimates from escapement monitoring projects.

<sup>c</sup> The fisheries may be opened or less restrictive in areas where indicator(s) suggest the escapement goal(s) in that area will be achieved.

<sup>d</sup> Subsistence fishing will be managed to achieve a minimum drainagewide escapement goal of 300,000 fall chum salmon.

<sup>e</sup> Drainagewide commercial fisheries may be open and the harvestable surplus above 500,000 fall chum salmon will be distributed by district or subdistrict (in proportion to the guidelines harvest levels established in 5 AAC 05.365 and 5 AAC 05.367).

Table 2. Preliminary fall season commercial salmon harvest, by district, Yukon Area, 2011.

District	Periods	Permits	Fall Chum Salmon			Coho Salmon		
			Number	Pounds	Average Weight	Number	Pounds	Average Weight
1	16	234	127,735	912,070	7.1	45,335	311,147	6.9
2	6	169	100,731	715,505	7.1	24,184	161,021	6.7
3			No commercial openings					
4			No commercial openings					
5 <sup>a</sup>	3	-	1,246	8,722	7.0	0	0	N/A
6	6	-	9,267	63,170	6.5	6,784	44,236	7.0
<b>TOTAL</b>	<b>31</b>	<b>410</b>	<b>238,979</b>	<b>1,699,467</b>	<b>N/A</b>	<b>76,303</b>	<b>516,404</b>	<b>N/A</b>

*NOTE: Endash indicates that fewer than three commercial permits were fished during the season and are confidential.*

<sup>a</sup> Commercial fishing occurred in Subdistricts 5-B and 5-C

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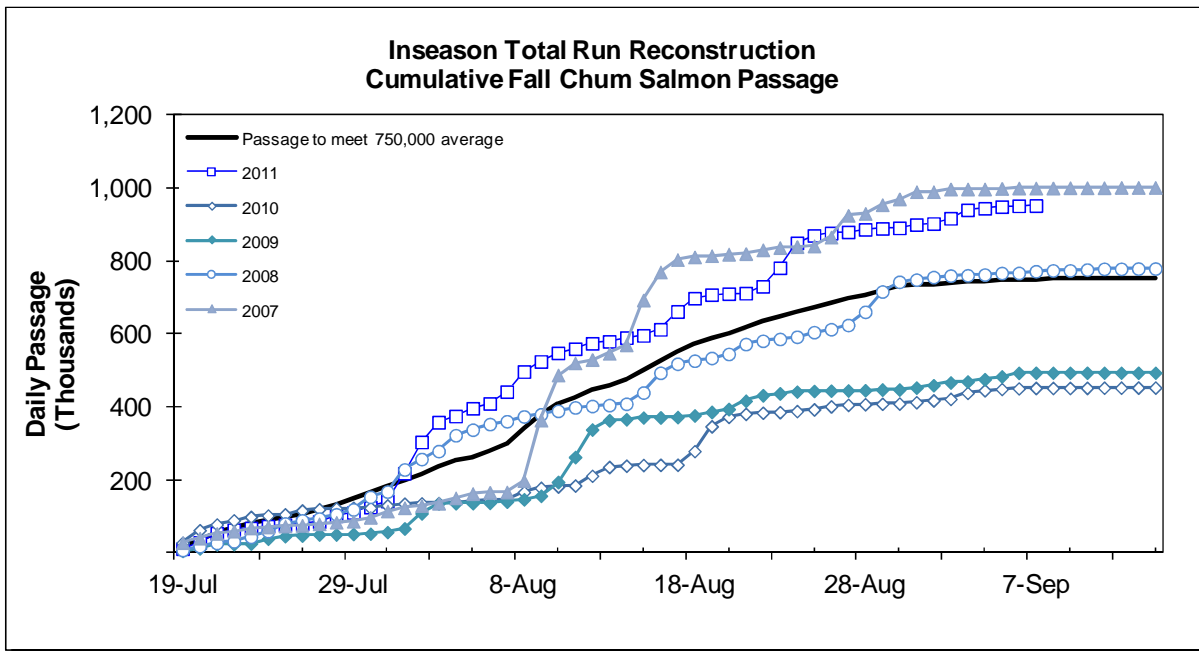
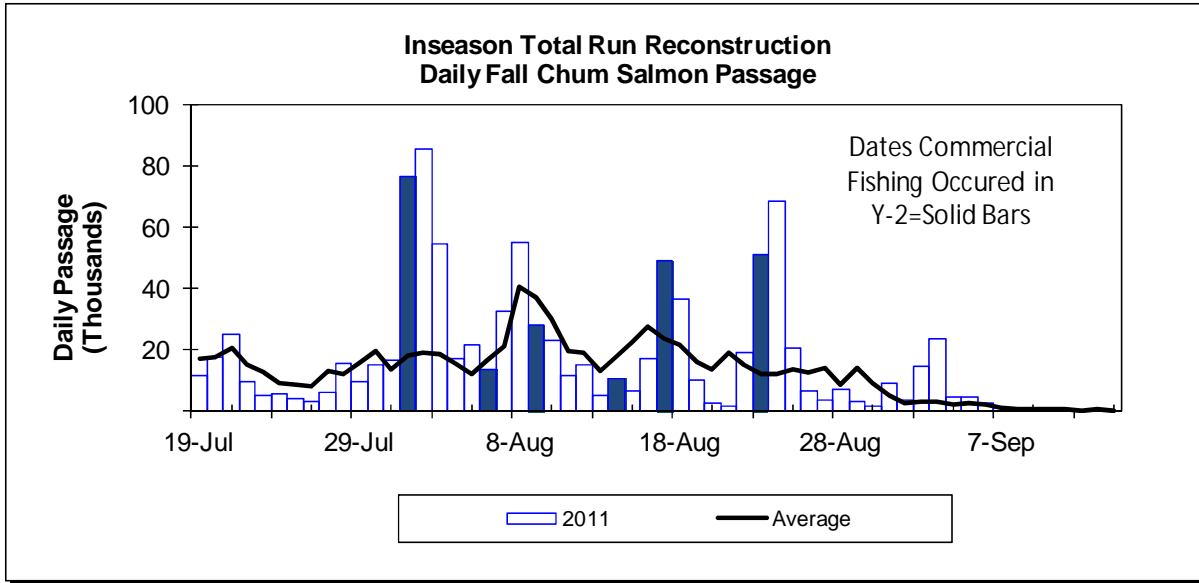


Figure 2. (top) Daily fall chum salmon passage counts, based on run reconstruction, at Pilot Station sonar in 2011 compared to historical average; (bottom) cumulative Pilot Station sonar passage counts in 2011 compared to select years and counts needed to reach 750,000 average run size.



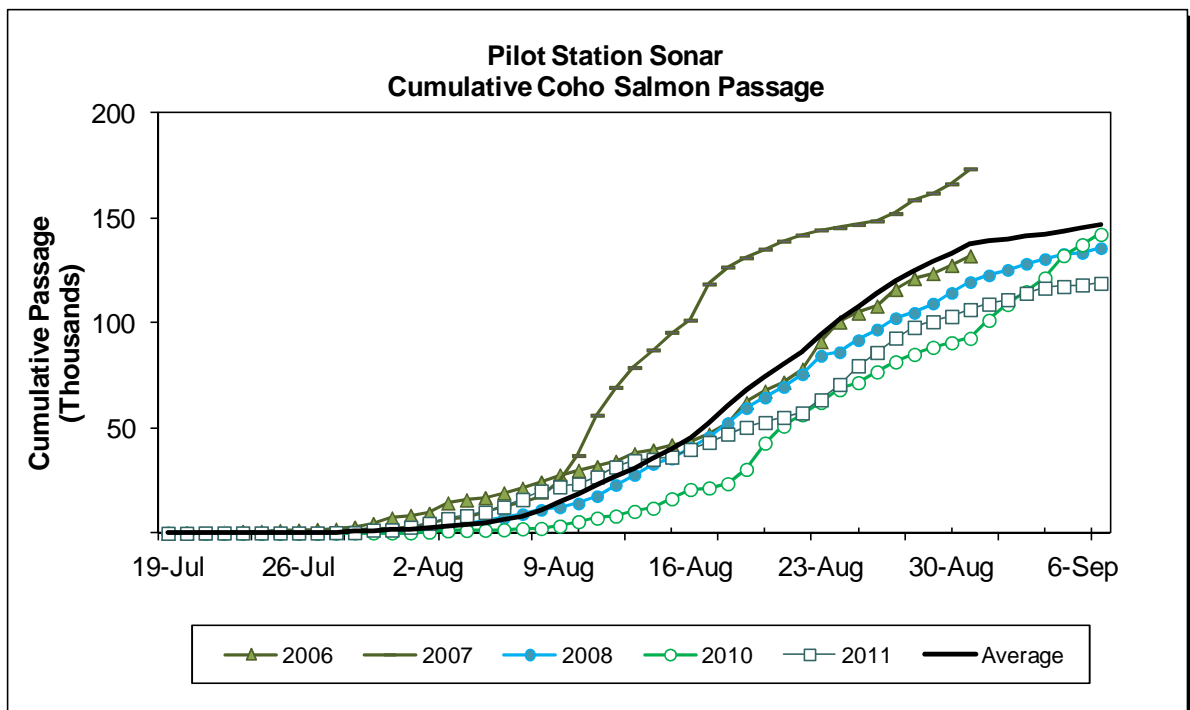
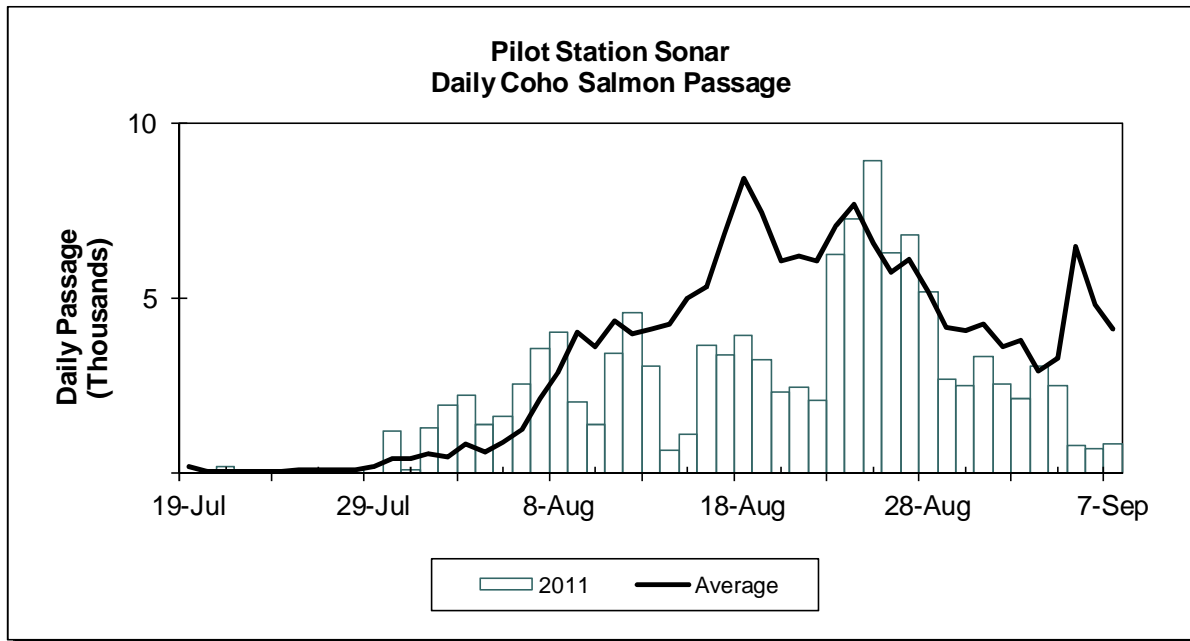


Figure 3. (top) Daily coho salmon Pilot Station sonar passage counts in 2011 compared to select years; (bottom) cumulative Pilot Station sonar passage counts in 2011 compared to cumulative counts for select years and historical average.

Table 3. Fall chum salmon commercial harvest by district, Yukon River, 1971–2011.

Year <sup>a</sup>	<i>Lower Yukon</i>				<i>Upper Yukon</i> <sup>b</sup>				Yukon Total
	District 1	District 2	District 3	<i>Subtotal</i>	District 4	District 5	District 6	<i>Subtotal</i>	
1971	188,533	0	0	188,533	1,061	-	-	1,061	189,594
1972	136,711	12,898	1,313	150,922	1,254	-	-	1,254	152,176
1973	173,783	45,304	0	219,087	13,003	-	-	13,003	232,090
1974	176,036	53,540	552	230,128	9,213	23,551	26,884	59,648	289,776
1975	158,183	51,666	5,590	215,439	13,666	27,212	18,692	59,570	275,009
1976	105,851	21,212	4,250	131,313	1,742	5,387	17,948	25,077	156,390
1977	131,758	51,994	15,851	199,603	13,980	25,730	18,673	58,383	257,986
1978	127,947	51,646	11,527	191,120	12,709	26,236	16,946	55,891	247,011
1979	109,406	94,042	25,955	229,403	52,098	55,556	41,355	149,009	378,412
1980	106,829	83,881	13,718	204,428	32,730	42,245	19,519	94,494	298,922
1981	167,834	154,883	19,043	341,760	19,851	94,793	29,608	144,252	486,012
1982	97,484	96,581	5,815	199,880	4,061	13,979	7,370	25,410	225,290
1983	124,371	85,645	10,018	220,034	6,114	43,993	35,994	86,101	306,135
1984	78,751	70,803	6,429	155,983	9,841	24,117	17,785	51,743	207,726
1985	129,948	40,490	5,164	175,602	26,977	25,338	42,352	94,667	270,269
1986	59,352	51,307	2,793	113,452	2,045	22,448	2,074	26,567	140,019
1987	0	0	0	0	0	0	0	0	0
1988	45,317	31,861	2,090	79,268	17,083	16,989	23,650	57,722	136,990
1989	77,876	97,906	15,332	191,114	15,183	22,204	56,443	93,830	284,944
1990	27,337	37,173	3,715	68,225	8,166	8,976	50,717	67,859	136,084
1991	59,724	102,628	9,213	171,565	6,091	32,114	44,448	82,653	254,218
1992	0	0	0	0	0	0	19,022	19,022	19,022
1993	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	3,630	4,369	7,999	7,999
1995	79,345	90,831	0	170,176	8,731	30,033	74,117	112,881	283,057
1996	33,629	29,651	0	63,280	2,918	21,858	17,574	42,350	105,630
1997	27,483	24,326	0	51,809	2,458	3,920	0	6,378	58,187
1998	0	0	0	0	0	0	0	0	0
1999	9,987	9,703	0	19,690	681	0	0	681	20,371
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	5,586	0	0	5,586	1,315	0	4,095	5,410	10,996
2004	660	0	0	660	0	0	3,450	3,450	4,110
2005	130,525	0	0	130,525	0	0	49,637	49,637	180,162
2006	101,254	39,905	0	141,159	0	10,030	23,353	33,383	174,542
2007	38,852	35,826	0	74,678	0	427	15,572	15,999	90,677
2008	67,704	41,270	0	108,974	0	4,556	5,735	10,291	119,265
2009	11,911	12,072	0	23,983	0	0	1,286	1,286	25,269
2010	545	270	0	815	0	0	1,735	1,735	2,550
2011	127,735	100,731	0	228,466	0	1,246	9,267	10,513	238,979
5 Year Average 2006 - 2010									
	22,027	12,934	0	34,961	0	1,501	4,768	6,270	82,461
10 Year Average 2001 - 2010									
	35,704	12,934	0	48,638	132	1,501	10,486	12,119	60,757

<sup>a</sup> Numbers of fish harvested are based on reports from the State TIX and Zephyr programs.

<sup>b</sup> Estimated harvest is the number of fish sold in the round plus the estimated number of females to produce the roe sold.

Table 4. Coho salmon commercial harvest by district, Yukon River, 1971–2011.

Year <sup>a</sup>	<i>Lower Yukon</i>				<i>Upper Yukon</i> <sup>b</sup>				Yukon Total
	District 1	District 2	District 3	<i>Subtotal</i>	District 4	District 5	District 6	<i>Subtotal</i>	
1971	12,165	0	0	12,165	38	-	-	38	12,203
1972	21,705	506	0	22,211	22	-	-	22	22,233
1973	34,860	1,781	0	36,641	0	-	-	0	36,641
1974	13,713	176	0	13,889	0	1,409	1,479	2,888	16,777
1975	2,288	200	0	2,488	0	5	53	58	2,546
1976	4,064	17	0	4,081	0	0	1,103	1,103	5,184
1977	31,720	5,319	538	37,577	0	2	1,284	1,286	38,863
1978	16,460	5,835	758	23,053	32	1	3,066	3,099	26,152
1979	11,369	2,850	0	14,219	155	0	2,791	2,946	17,165
1980	4,829	2,660	0	7,489	30	0	1,226	1,256	8,745
1981	13,129	7,848	419	21,396	0	0	2,284	2,284	23,680
1982	15,115	14,179	87	29,381	15	0	7,780	7,795	37,176
1983	4,595	2,557	0	7,152	0	0	6,168	6,168	13,320
1984	29,472	43,064	621	73,157	1,095	0	7,006	8,101	81,258
1985	27,676	17,125	171	44,972	938	0	11,760	12,698	57,670
1986	24,824	21,197	793	46,814	0	0	441	441	47,255
1987	0	0	0	0	0	0	0	0	0
1988	36,028	34,758	1,419	72,205	2	8	13,972	13,982	86,187
1989	24,670	38,397	3,988	67,055	3	84	16,079	16,166	83,221
1990	13,354	16,405	918	30,677	0	0	14,804	14,804	45,481
1991	54,095	40,898	1,905	96,898	14	0	9,774	9,788	106,686
1992	0	0	0	0	0	0	7,979	7,979	7,979
1993	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	4,451	4,451	4,451
1995	21,625	18,488	0	40,113	0	0	6,900	6,900	47,013
1996	27,705	20,974	0	48,679	161	0	7,142	7,303	55,982
1997	21,450	13,056	0	34,506	814	0	0	814	35,320
1998	0	0	0	0	0	0	0	0	0
1999	855	746	0	1,601	0	0	0	0	1,601
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	9,757	0	0	9,757	0	0	15,486	15,486	25,243
2004	1,583	0	0	1,583	0	0	18,649	18,649	20,232
2005	36,533	0	0	36,533	0	0	21,778	21,778	58,311
2006	39,323	14,482	0	53,805	0	0	11,137	11,137	64,942
2007	21,720	21,487	0	43,207	0	0	1,368	1,368	44,575
2008	13,946	19,246	0	33,192	0	91	2,408	2,499	35,691
2009	5,992	1,577	0	7,569	0	0	457	457	8,026
2010	1,027	1,023	0	2,050	0	0	1,700	1,700	3,750
2011	45,335	24,184	0	69,519	0	0	6,784	6,784	76,303
5 Year Average 2006 - 2010									
	16,402	11,563	0	27,965	0	18	3,414	3,432	31,397
10 Year Average 2001 - 2010									
	8,659	3,613	0	11,041	0	6	4,293	4,299	26,077

<sup>a</sup> Numbers of fish harvested are based on reports from the State TIX and Zephyr programs.

<sup>b</sup> Estimated harvest is the number of fish sold in the round plus number of females to produce the roe sold.

Table 5. Exvessel value of fall chum and coho salmon commercial salmon fishery, 1977-2011.

Year	Fall Chum					Coho						Value by Species	
	Lower Yukon		Upper Yukon			Lower Yukon			Upper Yukon			Fall Chum	Coho
	\$/lb	Value	\$/lb	\$/lb Roe	Value	\$/lb	\$/lb Roe	Value	\$/lb	\$/lb Roe	Value		
1977	0.45	718,571	0.22		102,170	0.50		140,914	0.27		2,251	820,741	143,165
1978	0.47	691,854	0.25		103,091	0.60		96,823	0.24		6,105	794,945	102,928
1979	0.68	1,158,485	0.29		347,814	0.80		83,466	0.25		6,599	1,506,299	90,065
1980	0.28	394,162	0.27		198,088	0.36		17,374	0.29		2,374	592,250	19,748
1981	0.55	1,503,744	0.35		356,805	0.60		87,385	0.35		4,568	1,860,549	91,953
1982	0.55	846,492	0.28		53,258	0.69		135,828	0.37		18,786	899,750	154,614
1983	0.34	591,011	0.19		128,950	0.35		17,497	0.31		11,472	719,961	28,969
1984	0.32	374,359	0.26		103,417	0.50		256,050	0.24		12,823	477,776	268,873
1985	0.47	634,616	0.25		178,125	0.53		176,254	0.33		26,797	812,741	203,051
1986	0.49	399,321	0.14		30,309	0.71		211,942	0.21		556	429,630	212,498
1987	-	0	-		0	-		0	-		0	0	0
1988	1.01	638,700	0.32		151,300	1.38		734,400	0.37		34,116	790,000	768,516
1989	0.50	713,400	0.28		223,996	0.66		323,300	0.35		33,959	937,396	357,259
1990	0.45	238,165	0.29		174,965	0.66		137,302	0.34		37,026	413,130	174,328
1991	0.34	438,310	0.23	3.56	157,831	0.44		300,182	0.30	2.50	21,556	596,141	321,738
1992	-	0	0.39	4.50	54,161	-		0	0.39	2.18	19,529	54,161	19,529
1993	-	0	-		0	-		0	-		0	0	0
1994	-	0	0.16	1.50	8,517	-		0	0.48	1.50	8,739	8,517	8,739
1995	0.15	185,036	0.13	2.96	167,571	0.29		80,019	0.14	2.51	11,292	352,607	91,311
1996	0.10	48,579	0.13	1.71	45,438	0.26	2.96	96,795	0.09	2.16	13,020	94,017	109,815
1997	0.22	86,526	0.17	1.75	7,252	0.32		79,973	0.20		1,062	93,778	81,035
1998	-	0	-		0	-		0	-		0	0	0
1999	0.25	35,639	0.20		876	0.35		3,620	-		0	36,515	3,620
2000	-	0	-		0	-		0	-		0	0	0
2001	-	0	-		0	-		0	-		0	0	0
2002	-	0	-		0	-		0	-		0	0	0
2003	0.15	5,993	0.10		3,398	0.25		18,168	0.05		5,095	9,391	23,263
2004	0.25	1,126	0.05		848	0.25		2,774	0.06		6,372	1,974	9,146
2005	0.32	316,698	0.14		48,159	0.32		83,793	0.12		19,182	364,857	102,975
2006	0.20	202,637	0.14		33,806	0.20		50,299	0.19		11,137	236,443	61,436
2007	0.27	144,256	0.20		16,907	0.39		127,869	0.20		1,368	161,163	129,237
2008	0.55	428,969	0.27		22,089	0.97		216,777	0.20		3,717	451,058	220,494
2009	0.70	108,778	0.19		1,286	1.00		52,176	0.15		457	110,064	52,633
2010	1.00	5,428	0.23		2,761	1.50		20,535	0.26		442	8,189	20,977
2011	\$1.00	1,627,575	0.22		16,114	\$1.00		472,168	0.15		6,792	1,643,689	478,960
Average (2003-2010)	0.43	151,736	0.17		16,157	0.61		71,549	0.15		5,971	167,892	77,520

Table 6. Number of permit holders, by district, participating in the Yukon River fall season commercial salmon fisheries, 1971-2011.

Year	Fall Chum and Coho Salmon Season <sup>a</sup>								Yukon Area Total
	Lower Yukon Area				Upper Yukon Area				
	District 1	District 2	District 3	Subtotal <sup>b</sup>	District 4	District 5	District 6	Subtotal <sup>c</sup>	
1971	352	ND	ND	352	ND	ND	ND	ND	352
1972	353	75	3	431	ND	ND	ND	ND	431
1973	445	183	0	628	ND	ND	ND	ND	628
1974	322	121	6	449	17	23	22	62	511
1975	428	185	12	625	44	33	33	110	735
1976	422	194	28	644	18	36	44	98	742
1977	337	172	37	546	28	34	32	94	640
1978	429	204	28	661	24	43	30	97	758
1979	458	220	32	710	31	44	37	112	822
1980	395	232	23	650	33	43	26	102	752
1981	462	240	21	723	30	50	30	110	833
1982	445	218	15	678	15	24	25	64	742
1983	312	224	18	554	13	29	23	65	619
1984	327	216	12	536	18	39	26	83	619
1985	345	222	13	559	22	39	25	86	645
1986	282	231	14	510	-	21	-	21	531
1987	0	0	0	0	0	0	0	0	0
1988	328	233	13	563	20	20	32	72	635
1989	332	229	22	550	20	24	28	72	622
1990	301	227	19	529	11	11	27	49	578
1991	319	238	19	540	8	21	25	54	594
1992	0	0	0	0	0	0	22	22	22
1993	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	-	-	11	11	12
1995	189	172	0	361	4	12	20	36	397
1996	158	109	0	263	-	17	-	17	280
1997	176	130	0	304	3	8	0	11	315
1998	0	0	0	0	0	0	0	0	0
1999	146	110	0	254	4	0	0	4	258
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	75	0	0	75	-	-	5	5	80
2004	26	0	0	26	0	0	6	6	32
2005	177	0	0	177	0	0	7	7	184
2006	219	71	0	286	0	4	11	15	301
2007	181	122	0	300	-	-	8	8	308
2008	251	177	0	428	0	3	8	11	439
2009	165	130	0	292	-	-	-	-	292
2010	72	18	0	90	0	0	4	4	94
2011	234	169	0	403	-	-	-	7	410
Average									
2001-2010	117	52	0	167	0	1	5	6	173
2006-2010	178	100	0	297	0	2	9	10	305

NOTE: ND indicates no data. Endash indicates that fewer than three commercial permits were fished during the season and are confidential.

<sup>a</sup> Number of permit holders which made at least one delivery.

<sup>b</sup> Since 1984, the Subtotal for the Lower Yukon Area was the "unique" number of permits fished. Consequently, the Districts 1, 2, and 3 totals may add up to be greater than the Lower Yukon Subtotal. Before 1984, the Districts 1, 2, and 3 totals are summed and the resulting Subtotals may reflect that some permit holders operated in more than one district during the year.

<sup>c</sup> The sum of Districts 4, 5, and 6 averages may not equal Upper Yukon Area district Subtotal due to rounding error.

Table 7. Fall chum salmon passage estimates or escapement estimates for selected spawning areas, Yukon River drainage, 1971 to 2011.

Year	Alaska										Canada	
	Yukon River Mainstem Sonar Estimate	Tanana River Drainage					Upper Yukon River Drainage				Fishing Branch River i	Mainstem Escapement Estimate j
		Toklat River a	Kantishna / Toklat Rivers Tagging Estimate b	Delta River c	Bluff Cabin Slough d	Upper Tanana River Tagging Estimate e	Tanana River Estimate f	Chandalar River g	Sheenjek River h			
1971											312,800 k	
1972				5,384							35,230 l	
1973				10,469							15,991	
1974		41,798		5,915						89,966 m	31,841	
1975		92,265		3,734 n						173,371 m	353,282	
1976		52,891		6,312 n						26,354 m	36,584 k	
1977		34,887		16,876 n						45,544 m	88,400 k	
1978		37,001		11,136						32,449 m	40,800 k	
1979		158,336		8,355						91,372 m	119,898 k	
1980		26,346 o		5,137	3,190 p					28,933 m	55,268 k	22,912
1981		15,623		23,508	6,120 p					74,560 q	57,386 r	47,066
1982		3,624		4,235	1,156					31,421 q	15,901 k	31,958
1983		21,869		7,705	12,715					49,392 q	27,200 k	90,875
1984		16,758		12,411	4,017					27,130 q	15,150 k	56,633 s
1985		22,750		17,276 n	2,655 p					152,768 q	56,223	62,010
1986		17,976		6,703 n	3,458			59,313		84,207 t	31,810	87,940
1987		22,117		21,180	9,395			52,416		153,267 t	49,038	80,776
1988		13,436		18,024	4,481 p			33,619		45,206 t	23,645	36,786
1989		30,421		21,342 n	5,386 p			69,161		99,116 t	44,041	35,750
1990		34,739		8,992 n	1,632			78,631		77,750 t	35,000 u	51,735
1991		13,347		32,905 n	7,198			-		86,496 v	37,870	78,461
1992		14,070		8,893 n	3,615 p			-		78,808 v	22,539	49,082
1993		27,838		19,857	5,550 p			-		42,922 v	28,707	29,743
1994		76,057		23,777 n	2,277 p			-		150,565 v	65,247	98,358
1995	1,053,248	54,513 o		20,587	19,460	268,173	276,238	280,999	241,855 v	51,971 w	158,092	
1996		18,264		19,758 n	7,074	134,563	145,256	208,170	246,889 v	77,302	122,429	
1997	506,621	14,511		7,705 n	5,707	71,661	102,136	199,874	80,423 x	27,031	85,419	
1998	372,927	15,605		7,804 n	3,549	62,384	94,383	75,811	33,058 v	13,687	46,252	
1999	379,493	4,551	27,199	16,534 n	7,037	97,843	114,485	88,662	14,229 v	12,958	58,552	
2000	247,935	8,911 y	21,450	3,001 n	1,595	34,844	55,983	65,894	30,084 z	5,057	53,732	
2001	376,182	6,007	22,992	8,103 n	1,808 p	96,556 aa	117,342	110,971	53,932 v	21,737	33,491	
2002	326,858	28,519	56,665	11,992 n	3,116	109,961	164,497	89,850	31,642	13,600	98,679	
2003	889,778	21,492	87,359	22,582 n	10,600 p	193,418	264,698	214,416	44,047 ab	29,713	143,133	
2004	594,060	35,480	76,163	25,073 n	10,270 p	123,879	188,938	136,706	37,878	20,417	154,080	
2005	1,813,589	17,779 o	107,719	28,132 n	11,964 p	377,755	379,020	496,484	561,863 ac	119,058	437,733	
2006	790,563	-	71,135	14,055 n	-	202,669	226,677	245,090	160,178 ac	30,954	211,994	
2007	684,011	-	81,843	18,610 n	-	320,811	374,563	228,056	65,435 ac	32,150	254,649	
2008	615,127	-	-	23,055 n	1,198	-	141,529 ad	178,278	50,353 ac	19,086	174,267 ae	
2009	240,449 af	-	-	13,492 n	2,900 p	-	139,480 ag	150,000 ah	54,126 ac	25,828	93,626 ae	
2010	350,981	-	-	17,993 n	1,610 p	-	100,325 ad	157,998	22,053	15,773	117,871 ae	
2011 ai	695,011	-	-	N/A	N/A	-	N/A	295,335	97,976 ac	13,297	200,000 ae	
All Years Average	646,426 af	31,243	61,392	14,323	5,543	161,117	180,347	159,806	91,253	51,938	103,253	
Five Year Average 2006-2010	610,171 af	-	76,489	17,441	1,903	261,740	196,515	191,884	70,429	24,758	170,481	
BEG Range	300,000	15,000	6,000	13,000	46,000 aj	61,000	74,000	50,000	50,000	50,000	> 80,000 ak	
Interim Escapement Objective	600,000	33,000	13,000	103,000	136,000	152,000	104,000	104,000	104,000	22,000-49,000 al	70,000-104,000 am	

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Table 7. (continued).

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- a Total abundance estimates for the upper Toklat River drainage spawning index area using stream life curve method developed with 1987 to 1993 data.
  - b Fall chum salmon passage estimate for the Kantishna and Toklat River drainages is based on tag deployment from a fish wheel located at the lower end of the Kantishna River and recaptures from three fish wheels; two located on the Toklat River (1999 to 2007) about eight miles upstream of the mouth and one fish wheel on the Kantishna River (2000 to 2007) near the Bear Paw River.
  - c Total escapement estimate generated from the migratory time density curve method unless otherwise indicated.
  - d Peak counts from foot surveys unless otherwise noted.
  - e Fall chum salmon passage estimate for the upper Tanana River drainage based on tag deployment from a fish wheel (two fish wheels in 1995) located just upstream of the Kantishna River and recaptures from one fish wheel (two fish wheels from 1995 to 1998) located downstream from the village of Nenana.
  - f Fall chum salmon passage estimate based on mark-recapture projects operated from 1995-2007 on the upper Tanana River and from 1999-2007 on the Kantishna River minus harvests.
  - g Single beam sonar estimate (1986 -1990), split beam sonar estimate (1995 to 2006). DIDSON sonar (2007-present).
  - h Single beam sonar estimate (1981-2002), split beam sonar estimate (2003-2004), DIDSON sonar (2005-present).
  - i Located within the Canadian portion of the Porcupine River drainage. Weir count, unless otherwise indicated. Late season adjustments have been made for the period when weir was not operating for most years.
  - j Estimated mainstem Canadian escapement derived from mark-recapture project minus Canadian mainstem harvest and excluding Canadian Porcupine River drainage escapement, unless otherwise noted.
  - k Total escapement estimated using weir to aerial survey expansion factor of 2.72, unless otherwise indicated.
  - l Weir installed on September 22, 1972. Estimate consists of a weir count of 17,190 after September 22, and a tagging passage estimate of 17,935 prior to weir installation.
  - m Total escapement estimate using sonar to aerial survey expansion factor of 2.22.
  - n Population estimate generated from replicate foot surveys and stream life data using AUC (area-under-curve) method.
  - o Minimal estimate because of late timing of ground surveys with respect to peak of spawning.
  - p Peak aerial survey counts.
  - q Project started late, estimated escapement expanded for portion missed using average run timing curves based on Chandalar (1986-1990) and Sheenjek (1991-1993) rivers.
  - r Initial aerial survey count was doubled before applying the weir to aerial expansion factor of 2.72 since only half of the spawning area was surveyed.
  - s Escapement estimate based on mark-recapture program is unavailable. Estimate is based on assumed average exploitation rate.
  - t Expanded estimates, using Chandalar River fall chum salmon run timing data, for the approximate period from mid-August through the middle of the fourth week of September.
  - u Population of spawners was reported by DFO as between 30,000 to 40,000 fish considering aerial survey timing. For purpose of this table an average of 35,000 fall chum salmon was estimated to pass by the weir. Note: A single survey flown October 26, 1990, counted 7,541 chum salmon. A population estimate of approximately 27,000 fish was made through date of survey, based upon historic average aerial to weir expansion of 28%.
  - v Total abundance estimates are for the approximate period from mid-August through the middle of the fourth week of September. Comparative escapement estimates prior to 1986 are considered more conservative; approximating the period from the end of August through middle of the fourth week of September.
  - w Minimal count because weir was closed while submerged due to high water, during the period August 31 to September 8, 1995.
  - x The passage estimate includes an additional 15,134 salmon that were estimated to have passed during 127 hours that the sonar was inoperable due to high water from August 29 until September 3, 1997.
  - y Aerial survey count from 10/23/00. Non expanded foot survey counts conducted from 10/11-10/16/00 were 2,496 fall chum salmon.
  - z Project ended early, sonar passage estimate was 18,652 (62% of normal run timing). The total sonar passage estimate, 30,083, was expanded to reflect the 1986-1999 average run timing through September 24.
  - aa Due to low numbers of tags deployed and recovered the estimate has a large range in confidence interval (95% CI  $\pm$  41,172).
  - ab Project ended on peak daily passage due to late run timing, estimate was expanded based on run timing (87%) at Rapids.
  - ac BEG based on right bank only. Inseason right bank counts include 266,963, 106,397, 39,548, 35,912, 28,480, and 49,080 in 2005 through 2009 and 2011 respectively.
  - ad Tanana River estimate is based on genetics apportionment to Pilot Station sonar and represents all Tanana fall chum as well as Tanana summer chum salmon after July 19th to be comparable to the historical mark-recapture estimates.
  - ae Estimated mainstem Canadian escapement derived from Eagle sonar estimate (2008 to present) minus harvest from Eagle community upstream including Canadian harvests.
  - af Excludes 2009 because of problems with apportionment during extremely low water operations.
  - ag Tanana River estimate is based on Delta River representing on average 10% of Upper Tanana plus 20,000 for Kantishna River component.
  - ah Project ended early, estimate based on regression of Chandalar to Fishing Branch River plus Mainstem Border from 1995-2009.
  - ai Preliminary data.
  - aj Upper Tanana River goal is the Tanana River drainage BEG minus the lower and upper ranges of the Toklat River goal based on Eggers (2001) and is not an established BEG.
  - ak The escapement goal after rebuilding is greater than 80,000 fish. Since 2008 has been based on Eagle sonar counts.
  - al Interim Management Escapement Goal (IMEG) established 2008. Based on Bue and Hasbrock SEG method.
  - am IMEG of 70,000 to 104,000 was established for 2010 and 2011 based on Canadian stock Ricker model which still needs reviewed.
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Table 8. Coho salmon escapement estimates for selected spawning areas, Yukon River drainage, 1972 to 2011.

Year	East Fork Andraafsky River a	Yukon River Mainstem Sonar Estimate b	Kantishna River Drainage			Nenana River Drainage					Delta Clearwater River e	Delta Clearwater River Tributaries f	Clearwater Lake and Outlet
			Anvik River	Geiger Creek c	Barton Creek	Lost Slough	Nenana Mainstem d	Wood Creek	Seventeen Slough	Lignite Springs c			
1972											632		417
1973											3,322		551
1974						1,388			27		3,954 h		560
1975						943			956		5,100		1,575
1976			467 g	25 g h		118			281		1,920		1,500
1977			81 g	60		524 g		310 c	1,167		4,793		730
1978						350		300 c	466		4,798		570
1979						227			1,987		8,970		1,015
1980				3 g h		499 g		1,603 c	592		3,946		1,545
1981	1,657 g					274		849 j k	1,005		8,563 l		459
1982				81				1,436 j k			8,365 l		
1983				42		766		1,042 j	103		8,019 l		253
1984				20 g h		2,677		8,826 j			11,061		1,368
1985				42 g h		1,584		4,470 j	2,081		6,842		750
1986				5	496	794		1,664 j	218 i		10,857		1,800
1987				1,175		2,511		2,387 j	3,802		22,300		4,225
1988	1,913 m		1,203	159	437	348		2,046 j			21,600		825
1989				155	12 g			412 j	824 g		12,600		1,600
1990				211		688	1,308		15 g		8,325		2,375
1991				427	467 g	564	447		52		23,900		3,150
1992				77	55 g	372			490		3,963		229
1993				138	141	484	419	666 j n	581		10,875		3,525
1994				410	2,000 j o	944	1,648	1,317 j p	2,909	244	62,675	17,565 g	3,425
1995	10,901	100,664		142	192 j q	4,169	2,218	500 j	2,972 g		20,100	6,283 g	3,625
1996	8,037			233	0 j	2,040	2,171	201 h r	3,666 i	282	14,075	3,300 g	1,125
1997	9,472	105,956		274		1,524 s	1,446	h r	1,996	50 j u	11,525	2,375 g	2,775
1998	7,193	129,076		157		1,360 h	2,771 h	370 t ab	1,413 t	175 j	11,100	2,775 g	2,775
1999	2,963	60,886		29		1,002 h	745 h	ab	662 h		10,975	2,805	
2000	8,451	169,392		142		55 g h	68 g h	ab	879 g h	95	9,225	2,358	1,025
2001	15,896	132,283	262 g	578		242	859	699	3,753	135	46,875	11,982	4,425
2002	3,577	117,908		744		0	328	935	1,910	130	38,625	9,873	5,900
2003	8,231	265,119		973		85	658	3,055	4,535	67	105,850	27,057	8,800
2004	11,146	199,884		583		220	450	840	3,370		37,950	9,701	2,925
2005	5,303	184,071		625		430	325 h	1,030	3,890		34,293	8,766	2,100
2006		131,919				194	160 h	634	1,916		16,748	4,281	4,375
2007		173,289				63	520	605	1,733	334	14,650	3,961	2,075
2008		135,570		183		1,342	1,539	578	1,652		7,500	1,917	1,275
2009		205,278 w		137		410		470	680		16,850	4,307	5,450
2010		142,149				1,110	280	340	720		5,867		813
2011 x		118,879		N/A		369	N/A	N/A	912		N/A	N/A	N/A
All Years Average	7,471	144,470 w	503	270	422	852	966	1,392	1,549	168	16,913	7,457	2,214
Five Year Average 2006-2010	-	145,732 w	-	160	-	624	625	525	1,340	334	12,323	3,617	2,798
Interim Escapement Objective											5,200 to 17,000 y		

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Table 8. (continued).

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a	Weir count, unless otherwise indicated.
b	Passage estimates for coho salmon are incomplete. The sonar project is terminated in most years prior to the end of the coho salmon run.
c	Foot survey, unless otherwise indicated.
d	Mainstem Nenana River between confluences of Lost Slough and Teklanika River.
e	Boat survey counts in the lower 17.5 river miles, unless otherwise indicated.
f	Helicopter surveys counted tributaries of the Delta Clearwater River, outside of the normal mainstem index area, from 1994 to 1999 after which an expansion factor was used to estimate the escapement to the areas.
g	Aerial survey, fixed winged or helicopter.
h	Poor survey.
i	Boat Survey.
j	Weir count.
k	Coho weir was operated at the mouth of Clear Creek (Shores Landing).
l	Expanded estimate based on partial survey counts and historic distribution of spawners from 1977 to 1980.
m	The West Fork Andreafsky was also surveyed and 830 chum salmon were observed.
n	Weir project terminated on October 4, 1993. Weir normally operated until mid to late October.
o	A total of 298 coho salmon were passed between September 11 and October 4, 1994. However, it was estimated that 1,500 to 2,000 coho salmon passed the weir site within a 24-hour period beginning at approximately no October 4. Weir operated from August 18 through morning of October 5, 1994.
p	Weir project terminated September 27, 1994. Weir normally operated until mid-October.
q	An additional 1,000 coho salmon were estimated pooled downstream of weir on October 2, 1995, just prior to weir removal.
r	Beginning at confluence of Clear Creek, the survey includes counts of both Glacier and Wood Creeks to their headwaters.
s	Survey of western floodplain only.
t	Combination foot and boat survey.
u	Estimated count by Perry Corsetti, Healy school teacher, operating a school project weir, after coho salmon were illegally (shot) taken from spawning grounds prior to October 9, 1997.
v	No survey of Wood Creek due to obstructions in creek.
w	Excludes 2009 because of problems with apportionment during extremely low water operations.
x	Preliminary data.
y	Sustainable escapement goal established in 2004, based on boat survey counts of coho salmon in the lower 17.5 river miles during the period October 21 through 27.

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