

ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

NEWS RELEASE



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2018 Yukon Area Fall Season Summary

This news release provides a preliminary summary of the 2018 fall season including fall chum and coho salmon harvests and escapement in the Yukon Area (Figure 1). All reported results are preliminary and subject to revision.

2018 Fall Season Outlook

The forecasted fall chum salmon run size, using brood year analysis, was a point estimate of 1,700,000 fish with a range of 1,600,000 to 1,800,000 fish. A preseason run projection was made in mid-July using the historical relationship between summer and fall chum salmon run sizes. Based on an estimated summer chum salmon run size of 2.0 M fish which was slightly below average, the resulting preseason fall chum salmon projection was 700,000-900,000 fish which was below the forecasted range.

Assuming average run survival from the 2014 parent year, and based on recent trends, the 2018 coho salmon outlook was for an average run size. A coho salmon index developed for the Yukon River from 1995 to 2017 (excluding 1996 and 2009) suggests that the median escapement is approximately 165,000 fish.

Preseason Management Strategy

The preseason run projection indicated that the 2018 fall chum salmon run would be sufficient to meet escapement needs, an above average subsistence harvest, and a limited commercial harvest. The preseason management strategy included the following components:

- Concurrent with the fall chum salmon migration upriver, all Yukon Area districts and subdistricts would be placed on their full regulatory subsistence fishing schedule, and the use of gillnets with a mesh size of 7.5 inches or less would be allowed.
- Porcupine River fall chum salmon stock abundances have been low in recent years compared to other stocks in the Yukon River drainage. Fall chum salmon escapements into the Canadian Fishing Branch River, a tributary of the Porcupine River, have consistently fallen short of meeting the escapement objectives agreed upon by U.S. and

Canadian representatives in recent years. In an attempt to improve fall chum salmon escapement into the spawning grounds in Canada, the department anticipated either implementing a restricted subsistence fishing schedule or completely closing subsistence salmon fishing in the Alaska portion of the mainstem Porcupine River as the fall chum salmon migration reached that area.

- Commercial salmon fishing in Districts 1 and 2 would proceed on a 2 day a week schedule with gillnets restricted to 6-inch or less mesh size. The amount of commercial opportunity would be adjusted based on inseason assessment information. It was anticipated that smaller scale commercial fishing would occur in Subdistricts 4-A, 5-B, 5-C, and District 6.

2018 Assessment

The department monitored a suite of assessment projects in the lower river that provided salmon run timing, relative abundance, and stock composition information. Projects operated included two drift gillnet test fisheries that provided timing information and relative abundance, a mainstem Yukon River sonar located near Pilot Station that provided abundance estimates, and harvest information from both subsistence and commercial fisheries. Genetic samples collected from chum salmon at the mainstem sonar provided stock composition information. Additionally, escapement projects were operated in the upper Yukon River tributaries and the upper mainstem of the Yukon River. Assessment projects operated in the upper river included a sonar in the mainstem Yukon River near U.S./Canada border as well as in two tributaries (Chandalar and Upper Porcupine Rivers), and a weir/sonar on the Fishing Branch River (Porcupine River headwater). Data from these projects were analyzed collectively inseason, were used to verify collaboration between projects, and project whether escapement goals would be achieved. Age, sex, and length information were also collected at the lower river test fisheries, District 1 commercial fishery, mainstem Yukon River sonar (Eagle), as well as escapements in the Fishing Branch and Delta rivers.

By regulation, the fall season began in District 1 on July 16. Chum salmon caught in the Lower Yukon River Drift Gillnet Test Fishery (LYTF) after July 16 were considered fall chum salmon. Mountain Village Drift Gillnet Test Fishery (MVTF) began operating on July 18, and the mainstem Yukon River sonar operated near Pilot Station began counting fall chum salmon on July 19. The subsequent transition of upriver districts and subdistricts to the fall season was based on the migration timing of fall chum salmon. The LYTF completed operations on September 10 (Yukon Delta Fisheries Development Association conducted drifts in late August through the end of the season) and had a preliminary total cumulative catch per unit effort (CPUE) for fall chum salmon of 2,954 which was above the historical median of 1,521. The MVTF ceased operations after September 12 with a preliminary cumulative CPUE for fall chum salmon of 3,025 which was well above the historical median of 2,051. The mainstem Yukon River sonar near Pilot Station ceased operations after September 7. The preliminary fall chum salmon passage estimate at the mainstem sonar project near Pilot Station was 928,664 fish, which was well above the historical median of 707,000 fish.

After July 19, seven distinct pulses of chum salmon entered the Yukon River in 2018 (Figure 2). The first pulse contained a high proportion of summer chum salmon and the transition date was delayed due to the late arrival of the fall chum salmon stocks. Each of the successive five pulses was larger than the last with the exception of the final pulse was the smallest of the season. The

fourth and fifth pulses entered in short succession and the sixth pulse was the largest with 188,000 fall chum salmon passage at the mainstem sonar in three days peaking on August 30 despite the lower Yukon harvest of 88,000 in the commercial fishery for that same time period.

Cumulative fall chum salmon passage past the mainstem sonar tracked slightly below the historical median (1995, 1997–2008, 2010–2017) through the middle of August and exceeded the median after August 29 when the largest pulse entered the river. Based on the harvest levels through mid-August the inseason run projections followed the 550,000 fall chum salmon threshold necessary to allow fall chum salmon directed commercial fishing but once the late large pulses arrived then the preseason projection was exceeded. Run timing for fall chum salmon was on average seven days late over all the assessment projects.

The cumulative coho salmon passage past the mainstem sonar near Pilot Station was tracking well below the historical median (1995, 1997–2008, 2010–2017) throughout the season. The preliminary coho salmon passage estimate at the mainstem sonar project near Pilot Station was 136,347 fish, which was below the historical median of 160,300 fish. Both the preliminary total cumulative CPUE for coho salmon at the LYTF and MVTF were well below their respective historical medians. The run reconstruction was below median until August 31 when a large pulse of coho salmon entered the Yukon. Run timing for coho salmon was on average four days late over all the assessment projects.

Subsistence Fisheries

In anticipation that the fall chum salmon run size in 2018 would meet both escapement needs and provide for a commercial surplus, all Yukon River mainstem districts and subdistricts were placed on their regulatory subsistence fishing schedules upon transitioning to fall season management. The transition date was based on the fall chum salmon migration timing upriver. Because of the strong run size and inseason run projections, the department liberalized subsistence fishing schedules on the Yukon River mainstem. Upon transitioning to fall season management, subsistence fishermen were allowed to use gillnets up to 7.5 inch mesh size.

Subsistence salmon fishing in the mainstem Porcupine River was placed on a reduced schedule of one 96-hour period per week beginning September 6. Subsistence salmon fishing on Porcupine River tributaries, such as the Sheenjek and Black rivers, remained open seven days a week, 24 hours per day. The reduced schedule was an attempt to increase the number of fall chum salmon reaching the Canadian portion of the Porcupine River drainage. The fall chum salmon run into the upper Porcupine River continued to be poor, and both the Porcupine River sonar and Fishing Branch river weir were projecting to be below average. On October 3, a full subsistence salmon fishing closure was implemented in the U.S. portion of the Porcupine River mainstem when assessment at the Fishing Branch River indicated the escapement objective would not be met.

A comprehensive estimate of the 2018 subsistence salmon harvest based on household surveys and permit harvest information is not available at this time, but is anticipated to be available by early spring of 2019. The preliminary subsistence and personal use harvests for 2018 are lower than the 2012–2016 average harvest of 95,000 fall chum salmon and 16,000 coho salmon.

Commercial Fishing Summary

There was a total of 65 commercial periods in 2018. Table 1 provides a summary of the 2018 Yukon Area fall season commercial salmon harvest by district. The majority of fall season

commercial harvest occurred in the lower river districts. Commercial fishing periods were established in Subdistricts 4-A, 5-B, and 5-C and in District 6, but limited markets resulted in low fishing effort and relatively small harvests. The total commercial harvest for the Yukon River in the Alaska portion of the drainage was 387,785 fall chum salmon and 110,590 coho salmon (Table 1). The commercial harvests of fall chum and coho salmon combined in 2018 were the fourth largest on record since 1961. The 2013–2017 5-year average commercial harvests of fall chum salmon (300,044) and coho salmon (128,198) have been well above the 2008–2017 10-year averages (Tables 2 and 3). The average weight of fall chum salmon caught commercially in Districts 1 and 2 was approximately 7.4 lbs. The average weight of coho salmon was approximately 6.4 lbs. All fall chum salmon and coho salmon were sold in the round. The exvessel value of the total salmon harvest was \$2.8 million; \$2.1 for fall chum salmon and \$0.7 million for coho salmon (Table 4). This is the third largest exvessel value of the fall season fisheries since 1977. The average price per pound paid for fall chum salmon in Districts 1 and 2 was \$0.78; the average price paid for coho salmon was \$1.00. A total of 458 individual permit holders participated in the fall chum and coho salmon fishery: 448 in Districts 1 and 2 combined and 10 in Districts 4 through 6 (Table 5). Participation is near the recent the 5-year average of 450 permits in the Yukon Area.

Salmon Escapement

Total run size, was estimated to be 1,236,000 fall chum salmon based on the abundance estimate from the mainstem Yukon River sonar operated near Pilot Station, including estimated commercial and average subsistence harvests downstream of the sonar site (including test fisheries). Based on the location of the project, at river mile 123, the abundance estimate includes Koyukuk River drainage stocks which turn off at river mile 508.

Calculating total run size postseason is based on individually monitored spawning escapements (primarily above river mile 695), including estimated U.S. and Canadian harvests. Escapements were monitored using sonars in the Chandalar River, upper Porcupine River in Canada, and Canadian mainstem Yukon River (near Eagle). The Fishing Branch River weir was operated with a sonar component in the headwaters of the Porcupine River in Canada. Sheenjek River was not monitored and was estimated based on a relationship of the two bank operations compared to Fishing Branch River weir. Assessment of Tanana River stocks were based on a relationship with the Canadian mainstem component; however there is some indication that the production on the Tanana River may have been higher relative to the upper Yukon and may warrant re-evaluation in the post season analysis. The Delta River escapement estimate was the second highest following last year's record. In 2018, estimating run size based on the various projects resulted in a preliminary estimate of greater than 1,000,000 fall chum salmon. The estimate based on the mainstem sonar plus estimates of downstream harvest was higher than the independent assessment by escapement projects plus overall estimated harvest. The differences between the two estimates are possibly affected by the unmonitored Koyukuk River stocks, the extremely late arrival of the majority of the fall chum salmon stocks, and preliminary harvest estimates. Using preliminary estimates of harvest, the drainagewide escapement is estimated to be above the upper end of sustainable escapement goal (SEG) range of 300,000 to 600,000 fall chum salmon. The final run reconstruction estimate however will be determined post season once the subsistence harvest estimates are completed.

In the Chandalar River, the estimate escapement of 170,000 fall chum salmon (includes expansions to the end of the run adjusted for late run timing) exceeded the upper end of the

biological escapement goal (BEG) range of 74,000 to 152,000 fish. The estimated run size of 53,000 fall chum salmon in the Sheenjek River would suggest that the escapement based on the right bank only would not have exceeded the previous existing goal. The Sheenjek River escapement goal was discontinued in 2016 due to the lack of assessment project to measure the goal. Table 6 shows historical escapements to selected spawning areas in the Yukon Area. The upper Porcupine River sonar was operated for only a portion of the season due to high water, therefore a border passage estimate is not available. The Fishing Branch River weir estimate was approximately 10,000 fall chum salmon which was well below the lower end of the interim management escapement goal (IMEG) of 22,000–49,000 fish. With a run size of greater than 1,000,000 fall chum salmon this system would have been expected to meet the goal but continues to exhibit extremely low productivity. The preliminary escapement for the mainstem Yukon River in Canada was estimated to be 154,000 fall chum salmon which exceeded the upper end of the IMEG range of 70,000 to 104,000 fish. The Tanana River preliminary estimate of escapement of greater than 188,000 fall chum salmon exceeded the upper end of the BEG range of 61,000 to 136,000 fall chum salmon.

Stock composition estimates were provided by the U.S. Fish and Wildlife Service Conservation Genetics Laboratory using tissue samples (fin clips) collected from chum salmon captured in the mainstem Yukon River sonar test net fishery. Chum salmon genetic samples processed from seven strata between July 19 and September 7 (fall season) indicated that stocks represented approximately 17% summer, 23% Border U.S. (Chandalar/Sheenjek), 25% Canadian, and 35% Tanana.

In 2018, the proportion of age-3 fall chum salmon was average (<3%), age-4 fish was average (68%), age-5 fish (28%) was slightly above average (27%), and age-6 fish was below average (<1%) based on samples collected at the Lower Yukon Test Fishery using 6-inch mesh drift gillnets. The 2013 brood year estimate of return per spawner of 2.6 is above the 1974–2012 average of 1.74, while the 2014 brood year production has fallen below average. Females contributed 61% of the samples and were slightly above average (58%). Fall chum salmon length samples in 2018 averaged 583 mm, well below the long term 1981–2017 average of 594 mm.

There are few coho salmon spawning escapement assessment projects in the Yukon River drainage because of funding limitations and late timing relative to onset of winter. The sonar in the mainstem Yukon River near Pilot Station was operated through September 7 with an estimated passage of 136,347 coho salmon (SE 7,261; Figure 3) which is the slightly below the historical average of 160,000 fish. Table 7 shows historical escapements to selected spawning areas in the Yukon Area. The Delta Clearwater River (DCR) has the only established escapement goal for coho salmon, a SEG of 5,200–17,000 fish. A boat survey conducted on the DCR in early November resulted in an estimated 2,884 coho salmon which was below the escapement goal. Escapement estimates for coho salmon were conducted by aerial surveys in the Nenana River drainage, where three out of four escapements were below the 1974–2017 average.

In 2018, coho salmon age, sex, and length samples were collected from the Lower Yukon Test Fishery using 6 inch mesh drift gillnets. The sex composition and length data are preliminary and ages are not currently available for coho salmon. Females contributed 48% to the coho salmon samples which was near average (47%). Coho salmon in 2018 averaged 563 mm in length, smaller than the 1981–2017 average of 578 mm but were larger than the previous two years.

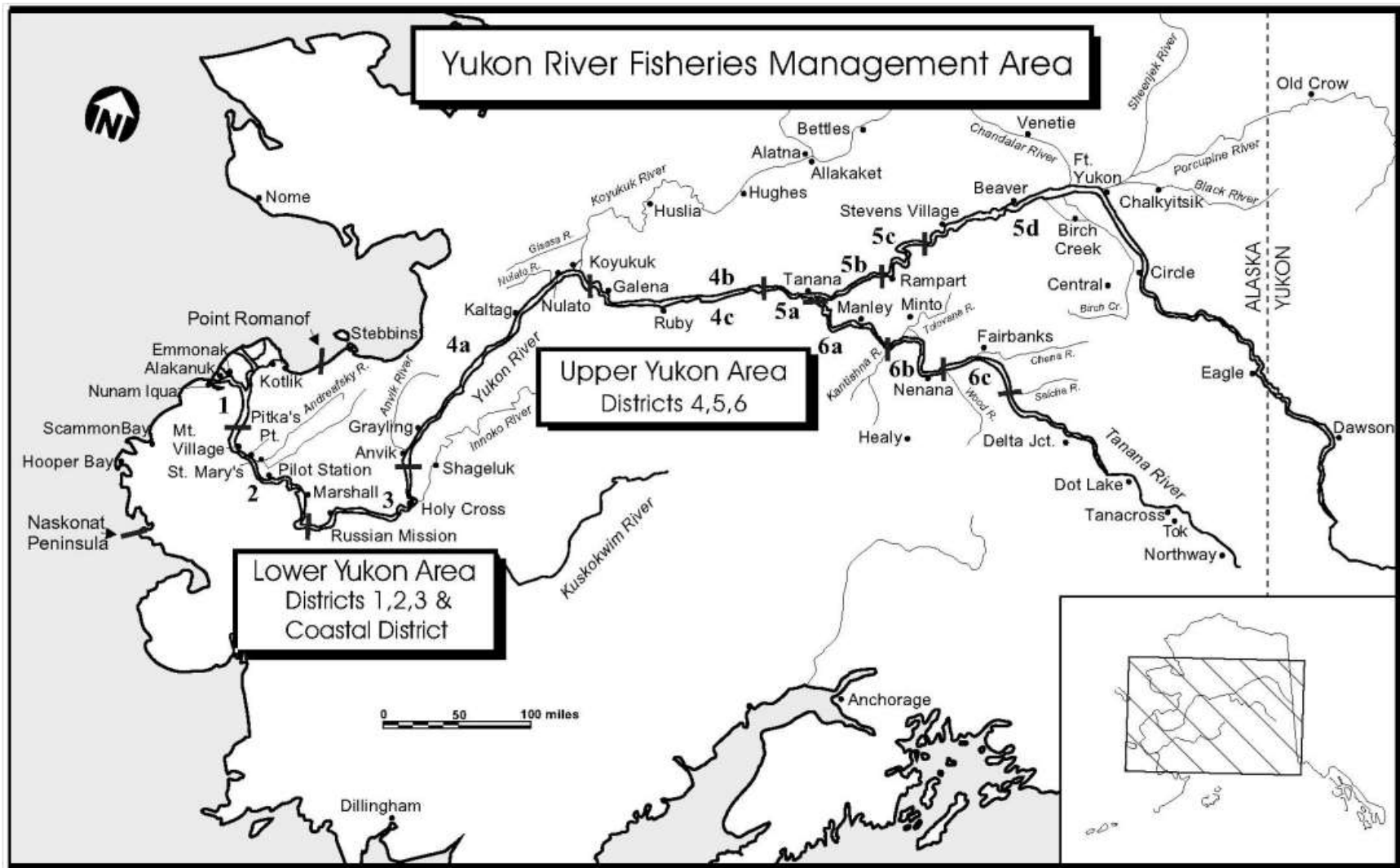


Figure 1.—Alaskan portion of the Yukon River drainage showing fishing districts and communities.

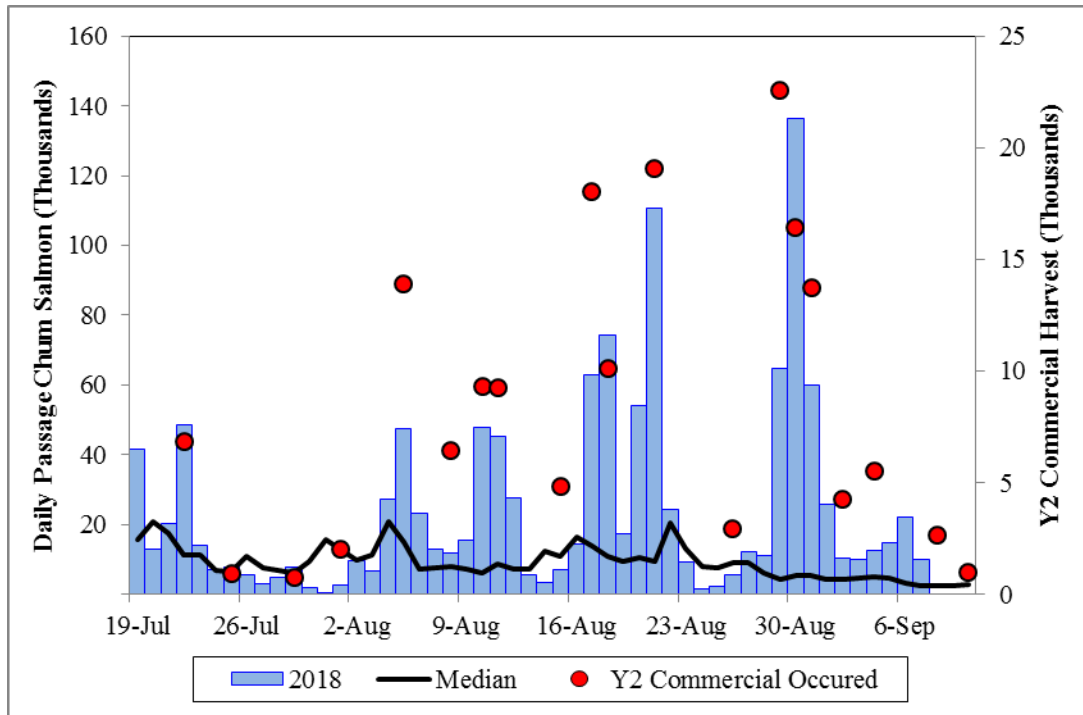


Figure 2.—Run reconstructed daily Yukon River mainstem sonar (Pilot Station) passage estimates attributed to fall chum salmon with commercial periods and harvest indicated, 2018 compared to historical (1995, 1997–2008, 2010–2017) median.

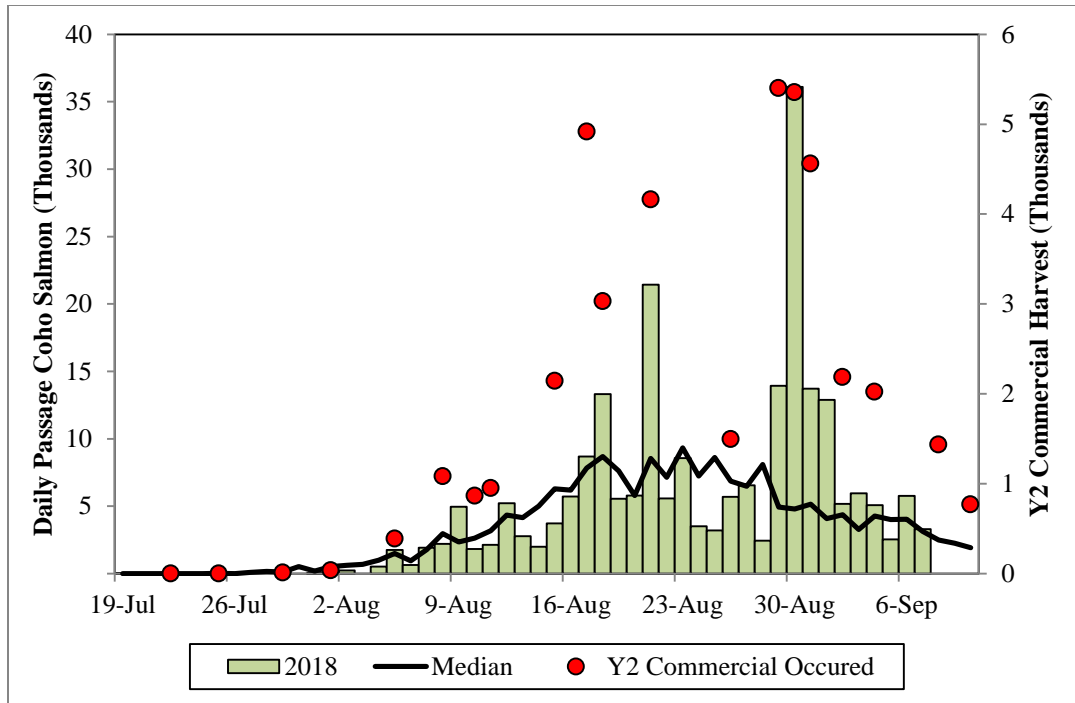


Figure 3.—Run reconstructed daily Yukon River mainstem sonar (Pilot Station) passage estimates attributed to coho salmon with commercial periods and harvest indicated, 2018 compared to historical (1995, 1997–2008, 2010–2017) median.

Table 1.–Summary of the fall season commercial salmon harvest, by district, Yukon Area, 2018.

District	Periods	Permits	Fall chum salmon			Coho salmon		
			Number	Pounds	Average weight ^a	Number	Pounds	Average weight ^a
1	20	284	198,950	1,458,576	7.3	65,431	419,613	6.4
2	21	172	170,645	1,263,624	7.4	40,845	258,503	6.3
3			No commercial openings					
4 ^b	1	4	596	2,980	5.0	0	0	–
5 ^c	2	3	896	6,988	7.8	0	0	–
6	21	3	16,698	123,678	7.4	4,314	25,203	5.8
TOTAL	65	458	387,785	2,855,846	7.4	110,590	703,319	6.4

Note: En dash indicates no data available.

^a Average weight is weighted based on individual periods.

^b Commercial fishing occurred in Subdistrict 4-A.

^c Commercial fishing occurred in Subdistricts 5-B and 5-C.

Table 2.–Fall chum salmon commercial harvest by district, Yukon Area, 1998–2018.

Year ^a	<i>Lower Yukon</i>				<i>Upper Yukon</i> ^b				Yukon total
	District 1	District 2	District 3	<i>Subtotal</i>	District 4	District 5	District 6	<i>Subtotal</i>	
1998	–	–	–	–	–	–	–	–	–
1999	9,987	9,703	–	19,690	681	–	–	681	20,371
2000	–	–	–	–	–	–	–	–	–
2001	–	–	–	–	–	–	–	–	–
2002	–	–	–	–	–	–	–	–	–
2003	5,586	–	–	5,586	1,315	–	4,095	5,410	10,996
2004	660	–	–	660	–	–	3,450	3,450	4,110
2005	130,525	–	–	130,525	–	–	49,637	49,637	180,162
2006	101,254	39,905	–	141,159	–	1,667	23,353	25,020	166,179
2007	38,852	35,826	–	74,678	–	427	15,572	15,999	90,677
2008	67,704	41,270	–	108,974	–	4,556	5,967	10,523	119,497
2009	11,911	12,072	–	23,983	–	–	1,893	1,893	25,876
2010	545	270	–	815	–	–	1,735	1,735	2,550
2011	127,735	100,731	–	228,466	–	1,246	10,917	12,163	240,629
2012	139,842	129,284	–	269,126	811	2,419	17,336	20,566	289,692
2013	106,588	106,274	–	212,862	–	1,041	24,148	25,189	238,051
2014	51,829	59,138	–	110,967	–	1,264	3,368	4,632	115,599
2015	100,562	74,214	–	174,776	–	1,048	15,646	16,694	191,470
2016	226,576	213,225	–	439,801	–	7,542	18,053	25,595	465,396
2017	328,410	134,668	–	463,078	1,402	1,952	23,270	26,624	489,702
2018	198,950	170,645	–	369,595	596	896	16,698	18,190	387,785
Average									
2013–2017	162,793	117,504	–	280,297	–	2,569	16,897	19,747	300,044
2008–2017	116,170	87,115	–	203,285	1,107	2,634	12,233	14,561	217,846

Note: En dash indicates no commercial fishing occurred. Blank cells indicate insufficient information to generate average.

^a Numbers of fish harvested are based on reports from the State TIX, Zephyr, and OceanAK programs.

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

Table 3.–Coho salmon commercial harvest by district, Yukon River, 1998–2018.

Year ^a	<i>Lower Yukon</i>				<i>Upper Yukon</i> ^b				Yukon total
	District 1	District 2	District 3	<i>Subtotal</i>	District 4	District 5	District 6	<i>Subtotal</i>	
1998	–	–	–	–	–	–	–	–	–
1999	855	746	–	1,601	–	–	–	–	1,601
2000	–	–	–	–	–	–	–	–	–
2001	–	–	–	–	–	–	–	–	–
2002	–	–	–	–	–	–	–	–	–
2003	9,757	–	–	9,757	–	–	15,119	15,119	24,876
2004	1,583	–	–	1,583	–	–	18,649	18,649	20,232
2005	36,533	–	–	36,533	–	–	21,778	21,778	58,311
2006	39,323	14,482	–	53,805	–	–	11,137	11,137	64,942
2007	21,720	21,487	–	43,207	–	–	1,368	1,368	44,575
2008	13,946	19,248	–	33,194	–	91	2,408	2,499	35,693
2009	5,992	1,577	–	7,569	–	–	742	742	8,311
2010	1,027	1,023	–	2,050	–	–	1,700	1,700	3,750
2011	45,335	24,184	–	69,519	–	–	7,502	7,502	77,021
2012	39,757	29,063	–	68,820	0	634	5,335	5,969	74,789
2013	27,304	31,456	–	58,760	–	0	7,439	7,439	66,199
2014	54,804	48,602	–	103,406	–	0	1,286	1,286	104,692
2015	66,029	54,860	–	120,889	–	0	8,811	8,811	129,700
2016	113,669	67,208	–	180,877	–	54	20,551	20,605	201,482
2017	95,982	33,277	–	129,259	0	0	9,656	9,656	138,915
2018	65,431	40,845	–	106,276	0	0	4,314	4,314	110,590
Average									
2013–2017	71,558	47,081	–	118,638	–	11	9,549	9,559	128,198
2008–2017	46,385	31,050	–	77,434	0	111	6,543	6,621	84,055

Note: En dash indicates no commercial fishing occurred. Blank cells indicate insufficient information to generate average.

^a Numbers of fish harvested are based on reports from the State TIX, Zephyr, and OceanAK programs.

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

Table 4.–Exvessel value of fall chum and coho salmon commercial salmon fishery, 1998–2018.

Year	Fall chum					Coho						Value by species		Value by area		
	Lower Yukon		Upper Yukon			Lower Yukon			Upper Yukon			Fall Chum	Coho	Lower	Upper	Total
	\$/lb	Value	\$/lb	\$/lb Roe	Value	\$/lb	\$/lb Roe	Value	\$/lb	\$/lb Roe	Value					
1998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1999	0.25	35,639	0.20		876	0.35		3,620	-		-	36,515	-	39,259	876	40,135
2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	0.15	5,993	0.10		3,398	0.25		18,168	0.05		5,095	9,391	23,263	24,161	8,493	32,654
2004	0.25	1,126	0.05		848	0.25		2,774	0.06		6,372	1,974	9,146	3,900	7,220	11,120
2005	0.32	316,698	0.14		48,159	0.32		83,793	0.12		19,182	364,857	102,975	400,491	67,341	467,832
2006	0.20	202,637	0.14		33,806	0.20		50,299	0.19		11,137	236,443	61,436	252,936	44,943	297,879
2007	0.27	144,256	0.20		16,907	0.39		127,869	0.20		1,368	161,163	129,237	272,125	18,275	290,400
2008	0.55	428,969	0.27		22,089	0.97		216,777	0.20		3,717	451,058	220,494	645,746	25,806	671,552
2009	0.70	108,778	0.19		1,286	1.00		52,176	0.15		457	110,064	52,633	160,954	1,743	162,697
2010	1.00	5,428	0.23		2,761	1.50		20,535	0.26		442	8,189	20,977	25,963	3,203	29,166
2011	1.00	1,627,575	0.22		16,114	1.00		472,168	0.15		6,792	1,643,689	478,960	2,099,743	22,906	2,122,649
2012	0.75	1,385,550	0.22		28,354	1.25		534,523	0.22		7,428	1,413,904	541,951	1,920,073	35,782	1,955,855
2013	0.75	1,154,203	0.16		25,744	1.10		453,998	0.17		7,115	1,179,947	461,113	1,608,201	32,859	1,641,060
2014	0.75	621,975	0.25		8,156	1.00		706,665	0.38		2,380	630,131	709,045	1,328,640	10,536	1,339,176
2015	0.60	762,142	0.14		15,683	0.70		616,617	0.12		6,877	777,825	623,494	1,378,759	22,560	1,401,319
2016	0.68	2,093,566	0.14		22,477	1.00		1,143,844	0.13		15,540	2,116,043	1,159,384	3,237,410	38,017	3,275,427
2017	0.60	2,038,232	0.15	1.75	29,176	1.00		814,580	0.15	2.00	8,778	2,067,408	823,358	2,852,812	37,954	2,890,766
2018	0.78	2,113,454	0.13		17,933	1.00		677,205	0.15		3,688	2,131,387	680,892	2,790,659	21,620	2,812,279
Average																
2013–2017	0.68	1,334,024	0.17		20,247	0.96		747,141	0.19		8,138	1,354,271	755,279	2,081,164	28,385	2,109,549

Note: En dash indicates no commercial fishing occurred.

Table 5.—Number of permit holders participating in fall season commercial salmon fisheries, by district, Yukon Area, 1998–2018.

Year	Lower Yukon Area				Upper Yukon Area				Yukon Area
	District 1	District 2	District 3	Subtotal ^b	District 4	District 5	District 6	Subtotal ^c	total
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	2	0	5	7	82
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	0	2	8	10	310
2008	251	177	0	428	0	3	8	11	439
2009	165	130	0	292	0	0	2	2	294
2010	72	18	0	90	0	0	4	4	94
2011	234	169	0	395	0	2	5	8	403
2012	266	201	0	457	4	3	5	13	462
2013	251	197	0	436	0	1	6	7	443
2014	256	199	0	441	0	2	2	4	445
2015	266	184	0	440	0	1	5	6	446
2016	275	197	0	459	0	4	4	8	467
2017	318	144	0	438	5	4	4	13	451
2018	284	172	0	448	4	3	3	10	458
Average									
2013-2017	273	184	0	443	1	2	4	8	450
2008-2017	235	162	0	388	1	2	5	8	394

^a Number of permit holders which made at least one delivery.

^b The Lower Yukon Area subtotal is the unique number of permits fished in Districts 1, 2, and 3 as fishermen may transfer between districts during the season.

^c The sum of Districts 4, 5, and 6 averages may not equal Upper Yukon Area district subtotal due to rounding error.

Table 6.–Fall chum salmon passage estimates or escapement estimates for selected spawning areas, Yukon River drainage, 1998 to 2018.

Year	Alaska						Canada			
	Yukon River mainstem sonar estimate	Tanana River drainage			Upper Yukon River drainage			Fishing Branch River	Porcupine River sonar	Mainstem escapement estimate
		Delta River ^a	Bluff Cabin Slough ^b	Tanana River estimate ^c	Chandalar River ^d	Sheenjek River ^e				
1998	375,222	7,804	3,549	82,475	83,899	33,058	13,687	–	46,252	
1999	451,505	16,534	7,037	109,309	92,685	14,229	12,958	–	58,552	
2000	273,206	3,001	1,595	55,983	71,048	30,084 ⁱ	5,057	–	53,732	
2001	408,961	8,103	1,808 ^j	116,012	112,664	53,932	21,737	–	33,491	
2002	367,886	11,992	3,116	163,421	94,472	31,642	13,600	–	98,679	
2003	923,540	22,582	10,600 ^j	263,302	221,343	44,047 ^k	29,713	–	143,133	
2004	633,368	25,073	10,270 ^j	187,409	169,848	37,878	20,417	–	154,080	
2005	1,894,078	28,132	11,964 ^j	372,758	526,838	561,863 ^l	119,058	–	437,733	
2006	964,238	14,055	–	233,193	254,778	160,178 ^l	30,954	–	220,898	
2007	740,195	18,610	–	357,016	243,805	65,435 ^l	32,150	–	236,987	
2008	636,525	23,055	1,198	264,200 ^m	178,278	50,353 ^l	19,086	–	167,898 ⁿ	
2009	– ^o	13,492	2,900 ^j	159,828 ^m	150,000 ^p	54,126 ^l	25,828	–	93,626 ⁿ	
2010	458,103	17,993	1,610 ^j	212,660 ^m	167,532	22,053	15,773	–	117,789 ⁿ	
2011	873,877	23,639	2,655 ^j	270,846 ^m	298,223	97,976 ^l	13,085	–	205,566 ⁿ	
2012	778,158	9,377 ^b	–	102,096 ^m	205,791	104,701 ^l	22,399	–	137,662 ⁿ	
2013	865,295	31,955	5,554 ^j	275,089 ^q	252,710	110,000 ^r	–	35,615	200,262 ⁿ	
2014	706,630	32,480 ^b	4,095 ^j	215,393 ^q	226,489	43,000 ^r	–	17,698	156,796 ⁿ	
2015	669,483	33,401 ^b	6,020 ^j	149,265 ^q	164,486	55,000 ^r	9,000	21,396	109,505 ⁿ	
2016	994,760	21,913 ^b	4,936 ^j	199,639 ^q	295,023	153,000 ^r	29,397	54,395	145,267 ⁿ	
2017	1,829,931	48,783 ^b	–	516,331 ^q	509,115	212,000 ^r	48,422	67,818	401,489 ⁿ	
2018 ^s	928,664	39,641 ^b	5,822 ^j	188,000 ^q	170,356	53,000 ^r	10,151	–	153,988 ⁿ	
Average										
1998–2017	781,314 ^o	20,599	4,932	215,311	215,951	96,728	26,796	39,384	160,970	
2013–2017	1,013,220	33,706	5,151	271,143	289,565	114,600	28,940	39,384	202,664	
BEG range	300,000 ^t	6,000		61,000	74,000	50,000 ^u	50,000		> 80,000 ^v	
	600,000	13,000		136,000	152,000	104,000	120,000 ^v			
Interim Escapement Objective							22,000-49,000 ^w		70,000-104,000 ^x	

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Note: En dash indicates no data were collected or calculated. Yukon River mainstem sonar historical estimates were revised in 2016, using updated selectivity parameters.

- ^a Population estimate generated from replicate foot surveys and stream life data using AUC (area-under-curve) method unless otherwise indicated.
- ^b Peak counts from foot surveys unless otherwise noted.
- ^c 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, unless otherwise noted.
- ^d Split beam sonar estimate (1995–2006). DIDSON sonar (2007–present). Includes expansions to the end of the run.
- ^e Single beam sonar estimate (1993–2002), split beam sonar estimate (2003–2004), DIDSON sonar (2005–2012).
- ^f Weir located within the Canadian portion of the Porcupine River drainage. Late season adjustments have been made for the period when weir was not operating for most years.
- ^g Porcupine River Sonar is located near Canadian border, downstream of community of Old Crow. Includes expansions to the end of the run.
- ^h Estimated mainstem Canadian escapement derived from mark-recapture project minus Canadian mainstem harvest and excluding Canadian Porcupine River drainage escapement, unless otherwise noted.
- ⁱ 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.
- ^j Peak aerial survey counts.
- ^k Project ended on peak daily passage in 2003 due to late run timing, estimate was expanded based on run timing (87%) at Rapids.
- ^l BEG based on right bank only. Inseason right bank counts include 266,963, 106,397, 39,548, 35,912, 28,480, 49,080, and 72,746 in 2005 through 2009 and 2011 to 2012 respectively.
- ^m Tanana River estimate is based on regression of Delta River 1995–2006 with estimate for Tanana River (Kantishna 1999–2007 and Upper Tanana 1995–2007 based on mark-recapture).
- ⁿ Estimated mainstem Yukon River Canadian escapement is derived from Eagle sonar estimate (expanded through October 18; 2008 to present) minus harvest from Eagle community upstream including Canadian harvests.
- ^o Project operated all or partial season, estimate was not usable.
- ^p Project ended early, estimate based on regression of Chandalar to Fishing Branch River plus Mainstem Border from 1995–2009.
- ^q Preliminary estimate based on regression of Tanana with mainstem Yukon River Canada from 1995 to 2012 excluding 2005.
- ^r Preliminary estimate based on regression of Fishing Branch River weir counts (1985–2012) to Sheenjek estimates from two bank operations in 1985–1987, 2005 to 2009, and 2011 to 2012 and remaining years were expanded using average 36% for second bank operations.
- ^s Data is preliminary.
- ^t Yukon River drainagewide sustainable escapement goal is assessed inseason using Pilot Station sonar estimates minus upstream estimated harvests. Post season run reconstruction uses harvest and escapements to determine whether the goal was achieved.
- ^u Escapement goal was discontinued in 2016.
- ^v Escapement goal as written in the Pacific Salmon Treaty.
- ^w Interim Management Escapement Goal (IMEG) established 2008. Based on Bue and Hasbrock SEG method.
- ^x IMEG of 70,000 to 104,000 was established for 2010 to present is based on Canadian stock Ricker model which was to be reviewed after 2005 returns were completed.

Table 7.—Coho salmon passage estimates or escapement estimates for selected spawning areas, Yukon River drainage, 1998 to 2018.

Year	Yukon River mainstem sonar estimate ^a	Nenana River drainage						Upper Tanana River drainage						
		Lost Slough		Nenana Mainstem ^b		Wood Creek		Seventeen Mile Slough		Delta Clearwater River ^c	Clearwater Lake and outlet	Richardson Clearwater River		
1998	146,365	1,360	(h) ^d	2,771	(h) ^d	—	^e	1,413	(g/b)	11,100	(b)	2,775	(b)	—
1999	76,174	1,002	(h) ^d	745	(h) ^d	370	(h)	662	(h) ^d	10,975	(b)	—		—
2000	206,365	55	(h) ^d	68	(h) ^d	—	^e	879	(h) ^d	9,225	(b)	1,025	(b)	2,175 (h)
2001	160,272	242	(h)	859	(h)	699	(h)	3,753	(h)	27,500	(b)	4,425	(b)	1,531 (f)
2002	137,077	0	(h)	328	(h)	935	(h)	1,910	(h)	38,625	(b)	5,900	(b)	874 (f)
2003	280,552	85	(h)	658	(h)	3055	(h)	4,535	(h)	102,800	(b)	8,800	(b)	6,232 (h)
2004	207,844	220	(h)	450	(h)	840	(h)	3,370	(h)	37,550	(b)	2,925	(b)	8,626 (h)
2005	194,622	430	(h)	325	(h)	1030	(h)	3,890	(h)	34,293	(b)	2,100	(b)	2,024 (h)
2006	163,889	194	(h)	160	(h)	634	(h)	1,916	(h)	16,748	(b)	4,375	(b)	271 (h)
2007	192,406	63	(h)	520	(h)	605	(h)	1,733	(h)	14,650	(b)	2,075	(b)	553 (h)
2008	145,378	1,342	(h)	1,539	(h)	578	(h)	1,652	(h)	7,500	(b)	1,275	(b)	265 (h)
2009	—	^f 410	(h)	—		470	(h)	680	(h)	16,850	(b)	5,450	(b)	155 (h)
2010	177,724	1,110	(h)	280	(h)	340	(h)	720	(h)	5,867	(b)	813	(b)	1,002 (h)
2011	149,533	369	(h)	—		—		912	(h)	6,180	(b)	2,092	(b)	575 (h)
2012	130,734	—		106	(h)	—		405	(h)	5,230	(b)	396	(h)	515 (h)
2013	110,515	721	(h)	—		55	(h)	425	(h)	6,222	(b)	2,221	(h)	647 (h)
2014	283,421	333	(h)	378	(h)	649	(h)	886	(h)	4,285	(b)	434	(h)	1,941 (h)
2015	121,193	242	(h)	1,789	(h)	1419	(h)	3,890	(h)	19,533	(b)	1,621	(h)	3,742 (h)
2016	168,297	334	(h)	1,680	(h)	1327	(h)	2,746	(h)	6,767	(b)	1,421	(h)	1,350 (h)
2017	166,320	^g 1,278	(h)	862	(h)	2,025	(h)	1,942	(h)	9,627	(b)	—		—
2018	136,347	1,822	(h)	241	(h)	361	(h)	347	(h)	2,884	(b)	2,465	(h)	976 (h)
SEG ^h										5,200-17,000				
Average														
1998–2017	166,865	^f 515		795		939		1,916		19,576		2,785		1,910
2013–2017	162,832	582		1,177		1,095		1,978		9,287		1,424		1,920

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Note: Only peak counts presented. Survey rating is fair to good, unless otherwise noted. Denotations of survey methods include: (b)=boat, (f)=fixed wing, (g)=ground/foot, (h)=helicopter, and (u)=undocumented. En dash indicates no data available.

^a Passage estimates for coho salmon are incomplete. The sonar project is terminated prior to the end of the coho salmon run. Yukon River mainstem sonar historical estimates were revised in 2016, using updated selectivity parameters.

^b Index area includes mainstem Nenana River between confluence's of Lost Slough and Teklanika River.

^c Index area is lower 17.5 miles of system.

^d Poor survey.

^e No survey of Wood Creek due to obstructions in creek.

^f Project operated all or partial season, estimate was not usable.

^g Data is preliminary.

^h Sustainable escapement goal (SEG) established January 2004, (replaces BEG of greater than 9,000 fish established March, 1993) based on boat survey counts of coho salmon in the lower 17.5 river miles during the period October 21 through 27.