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Summary of Pacific Salmon Escapement Goals in Alaska with a Review of Escapements from 2003 to 2011

by

Andrew R. Munro

and

Eric C. Volk

August 2012

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

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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)

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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By
Andrew R. Munro
and
Eric C. Volk
Alaska Department of Fish and Game, Division of Commercial Fisheries, Anchorage

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

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The Fishery Manuscript Series was established in 1987 by the Division of Sport Fish for the publication of technically-oriented results of several years' work undertaken on a project to address common objectives, provide an overview of work undertaken through multiple projects to address specific research or management goal(s), or new and/or highly technical methods, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Manuscripts are intended for fishery and other technical professionals. Fishery Manuscripts are available through the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/ This publication has undergone editorial and peer review.

Andrew R. Munro,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
333 Raspberry Road, Anchorage, Alaska 99518, USA

and

Eric C. Volk
Alaska Department of Fish and Game, Division of Commercial Fisheries,
333 Raspberry Road, Anchorage, Alaska 99518, USA

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ABSTRACT

This report summarizes statewide Pacific salmon escapement goals in effect in 2011 and documents escapements for all species and stocks with goals from 2003 through 2011. Annual escapements are compared against escapement goals in place at the time to assess outcomes, with summaries by the Division of Commercial Fisheries regions. We list methods used to enumerate escapements and to develop current escapement goals (with brief descriptions) for each monitored stock.

Key words: escapement, escapement goals, Chinook salmon, sockeye salmon, coho salmon, pink salmon, chum salmon, Alaska Board of Fisheries, statewide, Alaska

INTRODUCTION

Scientifically defensible Pacific salmon escapement goals are a central tenet of fisheries management in Alaska. Escapement goals are founded in the sustained yield principle highlighted in the Alaska Constitution (Article VIII, section 4) and in state statute (AS 16.05.020). Several policies in Alaska Administrative Code also provide guidance for establishing escapement goals including the policy for the management of sustainable salmon fisheries (5AAC 39.222), the policy for statewide salmon escapement goals (5 AAC 39.223) and the policy for the management of mixed stock fisheries (5 AAC 39.220). These policies provide detailed definitions of specific escapement goal types, outline the responsibilities of the Alaska Department of Fish and Game (department) and the Alaska Board of Fisheries (board) in establishing goals, and provide general direction for development and application of escapement goals in Alaska. Currently, there are 287 active salmon stock escapement goals throughout the state of Alaska (Figure 1).

It is the responsibility of the department to document, establish and review escapement goals, prepare scientific analyses in support of goals, notify the public when goals are established or modified, and notify the board of allocative implications associated with escapement goals. The foundation for this effort is regional or area escapement goal review teams assembled every three years to review goals, recommend changes, establish new goals or eliminate goals. The teams encompass broad expertise in biological characteristics of salmon stocks and technical approaches for establishing goals. Scientific staff from headquarters may assist regional teams and address issues of general importance for escapement goal development and application in Alaska. A detailed regional report of escapement goal recommendations is presented to the board and the public at tri-annual board meetings for that region or area. Following the board meeting, recommended goals are presented to the directors of the Divisions of Commercial Fisheries and Sport Fish for approval.

While development of regional escapement goals are exhaustively detailed in regional reports and supporting documents, this statewide summary report allows readers to examine the goals and escapements for salmon stocks in a single document. It provides an overview of salmon stocks for which goals exist, a numerical description of the goal, type of goal, year the current goal was first implemented and recent years' escapement data for each stock. In addition, summary statistics documenting performance in achieving goals is presented, including a statewide summary of stocks with yield or management concerns, as recommended by the department and established by the board. Data presented in this document is the most recently available at the time of publication and supersedes data in previous annual statewide escapement reports. This report will be a useful resource for department staff, stakeholders, and the public.

METHODS

We reviewed department escapement goal reports and supporting documents to catalog current escapement goals in each region for all five species of Pacific salmon, including information on stock name, type of goal, numerical description of the goal and the year it was implemented (i.e. the first season that the goal was used to manage escapements). Regional and area staff from the divisions of Commercial Fisheries and Sport Fish provided the most current escapement estimates from 2003 through 2011 for each stock with an established escapement goal. The escapement goals listed are those in effect during the 2011 spawning season including escapement goals that were established, or updated during the 2010/2011 board meeting cycle (Appendices A-C).

Escapements from 2003 through 2011 were compared against escapement goals in place at the time of enumeration to assess outcomes in achieving goals. Escapements for a particular stock were classed as "Under" if escapement for a given year was less than the lower bound of the escapement goal. If escapement fell within the escapement goal range or was greater than a lower-bound goal, we considered the goal "Met". Where escapement exceeded the upper bound of an escapement goal range, it was classed as "Over". Where escapement goals or enumeration methods changed between 2003 and 2011 for a stock, we assessed outcomes by comparing escapement estimates with the goal and methods in place at the time of the fishery. Information on previous escapement goals and methods came from a detailed review of regional escapement goal reports, supporting documents, and conversations with regional and area biologists.

METHODS OF ESCAPEMENT GOAL DEVELOPMENT

A variety of methods are used to develop escapement goals in Alaska and brief descriptions of each are summarized below. The most commonly used methods are listed first, followed by the less common methods.

Percentile Method: A method for establishing sustainable escapement goals (SEG) developed by Bue and Hasbrouck (Unpublished)[1]. Contrast of the observed annual escapements (largest escapement divided by smallest escapement) and exploitation rate of the stock are used to select percentiles of observed escapements for estimating lower and upper bounds of the escapement goal.

Spawner-Recruit Analysis (SRA): Analysis of the relationship between escapement (number of spawners) and subsequent production of recruits (i.e. adults) in the next generation. There are several SRA models, but the Ricker production model (Ricker 1954) is almost exclusively used for salmon populations in Alaska.

Risk Analysis: Risks of management error, unneeded management action or mistaken inaction, in future years are estimated based on a precautionary reference point established using past observations of escapement (Bernard et al. 2009). This method is primarily used to guide establishment of a lower-bound SEG for nontargeted stocks of salmon.

[1] Bue, B. G., and J. J. Hasbrouck. *Unpublished*. Escapement goal review of salmon stocks of Upper Cook Inlet. Alaska Department of Fish and Game, Report to the Alaska Board of Fisheries, November 2001 (and February 2002), Anchorage.

Yield Analysis: Graphical or tabular examination of yields produced from observed escapement indices from which the escapement range with the greatest yields is identified (Hilborn and Walters 1992).

Theoretical Spawner-Recruit Analysis (Theoretical SRA): Used in situations where there are few or no stock specific harvest estimates and/or age data. Information from nearby stocks, or generalizations about the species, are used in a spawner-recruit production model to estimate the number of spawners needed to achieve maximum sustained yield (e.g., Clark 2005).

Empirical Observation: Goal development methods classified as "Empirical Observation" generally are *ad hoc* methods for stocks with limited or sparse data. Goals are based on observed escapements over time and may be calculated as the average escapement or the value of a low escapement for which there is evidence that the stock is able to recover (e.g., Norton Sound pink salmon escapement goals, ADF&G 2004).

Zooplankton Model: This model estimates the number of sockeye salmon *Oncorhynchus nerka* smolts of a threshold or optimal size that a lake can support based upon measures of zooplankton biomass and surface area of the lake (Koenings and Kyle 1997). Adult production is then estimated from predicted smolt production by applying marine survival rates for a range of smolt sizes.

Spawning Habitat Model: Estimates of spawning capacity or number of spawners that produce maximum sustained yield are based on relationship with watershed area, available spawning habitat in a drainage, or stream length. Spawning habitat models have been developed for sockeye salmon (Burgner et al. 1969), coho salmon *O. kisutch* (Bradford et al. 1999; Bradford et al. 1997) and Chinook salmon *O. tshawytscha* (Parken et al. 2004).

Euphotic Volume (EV) Model: Measurement of the volume of a lake where enough light penetrates to support primary production (i.e. euphotic volume) is used to estimate sockeye salmon smolt biomass (Koenings and Burkett 1987) from which adult escapement is then estimated using marine survival rates.

Lake Surface Area: Similar to spawning habitat models, the relationship between the lake surface area and escapement are used to estimate adult sockeye salmon production (Honnold et al. 1996; Nelson et al. 2006).

Conditional Sustained Yield Analysis: Observed escapement indices and harvest are used to estimate if, on average, surplus production (yield) results from a particular goal range (Nelson et al. 2005). Estimated expected yields are conditioned on extreme values of measurement error in the escapement indices.

Brood Interaction Simulation Model: This model simulates production using a spawner–recruit relationship that modifies the simulated production for the year of return using an age-structured sub-model, and estimates resulting catches and escapements under user-specified harvest strategies (Carlson et al. 1999). This is a hybrid of a theoretical SRA and yield analysis that has only been used to develop the escapement goal for Kenai River sockeye salmon.

RESULTS AND DISCUSSION

Summaries of estimated escapements and escapement goals for each monitored salmon stock from 2003 to 2011 are presented by region and species in Tables 1–4. While most information was available through regional escapement goal reports, 2011 data were often obtained directly from area and regional biologists. Data for 2011 are often preliminary estimates because complete data regarding subsistence and sport harvests are often not available immediately following the season.

A summary of escapement goal types for all species by region indicate that the majority of goals in Central, Westward, and AYK regions are SEGs, including lower-bound SEGs, with biological escapement goals (BEG) making up a smaller proportion of goals (Figure 1a). The reverse is true for Southeast region, where most goals are BEGs. Escapement goals for sockeye, Chinook and chum salmon comprise 75% of all escapement goals statewide, with the majority of goals for each species being SEGs (Figure 1b). Optimal escapement goals (OEG) and inriver goals imposed by the board, management targets, and goals based upon international agreements collectively represent a small proportion of escapement goals in Alaska.

Use of different escapement goal types for each salmon species is summarized by Division of Commercial Fisheries regions (Figures 2–5). Among the four regions, there are some distinct differences in the distribution of goal types by salmon species. In Southeast Region, the majority of goals are BEGs, which include all pink salmon *O. gorbuscha* goals, all but one Chinook salmon goal, as well as over 60% of the coho salmon goals and over 40% of the sockeye salmon goals (Figure 2). This is sharply contrasted with Central Region, where the majority of all goals are SEGs, with three sockeye stocks representing the only BEGs (Figure 3). AYK Region has the only BEGs for chum salmon in the state, with additional BEGs for three Chinook and one sockeye salmon stock (Figure 4). All Chinook salmon stocks in Westward Region are BEGs, but compared to Southeast, a much smaller proportion of coho and sockeye salmon goals are BEGs (Figure 5). These are broad generalizations immediately apparent from our summary. There are many reasons why goal types would be different between regions including fishery structure, stock assessment capacity and technical approaches.

Summary comparisons of actual estimated escapements with escapement goals in place at the time are shown in Tables 5–8, highlighting whether the goal was exceeded, met, or not met. Numerous footnotes contain important information about changes in stock assessment methods or goal ranges during that time, and are essential for a thorough understanding of the escapement estimates and evaluations of outcomes against goals. Summaries of outcomes in achieving goals are presented by species (Tables 9–12) and region (Tables 13–16; Figures 6–9). Between 2003 and 2006, it was typical to observe greater than 80% success in achieving minimum escapement goals for all species in all regions except AYK (Figures 6–9; Tables 9–12). In recent years, the proportion of escapements falling below the lower bound of goals has increased in Southeast, Central and Westward regions (Figures 6–9; Tables 9–12). Statewide, the percentage of escapement goals within the goal range (or above the lower bound if a lower-bound SEG) has been between 35% and 58% since 2003 (Figure 10a). In recent years there has been a decrease in the percentage of goals exceeded, and an increase in the percentage of goals not achieved, when compared to previous years (Figures 10b and 10c). Because meeting escapement goals is fundamental to department efforts to manage for sustainable salmon stock productivity, it is important to document outcomes for meeting these goals. Where escapements chronically (4–5

years) fail to meet expectations for harvestable yield or spawning escapements, the department may recommend, and the board may adopt a stock of concern designation for those under-performing salmon stocks. The policy for the management of sustainable salmon fisheries (5 AAC 39.222) provides specific definitions for stocks of concern. Yield concerns arise from a chronic inability to maintain expected yields or harvestable surpluses above escapement needs. Management concerns are precipitated by a chronic failure to maintain escapements within the bounds, or above the lower bound of the established goal. A conservation concern may arise from a failure to maintain escapements above a sustained escapement threshold (SET). Methods to develop stock-specific SETs, as defined in the sustainable salmon fisheries policy, are not well developed for Pacific salmon, and no SETs or stocks of conservation concern exist in Alaska. In 2011 there were 13 stocks of concern in the state (Table 17). stocks of yield concern and six stocks of management concern in the state (Table 17). Seven of these are new stocks of concern that were declared During the 2010/2011 board meeting cycle and include: Karluk River Chinook salmon in Westward Region, and in Central Region, Chuitna, Theodore and Lewis rivers Chinook salmon, and Alexander, Willow and Goose creeks Chinook salmon. All of these new stocks were designated as stocks of management concern, except for Willow and Goose creeks Chinook salmon that were designated as stocks of yield concern.

The array of methods used to enumerate salmon for each of the stocks with escapement goals, as well as methods used to assist department staff in developing the escapement goal for a given stock are summarized by region in Tables 18-21.

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FIGURES AND TABLES

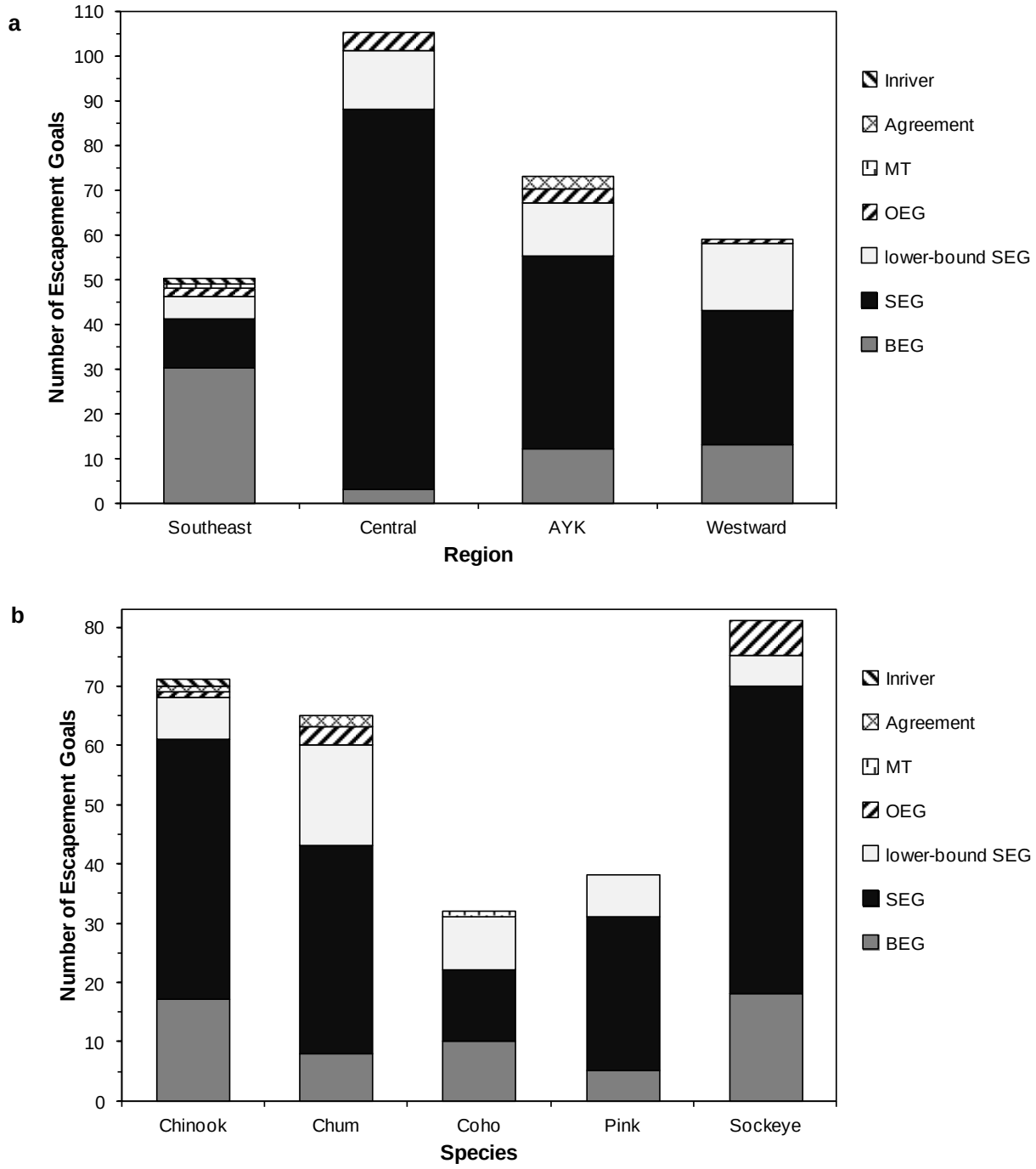

Figure 1.–Statewide summary of the 287 escapement goals in effect during the 2011 spawning season for (a) the four Division of Commercial Fisheries regions and (b) by species. BEG is biological escapement goal, SEG is sustainable escapement goal, OEG is optimal escapement goal (set by the Alaska Board of Fisheries), MT is management target, agreement goals are established through international treaties, and Inriver is inriver escapement goal (set by the Alaska Board of Fisheries).

Table 1.–Southeast Region Chinook, chum, coho, pink, and sockeye salmon escapement goals and escapements, 2003 to 2011.

System	2011 Goal Range		Type	Year Implemented	Escapement								
	Lower	Upper			2003	2004	2005	2006	2007	2008	2009	2010	2011
CHINOOK SALMON[a]													
Blossom River	250	500	BEG	1997	203	333	445	339	135	257	123	180	147
Keta River	250	500	BEG	1997	322	376	497	747	311	363	172	475	223
Unuk River	1,800	3,800	BEG	2009	5,546	3,963	4,742	5,645	5,668	3,104	3,157[b]	4,854[b]	3,272[b]
Chickamin River	450	900	BEG	1997	964	798	924	1,330	893	1,111	611	1,156	853
Andrew Creek	650	1,500	BEG	1998	1,160	2,991	1,979	2,124	1,736	981	628	1,205	936
Stikine River	14,000	28,000	BEG	2000	46,824	48,900	40,501	24,405	14,560	18,352	11,086[b]	15,180[b]	14,569[b]
King Salmon River	120	240	BEG	1997	119	135	143	150	181	120	109	158	192
Taku River	19,000	36,000	BEG	2009	36,435	75,032	38,725	42,296	14,854	27,383	20,762[b]	29,307[b]	27,523[b]
Chilkat River	1,850	3,600	Inriver[c]		5,657	3,422	3,366	3,039	1,445	2,905	4,429[b]	1,815[b]	2,803[b]
	1,750	3,500	BEG	2003									
Klukshu (Alsek) River	1,100	2,300	BEG	1998	1,645	2,451	1,034	568	676	466	1,466	2,159	1667[b]
Situk River	450	1,050	BEG	2003	2,163	698	599	695	677	413	902	167[d]	240
CHUM SALMON													
Southern Southeast Summer	68,000		lower-bound SEG	2009	66,000	74,000	66,000	76,000	132,000	13,000	41,000	47,000	157,000
Northern Southeast Inside Summer	149,000		lower-bound SEG	2009	210,000	242,000	185,000	282,000	149,000	99,000	107,000	77,000	125,000
Northern Southeast Outside Summer	19,000		lower-bound SEG	2009	30,000	86,000	77,000	57,000	34,000	46,000	15,000	24,000	23,000
Cholmondeley Sound Fall	30,000	48,000	SEG	2009	75,000	60,000	15,000	54,000	18,000	49,500	39,000	76,000	93,000
Port Camden Fall	2,000	7,000	SEG	2009	676	3,300	2,110	2,420	505	1,400	1,711	5,400	1,800
Security Bay Fall	5,000	15,000	SEG	2009	8,700	13,100	2,750	15,000	5,400	11,700	5,100	6,500	5,100
Excursion River Fall	4,000	18,000	SEG	2009	6,300	5,200	1,100	2,203	6,000	8,000	1,400	6,100	3,000
Chilkat River Fall	75,000	170,000	SEG	2009	166,000	310,000	202,000	704,000	331,000	451,000	337,000	91,000	368,000
COHO SALMON													
Hugh Smith Lake	500	1,600	BEG	2009	1,510	840	1,732	891	1,244	1,741	2,281	2,878	2,137
Taku River[e]	35,000		MT	1995	183,038	129,327	135,558	121,778	74,326	95,360[b]	104,321[b]	126,830[b]	70,745[b]
Auke Creek	200	500	BEG	1994	585	416	450	581	352	600	360	417	517
Montana Creek	400	1,200	SEG	2006	808	364	351	1,110	324	405	698	630	709
Peterson Creek	100	250	SEG	2006	203	284	139	439	226	660	123	467	138
Ketchikan Survey Index	4,250	8,500	BEG	2006	11,859	9,904	14,840	6,912	4,488	16,680	8,226	4,656	5,202
Sitka Survey Index	400	800	BEG	2006	1,101	1,124	1,668	2,647	1,066	1,117	1,156	1,273	2,222
Ford Arm Lake	1,300	2,900	BEG	1994	6,789	3,539	4,257	4,737	2,567	5,173	2,181	1,610	1,908
Berners River	4,000	9,200	BEG	1994	10,110	14,450	5,220	5,470	3,915	6,870	4,230	7,520	6,050
Chilkat River	30,000	70,000	BEG	2006	134,340	67,465	38,589	80,683	25,493	57,376	47,548	87,381	64,511
Lost River	2,200		lower-bound SEG	2009	6,394	5,047	1,241	3,500	2,542	NA	3,581	2,393	1,221
Situk River	3,300	9,800	BEG	1994	6,009	10,284	2,514	8,533	5,763	NA	5,814	11,195	3,652
Tsiu/Tsivat Rivers	10,000	29,000	BEG	1994	35,850	NA	16,600	14,500	14,000	25,200	28,000	11,000	21,000

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Table 1.–Page 2 of 2.

System	2011 Goal Range Lower	2011 Goal Range Upper	Type	Year Implemented	Escapement 2003	2004	2005	2006	2007	2008	2009	2010	2011
PINK SALMON													
Southern Southeast	3,000,000	8,000,000	BEG	2009	9,780,000	8,260,000	9,400,000	4,330,000	10,590,000	6,290,000	7,200,000	5,940,000	5,500,000
Northern Southeast Inside	2,500,000	6,000,000	BEG	2009	6,680,000	5,210,000	6,680,000	3,960,000	4,740,000	1,470,000	3,650,000	3,210,000	6,030,000
Northern Southeast Outside	750,000	2,500,000	BEG	2009	3,510,000	2,190,000	3,840,000	1,960,000	2,310,000	1,730,000	1,820,000	2,010,000	2,730,000
Situk River (even-year)	42,000	105,000	BEG	1995		144,938		114,779		1,232[f]		89,301[f]	
Situk River (odd-year)	54,000	200,000	BEG	1995	374,533		281,135		229,033		62,787		169,908
SOCKEYE SALMON													
Hugh Smith Lake	8,000	18,000	OEG[g]	2003	19,568	19,734	23,872	42,112	33,743	3,588	9,483	15,646	22,028
	8,000	18,000	BEG	2003									
McDonald Lake	55,000	120,000	SEG	2009	110,633	28,759	61,043	31,357	29,086	20,700	51,000	72,500	113,000
Mainstem Stikine River	20,000	40,000	SEG	1987	57,972	36,275	34,788	27,603	20,865	16,178[b]	23,045[b]	25,185[b]	33,659[b]
Tahltan Lake	18,000	30,000	BEG	1993	49,587	58,709	39,622	50,052	18,035	8,052	27,312	18,218	29,689
Speel Lake	4,000	13,000	BEG	2003	7,014	7,813	7,549	4,165	3,099	1,763	3,689	5,640	4,777
Taku River	71,000	80,000	SEG	1986	160,366	106,688	120,053	146,151	87,763	68,059[b]	71,811[b]	87,259[b]	112,187[b]
Redoubt Lake	7,000	25,000	OEG	2003	69,893	77,263	65,653	103,953	66,938	10,146	12,851	17,119	21,806
	10,000	25,000	BEG	2003									
Chilkat Lake	70,000	150,000	BEG	2009	113,000	119,000	84,000	73,000	68,000	71,735	150,033	61,906	63,628
Chilkoot Lake	38,000	86,000	SEG	2009	74,459	75,596	51,178	96,203	72,561	32,957	33,545	71,657	65,915
East Alsek-Doame River	13,000	26,000	BEG	2003	36,400	33,300	50,000	29,000	40,100	8,000	12,000	19,500	33,000
Klukshu River	7,500	15,000	BEG	2000	32,120	13,721	3,167	12,890	8,310	2,741	5,509	18,546	20,904
Lost River	1,000		lower-bound SEG	2009	3,057	1,123	1,476	1,018	180	200	NA	1,525	1,006
Situk River	30,000	70,000	BEG	2003	89,720	43,278	66,476	90,351	61,799	22,520	83,959	47,865[d]	89,943

Note: NA = data not available.

[a] Goals are for large (≥660 mm MEF, or fish age 1.3 and older) Chinook salmon, except the Alsek River goal, which is germane to fish age 1.2 and older and can include fish <660 mm MEF.

[b] Preliminary data.

[c] Inriver goal accounts for inriver subsistence harvest, which averages <100 fish.

[d] Incomplete weir count due to inseason problems with weir (e.g., breach of weir).

[e] For the Taku River coho salmon, the management intent of the U.S. is to ensure a minimum above border run (i.e. inriver run) of 38,000 fish as detailed in the Pacific Salmon Treaty. The management threshold for escapement is the inriver run minus the allowed Canadian inriver harvest of 3,000 at runs of less than 50,000.

[f] Situk River weir was pulled well before peak of pink salmon run so adequate assessment was not possible.

[g] Hugh Smith Lake sockeye salmon OEG includes wild and hatchery fish.

Table 2.–Central Region (Bristol Bay, Cook Inlet, and Prince William Sound/Copper River) Chinook, chum, coho, pink, and sockeye salmon escapement goals and escapements, 2003 to 2011.

	2011 Goal Range			Year	Escapement								
System	Lower	Upper	Type	Implemented	2003	2004	2005	2006	2007	2008	2009	2010	2,011
CHINOOK SALMON													
Bristol Bay													
Nushagak River	40,000	80,000	SEG	2007	72,420	107,591	163,506	117,364	50,960	91,653	73,379	56,134	59,728
Togiak River	9,300		lower-bound SEG	2007	NS	NS	NS	NS	NS	NS	NS	NS[a]	NS
Naknek River	5,000		lower-bound SEG	2007	6,081	12,878	NS	NS	5,498	6,559	3,305[b]	NS[a]	NS
Alagnak River	2,700		lower-bound SEG	2007	8,209	6,755	5,084	4,278	3,455	1,825	1,957	NS[a]	NS
Egegik River	450		lower-bound SEG	2007	790	579	335	196	458	162	350[c]	NS[a]	NS
Upper Cook Inlet													
Alexander Creek	2,100	6,000	SEG	2002	2,012	2,215	2,140	885	480	150	275	177	343
Campbell Creek	380		lower-bound SEG	2011	745	964	1,097	1,052	588	439	554	290	260
Chuitna River	1,200	2,900	SEG	2002	2,339	2,938	1,307	1,911	1,180	586	1,040	735	719
Chulitna River	1,800	5,100	SEG	2002	NS	2,162	2,838	2,862	5,166	2,514	2,093	1,052	1,875
Clear (Chunilna) Creek	950	3,400	SEG	2002	NS	3,417	1,924	1,520	3,310	1,795	1,205	903	512
Crooked Creek	650	1,700	SEG	2002	2,554	2,196	1,903	1,516	964	881	617	1,088	654
Deshka River	13,000	28,000	SEG	2011	39,257	57,934	37,725	31,150	18,714	7,533	11,967	18,594	19,026
Goose Creek	250	650	SEG	2002	175	417	468	306	105	117	65	76	80
Kenai River - Early Run	5,300	9,000	OEG	2005	10,097	11,855	16,387	18,428	12,504	11,732	9,771	NA[d]	NA[e]
	4,000	9,000	SEG	2011									
Kenai River - Late Run	17,800	35,700	SEG	2011	23,736	40,198	26,046	24,423	32,618	24,144	17,158	NA[d]	NA[e]
Lake Creek	2,500	7,100	SEG	2002	8,153	7,598	6,345	5,300	4,081	2,004	1,394	1,617	2,563
Lewis River	250	800	SEG	2002	878	1,000	441	341	0[f]	120	111	56	92
Little Susitna River	900	1,800	SEG	2002	1,114	1,694	2,095	1,855	1,731	1,297	1,028	589	887
Little Willow Creek	450	1,800	SEG	2002	879	2,227	1,784	816	1,103	NC	776	468	713
Montana Creek	1,100	3,100	SEG	2002	2,576	2,117	2,600	1,850	1,936	1,357	1,460	755	494
Peters Creek	1,000	2,600	SEG	2002	3,998	3,757	1,508	1,114	1,225	NC	1,283	NC	1,103
Prairie Creek	3,100	9,200	SEG	2002	4,095	5,570	3,862	3,570	5,036	3,039	3,500	3,022	2,038
Sheep Creek	600	1,200	SEG	2002	NS	285	760	580	400	NC	500	NC	350
Talachulitna River	2,200	5,000	SEG	2002	9,573	8,352	4,406	6,152	3,871	2,964	2,608	1,499	1,368
Theodore River	500	1,700	SEG	2002	1,059	491	478	958	486	345	352	202	327
Willow Creek	1,600	2,800	SEG	2002	3,855	2,840	2,411	2,193	1,373	1,255	1,133	1,173	1,061
Lower Cook Inlet													
Anchor River	3,800	10,000	SEG	2011	9,238	12,016	11,156	8,945	9,622	5,806	3,455	4,449	3,547[g]
Deep Creek	350	800	SEG	2002	1,008	1,075	1,076	507	553	205	483	387	696
Ninilchik River	550	1,300	SEG	2008	517	679	1,259	1,013	543	586	528	605	668[g]

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Table 2. –Page 2 of 5.

System	2011 Goal Range Lower	Upper	Type	Year Implemented	Escapement 2003	2004	2005	2006	2007	2008	2009	2010	2,011
Prince William Sound													
Copper River	24,000		lower-bound SEG	2003	34,034	30,628	21,528	58,454	34,565	32,487	27,787	16,771	27,000[h]
CHUM SALMON													
Bristol Bay													
Nushagak River	190,000		lower-bound SEG	2007	295,413	283,811	456,025	661,002	161,483	326,300	438,481	273,914	248,278
Upper Cook Inlet													
Clearwater Creek	3,800	8,400	SEG	2002	800	3,900	530	500	5,590	12,960	8,300	13,700	11,630
Lower Cook Inlet													
Port Graham River	1,450	4,800	SEG	2002	2,925	1,177	743	2,231	1,882	1,802	1,029	1,395	1,764
Dogfish Lagoon	3,350	9,150	SEG	2002	13,287	3,617	2,746	5,394	4,919	6,200	4,380	12,703	12,936
Rocky River	1,200	5,400	SEG	2002	5,549	17,159	6,060	11,200	1,600	3,763	2,500	1,271	4,480
Port Dick Creek	1,900	4,450	SEG	2002	5,595	8,620	4,848	2,786	2,753	11,774	5,592	2,439	7,087
Island Creek	6,400	15,600	SEG	2002	16,274	15,135	20,666	5,615	3,092	12,935	9,295	3,408	11,755
Big Kamishak River	9,350	24,000	SEG	2002	16,357	57,897	25,717	58,173	14,787	4,495	15,026	NS	5,532
Little Kamishak River	6,550	23,800	SEG	2002	22,194	45,342	12,066	42,929	15,569	21,265	4,213	18,414	19,310
McNeil River	24,000	48,000	SEG	2008	29,306	14,613	22,496	17,403	21,629	10,617	18,766	10,520	30,977
Bruin River	6,000	10,250	SEG	2002	13,080	15,886	21,208	7,000	3,055	17,535	10,071	6,200	3,486
Ursus Cove	6,050	9,850	SEG	2002	30,410	15,988	12,176	15,663	20,897	6,502	12,946	11,765	10,636
Cottonwood Creek	5,750	12,000	SEG	2002	72,764	16,277	17,914	13,243	12,522	11,561	19,405	15,848	4,730
Iniskin Bay	7,850	13,700	SEG	2002	18,709	22,044	16,461	15,640	5,340	20,042	30,821	19,252	16,522
Prince William Sound[i]													
Eastern District	50,000		lower-bound SEG	2006	198,921	108,833	113,135	109,403	123,814	74,740	55,219	91,514	196,933
Northern District	20,000		lower-bound SEG	2006	44,272	42,456	30,657	52,039	49,669	38,791	37,358	38,207	52,474
Coghill District	8,000		lower-bound SEG	2006	19,729	9,685	11,979	15,900	14,052	39,660	36,724	51,589	16,368
Northwestern District	5,000		lower-bound SEG	2006	12,736	10,371	12,696	25,860	10,778	28,051	34,290	30,074	11,447
Southeastern District	8,000		lower-bound SEG	2006	116,131	42,344	25,547	26,739	60,464	21,614	16,453	85,138	91,218
COHO SALMON													
Bristol Bay													
There are no coho salmon stocks with escapement goals in Bristol Bay.													
Upper Cook Inlet													
Fish Creek (Knik)	1,200	4,400	SEG	2011	1,231	1,415[j]	3,011[j]	4,967[j]	6,868[j]	4,868[j]	8,214	6,977	1,428[j]
Jim Creek	450	700	SEG	2002	1,421	4,652	1,464	2,389	725	1,890	1,331	242	229
Little Susitna River	10,100	17,700	SEG	2002	10,877	40,199	16,839[k]	8,786[k]	17,573	18,485	9,523	9,214	4,826[k]

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Table 2.–Page 3 of 5.

System	2011 Goal Range Lower	Upper	Type	Year Implemented	Escapement 2003	2004	2005	2006	2007	2008	2009	2010	2,011
Lower Cook Inlet													
There are no coho salmon stocks with escapement goals in Lower Cook Inlet													
Prince William Sound													
Copper River Delta	32,000	67,000	SEG	2003	72,180	99,980	101,082	89,270	53,820	76,892	41,294	41,077	38,495
Bering River	13,000	33,000	SEG	2003	32,475	30,185	44,542	33,192	33,062	28,932	22,141	21,311	18,890
PINK SALMON													
Bristol Bay													
There are no pink salmon stocks with escapement goals in Bristol Bay.													
Upper Cook Inlet													
There are no pink salmon stocks with escapement goals in Upper Cook Inlet.													
Lower Cook Inlet													
Humpy Creek	21,650	85,550	SEG	2002	90,853	28,945	93,756	48,368	53,989	90,870	5,207	70,686	1,670
China Poot Creek	2,900	8,200	SEG	2002	6,694	3,335	9,223	7,242	6,235	5,086	1,120	2,220	3,462
Tutka Creek	6,500	17,000	SEG	2002	30,866	17,846	133,600	25,824	5,664	14,144	3,770	2,141	21,974
Barabara Creek	1,900	8,950	SEG	2002	5,062	5,395	14,440	3,554	25,168	16,557	2,583	13,935	21,974
Seldovia Creek	19,050	38,950	SEG	2002	35,135	56,763	98,602	70,045	69,405	53,484	14,619	25,886	46,231
Port Graham River	7,700	19,850	SEG	2002	14,916	44,010	69,095	31,173	25,595	24,720	13,996	16,586	20,883
Port Chatham	7,800	21,000	SEG	2002	34,979	26,375	44,389	24,210	14,451	16,354	25,291	2,992	15,830
Windy Creek Right	3,350	10,950	SEG	2002	23,341	11,974	22,174	17,146	32,297	12,491	15,012	6,408	1,722
Windy Creek Left	3,650	29,950	SEG	2002	82,814	23,286	72,031	65,155	18,339	64,068	57,263	24,241	12,210
Rocky River	9,350	54,250	SEG	2002	287,443	53,760	198,671	67,840	189,992	90,876	173,583	27,045	22,706
Port Dick Creek	18,550	58,300	SEG	2002	107,575	13,323	122,236	51,500	44,170	34,228	41,681	41,090	16,868
Island Creek	7,200	28,300	SEG	2002	118,637	33,573	26,404	107,683	87,235	49,719	44,527	69,525	10,181
S. Nuka Island Creek	2,700	14,250	SEG	2002	41,366	6,432	11,199	5,100	6,645	12,300	19,934	NS	NS
Desire Lake Creek	1,900	20,200	SEG	2002	34,766	24,258	45,980	74,774	11,820	9,546	73,926	2,978	600
Bear & Salmon Creeks	eliminated			2011	4,435	1,236	34,452	9,033	NS	NS	NS	NS	
Thumb Cove	eliminated			2011	5,050	4,250	8,668	5,205	NS	NS	NS	NS	
Humpy Cove	eliminated			2011	2,563	990	14,586	1,905	NS	NS	NS	NS	
Tonsina Creek	eliminated			2011	5,180	3,450	9,922	6,453	NS	NS	NS	NS	
Bruin River	18,650	155,750	SEG	2002	138,674	66,494	98,346	515,114	350,420	150,717	1,067,351	40,256	4,534
Sunday Creek	4,850	28,850	SEG	2002	346,657	31,497	116,170	70,037	394,797	20,434	106,296	6,607	844
Brown's Peak Creek	2,450	18,800	SEG	2002	285,049	18,100	60,983	35,703	249,383	17,400	63,605	3,092	2,035
Prince William Sound													
All Districts Combined (even year)	1,250,000	2,750,000	SEG	2003		1,996,223		1,187,595		862,419		1,916,910	
All Districts Combined (odd year)[1]	1,250,000	2,750,000	SEG	2003	2,857,289		4,669,168		1,509,133		1,828,801		3,921,761

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Table 2.–Page 4 of 5.

System	2011 Goal Range Lower	Upper	Type	Year Implemented	Escapement 2003	2004	2005	2006	2007	2008	2009	2010	2,011
SOCKEYE SALMON													
Bristol Bay													
Kvichak River[m]	2,000,000	10,000,000	SEG	2009	1,687,000	5,500,000	2,320,000	3,068,000	2,810,000	2,758,000	2,266,000	4,207,000	2,264,000
Alagnak River	320,000		lower-bound SEG	2007	3,676,000	5,397,000	4,219,000	1,774,000	2,466,000	2,181,000	971,000	1,188,000	884,000
Naknek River	800,000	1,400,000	SEG[n]	1984	1,831,000	1,939,000	2,745,000	1,953,000	2,945,000	2,473,000	1,169,000	1,464,000	1,177,000
Egegik River	800,000	1,400,000	SEG	1995	1,152,000	1,290,000	1,622,000	1,465,000	1,433,000	1,260,000	1,146,000	927,000	961,000
Ugashik River	500,000	1,200,000	SEG	1995	790,000	815,000	800,000	1,003,000	2,599,000	596,000	1,364,000	831,000	1,030,000
Wood River	700,000	1,500,000	SEG	2000	1,460,000	1,543,000	1,497,000	4,008,000	1,528,000	1,725,000	1,319,000	1,804,000	1,098,000
Igushik River	150,000	300,000	SEG	2000	194,000	110,000	366,000	305,000	415,000	1,055,000	514,000	518,000	421,000
Nushagak River	235,000	760,000	OEG	1997	581,000	492,000	1,049,000	548,000	518,000	493,000	484,000	469,000	428,000
	340,000	760,000	SEG	1997									
Togiak River	120,000	270,000	SEG	2009	232,000	136,000	156,000	312,000	270,000	206,000	314,000	188,000	191,000
Upper Cook Inlet													
Crescent River	30,000	70,000	BEG	2005	122,159	103,201	125,623	92,533	79,406	62,029	NS	86,333	81,952
Fish Creek (Knik)	20,000	70,000	SEG	2002	91,952	22,157	14,215	32,562	27,948	19,339	83,480	126,836	66,678
Kasilof River	160,000	390,000	OEG	2011	347,434	575,721	346,516	366,216	335,943	299,601	295,434	265,513	244,221
	160,000	360,000	BEG	2011									
Kenai River[o]	700,000	1,400,000	OEG	2011	921,064	1,120,076	1,114,618	1,311,144	595,355	402,264	498,592	732,790	1,333,217
	700,000	1,200,000	SEG	2011									
Packers Creek	15,000	30,000	SEG	2008	NS	NS	22,000	NS	46,637	25,247	16,473	NS	NA
Russian River - Early Run	22,000	42,000	BEG	2011	23,650	56,582	52,903	80,524	27,298	30,989	52,178	27,074	29,129
Russian River - Late Run	30,000	110,000	SEG	2005	157,469	110,244	59,473	89,160	53,068	46,638	80,088	38,848	41,529
Yentna River[p]	eliminated			2009	180,813	71,281	36,921	92,045	79,901	90,180			
Chelatna Lake	20,000	65,000	SEG	2009				18,433	41,290	73,469	17,721	37,784	70,353
Judd Lake	25,000	55,000	SEG	2009				40,633	58,134	54,304	44,616	18,361	39,997
Larson Lake	15,000	50,000	SEG	2009			9,751	57,411	47,736	35,040	40,933	20,324	12,413
Lower Cook Inlet													
English Bay	6,000	13,500	SEG	2002	19,422	15,310	8,188	15,454	16,487	11,996	18,176	12,253	9,920
Delight Lake	7,550	17,650	SEG	2011	7,538	7,262	15,200	10,929	43,963	23,933	12,700	23,775	20,190
Desire Lake	8,800	15,200	SEG	2002	8,400	10,700	4,820	18,600	10,000	10,700	16,000	6,320	9,630
Bear Lake	700	8,300	SEG	2002	9,498	8,061	10,285	8,338	8,421	9,000	9,977	7,964	8,620
Aialik Lake	3,700	8,000	SEG	2002	5,370	10,100	5,250	4,760	5,370	4,200	3,100	5,315	3,480
Mikfik Lake	6,300	12,150	SEG	2002	12,830	14,020	5,970	17,700	11,190	5,560	15,130	11,330	345
Chenik Lake	3,500	14,000	SEG	2011	13,825	17,006	14,507	13,868	18,288	11,284	15,200	17,312	10,330

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Table 2.–Page 5 of 5.

System	2011 Goal Range Lower	2011 Goal Range Upper	Type	Year Implemented	Escapement 2003	2004	2005	2006	2007	2008	2009	2010	2,011
Amakdedori Creek	1,250	2,600	SEG	2002	11,800	7,200	1,710	300	3,830	3,200	2,160	1,210	3,412
Prince William Sound													
Upper Copper River	300,000	500,000	SEG	2003	461,050	438,482	541,247	605,874	638,029	496,451	477,905	504,549	629,544[q]
Copper River Delta	55,000	130,000	SEG	2003	73,150	69,385	58,406	98,896	88,285	67,950	69,292	82,835	76,507
Bering River	20,000	35,000	SEG	2003	32,840	25,135	30,890	14,671	21,471	18,396	17,022	4,367	28,530
Coghill Lake	20,000	40,000	SEG	2006	75,427	30,569	30,313	24,157	70,001	29,298	19,293	24,312[r]	102,359
Eshamy Lake	13,000	28,000	BEG	2009	39,845	13,443	23,523	41,823	16,646	18,495	24,025	16,291	20,565

Note: NA = data not available; NC = no count; NS = no survey.

[a] Aerial surveys for Chinook salmon were not flown in 2010 due to poor weather conditions and high water levels.

[b] In 2009, aerial surveys were only flown on Big Creek (2,834 Chinook salmon) and King Salmon River (471 Chinook salmon). Mainstem Naknek River and Paul's Creek were not surveyed in 2009.

[c] Aerial surveys were conducted in the Egegik and King Salmon River systems on August 5, 2009 to provide escapement indices for Chinook and chum salmon. Resulting counts were 350 Chinook, and 277 chum salmon. Water conditions were poor; high and turbid conditions prevented observation on most of the surveyed systems. Chinook escapement indices were well below average in streams surveyed, but should be considered minimum counts due to the poor water conditions. Based on carcass distribution and observed presence, the survey was likely conducted after peak spawning.

[d] TS-based escapement estimate deemed unreliable.

[e] TS-based escapement estimate not available.

[f] Lewis River diverged into swamp 1/2 mi. below bridge. No water in channel.

[g] Preliminary escapement estimates.

[h] The Copper River Chinook salmon spawning escapement estimate is preliminary. The estimate is generated from a mark-recapture project run by the Native Village of Eyak and LGL Consulting. The spawning escapement estimate is generated by subtracting the upper Copper River state and federal subsistence, state personal use, and sport fishery harvest estimates from the mark-recapture estimate of the inriver abundance. The estimates for the federal and state subsistence and the state personal use fishery harvests are generally not available for ~6 months after the fishery is closed. Additionally, the sport fishery harvest estimate is based on the mail-out survey and is generally available ~12 months after the fishery ends.

[i] No estimates for chum salmon escapements are included for the Unakwik, Eshamy, Southwestern, or Montague districts because there are no escapement goals for those districts.

[j] Incomplete counts for Fish Creek (Knik) in 2004-2008, and 2011 because weir was pulled in mid-August.

[k] Incomplete counts for Little Susitna River in 2005, 2006, and 2011 due to breach of weir.

[l] The estimates for pink salmon (odd year) do not include Unakwik District escapements, due to absence of an escapement goal and an average escapement estimate of a few thousand fish.

[m] Prior to 2010 Kvichak River had a pre-peak/peak-cycle escapement goal of 6-10 million sockeye and an off-peak escapement goal of 2-10 million fish. Between 2001 and 2009 only one year (2004) was classified as either a pre-peak or peak year.

[n] Naknek River has an OEG of 800,000-2,000,000 when the Naknek River Special Harvest Area (NRHSA) is open to fishing.

[o] Uses the best estimate of sport harvest upstream of sonar.

[p] Yentna River sockeye salmon escapement goal was replaced by SEGs on Chelatna, Judd and Larson lakes in early 2009.

[q] The 2011 upper Copper River sockeye salmon spawning escapement estimate is preliminary pending the estimates of sport fishery harvests and final mark-recapture estimate of upper Copper River Chinook salmon.

[r] The Coghill River weir was removed on 26 July 2010, so this provides a minimum estimate.

Table 3.–Arctic-Yukon-Kuskokwim Region Chinook, chum, coho, pink, and sockeye salmon escapement goals and escapements, 2003 to 2011.

System	2011 Goal Range		Type	Year Implemented	Escapement								
	Lower	Upper			2003	2004	2005	2006	2007	2008	2009	2010	2011
CHINOOK SALMON													
Kuskokwim Area													
North (Main) Fork Goodnews River	640	3,300	SEG	2005	3,935	7,462	NS	4,159	NS	2,155	NS	NS	853
Middle Fork Goodnews River	1,500	2,900	BEG	2007	2,389	4,388	4,633	4,559	3,852	2,161	1,630	2,244	1,861
Kanektok River	3,500	8,000	SEG	2005	6,206	28,375	14,202	8,433	NS	3,659	NS	1,228	NS
Kogrukluk River	5,300	14,000	SEG	2005	11,771	19,651	22,000	19,414	13,029	9,730	9,702	5,690	6,891
Kwethluk River	6,000	11,000	SEG	2007	14,474	28,604	NA	17,618	12,927	5,275	5,744	1,669	4,076
Tuluksak River	1,000	2,100	SEG	2007	1,064	1,475	2,653	1,043	374	701	362	201	286
George River	3,100	7,900	SEG	2007	4,693	5,207	3,845	4,357	4,883	2,698	3,663	1,500	1,571
Kisaralik River	400	1,200	SEG	2005	654	5,157	2,206	4,734	692	1,074	NS	235	NS
Aniak River	1,200	2,300	SEG	2005	3,514	5,362	NS	5,639	3,984	3,222	NS	NS	NS
Salmon River (Aniak R)	330	1,200	SEG	2005	1,242	2,177	4,097	NS	1,458	589	NS	NS	79
Holitna River	970	2,100	SEG	2005	NS	4,051	1,760	1,866	NS	NS	NS	587	NS
Cheeneetnuk River (Stony R)	340	1,300	SEG	2005	810	918	1,155	1,015	NS	290	323	NS	249
Gagaryah River (Stony R)	300	830	SEG	2005	1,095	670	788	531	1,035	177	303	62	96
Salmon River (Pitka Fork)	470	1,600	SEG	2005	1,241	1,138	1,801	862	943	1,305	632	135	767
Yukon River													
East Fork Andreafsky River	2,100	4,900	SEG	2010	4,336	8,045	2,239	6,463	4,504	4,242	3,004	2,413	5,213
West Fork Andreafsky River	640	1,600	SEG	2005	1,578	1,317	1,492	824	976	262	1,678	858	1,173
Anvik River	1,100	1,700	SEG	2005	1,100	3,679	2,421	1,876	1,529	992	832	974	642
Nulato River (forks combined)	940	1,900	SEG	2005	NS	1,321	553	1,292	2,583	922	2,260	711	1,401
Gisasa River	eliminated			2010	NS	731	958	843	593	487	515	264	906
Chena River	2,800	5,700	BEG	2001	11,100	9,696	4,075	2,936	3,806	3,208	5,253	2,382	
Salcha River	3,300	6,500	BEG	2001	15,500	15,761	5,988	10,679	6,425	5,415	12,774	6,135	3,537
Canada Mainstem	42,500	55,000	Agreement[a]	Annual	80,594	48,469	67,985	62,630	34,904	33,883	65,278	32,010	46,844
Norton Sound													
Fish River/Boston Creek	100		lower-bound SEG	2005	240	112	46	NS	NS	NS	67[b]	29	NS
Kwiniuk River	300	550	SEG	2005	744	663	342	195	194	237	444	135	57
North River (Unalakleet R)	1,200	2,600	SEG	2005	1,452	1,104	1,015	906	1,948	903	2,352	1,256	864
Shaktoolik River	400	800	SEG	2005	15[c]	91[c]	74[d]	150[c]	412	NS	129[b]	29	106
Unalakleet/Old Woman River	550	1,100	SEG	2005	168[c]	398[c]	510[d]	NS	821	NS	1,368	1,021[e]	1,111

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Table 3.–Page 2 of 4.

System	2011 Goal Range Lower	2011 Goal Range Upper	Type	Year Implemented	Escapement 2003	2004	2005	2006	2007	2008	2009	2010	2011
CHUM SALMON													
Kuskokwim Area													
Middle Fork Goodnews River	12,000		lower-bound SEG	2005	21,637	31,616	26,690	54,699	49,285	44,699	19,715	26,687	19,974
Kanektok River	5,200		lower-bound SEG	2005	NS	NS	NS	NS	NS	NS	NS	NS	NS
Kogrukluk River	15,000	49,000	SEG	2005	23,413	24,201	197,723	180,594	49,505	44,978	84,940	63,583	76,384
Aniak River	220,000	480,000	SEG	2007	477,544	672,931	1,151,505	1,108,626	696,801	427,911	479,531	429,643	345,630
Yukon River Summer Chum													
East Fork Andreafsky River	40,000		lower-bound SEG	2010	22,461	64,883	20,127	102,260	69,642	57,259	8,770	72,839	100,473
Anvik River	350,000	700,000	BEG	2005	256,920	365,353	525,391	605,485	459,038	374,928	193,098	396,173	642,527
Mainstem Yukon River	600,000	1,000,000	OEG	2001	1,168,518	1,357,826	2,439,616	3,767,044	1,726,885	1,665,667	1,283,206	1,327,581	1,778,870
Yukon River Fall Chum													
Yukon River Drainage	300,000	600,000	SEG	2010	694,000	536,000	1,990,000	881,000	911,000	687,000	482,000	526,000	881,000
Tanana River	61,000	136,000	BEG	2001	263,000	187,000	373,000	233,000	357,000	264,000	160,000	213,000	271,000
Delta River	6,000	13,000	BEG	2001	23,000	25,000	28,000	14,055	19,000	23,000	13,000	18,000	24,000
Toklat River	eliminated			2010	21,000	35,000	NA	NA	NA	NA	NA		
Upper Yukon River Tributaries	152,000	312,000	BEG	2001	288,000	195,000	1,179,000	435,000	327,000	248,000	NA	196,000	406,000
Chandalar River	74,000	152,000	BEG	2001	214,000	137,000	497,000	245,000	228,000	178,000	150,000	158,000	295,000
Sheenjek River	50,000	104,000	BEG	2001	44,000	38,000	561,000	160,000	65,000	50,000	54,000	22,000	98,000
Fishing Branch River (Canada)	22,000	49,000	Agreement	2008[f]	30,000	20,000	121,000	30,000	34,000	20,000	26,000	16,000	13,000
Yukon R. Mainstem (Canada)	70,000	104,000	Agreement	2010[g]	143,000	154,000	438,000	211,000	227,000	174,000	93,000	118,000	204,000
Norton Sound													
Subdistrict 1 Aggregate	23,000	35,000	BEG	2001	17,081	23,787	38,808	87,223	76,937	25,215	21,368	97,798	66,122
Sinuk River	eliminated			2010	3,482	3,197	4,710	4,834	16,481	1,000[h]	2,232	11,107	15,028
Nome River	2,900	4,300	SEG	2005	1,957	3,903	5,584	5,678	7,034	2,607	1,565	5,906	3,582
Bonanza River	eliminated			2010	1,664	2,166	5,534	708	8,491	1,000[h]	6,744	3,513	7,357
Snake River	1,600	2,500	SEG	2005	2,201	2,145	2,948	4,128	8,144	1,244	891	6,973	4,343
Solomon River	eliminated			2010	806	1,436	1,914	2,062	3,469	1,000[h]	918	2,678	4,529
Flambeau River	eliminated			2010	3,380	7,667	7,692	27,828	12,006	11,618	4,075	25,009	15,056
Eldorado River	6,000	9,200	SEG	2005	3,591	3,273	10,426	41,985	21,312	6,746	4,943	42,612	16,227
Niukluk River	23,000		lower-bound SEG	2010	20,018	10,770	25,598	29,199	50,994	12,078	15,879	48,561	23,607
Kwiniuk River	11,500	23,000	OEG	2001	12,123	10,362	12,083	39,519	27,756	9,462	8,733	71,388	31,604
	10,000	20,000	BEG	2001									
Tubutuluk River	9,200	18,400	OEG	2001	1,799	NS	4,842	NS	7,045	NS	3,161	16,097	14,127
	8,000	16,000	BEG	2001									

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Table 3.–Page 3 of 4.

System	2011 Goal Range Lower	2011 Goal Range Upper	Type	Year Implemented	Escapement 2003	2004	2005	2006	2007	2008	2009	2010	2011
Unalakleet/Old Woman River	2,400	4,800	SEG	2005	NS	NS	1,530	NS	1,902	NS	7,143	70,811[e]	108,770
Kotzebue Sound													
Kotzebue Sound Aggregate	196,000	421,000	BEG	2007									
Noatak and Eli Rivers	42,000	91,000	SEG	2007	NS	53,058	NS	39,785	NS	270,747	69,872	NS	
Upper Kobuk w/ Selby River	9,700	21,000	SEG	2007	11,175	26,018	NS	48,750	NS	42,622	45,155	NS	
Salmon River	3,300	7,200	SEG	2007	NS	NS	NS	NS	NS	NS	NS	NS	
Tutuksuk River	1,400	3,000	SEG	2007	NS	NS	1,736	NS	NS	NS	NS	NS	
Squirrel River	4,900	10,500	SEG	2007	NS	NS	NS	NS	NS	NS	NS	NS	
COHO SALMON													
Kuskokwim Area													
Middle Fork Goodnews River	12,000		lower-bound SEG	2005	52,810	47,916	15,683	15,969	20,975	36,630	20,000	23,839	23,826
Kogrukluk River	13,000	28,000	SEG	2005	74,604	27,041	24,116	17,011	27,033	29,661	22,981	13,971	24,174
Kwethluk River	19,000		lower-bound SEG	2010	107,789	64,216	NS	25,664	19,473	49,973	21,911	NA	NA
Yukon River													
Delta Clearwater River	5,200	17,000	SEG	2005	106,000	38,000	34,000	17,000	15,000	7,500	17,000	5,867[i]	6,000
Norton Sound													
Kwiniuk River	650	1,300	SEG	2005	760	1,237	NS	NS	5,174	2,676	NS	8,058	3,288
Niukluk River[j]	2,400	7,200	SEG	2010	1,282	2,064	2,727	11,169	3,498	13,779	6,861	9,042	2,405
North River (Unalakleet R.)	550	1,100	SEG	2005	NS	1,386	1,963	NS	2,349	2,744	2,830	7,608	3,624
PINK SALMON													
Kuskokwim Area													
There are no escapement goals for pink salmon in the Kuskokwim Management Area.													
Yukon River													
There are no escapement goals for pink salmon in the Yukon River drainage.													
Norton Sound													
Nome River (odd year)	3,200		lower-bound SEG	2005	11,402		285,759		24,395		16,490		14,403
Nome River (even year)	13,000		lower-bound SEG	2005		1,051,146		578,555		1,186,554		165,931	
Kwiniuk River	8,400		lower-bound SEG	2005	22,329	3,054,684	341,048	1,347,087	54,255	1,442,249	42,957	634,220	30,023
Niukluk River	10,500		lower-bound SEG	2005	75,855	1,022,236	270,424	1,371,919	43,617	669,234	24,204	434,205	15,425
North River	25,000		lower-bound SEG	2005	280,212	1,149,294	1,670,934	2,169,890	583,320	240,286	189,939	150,807	123,892

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Table 3.–Page 4 of 4.

System	2011 Goal Range Lower	Upper	Type	Year Implemented	Escapement 2003	2004	2005	2006	2007	2008	2009	2010	2011
SOCKEYE													
Kuskokwim Area													
North (Main) Fork Goodnews River	5,500	19,500	SEG	2005	50,140	31,695	NS	78,100	NS	32,500	NS	NS	14,140
Middle Fork Goodnews River	18,000	40,000	BEG	2007	44,387	55,926	113,809	126,772	72,282	50,459	25,465	35,762	17,946
Kanektok River	14,000	34,000	SEG	2005	21,335	78,380	110,730	382,800	NS	38,900	NS	16,950	NS
Kogrukluk River	4,440	17,000	SEG	2010	9,164	6,775	37,939	60,807	16,525	19,675	23,785	13,995	8,132
Yukon River													
There are no escapement goals for Sockeye in the Yukon River drainage.													
Norton Sound													
Salmon Lake/Grand Central River	4,000	8,000	SEG	2005	20,290	25,860	42,240	41,780	20,112	11,672	272	772	5,144
Glacial Lake	800	1,600	SEG	2005	865	970	3,730	5,810	1,505	540	169	1,047	1,697

Note: NA = data not available; NS = no survey.

Note: 2011 escapements are preliminary because harvest estimates are not completed until around the beginning of the following season.

[a] Canadian Yukon River Mainstem Chinook salmon IMEG (Interim Management Escapement Goal) of 42,500-55,000 was implemented for 2010 and 2011 seasons by the United States and Canada Yukon River Joint Technical Committee (JTC). Estimates from 2005-2011 represent escapement, after subtraction of Canadian harvest.

[b] 2009 aerial surveys of the Shaktoolik River and Boston Creek are rated as incomplete as they were conducted on August 9 and 12, respectively, well after peak Chinook salmon spawning. Several carcasses and moribund Chinook salmon were observed during survey.

[c] 2003, 2004 and 2006 Shaktoolik River surveys and combined Unalakleet and Old Woman rivers surveys (2003 and 2004) are not considered complete as they were conducted well before peak spawn. Surveys during these years were rated as acceptable, but the observer noted difficulty enumerating Chinook salmon due to large numbers of pink salmon.

[d] 2005 Shaktoolik and Unalakleet River drainage surveys were conducted during peak spawning periods but Chinook salmon counts are thought to be underestimated due to large numbers of pink salmon.

[e] 2010 escapement estimate for Unalakleet/Old Woman River is a weir count.

[f] Fishing Branch River fall chum salmon IMEG of 22,000-49,000 was implemented in 2008 by JTC and will be in place through 2010.

[g] Yukon River Mainstem fall chum salmon IMEG of 70,000-104,000 was implemented for 2010 and 2011 seasons by JTC.

[h] In 2008, unable to see chum salmon in the Bonanza, Sinuk and Solomon Rivers because of large number of pink salmon. Arbitrarily assigned 1,000 chum salmon to each river.

[i] Delta Clearwater River coho salmon 2010 escapement index is not a peak count.

[j] Niukluk River coho salmon numbers (all years) are actual tower counts, and do not take into consideration upstream harvest.

Table 4.–Westward Region (Alaska Peninsula/Aleutian Islands, Kodiak, and Chignik areas) Chinook, chum, coho, pink, and sockeye salmon escapement goals and escapements, 2003 to 2011.

	2011 Goal Range			Year	Escapement								
System	Lower	Upper	Type	Implemented	2003	2004	2005	2006	2007	2008	2009	2010	2011
CHINOOK SALMON													
AK Peninsula													
Nelson River	2,400	4,400	BEG	2004	5,154	6,959	4,993	2,516	2,492	5,012	2,048	2,769	NA
Chignik													
Chignik River	1,300	2,700	BEG	2002	6,205	7,633	6,037	3,175	1,675	1,620	1,590	3,373[a]	NA
Kodiak													
Karluk River	3,000	6,000	BEG	2011	6,986	7,228	4,684	3,673	1,697	752	1,306	2,917	3,420
Ayakulik River	4,000	7,000	BEG	2011	17,106	24,425	8,175	2,937	6,232	3,071	2,615	5,291	NA
CHUM SALMON													
AK Peninsula													
Northern District	119,600	239,200	SEG	2007	214,660	139,350	103,675	382,583	243,334	228,537	154,131	145,310	96,952
Northwestern District	100,000	215,000	SEG	2007	236,000	295,600	192,965	193,460	335,450	241,750	84,460	144,100	151,400
Southeastern District[b]	106,400	212,800	SEG	1992	218,810	367,200	412,500	405,300	201,451	277,450	106,500	62,612	145,300
South Central District	89,800	179,600	SEG	1992	79,000	184,800	235,700	119,600	126,000	140,450	18,600	85,600	169,000
Southwestern District	133,400	266,800	SEG	1992	193,030	180,000	317,910	231,935	398,010	171,250	385,730	142,650	176,425
Unimak District	800		lower-bound SEG	2007	200	400	4,200	7,915	1,200	2,800	1,400	1,050	7,000
Chignik													
Entire Chignik Area	57,400		lower-bound SEG	2008	300,325	349,518	308,700	93,489	238,216	197,259	214,959	177,220	278,145
Kodiak													
Mainland District	104,000		lower-bound SEG	2008	114,750	364,395	37,500	346,140	87,350	122,425	83,106	144,715	138,600
Kodiak Archipelago Aggregate	151,000		lower-bound SEG	2008	265,773	168,696	206,755	441,409	206,983	101,482	202,039	155,637	283,530
COHO SALMON													
AK Peninsula													
Nelson River	18,000		lower-bound SEG	2004	28,000	52,500	24,000	19,000	19,000	24,000	22,000	15,000	21,000
Thin Point Lake	3,000		lower-bound SEG	2004	25,000	9,600	17,500	9,750	9,000	3,200	900	NA[c]	200
Ilnik River	9,000		lower-bound SEG	2010	37,000	40,000	NA	31,000	22,000	27,000	NA	19,600	22,000
Chignik													
There are no coho salmon stocks with escapement goals in Chignik Area													
Kodiak													
Pasagshak River	1,200		lower-bound SEG	2011	8,886	3,402	3,773	937	1,896	3,875	2,385	1,971	1,083
Buskin River	3,200	7,200	BEG	2005	12,325	8,384	15,844	11,706	7,697	7,963	9,351	6,808[d]	6,025

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Table 4.–Page 2 of 3.

System	2011 Goal Range Lower	Upper	Type	Year Implemented	Escapement 2003	2004	2005	2006	2007	2008	2009	2010	2011
Olds River	1,000		lower-bound SEG	2011	1,534	1,860	2,495	1,912	868	656	697	127	1,003
American River	400		lower-bound SEG	2011	511	753	339	2,033	307	700	639	58	1,061
PINK SALMON													
AK Peninsula													
Bechevin Bay Section (odd year)	1,600		lower-bound SEG	2004	800		8,720		16,800		72,000		2,400
Bechevin Bay Section (even year)	31,000		lower-bound SEG	2004		84,300		116,075		11,900		13,600	
South Peninsula Total (odd year)	1,637,800	3,275,700	SEG	2007	5,511,220		6,165,634		2,680,213		3,067,000		2,494,950
South Peninsula Total (even year)	1,864,600	3,729,300	SEG	2007		8,311,410		2,862,250		3,338,370		742,912	
Chignik													
Entire Chignik Area (odd year)	500,000	800,000	SEG	2008	1,390,600		1,591,850		1,217,064		869,063		986,248
Entire Chignik Area (even year)	200,000	600,000	SEG	2008		1,114,860		374,826		863,031		330,570	
Kodiak													
Mainland District	250,000	1,000,000	SEG	2011	1,008,550	711,555	268,050	778,200	315,300	236,500	430,100	265,650	273,500
Kodiak Archipelago (odd year)	2,000,000	5,000,000	SEG	2011	4,088,412		3,688,158		2,208,678		4,707,894		2,506,714
Kodiak Archipelago (even year)	3,000,000	7,000,000	SEG	2011		8,074,963		5,086,372		2,924,708		3,378,483	
SOCKEYE SALMON													
AK Peninsula													
Cinder River	12,000	48,000	SEG	2007	102,700	58,050	141,000	101,100	142,000	129,800	133,600	108,900	106,000
Ilnik River	40,000	60,000	SEG	1991	69,000	82,000	154,000	88,000	93,000	44,300	66,000	59,000	43,000
Meshik River	25,000	100,000	SEG	2010	114,000	102,200	111,100	138,010	56,900	83,250	88,000	63,700	93,900
Sandy River	34,000	74,000	SEG	2007	66,000	32,000	101,000	48,000	44,700	32,200	36,000	37,000	37,500
Bear River Early Run	176,000	293,000	SEG	2004	226,201	354,565	332,248	262,995	206,233	125,526	216,237	226,534	207,451
Bear River Late Run	117,000	195,000	SEG	2004	139,799	80,435	221,752	182,005	224,767	195,474	133,263	142,966	132,549
Nelson River	97,000	219,000	BEG	2004	343,511	480,097	303,000	215,000	180,000	141,600	157,000	108,000	89,000
Christianson Lagoon	25,000	50,000	SEG	1980s	52,200	75,400	54,500	41,505	48,100	114,000	48,100	27,900	35,200
Swanson Lagoon	6,000	16,000	SEG	2007	16,100	24,300	2,400	376	9,200	5,500	1,000	1,700	1,000
North Creek	4,400	8,800	SEG	late 1980s	10,200	15,000	45,000	7,530	16,800	38,000	8,000	18,500	10,200
Orzinski Lake	15,000	20,000	SEG	1992	70,690	75,450	44,797	18,000	10,643	36,839	21,457	18,039	16,764
Mortensen Lagoon	3,200	6,400	SEG	late 1980s	16,804	7,215	21,703	14,688	6,200	5,600	25,000	6,600	500
Thin Point Lake	14,000	28,000	SEG	late 1980s	40,000	34,500	21,000	11,510	21,550	18,900	33,500	12,400	14,500
McLees Lake[e]	10,000	60,000	SEG	2010	101,793	40,283	12,097	12,936	21,428	8,661	10,120	32,842	36,602
Chignik													
Chignik River Early Run	350,000	400,000	SEG	2005	350,004	363,800	355,091	366,497	361,091	377,579	391,476	432,535	488,930

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Table 4.–Page 3 of 3.

System	2011 Goal Range		Type	Year Implemented	Escapement								
	Lower	Upper			2003	2004	2005	2006	2007	2008	2009	2010	2011
Chignik River Late Run[f]	200,000	400,000	SEG	2008	334,119	214,459	225,366	368,996	293,883	328,479	328,586	311,291	264,887
Kodiak													
Malina Creek	1,000	10,000	SEG	2005	12,000	9,636	3,180	6,400	1,900	3,690	1,400	4,000	3,800
Afognak (Litnik) River	20,000	50,000	BEG	2005	27,766	15,181	21,577	22,933	21,070	26,874	31,358	52,255	49,193
Little River	3,000		lower-bound SEG	2008	50,500	16,000	3,000	3,500	8,500	2,300	1,500	3,200	3,900
Uganik Lake	24,000		lower-bound SEG	2008	51,000	83,600	7,500	26,700	35,000	64,700	53,700	30,700	37,900
Karluk River Early Run	110,000	250,000	BEG	2008	451,856	393,468	283,860	202,366	294,740	82,191	52,466	70,544	87,049
Karluk River Late Run	170,000	380,000	BEG	2005	626,854	326,466	498,102	288,007	267,185	164,419	277,611	277,558	230,273
Ayakulik River	eliminated			2005	197,892	275,238	251,906	87,780	283,042	162,888	315,184	262,327	
Ayakulik River Early Run	140,000	280,000	SEG	2011	162,708	245,123	139,246	59,315	169,596	96,912	200,648	201,933	177,480
Ayakulik River Late Run	60,000	120,000	SEG	2011	35,184	30,115	112,660	28,465	113,446	65,976	114,536	60,394	83,661
Upper Station River Early Run	25,000		OEG	1999	76,175	78,487	60,349	24,997	31,895	38,800	34,585	42,060	28,759
	43,000	93,000	BEG	2011									
Upper Station River Late Run	120,000	265,000	BEG	2005	200,894	177,108	156,401	153,153	149,709	184,856	161,736	141,139	101,893
Frazer Lake	75,000	170,000	BEG	2008	201,679	120,664	136,948	89,516	120,186	105,363	101,845	94,680	134,642
Saltery Lake	15,000	35,000	BEG	2011	57,993	54,800[h]	28,500[h]	28,000[h]	17,200[h]	49,266	46,591	26,809	30,768
Pasagshak River	3,000		lower-bound SEG	2011	8,000	46,400	22,000	6,300	14,300	14,900	1,400	4,800	13,402[i]
Buskin Lake	5,000	8,000	BEG	2011	23,870	22,023	15,468	17,734	16,502	5,900	7,757	9,800	11,982

Note: NA = data not available.

[a] 2010 Chignik River Chinook salmon escapement is the weir count minus 300 fish for subsistence harvest.

[b] Southeastern District chum salmon escapement goal includes Shumagin Islands Section and Southeastern District Mainland.

[c] Poor survey conditions contributed to the zero aerial survey escapement index for Thin Point Lake coho salmon.

[d] Buskin River coho salmon 2010 escapement is weir count only as SWHS data are not available yet.

[e] McLees Lake sockeye salmon SEG will be in effect if a weir is in place; there will be no goal if a weir is not operated.

[f] The Chignik late-run sockeye escapement objective (July 5 to September 15) includes the late-run sockeye salmon sustainable escapement goal (SEG; 200,000 – 400,000) plus an additional 50,000 sockeye salmon inriver run goal (25,000 in August and 25,000 in September) to meet late season subsistence needs.

[g] 2002, 2004, and 2005 Malina Creek sockeye salmon escapements are weir counts. All other escapements are peak aerial survey indices.

[h] 2004-2007 Saltery Lake sockeye salmon escapements are peak aerial survey indices. All other escapements are weir counts.

[i] 2011 Pasagshak River sockeye salmon escapement is a weir count. All other escapements are peak aerial survey indices.

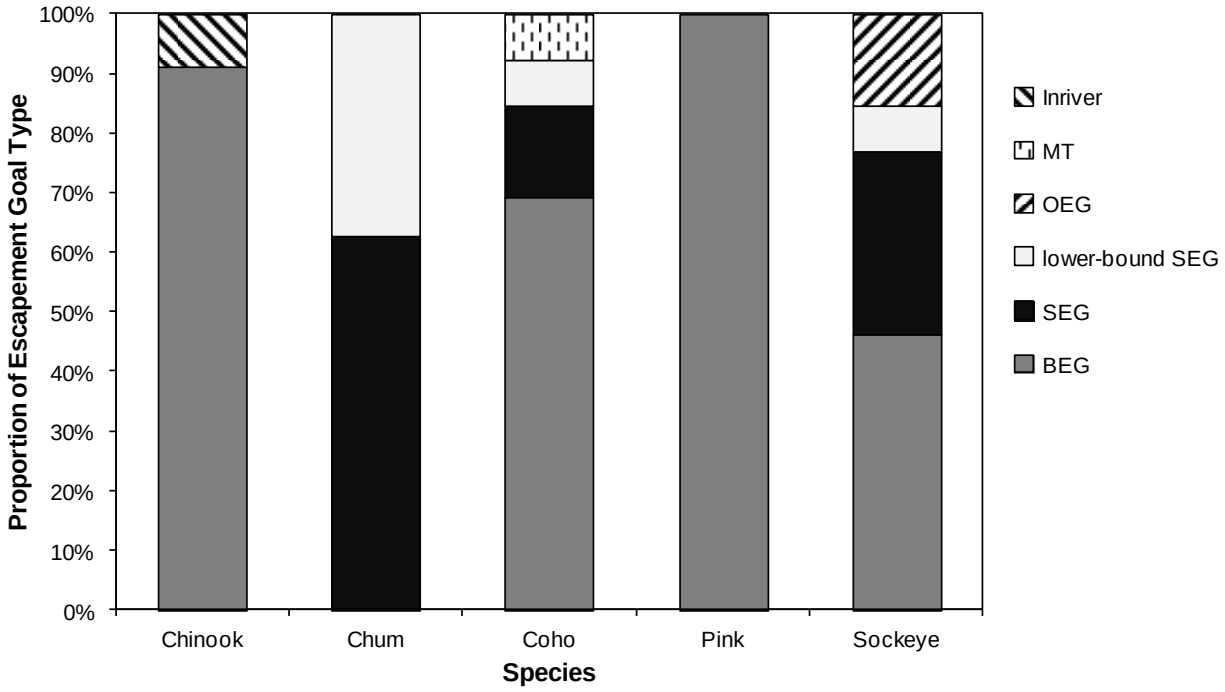

Figure 2.–Proportion of escapement goal types by species for the 50 escapement goals in Southeast Region. BEG is biological escapement goal, SEG is sustainable escapement goal, OEG is optimal escapement goal (set by the Alaska Board of Fisheries), MT is management target and Inriver is an inriver escapement goal (set by Alaska Board of Fisheries).

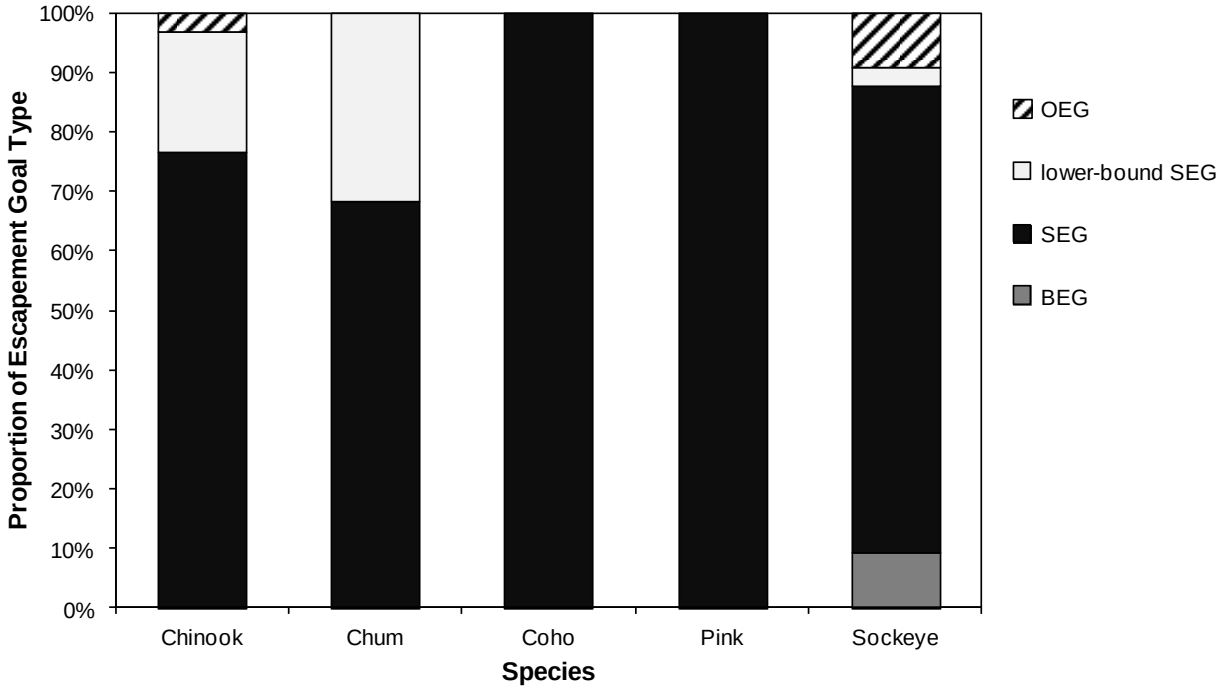

Figure 3.–Proportion of escapement goal types by species for the 105 escapement goals in Central Region (Bristol Bay, Cook Inlet, and Prince William Sound/Copper River). BEG is biological escapement goal, SEG is sustainable escapement goal, and OEG is optimal escapement goal (set by the Alaska Board of Fisheries).

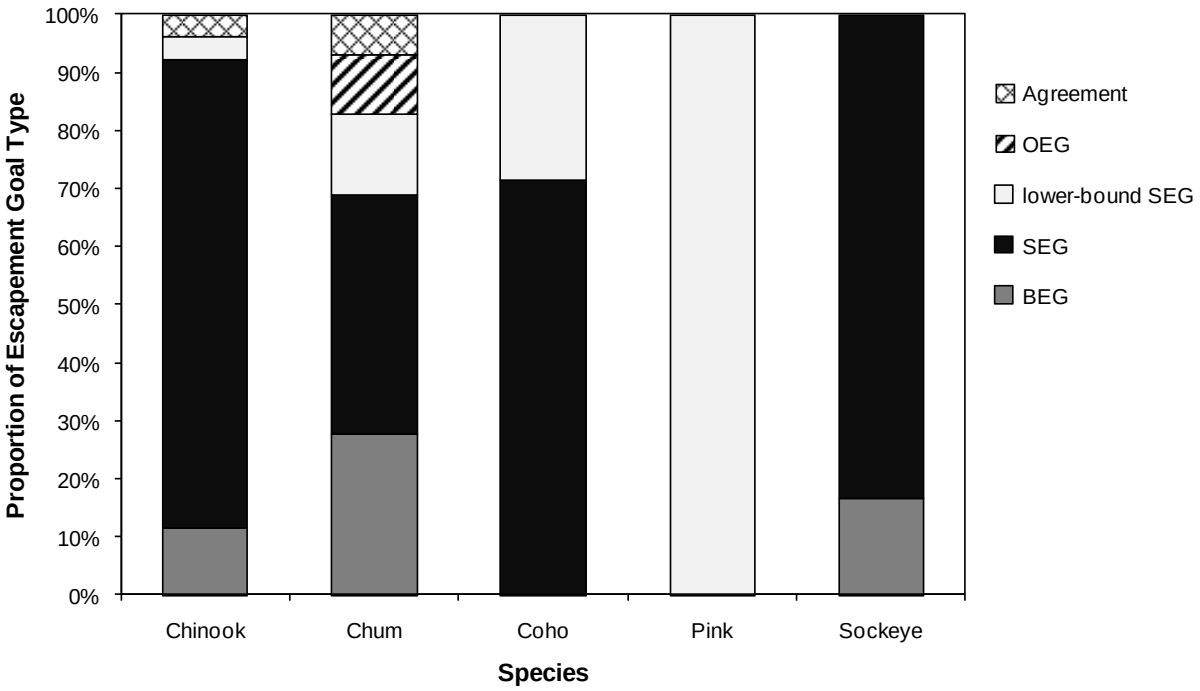

Figure 4.–Proportion of escapement goal types by species for the 73 escapement goals in Arctic-Yukon-Kuskokwim Region. BEG is biological escapement goal, SEG is sustainable escapement goal, OEG is optimal escapement goal (set by the Alaska Board of Fisheries), and agreement goals are established through international treaties.

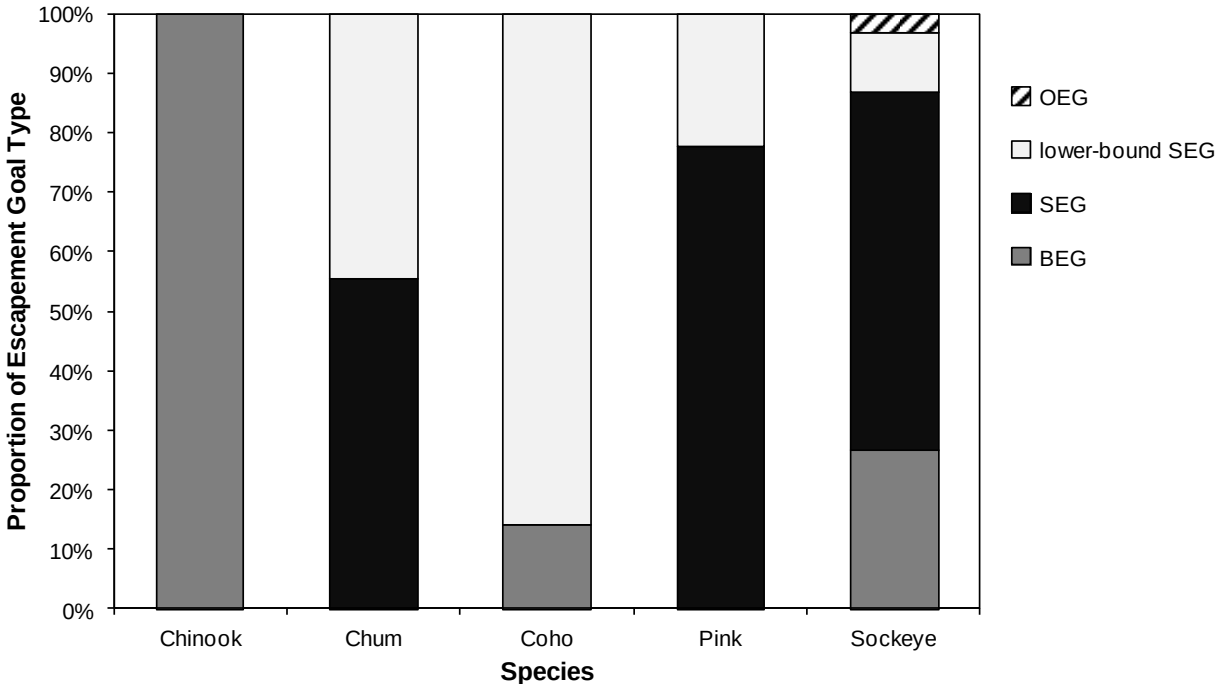

Figure 5.–Proportion of escapement goal types by species for the 59 escapement goals in Westward Region (Alaska Peninsula/Aleutian Islands, Kodiak, and Chignik areas). BEG is biological escapement goal, SEG is sustainable escapement goal, and OEG is optimal escapement goal (set by the Alaska Board of Fisheries).

Table 5.–Assessment of whether escapements met (Met), exceeded (Over), or did not meet (Under) the escapement goal in place at the time of enumeration for salmon stocks in Southeast Region.

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
Chinook salmon	Blossom River	Under	Met	Met	Met	Under	Met	Under	Under	Under
	Keta River	Met	Met	Met	Over	Met	Met	Under	Met	Under
	Unuk River	Met	Met	Met	Met	Met	Met	Met[a]	Over	Met
	Chickamin River	Over	Met	Over	Over	Met	Over	Met	Over	Met
	Andrew Creek	Met	Over	Over	Over	Over	Met	Under	Met	Met
	Stikine River	Over	Over	Over	Met	Met	Met	Under	Met	Met
	King Salmon River	Under	Met	Met	Met	Met	Met	Under	Met	Met
	Taku River	Met	Over	Met	Met	Under	Under	Met[b]	Met	Met
	Chilkat River	Over	Met	Met	Met	Under	Met	Over	Met	Met
	Klukshu (Alsek) River	Met	Over	Under	Under	Under	Under	Met	Met	Met
	Situk River	Over	Met	Met	Met	Met	Under	Met	Under	Under
Chum salmon	Southern Southeast Summer							Under	Under	Met
	Northern Southeast Inside Summer							Under	Under	Under
	Northern Southeast Outside Summer							Under	Met	Met
	Cholmondeley Sound Fall							Met	Over	Over
	Port Camden Fall							Under	Met	Under
	Security Bay Fall							Met	Met	Met
	Excursion River Fall							Under	Met	Under
	Chilkat River Fall							Over	Met	Over
Coho salmon	Hugh Smith Lake	Over	Met	Over	Met	Over	Over	Over[b]	Over	Met
	Taku River	Met	Met	Met	Met	Met	Met	Met	Met	Met
	Auke Creek	Over	Met	Met	Over	Met	Over	Met	Met	Over
	Montana Creek	Over	Met	Met	Met[b]	Under	Met	Met	Met	Met
	Peterson Creek	Met	Met	Met	Over[b]	Met	Over	Met	Over	Met
	Ketchikan Survey Index				Met	Met	Over	Met	Met	Met
	Sitka Survey Index				Over	Over	Over	Over	Over	Over
	Ford Arm Lake	Over	Over	Over	Over	Met	Over	Met	Met	Met
	Berners River	Over	Over	Met	Met	Under	Met	Met	Met	Met
	Chilkat River				Over	Under	Met	Met	Over	Met
	Lost River	Met	Met	Under	Met	Met	NA	Met[c]	Met	Under
	Situk River	Met	Over	Under	Met	Met	NA	Met	Over	Met
	Tsiu/Tsivat Rivers	Over	NA	Met	Met	Met	Met	Met	Met	Met

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Table 5.–Page 2 of 2.

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
Pink salmon	Southern Southeast	Over	Met	Over	Met	Over	Met	Met[d]	Met	Met
	Northern Southeast Inside	Met	Under	Met	Met	Met	Under	Met[d]	Met	Over
	Northern Southeast Outside	Over	Over	Over	Over	Over	Met	Met[d]	Met	Over
	Situk River (even-year)		Over		Over		NA[e]		NA[e]	
	Situk River (odd-year)	Over		Over		Over		Met		Met
Sockeye salmon	Hugh Smith Lake	Over	Over	Over	Over	Over	Under	Met	Met	Over
	McDonald Lake	Over	Under	Under	Under[b]	Under	Under	Under[b]	Met	Met
	Mainstem Stikine River	Over	Met	Met	Met	Met	Under	Met	Met	Met
	Tahltan Lake	Over	Over	Over	Over	Met	Under	Met	Met	Met
	Speel Lake	Met	Met	Met	Met	Under	Under	Under	Met	Met
	Taku River	Over	Over	Over	Over	Over	Under	Met	Over	Over
	Redoubt Lake	Over	Over	Over	Over	Over	Met	Met	Met	Met
	Chilkat Lake	Over	Over	Met	Under[f]	Under	Under	Over[b]	Under	Under
	Chilkoot Lake	Met	Met	Met	Over[b]	Met	Under	Under[b]	Met	Met
	East Alsek-Doame River	Over	Over	Over	Over	Over	Under	Under	Met	Met
	Klukshu River	Over	Met	Under	Met	Met	Under	Under	Over	Over
	Lost River	Over	Met	Met	Met	Under	Under	NA[c]	Met	Met
	Situk River	Over	Met	Met	Over	Met	Under	Over	Met	Over

Note: NA = data not available. Blank cells indicate that there was no official escapement goal for the stock in that particular year.

[a] Prior to 2009 goal was based on index count of escapements.

[b] Escapement goal reevaluated, goal range changed.

[c] Escapement goal reevaluated, upper bound eliminated, lower bound remained the same.

[d] Expansion factor was removed from escapement estimates and escapement goal was reevaluated.

[e] Weir on Situk River was pulled well before peak of pink salmon run, therefore a valid assessment of whether the goal was met is not possible.

[f] Prior to 2006 escapement goal was based on weir counts. From 2006 escapements and escapement goal were based on mark-recapture estimates (see DerHovanisian and Geiger 2005).

Table 6.–Assessment of whether escapements met (Met), exceeded (Over), or did not meet (Under) the escapement goal in place at the time of enumeration for salmon stocks in Central Region (Bristol Bay, Cook Inlet, and Prince William Sound/Copper River).

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
Chinook salmon	***Bristol Bay***									
	Nushagak River	Over	Over	Over	Over	Met[a]	Over	Met	Met	Met
	Togiak River	NS	NS	NS	NS	NS[b]	NS	NS	NS	NS
	Naknek River	Over	Over	NS	NS	Met[b]	Met	Under	NS	NS
	Alagnak River					Met	Under	Under	NS	NS
	Egegik River					Met	Under	Under	NS	NS
	Upper Cook Inlet									
	Alexander Creek	Under	Met	Met	Under	Under	Under	Under	Under	Under
	Campbell Creek	Over	Over	eliminated			Met[c]	Met	Met	Under
	Chuitna River	Met	Over	Met	Met	Under	Under	Under	Under	Under
	Chulitna River	NS	Met	Met	Met	Over	Met	Met	Under	Met
	Clear (Chunilna) Creek	NS	Over	Met	Met	Met	Met	Met	Under	Under
	Crooked Creek	Over	Over	Over	Met	Met	Met	Under	Met	Met
	Deshka River	Over	Over	Over	Over	Met	Under	Under	Met	Met
	Goose Creek	Under	Met	Met	Met	Under	Under	Under	Under	Under
	Kenai River - Early Run	Met	Met	Over[d]	Over	Over	Over	Over	NA	NA
	Kenai River - Late Run	Met	Over	Met	Met	Met	Met	Under	NA	NA
	Lake Creek	Over	Over	Met	Met	Met	Under	Under	Under	Met
	Lewis River	Over	Over	Met	Met	Under	Under	Under	Under	Under
	Little Susitna River	Met	Met	Over	Over	Met	Met	Met	Under	Under
	Little Willow Creek	Met	Over	Met	Met	Met	NC	Met	Met	Met
	Montana Creek	Met	Met	Met	Met	Met	Met	Met	Under	Under
	Peters Creek	Over	Over	Met	Met	Met	NC	Met	NC	Met
	Prairie Creek	Met	Met	Met	Met	Met	Under	Met	Under	Under
	Sheep Creek	NS	Under	Met	Under	Under	NC	Under	NC	Under
	Talachulitna River	Over	Over	Met	Over	Met	Met	Met	Under	Under
	Theodore River	Met	Under	Under	Met	Under	Under	Under	Under	Under
	Willow Creek	Over	Over	Met	Met	Under	Under	Under	Under	Under
	Lower Cook Inlet									
	Anchor River	Under	Over	eliminated			Met[e]	Under	Under	Under[f]
	Deep Creek	Over	Over	Over	Met	Met	Under	Met	Met	Met
	Ninilchik River	Under	Met	Met	Met	Met	Met[g]	Under	Met	Met

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Table 6.–Page 2 of 5.

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Prince William Sound									
	Copper River	Met	Met	Under	Met	Met	Met	Met	Under	Met
Chum salmon	***Bristol Bay***									
	Nushagak River					Under	Met	Met	Met	Met
	Upper Cook Inlet									
	Clearwater Creek	Under	Met	Under	Under	Met	Over	Met	Over	Over
	Lower Cook Inlet									
	Port Graham River	Met	Under	Under	Met	Met	Met	Under	Under	Met
	Dogfish Lagoon	Over	Met	Under	Met	Met	Met	Met	Over	Over
	Rocky River	Over	Over	Over	Over	Met	Met	Met	Met	Met
	Port Dick Creek	Over	Over	Over	Met	Met	Over	Over	Met	Over
	Island Creek	Over	Met	Over	Under	Under	Met	Met	Under	Met
	Big Kamishak River	Met	Over	Over	Over	Met	Under	Met	NS	Under
	Little Kamishak River	Met	Over	Met	Over	Met	Met	Under	Met	Met
	McNeil River	Over	Met	Met	Met	Met	Under[h]	Under	Under	Met
	Bruin River	Over	Over	Over	Met	Under	Over	Met	Met	Under
	Ursus Cove	Over	Over	Over	Over	Over	Met	Over	Over	Over
	Cottonwood Creek	Over	Over	Over	Over	Over	Met	Over	Over	Under
	Iniskin Bay	Over	Over	Over	Over	Under	Over	Over	Over	Under
	Prince William Sound									
	Eastern District	Over	Met	Met	Met[i]	Met	Met	Met	Met	Met
	Northern District	Met	Met	Met	Met[i]	Met	Met	Met	Met	Met
	Coghill District	Met	Met	Met	Met[i]	Met	Met	Met	Met	Met
	Northwestern District	Met	Met	Met	Met[i]	Met	Met	Met	Met	Met
	Southeastern District	Over	Over	Over	Met[i]	Met	Met	Met	Met	Met
Coho salmon	***Upper Cook Inlet***									
	Fish Creek (Knik)	Met	Met	eliminated						Met[c]
	Jim Creek	Over	Over	Over	Over	Over	Over	Over	Under	Under
	Little Susitna River	Met	Over	Met	NA	Met	Over	Under	Under	Under

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Table 6.–Page 3 of 5.

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Prince William Sound									
	Copper River Delta	Over	Over	Over	Over	Met	Over	Met	Met	Met
	Bering River	Met	Met	Over	Over	Over	Met	Met	Met	Met
Pink salmon	***Lower Cook Inlet***									
	Humpy Creek	Over	Met	Over	Met	Met	Over	Under	Met	Under
	China Poot Creek	Met	Met	Over	Met	Met	Met	Under	Under	Met
	Tutka Creek	Over	Over	Over	Over	Under	Met	Under	Under	Over
	Barabara Creek	Met	Met	Over	Met	Over	Over	Met	Over	Over
	Seldovia Creek	Met	Over	Over	Over	Over	Over	Under	Met	Over
	Port Graham River	Met	Over	Over	Over	Over	Over	Met	Met	Over
	Port Chatham	Over	Over	Over	Over	Met	Met	Over	Under	Met
	Windy Creek Right	Over	Over	Over	Over	Over	Over	Over	Met	Under
	Windy Creek Left	Over	Met	Over	Over	Met	Over	Over	Met	Met
	Rocky River	Over	Met	Over	Over	Over	Over	Over	Met	Met
	Port Dick Creek	Over	Under	Over	Met	Met	Met	Met	Met	Under
	Island Creek	Over	Over	Met	Over	Over	Over	Over	Over	Met
	S. Nuka Island Creek	Over	Met	Met	Met	Met	Met	Over	NS	NS
	Desire Lake Creek	Over	Over	Over	Over	Met	Met	Over	Met	Under
	Bear & Salmon Creeks			Over	Met	NS	NS	NS	NS	
	Thumb Cove	Met	Met	Met	Met	NS	NS	NS	NS	
	Humpy Cove	Met	Met	Over	Met	NS	NS	NS	NS	
	Tonsina Creek	Met	Met	Over	Over	NS	NS	NS	NS	
	Bruin River	Met	Met	Met	Over	Over	Met	Over	Met	Under
	Sunday Creek	Over	Over	Over	Over	Over	Met	Over	Met	Under
	Brown's Peak Creek	Over	Met	Over	Over	Over	Met	Over	Met	Under
	Prince William Sound									
	All Districts Combined (even year)		Met		Under		Under		Met	
	All Districts Combined (odd year)	Over		Over		Met		Met		Over
Sockeye salmon	***Bristol Bay***									
	Kvichak River	Under	Under[j]	Met	Met	Met	Met	Met	Met	Met
	Alagnak River	Over	Over	Over	Over	Met[k]	Met	Met	Met	Met
	Naknek River	Over	Over	Over	Over	Over	Over	Met	Over	Met

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Table 6.–Page 4 of 5.

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Egegik River	Met	Met	Over	Over	Over	Met	Met	Met	Met
	Ugashik River	Met	Met	Met	Met	Over	Met	Over	Met	Met
	Wood River	Met	Over	Met	Over	Over	Over	Met	Over	Met
	Igushik River	Met	Under	Over	Over	Over	Over	Over	Over	Over
	Nushagak River	Met	Met	Over	Met	Met	Met	Met	Met	Met
	Togiak River	Over	Met	Met	Over	Met[d]	Met	Over	Met[l]	Met
	Upper Cook Inlet									
	Crescent River	Over	Over	Over[d]	Over	Over	Met	NS	Over	Over
	Fish Creek (Knik)	Over	Met	Under	Met	Met	Under	Over	Over	Met
	Kasilof River	Over	Over	Over	Over	Over	Met	Met	Met	Met
	Kenai River	Met	Over	Over	Over	Met	Under	Under	Met	Met
	Packers Creek	NS	NS	eliminated			Met[c]	Met	NS	NA
	Russian River - Early Run	Met	Over	Over[l]	Over	Met	Met	Over	Met	Met
	Russian River - Late Run	Over	Met	Met[d]	Met	Met	Met	Met	Met	Met
	Yentna River	Over	Under	Under	Met	Under	Met			
	Chelatna Lake							Under	Met	Over
	Judd Lake							Met	Under	Met
	Larson Lake							Met	Met	Under
	Lower Cook Inlet									
	English Bay	Over	Over	Met	Over	Over	Met	Over	Met	Met
	Delight Lake	Met	Met	Over	Met	Over	Over	Over	Over	Over
	Desire Lake	Under	Met	Under	Over	Met	Met	Over	Under	Met
	Bear Lake	Over	Met	Over	Over	Over	Over	Over	Met	Over
	Aialik Lake	Met	Over	Met	Met	Met	Met	Under	Met	Under
	Mikfik Lake	Over	Over	Under	Over	Met	Under	Over	Met	Under
	Chenik Lake	Over	Over	Over	Over	Over	Over	Over	Over	Met
	Amakdedori Creek	Over	Over	Met	Under	Over	Over	Met	Under	Over
	Prince William Sound									
	Upper Copper River	Met	Met	Over	Over	Over	Met	Met	Over	Over
	Copper River Delta	Met	Met	Met	Met	Met	Met	Met	Met	Met
	Bering River	Met	Met	Met	Under	Met	Under	Under	Under	Met
	Coghill Lake	Over	Met	Met	Met[l]	Over	Met	Under	Met	Over
	Eshamy Lake	Met	Under	Met	Over	Under	Under	Met[d]	Met	Met

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Table 6. Page 5 of 5.

Note: NA = data not available; NC = no count; NS = no survey. There are no escapement goals for coho salmon in Bristol Bay or Lower Cook Inlet and there are no pink salmon escapement goals in Bristol Bay or Upper Cook Inlet.

[a] Escapement goal reevaluated, point goal changed to a range.
[b] Escapement goal reevaluated, point goal changed to a lower-bound goal.
[c] Previous escapement goal reinstated.
[d] Escapement goal reevaluated, goal range changed.
[e] Escapement goal from 2001-2004 based on aerial surveys, escapement numbers in Table 2 are not comparable.
[f] Escapement goal reevaluated, lower-bound goal changed to a range.
[g] Escapement goal reevaluated, current goal based on escapement count over longer period during spawning season, escapement numbers in Table 2 are based on longer counting time.
[h] Escapement goal reevaluated, escapement goal in place prior to 2002 was reinstated. Escapement goal in place from 2002 to 2007 was based on escapement estimates using a different aerial survey index expansion method (see Otis and Szarzi 2007).
[i] Escapement goal reevaluated, upper bound eliminated, lower bound remanded the same.
[j] 2004 and 2009 were identified as pre-peak/peak escapement years for Kvichak River sockeye salmon and evaluated against the 6-10 million escapement goal.
[k] Escapement goal reevaluated, goal range changed to a lower bound goal.
[l] Escapement goal reevaluated, goal type changed but goal range remained the same.

Table 7.–Assessment of whether escapements met (Met), exceeded (Over), or did not meet (Under) the escapement goal in place at the time of enumeration for salmon stocks in Arctic-Yukon-Kuskokwim Region.

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
Chinook salmon	***Kuskokwim Area***									
	North (Main) Fork Goodnews River	Met	Met	NS[a]	Over	NS	Met	NS	NS	Met
	Middle Fork Goodnews River	Under	Met	Over[a]	Over	Over[b]	Met	Met	Met	Met
	Kanektok River	Met	Met	Over[a]	Over	NS	Met	NS	Under	NS
	Kogrukluk River	Met	Met	Over[a]	Over	Met	Met	Met	Met	Met
	Kwethluk River	Over	Over	Over	NA	Over[c]	Under	Under	Under	Under
	Tuluksak River					Under	Under	Under	Under	Under
	George River					Met	Under	Met	Under	Under
	Kisaralik River	Under	Met	Over[a]	Over	Met	Met	NS	Under	NS
	Aniak River	Met	Met	NS[a]	Over	Over	Over	NS	NS	NS
	Salmon River (Aniak R)	Met	Met	Over[a]	NS	Over	Met	NS	NS	Under
	Holitna River	NS	Met	Over[a]	Over	NS	Under	NS	Under	NS
	Cheeneetnuk River (Stony R)			Met	Met	NS	Under	Under	NS	Under
	Gagaryah River (Stony R)			Met	Met	Over	Under	Met	Under	Under
	Salmon River (Pitka Fork)	Met	Under	Over[a]	Met	Met	Met	Met	Under	Met
	Yukon River									
	East Fork Andreafsky River	Under	Met	Over[a]	Under	Over	Under	Under	Met[c]	Over
	West Fork Andreafsky River	Met	Under	Met[a]	Met	Met	Under	Over	Met	Met
	Anvik River	Under	Met	Over[a]	Over	Met	Under	Under	Under	Under
	Nulato River (forks combined)	NS	Met	Under[a]	Met	Over	Under	Over	Under	Met
	Gisasa River	NS	Met	Met[a]	Met	Met	Met	Met	eliminated	
	Chena River	Over	Over	Met	Met	Met	Met	Met	Under	
	Salcha River	Over	Over	Met	Over	Met	Met	Over	Met	Met
	Canada Mainstem	Met	Met	Met	Met	Met[d]	Under[d]	Met	Under[d]	Met
	Norton Sound									
	Fish River/Boston Creek	Met	Met	Under[e]	NS	NS	NS	Under	Under	NS
	Kwiniuk River	Over	Over	Met[f]	Under	Under	Under	Met	Under	Under
	North River (Unalakleet R)	Met	Under	Under[b]	Under	Met	Under	Met	Met	Under
	Shaktoolik River	Under	Under	Under[f]	Under	Met	NS	Under	Under	Under
	Unalakleet/Old Woman River	Under	Under	Under[f]	NS	Met	NS	Over	Met	Over

-continued-

Table 7.–Page 2 of 4.

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
Chum salmon	***Kuskokwim Area***									
	Middle Fork Goodnews River	Met	Met	Met[b]	Met	Met	Met	Met	Met	Met
	Kanektok River	NS	NS	NS[b]	NS	NS	NS	NS	NS	NS
	Kogrukluk River	Under	Under	Over[a]	Over	Over	Met	Over	Over	Over
	Aniak River	Met	Met	Over[a]	Over	Over[g]	Met	Met	Met	Met
	Yukon River Summer Chum									
	East Fork Andreafsky River	Under	Under	Under	Met	Met	Under	Under	Met[e]	Met
	Anvik River	Under	Under	Met[b]	Met	Met	Met	Under	Met	Met
	Mainstem Yukon River	Over	Over	Over	Over	Over	Over	Over	Over	Over
	Yukon River Fall Chum									
	Yukon River Drainage	Over	Met	Over	Over	Over	Met	Met	Met[f]	Over
	Tanana River	Over	Over	Over	Over	Over	Over	Over	Over	Over
	Delta River	Over	Over	Over	Over	Over	Over	Met	Over	Over
	Toklat River	Met	Over	NA	NA	NA	NA	NA	eliminated	
	Upper Yukon River Tributaries	Met	Met	Over	Over	Over	Met	NA	Met	Over
	Chandalar River	Over	Met	Over	Over	Over	Over	Met	Over	Over
	Sheenjek River	Under	Under	Over	Over	Met	Met	Met	Under	Met
	Fishing Branch River (Canada)	Under	Under	Over	Under	Under	Under[d]	Met	Under	Under
	Yukon R. Mainstem (Canada)	Met	Met	Met	Met	Met	Met	Met	Over[d]	Over
	Norton Sound									
	Subdistrict 1 Aggregate	Under	Met	Over	Over	Over	Met	Under	Over	Over
	Sinuk River	Under	Under	Met[f]	Met	Over	Under	Under	eliminated	
	Nome River	Under	Met	Over[f]	Over	Over	Under	Under	Over	Met
	Bonanza River	Under	Under	Over[f]	Under	Over	Under	Over	eliminated	
	Snake River	Met	Met	Over[f]	Over	Over	Under	Under	Over	Over
	Solomon River	Under	Met	Over[f]	Over	Over	Under	Under	eliminated	
	Flambeau River	Under	Over	Over[f]	Over	Over	Over	Under	eliminated	
	Eldorado River	Under	Under	Over[f]	Over	Over	Met	Under	Over	Over
	Niukluk River			Under	Under	Met	Under	Under	Met[b]	Met
	Kwiniuk River	Met	Under	Met	Over	Over	Under	Under	Over	Over
	Tubutuluk River	Under	NS	Under	NS	Under	NS	Under	Met	Met
	Unalakleet/Old Woman River	NS	NS	Under[f]	NS	Under	NS	Over	Over	Over

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Table 7.–Page 3 of 4.

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Kotzebue Sound									
	Kotzebue Sound Aggregate									
	Noatak and Eli Rivers	NS	Under	NS[f]	Under	NS[b]	Over	Met	NS	NA
	Upper Kobuk w/ Selby River	Met	Over	NS[f]	Over	NS[b]	Over	Over	NS	NA
	Salmon River	NS	NS	NS[f]	NS	NS[b]	NS	NS	NS	NA
	Tutuksuk River	NS	NS	Met[f]	NS	NS[b]	NS	NS	NS	NA
	Squirrel River	NS	NS	NS[f]	NS	NS[b]	NS	NS	NS	NA
Coho salmon	***Kuskokwim Area***									
	Middle Fork Goodnews River			Met	Met	Met	Met	Met	Met	Met
	Kogrukluk River	Met	Met	Met[a]	Met	Met	Over	Met	Met	Met
	Kwethluk River								NA	NA
	Yukon River									
	Delta Clearwater River	Met	Met	Over[a]	Met	Met	Met	Met	Met	Met
	Norton Sound									
	Kwiniuk River	Met	Met	NS[f]	NS	Over	Over	NS	Over	Over
	Niukluk River	NS	Met	NS	NS	Met[h]	Over	Over	Over[b]	Met
	North River (Unalakleet R.)	NS	Over	Over[f]	NS	Over	Over	Over	Over	Over
Pink salmon	***Norton Sound***									
	Nome River (odd year)			Met		Met		Met		Met
	Nome River (even year)		Over	[i]	Met		Met		Met	
	Kwiniuk River	Over	Over	Met[i]	Met	Met	Met	Met	Met	Met
	Niukluk River	Over	Over	Met[i]	Met	Met	Met	Met	Met	Met
	North River	Over	Over	Met[i]	Met	Met	Met	Met	Met	Met
Sockeye salmon	***Kuskokwim Area***									
	North (Main) Fork Goodnews River	Met	Met	NS[a]	Over	NS	Over	NS	NS	Met
	Middle Fork Goodnews River	Met	Met	Over[a]	Over	Over[b]	Over	Met	Met	Under
	Kanektok River	Met	Met	Over[a]	Over	NS	Over	NS	Met	NS
	Kogrukluk River								Met	Met

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Table 7.–Page 4 of 4.

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Norton Sound									
	Salmon Lake/Grand Central River	Over	Over	Over[f]	Over	Over	Over	Under	Under	Met
	Glacial Lake	Met	Met	Over[f]	Over	Met	Under	Under	Met	Over

Note: NA = data not available; NS =no survey; ND = not determined yet. There are no escapement goals for pink salmon in Kuskokwim Area and Yukon River and there are no escapement goals for sockeye salmon in Yukon River.

[a] Escapement goal reevaluated, lower-bound goal changed to a range.

[b] Escapement goal reevaluated, goal value changed.

[c] Previous escapement goal was based on aerial surveys, replaced with escapement goal based on weir counts. Escapements in Table 3 are weir counts.

[d] Escapement goal revised by The United States and Canada Yukon River Joint Technical Committee (JTC).

[e] Escapement goal reevaluated, goal range changed to a lower-bound goal.

[f] Escapement goal reevaluated, goal type changed but goal value remained the same.

[g] Previous escapement goal was based on Bendix and Biosonics sonar counts, replaced with escapement goal based on DIDSON sonar counts. Escapements in Table 3 are in DIDSON units (see Molyneaux & Brannian 2006).

[h] Prior to 2007 escapement goal was based on escapements enumerated by aerial surveys of Niukluk and Ophir rivers. Escapements in Table 3 are weir counts.

[i] Escapement goal reevaluated, point goal changed to a lower-bound goal.

Table 8.–Assessment of whether escapements met (Met), exceeded (Over), or did not meet (Under) the escapement goal in place at the time of enumeration for salmon stocks in Westward Region (Alaska Peninsula/Aleutian Islands, Kodiak, and Chignik areas).

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
Chinook salmon	***AK Peninsula***									
	Nelson River	Met	Over[a]	Over	Met	Met	Over	Under	Met	NA
	Chignik									
	Chignik River	Over	Over	Over	Over	Met	Met	Met	Over	NA
	Kodiak									
	Karluk River	Met	Met	Met	Met	Under	Under	Under	Under	Met[a]
	Ayakulik River	Over	Over	Met	Under	Met	Under	Under	Met	NA[a]
Chum salmon	***AK Peninsula***									
	Northern District	Met	Met	Under	Over	Over[b]	Met	Met	Met	Under
	Northwestern District	Met	Over[a]	Met	Met	Over[b]	Over	Under	Met	Met
	Southeastern District	Over	Over	Over	Over	Met	Over	Met	Under	Met
	South Central District	Under	Over	Over	Met	Met	Met	Under	Under	Met
	Southwestern District	Met	Met	Over	Met	Over	Met	Over	Met	Met
	Unimak District	Under	Under[b]	Met	Met	Met[c]	Met	Met	Met	Met
	Chignik									
	Entire Chignik Area						Met[d]	Met	Met	Met
	Kodiak									
	Mainland District	Under	Met	Under[e]	Met	Under	Met[f]	Under	Met	Met
	Kodiak Archipelago Aggregate						Under[d]	Met	Met	Met
Coho salmon	***AK Peninsula***									
	Nelson River	Over	Met[c]	Met	Met	Met	Met	Met	Under	Met
	Thin Point Lake	Over	Met[c]	Met	Met	Met	Met	Under	NA	Under
	Ilnik River	Over	eliminated						Met[g]	Met
	Kodiak									
	Pasagshak River	Over	Over	Over[a]	Under	Met	Over	Met	Met	Under[c]
	Buskin River	Over	Met	Over[a]	Over	Over	Over	Over	Met	Met
	Olds River	Over	Over	Over[a]	Met	Under	Under	Under	Under	Met[c]
	American River	Over	Over	Under[a]	Over	Under	Met	Met	Under	Met[c]

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Table 8.–Page 2 of 3.

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
Pink salmon	***AK Peninsula***									
	Bechevin Bay Section (odd year)	Under	[e]	Met		Met		Met		Met
	Bechevin Bay Section (even year)		Met[e]		Met		Under		Under	
	South Peninsula Total (odd year)		[d]	Over		Met[b]		Met		Met
	South Peninsula Total (even year)		Over[d]		Met	[b]	Met		Under	
	Chignik									
	Entire Chignik Area (odd year)			Over[d]		Over	[a]	Over		Over
	Entire Chignik Area (even year)			[d]	Met		Over[a]		Met	
	Kodiak									
	Mainland District	Over	Met	Met[h]	Over	Met	Under	Met	Met	Met[l]
	Kodiak Archipelago (odd year)			Met[d]		Met		Met		Met[n]
	Kodiak Archipelago (even year)				Over		Met		Met	[n]
Sockeye salmon	***AK Peninsula***									
	Cinder River	Over	Over	Over	Over	Over[a]	Over	Over	Over	Over
	Ilnik River	Over	Over	Over	Over	Over	Met	Over	Met	Met
	Meshik River	Over	Over	Over	Over	Met[a]	Over	Over	Met[a]	Met
	Sandy River	Over	Under	Over	Met	Met[a]	Under	Met	Met	Met
	Bear River Early Run	Over	Over[a]	Over	Met	Met	Under	Met	Met	Met
	Bear River Late Run	Over	Under[a]	Over	Met	Over	Over	Met	Met	Met
	Nelson River	Over	Over[a]	Over	Met	Met	Met	Met	Met	Under
	Christianson Lagoon	Over	Over	Over	Met	Met	Over	Met	Met	Met
	Swanson Lagoon	Over	Over	Under	Under	Met[a]	Under	Under	Under	Under
	North Creek	Over	Over	Over	Met	Over	Over	Met	Over	Over
	Orzinski Lake	Over	Over	Over	Met	Under	Over	Over	Met	Met
	Mortensen Lagoon	Over	Over	Over	Over	Met	Met	Over	Over	Under
	Thin Point Lake	Over	Over	Met	Under	Met	Met	Over	Under	Met
	McLees Lake	Over	eliminated[i]						Met[g]	Met
	Chignik									
	Chignik River Early Run	Met	Met	Met[b]	Met	Met	Met	Met	Over	Over
	Chignik River Late Run	Over	Met	Met	Over	Over	Met[a]	Met	Met	Met

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Table 8.–Page 3 of 3.

Species	System	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Kodiak									
	Malina Creek	Met	Met	Met[a]	Met	Met	Met	Met	Met	Met
	Afognak (Litnik) River	Under	Under	Met[a]	Met	Met	Met	Met	Over	Met
	Little River	Over	Met	eliminated			Under[j]	Under	Met	Met
	Uganik Lake	Met	Over	eliminated			Met[j]	Met	Met	Met
	Karluk River Early Run	Over	Over	Over[a]	Met	Over	Under[a]	Under	Under	Under
	Karluk River Late Run	Over	Under	Over[a]	Met	Met	Under	Met	Met	Met
	Ayakulik River	Under	Met	Met	Under	Met	Under	Met	Met	
	Ayakulik River Early Run									Met[k]
	Ayakulik River Late Run									Met[k]
	Upper Station River Early Run	Met	Met	Met[a]	Under	Met	Met	Met	Met	Met
	Upper Station River Late Run	Over	Met	Met[a]	Met	Met	Met	Met	Met	Under
	Frazer Lake	Over	Under	Met[a]	Met	Met	Met[a]	Met	Met	Met
	Saltery Lake	Over	Over	Met	Met	Met	Over	Over	Met	Under[l]
	Pasagshak River	Over	Over	Over[a]	Met	Over	Over	Under	Met	Met[c]
	Buskin Lake	Over	Over	Over	Over	Over	Under	Under	Met	Over[m]

Note: There are no coho salmon escapement goals in Chignik Area.
[a] Escapement goal reevaluated, goal range changed.
[b] Escapement goal reevaluated, goal type changed but goal range remained the same.
[c] Escapement goal reevaluated, upper bound eliminated, lower bound remained the same.
[d] Aggregate goal established to replace individual district level goals.
[e] Escapement goal reevaluated, goal range changed to a lower bound goal.
[f] Escapement goal reevaluated, lower bound goal changed.
[g] Goal reestablished. New analysis.
[h] Separate odd and even year goals were discontinued and a single goal established.
[i] Escapement goal prior to elimination in 2004 was based on escapement indices enumerated by peak aerial surveys, escapements on Table 4 are weir counts.
[j] Previous escapement goal reestablished.
[k] Single escapement goal was changed to separate early- and late-run escapement goals.
[l] Escapement goal reevaluated, upper bound of goal changed.
[m] Escapement goal reevaluated, goal type and range changed.
[n] Single escapement goal was separated into odd- and even-year escapement goals.

Table 9.–Southeast Region Chinook, chum, coho, pink, and sockeye salmon escapements compared to escapement goals for the years 2003 to 2011.

	2003	2004	2005	2006	2007	2008	2009	2010	2011
CHINOOK SALMON									
Number Below	2	0	1	1	4	3	5	2	3
Number Met	5	7	7	7	6	7	5	7	8
Number Above	4	4	3	3	1	1	1	2	0
% Below	18	0	9	9	36	27	45	18	27
% Met	45	64	64	64	55	64	45	64	73
% Above	36	36	27	27	9	9	9	18	0
CHUM SALMON									
Number Below							5	2	3
Number Met							2	5	3
Number Above							1	1	2
% Below							63	25	38
% Met							25	63	38
% Above							13	13	25
COHO SALMON									
Number Below	0	0	2	0	3	0	0	0	1
Number Met	4	6	6	8	8	5	11	8	10
Number Above	6	3	2	5	2	6	2	5	2
% Below	0	0	20	0	23	0	0	0	8
% Met	40	67	60	62	62	45	85	62	77
% Above	60	33	20	38	15	55	15	38	15

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Table 9.–Page 2 of 2.

	2003	2004	2005	2006	2007	2008	2009	2010	2011
PINK SALMON									
Number Below	0	1	0	0	0	1	0	0	0
Number Met	1	1	1	2	1	2	4	3	2
Number Above	3	2	3	2	3	0	0	0	2
% Below	0	25	0	0	0	33	0	0	0
% Met	25	25	25	50	25	67	100	100	50
% Above	75	50	75	50	75	0	0	0	50
SOCKEYE SALMON									
Number Below	0	1	2	2	4	12	5	1	1
Number Met	2	6	6	4	5	1	5	10	8
Number Above	11	6	5	7	4	0	2	2	4
% Below	0	8	15	15	31	92	42	8	8
% Met	15	46	46	31	38	8	42	77	62
% Above	85	46	38	54	31	0	17	15	31

Note: Blank cells indicate that there were no official escapement goals for that species in those particular years.

Table 10.–Central Region (Bristol Bay, Cook Inlet, Prince William Sound/Copper River) Chinook, chum, coho, pink, and sockeye salmon escapements compared to escapement goals for the years 2003 to 2011.

	2003	2004	2005	2006	2007	2008	2009	2010	2011
CHINOOK SALMON									
Number Below	4	2	2	2	7	12	16	15	14
Number Met	9	9	16	17	18	12	12	7	10
Number Above	11	16	6	5	2	2	1	0	0
% Below	17	7	8	8	26	46	55	68	58
% Met	38	33	67	71	67	46	41	32	42
% Above	46	59	25	21	7	8	3	0	0
CHUM SALMON									
Number Below	1	1	3	2	4	2	3	3	4
Number Met	6	8	6	10	13	13	12	10	11
Number Above	11	9	9	6	2	4	4	5	4
% Below	6	6	17	11	21	11	16	17	21
% Met	33	44	33	56	68	68	63	56	58
% Above	61	50	50	33	11	21	21	28	21
COHO SALMON									
Number Below	0	0	0	0	0	0	1	2	2
Number Met	3	2	1	0	2	1	2	2	3
Number Above	2	3	3	3	2	3	1	0	0
% Below	0	0	0	0	0	0	25	50	40
% Met	60	40	25	0	50	25	50	50	60
% Above	40	60	75	100	50	75	25	0	0

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Table 10.–Page 2 of 2.

	2003	2004	2005	2006	2007	2008	2009	2010	2011
PINK SALMON									
Number Below	0	1	0	1	1	1	4	3	7
Number Met	8	12	4	8	8	9	4	12	5
Number Above	13	8	18	13	9	8	10	2	5
% Below	0	5	0	5	6	6	22	18	41
% Met	38	57	18	36	44	50	22	71	29
% Above	62	38	82	59	50	44	56	12	29
SOCKEYE SALMON									
Number Below	2	4	4	2	2	5	5	4	3
Number Met	13	13	12	10	13	18	15	19	20
Number Above	14	12	13	17	14	7	11	8	8
% Below	7	14	14	7	7	17	16	13	10
% Met	45	45	41	34	45	60	48	61	65
% Above	48	41	45	59	48	23	35	26	26

Table 11.–Arctic-Yukon-Kuskokwim Region Chinook, chum, coho, pink, and sockeye salmon escapements compared to escapement goals for the years 2003 to 2011.

	2003	2004	2005	2006	2007	2008	2009	2010	2011
CHINOOK SALMON									
Number Below	6	5	5	4	2	13	7	15	10
Number Met	10	14	8	8	13	10	10	7	8
Number Above	4	4	10	9	7	1	4	0	2
% Below	30	22	22	19	9	54	33	68	50
% Met	50	61	35	38	59	42	48	32	40
% Above	20	17	43	43	32	4	19	0	10
SUMMER CHUM SALMON									
Number Below	9	6	3	3	2	7	10	0	0
Number Met	5	6	4	2	2	5	3	4	5
Number Above	0	2	9	10	11	3	4	7	6
% Below	64	43	19	20	13	47	59	0	0
% Met	36	43	25	13	13	33	18	36	45
% Above	0	14	56	67	73	20	24	64	55
YUKON RIVER SUMMER CHUM SALMON									
Number Below	2	2	1	0	0	1	2	0	0
Number Met	0	0	1	2	2	1	0	2	2
Number Above	1	1	1	1	1	1	1	1	1
% Below	67	67	33	0	0	33	67	0	0
% Met	0	0	33	67	67	33	0	67	67
% Above	33	33	33	33	33	33	33	33	33
YUKON RIVER FALL CHUM SALMON									
Number Below	2	2	0	1	1	1	0	2	1
Number Met	3	4	1	1	2	4	6	2	1
Number Above	4	3	7	6	5	3	1	4	6

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Table 11.–Page 2 of 2.

	2003	2004	2005	2006	2007	2008	2009	2010	2011
% Below	22	22	0	13	13	13	0	25	13
% Met	33	44	13	13	25	50	86	25	13
% Above	44	33	88	75	63	38	14	50	75
COHO SALMON									
Number Below	0	0	0	0	0	0	0	0	0
Number Met	3	4	2	3	4	2	3	3	4
Number Above	0	1	2	0	2	4	2	3	2
% Below	0	0	0	0	0	0	0	0	0
% Met	100	80	50	100	67	33	60	50	67
% Above	0	20	50	0	33	67	40	50	33
PINK SALMON									
Number Below	0	0	0	0	0	0	0	0	0
Number Met	0	0	4	4	4	4	4	4	4
Number Above	3	4	0	0	0	0	0	0	0
% Below	0	0	0	0	0	0	0	0	0
% Met	0	0	100	100	100	100	100	100	100
% Above	100	100	0	0	0	0	0	0	0
SOCKEYE SALMON									
Number Below	0	0	0	0	0	1	2	1	1
Number Met	4	4	0	0	1	0	1	4	3
Number Above	1	1	4	5	2	4	0	0	1
% Below	0	0	0	0	0	20	67	20	20
% Met	80	80	0	0	33	0	33	80	60
% Above	20	20	100	100	67	80	0	0	20

Table 12.–Westward Region (Alaska Peninsula/Aleutian Islands, Kodiak, and Chignik areas) Chinook, chum, coho, pink, and sockeye salmon escapements compared to escapement goals for the years 2003 to 2011.

	2003	2004	2005	2006	2007	2008	2009	2010	2011
CHINOOK SALMON									
Number Below	0	0	0	1	1	2	3	1	0
Number Met	2	1	2	2	3	1	1	2	1
Number Above	2	3	2	1	0	1	0	1	0
% Below	0	0	0	25	25	50	75	25	0
% Met	50	25	50	50	75	25	25	50	100
% Above	50	75	50	25	0	25	0	25	0
CHUM SALMON									
Number Below	3	1	2	0	1	1	3	2	1
Number Met	3	3	2	5	3	6	5	7	8
Number Above	1	3	3	2	3	2	1	0	0
% Below	43	14	29	0	14	11	33	22	11
% Met	43	43	29	71	43	67	56	78	89
% Above	14	43	43	29	43	22	11	0	0
COHO SALMON									
Number Below	0	0	1	1	2	1	2	3	2
Number Met	0	3	2	3	3	3	3	3	5
Number Above	7	3	3	2	1	2	1	0	0
% Below	0	0	17	17	33	17	33	50	29
% Met	0	50	33	50	50	50	50	50	71
% Above	100	50	50	33	17	33	17	0	0

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	2003	2004	2005	2006	2007	2008	2009	2010	2011
PINK SALMON									
Number Below	1	0	0	0	0	2	0	2	0
Number Met	0	2	3	3	4	2	4	3	4
Number Above	1	1	2	2	1	1	1	0	1
% Below	50	0	0	0	0	40	0	40	0
% Met	0	67	60	60	80	40	80	60	80
% Above	50	33	40	40	20	20	20	0	20
SOCKEYE SALMON									
Number Below	2	5	1	4	1	8	5	3	6
Number Met	4	7	10	16	17	12	16	21	20
Number Above	23	16	15	6	8	8	7	5	4
% Below	7	18	4	15	4	29	18	10	20
% Met	14	25	38	62	65	43	57	72	67
% Above	79	57	58	23	31	29	25	17	13

Table 13.–Summary of Southeast Region salmon escapements compared against escapement goals for the years 2003 to 2011.

Southeast Region		2003	2004	2005	2006	2007	2008	2009	2010	2011
Stocks with Escapement Data		38	37	38	41	41	38	48	48	49
Below Lower Goal										
	Number	2	2	5	3	11	16	15	5	8
	Percent	5%	5%	13%	7%	27%	42%	31%	10%	16%
Goal Met										
	Number	12	20	20	21	20	15	27	33	31
	Percent	32%	54%	53%	51%	49%	39%	56%	69%	63%
Above Upper Goal										
	Number	24	15	13	17	10	7	6	10	10
	Percent	63%	41%	34%	41%	24%	18%	13%	21%	20%

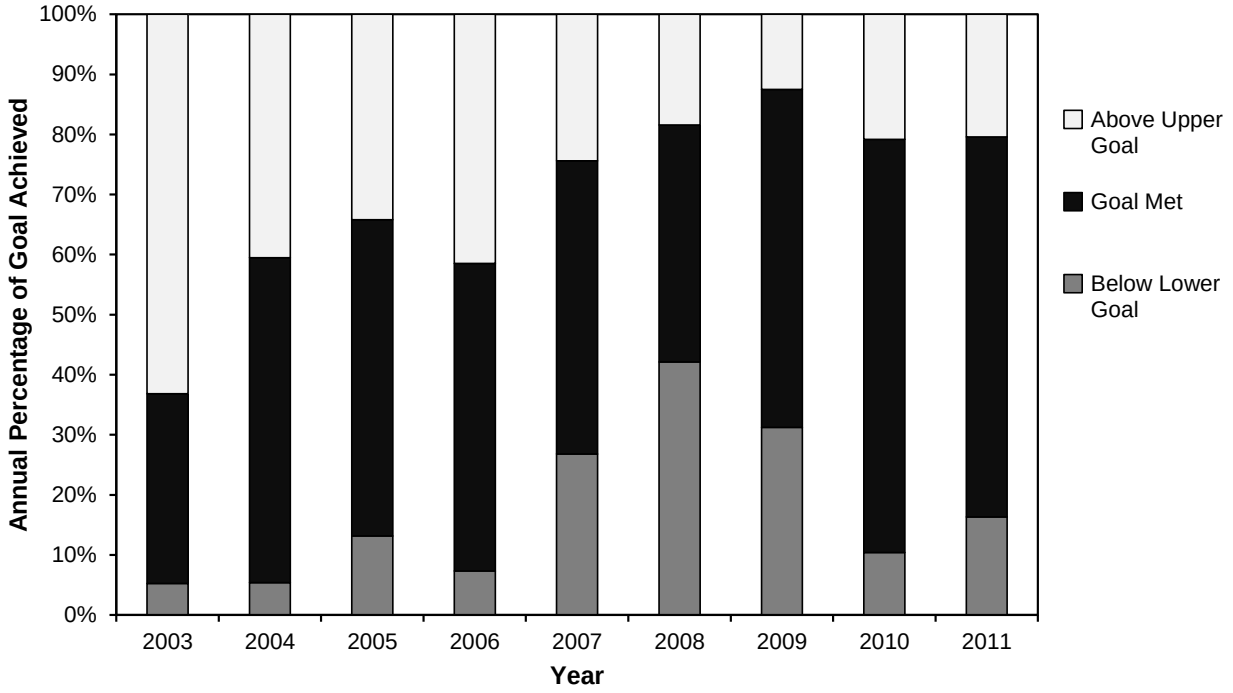

Figure 6.–Southeast Region salmon escapements compared against escapement goals for the years 2003 to 2011.

Table 14.–Summary of Central Region (Bristol Bay, Cook Inlet, Prince William Sound/Copper River) salmon escapements compared against escapement goals for the years 2003 to 2011.

Central Region		2003	2004	2005	2006	2007	2008	2009	2010	2011
Stocks with Escapement Data		97	100	97	96	97	97	101	92	96
Below Lower Goal										
	Number	7	8	9	7	14	20	29	27	30
	Percent	7%	8%	9%	7%	14%	21%	29%	29%	31%
Goal Met										
	Number	39	44	39	45	54	53	45	50	49
	Percent	39%	44%	40%	47%	56%	55%	45%	54%	51%
Above Upper Goal										
	Number	51	48	49	44	29	24	27	15	17
	Percent	52%	48%	51%	46%	30%	25%	27%	16%	18%

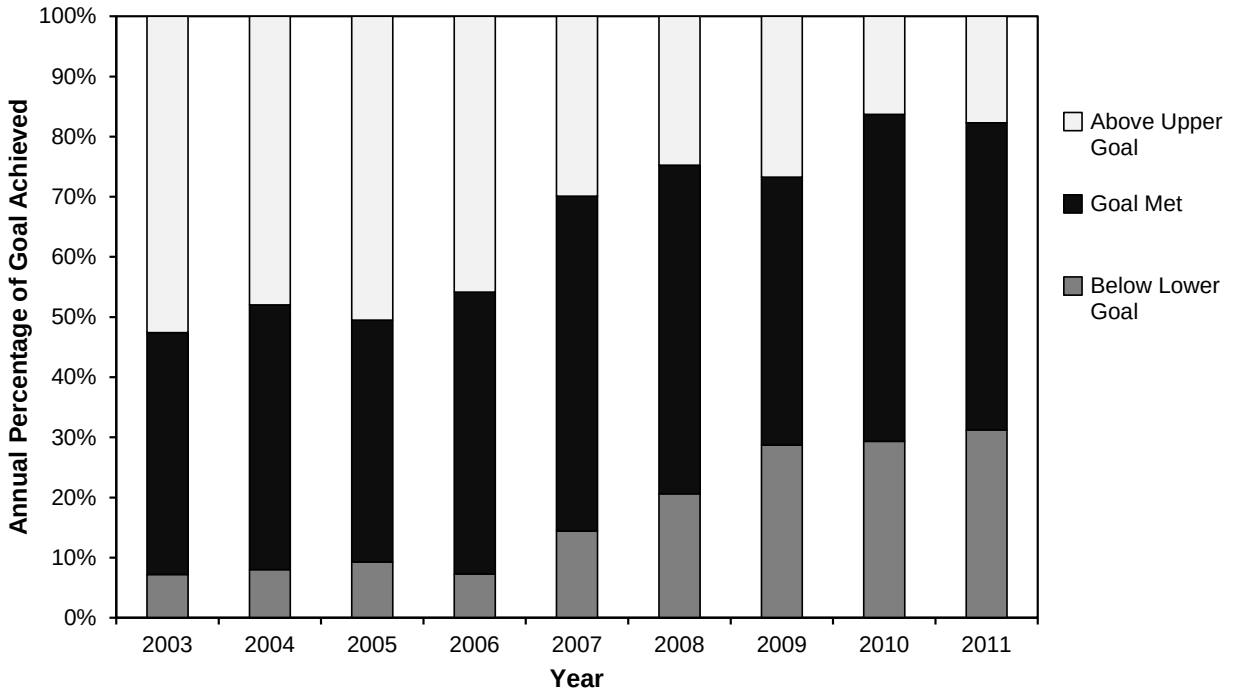

Figure 7.–Central Region (Bristol Bay, Cook Inlet, Prince William Sound/Copper River) salmon escapements compared against escapement goals for the years 2003 to 2011.

Table 15.–Summary of Arctic-Yukon-Kuskokwim Region salmon escapements compared against escapement goals for the years 2003 to 2011.

AYK Region		2003	2004	2005	2006	2007	2008	2009	2010	2011
Stocks with Escapement Data		57	63	62	59	61	65	60	59	57
Below Lower Goal										
	Number	19	15	9	8	5	23	21	18	12
	Percent	33%	24%	15%	14%	8%	35%	35%	31%	21%
Goal Met										
	Number	25	32	20	20	28	26	27	26	27
	Percent	44%	51%	32%	34%	46%	40%	45%	44%	47%
Above Upper Goal										
	Number	13	16	33	31	28	16	12	15	18
	Percent	23%	25%	53%	53%	46%	25%	20%	25%	32%

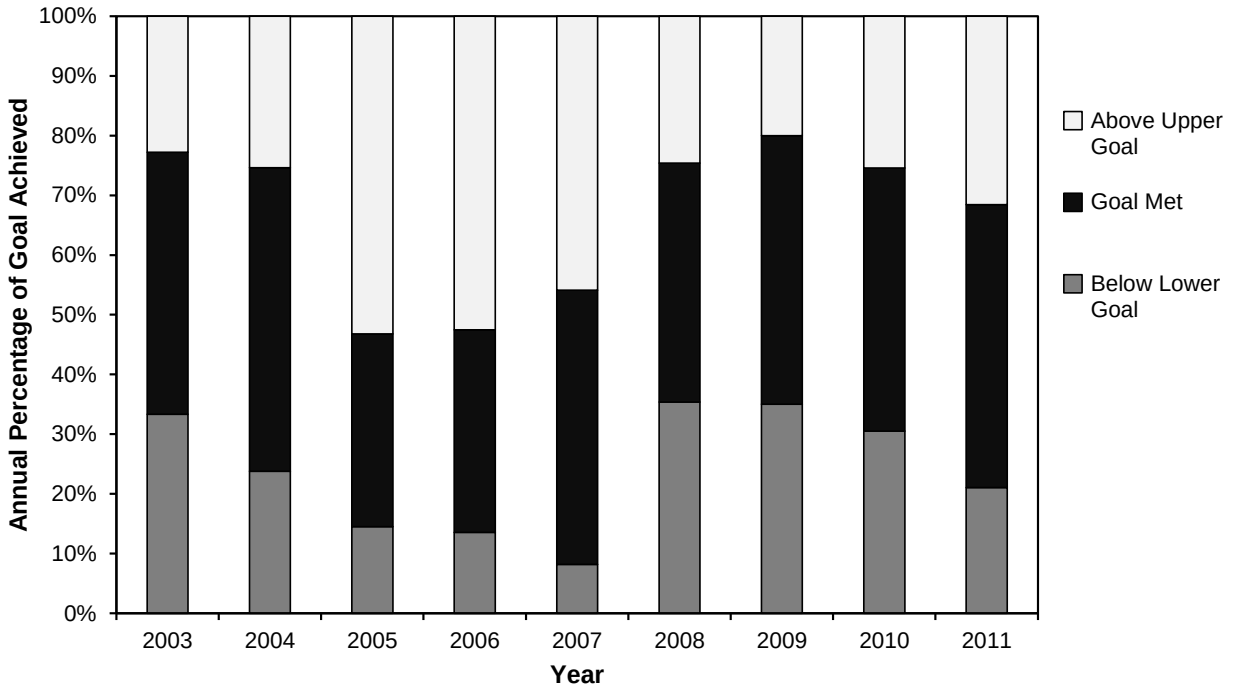

Figure 8.–Arctic-Yukon-Kuskokwim Region salmon escapements compared against escapement goals for the years 2003 to 2011.

Table 16.–Summary of Westward Region (Alaska Peninsula/Aleutian Islands, Kodiak, and Chignik areas) salmon escapements compared against escapement goals for the years 2003 to 2011.

Westward Region		2003	2004	2005	2006	2007	2008	2009	2010	2011
Stocks with Escapement Data		49	48	48	48	48	52	52	53	52
Below Lower Goal										
	Number	6	6	4	6	5	14	13	11	9
	Percent	12%	13%	8%	13%	10%	27%	25%	21%	17%
Goal Met										
	Number	9	16	19	29	30	24	29	36	38
	Percent	18%	33%	40%	60%	63%	46%	56%	68%	73%
Above Upper Goal										
	Number	34	26	25	13	13	14	10	6	5
	Percent	69%	54%	52%	27%	27%	27%	19%	11%	10%

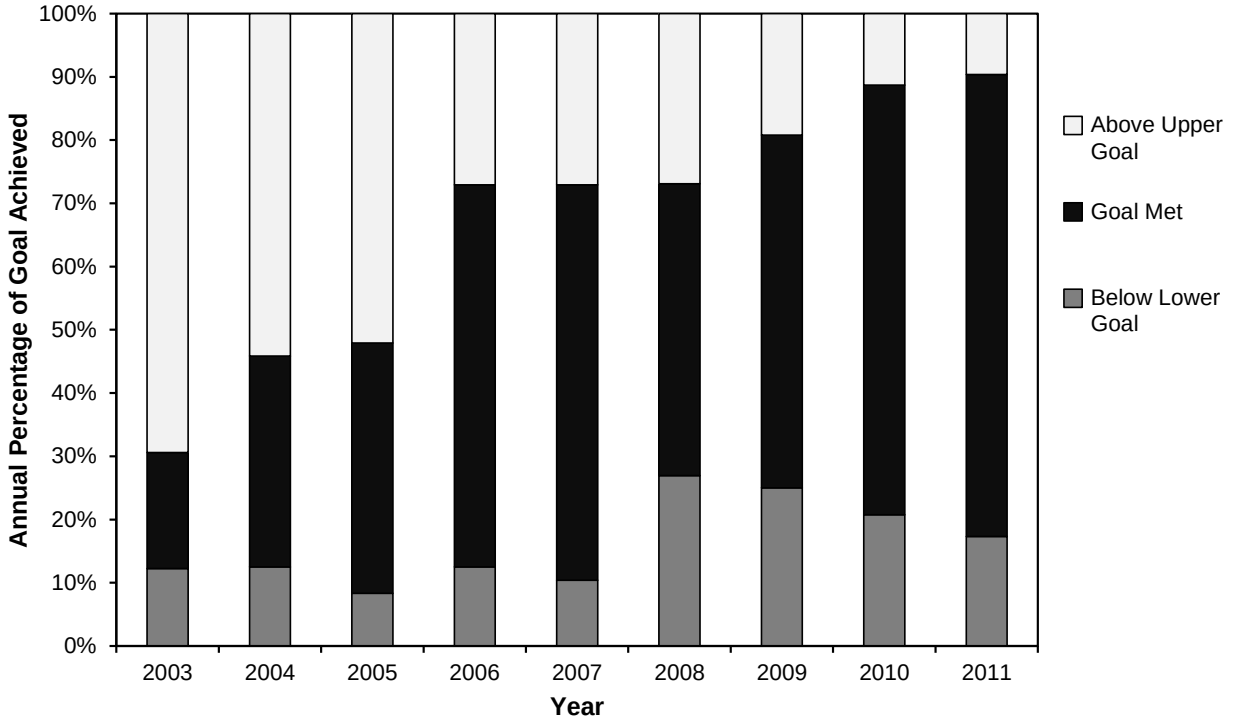

Figure 9.–Westward Region (Alaska Peninsula/Aleutian Islands, Kodiak, and Chignik areas) salmon escapements compared against escapement goals for the years 2003 to 2011.

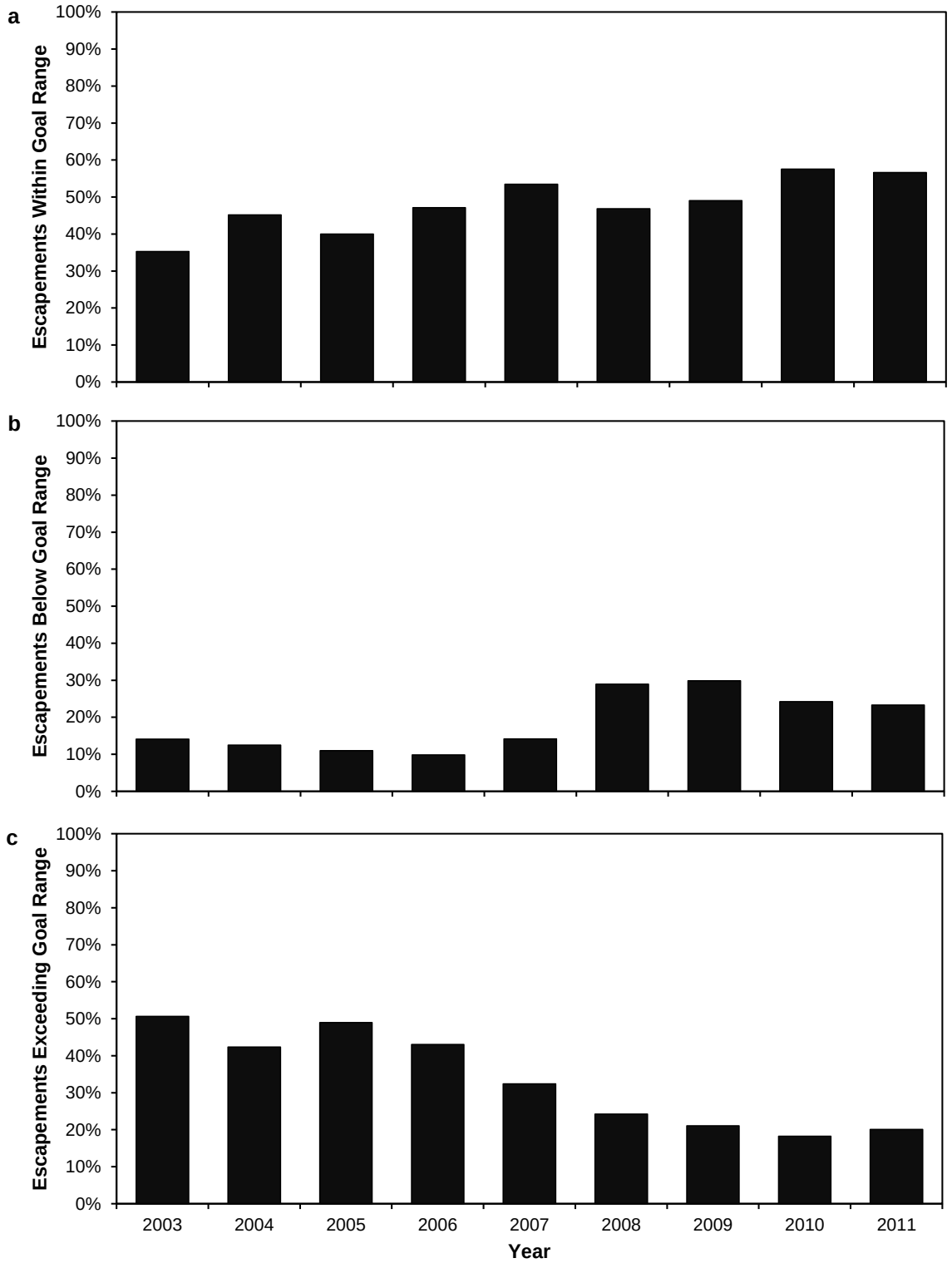

Figure 10.–Statewide summary by year of percentage of escapements that a) met the escapement goal (i.e. within goal range or above lower bound), b) were below lower bound of goal, or c) exceeded upper bound of goal range for the years 2003 to 2011.

Table 17.–Statewide summary of salmon stocks of concern in Alaska.

Region	System	Species	Year Designated[a]	Level of Concern	Year Last Reviewed[a]
Southeast	McDonald Lake	Sockeye	2008	Management	2011[b]
Central	Kvichak River	Sockeye	2000	Yield	2009
	Susitna (Yentna) River	Sockeye	2007	Yield	2010
	Chuitna River	Chinook	2010	Management	2010
	Theodore River	Chinook	2010	Management	2010
	Lewis River	Chinook	2010	Management	2010
	Alexander Creek	Chinook	2010	Management	2010
	Willow Creek	Chinook	2010	Yield	2010
	Goose Creek	Chinook	2010	Yield	2010
Westward	Karluk River	Chinook	2010	Management	2010
AYK-	Yukon River	Chinook	2000	Yield	2009
	Norton Sound Sub-district 5 & 6	Chinook	2003	Yield	2009
	Norton Sound Sub-district 1, 2, & 3	Chum	2000	Yield	2009

[a] Indicates start of Board of Fisheries cycle in which stock of concern was designated or last reviewed (e.g. 2011/2012 BOF cycle = 2011).

[b] The stock of concern designation for McDonald Lake sockeye was removed at the February 2012 Board of Fisheries meeting for Southeast Region.

Table 18.–Methods used to enumerate and develop escapement goals for Southeast Region Chinook, chum, coho, pink, and sockeye salmon stocks.

System	Enumeration Method	Goal Development Method
CHINOOK SALMON		
Blossom River	Peak Aerial Survey[a]	SRA[b]
Keta River	Peak Aerial Survey	SRA
Unuk River	Mark-Recapture	SRA
Chickamin River	Peak Aerial Survey	SRA
Andrew Creek	Peak Aerial Survey (Expanded)	SRA
Stikine River	Mark-Recapture	SRA
King Salmon River	Peak Aerial Survey (Expanded)	SRA
Taku River	Mark-Recapture	SRA
Chilkat River	Mark-Recapture	Theoretical SRA
Klukshu (Alsek) River	Weir Count	SRA
Situk River	Weir Count	SRA
CHUM SALMON		
Southern Southeast Summer	Peak Aerial Survey	Percentile
Northern Southeast Inside Summer	Peak Aerial Survey	Percentile
Northern Southeast Outside Summer	Peak Aerial Survey	Percentile
Cholmondeley Sound Fall	Peak Aerial Survey	Percentile
Port Camden Fall	Peak Aerial Survey	Risk Analysis
Security Bay Fall	Peak Aerial Survey	Percentile
Excursion River Fall	Peak Aerial Survey	Percentile
Chilkat River Fall	Mark-Recapture, Fish Wheel	SRA
COHO SALMON		
Hugh Smith Lake	Weir Count	SRA
Taku River	Mark-Recapture	Agreement[c], SRA
Auke Creek	Weir Count	SRA
Montana Creek	Foot Survey	Theoretical SRA
Peterson Creek	Foot Survey	Theoretical SRA
Ketchikan Survey Index	Peak Aerial Survey	Theoretical SRA
Sitka Survey Index	Foot Survey	Theoretical SRA
Ford Arm Lake	Weir Count	SRA
Berners River	Mark-Recapture	SRA
Chilkat River	Mark-Recapture, Foot Survey	SRA
Lost River	Foot Survey	SRA
Situk River	Peak Aerial Survey	SRA
Tsiu/Tsivat Rivers	Peak Aerial Survey	SRA
PINK SALMON		
Southern Southeast	Peak Aerial Survey	Yield Analysis
Northern Southeast Inside	Peak Aerial Survey	Yield Analysis
Northern Southeast Outside	Peak Aerial Survey	Yield Analysis
Situk River (even-year)	Weir Count	SRA
Situk River (odd-year)	Weir Count	SRA

-continued-

Table 18.–Page 2 of 2.

System	Enumeration Method	Goal Development Method
SOCKEYE SALMON		
Hugh Smith Lake	Weir Count	Risk Analysis, Theoretical SRA
McDonald Lake	Expanded Foot Survey	SRA
Mainstem Stikine River	Run Reconstruction	Professional Judgement[c]
Tahltan Lake	Weir Count	SRA
Speel Lake	Weir Count	SRA
Taku River	Mark-Recapture	Professional Judgement[c]
Redoubt Lake	Weir Count	SRA
Chilkat Lake	Sonar, Mark-Recapture	SRA
Chilkoot Lake	Weir Count	SRA
East Alsek-Doame River	Peak Aerial Survey	SRA
Klukshu River	Weir Count	SRA
Lost River	Foot/Boat Survey	Percentile
Situk River	Weir Count	SRA

[a] One or more aerial surveys are attempted during the peak of the run. Peak count is used to index the escapement.
[b] SRA = Spawner-recruit analysis.
[c] Transboundary Technical Committee, Pacific Salmon Commission.

Table 19.–Methods used to enumerate and develop escapement goals for Central Region (Bristol Bay, Cook Inlet, and Prince William Sound/Copper River) Chinook, chum, coho, pink, and sockeye salmon stocks.

System	Enumeration Method	Goal Development Method
CHINOOK SALMON		
Bristol Bay		
Nushagak River	Sonar	SRA[a], Yield Analysis
Togiak River	Single Aerial Survey[b]	Risk Analysis
Naknek River	Single Aerial Survey	Risk Analysis
Alagnak River	Single Aerial Survey	Risk Analysis
Egegik River	Single Aerial Survey	Risk Analysis
Upper Cook Inlet		
Alexander Creek	Single Aerial Survey	Percentile
Campbell Creek	Single Foot Survey	Risk Analysis
Chuitna River	Single Aerial Survey	Percentile
Chulitna River	Single Aerial Survey	Percentile
Clear (Chunilna) Creek	Single Aerial Survey	Percentile
Crooked Creek	Weir Count	Percentile
Deshka River	Weir Count	SRA
Goose Creek	Single Aerial Survey	Percentile
Kenai River - Early Run	Sonar	SRA
Kenai River - Late Run	Sonar	SRA
Lake Creek	Single Aerial Survey	Percentile
Lewis River	Single Aerial Survey	Percentile
Little Susitna River	Single Aerial Survey	Percentile
Little Willow Creek	Single Aerial Survey	Percentile
Montana Creek	Single Aerial Survey	Percentile
Peters Creek	Single Aerial Survey	Percentile
Prairie Creek	Single Aerial Survey	Percentile
Sheep Creek	Single Aerial Survey	Percentile
Talachulitna River	Single Aerial Survey	Percentile
Theodore River	Single Aerial Survey	Percentile
Willow Creek	Single Aerial Survey	Percentile
Lower Cook Inlet		
Anchor River	Sonar, Weir Count	SRA
Deep Creek	Single Aerial Survey	Percentile
Ninilchik River	Weir Count	Percentile
Prince William Sound		
Copper River	Mark-Recapture	Empirical Observation
CHUM SALMON		
Bristol Bay		
Nushagak River	Sonar	Risk Analysis
Upper Cook Inlet		
Clearwater Creek	Peak Aerial Survey[c]	Percentile
Lower Cook Inlet		
Port Graham River	Multiple Foot Surveys[d]	Percentile
Dogfish Lagoon	Multiple Foot Surveys	Percentile

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Table 19.–Page 2 of 3.

System	Enumeration Method	Goal Development Method
Rocky River	Multiple Foot Surveys	Percentile
Port Dick Creek	Multiple Aerial or Foot Surveys	Percentile
Island Creek	Multiple Aerial or Foot Surveys	Percentile
Big Kamishak River	Multiple Aerial Surveys	Percentile
Little Kamishak River	Multiple Aerial Surveys	Percentile
McNeil River	Multiple Aerial Surveys	Percentile
Bruin River	Multiple Aerial Surveys	Percentile
Ursus Cove	Multiple Aerial Surveys	Percentile
Cottonwood Creek	Multiple Aerial Surveys	Percentile
Iniskin Bay	Multiple Aerial Surveys	Percentile
Prince William Sound		
Eastern District	Multiple Aerial Surveys	Risk Analysis
Northern District	Multiple Aerial Surveys	Risk Analysis
Coghill District	Multiple Aerial Surveys	Risk Analysis
Northwestern District	Multiple Aerial Surveys	Risk Analysis
Southeastern District	Multiple Aerial Surveys	Risk Analysis
COHO SALMON		
Bristol Bay		
There are no coho salmon stocks with escapement goals in Bristol Bay		
Upper Cook Inlet		
Fish Creek (Knik)	Weir Count	Percentile
Jim Creek	Single Foot Survey	Percentile
Little Susitna River	Weir Count	Percentile
Lower Cook Inlet		
There are no coho salmon stocks with escapement goals in Lower Cook Inlet		
Prince William Sound		
Copper River Delta	Peak Aerial Survey	Percentile
Bering River	Peak Aerial Survey	Percentile
PINK SALMON		
Bristol Bay		
There are no pink salmon stocks with escapement goals in Bristol Bay		
Upper Cook Inlet		
There are no pink salmon stocks with escapement goals in Upper Cook Inlet		
Lower Cook Inlet		
Humpy Creek	Multiple Foot Surveys	Percentile
China Poot Creek	Multiple Foot Surveys	Percentile
Tutka Creek	Multiple Foot Surveys	Percentile
Barabara Creek	Multiple Foot Surveys	Percentile
Seldovia Creek	Multiple Foot Surveys	Percentile
Port Graham River	Multiple Foot Surveys	Percentile
Port Chatham	Multiple Foot Surveys	Percentile
Windy Creek Right	Multiple Foot Surveys	Percentile
Windy Creek Left	Multiple Foot Surveys	Percentile
Rocky River	Multiple Foot Surveys	Percentile
Port Dick Creek	Multiple Aerial or Foot Surveys	Percentile

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System	Enumeration Method	Goal Development Method
Island Creek	Multiple Aerial or Foot Surveys	Percentile
S. Nuka Island Creek	Multiple Aerial or Foot Surveys	Percentile
Desire Lake Creek	Multiple Aerial Surveys	Percentile
Bruin River	Multiple Aerial Surveys	Percentile
Sunday Creek	Multiple Aerial Surveys	Percentile
Brown's Peak Creek	Multiple Aerial Surveys	Percentile
Prince William Sound		
All Districts Combined (even year)	Multiple Aerial Surveys	Yield Analysis
All Districts Combined (odd year)	Multiple Aerial Surveys	Yield Analysis
SOCKEYE SALMON		
Bristol Bay		
Kvichak River	Tower Count	SRA, Yield Analysis
Alagnak River	Tower Count	Risk Analysis
Naknek River	Tower Count	SRA, Yield Analysis
Egegik River	Tower Count	SRA, Yield Analysis
Ugashik River	Tower Count	SRA, Yield Analysis
Wood River	Tower Count	SRA, Yield Analysis
Igushik River	Tower Count	SRA, Yield Analysis
Nushagak River	Sonar	SRA, Yield Analysis
Togiak River	Tower Count	SRA, Yield Analysis
Upper Cook Inlet		
Crescent River	Sonar	SRA
Fish Creek (Knik)	Weir Count	Percentile
Kasilof River	Sonar	SRA
Kenai River	Sonar	Brood Interaction Simulation Model
Packers Creek	Weir Count	Percentile
Russian River - Early Run	Weir Count	Percentile
Russian River - Late Run	Weir Count	Percentile
Chelatna Lake	Weir Count	Percentile
Judd Lake	Weir Count	Percentile
Larson Lake	Weir Count	Percentile
Lower Cook Inlet		
English Bay	Peak Aerial Survey, Weir Count	Percentile
Desire Lake	Peak Aerial Survey, Weir Count	Percentile
Bear Lake	Weir Count	Percentile
Aialik Lake	Peak Aerial Survey	Percentile
Mikfik Lake	Peak Aerial Survey	Percentile
Amakdedori Creek	Peak Aerial Survey	Percentile
Prince William Sound		
Upper Copper River	Sonar	Percentile
Copper River Delta	Peak Aerial Survey	Percentile
Bering River	Peak Aerial Survey	Percentile
Coghill Lake	Weir Count	SRA
Eshamy Lake	Weir Count	SRA

[a] SRA = Spawner-recruit analysis.
[b] Single survey done around time of presumed peak of the run with no expansion of counts.
[c] Multiple aerial surveys are attempted throughout the run. Peak count is used to index the escapement.
[d] Multiple surveys throughout run (at least 1 per week). Area under the curve method (AUC) used to estimate annual escapement.

Table 20.–Methods used to enumerate and develop escapement goals for Arctic-Yukon-Kuskokwim Region Chinook, chum, coho, pink, and sockeye salmon stocks.

System	Enumeration Method	Goal Development Method
CHINOOK SALMON		
Kuskokwim Area		
North (Main) Fork Goodnews River	Single Aerial Survey[a]	Percentile
Middle Fork Goodnews River	Weir Count	SRA[b]
Kanektok River	Single Aerial Survey	Percentile
Kogrukluk River	Weir Count	Percentile
Kwethluk River	Weir Count	Percentile
Tuluksak River	Weir Count	Percentile
George River	Weir Count	Percentile
Kisaralik River	Single Aerial Survey	Percentile
Aniak River	Single Aerial Survey	Percentile
Salmon River (Aniak R)	Single Aerial Survey	Percentile
Holitna River	Single Aerial Survey	Percentile
Cheeneetnuk River (Stony R)	Single Aerial Survey	Percentile
Gagaryah River (Stony R)	Single Aerial Survey	Percentile
Salmon River (Pitka Fork)	Single Aerial Survey	Percentile
Yukon River		
East Fork Andreafsky River	Weir Count	Percentile
West Fork Andreafsky River	Peak Aerial Survey[c]	Percentile
Anvik River	Peak Aerial Survey	Percentile
Nulato River (forks combined)	Peak Aerial Survey	Percentile
Chena River	Tower, Mark-Recapture	SRA
Salcha River	Tower, Mark-Recapture	SRA
Canada Mainstem	Sonar	Agreement (U.S./Canada Joint Technical Committee)
Norton Sound		
Fish River/Boston Creek	Peak Aerial Survey	Percentile
Kwiniuk River	Tower Count	SRA
North River (Unalakleet R)	Tower Count	Percentile
Shaktoolik River	Peak Aerial Survey	Theoretical SRA
Unalakleet/Old Woman River	Peak Aerial Survey	Theoretical SRA
CHUM SALMON		
Kuskokwim Area		
Middle Fork Goodnews River	Weir Count	Percentile
Kanektok River	Single Aerial Survey	Percentile
Kogrukluk River	Weir Count	Percentile
Aniak River	Sonar	Percentile
Yukon River Summer Chum		
East Fork Andreafsky River	Weir Count	SRA
Anvik River	Sonar	SRA
Mainstem Yukon River	NA	NA
Yukon River Fall Chum		
Yukon River Drainage	Calculated - Multiple Surveys	SRA
Tanana River	Mark-Recapture	SRA

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System	Enumeration Method	Goal Development Method
Delta River	Multiple Foot Surveys	Proportion of Tanana River Goal
Upper Yukon River Tributaries	Sonar & Weir Count	SRA
Chandalar River	Sonar	Proportion of Upper Yukon River Tributaries Goal
Sheenjek River	Sonar	Proportion of Upper Yukon River Tributaries Goal
Fishing Branch River (Canada)	Weir Count	Agreement (U.S./Canada Joint Technical Committee) IMEG Percentile
Yukon R. Mainstem (Canada)	Mark-Recapture	Agreement (U.S./Canada Joint Technical Committee) IMEG SRA
Norton Sound		
Subdistrict 1 Aggregate	Calculated - Multiple Surveys	SRA
Nome River	Weir Count	Proportion of Aggregate Goal
Snake River	Tower/Weir Count	Proportion of Aggregate Goal
Eldorado River	Peak Aerial Survey (Expanded)	Proportion of Aggregate Goal
Niukluk River	Tower Count	Risk Analysis
Kwiniuk River	Tower Count	SRA
Tubutuluk River	Peak Aerial Survey (Expanded)	SRA
Unalakleet/Old Woman River	Peak Aerial Survey	Empirical Observation
Kotzebue Sound		
Kotzebue Sound Aggregate	Peak Aerial Survey (Expanded)	SRA
Noatak and Eli Rivers	Peak Aerial Survey	Proportion of Aggregate Goal
Upper Kobuk w/ Selby River	Peak Aerial Survey	Proportion of Aggregate Goal
Salmon River	Peak Aerial Survey	Proportion of Aggregate Goal
Tutuksuk River	Peak Aerial Survey	Proportion of Aggregate Goal
Squirrel River	Peak Aerial Survey	Proportion of Aggregate Goal
COHO SALMON		
Kuskokwim Area		
Middle Fork Goodnews River	Weir Count	Percentile
Kogrukluk River	Weir Count	Percentile
Kwethluk River	Weir Count	Empirical Observation
Yukon River		
Delta Clearwater River	Boat Survey	Percentile
Norton Sound		
Kwiniuk River	Peak Aerial Survey	Theoretical SRA
Niukluk River	Tower Count	Percentile
North River (Unalakleet R.)	Peak Aerial Survey	Theoretical SRA
PINK SALMON		
Kuskokwim Area		
There are no escapement goals for pink salmon in the Kuskokwim Management Area.		
Yukon River		
There are no escapement goals for pink salmon in the Yukon River drainage.		
Norton Sound		
Nome River (odd year)	Weir Count	Empirical Observation
Nome River (even year)	Weir Count	Empirical Observation

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Table 20.–Page 3 of 3.

System	Enumeration Method	Goal Development Method
Kwiniuk River	Tower Count	Empirical Observation
Niukluk River	Tower Count	Empirical Observation
North River	Tower Count	Empirical Observation
SOCKEYE SALMON		
Kuskokwim Area		
North (Main) Fork Goodnews River	Single Aerial Survey	Percentile
Middle Fork Goodnews River	Weir Count	SRA
Kanektok River	Single Aerial Survey	Percentile
Kogrukluk River	Weir Count	Percentile
Yukon River		
There are no escapement goals for Sockeye in the Yukon River drainage.		
Norton Sound		
Salmon Lake/Grand Central River	Peak Aerial Survey	Empirical Observation
Glacial Lake	Peak Aerial Survey	Empirical Observation

Note: NA = data not available.
[a] Typically single survey done around time of presumed peak of the run with no expansion of counts.
[b] SRA = Spawner-recruit analysis.
[c] One or more aerial surveys are attempted during the peak of the run. Peak count is used to index the escapement.

Table 21.–Methods used to enumerate and develop escapement goals for Westward Region (Alaska Peninsula/Aleutian Islands, Kodiak, and Chignik areas) Chinook, chum, coho, pink, and sockeye salmon stocks.

System	Enumeration Method	Goal Development Method
CHINOOK SALMON		
AK Peninsula		
Nelson River	Weir, Peak Aerial Survey[a]	Spawning Habitat Model, SRA[b]
Chignik		
Chignik River	Weir Count	SRA
Kodiak		
Karluk River	Weir Count	SRA
Ayakulik River	Weir Count	SRA
CHUM SALMON		
AK Peninsula		
Northern District	Peak Aerial Survey	SRA
Northwestern District	Peak Aerial Survey	SRA
Southeastern District	Peak Aerial Survey	Percentile
South Central District	Peak Aerial Survey	Percentile
Southwestern District	Peak Aerial Survey	Percentile
Unimak District	Peak Aerial Survey	Risk Analysis
Chignik		
Entire Chignik Area	Peak Aerial Survey	Risk Analysis
Kodiak		
Mainland District	Peak Aerial Survey	Percentile, Risk Analysis
Kodiak Archipelago Aggregate	Peak Aerial Survey	Percentile
COHO SALMON		
AK Peninsula		
Nelson River	Peak Aerial Survey	Risk Analysis
Thin Point Lake	Peak Aerial Survey	Empirical Observation
Ilnik River	Peak Aerial Survey	Risk Analysis
Chignik		
There are no coho salmon stocks with escapement goals in Chignik Area		
Kodiak		
Pasagshak River	Foot Survey	Theoretical SRA
Buskin River	Weir Count	SRA
Olds River	Foot Survey	Theoretical SRA
American River	Foot Survey	Theoretical SRA
PINK SALMON		
AK Peninsula		
Bechevin Bay Section (odd year)	Peak Aerial Survey	Risk Analysis
Bechevin Bay Section (even year)	Peak Aerial Survey	Risk Analysis
South Peninsula Total (odd year)	Peak Aerial Survey	SRA
South Peninsula Total (even year)	Peak Aerial Survey	SRA
Chignik		
Entire Chignik Area (odd year)	Peak Aerial Survey	Yield Analysis
Entire Chignik Area (even year)	Peak Aerial Survey	Yield Analysis

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Table 21.–Page 2 of 2.

System	Enumeration Method	Goal Development Method
Kodiak		
Mainland District	Peak Aerial Survey	Conditional Sustained Yield Analysis
Kodiak Archipelago (odd year)	Peak Aerial Survey	SRA
Kodiak Archipelago (even year)	Peak Aerial Survey	SRA
SOCKEYE SALMON		
AK Peninsula		
Cinder River	Peak Aerial Survey	Percentile
Ilnik River	Weir Count	Percentile, Euphotic Volume Model, Zooplankton Model
Meshik River	Peak Aerial Survey	Percentile
Sandy River	Weir Count	Percentile
Bear River Early Run	Weir Count	Spawning Habitat Model, Percentile, Euphotic Volume Model, Zooplankton Model, Lake Surface Area
Bear River Late Run	Weir Count	Spawning Habitat Model, Percentile, Euphotic Volume Model, Zooplankton Model, Lake Surface Area
Nelson River	Weir Count	SRA
Christianson Lagoon	Peak Aerial Survey	Spawning Habitat Model
Swanson Lagoon	Peak Aerial Survey	Percentile
North Creek	Peak Aerial Survey	Percentile
Orzinski Lake	Weir Count	Percentile
Mortensen Lagoon	Peak Aerial Survey	Spawning Habitat Model, Percentile, Euphotic Volume Model, Zooplankton Model, Lake Surface Area
Thin Point Lake	Peak Aerial Survey	Spawning Habitat Model, Percentile, Euphotic Volume Model, Zooplankton Model, Lake Surface Area
McLees Lake	Weir Count	Percentile
Chignik		
Chignik River Early Run	Weir Count	Yield Analysis, Euphotic Volume Model, Zooplankton Model
Chignik River Late Run	Weir Count	SRA, Euphotic Volume Model, Zooplankton Model
Kodiak		
Malina Creek	Peak Aerial Survey	Percentile, Zooplankton Model
Afognak (Litnik) River	Weir Count	SRA
Little River	Peak Aerial Survey	Risk Analysis
Uganik Lake	Peak Aerial Survey	Percentile
Karluk River Early Run	Weir Count	SRA
Karluk River Late Run	Weir Count	SRA
Ayakulik River Early Run	Weir Count	Zooplankton Model and historical escapement
Ayakulik River Late Run	Weir Count	Zooplankton Model and historical escapement
Upper Station River Early Run	Weir Count	Percentile
Upper Station River Late Run	Weir Count	SRA
Frazer Lake	Weir Count	SRA
Saltery Lake	Weir Count	SRA
Pasagshak River	Peak Aerial Survey	Percentile, Risk Analysis
Buskin Lake	Weir Count	Empirical Observation

[a] One or more aerial surveys are attempted during the peak of the run. Peak count is used to index the escapement.
[b] SRA = Spawner-recruit analysis.

APPENDIX A. ESCAPEMENT GOAL MEMO FOR THE UPPER COOK INLET MEETING OF THE 2010/2011 BOARD OF FISHERIES MEETING CYCLE

STATE OF ALASKA

SEAN PARNELL, GOVERNOR

1255 W. 8TH Street
P.O. BOX 115526
JUNEAU, AK 99811-5526

PHONE: (907) 465-4210
FAX: (907) 465-2604

DEPARTMENT OF FISH AND GAME

Division of Commercial Fisheries
Division of Sport Fish

MEMORANDUM

TO: John Hilsinger, Director
Division of Commercial Fisheries

Charles Swanton, Director
Division of Sport Fish

DATE: September 28, 2010

THRU: Jeff Regnart, Regional Supervisor
Division of Commercial Fisheries, Region II

James Hasbrouck, Regional Supervisor
Division of Sport Fish, Region II

SUBJECT: Upper Cook Inlet
Escapement Goal Memo

FROM: Lowell Fair, Regional Research Coordinator
Division of Commercial Fisheries, Region II

Jack Erickson, Regional Research Coordinator
Division of Sport Fish, Region II

The purpose of this memo is to inform you of the interdivisional salmon escapement goal review committee's progress reviewing and recommending escapement goals for Upper Cook Inlet. Escapement goals in this management area have been set and evaluated at regular intervals since statehood. This effort has resulted in many of the stocks having long-term historical databases. Upper Cook Inlet escapement goals were last reviewed by the department (Fair et al. 2007) during the 2007–2008 Alaska Board of Fisheries (board) cycle. The escapement goal for Yentna River sockeye salmon, however, was reviewed out of cycle in 2009 (Fair et al. 2009). During this review, the sustainable escapement goal (SEG) for Yentna River sockeye salmon was replaced with 2 SEGs represented by Chelatna (20,000–65,000) and Judd (25,000–55,000) lakes. Additionally, an SEG (15,000–50,000) was developed for Larson Lake on the Susitna River mainstem.

In February 2010, an interdivisional salmon escapement goal review committee, including staff from the divisions of Commercial Fisheries and Sport Fish, reviewed existing salmon escapement goals in the Upper Cook Inlet management area. The review was based on the

Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) and the *Policy for Statewide Salmon Escapement Goals* (5 AAC 39.223). Two important terms are:

> 5 AAC 39.222 (f)(3) "*Biological Escapement Goal* (BEG): the escapement that provides the greatest potential for maximum sustained yield (MSY);" and
>
> 5 AAC 39.222 (f)(36) "*Sustainable Escapement Goal* (SEG): a level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yield over a 5 to 10 year period, used in situations where a BEG cannot be estimated or managed for."

The committee determined the appropriate goal type (BEG or SEG) for each salmon stock with an existing goal and considered other monitored, exploited stocks without an existing goal. Based on the quality and quantity of available data, the committee determined the most appropriate methods to evaluate the escapement goals. Due to the thoroughness of previous analyses by Bue and Hasbrouck (*Unpublished)*, Clark *et al.* (2007), Hasbrouck and Edmundson (2007), and Fair *et al.* (2007), this review re-analyzed only those goals with recent (2007-2009) data that could potentially result in a substantially different escapement goal from the last review, or those that should be eliminated or established.

Escapement goals were evaluated for Upper Cook Inlet stocks using the following methods: (1) spawner-recruit analyses; (2) yield analyses; (3) smolt/fry information; and/or (4) the percentile approach. Methods used to evaluate the escapement goals and the rationale for making subsequent recommendations will be described in a published report (Fair et al. *In prep*) available prior to the February–March, 2011 Upper Cook Inlet board meeting. Following the review, the committee estimated escapement goals for each stock, compared these estimates with the current goal, and agreed on a recommendation to keep the current goal, change the goal, or eliminate the goal.

There were 35 escapement goals (not including Yentna River sockeye salmon) evaluated for 32 stocks in Upper Cook Inlet (Table 1). The committee recommends that most escapement goals remain status quo. However, the committee recommends reinstating the previous Fish Creek coho salmon goal dropped during the 2004–2005 review. The Division of Sport Fish assessed Fish Creek coho salmon escapement with a weir in 2009 and 2010, anticipating that operations will continue in the near future. A risk-based lower bound SEG is proposed to replace the existing SEG range for the Campbell Creek Chinook salmon stock, which provides an annual youth fishery in Anchorage. The Kenai River sockeye salmon SEG range of 500,000–800,000 should change to an SEG range of 700,000–1,200,000, and the Kasilof sockeye salmon SEG of 150,000–250,000 should change to an SEG range of 160,000–360,000. These 2 goal changes are primarily the result of updating historical Bendix sonar escapement data sets with DIDSON-based estimates, and utilizing recent genetic information to develop brood tables. Based on the amount of uncertainty associated with their escapement estimates, the committee recommends changing early and late run Kenai River Chinook salmon BEGs to SEGs. Similarly, uncertainty in Deshka River Chinook salmon commercial harvests prompted a change from a BEG to SEG-type goal. Lastly, returns from 2001–2003 brood years provided sufficient information to develop a BEG (previously an SEG of 14,000–37,000) for early-run Russian River sockeye salmon. This proposed BEG of 22,000–42,000 originated from a Ricker spawner-recruit analysis.

In summary, the escapement goal committee reviewed 34 salmon escapement goals in Upper Cook Inlet with recommendations to: reinstate one previous goal; change one goal from an SEG range to a lower bound SEG; change the ranges of two goals; change three goals from BEGs to SEGs, and; change one goal from an SEG to a BEG and its range.

An oral and written report about Upper Cook Inlet escapement goals and specific recommendations for numerous stocks will be presented to the board in February, 2011. These reports will list all current and recommended escapement goals for Upper Cook Inlet and provide a detailed description of the methods used to reach these recommendations.

Literature Cited

Bue, B. G. and J. J. Hasbrouck. *Unpublished.* Escapement goal review of salmon stocks of Upper Cook Inlet. Alaska Department of Fish and Game, Report to the Alaska Board of Fisheries, November 2001 (and February 2002). Anchorage.

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Hasbrouck, J. J. and J. A. Edmundson. 2007. Escapement goals for salmon stocks in Upper Cook Inlet, Alaska: Report to the Alaska Board of Fisheries, January 2005. Alaska Department of Fish and Game, Special Publication No. 07-10, Anchorage.

Table 1.—Summary of current escapement goals and recommended escapement goals for salmon stocks in Upper Cook Inlet, 2010.

System	Current Escapement Goal			Recommended Escapement Goal			
			Year	Escapement			
	Goal	Type	Adopted	Range/Lower Bound	Type	Data[a]	Action
Chinook Salmon							
Alexander Creek	2,100–6,000	SEG	2002	2,100–6,000	SEG	SAS	No Change
Campbell Creek	50–700	SEG	2008	380	SEG	SFS	Change to lower bound SEG
Chuitna River	1,200–2,900	SEG	2002	1,200–2,900	SEG	SAS	No Change
Chulitna River	1,800–5,100	SEG	2002	1,800–5,100	SEG	SAS	No Change
Clear (Chunilna) Creek	950–3,400	SEG	2002	950–3,400	SEG	SAS	No Change
Crooked Creek	650–1,700	SEG	2002	650–1,700	SEG	Weir	No Change
Deshka River	13,000–28,000	BEG	2002	13,000–28,000	SEG	Weir	Change to SEG
Goose Creek	250–650	SEG	2002	250–650	SEG	SAS	No Change
Kenai River - Early Run	4,000–9,000	BEG	1999	4,000–9,000	SEG	Sonar	Change to SEG
Kenai River - Late Run	17,800–35,700	BEG	1999	17,800–35,700	SEG	Sonar	Change to SEG
Lake Creek	2,500–7,100	SEG	2002	2,500–7,100	SEG	SAS	No Change
Lewis River	250–800	SEG	2002	250–800	SEG	SAS	No Change
Little Susitna River	900–1,800	SEG	2002	900–1,800	SEG	SAS	No Change
Little Willow Creek	450–1,800	SEG	2002	450–1,800	SEG	SAS	No Change
Montana Creek	1,100–3,100	SEG	2002	1,100–3,100	SEG	SAS	No Change
Peters Creek	1,000–2,600	SEG	2002	1,000–2,600	SEG	SAS	No Change
Prairie Creek	3,100–9,200	SEG	2002	3,100–9,200	SEG	SAS	No Change
Sheep Creek	600–1,200	SEG	2002	600–1,200	SEG	SAS	No Change
Talachulitna River	2,200–5,000	SEG	2002	2,200–5,000	SEG	SAS	No Change
Theodore River	500–1,700	SEG	2002	500–1,700	SEG	SAS	No Change
Willow Creek	1,600–2,800	SEG	2002	1,600–2,800	SEG	SAS	No Change
Chum Salmon							
Clearwater Creek	3,800–8,400	SEG	2002	3,800–8,400	SEG	PAS	No Change
Coho Salmon							
Fish Creek (Knik)				1,200–4,400	SEG	Weir	Reinstate previous SEG
Jim Creek	450–700	SEG	2002	450–700	SEG	SFS	No Change
Little Susitna River	10,100–17,700	SEG	2002	10,100–17,700	SEG	Weir	No Change

Continued

Table 1.—Continued.

System	Current Escapement Goal			Recommended Escapement Goal			
	Goal	Type	Year Adopted	Range/Lower Bound	Escapement Type	Data[a]	Action
Sockeye Salmon							
Chelatna Lake	20,000–65,000	SEG	2009	20,000–65,000	SEG	Weir	No Change
Crescent River	30,000–70,000	BEG	1999	30,000–70,000	BEG	Sonar	No Change
Fish Creek (Knik)	20,000–70,000	SEG	2002	20,000–70,000	SEG	Weir	No Change
Judd Lake	25,000–55,000	SEG	2009	25,000–55,000	SEG	Weir	No Change
Kasilof River	150,000–250,000	BEG	1986	160,000–360,000	BEG	Sonar	Change in Range
Kenai River	500,000–800,000	SEG	1999	700,000–1,200,000	SEG	Sonar	Change in Range
Larson Lake	15,000–50,000	SEG	2009	15,000–50,000	SEG	Weir	No Change
Packers Creek	15,000–30,000	SEG	2008	15,000–30,000	SEG	Weir	No Change
Russian River - Early Run	14,000–37,000	SEG	2002	22,000–42,000	BEG	Weir	Change in Range and to BEG
Russian River - Late Run	30,000–110,000	SEG	2002	30,000–110,000	SEG	Weir	No Change
Yentna River	90,000–160,000	SEG	2002	Eliminated in 2009	Eliminated in 2009		Eliminated in 2009

[a] PAS = Peak Aerial Survey, SAS = Single Aerial Survey, and SFS = Single Foot Survey.

cc: Members, Alaska Board of Fisheries.

APPENDIX B.
ESCAPEMENT GOAL MEMO FOR THE LOWER COOK INLET MANAGEMENT AREA MEETING OF THE 2010/2011 BOARD OF FISHERIES MEETING CYCLE

STATE OF ALASKA

SEAN PARNELL, GOVERNOR

1255 W. 8TH Street
P.O. BOX 115526
JUNEAU, AK 99811-5526

PHONE: (907) 465-4210
FAX: (907) 465-2604

DEPARTMENT OF FISH AND GAME

Division of Commercial Fisheries
Division of Sport Fish

MEMORANDUM

TO: John Hilsinger, Director
Division of Commercial Fisheries

Charles Swanton, Director
Division of Sport Fish

DATE: September 30, 2010

THRU: Jeff Regnart, Regional Supervisor
Division of Commercial Fisheries, Region II

James Hasbrouck, Regional Supervisor
Division of Sport Fish, Region II

SUBJECT: Lower Cook Inlet
Escapement Goal Memo

FROM: Lowell Fair, Regional Research Coordinator
Division of Commercial Fisheries, Region II

Jack Erickson, Regional Research
Coordinator
Division of Sport Fish, Region II

The purpose of this memo is to inform you of our progress reviewing and recommending escapement goals for Lower Cook Inlet. Escapement goals in Lower Cook Inlet have been set and evaluated at regular intervals since statehood. Because of this effort, many of the stocks have long-term historical databases. Lower Cook Inlet escapement goals were last reviewed, changes recommended, and subsequently implemented by the department (Otis and Szarzi 2007) during the 2007-2008 Alaska Board of Fisheries (board) cycle.

In February 2010, an interdivisional salmon escapement goal review committee, including staff from the divisions of Commercial Fisheries and Sport Fish, was formed to review existing salmon escapement goals in the Lower Cook Inlet Management Area. The review was based on the *Policy for the Management of Sustainable Salmon Fisheries* (5 AAC 39.222) and the *Policy for Statewide Salmon Escapement Goals* (5 AAC 39.223). Two important terms are:

> 5 AAC 39.222 (f)(3) "*Biological Escapement Goal* (BEG): the escapement that provides the greatest potential for maximum sustained yield (MSY);" and

5 AAC 39.222 (f)(36) "*Sustainable Escapement Goal* (SEG): a level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yield over a 5 to 10 year period, used in situations where a BEG cannot be estimated or managed for."

The committee determined the appropriate goal type (BEG or SEG) for each salmon stock with an existing goal and other monitored, exploited stocks without an existing goal. Based on the quality and quantity of available data, we determined the most appropriate methods to evaluate the escapement goal. Due to the thoroughness of the previous analyses by Otis (2001), Otis and Hasbrouck (2004), and Otis and Szarzi (2007), this review only re-analyzed goals with recent (2008-2010) data that could potentially result in a substantially different escapement goal from the last review, or those that should be eliminated or established. For Lower Cook Inlet stocks, the available data were most appropriate for SEG type goals.

Salmon escapements are primarily monitored by multiple aerial and/or foot surveys of stream reaches that can be monitored. The resulting escapement indices do not provide absolute abundance estimates suitable for estimating biological escapement goals. Consequently, escapement goals were evaluated for Lower Cook Inlet stocks using percentiles of observed escapement estimates or indices that also incorporated contrast in the escapement data (Bue and Hasbrouck, *Unpublished*). Following these analyses, the committee estimated escapement goals for each stock, compared these estimates with the current goal, and agreed on a recommendation to keep the current goal, change the goal, or eliminate the goal.

There were 44 existing escapement goals evaluated in Lower Cook Inlet (Table 1). The committee recommended changes to seven existing escapement goals in Lower Cook Inlet. Based on additional years of escapement and harvest data, we recommend changing the Anchor River Chinook salmon goal from a lower bound SEG of 5,000 to an SEG range of 3,800–10,000 fish. We recommend eliminating escapement goals for 4 inconsistently monitored pink salmon stocks in Resurrection Bay (Bear, Salmon, and Tonsina creeks, and Thumb and Humpy coves) having modest returns without targeted commercial fisheries. We also recommend changing the current SEG of 5,950–12,550 for Delight Creek sockeye salmon to a range of 7,550–17,650, and the current SEG range of 1,880–9,300 for Chenik Lake sockeye salmon to a range of 3,500–14,000. These 2 goals were originally derived primarily from aerial survey indices, but are now monitored by weir and/or video projects.

In summary, this comprehensive review of the 44 existing salmon escapement goals in Lower Cook Inlet resulted in 7 modifications. Three goals had a change in range and 4 goals were eliminated. An oral and written report (Otis et al. *In prep*) concerning escapement goals and specific recommendations for numerous stocks in Lower Cook Inlet will be presented to the board in November 2010. These reports will list all current and recommended escapement goals for Lower Cook Inlet, as well as detailed descriptions of the methods used to reach these recommendations.

Literature Cited

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 November 2001 (and February 2002). Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

Otis, E. O. 2001. Report to the Alaska Board of Fisheries on sustainable escapement goals for chum, pink, and sockeye salmon in Lower Cook Inlet. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 2A01-21, Anchorage.

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Otis, E. O., and N. J. Szarzi. 2007. A review of escapement goals for salmon stocks in Lower Cook Inlet, Alaska, 2007. Alaska Department of Fish and Game, Fishery Manuscript No. 07-04, Anchorage.

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Table 1.—Summary of current escapement goals and recommended escapement goals for salmon stocks in Lower Cook Inlet.

	Current Escapement Goal			Recommended Escapement Goal		
System	Goal	Type	Year Adopted	Range	Escapement Data[a]	Action
Chinook Salmon						
Anchor River	5,000	SEG	2008	3,800–10,000	Weir/Sonar	Change
Deep Creek	350-800	SEG	1993	350-800	SAS	No Change
Ninilchik River	550–1,300	SEG	2008	550–1,300	Weir	No Change
Chum Salmon						
Port Graham R.	1,450-4,800	SEG	2002	1,450-4,800	MFS	No Change
Dogfish Lagoon	3,350-9,150	SEG	2002	3,350-9,150	MFS	No Change
Rocky River	1,200-5,400	SEG	2002	1,200-5,400	MFS	No Change
Port Dick Creek	1,900-4,450	SEG	2002	1,900-4,450	MAS/MFS	No Change
Island Creek	6,400-15,600	SEG	2002	6,400-15,600	MAS/MFS	No Change
Big Kamishak R.	9,350-24,000	SEG	2002	9,350-24,000	MAS	No Change
Little Kamishak River	6,550-23,800	SEG	2002	6,550-23,800	MAS	No Change
McNeil River	24,000-48,000	SEG	2008	24,000-48,000	MAS	No Change
Bruin River	6,000-10,250	SEG	2002	6,000-10,250	MAS	No Change
Ursus Cove	6,050-9,850	SEG	2002	6,050-9,850	MAS	No Change
Cottonwood Cr.	5,750-12,000	SEG	2002	5,750-12,000	MAS	No Change
Iniskin Bay	7,850-13,700	SEG	2002	7,850-13,700	MAS	No Change
Pink Salmon						
Humpy Creek	21,650-85,550	SEG	2002	21,650-85,550	MFS	No Change
China Poot Creek	2,900-8,200	SEG	2002	2,900-8,200	MFS	No Change
Tutka Creek	6,500-17,000	SEG	2002	6,500-17,000	MFS	No Change
Barabara Creek	1,900-8,950	SEG	2002	1,900-8,950	MFS	No Change
Seldovia Creek	19,050-38,950	SEG	2002	19,050-38,950	MFS	No Change
Port Graham R.	7,700-19,850	SEG	2002	7,700-19,850	MFS	No Change
Port Chatham	7,800-21,000	SEG	2002	7,800-21,000	MFS	No Change
Windy Cr. Right	3,350-10,950	SEG	2002	3,350-10,950	MFS	No Change
Windy Cr. Left	3,650-29,950	SEG	2002	3,650-29,950	MFS	No Change
Rocky River	9,350-54,250	SEG	2002	9,350-54,250	MFS	No Change
Port Dick Creek	18,550-58,300	SEG	2002	18,550-58,300	MAS/MFS	No Change
Island Creek	7,200-28,300	SEG	2002	7,200-28,300	MAS/MFS	No Change
S. Nuka Island Creek	2,700-14,250	SEG	2002	2,700-14,250	MAS/MFS	No Change
Desire Lake Cr.	1,900-20,200	SEG	2002	1,900-20,200	MAS	No Change
Bear & Salmon creeks	5,000-23,500	SEG	2005			Eliminate
Thumb Cove	2,350-8,850	SEG	2002			Eliminate

Continued ...

Table 1. —Continued.

System	Current Escapement Goal			Recommended Escapement Goal		
	Goal	Type	Year Adopted	Range	Escapement Data[a]	Action
Pink Salmon						
Humpy Cove	900-3,200	SEG	2002			Eliminate
Tonsina Creek	500-5,850	SEG	2002			Eliminate
Bruin River	18,650-155,750	SEG	2002	18,650-155,750	MAS	No Change
Sunday Creek	4,850-28,850	SEG	2002	4,850-28,850	MAS	No Change
Brown's Peak Creek	2,450-18,800	SEG	2002	2,450-18,800	MAS	No Change
Sockeye Salmon						
English Bay	6,000-13,500	SEG	2002	6,000-13,500	PAS/Weir	No Change
Delight Lake	5,950-12,550	SEG	2002	7,550-17,650	PAS/Weir	Range Change
Desire Lake	8,800-15,200	SEG	2002	8,800-15,200	PAS/Weir	No Change
Bear Lake	700-8,300	SEG	2002	700-8,300	Weir	No Change
Aialik Lake	3,700-8,000	SEG	2002	3,700-8,000	PAS	No Change
Mikfik Lake	6,300-12,150	SEG	2002	6,300-12,150	PAS	No Change
Chenik Lake	1,880-9,300	SEG	2002	3,500-14,000	PAS/Video	Range Change
Amakdedori Cr.	1,250-2,600	SEG	2002	1,250-2,600	PAS	No Change

[a] SAS = Single Aerial Survey, MAS = Multiple Aerial Survey, PAS = Peak Aerial Survey, MFS = Multiple Foot Survey.

cc: Members, Alaska Board of Fisheries

APPENDIX C.
ESCAPEMENT GOAL MEMO FOR THE CHIGNIK MANAGEMENT AREA MEETING AND KODIAK MANAGEMENT AREA MEETING OF THE 2010/2011 BOARD OF FISHERIES MEETING CYCLE

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

Division of Commercial Fisheries
Division of Sport Fish

SEAN PARNELL, GOVERNOR

1255 W. 8TH Street
P.O. BOX 115526
JUNEAU, AK 99811-5526

PHONE: (907) 465-4210
FAX: (907) 465-2604

MEMORANDUM

TO: John Hilsinger, Director
Division of Commercial Fisheries

Charles Swanton, Director
Division of Sport Fish

DATE: September 28, 2010

THRU: Steve Honnold, Regional Supervisor
Division of Commercial Fisheries, Region IV

James Hasbrouck, Regional Supervisor
Division of Sport Fish, Region II

SUBJECT: Kodiak and Chignik Escapement Goal Reports

FROM: Matt Nemeth, Regional Finfish Research Biologist
Division of Commercial Fisheries, Region IV

Jack Erickson, Regional Research Coordinator
Division of Sport Fish, Region II

The purpose of this memorandum is to inform you of our progress reviewing and recommending salmon escapement goals for the Chignik and Kodiak management areas (CMA and KMA), to be reported at the Board of Fisheries (board) meeting in January 2011. This is the third review of escapement goals in each area since goals began to be reviewed periodically as part of the implementation of the *Policy for Statewide Salmon Escapement Goals* (EGP; 5 AAC 39.223) and the *Policy for the Management of Sustainable Salmon Fisheries* (SSFP; 5 AAC 39.222) in 2001. Escapement goals for both areas were extensively reviewed and revised in 2004 (Nelson et al. 2005; Witteveen et al. 2005) and 2007 (Honnold et al. 2007; Witteveen et al. 2007).

In May 2010, an interdivisional team consisting of staff from the divisions of Commercial Fisheries and Sport Fish from the Alaska Department of Fish and Game (department) was formed to conduct the current review of salmon escapement goals in the CMA and KMA. The team's objectives were to review documented salmon escapement goals in each area and recommend either maintaining or changing them; to identify systems suitable for new goals; and

to document the review and recommendations in a report presented to the board. The review team determined the appropriate goal type for each salmon stock with an existing goal, based on the quantity and quality of the existing data, and then determined the most appropriate methods to evaluate the goals. Data were considered sufficient for a biological escapement goal (BEG) if escapements, total returns, return by age class (i.e., brood tables), and data quality were sufficient to provide a scientifically defensible estimate of the salmon escapement with the greatest potential to produce maximum sustained yield (S_{msy}). If data were not sufficient to credibly estimate S_{msy}, the goals were considered sustainable escapement goals (SEGs). The numerical range of each goal was assessed using several established methods as determined by the professional judgment of team members. This memorandum summarizes the team's review in 2010, its recommendations, and the methods used to assess goals recommended for change.

Chignik Management Area (CMA)

The previous escapement goal review in 2007 resulted in changes to four escapement goals in the CMA. The goal for late run sockeye salmon from the Chignik River changed from an SEG of 200,000–250,000 to an SEG of 200,000–400,000; the aggregate goal for odd-year pink salmon changed from a BEG of 541,000–1,177,000 to an SEG of 500,000–800,000; the aggregate goal for even-year pink salmon changed from a BEG of 327,000–737,000 to an SEG of 200,000–600,000; and the aggregate goal for chum salmon changed from a lower bound SEG of 50,400–57,400. There were no changes to the remaining goals for Chinook salmon and early-run sockeye salmon (Witteveen and Hasbrouck, *Chignik and Kodiak escapement goal recommendations,* unpublished ADF&G memorandum to directors Hilsinger and Swanton, May 13, 2009; hereafter, Witteveen and Hasbrouck 2009).

For the review in 2010, we added the last three years of data (2007 through 2009) to the data set for each of the six escapement goals (Table 1). If these three new years of data contained information that could potentially alter the existing goals, we then conducted a full analysis of the data and determined the correct goal classification and escapement goal range.

The team concluded that an additional three years of data would not affect the escapement goals for Chinook and chum salmon, which were thus not reevaluated. In each of the past three years (2007–2009), Chinook salmon escapement was within the BEG range of 1,300–1,700 fish and chum salmon escapement exceeded the lower bound SEG of 57,400 fish (Table 1). For the remaining four CMA escapement goals, the team conducted further analysis of each stock, made initial escapement goal recommendations, compared these recommendations with the existing goals, and then made a final recommendation. The analytical methods and additional rationale for each recommendation will be described in detail in a department Fishery Manuscript to be published prior to the CMA board meeting in January 2011. In total, the team recommended no changes to any of the six escapement goals in the CMA, and identified no other stocks suitable for adding as new goals. Results from the four goals analyzed are summarized below.

Sockeye salmon – early and late runs

The team recommended no change to the Chignik River early run sockeye salmon SEG of 350,000–400,000 (Table 1). The early run was assessed using the percentile method (Bue and Hasbrouck, *Unpublished*), as in 2007. Four different data sets were analyzed: 1952–2009,

1965–2009, 1977–2009, and 1980–2009. As in 2007, the latest three data sets produced an escapement range of approximately 350,000 to 750,000 fish; however, these results do not incorporate the need for progeny of early run fish to migrate to Chignik Lake and share rearing habitat with other species. Without additional productivity or carrying capacity data, the team agreed to leave the existing escapement goal range in place.

The team carefully considered other potential approaches as an alternative to the percentile analysis for the early run stock. In these, the team identified autocorrelation and nonstationarity of the return data, relatively low contrast in the most recent data sets (2.2), and the fact that most contrast is from escapements below the SEG range. It is possible that other approaches could add insight to the escapement goal determination, but these approaches would also have to consider rearing interactions between progeny of early and late run fish in Chignik Lake and evidence of food limitations in the system. The team agreed that such approaches should be revisited well in advance of the 2013 cycle, when it can also incorporate genetic data scheduled for analysis in 2012.

The team also recommended no change to the Chignik River late run sockeye salmon SEG of 200,000–400,000 fish (Table 1) because the updated spawner-recruit analysis corroborated the existing goal. The model was significant ($P<0.05$), with an S_{msy} of 355,000 fish and an (S_{eq}) of 974,000 fish.

Pink salmon – odd- and even-year goals

The team recommended no change to the existing Chignik River pink salmon SEGs of 200,000–600,000 fish in even years and 500,000–800,000 fish in odd years (Table 1). A yield analysis was conducted using different intervals of observed escapement for escapement goal estimates. Intervals which had fewer than four escapements within the interval were not considered to have reliable estimates of yield for that escapement interval. The escapement range for even-year escapements was assessed from 100,000 to 1,600,000 fish, with intervals of 400,000, 500,000, and 600,000 fish. The escapement range for odd-year escapements was assessed from 100,000 to 1,800,000 fish, with intervals of 300,000, 400,000; 500,000; and 600,000 fish. By assessing the amount of years in each range and the returns per spawner, returns minus parent escapement, and harvest in each scenario, it was determined that the best recommendations were the goal ranges already in existence.

Kodiak Management Area (KMA)

The previous escapement goal review in 2007 resulted in changes to 9 of the 26 goals then in existence, and the addition of three new goals (Witteveen and Hasbrouck 2009). Sockeye salmon goals were changed on Paul's Bay (goal eliminated), Little River (lower bound SEG of 3,000 fish established), Uganik Lake (lower bound SEG of 24,000 fish established), Frazer Lake (BEG changed from 70,000 to 150,000 to 75,000 to 170,000 fish), and for early-run Karluk Lake (BEG changed from 100,000 to 210,000 to 110,000 to 250,000 fish). Chum salmon goals were eliminated for five specific districts and replaced by one newly-created aggregate lower bound SEG of 151,000 fish for the Kodiak Archipelago. The chum salmon goal for the Mainland District was changed to a lower bound SEG of 104,000 fish. There were no changes to the remaining 17 goals.

For the review in 2010, we added the last three years of data (2007–2009) to the data set for each of the 23 current escapement goals (Table 2). If these three new years of data contained enough information to potentially alter the existing goals, we then conducted a full analysis of the data and determined the correct goal classification and escapement goal range.

The team concluded that an additional three years of data did not provide enough information to warrant further assessment of the chum salmon goals, which were therefore not reevaluated. For the remaining KMA escapement goals, the team conducted further analysis of each stock, made initial escapement goal recommendations, compared these recommendations with the existing goals, and then made a final recommendation. The analytical methods and additional rationale for each goal will be described in detail in a department Fishery Manuscript to be published prior to the KMA board meeting in January of 2011. In total, the team analyzed 18 of the 23 goals currently in existence. The team recommended changing twelve goals, two of which would be split into two new goals each. The team recommended no goals for elimination and identified no new systems suitable for adding as goals.

Sockeye salmon (13 existing goals)

The team recommended no change to the Afognak Lake sockeye salmon BEG of 20,000–50,000 fish (Table 2), based on the updated Ricker spawner-recruit curve (Ricker 1954) and corroborating euphotic volume and zooplankton biomass models. Returns from brood years fully recruited since the last escapement goal review had little effect on the existing escapement goal range. The Ricker spawner-recruit regression was significant ($P < 0.05$) and S_{msy} was estimated to be 39,000 with a 90% S_{msy} range of 29,000 to 56,000; the escapement data had sufficient contrast. The euphotic volume model estimated the optimal escapement to Afognak Lake to be 43,000 adult sockeye salmon. The zooplankton biomass model estimated the optimal escapement to Afognak Lake to be 24,000 adult sockeye salmon.

The team recommended that the Ayakulik River sockeye salmon SEG (200,000–500,000) be split into early and late runs to protect the different temporal components of the run, since it extends from May to September. An early run SEG of 140,000–280,000 fish by July 15th and a late run SEG of 60,000–120,000 fish after July 15th are recommended (Table 2) based on zooplankton biomass models and historical escapement goals. Historically, there were separate goals for early and late run components until 2004. The goals were combined into a single one in 2004, which was retained in the 2007 review. In the current review, a spawner-recruit model was not significant for the entire run when using datasets from various time periods. These new early and late run goals will be reinvestigated in 2013, after completion of run reconstructions and brood tables for the early and late segments.

The escapement goal team recommended the current Buskin River sockeye salmon SEG of 8,000–13,000 fish should be changed to a BEG of 5,000–8,000 fish (Table 2). Staff conducted a Bayesian spawner-recruit analysis (Schmidt and Evans 2010) which yielded a 90% credibility interval of S_{msy} of 4,950–8,700 fish and a probability of sustained yield being greater than 90% of S_{msy} occurring for an escapement range of 5,000–8,000 fish. The past decade has included record high and low returns of Buskin River sockeye salmon, with the low returns possibly related to overescapement.

The team recommended no change to the Frazer Lake sockeye salmon BEG of 75,000–170,000 fish (Table 2). The addition of three more years of spawner-recruit data yielded little change in the estimates of productivity. A zooplankton biomass model corroborated the current spawner-recruit analysis, whereas a euphotic volume model produced an optimum estimate over the upper range. The Ricker spawner-recruit analysis was performed using the Frazer Lake fully recruited brood year spawner-recruit data from 1966 to 2002, excluding the brood years of 1985 through 1991 when fertilization directly affected production. The multiplicative error model was significant ($P < 0.001$), the S_{msy} was estimated at 117,000 fish with a 90% S_{msy} range of 75,000–168,000 fish, and S_{eq} was estimated at 321,000 fish. The escapement data contrast was 30.7 and there was no autocorrelation detected in the residual plots.

The team recommended no change to the early and late run sockeye salmon BEGs for Karluk Lake (Table 2). For the early run BEG (110,000–250,000 fish, with an S_{msy} of 175,000 fish), the spawner-recruit estimate was similar to estimates made during the 2004 review and the committee agreed that small scale changes to this goal should not be made during every review. For the late run BEG (170,000–380,000 fish, with an S_{msy} of 270,000 fish), the updated spawner-recruit analysis was also similar to the previous estimate. Data contrast was acceptable for both the early (8.7) and late (19.9) runs, and neither run had autocorrelated residuals. Recent low returns of sockeye salmon with large parent-year escapements have caused some concerns regarding Karluk Lake sockeye salmon. The parent year escapements for recent runs, on average, were well above the escapement goals; however, the returns are not fully recruited at this time and were therefore not used in this analysis. Limnological analyses also indicate that the current escapement goals are appropriate; euphotic volume (593,000 fish) and zooplankton biomass (397,000 fish) models corroborate the combined total of the early- and late-run goals (280,000–630,000 fish).

The team recommended no change to the lower bound SEG of 3,000 sockeye salmon for Little River Lake sockeye salmon (Table 2). Since 1985, escapements have fallen above the current lower bound SEG in 22 years and have been below only three years; however, two of these years were 2008 and 2009, when aerial surveys appear of sufficient quality that the low escapement numbers are likely real and not a function of unusually low effort or poor survey conditions. The team had lengthy conversations about whether to keep the goal, given the difficulties in surveying and the lack of direct management of the stock, but ultimately elected to keep the goal.

The team recommended no change to the Malina Creek SEG of 1,000–10,000 sockeye salmon, based on results of the percentile method and corroborating results from limnological models (Table 2). The percentile algorithm yielded an escapement goal range of 1,000 to 7,000 fish, with a contrast of 31 in the peak aerial survey data. A euphotic volume model estimated the optimal escapement to be 10,900 adult sockeye salmon, and a zooplankton biomass model estimated the optimal escapement to be 5,900 adult sockeye salmon. Escapements have been within the SEG of 1,000–10,000 fish since 2005.

The team recommended changing the goal for Pasagshak River sockeye salmon to a lower bound SEG of 3,000 fish (Table 2) because escapements are not managed inseason, but instead, only quantified postseason (making this goal type consistent with the other two systems that have the same management strategy: Little River and Uganik Lake). The team used the percentile

method for the primary analysis, along with euphotic volume for secondary analyses. The percentile method used peak aerial survey data from 1968 to 2009; no age data are available for this stock. The euphotic volume model estimated the optimal escapement to Pasagshak River to be 4,500 fish.

The team recommended changing the upper range of the BEG for Saltery Lake sockeye salmon from 15,000–30,000 fish to 15,000–35,000 fish (Table 2). A spawner-recruit model was fit to the Saltery Lake fully recruited brood year spawner-recruit data from 1976 to 2003; the model was significant ($P < 0.001$), with an S_{msy} estimate of 23,600 fish, a 90% MSY range of 15,300–33,400 fish, and an S_{eq} of 61,000 fish. Contrast of the escapement data was 6.7, and no autocorrelation was detected in residual plots. A zooplankton biomass model estimated the optimal escapement to Saltery Lake to be between 23,000 and 35,000 adult sockeye salmon based on the 1997–2002 average smolt size of 2.1 grams; a euphotic volume model suggested a lower goal of 9,000 fish. Overall, the team agreed that results from the spawner-recruit and zooplankton biomass models warranted the change to the upper end of the goal.

The team recommended no change to the lower bound SEG of 24,000 sockeye salmon for Uganik Lake (Table 2). Analysis was performed using the percentile method; data contrast was 34, and the 25th percentile was 25,000 fish. The team had lengthy conversations about whether to keep the goal, given the difficulties in surveying and lack of direct management of the stock, but ultimately elected to retain the goal for the current cycle.

The team recommended changing the escapement goal for early-run sockeye salmon from Upper Station from an SEG of 30,000–65,000 to a BEG of 43,000–93,000 (Table 2). A Ricker spawner-recruit model was fit to the Upper Station early run fully recruited brood year spawner-recruit data from 1975 to 2003. The model was significant ($P < 0.05$), with an S_{msy} of 66,000 fish, a 90% MSY range of 43,000 to 93,000 fish, and an S_{eq} estimate of 165,000 fish. Data contrast was acceptable (16.5) and the residuals did not have significant autocorrelation. Upper Station also has an OEG of 25,000 fish, which was established by the board in 1999.

The team recommended no change to the late run Upper Station sockeye salmon BEG of 120,000–265,000 fish (Table 2). The model was fit to the fully recruited brood year spawner-recruit data from 1975 to 2003. The model was significant ($P < 0.05$), with an S_{msy} of 238,000, a 90% MSY range of 153,000 to 337,000, and an S_{eq} of 624,000 sockeye salmon. Data contrast was acceptable (10.7), but residuals had significant autocorrelation (lag-1) and serious non stationary processes affecting the time series of production. A combined early and late run spawner recruit model was not significant ($P > 0.05$).

Chinook salmon (two existing goals)

The escapement goal team reviewed weir and harvest data for the past three years (2007–2009) for the Chinook salmon goals on the Ayakulik and Karluk rivers. For both systems, the team concluded that recent low returns from large brood year escapements could improve the current spawner recruit analyses. Bayesian spawner-recruit analyses with AR(1) productivity terms to account for serial correlation between successive years were completed for each stock. The team recommended changing the BEG for Ayakulik River Chinook salmon from its current range of 4,800–9,600 fish to a range of 4,000–7,000 fish, and the BEG for Karluk River Chinook salmon

from its current range of 3,600–7,300 fish to a range of 3,000–6,000 fish (Table 2). The Karluk River stock has been below the escapement goal range in each of the last four years (2007–2010). ADF&G will request Karluk River Chinook salmon be designated a stock of management concern at the board work session in October 2010.

Coho salmon (four existing goals)

The escapement goal team recommended eliminating the upper bounds of coho salmon SEGs for the American, Olds, and Pasagshak rivers, and that the stocks be identified as lower bound SEGs because the upper ends of the goals are not managed for. The recommended lower bound SEGs are 400 fish for the American River, 1,000 fish for the Olds River, and 1,200 fish for the Pasagshak River (Table 2). The team examined stock assessment data from these three stocks, concluded that the three additional years of data would not affect the results of the previous analyses in 2007, and declined to evaluate them further. The team analyzed the Buskin River SEG and recommended it remain unchanged at 3,200–7,200 fish (Table 2).

Pink salmon (two existing goals)

The team recommended changing the Kodiak Archipelago pink salmon SEG of 2,000,000–5,000,000 fish to an odd year SEG range of 2,000,000– 6,000,000 fish and an even year SEG of 3,000,000–8,000,000 fish (Table 2). The difference in odd- and even-year SEGs is due more to differences in odd and even year pink salmon runs to the Karluk and Ayakulik rivers than to differences between odd and even years throughout the entire Kodiak Management Area.

The team recommended changing the Kodiak Mainland pink salmon SEG of 250,000–750,000 fish to an SEG range of 250,000–1,000,000 fish (Table 2). Although the current goal would likely ensure continued sustainability of the stock, increasing the upper goal to 1,000,000 is more likely to result in a range containing S_{msy}.

In summary, the review of CMA escapement goals recommended no changes after analyzing four of the six goals. The review of the KMA escapement goals recommended changes to 12 of the 23 existing goals, including the splitting of two goals (Ayakulik River sockeye salmon and Kodiak Archipelago pink salmon) into two goals each. All of the recommendations have gone through a three-step process thus far, consisting of initial recommendations by the lead analyst (completed in early July 2010), follow-up with the entire team in a dedicated meeting on August 25, 2010, and subsequent revisions and review completed on September 23, 2010.

The overall process is on course and similar to the timeline used in 2007. Staff are now preparing a draft report for team review and preparing for the October work session and the January 2011 board meeting. Escapement goal recommendations for each separate area will be presented to the board orally and in writing. These reports will list all current and recommended escapement goals, as shown in tables 1 and 2, and will provide detailed descriptions of the analyses performed. After the board meetings in January 2011, a memorandum to the division directors will be prepared that describes the final recommendations.

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cc: Members, Alaska Board of Fisheries

Table 1. Existing and recommended escapement goals for Chignik Management Area, based on results from the team meeting on 8/25/10.

Species	System	Escapement data[a]	Current escapement goal				Escapements			Preliminary 2010 recommendation
			Type	Lower	Point	Upper	2007	2008	2009	
Chinook										
	Chignik	WC	BEG	1,300	1,695	2,700	2,000	1,730	1,680	No change
Sockeye										
	Chignik									
	Early run	WC	SEG	350,000		400,000	361,091	377,579	391,476	No change
	Late run[b]	WC	SEG	200,000		400,000	293,883	328,479	328,586	No change
Pink										
	Chignik aggregate – odd years	PAS	SEG	500,000		800,000	1,217,064		869,063	No change
	Chignik aggregate – even years	PAS	SEG	200,000		600,000		863,031		No change
Chum										
	Chignik aggregate	PAS	Lower bound SEG	57,400			238,098	197,259	214,959	No change

[a] PAS = Peak Aerial Survey, WC= Weir Count

[b] The late-run escapement goal for Chignik River sockeye salmon includes the SEG range, plus an additional 50,000 sockeye salmon for an inriver run goal (25,000 in August and 25,000 in September) to meet late season subsistence needs.

Table 2. Existing and recommended escapement goals for Kodiak Management Area, based on results from the team meeting on 8/25/10.

Species	System	Escapement data[a]	Current escapement goal				Escapements			Preliminary 2010 recommendation
			Type	Lower	Point	Upper	2007	2008	2009	
Chinook										
	Ayakulik	WC	BEG	4,800	6,638	9,600	6,410	3,071	2,615	Change to BEG 4,000-7,000
	Karluk	WC	BEG	3,600	4,492	7,300	1,554	752	1,308	Change to BEG 3,000-6,000
Sockeye										
	Afognak	WC	BEG	20,000	34,000	50,000	21,070	26,874	31,358	No change
	Ayakulik	WC	SEG	200,000		500,000	283,042	162,888	315,184	Change to early run SEG of 140,000-280,000 and late run SEG of 60,000-120,000
	Buskin	WC	SEG	8,000		13,000	16,502	5,900	7,757	Change to BEG of 5,000-8,000
	Frazer	WC	BEG	75,000	118,000	170,000	120,186	105,363	101,845	No change
	Karluk									
	Early run	WC	BEG	110,000	175,000	250,000	279,390	82,071	52,466	No change
	Late run	WC	BEG	170,000	270,000	380,000	267,185	164,419	277,611	No change
	Little River	PAS	Lower bound SEG	3,000			8,500	2,300	1,500	No change
	Malina	PAS	SEG	1,000		10,000	1,900	3,690	1,400	No change
	Pasagshak	FS	SEG	3,000		12,000	14,300	14,900	1,400	Change to lower bound SEG of 3,000
	Saltery	WC or PAS	BEG	15,000	23,000	30,000	17,200	49,266	46,591	Change to BEG 15,000 - 35,000
	Uganik Lake	PAS	Lower bound SEG	24,000			35,000	64,700	53,700	No change
	Upper Station									
	Early run[b]	WC	SEG	30,000		65,000	31,895	38,800	34,585	Change to BEG of 43,000 - 93,000
	Late run	WC	BEG	120,000	186,000	265,000	149,709	184,856	161,736	No change
Coho										
	Buskin	WC	BEG	3,200	5,000	7,200	9,001	9,028	10,624	No change
	American	FS	SEG	400		900	307	700	639	Change to lower bound SEG of 400
	Olds	FS	SEG	1000		2,200	868	697	656	Change to lower bound SEG of 1,000
	Pasagshak	FS	SEG	1200		3,300	1,896	3,875	2385	Change to lower bound SEG of 1,200
Pink										
	Kodiak Archipelago	PAS	SEG	2,000,000		5,000,000	2,208,678	2,924,708	4,711,087	Change to SEGs: even yr 3-8M, odd yr 2-6M
	Mainland District	PAS	SEG	250,000		750,000	315,300	236,500	430,100	Change to SEG of 250K-1M
Chum										
	Kodiak Archipelago	PAS	Lower bound SEG	151,000			206,983	101,482	202,039	No change
	Mainland District	PAS	Lower bound SEG	104,000			87,350	122,425	103,656	No change

[a] PAS = Peak Aerial Survey, WC= Weir Count, FS = Foot Survey

[b] Upper Station early run has the only optimal escapement goal (OEG; 25,000) in the KMA, established by the BOF in 1999.