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Kuskokwim River Salmon Stock Status and Kuskokwim Area Fisheries, 2012; a Report to the Alaska Board of Fisheries

by

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative Code		fork length	FL
deciliter	dL		AAC	mideye to fork	MEF
gram	g	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	mideye to tail fork	METF
hectare	ha			standard length	SL
kilogram	kg			total length	TL
kilometer	km	all commonly accepted			
liter	L	professional titles	e.g., Dr., Ph.D., R.N., etc.	Mathematics, statistics	
meter	m			<i>all standard mathematical signs, symbols and abbreviations</i>	
milliliter	mL	at	@		
millimeter	mm	compass directions:			
		east	E	alternate hypothesis	H _A
Weights and measures (English)		north	N	base of natural logarithm	<i>e</i>
cubic feet per second	ft³/s	south	S	catch per unit effort	CPUE
foot	ft	west	W	coefficient of variation	CV
gallon	gal	copyright	©	common test statistics	(F, t, χ^2 , etc.)
inch	in	corporate suffixes:		confidence interval	CI
mile	mi	Company	Co.	correlation coefficient (multiple)	R
nautical mile	nmi	Corporation	Corp.		
ounce	oz	Incorporated	Inc.	correlation coefficient (simple)	r
pound	lb	Limited	Ltd.	covariance	cov
quart	qt	District of Columbia	D.C.	degree (angular)	°
yard	yd	et alii (and others)	et al.	degrees of freedom	df
		et cetera (and so forth)	etc.	expected value	<i>E</i>
Time and temperature		exempli gratia		greater than	>
day	d	(for example)	e.g.	greater than or equal to	≥
degrees Celsius	°C	Federal Information Code	FIC	harvest per unit effort	HPUE
degrees Fahrenheit	°F	id est (that is)	i.e.	less than	<
degrees kelvin	K	latitude or longitude	lat. or long.	less than or equal to	≤
hour	h	monetary symbols		logarithm (natural)	ln
minute	min	(U.S.)	\$, ¢	logarithm (base 10)	log
second	s	months (tables and figures): first three letters	Jan,,...,Dec	logarithm (specify base)	log ₂ , etc.
Physics and chemistry				minute (angular)	'
all atomic symbols				not significant	NS
alternating current	AC	registered trademark	®	null hypothesis	H ₀
ampere	A	trademark	™	percent	%
calorie	cal	United States		probability	P
direct current	DC	(adjective)	U.S.	probability of a type I error (rejection of the null hypothesis when true)	α
hertz	Hz	United States of America (noun)	USA	probability of a type II error (acceptance of the null hypothesis when false)	β
horsepower	hp	U.S.C.	United States Code	second (angular)	"
hydrogen ion activity (negative log of)	pH			standard deviation	SD
parts per million	ppm	U.S. state	use two-letter abbreviations (e.g., AK, WA)	standard error	SE
parts per thousand	ppt, ‰			variance	
				population	Var
volts	V			sample	var
watts	W				

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AREA FISHERIES, 2012; A REPORT TO THE ALASKA BOARD OF
FISHERIES**

by

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ABSTRACT

This report provides the Alaska Board of Fisheries with information on Kuskokwim Area salmon stock status including escapement and harvest data for the January 2013 regulatory meeting. The Alaska Department of Fish and Game is responsible for managing Kuskokwim Area salmon stocks for sustained yield. Subsistence fishing occurs throughout the area. There are four commercial salmon fishing districts within the Kuskokwim Area. Districts 1 and 2 are within the Kuskokwim River and districts 4 and 5 are in Kuskokwim Bay and target salmon bound for the Kanektok and Goodnews rivers, respectively. This report presents an overview of Kuskokwim Area abundance, escapement, and harvest/exploitation trends for king, sockeye, chum, and coho salmon since 2010.

Key words: Kuskokwim Area, king salmon, *Oncorhynchus tshawytscha*, Chinook salmon, chum salmon, *O. keta*, subsistence, commercial, fishing, stock status, Alaska Board of Fisheries.

INTRODUCTION

This report provides the Alaska Board of Fisheries (board) with information on Kuskokwim Area salmon stock status for the January 2013 regulatory meeting. The Alaska Department of Fish and Game (department) is responsible for managing Kuskokwim Area salmon stocks for sustained yield. While sport fishing effort and harvests do occur, the harvest is much smaller and is covered in a separate report by Division of Sport Fish (Chythlook 2012). The Kuskokwim Management Area is approximately 50,000 square miles in size, including the Kuskokwim River drainage and all waters of Alaska that flow into the Bering Sea between Cape Newenham and the Naskonat Peninsula, plus Nunivak and St. Matthew islands. There are four commercial salmon fishing districts within the Kuskokwim Area (Figure 1). Districts 1 and 2 are within the Kuskokwim River; districts 4 and 5 are in Kuskokwim Bay and target salmon bound for the Kanektok and Goodnews rivers, respectively.

Salmon escapements are evaluated by weirs and sonar on 10 tributary streams. In addition, aerial surveys are flown during peak spawning abundances in up to 16 tributaries for king salmon *Oncorhynchus tshawytscha* and in 2 tributaries for sockeye salmon *O. nerka*.

FISHERIES AND SALMON STOCK STATUS

KUSKOKWIM RIVER

King Salmon

Abundance of king salmon in the Kuskokwim River over the past 3 years has encompassed some of the lowest known escapements (Tables 1 and 2). This has resulted in restriction to subsistence fisheries and delay of chum salmon directed commercial fisheries to avoid incidental catch of king salmon. However, recent advances in estimation of total run and escapement have provided the necessary information to conduct spawner-recruit analysis on the Kuskokwim River king salmon stock (Schaberg et al. 2012; Bue et al. 2012). This analysis indicates the recent escapement levels are low, but sustainable, and similar escapements in past years have been highly productive.

Escapement

King salmon escapement is monitored with weirs operated in 7 tributary streams (Figure 1), and peak aerial survey counts at up to 13 tributaries distributed throughout the drainage. Sustainable Escapement Goals (SEGs) have been established for 4 of the tributaries monitored with weirs and 8 of the tributaries monitored with aerial surveys. Achievement of these goals over the past 3 years has been inconsistent. This can be attributed to both the recent low runs and to weir-

based escapement goals that were established with inadequate data. As a result, many recently established weir-based tributary SEGs are believed to be biased high (Hamazaki et al. 2012).

Current escapement goals for Kuskokwim River king salmon stocks are as follows:

Stock Unit	Enumeration	Current Escapement Goal		
	Method	Goal	Type	Year Established
King Salmon				
Aniak River	Aerial Survey	1,200–2,300	SEG	2005
Cheneetnuk River	Aerial Survey	340–1,300	SEG	2005
Gagaraya River	Aerial Survey	300–830	SEG	2005
George River	Weir	3,100–7,900	SEG	2007
Holitna River	Aerial Survey	970–2,100	SEG	2005
Kanektok River	Aerial Survey	3,500–8,000	SEG	2005
Kisaralik River	Aerial Survey	400–1,200	SEG	2005
Kogruluk River	Weir	5,300–14,000	SEG	2005
Kwethluk River	Weir	6,000–11,000	SEG	2007
Pitka Fork Salmon River	Aerial Survey	470–1,600	SEG	2005
Salmon River (Aniak Drainage)	Aerial Survey	330–1,200	SEG	2005
Tuluksak River	Weir	1,000–2,100	SEG	2007

The department is recommending establishment of a Kuskokwim River drainagewide king salmon SEG and revisions to currently established SEGs on the Kwethluk, George, and Kogruluk rivers, as well as discontinuation of the SEG on Tuluksak River (Conitz et al. 2012).

Harvest/Exploitation

The subsistence fishery on the Kuskokwim River has constituted 91–99% of the total harvest of king salmon since 2000. The average annual subsistence harvest from 1990 to 2011 was approximately 84,000 fish. Subsistence harvest in 2010 was 66,053 king salmon and the 2011 subsistence harvest was 58,836 king salmon (Table 3). Both were lower than average, likely due to a low run in 2010 and restrictions to the subsistence fishery for king salmon conservation in 2011. Because of subsistence restrictions in 2012, this estimate is also expected to be below average; however, the level of reduction is unknown at this time.

King salmon are harvested incidentally in the chum salmon directed commercial fishery during late June and July under a guideline harvest range of 0–50,000 fish. King salmon are harvested incidentally in directed chum and sockeye salmon commercial fisheries using 6-inch mesh size due to overlapping run timing of king, sockeye, and chum salmon (Figure 2). The commercial fishery harvests more male and smaller king salmon relative to the larger fish and higher proportion of females in the subsistence harvest (Molyneaux et al. 2010; Figure 3). The commercial harvest of king salmon, excluding fish retained for personal use, was 2,731; 49; and 14 in 2010, 2011, and 2012, respectively (Table 4). The majority of the king salmon caught in the commercial fishery during these years were not sold, but retained by the permit holders for personal use. Approximately 699 and 351 king salmon were retained for personal use in 2011 and 2012. The reductions in 2011 and 2012 were due to a delay in commercial fishing activity related to conservation of king salmon. The buyers agreed to not purchase king salmon during

most of the fishing season in 2011 and 2012, so that the incidental harvest could be used for subsistence purposes.

The exploitation rate of king salmon in 2010 was 59%, and 46% in 2011 (Bue et al. 2012). This is higher than the recent 10-year average of 37%, with 95% and 99% of the harvest attributed to the subsistence fishery in 2010 and 2011 respectively (Table 5).

Inseason Assessment

Recently, investigations into the relationship between the Bethel test fishery (BTF) catch per unit effort (CPUE) and escapements observed at monitoring weirs identified strong linear relationships among projects (Figure 4). There are two separate relationships, which may be attributed to changes in catchability resulting from two different gillnet web materials used starting in 2008. However, there are good linear relationships for both web types, indicating that BTF CPUE is a good index for Kuskokwim River king salmon escapement and can be used to project tributary and total drainage escapement. These relationships are not exact; incorporating the range of observed deviation from the identified relationships into the projection will acknowledge this level of uncertainty within the prediction of end-of-season results.

While this relationship allows for projecting escapement inseason from total cumulative BTF CPUE, run timing must be considered. Run timing observed at BTF shows a large difference in when fish first arrive (Figure 5). If the average of these observations were used for projecting end-of-season BTF CPUE, escapement projections would be inaccurate if run timing was not average. Therefore the observed run timing is split into 3 ranges that separate possible run timings: early, average, or late. This is especially important early in the season when uncertainty about run timing and abundance is high (i.e., a weak run might be identified as late run timing, or a strong run might be identified as early run timing). Having the ability to assess different possibilities reflects the uncertainty in assigning run timing to inseason information as it comes in.

The indication from BTF throughout the 2012 season was that management objectives would unlikely be met with an average subsistence harvest. The late run timing observed during the 2012 Kuskokwim River king salmon run made assessment difficult; however, assessing against the various run-timing scenarios used in the assessment tool allowed us to narrow run assessment on late run timing and have some confidence the run would materialize within expectation.

Chum Salmon

Kuskokwim River chum salmon escapements have been average from 2010 to 2012. Exploitation from commercial harvest has been limited due to king salmon conservation measures in these years.

Escapement

Chum salmon escapement is monitored with weirs operated in 7 tributary streams and one sonar project (Figure 1). Escapement goals are established for Kogruklu River weir and Aniak River sonar. These goals have been annually achieved or exceeded in all of the past 11 years (Table 6). In 2012 Aniak River sonar did not operate and Kogruklu River weir was not operational for the majority of the run and no estimates were available for these projects.

Current escapement goals for Kuskokwim River chum salmon stocks are as follows:

Stock Unit	Enumeration Method	Current Escapement Goal		
		Goal	Type	Year Established
Chum Salmon				
Aniak River	Sonar	220,000–480,000	SEG	2007
Kogruklu River	Weir	15,000–49,000	SEG	2005

Harvest/Exploitation

Historically, Kuskokwim River chum salmon have been primarily targeted for commercial use. However, since the late 1990s, the fishery has been constrained by low market interest in chum salmon, limited processing capacity, and, more recently, reduced opportunities due to king salmon conservation measures. In 2010, 2011, and 2012, a modest commercial harvest of 93,148; 118,256; and 65,171 fish were caught, respectively (Table 4). From 2000 to 2011, commercial chum salmon harvest contribution averaged about 2% and 27% of the total exvessel value of the District 1 commercial salmon fishery. The exvessel value of commercial chum salmon harvest in 2012 was well above average.

Average annual subsistence harvest from 1990 to 2011 was approximately 70,000 chum salmon (Table 7). The subsistence harvest was 46,143 and 49,717 chum salmon in 2010 and 2011 respectively. Subsistence harvest information from 2012 has not been finalized; however it is expected to be higher than most other recent years due to mesh-size restrictions of 6-inch or smaller to conserve king salmon, and possibly, increased effort due to restrictions to the king salmon subsistence fishery.

Sockeye Salmon

Since 2010, annual abundance has been average. Understanding of sockeye salmon abundance in the Kuskokwim River has recently changed with incorporation of a new monitoring project at Telaquana Lake. This project monitors the lake-type life history of sockeye salmon while all other weir projects monitor mostly river-type (McPhee et al. 2009). Telaquana Lake results have shown that it is a major contributor to overall Kuskokwim River sockeye salmon abundance (Table 8).

Escapement

Sockeye salmon escapements are monitored at each of the 7 tributary weir projects operated throughout the Kuskokwim River drainage (Figure 1), although they are only prominent in Kogruklu River and Telaquana Lake. The only current escapement goal for sockeye salmon is at Kogruklu River weir and it has been achieved each of the last 10 years. Kogruklu River weir estimates for 2012 are unavailable because the weir was inoperable for a large portion of the sockeye salmon run (Table 8).

Current escapement goals for Kuskokwim River sockeye salmon stocks are as follows:

Stock Unit	Enumeration Method	Current Escapement Goal		
		Goal	Type	Year Established
Chum Salmon				
Kogruklu River	Weir	4,400–17,000	SEG	2010

Harvest/Exploitation

Kuskokwim River sockeye salmon are targeted in subsistence and commercial fisheries. Average annual subsistence harvest from 1990 to 2011 was approximately 43,000 fish (Table 9). The subsistence harvest was 38,130 and 40,207 sockeye salmon in 2010 and 2011, respectively.

In 2004, the board established a commercial guideline harvest level of 0 to 50,000 sockeye salmon. A total of 2,857 fish were commercially harvested in 2012, the lowest harvest since 2007 (Table 4). Commercial sockeye salmon harvests make up about 11% of total District 1 commercial salmon exvessel value, on average, and the value in 2012 was the lowest since 2007.

Coho Salmon

Coho salmon abundance was below average in 2010, and average in 2011 and 2012. Recent advances in estimating the historical run size of Kuskokwim River coho salmon are ongoing and preliminary results indicate run sizes seen from 2010 through 2012 are not outside those seen historically.

Escapement

Coho salmon escapement is monitored with weirs operated in 6 tributary streams (Figure 1). The Kogruklu River escapement goal has been annually achieved or exceeded in each of the last 10 years. Kwethluk River weir was not in full operation during 2010 or 2011, but the escapement goal was achieved in 2012 (Table 10).

Current escapement goals for Kuskokwim River coho salmon stocks are as follows:

Stock Unit	Enumeration	Current Escapement Goal		
	Method	Goal	Type	Year Amended or Established
Coho Salmon				
Kwethluk River	Weir	>19,000	SEG	2010
Kogruklu River	Weir	13,000–28,000	SEG	2005

Harvest/Exploitation

Kuskokwim River coho salmon are harvested primarily in the commercial fishery. The most recent 10-year average harvest is 165,145 fish, and has ranged from 58,031 to 435,401 fish. Commercial coho salmon harvests make up about 75% of total District 1 commercial salmon exvessel value, on average, and has contributed approximately 50% of the total exvessel value since 2010 (Table 4). Average annual subsistence harvest from 1990 to 2011 was approximately 38,000 fish (Table 11). The subsistence harvest was 32,094 and 29,583 coho salmon in 2010 and 2011 respectively.

QUINHAGAK (DISTRICT 4)

Escapement

A salmon enumeration weir is operated on Kanektok River at river mile 45 (Taylor and Elison 2012). Given the relatively short data series from this project, no formal escapement goals for any species have been developed for this weir. Comparison of escapement among years is problematic because of variation in weir operational periods (Table 12), and substantial numbers of king, chum, and coho salmon spawn downstream of the weir. Also, starting in 2008, the weir

project began to cease operations in mid-August; thus, coho salmon counts are incomplete. Aerial survey escapement goals have been established for king, sockeye, and chum salmon (Table 13). Sockeye salmon escapement goals have been achieved or exceeded in each of the last 10 years that aerial survey data are available. With the exception of 2010, king salmon escapement goals have also been achieved or exceeded in each of the last 10 years that aerial survey data are available.

Current escapement goals for Kanektok River salmon stocks are as follows:

Stock Unit	Enumeration Method	Current Escapement Goal		
		Goal	Type	Year Amended or Established
King Salmon				
Kanektok River	Aerial Survey	3,500–8,000	SEG	2005
Chum Salmon				
Kanektok River	Aerial Survey	>5,200	SEG	2005
Sockeye Salmon				
Kanektok River	Aerial Survey	14,000–34,000	SEG	2005

The department has recommended to discontinue the chum salmon aerial survey lower bound-SEG on Kanektok River. Additional details and rationale for discontinuation of this escapement goal can be found in Conitz et al. (2012).

Harvest/Exploitation

Overall, District 4 commercial salmon harvests were well above average in 2010, average in 2011, and below average in 2012 (Table 14). King salmon harvests have been slightly below average since 2008 and fell well below average in 2012. Sockeye salmon harvests in 2009 and 2010 were the highest on record followed by below average harvest in 2011 and 2012. The chum salmon harvests from 2009 to 2011 were the highest on record, followed by average harvest in 2012. Coho salmon harvests have been below average since 2010. Value of the commercial salmon fishery has been above average since 2007, with a record value of \$1,655,321 occurring in 2010 (Table 14). Relative to the commercial harvest, subsistence harvests of these stocks are small with king salmon making up the largest portion of subsistence harvest (Tables 3, 7, 9, and 11).

GOODNEWS BAY (DISTRICT 5)

Escapement

Salmon escapement into the Goodnews River drainage is assessed by an enumeration weir on the Middle Fork Goodnews River (Elison and Taylor 2012) and by aerial survey. Weir-based escapement goals have been established for king, sockeye, chum, and coho salmon (Table 15). These goals have been achieved or exceeded for all species in each of the last 10 years, excluding sockeye salmon in 2011 and king salmon in 2012. For years with available data, aerial survey escapement goals for Goodnews River king and sockeye salmon have been achieved each year since 2003, except king salmon in 2012 (Table 16).

Current escapement goals for Goodnews River salmon stocks are as follows:

	Enumeration	Current Escapement Goal		
Stock Unit	Method	Goal	Type	Year Amended or Established
King Salmon				
Goodnews River (Main Fork)	Aerial Survey	640–3,300	SEG	2005
Middle Fork Goodnews River	Weir	1,500–2,900	BEG	2005
Chum Salmon				
Middle Fork Goodnews River	Weir	>12,000	SEG	2005
Coho Salmon				
Middle Fork Goodnews River	Weir	>12,000	SEG	2005
Sockeye Salmon				
Goodnews River (Main Fork)	Aerial Survey	5,500–19,500	SEG	2005
Middle Fork Goodnews River	Weir	18,000–40,000	BEG	2007

Harvest/Exploitation

Total commercial salmon harvest in 2012 was the highest since 1994. King salmon harvests have been average to below average since 2008 (Table 17). Sockeye salmon harvests have been average to above average since 2006. Chum salmon harvests have been above average since 2009. Coho salmon harvests were below average in 2009 and 2010, average in 2011, and above average in 2012. Value of the commercial salmon fishery in 2012 more than doubled when compared the most recent 5-year (2007–2011) average of \$285,823. Relative to the commercial harvest, subsistence harvests of these stocks are small, with sockeye salmon making up the largest portion of subsistence harvest (Tables 3, 7, 9, and 11).

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TABLES AND FIGURES

Table 1.—King salmon spawning aerial survey index estimates, Kuskokwim River Drainage, Kuskokwim Management Area, 1975–2012.

Year	Lower Kuskokwim River				Middle Kuskokwim River						Upper Kuskokwim River		
	Eek	Kwethluk Canyon C.	Kisaralik	Tuluksak	Aniak	Kipchuk	Salmon	Holokuk	Oskawalik	Holitna	Gagarayah	Cheeneetnuk	Salmon (Pitka)
1975					202	94							
1976		997								2,571	663		
1977		1,116		439				60			897	1,407	1,940
1978		1,722	2,417	403			322			2,766	504		1,100
1979								45					682
1980	2,378			1,035			1,186						1,450
1981		2,034	672		9,074								1,439
1982		471	81					42		521			413
1983	188			202	1,909		231	33		1,069			572
1984												1,177	545
1985	1,118	51	63	142				135				1,002	620
1986					424		336	100		650		317	
1987	1,739					193	516	210	193		205		
1988	2,255		869	188	954		244		80				473
1989	1,042	610	152		2,109	994	631						452
1990			631	200	1,255	537	596	157	113				
1991	1,312		217	358	1,564	885	583						
1992					2,284	670	335	64	91	2,022	328	1,050	2,536
1993					2,687	1,248	1,082	114	103	1,573	419	678	1,010
1994			1,243			1,520	1,218				807	1,206	1,010
1995			1,243		3,171	1,215	1,446	181	326	1,887	1,193	1,565	1,911
1996							985	85					
1997					2,187	855	980	165	1,470	2,093		345	
1998	522	126	457		1,930	443	557						
1999								18	98				
2000					714	182	238	42		301			362
2001							598		186	1,130	143		1,033
2002		1,795	1,727			1,615	1,236	186	295	1,578	452		1,255

-continued-

Table 1.–Page 2 of 2.

Year	Lower Kuskokwim River				Middle Kuskokwim River						Upper Kuskokwim River		
	Kwethluk				Aniak	Kipchuk	Salmon	Holokuk	Oskawalik	Holitna	Gagarayah	Cheeneetnuk	Salmon (Pitka)
2003	1,236	2,628	654	94	3,514	1,493	1,242	528	844		1,095	810	1,241
2004	4,653	6,801	6,913	1,196	5,569	1,868	2,177	539	293	4,842	670	918	1,138
2005		5,059	4,112	672		1,944	4,097	510	582	2,795	788	1,155	1,809
2006			4,734		5,639	1,618		705	386	3,924	531	1,015	928
2007			1,373	173	3,984	2,147	1,458	146			1,035		1,014
2008		487	1,493		3,222	1,061	589	418	213	832	177	290	1,305
2009								565	378		303	323	632
2010			235					229		587	62		150
2011	249		534			116	79	20	26		96	249	767
2012			610			193	49	36	51		178	229	670
Escapement Goal:			400- 1,200		1,200- 2,300		330- 1,200			970- 2,100	300- 830	340- 1,300	470- 1,600
10-yr average	2,046	3,354		534		1,483		385	377				

Source: Historical data are from Brazil et al. 2011. Data from 2011 and 2012 are unpublished.

Note: Estimates are from aerial surveys conducted during peak spawning periods under 'good' or 'fair' survey conditions. Blank cells represent no data. No data exists because the survey was either not flown or did not meet acceptable criteria.

Table 2.–Kuskokwim River king salmon escapement estimates, 1976–2012.

Year	Kwethluk Weir	Tuluksak Weir	George Weir	Kogruluk Weir	Tatlawiksuk Weir	Takotna Weir
1976				5,600		
1977				^a		
1978				13,667		
1979				11,338 ^b		
1980				^a		
1981				16,809		
1982				10,993 ^b		
1983				3,025 ^b		
1984				4,928		
1985				4,625		
1986				5,038		
1987				^a		
1988				8,520 ^b		
1989				11,940 ^b		
1990				10,214		
1991		697		7,850		
1992	9,675	1,083		6,755		
1993		2,218		12,333		
1994		2,917		15,227		
1995				20,651		
1996	7,415		7,716	14,199		
1997	10,395		7,823	13,285		
1998	^a		^a	12,107 ^b	^a	
1999	^a		3,548 ^c	5,570	1,490	
2000	3,547		2,960	3,310	810	345
2001	^a	997 ^c	3,309	9,298 ^b	2,010	721
2002	8,502	1,346	2,444	10,104	2,237	316
2003	14,474	1,064	4,693 ^c	11,771	1,683 ^c	378
2004	28,605	1,475	5,207	19,651	2,833	461
2005		2,653	3,845	22,000	2,918	499
2006	17,619	1,044	4,357	19,414	1,700	539
2007	13,267	374	4,883	13,029	2,061	418
2008	5,312	665	2,698	9,730	1,071	413
2009	5,710	404	3,663	9,702	1,071	311
2010	1,693	201	1,500	5,690	567	178
2011	4,079	288	1,571	6,891	1,012	136
2012 ^d	^a	545	2,267	^a	1,115	227
Escapement Goal:	6,000-11,000	1,000-2,100	3,100-7,900	5,300-14,000		

Sources: Clark et al. 2011; Hansen and Shelden 2011; Miller and Harper 2012a; Miller and Harper 2012b; Smith and Shelden 2011; Williams and Shelden 2011.

Note: Blank cells represent no data.

^a Field operations were incomplete and no total annual escapement was estimated.

^b Field operations were incomplete; sum of daily counts is an underestimate of total escapement, but considered reasonable. Additional estimates were not made.

^c Field operations were incomplete; more than 20% of the total annual escapement is based on daily.

^d Preliminary numbers, subject to change.

Table 3.—Estimated subsistence king salmon harvest in the Kuskokwim Area.

Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Kipnuk	-	-	-	-	-	-	-	-	-	-
Kwigillingok	-	-	-	-	-	-	-	-	-	-
Kongiganak	1,559	729	929	680	1,281	1,095	1,108	1,376	1,128	1,153
N. Kuskokwim Bay	1,559	729	929	680	1,281	1,095	1,108	1,376	1,128	1,153
Tuntutuliak	4,174	4,156	3,750	3,905	5,019	3,928	4,256	3,159	3,797	3,412
Eek	4,923	2,617	2,057	2,496	2,976	3,679	2,786	2,009	2,215	1,730
Kasigluk	3,300	2,875	3,324	3,453	3,877	3,398	3,249	3,630	2,857	4,710
Nunapitchuk	4,192	4,004	4,123	3,852	4,580	4,543	3,479	3,605	4,502	4,215
Atmautluak	2,895	1,661	1,239	1,715	1,856	2,016	1,752	1,648	1,397	1,372
Napakiak	4,427	2,573	4,147	3,822	3,355	3,515	3,842	2,908	3,436	2,265
Napaskiak	6,586	4,008	5,299	5,566	6,521	4,862	5,261	4,756	4,901	3,633
Oscarville	1,263	1,476	1,480	1,496	1,390	1,046	995	953	754	1,543
Bethel	34,925	18,041	22,220	19,800	31,251	32,463	32,116	20,100	24,877	22,751
Kwethluk	10,657	7,298	6,949	9,280	9,546	9,907	9,786	6,319	7,502	6,366
Akiachak	8,395	5,607	8,130	7,678	7,622	6,410	5,689	6,699	6,026	5,210
Akiak	5,966	3,168	3,452	4,478	4,653	4,401	4,851	3,196	2,943	2,377
Tuluksak	2,022	3,114	2,330	3,662	4,414	4,175	3,309	5,456	3,554	2,239
Lower Kuskokwim River	93,725	60,598	68,499	71,203	87,060	84,343	81,371	64,438	68,761	61,823
Lower Kalskag	2,946	4,022	2,338	3,603	4,087	4,541	3,513	3,103	1,954	1,726
Upper Kalskag	1,618	1,031	1,321	1,682	1,297	1,447	1,304	941	1,394	1,670
Aniak	3,589	3,562	3,976	4,651	3,714	3,506	3,343	3,640	3,466	2,603
Chuathbaluk	1,718	998	986	1,443	1,013	2,461	914	1,204	730	1,035
Middle Kuskokwim River	9,871	9,613	8,621	11,379	10,111	11,955	9,074	8,888	7,544	7,034
Crooked Creek	971	916	583	707	1,126	874	890	963	768	702
Red Devil	297	154	400	449	409	412	359	404	243	141
Sleetmute	777	887	782	1,795	1,295	964	1,265	1,171	978	414
Stony River	574	614	247	445	391	534	596	874	302	46
Lime Village	399	70	176	40	195	180	125	57	241	145
McGrath	896	902	1,586	550	1,026	804	1,223	995	872	1,033
Takotna	74	0	6	0	0	11	6	3	2	0
Nikolai	635	337	818	426	449	938	398	212	380	284
Telida	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim River	4,623	3,880	4,598	4,412	4,891	4,717	4,862	4,679	3,786	2,765
Kuskokwim River Total	109,778	74,820	82,648	87,674	103,343	102,110	96,415	79,382	81,219	72,775

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Table 3.–Page 2 of 3.

Community	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Kipnuk	3,205	-	-	-	322	-	-	-	-	-	-	-
Kwigillingok	-	-	-	-	-	-	-	-	-	-	-	-
Kongiganak	1,285	1,612	1,349	2,003	2,663	1,536	1,729	1,984	2,086	1,148	1,470	1,012
N. Kuskokwim Bay	4,490	1,612	1,349	2,003	2,985	1,536	1,729	1,984	2,086	1,148	1,470	1,012
Tuntutuliak	2,826	2,958	3,907	2,657	3,912	4,545	4,469	4,614	4,341	3,067	3,205	3,073
Eek	2,140	2,035	2,514	2,075	2,954	3,133	2,700	2,635	2,877	1,812	1,761	1,322
Kasigluk	3,857	4,889	4,470	4,212	7,859	4,488	4,304	5,350	2,928	2,341	3,020	2,346
Nunapitchuk	3,425	3,328	4,503	3,179	4,921	4,103	4,121	4,661	4,296	3,320	2,548	2,989
Atmautluak	1,191	754	1,479	547	2,153	1,927	1,422	1,890	1,737	1,581	1,091	1,171
Napakiak	2,073	2,408	2,702	2,438	2,839	3,060	5,125	3,245	2,165	2,335	1,640	1,999
Napaskiak	4,175	4,596	3,922	3,390	4,058	4,485	5,877	6,392	4,425	5,170	4,313	3,349
Oscarville	1,264	1,779	1,115	1,153	1,325	1,069	1,052	1,360	1,351	754	618	694
Bethel	20,629	24,684	22,892	24,584	29,443	28,293	27,805	30,422	35,205	26,302	24,973	23,503
Kwethluk	5,174	6,460	6,880	4,206	7,157	6,089	7,258	6,466	8,209	6,409	4,445	2,445
Akiachak	6,311	6,978	6,946	2,493	7,131	5,411	5,561	7,621	9,509	7,078	4,470	3,873
Akiak	2,335	3,528	3,390	3,905	3,775	3,860	4,423	4,297	3,784	3,247	3,625	2,465
Tuluksak	2,464	2,520	2,860	3,286	3,766	2,655	2,372	3,886	3,374	3,212	2,110	1,233
Lower Kuskokwim R.	57,864	66,917	67,580	58,125	81,293	73,118	76,488	82,839	84,201	66,628	57,819	50,462
Lower Kalskag	1,691	2,432	1,535	1,556	1,991	1,417	3,494	1,937	2,442	2,525	1,030	991
Upper Kalskag	1,234	1,149	1,545	1,328	2,498	2,533	1,569	1,383	2,368	1,696	1,500	1401
Aniak	3,100	2,684	4,576	1,837	3,022	1,977	2,412	3,417	3,252	2,062	2,212	2214
Chuathbaluk	281	700	505	405	1,460	913	887	1,007	772	877	551	409
Middle Kuskokwim R.	6,306	6,965	8,161	5,126	8,971	6,840	8,362	7,744	8,834	7,160	5,293	5,015
Crooked Creek	592	689	859	582	946	948	736	718	573	608	240	402
Red Devil	95	174	293	31	156	181	232	301	177	258	33	186
Sleetmute	412	505	604	600	906	522	750	861	668	723	272	242
Stony River	205	167	415	118	688	320	290	564	699	704	189	134
Lime Village	69	251	207	34	69	176	122	119	55	97	78	171
McGrath	656	444	970	395	587	896	689	495	619	593	257	762
Takotna	0	5	10	0	16	8	0	12	3	9	0	0
Nikolai	144	280	535	213	493	551	696	501	184	298	402	450
Telida	-	-	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim R.	2,173	2,515	3,893	1,973	3,861	3,602	3,515	3,572	2,978	3,289	1,471	2,347
Kuskokwim R. Total	70,833	78,009	80,983	67,228	97,110	85,097	90,094	96,139	98,099	78,225	66,053	58,836

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Table 3.–Page 3 of 3.

Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Quinhagak	3,881	3,753	4,394	3,634	3,977	2,864	3,506	3,186	3,774	2,815	3,053	3,177	2,649	2,563	4,563	3,505	5,163	4,686	3,923	2,976	2,692	2,177
Goodnews Bay	358	852	548	590	672	789	392	441	735	759	564	863	723	807	863	869	713	647	1,012	585	480	784
Platinum	202	20	67	75	74	24	41	14	57	69	99	57	154	45	122	74	45	66	42	61	14	62
S. Kuskokwim Bay	4,441	4,625	5,009	4,299	4,723	3,677	3,939	3,641	4,566	3,643	3,716	4,097	3,526	3,415	5,548	4,448	5,921	5,399	4,977	3,622	3,186	3,023
Mekoryuk	-	-	-	0	14	-	-	-	2	35	13	-	4	30	-	-	-	-	-	-	-	-
Newtok	-	-	-	-	-	-	-	-	-	-	136	-	-	-	-	-	-	-	-	-	-	-
Nightmute	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toksook Bay	-	-	-	-	2,842	-	-	-	-	3,299	609	-	-	-	525	-	851	-	-	-	-	-
Tununak	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chefornak	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Bering Sea Coast	0	0	0	0	2,856	0	0	0	2	3,334	758	0	4	30	525	0	851	0	0	0	0	0
Total Estimate	114,219	79,445	87,657	91,973	110,922	105,787	100,354	83,023	85,787	79,752	75,307	82,106	84,513	70,673	103,183	89,545	96,866	101,538	103,076	81,847	69,239	61,859

Source: Historical data are from Hamazaki (2011); 2010–2012 are unpublished; T. Hamazaki, Division of Commercial Fisheries Biometrician, ADF&G, Anchorage, September 24, 2012.

Note: dashes indicate that harvest was not estimated and numbers in italic are Bayesian inputted estimates.

Table 4.–Commercial salmon harvest and exvessel value, District W-1, Kuskokwim River, Kuskokwim Management Area, 1993–2012.

Year	King		Sockeye		Pink		Chum		Coho		Total	
	Number ^a	Value (\$)	Number ^a	Value (\$)	Number ^a	Value (\$)	Number ^a	Value (\$)	Number ^a	Value (\$)	Number ^a	Value (\$)
1993	8,714	72,659	27,003	140,000	64	59	42,718	112,756	586,330	2,535,321	664,829	2,860,795
1994	16,201	126,892	49,362	188,691	30,930	8,967	269,426	381,639	690,369	2,875,803	1,056,288	3,581,992
1995	28,054	280,287	90,026	448,530	335	50	588,250	724,273	455,269	1,313,742	1,161,934	2,766,882
1996	6,972	23,665	33,404	97,176	1,621	744	202,827	170,977	930,131	1,824,683	1,174,955	2,117,245
1997	10,436	36,843	21,988	64,922	2	1	17,003	19,509	129,601	2,167,491	179,030	2,288,766
1998	17,356	74,387	60,906	209,860	92	55	207,698	183,307	210,168	516,024	496,220	983,633
1999	4,705	22,266	16,976	86,442	2	0	23,006	16,428	23,593	44,633	68,282	169,769
2000	444	3,044	4,130	14,272	7	3	11,570	7,967	259,721	489,644	275,872	514,930
2001	90	534	84	265	0	0	1,272	827	192,998	422,573	194,444	424,199
2002	72	212	84	196	0	0	1,900	1,190	83,463	124,763	85,519	126,361
2003	158	846	282	803	0	0	2,764	1,087	284,064	450,451	287,268	453,187
2004	2,305	9,815	8,532	19,549	0	0	20,150	6,611	435,407	907,791	466,394	943,766
2005	4,784	29,040	27,645	109,063	0	0	69,139	23,115	142,319	287,635	243,887	448,853
2006	2,777	16,192	12,618	41,891	1	1	44,070	14,988	185,598	378,318	245,064	451,390
2007	179	1,607	703	2,411	0	0	10,763	3,033	141,049	373,789	152,694	380,840
2008	8,865	70,988	15,601	59,777	15	4	30,516	11,212	142,862	396,329	197,859	538,310
2009	6,664	61,452	25,673	101,445	2	0	76,790	76,494	104,546	263,457	213,675	502,848
2010	2,731	53,134	22,428	167,575	0	0	93,148	162,445	58,031	382,452	176,338	765,606
2011	49	411	13,482	79,370	1	0	118,256	350,124	74,108	334,452	205,896	764,358
2012	14	225	2,857	16,154	0	0	65,171	257,932	86,389	323,687	154,431	597,998
10 Yr Avg	2,858	24,370	12,705	58,208	2	0	46,750	65,030	165,145	389,944	227,459	537,552

Source: Historical data are from Brazil et al. 2011. Data from 2011 and 2012 are unpublished.

^a Does not include fish retained for personal use.

Table 5.—Kuskokwim River king salmon estimated total run, escapement, harvest, and exploitation rate 1976-2011.

Year	Estimated Total Run	Estimated Escapement	Harvest				Total Exploitation
			Subsistence	Commercial ^a	Sport	Test Fish	
1976	233,967	143,420	58,606	30,735		1,206	90,547 39%
1977	295,559	201,852	56,580	35,830	33	1,264	93,707 32%
1978	264,325	180,853	36,270	45,641	116	1,445	83,472 32%
1979	253,970	157,668	56,283	38,966	74	979	96,302 38%
1980	300,573	203,605	59,892	35,881	162	1,033	96,968 32%
1981	389,791	279,392	61,329	47,663	189	1,218	110,399 28%
1982	187,354	80,353	58,018	48,234	207	542	107,001 57%
1983	166,333	84,188	47,412	33,174	420	1,139	82,145 49%
1984	188,238	99,062	56,930	31,742	273	231	89,176 47%
1985	176,292	94,365	43,874	37,889	85	79	81,927 46%
1986	129,168	58,556	51,019	19,414	49	130	70,612 55%
1987	193,465	89,222	67,325	36,179	355	384	104,243 54%
1988	207,818	80,055	70,943	55,716	528	576	127,763 61%
1989	241,857	115,704	81,175	43,217	1,218	543	126,153 52%
1990	264,802	100,614	109,778	53,504	394	512	164,188 62%
1991	218,705	105,589	74,820	37,778	401	117	113,116 52%
1992	284,846	153,573	82,648	46,872	367	1,380	131,267 46%
1993	269,305	169,816	87,674	8,735	587	2,483	99,479 37%
1994	365,246	242,616	103,343	16,211	1,139	1,937	122,630 34%
1995	360,513	225,595	102,110	30,846	541	1,421	134,918 37%
1996	302,603	197,092	96,415	7,419	1,432	247	105,513 35%
1997	303,189	211,247	79,382	10,441	1,788	332	91,943 30%
1998	213,873	113,627	81,219	17,359	1,464	210	100,252 47%
1999	189,939	112,082	72,775	4,705	279	98	77,857 41%
2000	136,618	65,180	70,833	444	105	64	71,446 52%
2001	223,707	145,232	78,009	90	290	86	78,475 35%
2002	246,296	164,635	80,983	72	319	288	81,662 33%
2003	248,789	180,687	67,228	158	401	409	68,196 27%
2004	388,136	287,178	97,110	2,300	857	691	100,958 26%
2005	366,601	275,598	85,097	4,784	572	557	91,010 25%
2006	307,662	214,004	90,094	2,777	444	352	93,667 30%
2007	273,060	174,943	96,139	179	1,478	305	98,101 36%
2008	237,074	128,978	98,099	8,865	708	420	108,092 46%
2009	204,747	118,478	78,225	6,664	904	470	86,263 42%
2010	118,507	49,073	66,053	2,732	354	292	69,431 59%
2011	133,059	72,097	58,836	748	633	337	60,553 46%
10-year average (2002-2011)	252,393	166,567	81,786	2,928	667	412	85,793 37%

Source: Bue et al. 2012. Subsistence harvest from 1990 to 2011 is from T. Hamazaki, Division of Commercial Fisheries Biometrician, ADF&G, Anchorage, September 24, 2012; (Hamazaki 2011).

Note: Blank cells represent no data.

^a Includes fish retained for personal use.

Table 6.–Kuskokwim River chum salmon escapement estimates, 1976–2012.

Year	Kwethluk Weir	Tuluksak Weir	George Weir	Kogrukluk Weir	Tatlawiksuk Weir	Takotna Weir	Aniak Sonar ^c
1976				8,177			
1977				19,443			
1978				48,125			
1979				18,198			
1980				^a			1,600,032
1981				57,365			649,849
1982				64,063			529,758
1983				9,407			166,452
1984				41,484			317,688
1985				15,005			273,306
1986				14,693			219,770
1987				^a			204,834
1988				39,540			485,077
1989				39,549			295,993
1990				26,765			246,813
1991		7,675		24,188			366,687
1992	30,595	11,183		34,105			87,467
1993		13,804		31,899			15,278
1994		15,724		46,635			474,356
1995				31,265		^a	^a
1996	26,049		19,393	48,495		2,872	402,195
1997	10,659		5,907	7,958		1,779	289,654
1998	^a			36,442	^a	^a	351,792
1999	^a		11,552	13,820	9,599	^a	214,429
2000	11,691		3,492	11,491	7,044	1,254	177,384
2001	^a	19,321	11,601	30,569	23,718	5,414	408,830
2002	35,854	9,958	6,543	51,570	24,542	4,377	472,346
2003	41,812	11,724	33,666	23,413	^a	3,393	477,544
2004	38,646	11,796	14,409	24,201	21,245	1,630	672,931
2005	^a	35,696	14,828	197,723	55,720	6,467	1,151,505
2006	47,490	25,648	41,467	180,594	32,301	12,598	1,108,626
2007	57,230	17,286	55,842	49,505	83,246	8,900	696,801
2008	20,048	12,518	29,978	44,978	30,896	5,691	427,911
2009	32,028	13,658	7,941	84,940	19,975	2,487	479,531
2010	19,242	13,042	26,154	63,583	36,701	4,057	429,643
2011	18,329	10,010	44,640	76,384	84,202	8,414	345,974
2012 ^b	^a	16,782	34,338	^a	44,572	6,662	^a
Escapement Goal:				15,000-49,000		210,000-480,000	

Sources: Clark et al. 2011; Hansen and Shelden 2011; Miller and Harper 2012a-b; Smith and Shelden 2011; Williams and Shelden 2011.

Note: Blank cells represent no data.

^a Field operations were incomplete and total annual escapement was not estimated.

^b Preliminary numbers, subject to change.

^c Sonar estimates for the Aniak River are generally not apportioned to species, but chum salmon dominate throughout most of the project operational period. The minimum target operational period is defined here as June 26 to July 28.

Table 7.—Estimated subsistence chum salmon harvest in the Kuskokwim Area.

Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Kipnuk	-	-	-	-	-	-	-	-	-	-
Kwigillingok	-	-	-	-	-	-	-	-	-	-
Kongiganak	1,009	978	1,584	708	1,414	1,269	1,763	753	1,579	1,049
N. Kuskokwim Bay	1,009	978	1,584	708	1,414	1,269	1,763	753	1,579	1,049
Tuntutuliak	6,592	4,697	6,245	3,325	5,346	3,509	6,119	2,435	3,640	1,709
Eek	3,014	790	1,324	250	591	899	999	556	795	484
Kasigluk	3,877	3,013	4,759	2,269	3,012	2,605	4,143	1,460	2,102	3,768
Nunapitchuk	6,448	5,840	9,195	4,895	4,560	4,264	6,255	2,465	4,885	4,428
Atmautluak	4,676	2,241	2,614	1,300	1,420	3,768	2,660	1,395	1,875	1,552
Napakiak	9,714	2,351	5,474	2,269	3,819	2,820	4,352	1,430	3,605	1,495
Napaskiak	11,334	6,703	7,817	3,653	5,797	4,137	6,200	2,318	3,771	2,529
Oscarville	1,400	1,147	1,515	561	676	740	1,548	434	378	1,530
Bethel	34,257	16,781	17,231	8,608	15,722	17,416	21,706	8,078	12,522	9,918
Kwethluk	11,451	5,714	8,001	3,499	6,340	6,114	12,043	3,266	4,508	3,582
Akiachak	10,565	5,921	9,532	3,308	5,998	3,992	5,019	1,615	2,218	2,696
Akiak	9,226	6,575	6,679	7,577	4,483	2,007	4,967	1,639	1,894	1,210
Tuluksak	5,863	5,454	4,632	3,774	2,395	2,698	3,208	2,790	3,044	1,480
Lower Kuskokwim River	118,417	67,227	85,018	45,288	60,159	54,969	79,219	29,882	45,237	36,381
Lower Kalskag	4,980	2,958	2,807	2,938	2,856	1,438	4,070	1,298	968	733
Upper Kalskag	1,406	3,139	3,040	591	836	1,326	1,565	349	464	649
Aniak	10,160	3,511	7,687	2,926	2,538	3,454	8,569	1,678	4,964	1,753
Chuathbaluk	4,408	2,138	2,644	2,879	1,495	1,701	2,175	1,135	925	698
Middle Kuskokwim River	20,954	11,746	16,178	9,334	7,725	7,919	16,379	4,460	7,321	3,833
Crooked Creek	2,977	1,326	1,242	664	757	332	355	313	2,527	830
Red Devil	1,613	1,133	1,500	927	1,318	882	727	499	462	169
Sleetmute	2,006	1,880	2,961	692	1,520	1,683	1,250	417	870	340
Stony River	1,234	638	1,165	775	881	1,311	443	600	648	296
Lime Village	2,350	830	1,325	497	1,600	789	324	244	964	1,015
McGrath	2,326	1,083	4,472	578	1,264	1,525	211	138	1,510	242
Takotna	64	0	14	0	6	1	0	0	15	0
Nikolai	875	396	914	334	293	297	229	60	519	87
Telida	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim River	13,445	7,286	13,593	4,467	7,639	6,820	3,539	2,271	7,515	2,979
Kuskokwim River Total	153,825	87,237	116,373	59,797	76,937	70,977	100,900	37,366	61,652	44,242

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Table 7.–Page 2 of 3.

Community	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Kipnuk	2,888	-	-	-	759	-	-	-	-	-	-	-
Kwigillingok	-	-	-	-	-	-	-	-	-	-	-	-
Kongiganak	1,839	2,399	3,247	897	2,958	1,960	2,420	2,158	1,592	1,307	2,513	2,303
N. Kuskokwim Bay	4,727	2,399	3,247	897	3,717	1,960	2,420	2,158	1,592	1,307	2,513	2,303
											0	0
Tuntutuliak	2,622	2,585	4,150	1,288	2,546	3,568	4,024	3,350	4,416	3,330	2,439	1,906
Eek	636	402	1,228	578	688	877	1,256	803	761	696	721	492
Kasigluk	4,689	4,972	5,783	2,733	5,064	3,413	4,958	4,292	1,677	1,648	2,403	1,923
Nunapitchuk	4,865	4,724	8,002	2,865	5,053	4,167	5,150	6,619	4,726	3,468	3,223	3,341
Atmautluak	1,848	1,397	2,514	849	2,271	1,940	2,664	2,193	2,207	1,673	1,406	1,800
Napakiak	2,859	1,793	3,421	1,560	2,328	3,238	8,143	3,628	1,811	1,679	1,766	1,578
Napaskiak	2,757	2,364	4,010	2,061	2,705	2,205	4,323	3,032	2,638	1,410	3,110	1,792
Oscarville	1,260	1,831	1,319	804	828	686	1,151	932	836	534	352	402
Bethel	10,149	10,757	17,731	11,452	13,448	14,273	20,953	16,540	18,660	10,480	10,986	12,822
Kwethluk	5,232	4,601	8,019	2,294	4,288	4,328	6,328	6,291	5,935	3,331	3,082	3,523
Akiachak	4,719	3,170	5,173	2,650	3,880	2,428	4,333	4,782	4,043	2,844	2,856	3,189
Akiak	2,617	2,240	2,571	2,928	3,499	3,528	3,095	4,141	3,184	1,350	1,163	2,439
Tuluksak	2,492	2,068	3,719	894	2,433	2,183	3,094	3,204	4,005	1,570	3,249	2,699
Lower Kuskokwim River	46,745	42,904	67,640	32,956	49,031	46,834	69,472	59,807	54,899	34,013	36,756	37,906
											0	0
Lower Kalskag	1,534	1,498	1,445	1,087	1,316	997	4,703	1,997	2,030	930	691	1,284
Upper Kalskag	1,550	1,502	2,460	516	1,656	1,201	2,469	294	1,829	329	393	1,309
Aniak	1,933	1,934	4,367	820	2,535	2,952	3,722	4,108	2,839	2,626	2,538	2,391
Chuathbaluk	654	2,711	1,458	2,502	2,352	530	1,451	1,741	593	937	535	686
Middle Kuskokwim River	5,671	7,645	9,730	4,925	7,859	5,680	12,345	8,140	7,291	4,822	4,157	5,670
												0
Crooked Creek	809	1,211	1,417	750	1,583	1,064	1,513	830	930	519	539	862
Red Devil	54	334	384	63	135	214	41	186	188	244	122	434
Sleetmute	371	379	1,293	468	1,054	422	1,475	818	358	388	524	689
Stony River	297	172	696	361	754	500	599	504	1,470	771	338	516
Lime Village	451	651	841	110	199	611	328	426	539	416	272	516
McGrath	188	247	969	513	290	529	999	464	1,352	841	482	472
Takotna	0	10	1	0	0	5	0	0	5	0	0	0
Nikolai	56	53	187	174	277	201	308	228	54	300	440	349
Telida	-	-	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim River	2,226	3,057	5,788	2,439	4,292	3,546	5,263	3,456	4,896	3,479	2,717	3,838
Kuskokwim River Total	59,369	56,005	86,406	41,217	64,899	58,020	89,500	73,561	68,678	43,621	46,143	49,717

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Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Quinhagak	3,161	1,631	2,287	1,053	1,401	669	943	572	1,375	1,587	895	808	2,011	559	1,383	994	2,754	2,249	1,795	1,297	1,376	1,051
Goodnews Bay	200	136	1,311	177	406	140	221	135	295	232	251	187	349	200	240	192	555	307	643	141	324	338
Platinum	149	4	137	0	51	3	2	0	11	33	82	60	95	19	42	21	108	28	106	28	37	70
South Kuskokwim Bay	3,510	1,771	3,735	1,230	1,858	812	1,166	707	1,681	1,852	1,228	1,055	2,455	778	1,665	1,207	3,417	2,584	2,544	1,466	1,737	1,459
Mekoryuk	-	-	-	3,524	5,258	-	-	-	9,447	4,328	11,114	-	6,162	4,721	-	-	-	-	-	-	-	-
Newtok	-	-	-	-	-	-	-	-	-	-	115	-	-	-	-	-	-	-	-	-	-	-
Nightmute	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toksook Bay	-	-	-	-	5,500	-	-	-	-	778	1,007	-	-	-	1,504	-	2,984	-	-	-	-	-
Tununak	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chefornak	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bering Sea Coast	0	0	0	3,524	10,758	0	0	0	9,447	5,106	12,236	0	6,162	4,721	1,504	0	2,984	0	0	0	0	0
Total Estimate	157,335	89,008	120,108	64,551	89,553	71,789	102,066	38,073	72,780	51,200	72,833	57,060	95,023	46,716	68,068	59,227	95,901	76,145	71,222	45,087	47,880	51,176

Source: Historical data are from Hamazaki (2011); 2010–2012 are unpublished; T. Hamazaki, Division of Commercial Fisheries Biometrician, ADF&G, Anchorage, September 24, 2012.

Note: dashes indicate that harvest was not estimated and numbers in italic are Bayesian inputted estimates.

Table 8.—Kuskokwim River sockeye salmon escapement estimates, 1976–2012.

Year	Kwethluk Weir	Tuluksak Weir	George Weir	Kogrukluks Weir	Tatlawiksuk Weir	Takotna Weir	Telaquana Weir
1976				2,326			
1977				1,637			
1978				1,670			
1979				2,628			
1980				^a			
1981				18,066			
1982				17,297			
1983				1,176			
1984				4,133			
1985				4,359			
1986				4,244			
1987				^a			
1988				4,397			
1989				5,811			
1990				8,406			
1991		697		16,455			
1992	1,316	1,083		7,540			
1993		2,218		29,358			
1994		2,917		14,192			
1995				10,996			^a
1996	1,801		^a	15,385		0	
1997	1,374		445	13,078		0	
1998	^a		^a	16,773	^a		^a
1999	^a		^a	5,864	6		
2000	358		22	2,867	0	3	
2001	^a	997	24	8,773	3	1	
2002	272	1,346	17	4,050	1	1	
2003	2,928	1,064	11	9,138	^a	3	
2004	3,302	1,479	174	6,671	10	17	
2005	^a	2,663	270	37,960	77	34	
2006	6,732	985	164	60,807	41	59	
2007	5,262	352	74	16,525	27	13	
2008	2,451	185	94	19,675	39	12	
2009	4,385	708	54	23,785	39	3	
2010	4,242	437	115	13,995	33	8	72,021
2011	2,031	131	43	8,132	23	1	35,105
2012 ^b	^a	181	78	^a	9	0	22,752
Escapement Goal:				4,400-17,000			

Sources: Clark et al. 2011; Hansen and Shelden 2011; Miller and Harper 2012a-b; Smith and Shelden 2011; Williams and Shelden 2011.

Note: Blank cells represent no data.

^a Field operations were incomplete and no total annual escapement was estimated.

^b Preliminary numbers, subject to change.

Table 9.—Estimated subsistence sockeye salmon harvest in the Kuskokwim Area.

Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Kipnuk	-	-	-	-	-	-	-	-	-	-
Kwigillingok	-	-	-	-	-	-	-	-	-	-
Kongiganak	552	498	923	583	743	658	951	976	878	908
N. Kuskokwim Bay	552	498	923	583	743	658	951	976	878	908
Tuntutuliak	2,132	1,768	1,846	1,063	3,289	1,082	1,561	1,724	1,227	2,070
Eek	1,293	479	669	363	452	308	526	503	375	595
Kasigluk	843	1,376	1,951	1,769	956	794	1,075	1,320	834	3,229
Nunapitchuk	1,520	2,193	2,329	2,743	1,633	870	1,877	2,082	2,029	3,258
Atmautluak	1,696	830	1,193	1,313	837	1,173	1,408	681	982	1,743
Napakiak	1,548	1,187	1,663	1,217	1,533	887	1,106	1,526	1,487	2,018
Napaskiak	1,660	2,850	3,116	3,508	1,933	1,573	3,180	2,209	1,457	1,929
Oscarville	287	726	1,169	957	398	301	208	492	249	1,724
Bethel	11,787	11,428	9,225	9,501	11,370	8,802	10,556	10,233	8,464	12,094
Kwethluk	4,271	3,746	1,958	3,802	3,864	2,536	3,963	3,288	3,785	3,485
Akiachak	3,461	4,029	3,970	4,990	3,241	1,942	2,767	2,737	2,395	3,066
Akiak	1,873	1,696	1,769	3,537	1,740	809	1,544	1,327	1,640	1,151
Tuluksak	1,225	3,427	2,063	2,452	1,390	1,270	1,108	1,514	1,413	1,412
Lower Kuskokwim River	33,596	35,735	32,921	37,215	32,636	22,347	30,879	29,636	26,337	37,774
Lower Kalskag	1,007	1,080	503	2,286	989	679	1,387	1,277	546	583
Upper Kalskag	284	314	354	346	288	82	284	216	238	586
Aniak	1,539	2,073	1,213	1,609	751	955	1,295	1,078	1,132	1,302
Chuathbaluk	1,157	1,471	497	822	924	465	687	796	223	441
Middle Kuskokwim River	3,987	4,938	2,567	5,063	2,952	2,181	3,653	3,367	2,139	2,912
Crooked Creek	1,607	968	738	752	558	177	311	350	717	710
Red Devil	455	391	355	662	336	576	914	637	692	497
Sleetmute	1,153	1,347	794	1,643	1,120	1,109	1,341	1,458	1,282	879
Stony River	933	1,966	1,389	1,485	758	1,281	1,267	1,626	1,063	1,018
Lime Village	2,125	1,110	1,304	2,743	1,733	857	1,138	642	2,782	2,619
McGrath	1,489	416	2,494	1,465	1,501	1,652	111	52	146	0
Takotna	0	0	1	0	0	2	1	1	0	0
Nikolai	0	1	0	5	25	65	23	0	16	43
Telida	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim River	7,762	6,199	7,075	8,755	6,031	5,719	5,106	4,766	6,698	5,766
Kuskokwim River Total	45,897	47,370	43,486	51,616	42,362	30,905	40,589	38,745	36,052	47,360

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Community	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Kipnuk	2,788	-	-	-	1,278	-	-	-	-	-	-	-
Kwigillingok	-	-	-	-	-	-	-	-	-	-	-	-
Kongiganak	1,770	1,546	1,347	929	1,809	1,103	1,464	1,083	1,347	830	1,842	1,097
N. Kuskokwim Bay	4,558	1,546	1,347	929	3,087	1,103	1,464	1,083	1,347	830	1,842	1,097
Tuntutuliak	1,180	1,702	1,045	1,148	1,620	2,145	1,834	1,763	2,418	932	2,068	1,321
Eek	883	1,085	759	586	567	1,033	673	663	739	1,019	1,241	678
Kasigluk	3,805	3,733	1,537	1,683	1,668	1,273	1,926	1,635	1,230	945	1,448	1,000
Nunapitchuk	2,194	2,529	1,500	1,714	1,659	1,821	1,871	2,147	2,331	1,484	1,902	1,777
Atmautluak	1,540	988	1,150	679	1,103	1,444	1,011	1,041	1,381	628	735	798
Napakiak	1,916	1,917	1,688	1,453	1,351	2,122	1,845	1,962	1,625	917	1,187	1,368
Napaskiak	2,525	3,377	1,296	1,643	1,148	1,344	1,784	1,738	2,505	1,523	1,979	1,601
Oscarville	1,331	1,451	400	806	436	278	778	712	677	334	250	228
Bethel	11,613	14,264	8,850	12,198	11,679	14,297	12,816	13,902	18,016	11,329	10,662	15,193
Kwethluk	3,859	4,191	2,100	1,903	3,302	2,457	2,770	3,536	5,097	2,183	2,571	2,368
Akiachak	3,687	4,680	2,507	1,607	3,109	2,372	2,661	3,269	4,731	2,408	2,433	2,639
Akiak	1,036	2,005	1,214	995	1,258	1,920	2,000	3,695	2,644	1,290	1,161	2,595
Tuluksak	2,201	1,862	1,205	875	1,670	987	2,247	2,021	2,276	1,691	2,534	1,672
Lower Kuskokwim River	37,770	43,784	25,251	27,290	30,570	33,493	34,215	38,084	45,670	26,683	30,171	33,238
Lower Kalskag	824	918	347	515	775	439	1,434	780	1,736	1,044	507	633
Upper Kalskag	588	319	508	431	686	945	563	417	996	369	465	746
Aniak	1,136	2,167	1,059	756	996	1,015	692	1,261	1,796	941	1,055	1,168
Chuathbaluk	476	614	313	274	526	369	508	523	363	564	403	300
Middle Kuskokwim River	3,024	4,018	2,227	1,976	2,983	2,768	3,197	2,981	4,891	2,918	2,430	2,847
Crooked Creek	514	640	449	571	732	693	544	592	754	329	302	243
Red Devil	109	360	109	309	88	272	510	318	475	477	475	502
Sleetmute	725	1,008	706	504	980	673	1,181	1,303	1,111	707	1,024	693
Stony River	614	163	602	158	896	673	721	1,043	1,759	977	372	303
Lime Village	1,409	1,453	1,152	374	874	1,338	1,141	1,480	1,318	969	825	650
McGrath	43	273	407	112	194	487	149	375	1,392	984	622	621
Takotna	0	0	0	1	0	1	0	1	2	3	2	0
Nikolai	0	0	22	12	1	16	20	12	13	66	65	13
Telida	-	-	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim River	3,414	3,897	3,447	2,041	3,765	4,152	4,267	5,124	6,824	4,512	3,687	3,025
Kuskokwim River Total	48,766	53,245	32,272	32,237	40,405	41,517	43,143	47,272	58,732	34,943	38,130	40,207

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Table 9.–Page 3 of 3.

Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Quinhagak	1,710	1,818	1,448	1,228	962	597	499	460	1,368	1,433	1,368	1,054	909	805	1,375	1,745	3,128	1,755	2,692	1,744	1,671	1,328
Goodnews Bay	982	1,061	1,293	733	646	202	387	480	499	715	951	908	855	705	873	1,213	995	880	2,225	908	1,093	1,336
Platinum	163	134	238	48	90	32	56	143	79	106	188	83	257	64	183	90	63	118	156	186	175	135
South Kuskokwim Bay	2,855	3,013	2,979	2,009	1,698	831	942	1,083	1,946	2,254	2,507	2,045	2,021	1,574	2,431	3,048	4,186	2,753	5,073	2,838	2,939	2,799
Mekoryuk	-	-	-	6	167	-	-	-	179	5	40	-	14	6	-	-	-	-	-	-	-	-
Newtok	-	-	-	-	-	-	-	-	-	-	891	-	-	-	-	-	-	-	-	-	-	-
Nightmute	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toksook Bay	-	-	-	-	1,900	-	-	-	-	1,369	1,300	-	-	-	589	-	1,966	-	-	-	-	-
Tununak	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chefornak	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bering Sea Coast	0	0	0	6	2,067	0	0	0	179	1,374	2,231	0	14	6	589	0	1,966	0	0	0	0	0
Total Estimate	48,752	50,383	46,465	53,631	46,127	31,736	41,530	39,828	38,177	50,988	53,504	55,290	34,307	33,817	43,425	44,565	49,295	50,025	63,805	37,781	41,069	43,006

Source: Source: Historical data are from Hamazaki (2011); 2010–2012 are unpublished; T. Hamazaki, Division of Commercial Fisheries Biometrician, ADF&G, Anchorage, September 24, 2012.

Note: dashes indicate that harvest was not estimated and italic numbers indicate Bayesian inputted estimates.

Table 10.—Kuskokwim River coho salmon escapement estimates, 1976–2012.

Year	Kwethluk Weir	Tuluksak Weir	George Weir	Kogrukluks Weir	Tatlawiksuk Weir	Takotna Weir
1981				11,455		
1982				37,796		
1983				8,538		
1984				27,595		
1985				16,441		
1986				22,506		
1987				22,821		
1988				13,512		
1989				1,272		
1990				6,132		
1991		4,651		9,964		
1992	45,605	7,501		26,057		
1993		8,328		20,517		
1994		7,952 ^b		34,695		
1995				27,862		a
1996	a		a	50,555		a
1997	a		9,210	12,238		a
1998	a		a	24,348	a	a
1999	a		8,914	12,609	3,455	a
2000	25,610	a	11,262	33,135	a	3,957
2001	21,596 ^a	23,768	14,398	19,387	10,539 ^b	2,606
2002	23,298	11,487	6,759	14,516	11,345	3,984
2003	107,789	41,071	33,280	74,604	a	7,171
2004	64,216	20,336	12,499	27,041	16,410	3,207
2005	a	11,324	8,200	24,116	7,495	2,216
2006	25,664	6,111	11,296	17,011	9,453	5,548
2007	20,257	2,807	29,317	27,033	8,685	2,853
2008	49,971	7,457	21,931	29,661	11,065	2,817
2009	21,911	8,137	12,573	22,981	10,148	2,708
2010	a	1,216	12,961	13,971	3,520	3,217
2011	a	a	30,028	24,174	12,928	4,063
2012 ^c	19,960	4,407	15,273	13,698	8,071	1,823
Escapement Goal:	>19,000		13,000-28,000			

Sources: Clark et al. 2011; Hansen and Shelden 2011; Miller and Harper 2012a-b; Smith and Shelden 2011; Williams and Shelden 2011.

Note: Blank cells represent no data.

^a Field operations were incomplete and no total annual escapement was estimated.

^b Field operations were incomplete; more than 20% of the total annual escapement is based on daily passage estimates.

^c Preliminary numbers, subject to change.

Table 11.—Estimated subsistence coho salmon harvest in the Kuskokwim Area.

Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Kipnuk	-	-	-	-	-	-	-	-	-	-
Kwigillingok	-	-	-	-	-	-	-	-	-	-
Kongiganak	474	490	605	448	569	662	579	514	204	203
N. Kuskokwim Bay	474	490	605	448	569	662	579	514	204	203
Tuntutuliak	1,287	733	693	820	364	339	1,335	558	858	277
Eek	1,800	387	502	160	399	387	437	63	314	242
Kasigluk	922	1,723	1,811	399	676	269	815	337	299	4,213
Nunapitchuk	746	1,131	2,242	318	749	629	1,444	732	345	368
Atmautluak	398	237	333	380	402	634	534	485	283	190
Napakiak	1,470	599	1,570	586	871	344	602	161	739	459
Napaskiak	1,139	798	1,108	780	2,016	584	506	592	488	316
Oscarville	57	147	160	0	48	0	15	0	0	779
Bethel	32,988	17,677	24,908	12,310	17,082	22,007	21,982	17,077	12,058	11,565
Kwethluk	3,928	2,311	2,419	1,809	1,880	1,690	2,995	1,104	1,583	2,883
Akiachak	1,910	2,337	3,058	1,102	1,281	628	903	383	409	662
Akiak	1,789	2,193	1,072	1,373	1,099	481	920	798	521	259
Tuluksak	978	1,854	1,629	408	223	522	1,175	418	812	298
Lower Kuskokwim River	49,412	32,127	41,505	20,445	27,090	28,514	33,663	22,708	18,709	22,511
Lower Kalskag	445	500	526	823	881	715	1,246	572	345	285
Upper Kalskag	346	527	972	353	178	257	348	661	834	155
Aniak	1,669	1,171	1,933	1,104	1,768	1,244	2,723	1,428	1,284	1,419
Chuathbaluk	826	87	368	366	741	79	409	196	50	138
Middle Kuskokwim River	3,286	2,285	3,799	2,646	3,568	2,295	4,726	2,857	2,513	1,997
Crooked Creek	922	279	712	396	646	358	175	261	394	529
Red Devil	914	1,038	1,284	1,673	1,074	1,539	1,135	1,455	504	424
Sleetmute	1,036	1,588	937	912	626	1,104	870	419	267	210
Stony River	474	513	727	511	477	1,023	529	455	422	423
Lime Village	486	390	382	606	1,467	223	656	270	776	701
McGrath	466	477	2,146	563	998	604	824	745	734	338
Takotna	0	0	4	0	0	7	6	3	3	0
Nikolai	90	65	204	285	94	499	36	130	97	73
Telida	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim River	4,388	4,350	6,396	4,946	5,382	5,357	4,231	3,738	3,197	2,698
Kuskokwim River Total	57,560	39,252	52,305	28,485	36,609	36,828	43,199	29,817	24,623	27,409

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Table 11.–Page 2 of 3.

Community	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Kipnuk	3,642	-	-	-	3,448	-	-	-	-	-	-	-
Kwigillingok	-	-	-	-	-	-	-	-	-	-	-	-
Kongiganak	339	919	1,138	236	937	740	657	883	551	588	390	505
N. Kuskokwim Bay	3,981	919	1,138	236	4,385	740	657	883	551	588	390	505
Tuntutuliak	3,264	335	1,239	2,092	1,189	1,074	948	703	1,495	359	698	250
Eek	493	241	821	747	1,018	378	<u>652</u>	<u>389</u>	<u>815</u>	176	315	268
Kasigluk	9,726	1,682	3,494	1,505	5,034	1,906	3,008	2,826	917	628	1,078	316
Nunapitchuk	355	425	821	627	555	807	692	1,752	483	286	195	323
Atmaultluak	227	375	612	283	744	530	500	424	280	68	36	259
Napakiak	453	667	793	992	1,648	742	2,363	1,244	1,375	428	884	932
Napaskiak	836	455	717	983	655	602	1,640	639	816	755	1,015	447
Oscarville	388	90	161	19	304	60	175	180	62	67	12	43
Bethel	13,478	14,108	15,489	15,062	17,040	12,994	18,810	12,972	16,998	13,037	19,000	16,131
Kwethluk	3,435	1,773	2,706	1,787	3,430	3,048	1,245	1,624	6,867	4,044	1,527	1,078
Akiachak	2,555	1,912	1,690	1,627	2,397	1,817	1,714	2,355	4,132	1,593	1,181	1,521
Akiak	479	594	1,136	1,094	1,342	1,847	379	1,325	1,260	661	475	508
Tuluksak	520	1,136	1,349	921	1,007	484	498	1,401	777	857	337	160
Lower Kuskokwim River	36,209	23,793	31,028	27,739	36,363	26,289	32,624	27,835	36,277	22,959	26,753	22,236
Lower Kalskag	403	597	281	314	368	319	1,415	515	95	318	96	530
Upper Kalskag	286	536	1,069	462	1,500	594	1,799	381	2,063	181	93	813
Aniak	1,911	2,006	3,737	1,164	2,355	2,032	1,018	3,003	3,013	2,264	2,472	2,215
Chuathbaluk	462	733	610	259	284	346	727	498	525	96	76	109
Middle Kuskokwim River	3,062	3,872	5,697	2,199	4,507	3,291	4,959	4,397	5,696	2,859	2,737	3,667
Crooked Creek	137	97	440	375	713	312	401	349	1,788	283	87	297
Red Devil	161	426	499	351	65	331	171	193	452	126	88	130
Sleetmute	525	428	806	731	505	581	671	360	218	397	458	426
Stony River	349	397	662	214	679	483	337	373	546	634	201	333
Lime Village	556	559	722	46	231	401	151	439	790	236	172	669
McGrath	881	436	1,508	997	1,228	755	894	279	90	1,246	1,053	1,297
Takotna	20	31	25	7	51	8	0	8	0	28	20	3
Nikolai	30	131	93	396	171	161	407	96	53	203	135	20
Telida	-	-	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim River	2,659	2,505	4,755	3,117	3,643	3,031	3,032	2,097	3,937	3,153	2,214	3,175
Kuskokwim River Total	45,911	31,089	42,617	33,291	48,898	33,351	41,272	35,212	46,461	29,559	32,094	29,583

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Table 11.–Page 3 of 3.

Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Quinhagak	3,799	3,230	3,291	2,029	2,544	2,480	1,734	1,105	1,537	1,781	1,042	1,719	1,133	1,868	1,435	1,558	1,315	1,550	2,217	1,703	1,547	1,361
Goodnews Bay	1,630	1,704	1,671	1,118	428	268	330	348	323	421	380	548	198	1,228	1,542	634	605	497	961	268	319	273
Platinum	95	36	290	27	87	11	41	55	67	147	100	118	96	144	266	223	116	102	114	81	197	143
South Kuskokwim Bay	5,524	4,970	5,252	3,174	3,059	2,759	2,105	1,508	1,927	2,349	1,522	2,385	1,427	3,240	3,243	2,415	2,036	2,149	3,292	2,052	2,063	1,777
Mekoryuk	-	-	-	312	180	-	-	-	841	167	473	-	559	454	-	-	-	-	-	-	-	-
Newtok	-	-	-	-	-	-	-	-	-	-	460	-	-	-	-	-	-	-	-	-	-	-
Nightmute	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toksook Bay	-	-	-	-	967	-	-	-	-	259	1,031	-	-	-	1,045	-	436	-	-	-	-	-
Tununak	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chefornak	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bering Sea Coast	0	0	0	312	1,147	0	0	0	841	426	1,964	0	559	454	1,045	0	436	0	0	0	0	0
Total Estimate	63,084	44,222	57,557	31,971	40,815	39,587	45,304	31,325	27,391	30,184	49,397	33,474	44,603	36,985	53,186	35,766	43,744	37,361	49,753	31,611	34,157	31,360

Source: Historical data are from Hamazaki (2011); 2010–2012 are unpublished, T. Hamazaki, Division of Commercial Fisheries Biometrician, ADF&G, Anchorage, September 24, 2012.

Note: dashes indicate that harvest was not estimated and italic numbers indicate Bayesian inputted estimates.

Table 12.—Salmon spawning escapement, Kanektok River, Kuskokwim Bay, 1996–2012.

Year	Operating Period ^a	King	Sockeye	Chum	Pink ^b	Coho
Counting Tower						
1996	7/2-7/13; 7/20-7/25	^c	^c	^c		
1997	06/11 to 08/21	16,731	96,348	51,180	7,872	
1998	07/23 to 08/17	^c	^c	^c	^c	
1999		Not Operational				
2000		Not Operational				
Weir						
2001	08/10 to 10/03	132 ^c	739 ^c	1,056 ^c	19	35,650
2002	07/01 to 09/20	5,343 ^d	58,326 ^d	42,009 ^d	87,031	24,840
2003	06/24 to 09/18	8,231	127,471	40,066	2,443	72,448
2004	06/29 to 09/20	19,528	102,867	46,444	98,060	87,828
2005	06/25 to 09/18	14,331	242,208	53,580	3,530	26,343
2006		Not Operational				
2007	06/19 to 09/18	14,120	307,750	133,215	3,075	30,471
2008	07/17 to 08/21	6,578 ^d	141,388 ^e	54,024 ^d	142,430	24,490
2009	07/05 to 08/11	6,841	272,483 ^d	51,652 ^d	1,246	2,336
2010	06/28 to 08/05	5,800	202,643	62,567	114,074	344
2011	06/27 to 08/15	5,032	84,805	50,908	491	5,779
2012	07/06 to 08/16	1,568	88,800	24,173	62,141	4,248

Source: Taylor and Elison 2012.

Note: Blank cells represent no data.

^a The operational period is inclusive of days when passage was estimated; unless noted otherwise, less than 20% of the total annual escapement is estimated.

^b Pink salmon numbers represent actual counts. No estimates of missed escapement, due to picket spacing allowing unmonitored passage of small pink salmon.

^c Field operations were incomplete and total annual escapement was not estimated.

^d Field operations were incomplete; sum of daily counts is an underestimate of total escapement, but considered reasonable. Additional estimates were not made.

^e Field operations were incomplete; more than 20% of the total estimate is based on daily passage estimates.

Table 13.–Salmon spawning aerial survey index estimates, Kanektok River, Kuskokwim Bay, 1962–2012.

Year	King	Sockeye	Chum	Coho
1962	935	43,108		
1963				
1964				
1965				
1966	3,718		28,800	
1967				
1968	4,170	8,000	14,000	
1969				
1970	3,112	11,375		
1971				
1972				
1973	814			
1974				
1975		6,018		
1976		22,936	8,697	
1977	5,787	7,244	32,157	
1978	19,180	44,215	229,290 ^a	
1979				
1980				
1981	6,172	113,931	25,950	69,325
1982	15,900	49,175	71,840	
1983	8,142	55,940		
1984	8,890	2,340	9,360	
1985	12,182	30,840	53,060	46,830
1986	13,465	16,270	14,385	
1987	3,643	14,940	16,790	
1988	4,223	51,753	9,420	20,056
1989	11,180	30,440	20,583	
1990	7,914	14,735	6,270	
1991	2,563	32,082	2,475	
1992	2,100	44,436		4,330
1993	3,856	14,955	25,675	
1994	4,670	23,128	1,285	
1995	7,386	30,090	10,000	
1996	6,107	22,020		23,656
1997				5,192
1998				10,120
1999				
2000				
2001	6,483	38,610	11,440	
2002				
2003	6,206	21,335		
2004	28,375	78,380		
2005	14,202	110,730		
2006	8,433	382,800		
2007				
2008	3,659	38,900		
2009				
2010	1,228	16,950		
2011				
2012				
SEG	3,500-8,000	14,000-34,000	>5,200	

Source: Historical data are from Brazil et al. 2011.

Note: Estimates are from aerial surveys conducted during peak spawning periods under 'good' or 'fair' survey conditions. Blank cells represent no data. No data exists because the survey was either not flown or did not meet acceptable criteria.

^a Chum salmon count excluded from escapement objective calculation due to exceptional magnitude.

Table 14.–Commercial salmon fishing exvessel value, District 4, Quinhagak, Kuskokwim Bay, 1990–2012.

Year	King		Sockeye		Coho		Pink		Chum		Total	
	Number	Value (\$)	Number	Value (\$)	Number	Value (\$)	Number	Value (\$)	Number	Value (\$)	Number	Value (\$)
1990	27,644	253,562	83,681	542,485	26,926	123,936	12,056	4,146	47,717	89,343	1,122,153	1,183,852
1991	9,480	94,950	53,657	246,734	42,571	144,379	115	52	54,493	106,321	646,431	743,272
1992	17,197	166,471	60,929	368,310	86,404	303,740	64,217	15,875	73,383	139,268	1,156,526	1,278,597
1993	15,784	143,506	80,934	402,763	55,817	246,746	7	4	40,943	105,236	986,504	1,075,956
1994	8,564	67,584	72,314	253,922	83,912	420,802	35,904	\$ 10,454	61,301	84,395	1,014,757	1,090,588
1995	38,584	418,067	68,194	323,104	66,203	201,413	186	81	81,462	104,523	1,197,294	1,263,233
1996	14,165	61,004	57,665	165,100	118,718	246,930	20	6	83,005	61,686	746,613	794,134
1997	35,510	171,688	69,562	204,190	32,862	91,584	5	0	38,445	29,609	643,846	637,945
1998	23,158	82,168	41,382	150,631	80,183	197,676	2,217	871	45,095	36,497	623,381	636,720
1999	18,426	94,880	41,315	140,846	6,184	14,997	0	0	38,091	28,368	354,739	364,681
2000	21,229	131,351	68,557	249,382	30,529	31,898	3	1	30,553	23,929	563,503	566,203
2001	12,775	93,697	33,807	89,334	18,531	32,577	0	0	17,209	13,007	297,930	298,162
2002	11,480	56,356	17,802	40,368	26,695	47,651	0	0	29,252	23,374	229,604	241,498
2003	14,444	69,201	33,941	107,287	49,833	108,804	0	0	27,868	19,261	411,378	416,195
2004	25,465	107,700	34,627	77,394	82,398	201,879	0	0	25,820	18,372	555,283	548,190
2005	24,195	221,854	68,801	241,478	51,780	101,776	19	4	13,529	6,853	723,436	706,094
2006	19,184	147,802	106,308	327,917	26,831	61,433	0	0	39,151	14,030	728,626	723,472
2007	19,573	163,248	109,343	374,004	34,710	102,569	0	0	61,228	21,044	864,675	866,146
2008	13,812	140,580	69,743	272,427	94,257	317,143	0	0	57,033	20,581	964,995	971,764
2009	13,920	130,561	112,153	384,209	48,115	136,562	0	0	91,158	95,993	916,678	998,751
2010	14,230	294,163	138,362	1,049,395	13,690	117,658	0	0	106,610	194,105	1,734,108	1,913,983
2011	15,387	166,606	38,543	207,642	30,457	198,333	0	0	104,959	603,855	761,927	1,350,395
2012	6,675	85,934	37,688	208,023	31,214	167,638	0	0	61,140	362,840	598,312	954,477
10 Yr Avg	17,169	149,807	72,962	308,212	45,877	139,381	1.9	0	55,661	101,747	789,071	873,649

Source: Historical data are from Brazil et al. 2011. Data from 2011 and 2012 are unpublished.

Table 15.—Salmon spawning escapement, Middle Fork Goodnews River, Kuskokwim Bay, 1981–2012.

Year	Operating Period ^a	King	Sockeye	Chum	Pink ^b	Coho
Middle Fork Goodnews River						
BEG:		1,500-2,900	18,000-40,000			
SEG:				>12,000		>12,000
<i>Counting Tower</i>						
1981	06/13 to 08/15	3,688	49,108	21,827	1,327	^c
1982	06/23 to 08/03	1,395	56,255	6,767	13,855	^c
1983	06/11 to 07/28	6,027	25,816	15,548	102	^c
1984	06/15 to 07/31	3,260	32,053	19,003	13,744	^c
1985	06/27 to 07/31	2,831	24,131	10,367	144	^c
1986	06/16 to 07/24	2,080	51,069	14,764	8,134	^c
1987	06/22 to 07/30	2,272	28,871	17,517	71	^c
1988	06/23 to 07/30	2,712	15,799	20,799	6,781	^c
1989	06/29 to 07/31	1,915	21,186	10,380	246	^c
1990	06/19 to 07/24	3,636	31,679	6,410	3,378	^c
<i>Weir</i>						
1991	06/29 to 08/24	1,952	47,397 ^d	31,644	1,694	^c
1992	06/29 to 08/25	1,905 ^d	27,268	22,023	22,155	^c
1993	06/22 to 08/18	2,349	26,452 ^e	14,952	318	^c
1994	06/23 to 08/08	3,856	50,801	34,849 ^d	38,710	^c
1995	06/19 to 08/28	4,836	39,009	33,699	322	^c
1996	06/19 to 08/23	2,931 ^d	58,290	40,450 ^d	20,105	^c
1997	06/11 to 09/17	2,937	35,530	17,369	970	13,413
1998	07/04 to 09/13	4,584	49,513 ^d	28,832	10,376	36,596
1999	06/26 to 09/26	3,221	48,205	19,513	914	11,545
2000	07/02 to 09/22	3,295 ^e	32,341 ^e	13,791 ^e	2,529	13,907 ^e
2001	06/26 to 09/30	5,391 ^e	21,024 ^e	26,829 ^e	1,328	19,626 ^e
2002	06/22 to 09/18	3,085	22,101	30,300	3,034	27,364
2003	06/18 to 09/18	2,389	44,387	21,637	1,881	52,810
2004	06/21 to 09/20	4,388	55,926	31,616	21,633	47,916
2005	06/26 to 09/20	4,633	113,809	26,690	5,926	15,683
2006	06/26 to 09/18	4,559	126,772	54,699	18,432	15,969
2007	06/25 to 09/19	3,852	72,282	48,285	4,919	20,975 ^d
2008	07/02 to 09/16	2,158	51,763 ^d	44,310 ^d	9,807	36,663
2009	06/28 to 09/22	1,630	25,465	19,715	767	19,992
2010	06/25 to 09/18	2,244	35,762	26,687	3,444	23,898 ^d
2011	06/24 to 09/18	1,861	17,946	19,974	1,394	23,826
2012 ^f	06/29 to 09/03	516	31,066	^c	6,316	13,679

Source: Elison and Taylor 2012.

^a The operational period is inclusive of days when passage was estimated; unless noted otherwise less than 20% of the total annual escapement is estimated.

^b Total pink salmon passage is not estimated because they are small enough to pass between weir pickets.

^c Field operations were incomplete and total annual escapement was not estimated.

^d Field operations were incomplete; more than 20% of the total annual escapement is based on daily passage estimates.

^e Field operations were incomplete; sum of daily counts is an underestimate of total escapement, but considered reasonable. Additional estimates were not made.

^f Preliminary numbers subject to change.

Table 16.—Salmon spawning aerial survey index estimates, Goodnews rivers and lakes, Kuskokwim Bay, 1980–2012.

Year	Goodnews River and Lakes			Middle Fork Goodnews River and Lakes		
	King	Sockeye	Chum	King	Sockeye	Chum
1980	1,228	75,639	1,975	1,164	18,926	3,782
1981						
1982	1,990	19,160	9,700	1,546	2,327	6,300
1983	2,600	9,650		2,500	5,900	
1984	3,235	9,240	17,250	2,020	12,897	9,172
1985	3,535	2,843	4,415	2,050	5,470	3,593
1986	1,068	8,960	11,850	1,249	16,990	7,645
1987	2,244	19,786	12,148	2,222	24,505	9,789
1988						
1989						
1990	658	27,689				
1991						
1992	875	10,397	1,950	1,012	7,200	3,270
1993						
1994						
1995	3,314					
1996						
1997	3,611	12,610		1,447	19,843	
1998	578	3,497	2,743	731	11,632	3,619
1999						
2000						
2001	3,561	29,340	7,330	2,799	12,383	6,945
2002	1,470	3,475	3,075	1,195	2,626	1,208
2003	3,935	50,140		2,131	29,150	
2004	7,462	31,695		2,617	33,670	
2005						
2006	4,159	78,100				
2007						
2008	2,155	32,500		2,190	13,935	
2009						
2010						
2011	853	14,140				
2012	382	16,700		380	6,933	
SEG	640 - 3,300	5,500 - 19,500		a	a	

Source: Historical data are from Brazil et al. 2011. Data from 2011 and 2012 are unpublished.

Note: Estimates are from aerial surveys conducted during peak spawning periods under 'good' or 'fair' survey conditions. Blank cells represent no data. No data exists because the survey was either not flown or did not meet acceptable criteria.

^a Aerial survey escapement goal was discontinued in 2004.

Table 17.—Commercial salmon fishing exvessel value, District W-5 Goodnews Bay, Kuskokwim Bay, 1990–2012.

Year	King		Sockeye		Coho		Pink		Chum		Total	
	Number	Value (\$)	Number	Value (\$)	Number	Value (\$)	Number	Value (\$)	Number	Value (\$)	Number	Value (\$)
1990	3,303	32,135	35,823	263,598	7,804	38,910	629	254	13,194	25,767	60,753	418,114
1991	912	8,370	39,838	187,622	13,312	47,519	29	14	15,892	31,394	69,983	343,990
1992	3,528	30,688	39,194	257,457	19,875	75,278	14,310	2,913	18,520	39,111	95,427	497,346
1993	2,117	21,351	59,293	296,437	20,014	95,043	0	0	10,657	28,304	92,081	531,099
1994	2,570	21,732	69,490	309,577	47,499	271,687	18,017	5,442	28,477	41,309	166,053	813,230
1995	2,922	31,339	37,351	175,552	17,875	58,061	39	19	19,832	21,427	78,019	361,495
1996	1,375	5,952	30,717	87,427	43,836	120,191	22	4	11,093	9,015	87,043	308,257
1997	2,039	10,867	31,451	93,146	2,983	9,497	0	0	11,729	9,358	48,202	169,031
1998	3,675	13,685	27,161	100,171	21,246	59,102	411	174	14,155	11,133	66,648	247,238
1999	1,888	9,020	22,910	78,800	2,474	7,515	0	0	11,562	8,327	38,834	140,608
2000	4,442	25,614	37,252	146,708	15,531	34,689	7	2	7,450	6,001	64,682	273,254
2001	1,519	10,496	25,654	68,678	9,275	17,089	0	0	3,412	2,586	39,860	137,190
2002	979	343	6,304	15,846	3,041	5,634	0	0	3,799	2,979	14,123	37,946
2003	1,412	6,461	29,423	95,818	12,658	28,945	0	0	5,593	3,883	49,086	182,781
2004	2,565	10,857	20,523	49,741	24,089	70,404	0	0	5,965	4,244	53,142	185,823
2005	2,035	16,696	23,933	91,135	11,735	25,010	0	0	2,568	1,454	40,271	172,531
2006	2,892	21,314	29,857	87,996	12,436	27,587	0	0	11,568	4,368	56,753	195,126
2007	3,126	23,951	43,766	156,802	13,697	38,796	6	0	7,853	2,781	68,448	287,652
2008	1,281	13,181	27,236	104,296	22,547	76,683	0	0	10,408	3,910	61,472	258,261
2009	1,509	13,333	32,544	134,244	8,406	25,456	0	0	16,985	18,998	59,444	249,966
2010	1,752	44,910	41,074	334,366	4,900	44,706	0	0	26,914	46,679	74,640	543,549
2011	2,092	19,224	24,573	141,347	15,358	106,471	0	0	13,191	78,980	55,214	399,144
2012	1,531	20,509	50,635	299,187	25,515	150,668	0	0	24,487	147,401	102,168	718,402
10 Yr Avg	1,964	17,027	27,923	121,159	12,887	44,969	1	0	10,484	16,828	53,259	251,278

Source: Historical data are from Brazil et al. 2011. Data from 2011 and 2012 are unpublished.

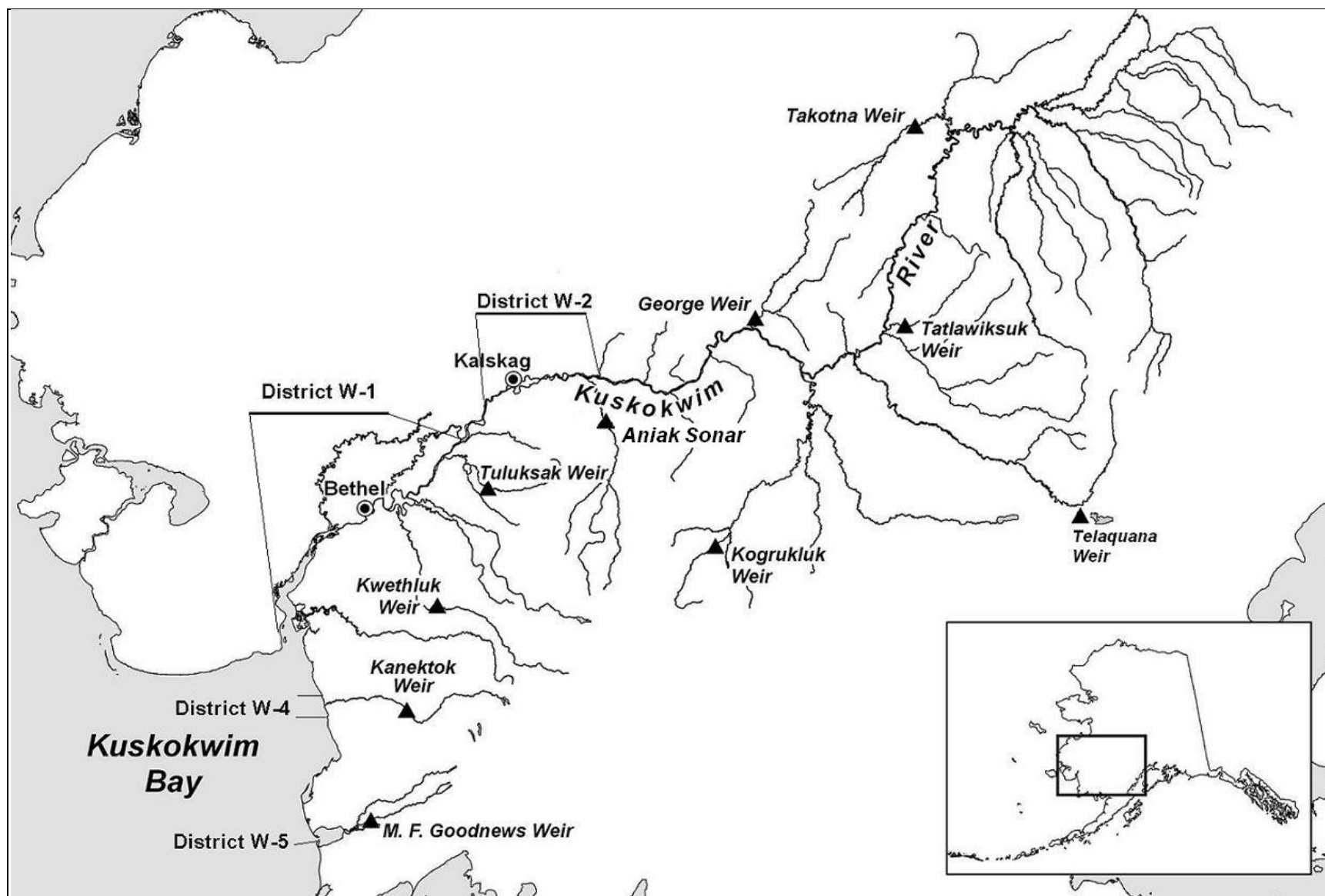


Figure 1.—Map of Kuskokwim Area commercial fishing districts and escapement assessment projects.

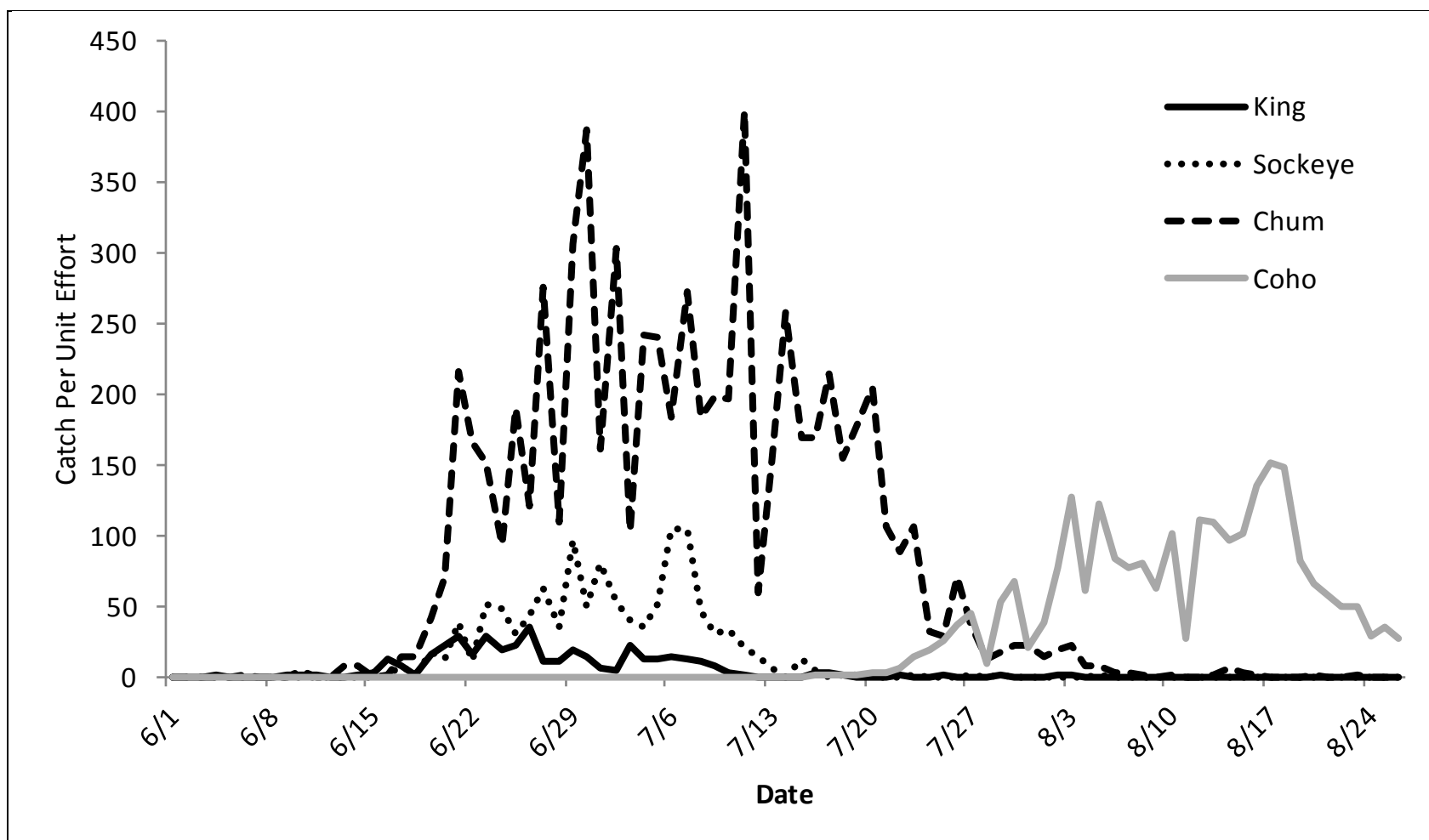


Figure 2.—Bethel test fishery daily catch per unit effort of king, sockeye, chum, and coho salmon in 2012.

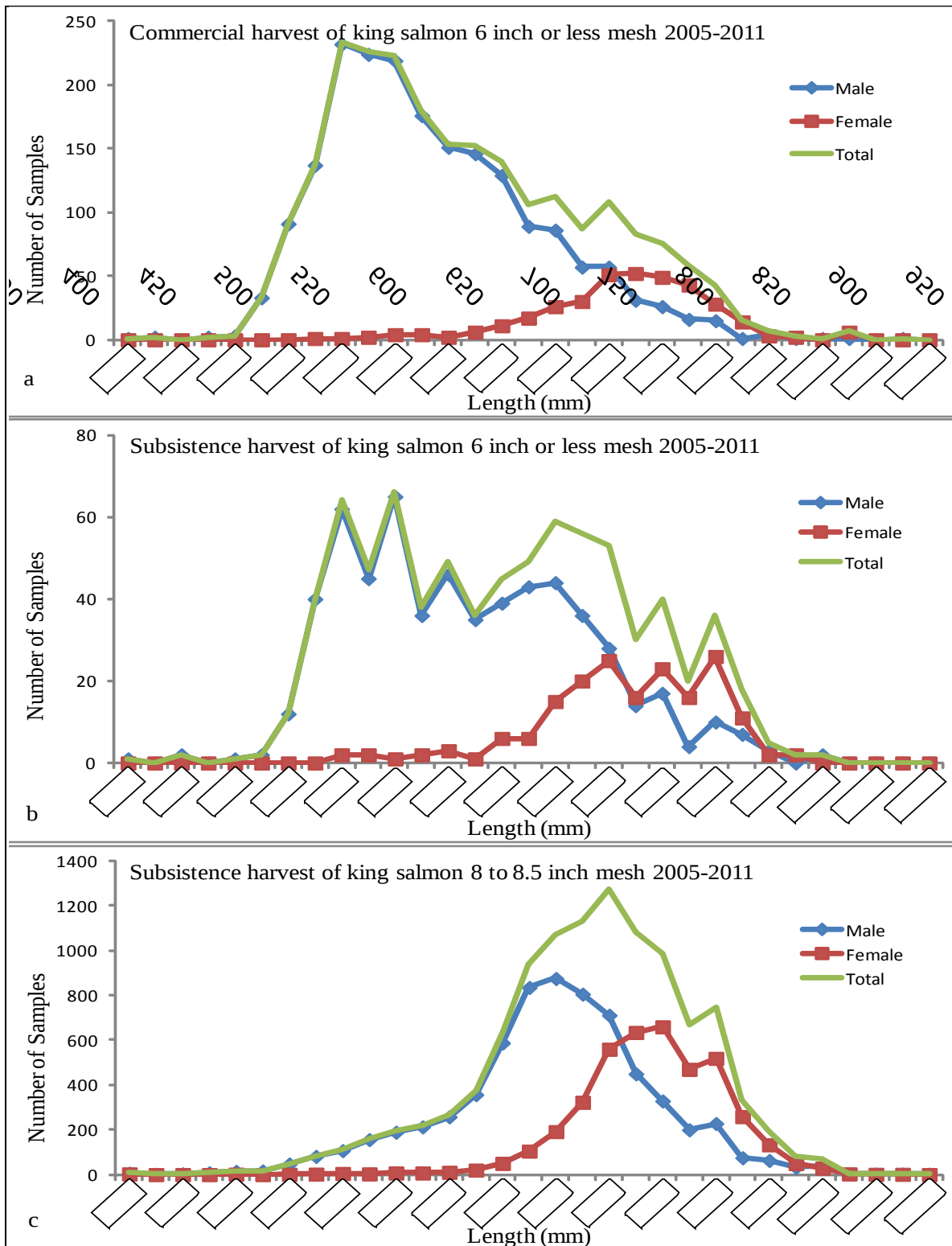
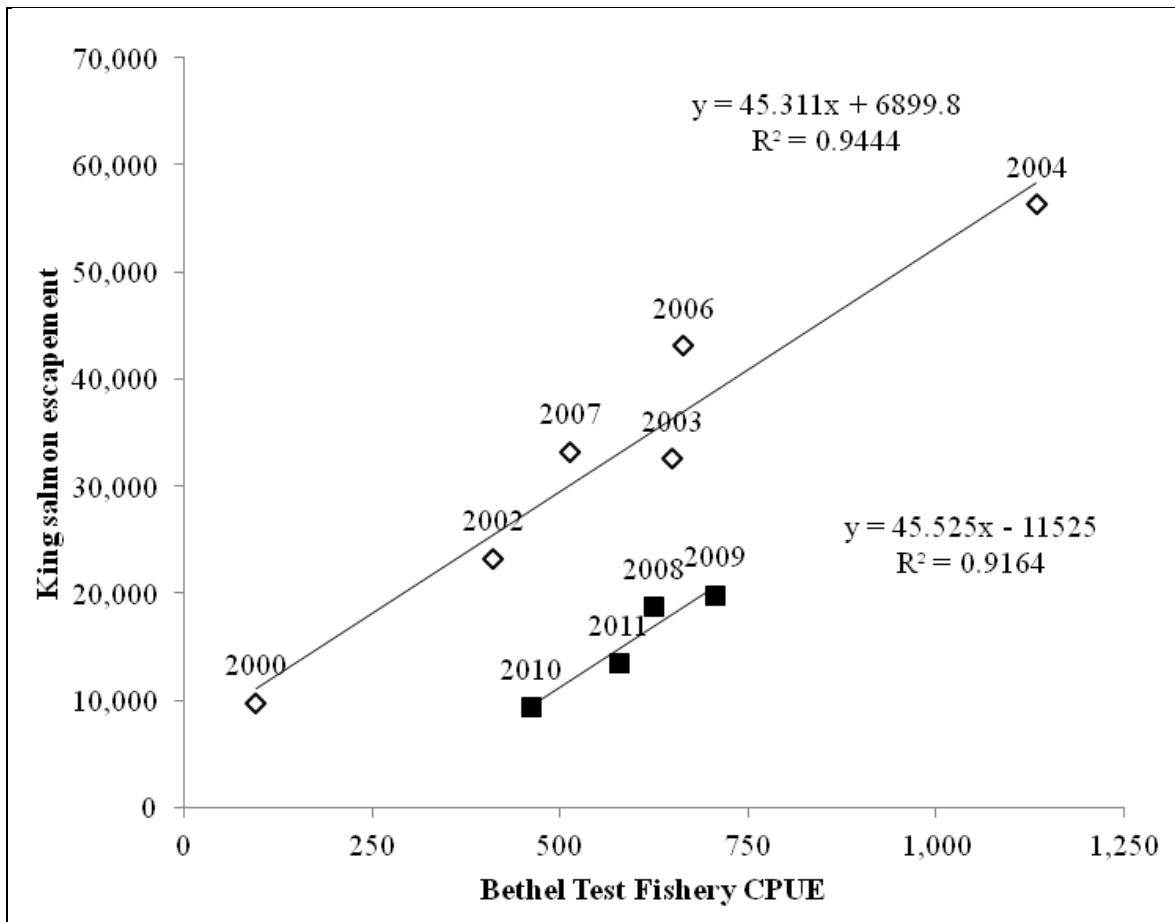


Figure 3.—Length frequency of king salmon harvested in (a) commercial harvest with 6-inch or less mesh, (b) subsistence harvest with 6-inch or less mesh, and (c) subsistence harvest with 8 to 8.5-inch mesh from 2005 to 2011 in the Kuskokwim River.



Note: The difference in these two relationships is attributed to selectivity differences in the gillnet material used at Bethel test fishery.

Figure 4.—Scatter plot of combined escapement monitored at Kuskokwim River tributary weirs (Kwethluk, George, Kogrukluk, and Tatlawiksuk rivers) and Bethel test fishery CPUE.

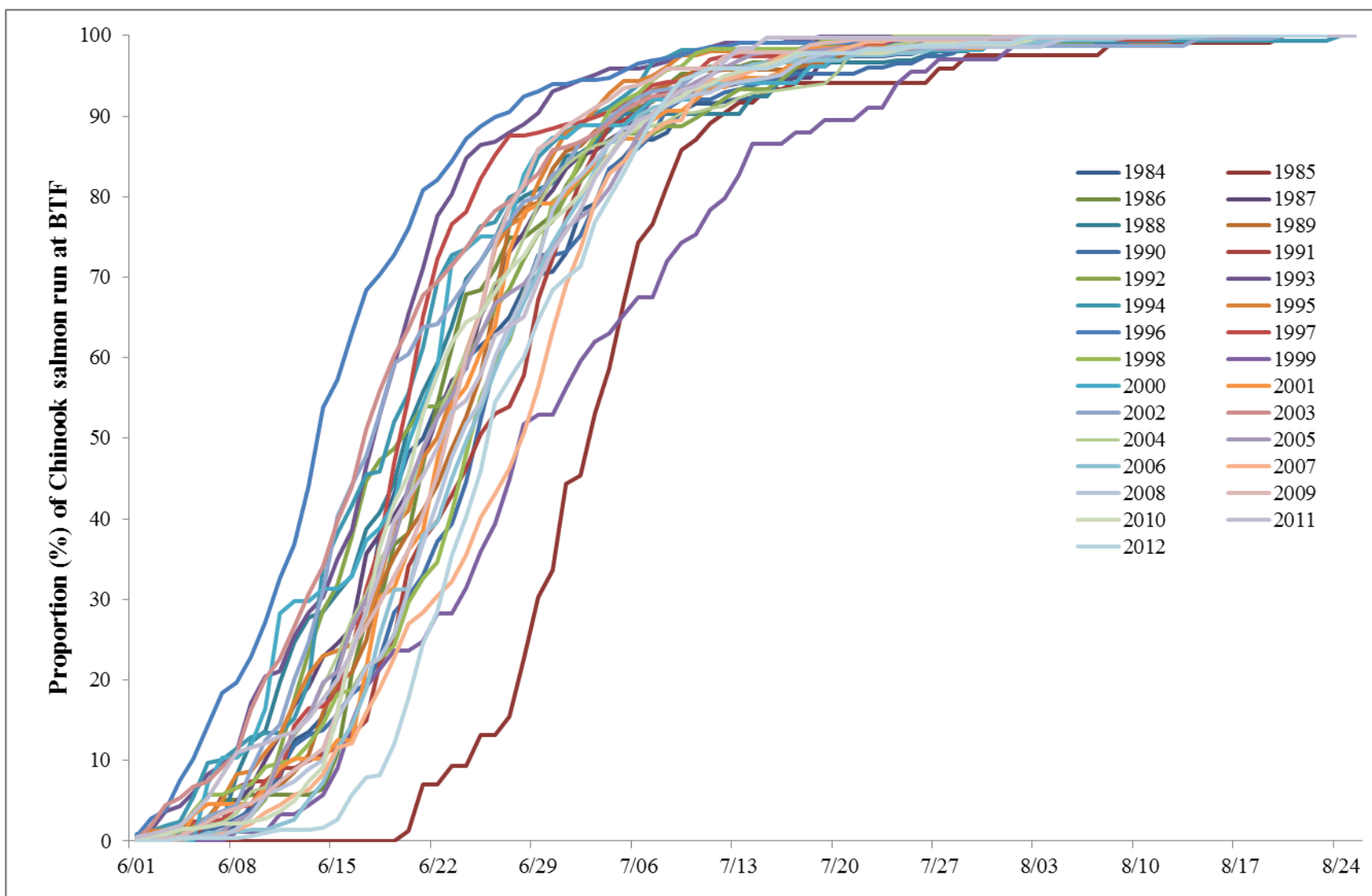


Figure 5.—Cumulative run timing at Bethel test fishery for king salmon runs in the Kuskokwim River, 1984–2012.