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Yukon River Fall Chum Salmon Stock Status and Fall Season Salmon Fisheries, 2009; a Report to the Alaska Board of Fisheries

by

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and

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December 2009

Alaska Department of Fish and Game   Divisions of Sport Fish and Commercial Fisheries

Symbols and Abbreviations

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye to fork	MEF
mideye to tail fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	log_2, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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The Special Publication series was established by the Division of Sport Fish in 1991 for the publication of techniques and procedures manuals, informational pamphlets, special subject reports to decision-making bodies, symposia and workshop proceedings, application software documentation, in-house lectures, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Special Publications are intended for fishery and other technical professionals. Special Publications are available through the Alaska State Library, Alaska Resources Library and Information Services (ARLIS) and on the Internet: http://www.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm. This publication has undergone editorial and peer review.

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ABSTRACT

Yukon River fall chum salmon *Oncorhynchus keta* were delisted as stocks of concern by the Alaska Board of Fisheries (BOF) in 2007. The minimum drainagewide escapement goal of 300,000 fish has been exceeded since 2001, and the upper end of the goal was exceeded in 2003 and 2005 through 2007. Since 2001, most tributary escapement goals have also been met, with weakness primarily in the Porcupine River drainage, including Sheenjek and Fishing Branch River goals. A record run occurred in 2005 and all escapements exceeded the upper ends of their respective goals, including Porcupine River systems; however, production from those escapements appears to be extremely low. Exploitation rates have been on the increase since low production years in the early 2000s. However, harvest rates still remain low compared to historical levels (pre-1992) as changes occurred in subsistence harvest patterns after several extremely poor runs and poor commercial markets prior to 2007. The last 2 decades have seen uncommonly large swings in fall chum salmon production, making fishery management even more difficult. Escapement and harvest monitoring projects are in place to aid in managing for sustained yield objectives. Proposal 199 has been submitted to the BOF for consideration of changes to the *Yukon River Coho Salmon Management Plan* (5 AAC 05.369) to allow late season harvests after the majority of fall chum salmon have migrated through. Proposal 194, *Yukon River Drainage Fall Chum Salmon Management Plan* (5 AAC 01.249), was submitted to revise management triggers for subsistence and commercial fisheries.

Key words: Yukon River, fall chum salmon, *Oncorhynchus keta,* coho salmon, *Oncorhynchus kisutch,* commercial, fishing, ADF&G, Alaska Board of Fisheries.

INTRODUCTION

Yukon Area includes all waters of Alaska within the Yukon River drainage and coastal waters from Naskonat Peninsula to Point Romanof, northeast of the village of Kotlik. For management purposes, Yukon Area is divided into 7 districts and 10 subdistricts (Figure 1). Commercial fishing may be allowed along the entire 1,224 miles of Yukon River in Alaska and along the lower 225 miles of Tanana River. Coastal District includes the majority of coastal marine waters within Yukon Area and is only open to subsistence fishing. Lower Yukon Area (Districts 1, 2, and 3) includes coastal waters of the Yukon River delta and that portion of the Yukon River drainage downstream of Old Paradise Village (river mile 301). Upper Yukon Area (Districts 4, 5, and 6) is the Alaskan portion of the Yukon River drainage upstream of Old Paradise Village.

Chinook (*Oncorhynchus tshawytscha),* chum (*O. keta),* and coho (*O. kisutch)* salmon are harvested in Yukon River commercial, subsistence, personal use, and sport fisheries. Subsistence fishing in portions of Yukon Area is under dual management authority of the Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS). Chum salmon in Yukon River consists of an earlier and typically more abundant summer chum salmon run, and a later fall chum salmon run. No directed commercial fishing has occurred for pink (*O. gorbuscha)* salmon, which overlap in run timing with summer chum salmon. However, sporadic sales of incidental harvests of pink salmon have been documented.

The *Policy for the Management of Sustainable Salmon Fisheries* (SSFP; 5 AAC 39.222, 2001) directs ADF&G to provide the Alaska Board of Fisheries (BOF) with reports on the status of salmon stocks and identify any salmon stocks that present a concern related to yield, management, or conservation during regular BOF meetings. This report provides ADF&G's assessment of Yukon Area fall chum salmon stock status and also provides a review of the fall season fishery, including coho salmon.

In response to guidelines established in the SSFP, the BOF classified Yukon River fall chum salmon as a stock of yield concern and classified Toklat and Fishing Branch Rivers fall chum salmon as a stock of management concerns at its September 2000 work session. A stock of management concern is defined as “a concern arising from a chronic inability, despite use of specific management measures, to maintain escapements for a salmon stock within the bounds of the sustainable escapement goal (SEG), biological escapement goal (BEG), optimum escapement goal (OEG), or other specified management objectives for the fishery” (5 AAC 39.222(f)(21)). A “yield concern” is defined as, “a concern arising from a chronic inability, despite use of specific management measures, to maintain expected yields, or harvestable surpluses, above a stock’s escapement needs” (5AAC 39.222(f)(42)). The SSFP further defines chronic inability as the continuing or anticipated inability to meet escapement objectives (management concern) or average surplus yield (yield concern) over a 4- to 5-year period. The determination for the entire Yukon River fall chum salmon as a stock of yield concern was based on substantial decrease in yields and harvestable surpluses during the period 1998–2000, and the anticipated very low run expected in 2001. The determination for Toklat and Fishing Branch rivers as stocks of management concern was based on escapements not meeting the OEG of 33,000 for Toklat River from 1996 to 2000, and not meeting the escapement objective of 50,000–120,000 salmon for Fishing Branch River from 1997 to 2000. An action plan was subsequently developed by ADF&G (ADF&G 2000) and acted upon by the BOF in January 2001.

Yukon River fall chum salmon classification as a yield concern was continued at the January 2004 BOF meeting because the combined commercial and subsistence harvests showed a substantial decrease in fall chum salmon yield from the 10-year period (1989–1998) to the more recent 5-year (1999–2003) average (Bue et al. 2004). Toklat River stock was removed from management concern classification as a result of the BEG review presented at that BOF meeting. However, as a component of the Yukon River drainage, Toklat River fall chum salmon stock was included in the drainagewide yield concern classification. Fishing Branch River stock was also removed from the management concern classification because management of that portion of the drainage is covered by an annex to the Pacific Salmon Treaty, the U.S./Canada Yukon River Salmon Agreement (Agreement), which is governed under the authority of the Yukon River Panel (Panel).

In January 2007, the BOF determined that Yukon River fall chum salmon stock no longer met the criteria for a yield concern. Run strength was poor from 1998 through 2002; however, steady improvement had been observed since 2003 (JTC 2006). The 2005 run was the largest in 30 years and 2006 was above average for an even-numbered year run; the drainagewide OEG of 300,000 fall chum salmon was exceeded in the preceding 5 years. The 5-year average (2002–2006) total reconstructed run of approximately 950,000 fish was greater than the 1989–1998 10-year average of approximately 818,000 fish, which indicated a return to historical run levels. This report provides stock assessment through the 2009 fall season fishery.

STOCK ASSESSMENT BACKGROUND

Fall chum salmon run strength was poor from 1998 through 2002, with dramatic improvements in drainagewide run size since 2003. The 2000 fall chum salmon run was the worst on record, with 1998 and 2001 close behind as all time low runs. The drainagewide OEG of 300,000 fall chum salmon has been exceeded every year since 2001 (Figure 2) and most tributary escapement goals were met throughout the Alaska portion of the drainage.

ESCAPEMENT

Because fall chum salmon congregate in fairly unique areas of the drainage in search of upwelling warmer waters to incubate their eggs in a shorter time frame than summer chum salmon habitats would allow, monitoring of major spawning escapements was nearly complete between 1995 and 2007. Analysis of BEGs conducted by Eggers (2001) provided a drainagewide goal, as well as tributary goals for main monitored systems in the upper Yukon River drainage, including Tanana River.

Biological escapement goals in Chandalar and Delta rivers have been met or exceeded in each of the past 10 years, except for low escapements in 2000 (Table 1). Sheenjek River BEG is based on estimated passage for only one bank and the goal has only been met 4 times since 1997. Escapement objectives for fall chum salmon stocks in Yukon River Canadian mainstem and Fishing Branch River were originally recommended by the U.S./Canada Joint Technical Committee (JTC) and specifically stipulated in the Agreement. Because of poor runs in the early 2000s, the Panel agreed to lower escapement targets through 2005 for Canadian mainstem fall chum salmon stock to allow for some U.S. subsistence and Canadian aboriginal harvest, while rebuilding the stock over 3 life cycles. However, the escapement objective of >80,000 for this stock had been exceeded since 2002 and since 2006, goals were again based on rebuilt status.

Escapement in Fishing Branch River in Canada has only met the escapement objective established in 1987 of 50,000 to 120,000 fall chum salmon once in the past 12 years, in 2005. ADF&G developed a BEG for this stock of 27,000 to 56,000 in conjunction with total run reconstruction analysis in 2000 (Eggers 2001); however, this goal has only been met 4 times since 1997. Like the Canadian mainstem stock, the Fishing Branch River fall chum salmon stock is managed based on recommendations of the Panel that are addressed annually. The Panel agreed to an interim management goal of 28,000 fish for the 2006 season and 33,667 fish in 2007, which were both exceeded. For the years 2008–2010, JTC has recommended an Interim Management Escapement Goal (IMEG) range of 22,000–49,000 fall chum salmon for Fishing Branch River (JTC 2009). This recommendation was based on the Bue and Hasbrouck[1] percentile method of determining an SEG. The IMEG for Fishing Branch River was nearly achieved in 2008 and was met in 2009.

In 1993, the BOF established the Toklat River OEG of 33,000 fall chum salmon based on an average return for this system. As part of the total run reconstruction analysis conducted by Eggers (2001), a BEG range of 15,000 to 33,000 fall chum salmon was recommended and adopted by ADF&G. The BOF removed the OEG from regulation in 2004. Based on the BEG range, the goal has been met each year from 2002 to 2005; however, assessment of the area has been hampered by the later freeze ups and counts used for developing an annual population estimate have not been achieved since 2005. The results of mark–recapture projects on both Kantishna and Tanana rivers suggest that the index streams of Toklat and Delta rivers support a relatively small proportion of fall chum salmon. A radiotelemetry study conducted in 2008 has confirmed major mainstem spawning in Tanana River between Fairbanks and Delta Junction.

Some have contended that overharvest caused poor runs between 1997 and 2001. However, parent year escapement from 1994 through 1996 were some of the largest escapements on

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1 Bue, B. G., and J. J. Hasbrouck. *Unpublished*. Escapement goal review of salmon stocks of Upper Cook Inlet, Report to the Alaska Board of Fisheries, 2001. Alaska Department of Fish and Game, Anchorage.

record, yet they produced the extremely poor fall chum salmon runs from 1998 through 2000 (Figure 2). Extremely poor production from those very large escapements, in some cases dramatically less than 1.0 return per spawner, resulted in the extremely poor runs observed (Table 2). Because escapements in these parent years were deemed more than adequate, resulting poor runs cannot be attributed to overharvest (Figure 3). Most individuals in the scientific community attribute poor production to poor ocean environments (Scheuerell and Williams 2005). Poor wild-stock runs occurred throughout Western Alaska during 1998 through 2002. As shown in the past, low escapements can produce large returns and a particularly strong return in 2005 was observed from brood year 2001.

Escapement goals are reviewed prior to each BOF cycle meeting. Current fall chum salmon BEGs within the Yukon River drainage were developed in 2000 (Eggers 2001) and reevaluated in 2003 (ADF&G 2004) and 2006 (Brannian et al. 2006). The 2009 review team recommends continuing the existing fall chum salmon drainagewide escapement goal range, but changing it from a BEG to an SEG as described in Fleischman and Borba (2009). Additionally, the review team recommends eliminating the Tolkat River BEG because a population estimate can no longer be developed for this stock due to changes in the environment (Volk et al. 2009). All other existing goals are recommended to continue without revision.

Current and proposed BEGs and SEGs for Yukon River fall chum salmon are as follows:

Stream (Project Type)	Current Goal	Recommended Range	Type of Goal
Yukon Drainage (multiple)	300,000–600,000	Revise Type	SEG
Tanana River (mark-recapture)	61,000–136,000	No Revision	BEG
Delta River (foot surveys)	6,000–13,000	No Revision	BEG
Toklat River (foot survey)	15,000–33,000	Eliminate	Eliminate
Upper Yukon R. Tributaries (multiple)	152,000–312,000	No Revision	BEG
Chandalar River (sonar)	74,000–152,000	No Revision	BEG
Sheenjek River (sonar)	50,000–104,000	No Revision	BEG
Canadian Upper Yukon River (sonar)	>80,000[a]	No Revision	IMEG[b]
Fishing Branch River (weir)	50,000–120,000[a]	No Revision	IMEG[b]

[a] U.S./Canada escapement goals based on Yukon Salmon Agreement.

[b] Interim Management Escapement Goals (IMEG) are set by the U.S./Canada Panel. The current IMEG for Fishing Branch River is 22,000 to 49,000 fall chum salmon through 2010.

HARVEST AND MANAGEMENT REVIEW

Management of the fall season fishery is prescribed in 5 AAC 01.249. *Yukon River Drainage Fall Chum Salmon Management Plan* that was amended by the BOF in January 2004. The plan aligned the escapement goal threshold with the lower end of the established BEG range of 300,000 to 600,000 fall chum salmon. This provides more subsistence fishing opportunity in years of poor runs than had previously been allowed while still attaining escapement goals. Drainagewide commercial fishing is allowed on the projected surplus above 600,000 fish which provides for subsistence use priority and bolsters escapement on strong runs. The management plan describes recommended fishery actions based on estimates of run size (Table 3). Yukon River coho salmon have a slightly later, but overlapping, run timing with fall chum salmon and ADF&G follows guidelines adopted by the BOF in *Yukon River Coho Salmon Management Plan* (5 AAC 05.369). ADF&G monitors run abundance and harvest levels inseason relative to established individual tributary BEGs/SEGs and the drainagewide BEG to assess changes in productivity and benefits to users (ADF&G 2004).

In most years, fall chum salmon are the primary species of management concern and harvest of coho salmon are often considered incidental in fall season fisheries (Figures 4–6). The dramatic decline of salmon stocks from 1998 through 2002, followed by the rapid recovery beginning in 2003 has significantly changed the character of Yukon River salmon fisheries. Many fishermen moved away from using long-established fish camps, fishing gear fell into disrepair or was replaced with other types, and market interest shifted to other available fisheries outside the region. With recent run size improvements, fishermen and markets are again becoming optimistic. Management has had to adapt to shifts in efficiency and distribution of fishing effort. Generally, the amended fall chum and coho salmon management plans have worked well in attaining target escapement goals and providing fishing opportunities for subsistence and commercial fishermen. The plans have also provided flexibility to incorporate most coho salmon management considerations in these overlapping fisheries.

Combined commercial and subsistence harvests (Busher et al. *In prep*) show a substantial decrease from the 1980s and 1990s compared to the recent 5-year (2004–2008) average (Tables 4–7 and Figure 3). Conservative management strategies based on fall chum salmon management action plans adopted by the BOF in 2001 have contributed to success in achieving escapement goals. However, as production rates increased, there has been underutilization of the fall chum salmon stock. Furthermore, coho salmon harvests have been constrained as a consequence of management strategies conserving the overlapping fall chum salmon run.

Parent year escapements that produced fall chum salmon runs in 2005, 2006, and 2007 were low, and run outlooks for those years were only moderate. Therefore, the management strategy in those years was to wait until inseason assessment indicated there would be adequate surplus before a commercial fishery was opened. Subsistence fishermen were not restricted, but their utilization had shifted to a lower level after the recent series of poor runs so their annual harvest was below average. Once managers were certain that surpluses were available, a large portion of the run had already passed through the major commercial fishery, thereby missing harvest opportunity.

Harvesting power of commercial fisheries declined due to loss of markets, increased operating costs, and unpredictability of run strength, further compounding underutilization. In 2008, strength of the preceding summer chum salmon run (average) indicated that the fall chum salmon run would be large enough to provide commercial opportunity. The fall season management strategy was to continue commercial fishing during the transition period when both summer and fall chum salmon runs overlapped, with the goal of increasing fishing time in order to offset the lower harvest rate. By fishing during the transition, harvest volume was reasonably good, markets and fishermen remained interested, and risk of overharvesting either stock was relatively low because neither stock is in large abundance during that time. Unfortunately, the 2008 run was slow to develop. Management delayed commercial fishing for 3 weeks mid season to assure adequate numbers of fall chum salmon were in the river for escapement needs and subsistence opportunity.

In 2009, this same early season strategy was initiated, but the fall chum salmon run was even slower to develop. Commercial fishing in Districts 1 and 2 was suspended at the first quarter point in the run, with a total Yukon Area harvest of approximately 25,000 fall chum salmon and

8,000 coho salmon. Genetic stock identification of Pilot Station sonar test fishery samples from initial openings indicated a majority of chum salmon caught were summer chum salmon. Although Pilot Station sonar indicated the run was very poor, it was not necessary to impose total subsistence fishing closures as outlined in the management plan, because extremely low water levels and difficulties test fishing for species apportionment were suspected of underestimating fall chum salmon abundance. Subsistence fishermen throughout the drainage were provided opportunity to harvest salmon from the first pulse, which typically comprise the highest flesh quality for human consumption. Subsistence fishing periods were reduced by one third during the middle of the run to bolster escapements, and then returned to the standard schedule late in the season to facilitate harvesting salmon for dog food when lower temperatures are better for preserving fish.

On September 6, commercial fishing in District 1 was reopened with harvest directed at coho salmon after most fall chum salmon had passed. The coho salmon management plan does not allow commercial fishing when the fall chum salmon run is projected to be less than 550,000 fish. However, there was a determination that initiation of a coho salmon-directed fishery late in the season after the vast majority of the fall chum salmon run had passed through fishing districts would not have a significant impact on escapement or allocations of fall chum salmon. The BOF responded to a request for an emergency regulation to discuss this issue by teleconference on September 8, 2009. An emergency regulation was adopted stating if the commissioner determines that there is a harvestable surplus of coho salmon above escapement needs and those necessary for subsistence uses, and that a directed coho salmon commercial fishery will not have a significant impact on escapement or allocation of fall chum salmon, the commissioner may, by emergency order, open a directed coho salmon commercial fishery. The BOF further acted by adding a review of the coho salmon management plan to the agenda of the regular AYK BOF meeting for public input. Although late season periods landed few fish as most coho salmon had already passed, the harvest averaged 77% coho salmon during late season commercial fishing periods in District 1. In the upper river, 4 commercial fishing periods were announced for District 6 after September 18, when the majority of fall chum salmon had passed. The potential for commercial harvests of coho salmon would have been greater in 2009 if not for the fall chum salmon conservation concerns and actions.

EXPLOITATION RATES AND YIELD

Annual total run estimates can be coupled with total inriver harvests to estimate exploitation rates exerted on fall chum salmon for the years 1974–2009 (Figure 3). Total exploitation rates exerted by Yukon River fisheries on fall chum salmon over 36 years averaged about 17.4%, ranging from as high as 67.5% in 1982 to as low as 6.4% in 2002. Exploitation rates on 2 of the lowest runs, approximately 239,000 fish, in 2000 and 334,000 fish in 2001, were 11.9% and 21.2%, respectively. Exploitation rates have been increasing slightly since 2002 with improvements in run size and reestablishment of market interest; however, current exploitation rates are much lower than historical rates (averaging 51% pre-1992 to an average of 20% post-1991), partly due to highly variable runs occurring in the last 2 decades which are highly unpredictable.

Yields based on brood return from individual escapements have also become highly variable in the last 2 decades (Figure 7). Yields from brood years pre-1992 averaged 400,000 fish and ranged from 27,000 in 1975 to 840,000 in 1977, whereas yields after 1991 average 143,000 fall chum salmon, with 6 of the last 13 brood year returns (through 2005) resulting in negative yields representing substantially less production. Production levels for years 1974 through 1992 allowed for average harvests of 456,000 fish, whereas current production levels and conservative management actions through this period of high and low production extremes has reduced harvests to less than 200,000 fish. Harvests from 1999–2003 were at all time lows that averaged only 62,000 fall chum salmon drainagewide, whereas harvests from 2004–2008 average 211,000 fall chum salmon; this level of harvest is comparable to average harvest taken from 1994–1998 (Figure 2). As a result of previous poor fall chum salmon runs in the early 2000s and subsequent fishing restrictions and closures, it appears subsistence fishing effort and harvest has remained relatively low even in those years with much larger runs, as in 2003 and 2005 through 2008 (Figures 2 and 8). With the exception of 1995, fall chum salmon commercial harvests (Figure 8) have been low since 1992, partly due to weak market conditions, but also because of uncertainty in predicting run strength. Most recently this has resulted in underutilization of the stock in commercial fisheries in 2003, and 2005 through 2007. Fall chum salmon runs in 2008 and 2009 were fully utilized, with most escapement objectives attained and below average harvests due to below average available surpluses.

OUTLOOK

The preliminary outlook for 2010 is for a fall chum salmon run size ranging from 545,000 to 824,000 fish. Prior to 1992, fall chum salmon exhibited a strong odd-even year abundance cycle, with even-numbered years producing average returns of 660,000 fish, while odd-numbered years averaged 1 million fish. However, since 1993, wide swings in productivity have made predictions of run size extremely difficult. There have been 2 even-numbered years, 1996 and 2006, that exceeded 1 million fish, and 6 of the last 9 odd-numbered years have been well below average. Although the 2001 brood year produced a record brood year return of 3 million fish, most of which returned in 2005 and 2006, production from the large escapement in 2005 is indicating a record low return per spawner of 0.26. During this time, leading up to record returns, information from Bering Sea studies known as BASIS and trawl bycatch data indicated a higher abundance of all salmon species, particularly chum salmon that also peaked in 2005 (JTC 2008). Bycatch has since dropped off to a record low in 2008, with a slight increase in 2009, but it is unknown if these results reflect truly low abundance or changes in fishing patterns. Given inherent difficulties in managing this complex fishery, a return within the projected range would be anticipated to provide for normal subsistence harvests, and possibly commercial fisheries.

COHO SALMON STOCK STATUS

Subsistence coho salmon harvests have been relatively stable during the past decade, while commercial harvests have shown an increase (Tables 5 and 7). Commercial markets for coho salmon improved before fall chum salmon, and conservative management strategies for fall chum salmon have resulted in fishing later in the season when coho salmon abundance is generally higher.

There is only one established escapement goal for coho salmon in the Yukon River drainage, which is an SEG for Delta Clearwater River of 5,200–17,000 (Table 8 and Figure 9). The lower end of the SEG has been exceeded since 1993 and the upper end of the SEG has been exceeded 7 times through 2008. The 2009 boat count survey of Delta Clearwater River estimated 16,850 coho salmon, which is near the upper end of the SEG range. Several areas in Nenana River and upper Tanana River drainages are also monitored, but no escapement goals exist for these systems (Figure 9). The 2009 Pilot Station sonar passage index of 207,000 coho salmon was well above the 2004–2008 average of 163,000 fish, but is suspect. Problems with apportionment of salmon catches at the test net fishery in 2009 at Pilot Station sonar may have artificially inflated the coho salmon passage estimate (Figure 10) as assessment projects upriver did not confirm a near record run. Outlooks for the coming season are based on the level of escapement achieved across various projects based on the parent year of age-4 fish. The 2010 run is expected to be average based on the escapements observed in 2006 (Table 8).

2010 ALASKA BOARD OF FISHERIES REGULATORY PROPOSALS AFFECTING YUKON RIVER FALL CHUM AND COHO SALMON

There are a several proposals before the BOF that affect fall chum and coho salmon management.

Subsistence and Commercial Proposals

Proposal 85 – Extends Subdistricts 4-B and 4-C drift gillnet area for Chinook and fall chum salmon.

> Extending the area of use of drift gillnet gear may shift subsistence harvest patterns between subsistence gear types and locations, and to different stocks than that of current set gillnet and fish wheel gear.

Proposal 88 – Prohibits drift gillnet gear for subsistence and commercial fishing.

> Prohibiting use of drift gillnets, the primary gear type already in use, would affect many subsistence and commercial fishermen from Subdistrict 4-A downstream 500 miles. Such an action would produce competition for the limited number of set gillnet sites, and would also create an overall reduction in harvest efficiency.

Proposal 194 – Revises management triggers in 5 AAC 01.249. *Yukon River Drainage Fall Chum Salmon Management Plan*.

> This proposal would allow commercial fishing on fall chum salmon at lower run sizes (Table 3). A majority of fall chum salmon subsistence harvest is taken in Upper Yukon Area (Table 4).

Proposal 199 – Modifies 5 AAC 05.369. *Yukon River Coho Salmon Management Plan* for late season harvests.

> This proposal would allow directed coho salmon commercial fishing late in the season if the commissioner determines that there is a harvestable surplus of coho salmon above escapement needs and those necessary for subsistence uses, and that a directed coho salmon commercial fishery will not have a significant impact on escapement or allocation of fall chum salmon.

Commercial Proposals

Proposal 97 – Reallocate commercial fall chum salmon harvest.

> This proposal would reallocate commercial harvest from Lower Yukon Area to Upper Yukon Area. Currently, a majority of commercial harvest, value, and fishing effort is located in Lower Yukon Area (Tables 6, 9 and 10; Figure 11). Harvests of coho salmon would also be shifted because they are normally caught incidentally to fall chum salmon (Tables 5 and 7; Figures 5, 6, and 12).

RESEARCH AND ASSESSMENT

Long-term stock assessment information is needed to assess how various fall chum salmon stocks in the Yukon River drainage can support sustained fisheries. Little stock assessment information is available for Yukon River salmon prior to statehood. Additionally, most stock assessment information collected during the 1960s and 1970s consisted of aerial surveys conducted on a periodic basis, which provided crude indices of spawning abundance. Long-term and accurate estimates of abundance and stock composition are needed, along with harvest estimates from various fisheries in the Yukon River drainage. Progress toward these objectives has been made since the late 1980s, with the most complete coverage of escapement assessment projects occurring between 1995 and 2007. Loss of USFWS Office of Subsistence Management (OSM) funding since 2008 for the Tanana and Kantishna river mark–recapture project has left analysis incomplete. Run reconstructions and escapement goal analysis becomes much more difficult with loss of coverage of component stocks. It was hoped that genetic mixed stock analysis (MSA), available since 2004 for fall chum salmon, could substitute for escapement projects because data is timelier. Some aspects of deriving MSA estimates, such as stock assignments, are not as clear (for example, Sheenjek and Chandalar cannot be distinguished from one another and small stocks such as Fishing Branch River are most likely underrepresented in any sampling protocol), and estimates by stock provided are dependent on the accuracy of Pilot Station sonar assessment of passage, which is typically conservative.

ADF&G, several federal agencies, non-governmental organizations, and various organized groups of fishermen operate salmon stock assessment projects throughout the Yukon River drainage, which is used by the Division of Commercial Fisheries to manage Alaskan Yukon River salmon fisheries. Preseason forecasts are based upon historic performance of parent spawning and are generally expressed as below average, average, or above average. Inseason run assessment tools include: (1) abundance indices from test fisheries, (2) sonar counts of fish passage, (3) various escapement assessment projects in tributary systems, (4) commercial and subsistence catch data, (5) catch per effort data from monitored fisheries, and (6) inseason MSA from lower river test fisheries.

U.S./CANADA JOINT TECHNICAL COMMITTEE PLAN

The U.S./Canada Yukon River Joint Technical Committee completed a research plan in 2005, with the intent that it would be periodically updated based on changes in priorities and on completing projects that fill initial data gaps. The goals, issues, and comprehensive listing of all research needs contained in this plan provide a framework for research in the entire Yukon River basin, as well as other plans in the region. The intent of the plan is to help management meet and protect escapements while maximizing harvests. This plan provides focus and direction for research time and monies, and is used by agencies internally and to communicate with an international public. Projects can be prioritized, and personnel and equipment allocated to those projects agreed to be most important.

CURRENT PROGRAMS

Main river sonar, tributary sonar, weir, and spawning ground surveys are used to monitor spawning populations or major segments of those populations. Other information collected at ground-based assessment projects may include, but is not limited to, sex and length composition, scales for age determination, samples for genetic stock identification, and data on resident species.

MAIN RIVER SONAR

This main river sonar project, located near Pilot Station (river mile 123), estimates fish passage and uses a drift gillnet test fishery to apportion fish passage estimates to species. The *Yukon River Drainage Fall Chum Salmon Management Plan* utilizes daily projected passage estimates at Pilot Station, with varying levels of management actions dependent on projected inseason passage estimates for fall chum and coho salmon.

MIXED STOCK ANALYSIS

The USFWS' genetic laboratory works in cooperation with ADF&G's Pilot Station sonar project to estimate contribution of fall chum salmon stock components to the total run. Funding to collect and analyze genetic samples is provided through USFWS OSM. The intent is to develop an efficient technique that provides timely information on stock-specific harvests low in the drainage to support discrete stock management in a mixed-stock fishery. The project has been operated since 2004 and indicates a good relationship in most years between inseason stock compositions at Pilot Station sonar, with postseason run reconstruction based on escapement estimates.

BORDER SONAR

ADF&G and Canadian Department of Fisheries and Oceans (DFO), supported by U.S./Canada Treaty Implementation and Research and Enhancement (R&E) funding, have been operating a sonar downstream from the community of Eagle, Alaska to provide population estimates of salmon crossing the U.S./Canada Border. This project directly assists in assessment of U.S. management and treaty commitments for escapement of Canadian origin salmon stocks. Estimates for fall chum salmon have been available since 2006. Data collected thus far showed a good relationship between sonar-based and DFO mark–recapture estimates for fall chum salmon. Beginning in 2008, the Panel agreed to base Canadian escapement goals for fall chum salmon on sonar estimates. DFO operated the mark–recapture project in 2008 during transition, but the project was discontinued in 2009.

TRIBUTARY SONAR

Chandalar River is a major producer of fall chum salmon in upper Yukon River in Alaska, accounting for as much as 42% of the overall fall chum salmon run, and averaging 29% during the time period from 1995–2008. Chandalar River has been monitored annually using sonar since 1995, except 2009.

Sheenjek River is a tributary of Porcupine River that has been monitored annually since 1974 using various methods of assessment, from aerial surveys to sonar technology. This system provides the second largest upper Yukon River U.S. stock, contributing between 5% and 30% annually (1995–2004). Sonar operations since 2005 include monitoring of both banks of the river, compared to just the right bank operations previously employed. Between 2005 and 2009, the left bank has most consistently represented an average of 38% of total passage, with the exception of 2008 when the left bank averaged only 16%. The bank primarily used for migration at a given time seems to be linked to high water events and amount of cloud cover.

WEIRS AND ESCAPEMENT GROUND SURVEYS

Fishing Branch River forms part of the headwaters of Porcupine River and is located in Canada. Fishing Branch River has been monitored primarily by weir since 1971, with some aerial survey work contributing to weir estimates prior to 1984. This system is currently a minor producer, averaging 5% during the time period from 1995–2008, with the greatest contribution being 24% in 1975.

Delta River serves as an index area for upper Tanana River stocks. Delta River has been monitored by replicate foot surveys since 1974 from which population estimates are derived. Based on the mark–recapture project that provided population estimates for upper Tanana River from 1995–2007, Delta River, on average, represents 10% of the stock. A radiotelemetry project was conducted in 2008 on fall chum salmon bound for upper Tanana River, and preliminary analysis indicated that 10% of the tags were tracked to Delta River.

The Toklat River springs area was previously an index for the Kantishna River portion of the Tanana River drainage. Population estimates were derived by various methods (Table 1) from 1974 through 2005 based on thorough counts of salmon congregating at this location. Changes in environmental conditions have prevented estimation of population abundance in recent years. The site is still used for collecting data on escapement age, sex, and length for fall chum salmon, and a coho salmon survey is conducted in nearby Geiger Creek.

TEST FISH WHEELS AND NETS

There are 3 fish wheel projects currently associated with assessment of fall chum and coho salmon. One is located in mainstem Yukon River near the mouth of Tanana River (Subdistrict 5-A); another is located upstream near Rapids (Subdistrict 5-B); and the third is located in the Tanana River drainage downstream from Nenana (District 6). All 3 of these fish wheels provide indices of fall chum and coho salmon abundance through catch per unit effort (CPUE) information. Additionally, test drift gillnet projects are operated to provide CPUE in mainstem Yukon River in lower Yukon (District 1) and in Mt. Village (District 2). Test drift gillnet sites in the lower Yukon projects are also used to provide inseason estimates of age composition and sex ratios, and postseason, ages are used to develop the brood table for the aggregate of fall chum salmon.

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TABLES AND FIGURES

Table 1.–Fall chum salmon passage estimates and escapement estimates for selected spawning areas, Yukon River drainage, 1971–2009.

	Alaska								Canada	
	Yukon River	Tanana River Drainage					Upper Yukon River Drainage			
Year	Yukon River Mainstem Sonar Estimate	Toklat River [a]	Kantishna / Toklat Rivers Tagging Estimate [b]	Delta River [c]	Bluff Cabin Slough [d]	Upper Tanana River Tagging Estimate [e]	Chandalar River [f]	Sheenjek River [g]	Fishing Branch River [h]	Mainstem Tagging Escapement Estimate [i]
1971									312,800 [j]	
1972									35,125 [k]	
1973									15,989	
1974		41,798		5,915 [l]				89,966 [m]	31,525	
1975		92,265		3,734				173,371 [m]	353,282	
1976		52,891		6,312				26,354 [m]	36,584 [j]	
1977		34,887		16,876				45,544 [m]	88,400 [j]	
1978		37,001		11,136 [l]				32,449 [m]	40,800 [j]	
1979		158,336		8,355 [l]				91,372 [m]	119,898 [j]	
1980		26,346		5,137 [l]	3,190 [n]			28,933 [m]	55,268 [j]	22,912
1981		15,623		23,508 [l]	6,120 [n]			74,560	57,386 [o]	47,066 [p]
1982		3,624		4,235 [l]	1,156			31,421	15,901 [j]	31,958
1983		21,869		7,705 [l]	12,715			49,392	27,200 [j]	90,875
1984		16,758		12,411 [l]	4,017			27,130	15,150 [j]	56,633 [p]
1985		22,750		17,276	2,655 [n]			152,768 [q]	56,016	62,010
1986		17,976		6,703	3,458		59,313	84,207 [q, r]	31,723	87,940
1987		22,117		21,180 [l]	9,395		52,416	153,267 [q, r]	48,956	80,776
1988		13,436		18,024 [l]	4,481 [n]		33,619	45,206 [r]	23,597	36,786
1989		30,421		21,342	5,386 [n]		69,161	99,116 [r]	43,834	35,750
1990		34,739		8,992	1,632		78,631	77,750 [r]	35,000 [s]	51,735
1991		13,347		32,905	7,198			86,496	37,733	78,461
1992		14,070		8,893	3,615 [n]			78,808	22,517	49,082
1993	295,000	27,838		19,857 [l]	5,550 [n]			42,922	28,707	29,743
1994	407,000	76,057		23,777	2,277 [n]			150,565	65,247	98,358
1995	1,053,245	54,513 [t]		20,587 [l]	19,460	268,173	280,999	241,855	51,971 [u]	158,092

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Table 1.–Page 2 of 4.

	Alaska									Canada
		Tanana River Drainage					Upper Yukon River Drainage			
Year	Yukon River M115 instem Sonar Estimate	Toklat River [a]	Kantishna / Toklat Rivers Tagging Estimate [b]	Delta River [c]	Bluff Cabin Slough [d]	Upper Tanana River Tagging Estimate [e]	Chandalar River [f]	Sheenjek River [g]	Fishing Branch River [h]	Mainstem Tagging Escapement Estimate [i]
1996		18,264		19,758	7,074 [d]	134,563	208,170	246,889	77,278	122,429
1997	506,621	14,511		7,705	5,707 [d]	71,661	199,874	80,423 [v]	26,959	85,439
1998	372,927	15,605		7,804	3,549 [d]	62,384	75,811	33,058	13,564	46,305
1999	379,493	4,551	27,199	16,534	7,037 [d]	97,843	88,662	14,229	12,904	58,682
2000	247,935	8,911	21,450	3,001	1,595	34,844	65,894	30,084 [w]	5,053	53,742
2001	376,182	6,007 [x]	22,992	8,103	1,808 [n]	96,556 [y]	110,971	53,932	21,669	33,851
2002	326,858	28,519	56,665	11,992	3,116	109,961	89,850	31,642	13,563	98,695
2003	889,778	21,492	87,359	22,582	10,600 [n]	193,418	214,416	44,047 [z]	29,519	142,683
2004	594,060	35,480	76,163	25,073	10,270 [n]	123,879	136,703	37,878	20,274	154,080
2005	1,813,589	17,779 [t]	107,719	28,132	11,964 [n]	377,755	496,484	438,253 [q]	121,413	437,920
2006	790,563	-	71,135	14,055	-	202,669	245,090	160,178 [q]	30,849	211,193
2007	684,011	-	81,843	18,610	-	320,811	228,056	65,435 [q]	33,750	214,802
2008	615,127	-	-	23,055	1,198 [n]	-	178,278	50,353 [q]	20,055 [aa]	174,424
2009 [ab]	235,891	-	-	13,000		-	-	54,126 [q]	25,130 [aa]	92,000
All Years										
Average	599,268	31,243	61,392	14,563	5,786	161,117	153,284	89,555	53,913	98,147
Five Year Average										
2004-2008	899,470	26,630	84,215	21,785	7,811	256,279	256,922	150,419	45,268	238,484
BEG Range		15,000	N/A	6,000	N/A	46,000 [ac]	74,000	50,000	27,000	60,000
		33,000		13,000		103,000	152,000	104,000	56,000	129,000
Drainagewide BEG								Treaty Negotiated Interim Objectives:	50,000-120,000	>80,000
300,000-600,000								Yukon River Panel Negotiated Objectives for 2008-2010:	22,000-49,000	

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Note: Latest table revision December 4, 2009.

[a] Total abundance estimates for upper Toklat River drainage spawning index area using stream life curve method developed with 1987 to 1993 data.

[b] Fall chum salmon passage estimate for Kantishna and Toklat river drainages is based on tag deployment from a fish wheel located at the lower end of Kantishna River and recaptures from three fish wheels; two located on Toklat River (1999 to 2007) about eight miles upstream of the mouth and one fish wheel on Kantishna River (2000 and 2007) near Bear Paw River.

[c] Population estimate generated from replicate foot surveys and stream life data (area under the curve method), unless otherwise noted.

[d] Peak counts from foot surveys unless otherwise noted.

[e] Fall chum salmon passage estimate for upper Tanana River drainage based on tag deployment from a fish wheel (two fish wheels in 1995) located just upstream of Kantishna River and recaptures from one fish wheel (two fish wheels from 1995 to 1998) located downstream from the village of Nenana.

[f] Side-scan sonar estimate from 1986 through 1990. Split beam sonar estimate from 1995 through 2006. DIDSON sonar estimate in 2007 to present.

[g] Side-scan sonar estimate from 1986 through 1999, 2001, and 2002. Split-beam sonar estimate from 2003 through 2004. DIDSON sonar estimate since 2005. Counts prior to 1986 are considered conservative, approximating the period from the end of August through middle of the fourth week of September. Since 1991, total abundance estimates are for the approximate period second week in August through the middle of the fourth week of September.

[h] Total escapement estimated using weir count unless otherwise indicated. Counts for 1974, 1975, and 1998 revised from DFO, February 23, 2000.

[i] Estimated border passage minus Canadian mainstem harvest and excluding Canadian Porcupine River drainage escapement. Based on mark-recapture from 1980 to 2007 and sonar thereafter.

[j] Total escapement estimated using weir to aerial survey expansion factor of 2.72.

[k] Weir installed on September 22, 1972. Estimate consists of a weir count of 17,190 after September 22 and a tagging passage estimate of 17,935 prior to weir installation.

[l] Total escapement estimate generated from the migratory time density curve method.

[m] Total escapement estimate using sonar to aerial survey expansion factor of 2.22.

[n] Peak counts aerial surveys.

[o] In 1981, the initial aerial survey count was doubled before applying the weir to aerial expansion factor of 2.72 since only half of the spawning area was surveyed.

[p] In 1984, the escapement estimate based on mark-recapture program is unavailable. Estimate is based on assumed average exploitation rate.

[q] Sonar counts included both banks in 1985-1987 and 2005 to present.

[r] Expanded estimates, using Chandalar River fall chum salmon run timing data, for the approximate period from mid-August through the middle of the fourth week of September 1986-1990.

[s] Population of spawners was reported by DFO as between 30,000 to 40,000 fish considering aerial survey timing. For purpose of this table, an average of 35,000 fall chum salmon was estimated to pass by the weir. Note: A single survey flown October 26, 1990, counted 7,541 chum salmon. A population estimate of approximately 27,000 fish was made through date of survey, based upon historic average aerial to weir expansion of 28%.

[t] Minimal estimate because of late timing of ground surveys with respect to peak of spawning.

[u] Minimal count because weir was closed while submerged due to high water, during the period August 31 to September 8, 1995.

[v] The passage estimate includes an additional 15,134 salmon that were estimated to have passed during 127 hours that the sonar was inoperable due to high water from August 29 until September 3, 1997.

[w] 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.

[x] Minimal estimate because Sushana River was breached by the main channel and uncountable.

[y] Due to low numbers of tags deployed and recovered on Tanana River the estimate has a large range in confidence interval (95% CI + 41,172).

[z] Project ended on peak daily passages due to late run timing; estimate was expanded based on run timing (87%) at Rapids.

[aa] Project estimated for late run timing through October 25 as project ended on October 10, 2008 and October 12, 2009.

[ab] Preliminary.

[ac] Upper Tanana River goal is Tanana River drainage BEG (61,000 to 136,000) minus the lower and upper ranges of Toklat River goal based on Eggers (2001), and is not an established BEG.

Table 2.–Fall chum salmon estimated brood year production and return per spawner estimates, Yukon Area, 1974–2008.

	(P)			Estimated Brood Year Return									(R)	(R/P)
	Estimated Annual Totals			Number of Salmon [a]				Percent					Total Brood	Return/
Year	Escapement [b]	Catch	Return	Age 3	Age 4	Age 5	Age 6	Age 3	Age 4	Age 5	Age 6		Year Return[a]	Spawner
1974	436,485	478,875	915,360	91,751	497,755	68,693	0	0.139	0.756	0.104	0.000		658,199	1.51
1975	1,465,213	473,062	1,938,275	150,451	1,225,440	61,401	123	0.105	0.853	0.043	0.000		1,437,415	0.98
1976	268,841	339,043	607,884	102,062	587,479	137,039	4,316	0.123	0.707	0.165	0.005		830,895	3.09
1977	514,843	447,918	962,761	102,660	1,075,198	175,688	4,189	0.076	0.792	0.129	0.003		1,357,735	2.64
1978	320,487	434,030	754,517	22,222	332,230	90,580	0	0.050	0.747	0.204	0.000		445,032	1.39
1979	780,818	615,377	1,396,195	41,114	769,496	274,311	3,894	0.038	0.707	0.252	0.004		1,088,814	1.39
1980	263,167	488,373	751,540	8,377	362,199	208,962	3,125	0.014	0.622	0.359	0.005		582,663	2.21
1981	551,192	683,391	1,234,583	45,855	955,725	278,386	8,888	0.036	0.742	0.216	0.007		1,288,853	2.34
1982	179,828	373,519	553,347	11,327	400,323	166,754	679	0.020	0.691	0.288	0.001		579,083	3.22
1983	347,157	525,485	872,642	12,569	875,355	223,468	2,313	0.011	0.786	0.201	0.002		1,113,704	3.21
1984	270,042	412,323	682,365	7,089	408,040	174,207	8,516	0.012	0.683	0.291	0.014		597,852	2.21
1985	664,426	515,481	1,179,907	46,635	874,819	270,984	3,194	0.039	0.732	0.227	0.003		1,195,632	1.80
1986	376,374	318,028	694,402	0	429,749	368,513	4,353	0.000	0.535	0.459	0.005		802,614	2.13
1987	651,943	406,143	1,058,086	12,413	617,519	290,767	7,720	0.013	0.665	0.313	0.008		928,418	1.42
1988	325,137	353,685	678,822	41,003	175,236	152,368	10,894 [c]	0.108	0.462	0.401	0.029		379,501	1.17
1989	506,173	545,166	1,051,339	2,744	282,905	345,136 [c]	20,290	0.004	0.435	0.530	0.031		651,075	1.29
1990	369,654	352,007	721,661	710	579,452 [c]	418,448	30,449	0.001	0.563	0.407	0.030		1,029,059	2.78
1991	591,132	439,096	1,030,228	3,663 [c]	1,024,800	369,103	12,167	0.003	0.727	0.262	0.009		1,409,733	2.38
1992	324,253	148,846	473,099	6,763	653,648	197,073	3,907	0.008	0.759	0.229	0.005		861,392	2.66
1993	352,688	91,015	443,703	7,745	451,327	102,420	3,235	0.014	0.799	0.181	0.006		564,727	1.60
1994	769,920	169,225	939,145	4,322	225,243	149,527	1,603 [c]	0.011	0.592	0.393	0.004		380,695	0.49

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Table 2.–Page 2 of 2.

	(P)			Estimated Brood Year Return								(R)	(R/P)
	Estimated Annual Totals			Number of Salmon				Percent				Total Brood	Return
Year	Escapement	Catch	Return	Age 3	Age 4	Age 5	Age 6	Age 3	Age 4	Age 5	Age 6	Year Return	Spawner
1995	1,009,155	461,147	1,470,302	2,371	266,955	68,918 [c]	383	0.007	0.788	0.204	0.001	338,627	0.34
1996	800,022	260,923	1,060,945	420	165,691 [c]	136,906	8,295	0.001	0.532	0.440	0.027	311,312	0.39
1997	494,831	170,059	664,890	3,087 [c]	244,801	118,343	3,332	0.008	0.662	0.320	0.009	369,563	0.75
1998	263,121	70,820	333,941	651	269,653	57,962	6,694	0.002	0.805	0.173	0.020	334,960	1.27
1999	288,962	131,175	420,137	29,097	705,152	174,424	13,721	0.032	0.764	0.189	0.015	922,394	3.19
2000	210,756	28,543	239,299	8,446	297,012	115,488	0	0.020	0.706	0.274	0.000	420,946	2.00
2001	337,765	44,976	382,741	136,038	2,157,674	675,688	33,600	0.045	0.719	0.225	0.011	3,003,001	8.89
2002	397,977	27,411	425,388	0	444,507	236,656	12,831	0.000	0.651	0.346	0.019	683,312	1.72
2003	695,363	79,529	774,892	24,263	849,743	426,811	16,982	0.018	0.645	0.324		1,317,798 [d]	>1.90
2004	537,873	76,296	614,169	0	326,466	180,928						507,394 [e]	>0.94
2005	1,996,700	290,183	2,286,883	2,228									
2006	873,987	270,471	1,144,458										
2007	916,606	203,393	1,119,999										
2008	559,541	208,795	768,336										
2007 Avg.	563,320	315,442	878,762										
	487,323	All Brood Years (1974–2002)		31,089	598,462	210,628	7,335	0.0324	0.6889	0.2698	0.0094	847,145	2.09
	371,738	Even Brood Years (1974–2002)		20,343	388,548	178,612	6,377	0.0340	0.6540	0.3022	0.0109	593,168	1.88
	611,164	Odd Brood Years (1974–2002)		42,603	823,369	244,931	8,361	0.0307	0.7264	0.2351	0.0077	1,119,264	2.30

[a] The estimated number of salmon which returned are based upon annual age composition observed in lower Yukon test nets each year, weighted by test fish CPUE.

[b] Contrast in escapement data is 11.10.

[c] Based upon expanded test fish age composition estimates for years in which the test fishery terminated early (both in 1994 and 2000).

[d] Brood year return for 3, 4, and 5 year fish indicate that production (R/P) from brood year 2003 was at least 1.90. Recruits estimated for incomplete brood year.

[e] Brood year return for 3 and 4 year fish indicate that production (R/P) from brood year 2004 was at least 0.94. Recruits estimated for incomplete brood year.

Table 3.–Yukon River drainage fall chum salmon management plan, 5AAC 01.249, 2009.

Run Size Estimate [b] (Point Estimate)	Recommended Management Action Fall Chum Salmon Directed Fisheries [a]				Targeted Drainagewide Escapement
	Commercial	Personal Use	Sport	Subsistence	
300,000 or Less	Closure	Closure	Closure	Closure [c]	
300,001 to 500,000	Closure	Closure [c]	Closure [c]	Possible Restrictions [c, d]	300,000 to 600000
500,001 to 600,000	Restrictions [c]	Open	Open	Pre-2001 Fishing Schedules	
Greater Than 600,000	Open [e]	Open	Open	Pre-2001 Fishing Schedules	

[a] Considerations for the Toklat River and Canadian mainstem rebuilding plans may require more restrictive management actions.

[b] The department will use the best available data, including preseason projections, mainstem river sonar passage estimates, test fisheries indices, subsistence and commercial fishing reports, and passage estimates from escapement monitoring projects.

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

[d] Subsistence fishing will be managed to achieve a minimum drainagewide escapement goal of 300,000 fall chum salmon.

[e] Drainagewide commercial fisheries may be open and the harvestable surplus above 600,000 fall chum salmon w ill be distributed by district or subdistrict (in proportion to the guidelines harvest levels established in 5 AAC 05.365 and 5 AAC 05.367).

Table 4.–Estimated fall chum salmon subsistence and personal use harvest in numbers of fish by district, Yukon River, 1979–2008.

	District 1		District 2		District 3		Lower Yukon Subtotal		District 4		District 5		District 6		Upper Yukon Subtotal		Total
Year	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Subsistence Harvest[a]
1979	15,788	7%	14,622	6%	2,443	1%	32,853	14%	37,896	16%	110,792	47%	51,766	22%	200,454	86%	233,307
1980	7,433	4%	12,435	7%	2,320	1%	22,188	13%	23,675	14%	76,466	44%	50,328	29%	150,469	87%	172,657
1981	15,540	8%	11,770	6%	3,043	2%	30,353	16%	19,973	11%	111,567	59%	26,632	14%	158,172	84%	188,525
1982	10,016	8%	9,511	7%	1,659	1%	21,186	16%	20,319	15%	71,828	54%	19,564	15%	111,711	84%	132,897
1983	8,238	4%	10,341	5%	2,863	1%	21,442	11%	34,209	18%	105,103	54%	32,174	17%	171,486	89%	192,928
1984	8,885	5%	11,394	7%	2,233	1%	22,512	13%	31,152	18%	98,433	56%	22,726	13%	152,311	87%	174,823
1985	13,275	6%	11,544	6%	2,290	1%	27,109	13%	25,275	12%	117,125	57%	36,963	18%	179,363	87%	206,472
1986	9,000	5%	13,483	8%	1,785	1%	24,268	15%	26,496	16%	88,124	54%	25,155	15%	139,775	85%	164,043
1987	18,467	8%	13,454	6%	2,853	1%	34,774	15%	41,901	18%	113,498	50%	36,595	16%	191,994	85%	226,768
1988	5,475	4%	8,600	6%	1,747	1%	15,822	10%	18,379	12%	84,209	54%	36,403	24%	138,991	90%	154,813
1989	4,914	2%	10,015	5%	1,019	0%	15,948	8%	24,544	12%	112,001	53%	58,654	28%	195,199	92%	211,147
1990	5,335	3%	6,187	4%	2,056	1%	13,578	8%	19,241	11%	90,513	54%	44,568	27%	154,322	92%	167,900
1991	3,935	3%	5,628	4%	615	0%	10,178	7%	20,875	14%	74,002	51%	40,469	28%	135,346	93%	145,524
1992	5,216	5%	7,382	7%	1,493	1%	14,091	13%	22,097	21%	45,701	42%	25,713	24%	93,511	87%	107,602
1993	7,770	10%	3,094	4%	1,449	2%	12,313	16%	10,832	14%	43,764	57%	10,016	13%	64,612	84%	76,925
1994	4,887	4%	4,151	3%	862	1%	9,900	8%	13,325	11%	66,396	54%	33,597	27%	113,318	92%	123,218
1995	4,698	4%	3,317	3%	1,672	1%	9,687	7%	14,057	11%	57,594	44%	50,031	38%	121,682	93%	131,369
1996	4,147	3%	5,287	4%	2,706	2%	12,140	9%	16,786	13%	63,473	49%	36,823	28%	117,082	91%	129,222
1997	3,132	3%	4,680	5%	787	1%	8,599	9%	11,734	12%	55,258	58%	19,834	21%	86,826	91%	95,425
1998	3,163	5%	4,482	7%	1,561	2%	9,206	15%	7,898	13%	31,393	50%	14,372	23%	53,663	85%	62,869
1999	6,502	7%	4,594	5%	415	0%	11,511	13%	9,174	10%	53,580	60%	15,732	17%	78,486	87%	89,997
2000	5,294	27%	1,425	7%	598	3%	7,317	38%	1,759	9%	9,920	51%	311	2%	11,990	62%	19,307
2001	3,437	10%	3,256	9%	700	2%	7,393	21%	3,352	10%	20,873	59%	3,536	10%	27,761	79%	35,154
2002	1,881	10%	1,618	8%	164	1%	3,663	19%	1,549	8%	10,976	57%	3,205	17%	15,730	81%	19,393
2003	2,139	4%	2,901	5%	738	1%	5,778	10%	9,750	17%	28,270	49%	13,380	23%	51,400	90%	57,178
2004	2,067	3%	2,421	4%	298	0%	4,786	8%	7,797	12%	40,670	65%	9,183	15%	57,650	92%	62,436

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	District 1		District 2		District 3		Lower Yukon Subtotal		District 4		District 5		District 6		Upper Yukon Subtotal		Total
Year	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Subsistence Harvest[a]
2005	2,889	3%	3,257	4%	1,304	1%	7,450	8%	9,405	10%	51,663	56%	23,079	25%	84,147	92%	91,597
2006 [b]	3,902	5%	4,015	5%	480	1%	8,397	10%	6,335	8%	52,143	62%	17,258	21%	75,736	90%	84,133
2007 [b]	4,390	4%	3,472	4%	925	1%	8,787	9%	8,576	9%	51,457	52%	30,066	30%	90,099	91%	98,886
2008 [b]	2,823	3%	3,522	4%	1,821	2%	8,166	9%	7,412	8%	57,258	64%	16,316	18%	80,986	91%	89,152
5 Yr Avg 2004-2008	3,214	4%	3,337	4%	966	1%	7,517	9%	7,905	9%	50,638	60%	19,180	22%	77,724	91%	85,241
10 Yr Avg 1999-2008	3,532	8%	3,048	5%	744	1%	7,325	14%	6,511	10%	37,681	58%	13,207	18%	57,399	86%	64,723
15 Yr Avg 1994-2008	3,690	6%	3,493	5%	1,002	1%	8,185	13%	8,594	11%	43,395	55%	19,115	21%	71,104	87%	79,289
20 Yr Avg 1989-2008	4,126	6%	4,235	5%	1,083	1%	9,444	12%	11,325	12%	50,845	54%	23,307	22%	85,477	88%	94,922

[a] Total harvest does not include Coastal District.

[b] Preliminary data.

Table 5.–Estimated coho salmon subsistence and personal use harvest in numbers of fish by district, Yukon River, 1979–2008.

	District 1		District 2		District 3		Lower Yukon Subtotal		District 4		District 5		District 6		Upper Yukon Subtotal		Total
Year	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Subsistence Harvest[a]
1979	3,184	33%	1,132	12%	74	1%	4,390	45%	197	2%	595	6%	4,612	47%	5,404	55%	9,794
1980	1,808	9%	4,801	24%	91	0%	6,700	33%	7,734	38%	561	3%	5,163	26%	13,458	67%	20,158
1981	3,769	18%	3,736	18%	510	2%	8,015	38%	2,239	11%	1,713	8%	9,261	44%	13,213	62%	21,228
1982	11,192	31%	10,229	28%	675	2%	22,096	62%	2,952	8%	3,428	10%	7,418	21%	13,798	38%	35,894
1983	3,590	15%	6,072	25%	917	4%	10,579	44%	3,946	17%	2,448	10%	6,932	29%	13,326	56%	23,905
1984	6,095	12%	7,066	14%	740	2%	13,901	28%	2,867	6%	17,467	36%	14,785	30%	35,119	72%	49,020
1985	3,246	10%	4,834	15%	376	1%	8,456	26%	3,949	12%	8,098	25%	11,761	36%	23,808	74%	32,264
1986	2,725	8%	9,140	27%	954	3%	12,819	37%	2,458	7%	5,870	17%	13,321	39%	21,649	63%	34,468
1987	6,529	13%	6,894	14%	754	2%	14,177	29%	3,479	7%	6,885	14%	24,195	50%	34,559	71%	48,736
1988	6,238	9%	7,104	10%	1,667	2%	15,009	21%	4,714	7%	19,858	28%	31,348	44%	55,920	79%	70,929
1989	5,349	13%	5,039	12%	537	1%	10,925	26%	4,030	10%	7,269	17%	19,572	47%	30,871	74%	41,796
1990	3,309	7%	6,344	14%	1,026	2%	10,679	24%	3,614	8%	11,580	26%	18,768	42%	33,962	76%	44,641
1991	1,808	5%	3,297	9%	1,340	4%	6,445	17%	4,451	12%	4,931	13%	21,561	58%	30,943	83%	37,388
1992	5,485	11%	6,587	13%	1,549	3%	13,621	26%	8,429	16%	12,376	24%	17,554	34%	38,359	74%	51,980
1993	2,383	15%	1,695	11%	279	2%	4,357	28%	1,167	7%	5,984	38%	4,304	27%	11,455	72%	15,812
1994	3,353	8%	3,881	9%	363	1%	7,597	18%	3,601	9%	4,174	10%	26,489	63%	34,264	82%	41,861
1995	2,403	8%	2,142	7%	891	3%	5,436	19%	1,934	7%	2,205	8%	19,219	67%	23,358	81%	28,794
1996	2,445	8%	3,475	11%	444	1%	6,364	21%	2,467	8%	6,588	22%	15,091	49%	24,146	79%	30,510
1997	1,823	8%	2,424	10%	766	3%	5,013	21%	3,754	15%	3,583	15%	11,945	49%	19,282	79%	24,295
1998	2,171	12%	2,297	13%	400	2%	4,868	27%	2,593	15%	2,839	16%	7,481	42%	12,913	73%	17,781
1999	1,730	8%	2,793	13%	610	3%	5,133	24%	2,049	10%	4,241	20%	9,541	46%	15,831	76%	20,964
2000	1,067	7%	2,351	16%	94	1%	3,512	24%	1,068	7%	4,987	34%	5,150	35%	11,205	76%	14,717
2001	1,274	6%	1,440	7%	0	0%	2,714	13%	2,266	10%	7,674	35%	9,000	42%	18,940	87%	21,654
2002	1,295	8%	1,233	8%	115	1%	2,643	17%	1,023	7%	2,076	14%	9,519	62%	12,618	83%	15,261
2003	1,260	5%	1,586	7%	711	3%	3,557	15%	5,773	24%	3,887	16%	10,912	45%	20,572	85%	24,129
2004	1,175	6%	1,500	7%	284	1%	2,959	14%	4,766	23%	1,423	7%	11,817	56%	18,006	86%	20,965
2005	976	4%	1,110	4%	217	1%	2,303	9%	2,971	11%	2,159	8%	19,645	73%	24,775	91%	27,078

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	District 1		District 2		District 3		Lower Yukon Subtotal		District 4		District 5		District 6		Upper Yukon Subtotal		Total
Year	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Est. Harvest	% of Harvest	Subsistence Harvest[a]
2006 [b]	1,177	6%	2,459	13%	83	0%	3,719	19%	1,302	7%	3,779	19%	10,850	55%	15,931	81%	19,650
2007 [b]	2,265	10%	2,347	11%	739	3%	5,351	24%	2,952	13%	5,620	26%	7,980	36%	16,552	76%	21,903
2008 [b]	1,211	7%	1,997	12%	410	2%	3,618	22%	1,490	9%	3,203	19%	8,478	50%	13,171	78%	16,789
5 Yr Avg 2004-2008	1,361	7%	1,883	9%	347	2%	3,590	18%	2,696	13%	3,237	16%	11,754	54%	17,687	82%	21,277
10 Yr Avg 1999-2008	1,343	7%	1,882	10%	326	2%	3,551	18%	2,566	12%	3,905	20%	10,289	50%	16,760	82%	20,311
15 Yr Avg 1994-2008	1,708	7%	2,202	10%	408	2%	4,319	19%	2,667	12%	3,896	18%	12,208	51%	18,771	81%	23,090
20 Yr Avg 1989-2008	2,198	8%	2,800	10%	543	2%	5,541	20%	3,085	11%	5,029	19%	13,244	49%	21,358	80%	26,898

[a] Total harvest does not include Coastal District.

[b] Preliminary data.

Table 6.–Commercial harvest of fall chum salmon by district, Yukon River, 1961–2009.

	Lower Yukon								Upper Yukon								
	District 1		District 2		District 3		Lower Yukon Subtotal		District 4		District 5		District 6		Upper Yukon Subtotal		Total Commercial
Year [a]	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Harvest
1961	42,461	100.0%	0	0.0%	0	0.0%	42,461	100.0%	0	0.0%	-	0.0%	-	0.0%	0	0.0%	42,461
1962	53,116	100.0%	0	0.0%	0	0.0%	53,116	100.0%	0	0.0%	-	0.0%	-	0.0%	0	0.0%	53,116
1963	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	-	0.0%	-	0.0%	0	0.0%	0
1964	8,347	100.0%	0	0.0%	0	0.0%	8,347	100.0%	0	0.0%	-	0.0%	-	0.0%	0	0.0%	8,347
1965	22,936	98.4%	0	0.0%	0	0.0%	22,936	98.4%	381	1.6%	-	0.0%	-	0.0%	381	1.6%	23,317
1966	69,836	98.3%	0	0.0%	1,209	1.7%	71,045	100.0%	0	0.0%	-	0.0%	-	0.0%	0	0.0%	71,045
1967	36,451	95.2%	0	0.0%	1,823	4.8%	38,274	100.0%	0	0.0%	-	0.0%	-	0.0%	0	0.0%	38,274
1968	49,857	94.2%	0	0.0%	3,068	5.8%	52,925	100.0%	0	0.0%	-	0.0%	-	0.0%	0	0.0%	52,925
1969	128,866	98.1%	0	0.0%	1,722	1.3%	130,588	99.5%	722	0.5%	-	0.0%	-	0.0%	722	0.5%	131,310
1970	200,306	95.6%	4,858	2.3%	3,285	1.6%	208,449	99.5%	1,146	0.5%	-	0.0%	-	0.0%	1,146	0.5%	209,595
1971	188,533	99.4%	0	0.0%	0	0.0%	188,533	99.4%	1,061	0.6%	-	0.0%	-	0.0%	1,061	0.6%	189,594
1972	136,711	89.8%	12,898	8.5%	1,313	0.9%	150,922	99.2%	1,254	0.8%	-	0.0%	-	0.0%	1,254	0.8%	152,176
1973	173,783	74.9%	45,304	19.5%	0	0.0%	219,087	94.4%	13,003	5.6%	-	0.0%	-	0.0%	13,003	5.6%	232,090
1974	176,036	60.7%	53,540	18.5%	552	0.2%	230,128	79.4%	9,213	3.2%	23,551	8.1%	26,884	9.3%	59,648	20.6%	289,776
1975	158,183	57.5%	51,666	18.8%	5,590	2.0%	215,439	78.3%	13,666	5.0%	27,212	9.9%	18,692	6.8%	59,570	21.7%	275,009
1976	105,851	67.7%	21,212	13.6%	4,250	2.7%	131,313	84.0%	1,742	1.1%	5,387	3.4%	17,948	11.5%	25,077	16.0%	156,390
1977	131,758	51.1%	51,994	20.2%	15,851	6.1%	199,603	77.4%	13,980	5.4%	25,730	10.0%	18,673	7.2%	58,383	22.6%	257,986
1978	127,947	51.8%	51,646	20.9%	11,527	4.7%	191,120	77.4%	12,709	5.1%	26,236	10.6%	16,946	6.9%	55,891	22.6%	247,011
1979	109,406	28.9%	94,042	24.9%	25,955	6.9%	229,403	60.6%	52,098	13.8%	55,556	14.7%	41,355	10.9%	149,009	39.4%	378,412
1980	106,829	35.7%	83,881	28.1%	13,718	4.6%	204,428	68.4%	32,730	10.9%	42,245	14.1%	19,519	6.5%	94,494	31.6%	298,922
1981	167,834	34.5%	154,883	31.9%	19,043	3.9%	341,760	70.3%	19,851	4.1%	94,793	19.5%	29,608	6.1%	144,252	29.7%	486,012
1982	97,484	43.3%	96,581	42.9%	5,815	2.6%	199,880	88.7%	4,061	1.8%	13,979	6.2%	7,370	3.3%	25,410	11.3%	225,290
1983	124,371	40.6%	85,645	28.0%	10,018	3.3%	220,034	71.9%	6,114	2.0%	43,993	14.4%	35,994	11.8%	86,101	28.1%	306,135
1984	78,751	37.9%	70,803	34.1%	6,429	3.1%	155,983	75.1%	9,841	4.7%	24,117	11.6%	17,785	8.6%	51,743	24.9%	207,726
1985	129,948	48.1%	40,490	15.0%	5,164	1.9%	175,602	65.0%	26,977	10.0%	25,338	9.4%	42,352	15.7%	94,667	35.0%	270,269
1986	59,352	42.4%	51,307	36.6%	2,793	2.0%	113,452	81.0%	2,045	1.5%	22,448	16.0%	2,074	1.5%	26,567	19.0%	140,019
1987	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
1988	45,317	33.1%	31,861	23.3%	2,090	1.5%	79,268	57.9%	17,083	12.5%	16,989	12.4%	23,650	17.3%	57,722	42.1%	136,990

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Table 6.–Page 2 of 2.

	Lower Yukon								Upper Yukon								
	District 1		District 2		District 3		Lower Yukon Subtotal		District 4		District 5		District 6		Upper Yukon Subtotal		Total Commercial
Year [a]	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Harvest
1989	77,876	27.4%	97,096	34.2%	15,332	5.4%	190,304	67.0%	15,183	5.3%	22,204	7.8%	56,443	19.9%	93,830	33.0%	284,134
1990	27,337	20.1%	37,173	27.3%	3,715	2.7%	68,225	50.1%	8,166	6.0%	8,976	6.6%	50,717	37.3%	67,859	49.9%	136,084
1991	59,724	23.5%	102,628	40.4%	9,213	3.6%	171,565	67.5%	6,091	2.4%	32,114	12.6%	44,448	17.5%	82,653	32.5%	254,218
1992	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	19,022	100.0%	19,022	100.0%	19,022
1993	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
1994	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3,630	45.4%	4,369	54.6%	7,999	100.0%	7,999
1995	79,345	28.0%	90,831	32.1%	0	0.0%	170,176	60.1%	8,731	3.1%	30,033	10.6%	74,117	26.2%	112,881	39.9%	283,057
1996	33,629	31.8%	29,651	28.1%	0	0.0%	63,280	59.9%	2,918	2.8%	21,858	20.7%	17,574	16.6%	42,350	40.1%	105,630
1997	27,483	47.2%	24,326	41.8%	0	0.0%	51,809	89.0%	2,458	4.2%	3,920	6.7%	0	0.0%	6,378	11.0%	58,187
1998	0	0.0% -	0	0.0% -	0	0.0% -	0	0.0%	0	0.0% -	0	0.0%	0	0.0%	0	0.0%	0
1999	9,987	49.0%	9,703	47.6%	0	0.0%	19,690	96.7%	681	3.3%	0	0.0%	0	0.0%	681	3.3%	20,371
2000	0	0.0% -	0	0.0% -	0	0.0% -	0	0.0%	0	0.0% -	0	0.0%	0	0.0%	0	0.0%	0
2001	0	0.0% -	0	0.0% -	0	0.0% -	0	0.0%	0	0.0% -	0	0.0%	0	0.0%	0	0.0%	0
2002	0	0.0% -	0	0.0% -	0	0.0% -	0	0.0%	0	0.0% -	0	0.0%	0	0.0%	0	0.0%	0
2003	5,586	50.8%	0	0.0%	0	0.0%	5,586	50.8%	1,315	12.0%	0	0.0%	4,095	37.2%	5,410	49.2%	10,996
2004	660	16.1%	0	0.0%	0	0.0%	660	16.1%	0	0.0%	0	0.0%	3,450	83.9%	3,450	83.9%	4,110
2005	130,525	72.4%	0	0.0%	0	0.0%	130,525	72.4%	0	0.0%	0	0.0%	49,637	27.6%	49,637	27.6%	180,162
2006	101,254	58.0%	39,905	22.9%	0	0.0%	141,159	80.9%	0	0.0%	10,030	5.7%	23,353	13.4%	33,383	19.1%	174,542
2007	38,852	42.8%	35,826	39.5%	0	0.0%	74,678	82.4%	0	0.0%	427	0.5%	15,572	17.2%	15,999	17.6%	90,677
2008	67,704	56.8%	41,270	34.6%	0	0.0%	108,974	91.4%	0	0.0%	4,556	3.8%	5,735	4.8%	10,291	8.6%	119,265
2009 *c*	11,911	47.1%	12,072	47.8%	0	0.0%	23,983	94.9%	0	0.0%	0	0.0%	1,286	5.1%	1,286	5.1%	25,269
5 Yr Avg 2004-2008	67,799	49.2%	23,400	19.4%	0	0.0%	91,199	68.6%	0	0.0%	3,003	2.0%	19,549	29.4%	22,552	31.4%	113,751
10 Yr Avg 1999-2008	35,457	34.6%	12,670	14.5%	0	0.0%	48,127	49.1%	200	1.5%	1,501	1.0%	10,184	18.4%	11,885	20.9%	60,012
15 Yr Avg 1994-2008	33,002	30.2%	18,101	16.4%	0	0.0%	51,102	46.6%	1,074	1.7%	4,964	6.2%	13,193	18.8%	19,231	26.7%	70,333
20 Yr Avg 1989-2008	32,998	26.2%	25,420	17.4%	1,413	0.6%	59,832	44.2%	2,277	2.0%	6,887	6.0%	18,427	22.8%	27,591	30.8%	87,423

[a] Numbers of fish harvested are based on reports from State TIX and Zephyr programs.

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

[c] Preliminary data.

Table 7.–Commercial harvest of coho salmon by district, Yukon River, 1961–2009.

	Lower Yukon								Upper Yukon								
	District 1		District 2		District 3		Lower Yukon Subtotal		District 4		District 5		District 6		Upper Yukon Subtotal		Alaska
Year [a]	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Total Harvest
1961	2,855	100.0%	0	0.0%	0	0.0%	2,855	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	2,855
1962	22,926	100.0%	0	0.0%	0	0.0%	22,926	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	22,926
1963	5,572	100.0%	0	0.0%	0	0.0%	5,572	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	5,572
1964	2,446	100.0%	0	0.0%	0	0.0%	2,446	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	2,446
1965	350	100.0%	0	0.0%	0	0.0%	350	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	350
1966	19,254	100.0%	0	0.0%	0	0.0%	19,254	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	19,254
1967	9,925	89.8%	0	0.0%	1,122	10.2%	11,047	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	11,047
1968	13,153	98.9%	0	0.0%	150	1.1%	13,303	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	13,303
1969	13,989	92.7%	0	0.0%	1,009	6.7%	14,998	99.4%	95	0.6%	-	0.0%	-	0.0%	95	0.6%	15,093
1970	12,632	95.8%	0	0.0%	0	0.0%	12,632	95.8%	556	4.2%	-	0.0%	-	0.0%	556	4.2%	13,188
1971	12,165	99.7%	0	0.0%	0	0.0%	12,165	99.7%	38	0.3%	-	0.0%	-	0.0%	38	0.3%	12,203
1972	21,705	97.6%	506	2.3%	0	0.0%	22,211	99.9%	22	0.1%	-	0.0%	-	0.0%	22	0.1%	22,233
1973	34,860	95.1%	1,781	4.9%	0	0.0%	36,641	100.0%	0	0.0%	-	0.0%	-	0.0%	-	0.0%	36,641
1974	13,713	81.7%	176	1.0%	0	0.0%	13,889	82.8%	0	0.0%	1,409	8.4%	1,479	8.8%	2,888	17.2%	16,777
1975	2,288	89.9%	200	7.9%	0	0.0%	2,488	97.7%	0	0.0%	5	0.2%	53	2.1%	58	2.3%	2,546
1976	4,064	78.4%	17	0.3%	0	0.0%	4,081	78.7%	0	0.0%	0	0.0%	1,103	21.3%	1,103	21.3%	5,184
1977	31,720	81.6%	5,319	13.7%	538	1.4%	37,577	96.7%	0	0.0%	2	0.0%	1,284	3.3%	1,286	3.3%	38,863
1978	16,460	62.9%	5,835	22.3%	758	2.9%	23,053	88.2%	32	0.1%	1	0.0%	3,066	11.7%	3,099	11.8%	26,152
1979	11,369	66.2%	2,850	16.6%	0	0.0%	14,219	82.8%	155	0.9%	0	0.0%	2,791	16.3%	2,946	17.2%	17,165
1980	4,829	55.2%	2,660	30.4%	0	0.0%	7,489	85.6%	30	0.3%	0	0.0%	1,226	14.0%	1,256	14.4%	8,745
1981	13,129	55.4%	7,848	33.1%	419	1.8%	21,396	90.4%	0	0.0%	0	0.0%	2,284	9.6%	2,284	9.6%	23,680
1982	15,115	40.7%	14,179	38.1%	87	0.2%	29,381	79.0%	15	0.0%	0	0.0%	7,780	20.9%	7,795	21.0%	37,176
1983	4,595	34.5%	2,557	19.2%	0	0.0%	7,152	53.7%	0	0.0%	0	0.0%	6,168	46.3%	6,168	46.3%	13,320
1984	29,472	36.3%	43,064	53.0%	621	0.8%	73,157	90.0%	1,095	1.3%	0	0.0%	7,006	8.6%	8,101	10.0%	81,258
1985	27,676	48.0%	17,125	29.7%	171	0.3%	44,972	78.0%	938	1.6%	0	0.0%	11,760	20.4%	12,698	22.0%	57,670
1986	24,824	52.5%	21,197	44.9%	793	1.7%	46,814	99.1%	0	0.0%	0	0.0%	441	0.9%	441	0.9%	47,255

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	Lower Yukon								Upper Yukon								
	District 1		District 2		District 3		Lower Yukon Subtotal		District 4		District 5		District 6		Upper Yukon Subtotal		Alaska
Year [a]	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Harvest [b]	Harvest (%)	Total Harvest
1987	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
1988	36,028	41.8%	34,758	40.3%	1,419	1.6%	72,205	83.8%	2	0.0%	8	0.0%	13,972	16.2%	13,982	16.2%	86,187
1989	24,670	29.6%	38,397	46.1%	3,988	4.8%	67,055	80.6%	3	0.0%	84	0.1%	16,079	19.3%	16,166	19.4%	83,221
1990	13,354	29.4%	16,405	36.1%	918	2.0%	30,677	67.5%	0	0.0%	0	0.0%	14,804	32.5%	14,804	32.5%	45,481
1991	54,095	50.7%	40,898	38.3%	1,905	1.8%	96,898	90.8%	14	0.0%	0	0.0%	9,774	9.2%	9,788	9.2%	106,686
1992	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	7,979	100.0%	7,979	100.0%	7,979
1993	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
1994	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	4,451	100.0%	4,451	100.0%	4,451
1995	21,625	46.0%	18,488	39.3%	0	0.0%	40,113	85.3%	0	0.0%	0	0.0%	6,900	14.7%	6,900	14.7%	47,013
1996	27,705	49.5%	20,974	37.5%	0	0.0%	48,679	87.0%	161	0.3%	0	0.0%	7,142	12.8%	7,303	13.0%	55,982
1997	21,450	60.7%	13,056	37.0%	0	0.0%	34,506	97.7%	814	2.3%	0	0.0%	0	0.0%	814	2.3%	35,320
1998	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
1999	855	53.4%	746	46.6%	0	0.0%	1,601	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1,601
2000	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
2001	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
2002	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
2003	9,757	38.7%	0	0.0%	0	0.0%	9,757	38.7%	367	1.5%	0	0.0%	15,119	59.9%	15,486	61.3%	25,243
2004	1,583	7.8%	0	0.0%	0	0.0%	1,583	7.8%	0	0.0%	0	0.0%	18,649	92.2%	18,649	92.2%	20,232
2005	36,533	62.7%	0	0.0%	0	0.0%	36,533	62.7%	0	0.0%	0	0.0%	21,778	37.3%	21,778	37.3%	58,311
2006	39,323	60.6%	14,482	22.3%	0	0.0%	53,805	82.9%	0	0.0%	0	0.0%	11,137	17.1%	11,137	17.1%	64,942
2007	21,720	48.7%	21,487	48.2%	0	0.0%	43,207	96.9%	0	0.0%	0	0.0%	1,368	3.1%	1,368	3.1%	44,575
2008	13,946	39.1%	19,246	53.9%	0	0.0%	33,192	93.0%	0	0.0%	91	0.3%	2,408	6.7%	2,499	7.0%	35,691
2009 [c]	5,992	74.7%	1,577	19.6%	0	0.0%	7,569	94.3%	0	0.0%	0	0.0%	457	5.7%	457	5.7%	8,026
5 Yr Avg 2004-2008	22,621	43.8%	11,043	24.9%	0	0.0%	33,664	68.7%	0	0.0%	18	0.1%	11,068	31.3%	11,086	31.3%	44,750
10 Yr Avg 1999-2008	12,372	31.1%	5,596	17.1%	0	0.0%	17,968	48.2%	37	0.2%	9	0.0%	7,046	21.6%	7,092	21.8%	25,060
15 Yr Avg 1994-2008	12,966	31.1%	7,232	19.0%	0	0.0%	20,198	50.1%	89	0.3%	6	0.0%	5,930	22.9%	6,026	23.2%	26,224
20 Yr Avg 1989-2008	14,331	28.8%	10,209	20.3%	341	0.4%	24,880	49.5%	68	0.2%	9	0.0%	6,879	25.2%	6,956	25.5%	31,836

[a] Numbers of fish harvested are based on reports from State TIX and Zephyr programs.

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

[c] Preliminary data.

Table 8.–Coho escapement estimates for selected spawning areas, Yukon River drainage, 1972–2009.

				Kantishna River Drainage		Nenana River Drainage								
Year[a]	East Fork Andreafsky River[b]	River Mainstem Sonar Estimate[c]	Anvik River	Geiger Creek[d]	Barton Creek	Lost Slough	Nenana Mainstem[e]	Wood Creek	Seventeen Slough	Lignite Springs[d]	Delta Clearwater River[f]	Delta Clearwater River Tributaries[g]	Clearwater Lake and Outlet	Richardson Clearwater River[h]
1972											632		417	454[i]
1973											3,322		551	375
1974						1,388			27		3,954[i]		560	652
1975						943			956		5,100		1,575[j]	4[i]
1976			467[h]	25[h i]		118			281		1,920		1,500[j]	80[i]
1977			81[h]	60		524[h]		310[d]	1,167		4,793		730[j]	327
1978						350		300[d]	466		4,798		570[j]	
1979						227			1,987		8,970		1,015[j]	372
1980				3[h i]		499[h]		1,603[d]	592		3,946		1,545[j]	611
1981	1,657[h]					274		849[k l]	1,005		8,563[m]		459[h]	550
1982				81				1,436[k l]			8,365[m]			
1983				42		766		1,042[k]	103		8,019[m]		253	88
1984				20[h i]		2,677		8,826[k]			11,061		1,368	428
1985				42[h i]		1,584		4,470[k]	2,081		6,842		750	
1986				5	496	794		1,664[k]	218[j]		10,857		1,800	146[h]
1987				1,175		2,511		2,387[k]	3,802		22,300		4,225[j]	
1988	1,913[n]		1,203	159	437	348		2,046[k]			21,600		825[j]	
1989				155	12[h]			412[k]	824[h]		12,600		1,600[j]	483
1990				211		688	1,308		15[h]		8,325		2,375[j]	
1991				427	467[h]	564	447		52		23,900		3,150[j]	
1992				77	55[h]	372			490		3,963		229[j]	500
1993				138	141	484	419	666[k o]	581		10,875		3,525[j]	
1994				410	2,000[k p]	944	1,648	1,317[k q]	2,909	244	62,675	17,565	3,425[j]	5,800
1995	10,901	101,806		142	192[k r]	4,169	2,218	500[k]	2,972[j]		20,100	6,283	3,625[j]	
1996	8,037			233	0[k]	2,040	2,171	201[i s]	3,668[m]	282	14,075	3,300	1,125[h]	
1997	9,472	104,343		274		1,524[t]	1,446	[i s]	1,996	50[n aa]	11,525	2,375	2,775[j]	
1998	7,193	136,906		157		1,360[i]	2,771[i]	370[v w]	1,413[z]	175[n]	11,100	2,775	2,775[j]	
1999	2,963	62,521		29		1,002[i]	745[i]	[w]	662[k]		10,975	2,805		
2000	8,451	175,421		142		55[h i]	66[h i]	[w]	879[j k]	95	9,225	2,358	1,025[j]	2,175

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Table 8.–Page 2 of 3.

Year[a]	East Fork Andreafsky River[b]	River Mainstem Sonar Estimate[c]	Anvik River	Kantishna River Drainage: Geiger Creek[d]	Kantishna River Drainage: Barton Creek	Nenana River Drainage: Lost Slough	Nenana River Drainage: Nenana Mainstem[e]	Nenana River Drainage: Wood Creek	Nenana River Drainage: Seventeen Slough	Nenana River Drainage: Lignite Springs[d]	Delta Clearwater River[f]	Delta Clearwater River Tributaries[g]	Clearwater Lake and Outlet	Richardson Clearwater River[h]
2001	15,896	137,769	262 [h]	578		242	855	699	3,741	135	46,875	11,982	4,425 [j]	1,531
2002	3,577	122,566		744		0	328	935	1,910	130	38,625	9,873	5,900 [j]	874
2003	8,231	269,081		973		85	658	3,055	4,535	67	105,850	27,057	8,800	6,232
2004	11,146	188,350		583		220	450	840	3,370	91	37,950	9,701	2,925	8,626
2005	5,303	184,281		625		430	325 [i]	1,030	3,890	378	34,293	8,766	2,100	2,024
2006		131,919				194	160 [i]	634	1,916	168	16,748	4,281	4,375	271
2007		173,289				63	520	605	1,733	334	14,650	3,961	2,075	553
2008		135,570		183		1,342	1,539	578	1,652	343	7,500	1,917	1,275	265
2009 [x]		206,621		137		410		470	680	113	16,850	4,307	5,450	155
All Years Average	7,288	152,175	503	270	422	859	1,004	1,433	1,593	143	17,203	7,457	2,253	1,343
Five Year Average 2004-2008	8,225	162,682	-	464	-	450	599	737	2,512	263	22,228	5,725	2,550	2,348
Interim Escapement Objective											5,200 to 17,000 [y]			

[a] Only peak counts presented. Survey rating is fair to good, unless otherwise noted.

[b] Weir count, unless otherwise indicated.

[c] Passage estimates for coho salmon are incomplete. The sonar project is terminated prior to the end of the coho salmon run.

[d] Foot survey, unless otherwise indicated.

[e] Mainstem Nenana River between confluence's of Lost Slough and Teklanika River.

[f] Boat survey counts in the lower 17.5 river miles, unless otherwise indicated.

[g] Helicopter surveys counted tributaries of Delta Clearwater River, outside of the normal mainstem index area, from 1994 to 1999 after which an expansion factor was used to estimate escapement to areas.

[h] Aerial survey, fixed winged or helicopter.

[i] Poor survey.

[j] Boat survey.

[k] Weir count.

[l] Coho weir was operated at the mouth of Clear Creek (Shores Landing).

[m] Expanded estimate based on partial survey counts and historic distribution of spawners from 1977 to 1980.

[n] West Fork Andreafsky was also surveyed and 830 chum salmon were observed.

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[o] Weir project terminated on October 4, 1993. Weir normally operated until mid to late October.

[p] A total of 298 coho salmon were passed between September 11 and October 4, 1994. However, it was estimated that 1,500 to 2,000 coho salmon passed the weir site within a 24-hour period beginning at approximately noon on October 4.

Weir operated from August 18 through morning of October 5, 1994.

[q] Weir project terminated September 27, 1994. Weir normally operated until mid-October.

[r] An additional 1,000 coho salmon were estimated pooled downstream of weir on October 2, 1995, just prior to weir removal.

[s] Beginning at confluence of Clear Creek, the survey includes counts of both Glacier and Wood Creeks to their headwaters.

[t] Survey of western floodplain only.

[u] Estimated count by Perry Corsetti, Healy school teacher, operating a school project weir, after coho salmon were illegally (shot) taken from spawning grounds prior to October 9, 1997.

[v] Combination foot and boat survey.

[w] No survey of Wood Creek due to obstructions in creek.

[x] Preliminary.

[y] Interim escapement objective 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. SEG established in 2004.

Table 9.–Value of commercial fall fishery to Yukon Area fishermen, 1977–2009.

	Fall Chum					Coho										
	Lower Yukon		Upper Yukon			Lower Yukon			Upper Yukon			Value by Species		Value by Area		
Year	$/lb	Value	$/lb	$/lb Roe	Value	$/lb	$/lb Roe	Value	$/lb	$/lb Roe	Value	Fall Chum	Coho	Lower	Upper	Total
1977	0.45	718,571	0.22		102,170	0.50		140,914	0.27		2,251	820,741	143,165	859,485	104,421	963,906
1978	0.47	691,854	0.25		103,091	0.60		96,823	0.24		6,105	794,945	102,928	788,677	109,196	897,873
1979	0.68	1,158,485	0.29		347,814	0.80		83,466	0.25		6,599	1,506,299	90,065	1,241,951	354,413	1,596,364
1980	0.28	394,162	0.27		198,088	0.36		17,374	0.29		2,374	592,250	19,748	411,536	200,462	611,998
1981	0.55	1,503,744	0.35		356,805	0.60		87,385	0.35		4,568	1,860,549	91,953	1,591,129	361,373	1,952,502
1982	0.55	846,492	0.28		53,258	0.69		135,828	0.37		18,786	899,750	154,614	982,320	72,044	1,054,364
1983	0.34	591,011	0.19		128,950	0.35		17,497	0.31		11,472	719,961	28,969	608,508	140,422	748,930
1984	0.32	374,359	0.26		103,417	0.50		256,050	0.24		12,823	477,776	268,873	630,409	116,240	746,649
1985	0.47	634,616	0.25		178,125	0.53		176,254	0.33		26,797	812,741	203,051	810,870	204,922	1,015,792
1986	0.49	399,321	0.14		30,309	0.71		211,942	0.21		556	429,630	212,498	611,263	30,865	642,128
1987	-	0	-		0	-		0	-		0	0	0	0	0	0
1988	1.01	638,700	0.32		151,300	1.38		734,400	0.37		34,116	790,000	768,516	1,373,100	185,416	1,558,516
1989	0.50	713,400	0.28		223,996	0.66		323,300	0.35		33,959	937,396	357,259	1,036,700	257,955	1,294,655
1990	0.45	238,165	0.29		174,965	0.66		137,302	0.34		37,026	413,130	174,328	375,467	211,991	587,458
1991	0.34	438,310	0.23	3.56	157,831	0.44		300,182	0.30	2.50	21,556	596,141	321,738	738,492	179,387	917,879
1992	-	0	0.39	4.50	54,161	-		0	0.39	2.18	19,529	54,161	19,529	0	73,690	73,690
1993	-	0	-		0	-		0	-		0	0	0	0	0	0
1994	-	0	0.16	1.50	8,517	-		0	0.48	1.50	8,739	8,517	8,739	0	17,256	17,256
1995	0.15	185,036	0.13	2.96	167,571	0.29		80,019	0.14	2.51	11,292	352,607	91,311	265,055	178,863	443,918
1996	0.10	48,579	0.13	1.71	45,438	0.26	2.96	96,795	0.09	2.16	13,020	94,017	109,815	145,374	58,458	203,832
1997	0.22	86,526	0.17	1.75	7,252	0.32		79,973	0.20		1,062	93,778	81,035	166,499	8,314	174,813
1998	-	0	-		0	-		0	-		0	0	0	0	0	0
1999	0.25	35,639	0.20		876	0.35		3,620	-		0	36,515	3,620	39,259	876	40,135
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

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Table 9.–Page 2 of 2.

	Fall Chum					Coho										
	Lower Yukon		Upper Yukon			Lower Yukon			Upper Yukon			Value by Species		Value by Area		
Year	$/lb	Value	$/lb	$/lb Roe	Value	$/lb	$/lb Roe	Value	$/lb	$/lb Roe	Value	Fall Chum	Coho	Lower	Upper	Total
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	110,408	0.19		1,262	1.00		52,303	0.15		467	111,670	52,770	162,711	1,729	164,440
10 Year Average (1999-2008)	0.28	113,532	0.16		12,608	0.39		50,330	0.12		4,687	126,140	55,017	163,862	17,295	181,157
2009 vs. 10 Year Avg	146.2%	-2.8%	20.9%		-90.0%	156.4%		3.9% #	28.0%		-90.0%	-11.5%	-4.1%	-0.7%	-90.0%	-9.2%

Table 10.–Number of commercial permit holders by district participating in the fall season salmon fishery, Yukon Area, 1971–2009.

Fall Chum and Coho Salmon Season [a]									
	Lower Yukon Area				Upper Yukon Area				Yukon Area
Year	District 1	District 2	District 3	Subtotal [b]	District 4	District 5	District 6	Subtotal	Total
1971	352	-	-	352	-	-	-	-	352
1972	353	75	3	431	-	-	-	-	431
1973	445	183	0	628	-	-	-	-	628
1974	322	121	6	449	17	23	22	62	511
1975	428	185	12	625	44	33	33	110	735
1976	422	194	28	644	18	36	44	98	742
1977	337	172	37	546	28	34	32	94	640
1978	429	204	28	661	24	43	30	97	758
1979	458	220	32	710	31	44	37	112	822
1980	395	232	23	650	33	43	26	102	752
1981	462	240	21	723	30	50	30	110	833
1982	445	218	15	678	15	24	25	64	742
1983	312	224	18	554	13	29	23	65	619
1984	327	216	12	536	18	39	26	83	619
1985	345	222	13	559	22	39	25	86	645
1986	282	231	14	510	1	21	16	38	548
1987	0	0	0	0	0	0	0	0	0
1988	328	233	13	563	20	20	32	72	635
1989	332	229	22	550	20	24	28	72	622
1990	301	227	19	529	11	11	27	49	578
1991	319	238	19	540	8	21	25	54	594
1992	0	0	0	0	0	0	22	22	22
1993	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	1	11	12	12
1995	189	172	0	357	4	12	20	36	393
1996	158	109	0	263	1	17	17	35	298
1997	176	130	0	304	3	8	0	11	315
1998	0	0	0	0	0	0	0	0	0
1999	146	110	0	254	4	0	0	4	258
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	75	0	0	75	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	218	71	0	289	0	4	11	15	304
2007	181	122	0	303	0	2	8	10	313
2008	251	180	0	431	0	3	10	13	444
2009	165	130	0	292	0	0	2	2	294
Average									
1971-2008	235	129	9	366	10	17	17	44	407
1999-2008	107	48	0	156	1	1	5	6	162
2004-2008	171	75	0	245	0	2	8	10	255

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

[b] Since 1984, the subtotal for Lower Yukon Area was the unique number of permits fished. Before 1984, the subtotals are additive for Districts 1, 2, and 3. Some individual fishermen in the Lower Yukon Area may have operated in more than one district during the year.

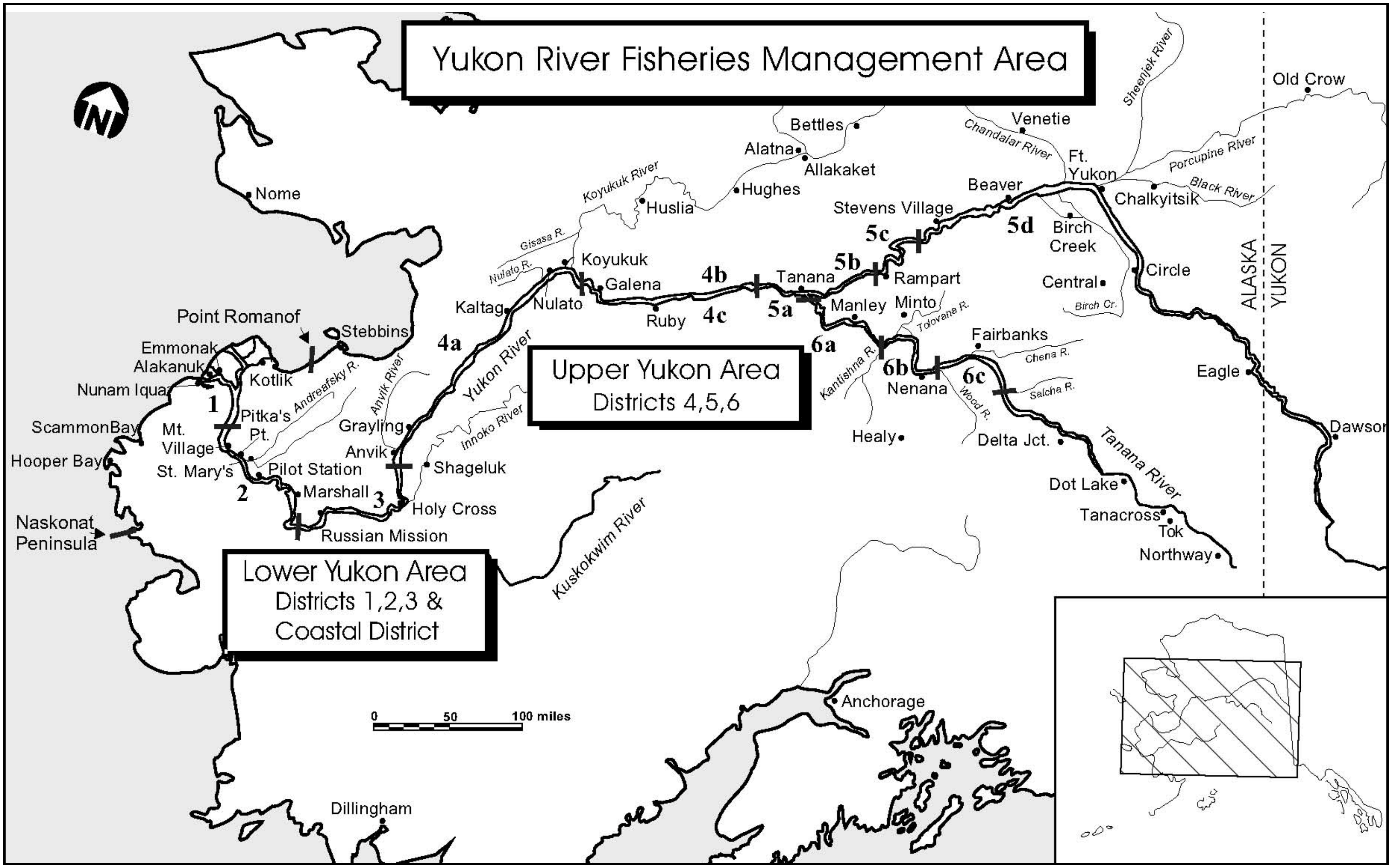
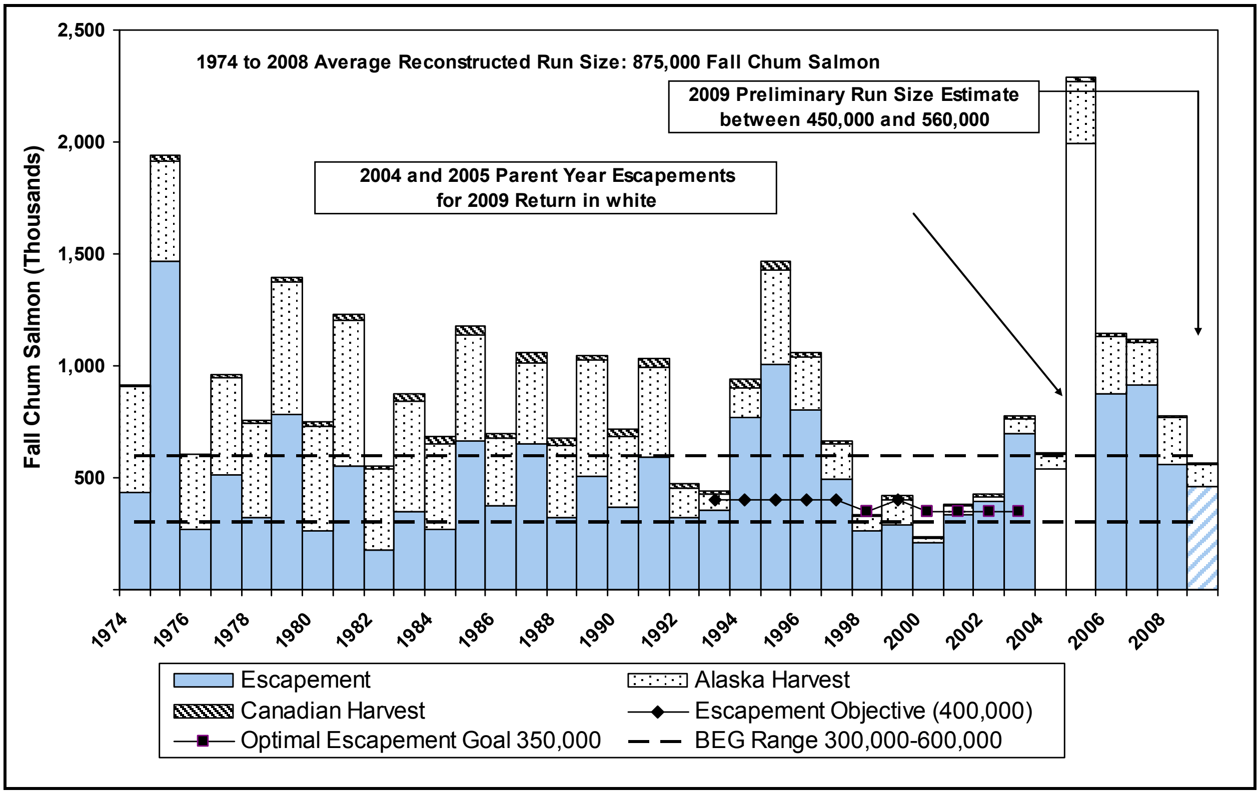
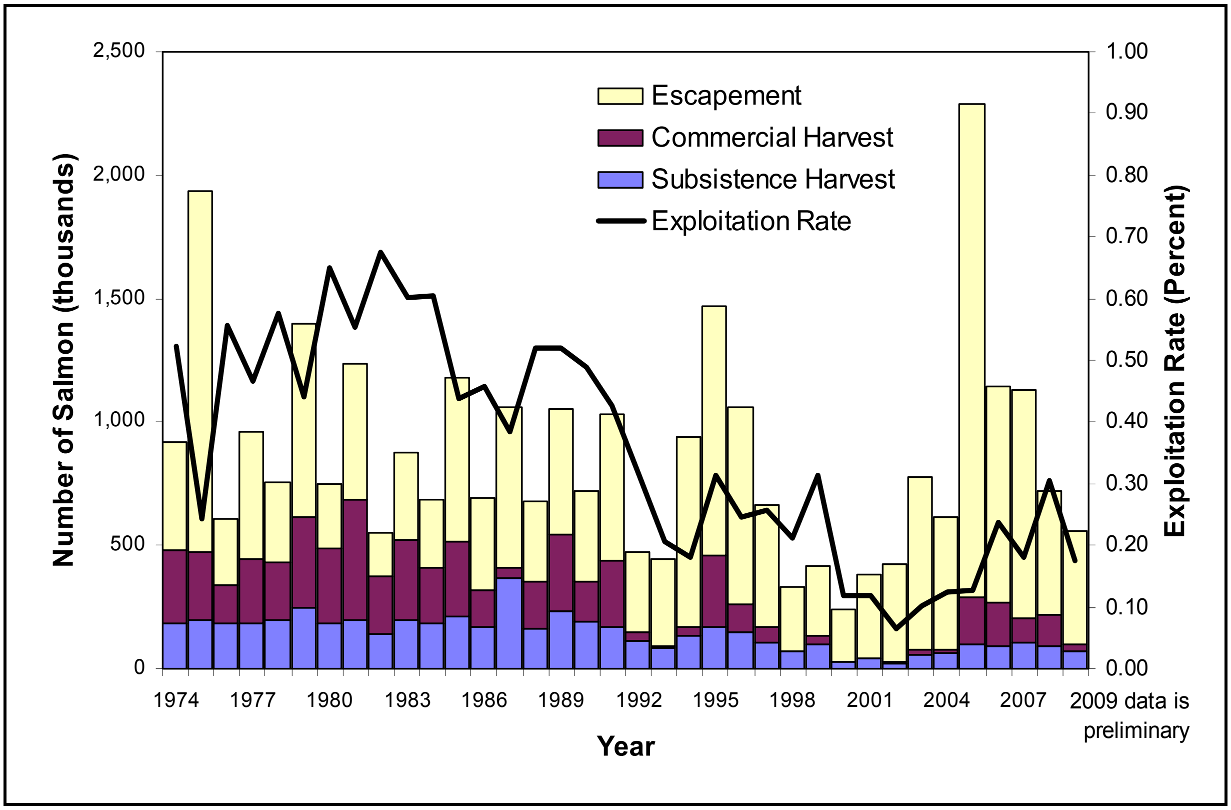


Figure 1.–Alaskan portion of the Yukon River drainage showing communities and fishing districts.



Note: The drainagewide escapement goal of 400,000 fall chum salmon was established in 1993. In 1996, an optimal escapement goal of 350,000 fall chum salmon was established in the *Yukon River Fall Chum Salmon Management Plan* and was utilized in 1998, 2000, and 2001. In 2004, a drainagewide escapement goal range of 300,000 to 600,000 fall chum salmon was established.

Figure 2.–Total run reconstruction based on estimated harvest and escapement of fall chum salmon, Yukon River drainage, 1974–2008 with the 2009 run size estimate.



Note: 2009 data is preliminary.

Figure 3.–Estimated fall chum salmon harvest and escapement with exploitation rate, Yukon Area, 1974–2009.

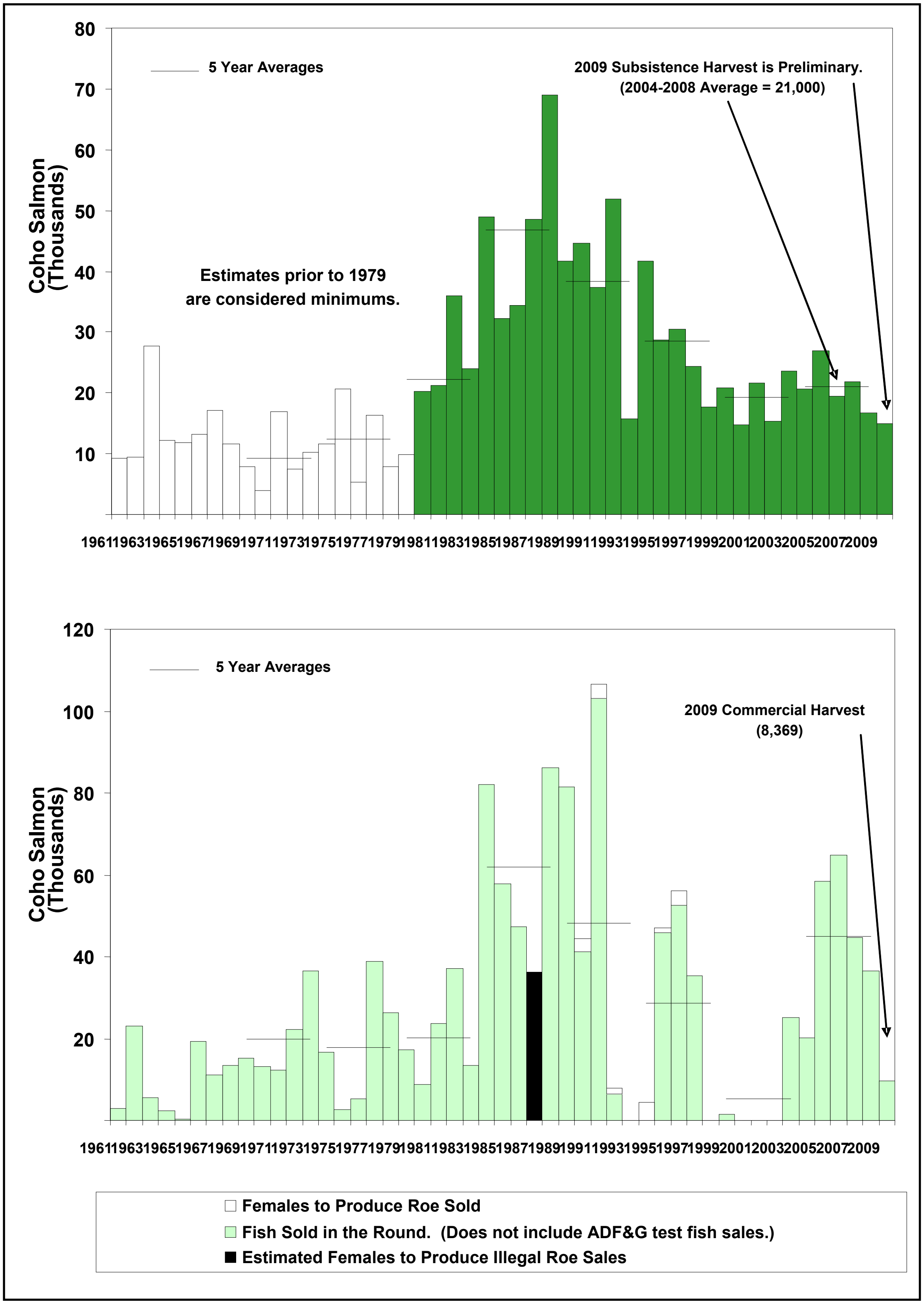


Figure 4.–Subsistence (top) and commercial (bottom) harvest of coho salmon, Yukon River drainage, Alaska, 1961–2009.

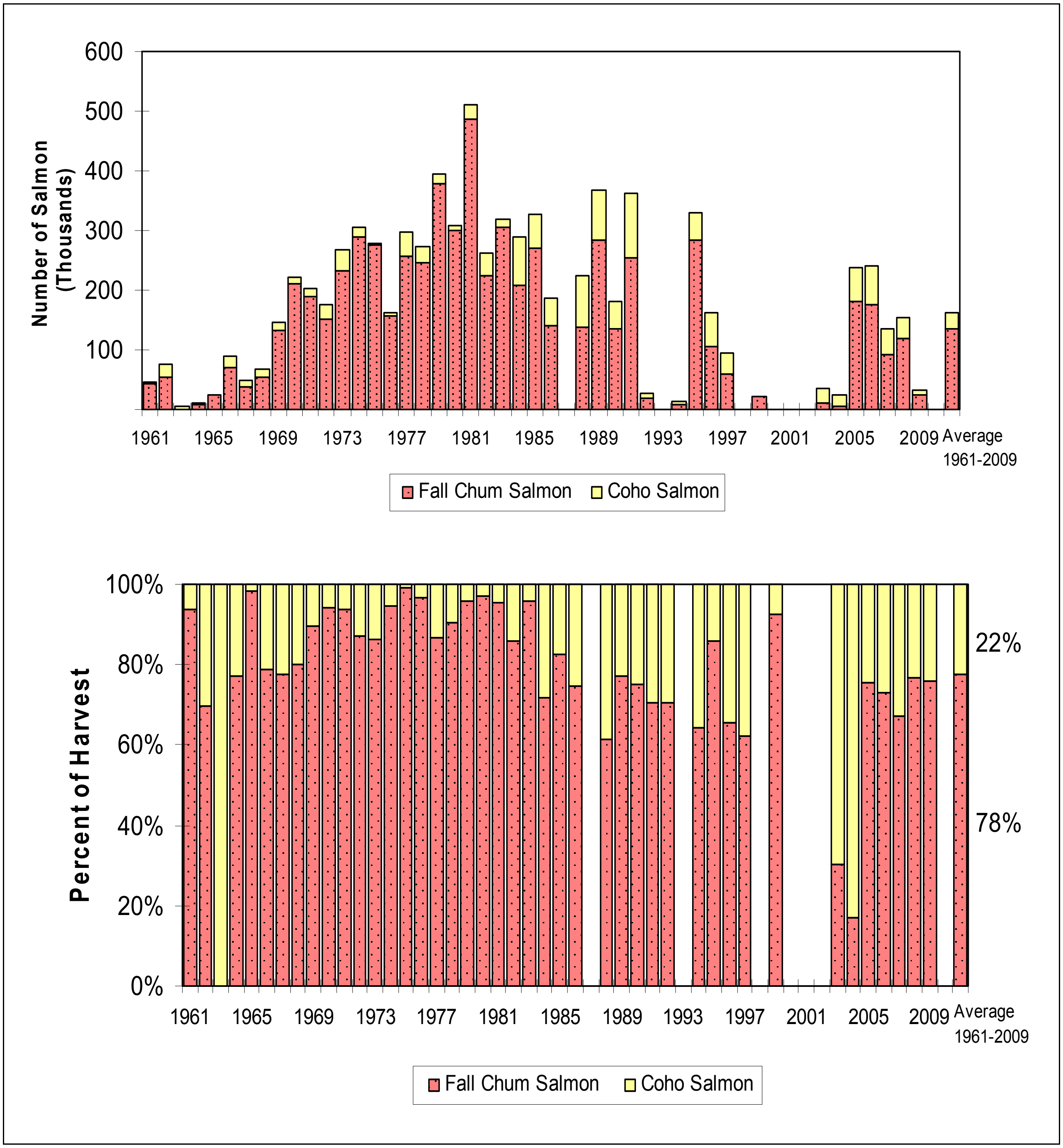


Figure 5.–Total commercial harvest of fall chum and coho salmon combined (top) and percent (bottom) of harvest by species in the Yukon River drainage, Alaska, 1961–2009.

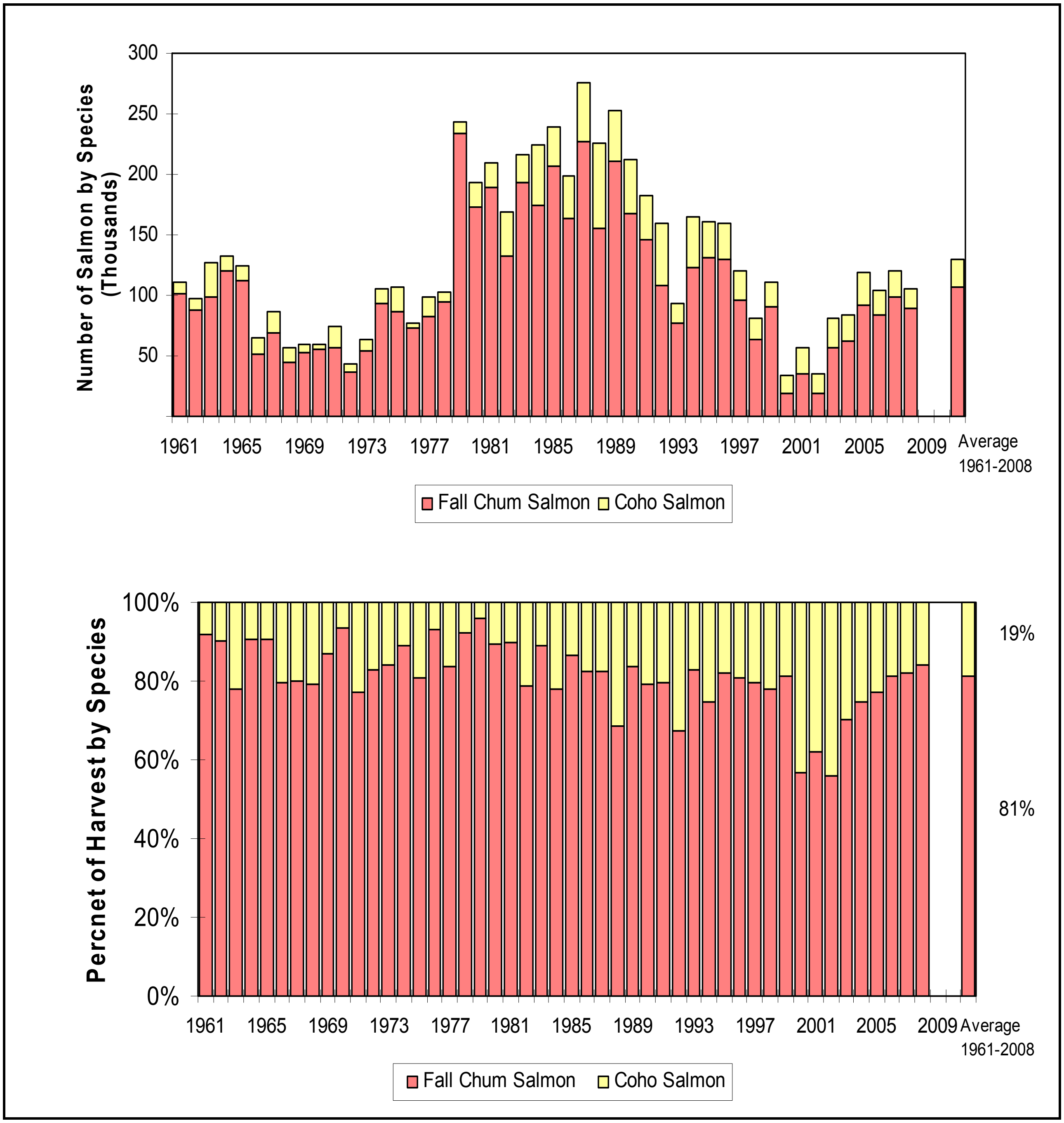
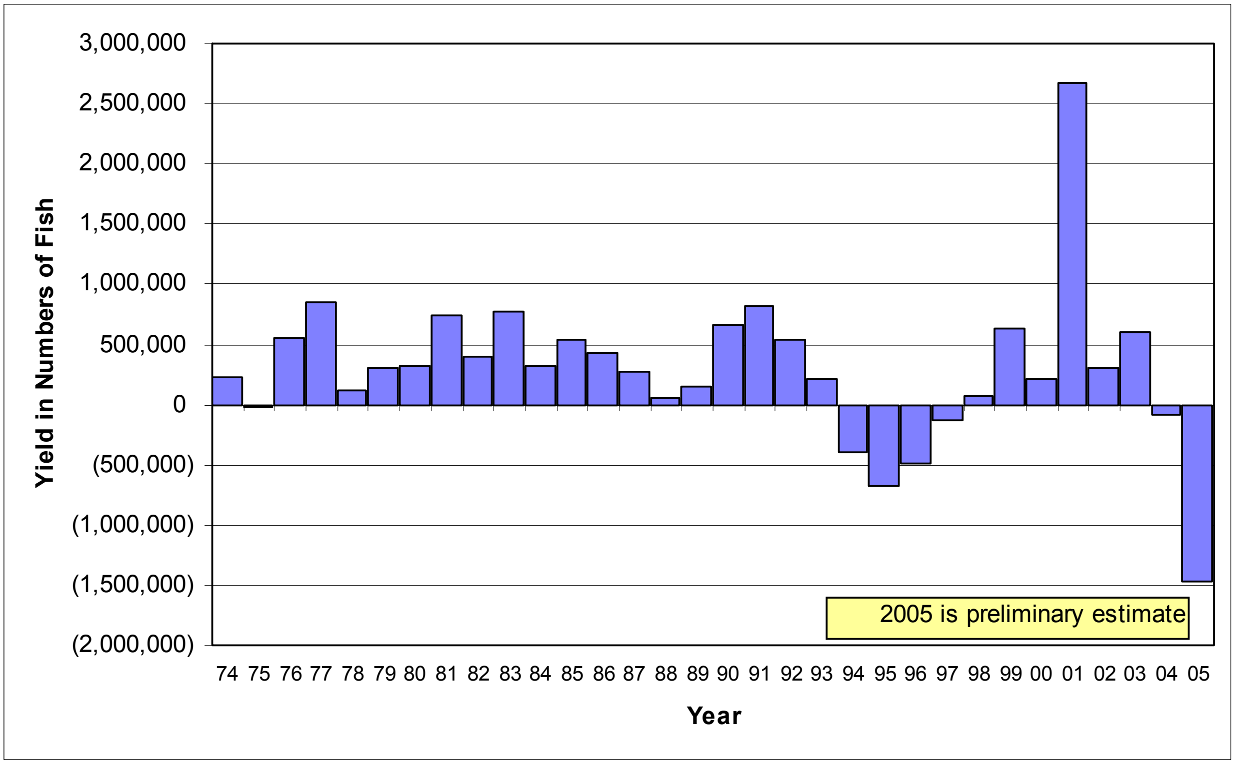


Figure 6.–Total subsistence and personal use harvest of fall chum and coho salmon combined (top) and percent (bottom) of harvest by species in the Yukon River drainage, Alaska, 1961–2008.



Note: Yield equals the number of offspring produced (brood year returns for ages 3–6), minus the parent year escapement number. As an example of yield, in 1995, an escapement of over one million fall chum salmon produced only 400,000 fish.

Figure 7.–Yields of fall chum salmon based on parent year escapements and resulting brood year returns, 1974-2005.

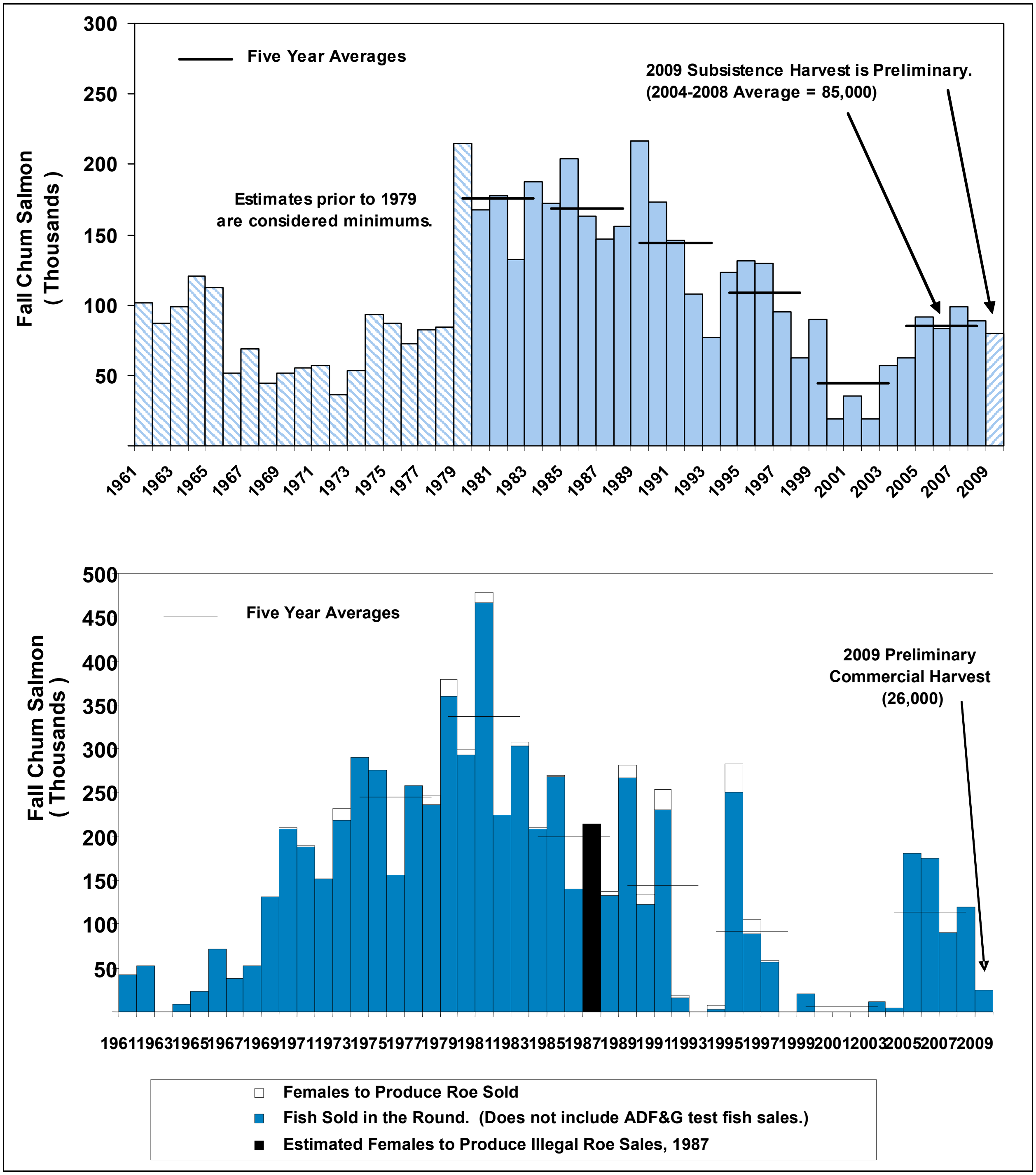


Figure 8.–Subsistence (top) and commercial (bottom) harvest of fall chum salmon, Yukon River drainage, Alaska, 1961–2009.

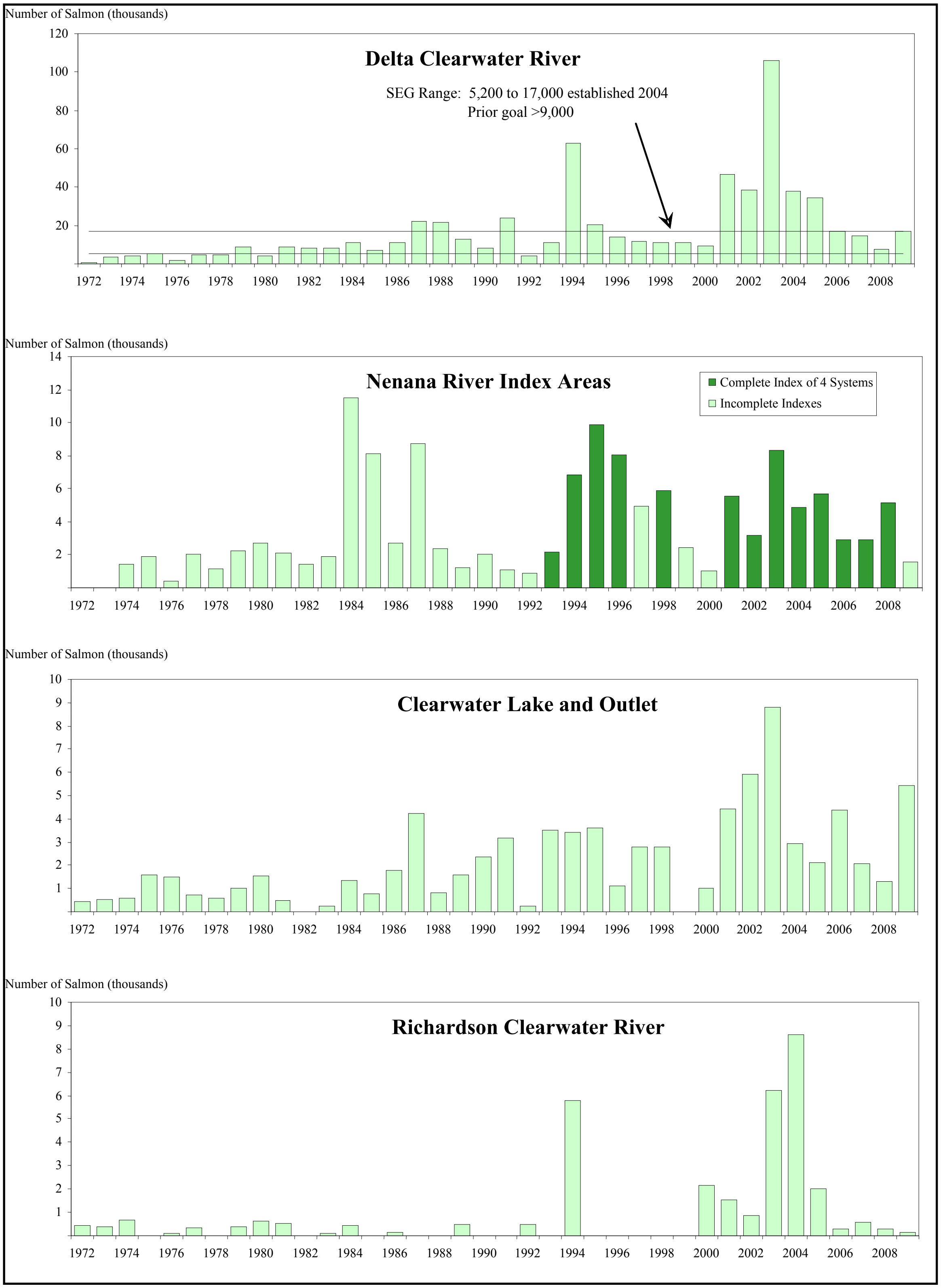


Figure 9.–Coho salmon escapement estimates for Delta Clearwater River, Nenana River Index Areas, Clearwater Lake and Outlet, and Richardson Clearwater River, 1972–2009.

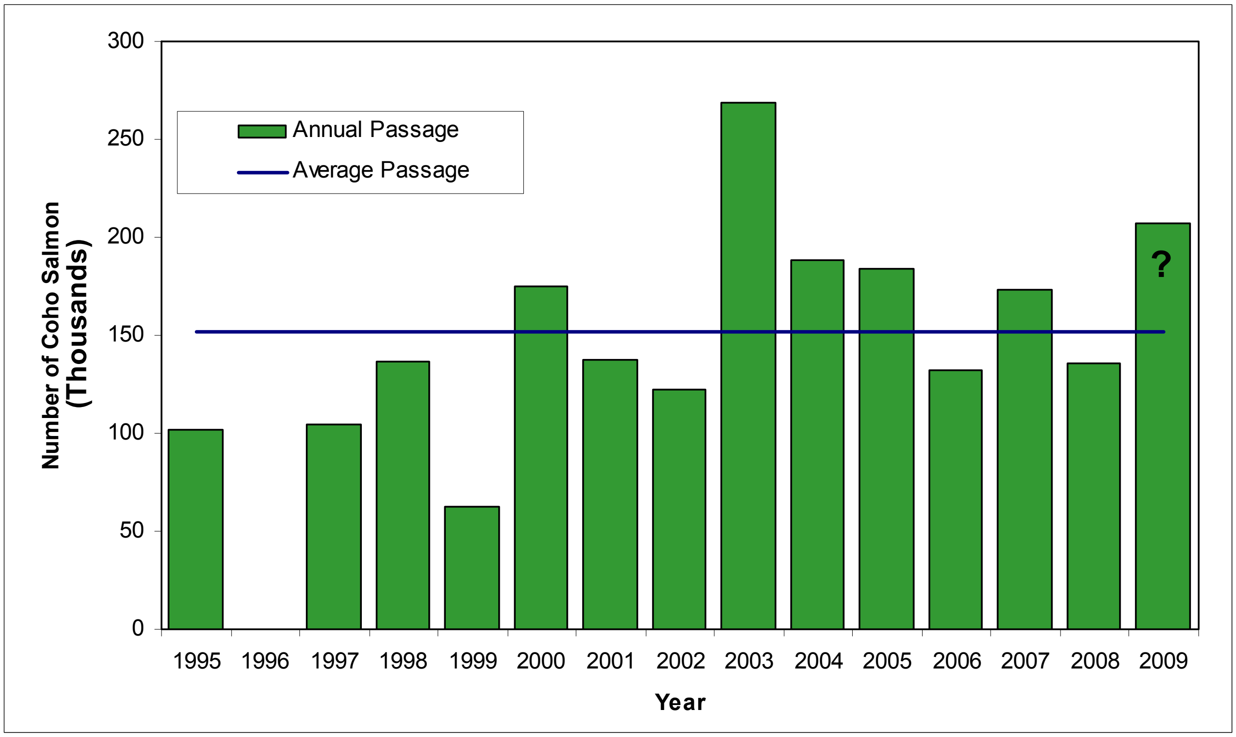


Figure 10.–Historical coho salmon assessment based on passage at Pilot Station sonar, Yukon Area, 1995–2008 and preliminary 2009.

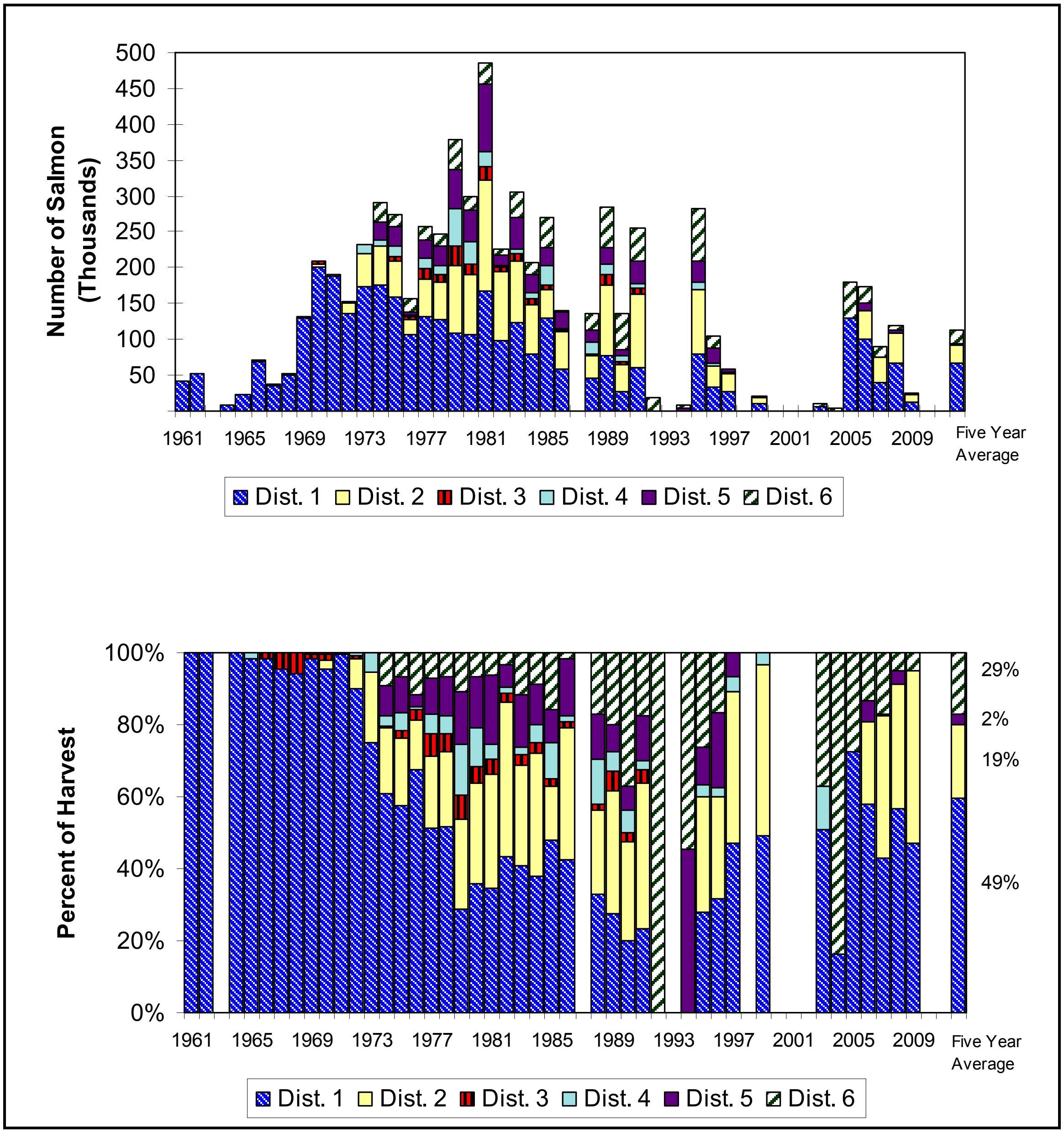


Figure 11.–Total commercial harvest of fall chum salmon (top) and percent (bottom) of harvest by district, Yukon River drainage, 1961–2009.

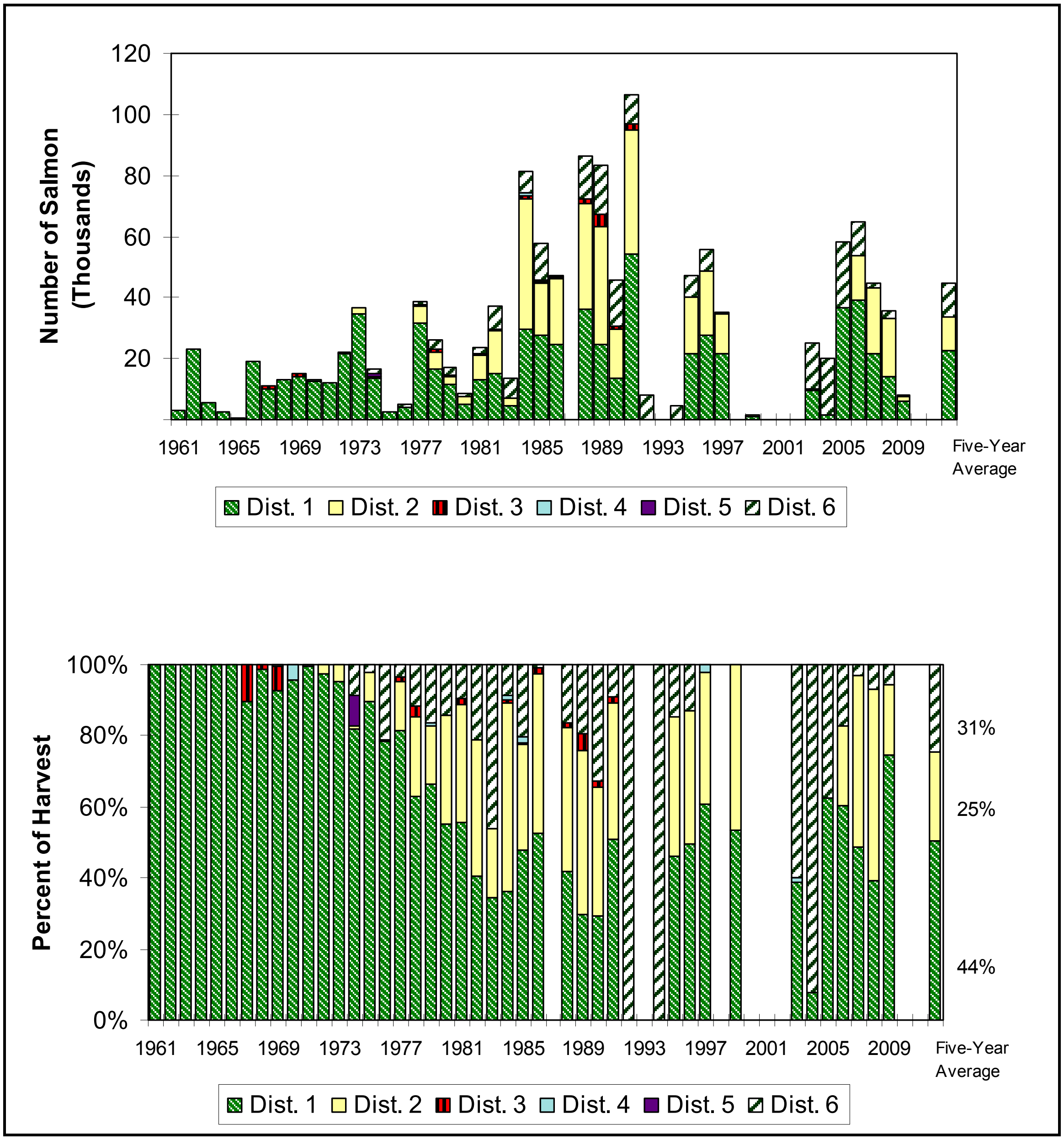


Figure 12.–Total commercial harvest of coho salmon (top) and percent (bottom) of harvest in the Yukon River drainage, 1961–2009.