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**Review of Salmon Escapement Goals in the Chignik
Management Area, 2025**

by

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January 2026

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H_A
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, χ^2 , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient (simple)	r
		corporate suffixes:		covariance	cov
Weights and measures (English)		Company	Co.	degree (angular)	$^\circ$
cubic feet per second	ft ³ /s	Corporation	Corp.	degrees of freedom	df
foot	ft	Incorporated	Inc.	expected value	E
gallon	gal	Limited	Ltd.	greater than	>
inch	in	District of Columbia	D.C.	greater than or equal to	≥
mile	mi	et alii (and others)	et al.	harvest per unit effort	HPUE
nautical mile	nmi	et cetera (and so forth)	etc.	less than	<
ounce	oz	exempli gratia (for example)	e.g.	less than or equal to	≤
pound	lb	Federal Information Code	FIC	logarithm (natural)	ln
quart	qt	id est (that is)	i.e.	logarithm (base 10)	log
yard	yd	latitude or longitude	lat or long	logarithm (specify base)	log ₂ , etc.
		monetary symbols (U.S.)	\$, ¢	minute (angular)	'
Time and temperature		months (tables and figures): first three letters	Jan, ..., Dec	not significant	NS
day	d	registered trademark	®	null hypothesis	H_0
degrees Celsius	°C	trademark	™	percent	%
degrees Fahrenheit	°F	United States (adjective)	U.S.	probability	P
degrees kelvin	K	United States of America (noun)	USA	probability of a type I error (rejection of the null hypothesis when true)	α
hour	h	U.S.C.	United States Code	probability of a type II error (acceptance of the null hypothesis when false)	β
minute	min	U.S. state	use two-letter abbreviations (e.g., AK, WA)	second (angular)	"
second	s			standard deviation	SD
Physics and chemistry				standard error	SE
all atomic symbols				variance	
alternating current	AC			population sample	Var
ampere	A			sample	var
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				

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ABSTRACT

Beginning in February 2025, an interdivisional team of staff from the Alaska Department of Fish and Game met and reviewed existing Pacific salmon *Oncorhynchus* escapement goals of the Chignik Management Area (CMA) to report findings to the directors of the Divisions of Commercial Fisheries and Sport Fish. The 6 CMA salmon escapement goals were last reviewed in 2022. Analyses were conducted on all escapement goals. The team found no changes were warranted for any CMA goals because findings from spawner-recruit analyses that incorporated new data from 2022 to 2024 corroborated the existing sockeye salmon *O. nerka* goal and updated percentile approach analyses for Chignik Chinook *O. tshawytscha*, chum *O. keta*, and pink *O. gorbuscha* salmon goals presented no new findings using additional years of new data.

Keywords: Pacific salmon, *Oncorhynchus*, escapement goal, Chignik, Chignik Management Area, Chignik Lake, Black Lake, stock status

INTRODUCTION

The Alaska Department of Fish and Game (ADF&G) manages fisheries of Pacific salmon (*Oncorhynchus*) in Alaska to achieve sustainable spawning escapement levels. Returning salmon that are surplus to a targeted level of escapement are thus available for harvest in subsistence, commercial, and sport fisheries. The desired escapement levels are referred to as escapement goals and are scientifically determined with the goal of creating management targets that meet constitutional, statutory, and regulatory obligations.

This report documents the 2025 review of salmon escapement goals in the Chignik Management Area (CMA) based on the State of Alaska's *Policy for the Management of Sustainable Salmon Fisheries* (SSFP; 5 AAC 39.222) and the *Policy for Statewide Salmon Escapement Goals* (EGP; 5 AAC 39.223). Directors of the Divisions of Commercial Fisheries and Sport Fish of the Alaska Department of Fish and Game (ADF&G) receive the findings of this review that are intended to take effect for salmon stocks returning in 2026. Salmon escapement goals in the CMA were last reviewed in 2022 (Finkle et al. 2022). An important facet of the EGP is that the establishment of escapement goals is a collaborative job of the BOF and ADF&G, with the BOF recognizing ADF&G's responsibility to establish biological escapement goals, sustainable escapement goals, and sustained escapement thresholds as singular or aggregate goals.

The different types of goals are defined in the SSFP as follows:

- biological escapement goal (BEG): the escapement that provides the greatest potential for maximum sustained yield;
- 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;
- sustained escapement thresholds (SET): a threshold level of escapement, below which the ability of the salmon stock to sustain itself is jeopardized;
- aggregate goals: escapement goals for aggregates of individual spawning populations with similar productivity and vulnerability to fisheries and for salmon stocks managed as units.

Since the implementation of the SSFP and EGP in 2001, escapement goals for the CMA have been reviewed 7 times (Witteveen et al. 2005; Witteveen et al. 2007; Nemeth et al. 2010; Sagalkin et al. 2013; Schaberg et al. 2015; Schaberg et al. 2019; Finkle et al. 2022). These reviews correspond with area BOF meetings, which have historically been on a 3-year cycle; however, the CMA cycle was altered in 2014 and the review in 2015 only reflected 2 additional

years of data (2013–2014). The 2018 escapement goal review proceeded as planned, but the 2020 CMA review cycle was delayed by the beginning of the COVID-19 global pandemic, with the BOF meeting delayed until 2023.

STUDY AREA

The CMA, also designated as Area L, encompasses all coastal waters and inland drainages on the south side of the Alaska Peninsula, bounded by a line extending 135° southeast for 3 miles from a point near Kilokak Rocks (57°10.34' N lat, 156°20.22' W long) then due south to a line extending 135° southeast for 3 miles from Kupreanof Point at 55°33.98' N lat, 159°35.88' W long (Figure 1). The area is divided into 5 commercial fishing districts: Eastern, Central, Chignik Bay, Western, and Perryville Districts. These districts are further divided into 14 sections and 41 statistical reporting areas.

The Chignik watershed in the CMA consists of 2 interconnected lakes (Black and Chignik Lakes) with a single outlet river (the Chignik River) that empties into the Chignik Lagoon (Figure 2). All 5 species of Pacific salmon return to the Chignik River; sockeye salmon *O. nerka* returns consist of an early run and a late run, and Chinook salmon *O. tshawytscha* are only monitored in the Chignik River. Pink *O. gorbuscha*, chum *O. keta*, and coho *O. kisutch* salmon also return to other streams throughout the CMA (Table 1, Figure 1).

BACKGROUND

To regulate commercial salmon fisheries in the CMA, ADF&G staff are guided by the Chignik salmon management plans that describe biological and allocative constraints that were adopted into regulation by the BOF (5 AAC 15.357). Subsistence fishing is largely advised through the subsistence regulations. These plans and regulations reflect the traditional subsistence fishing practices. The primary objective of the management plan is to achieve salmon escapement goals while allowing for orderly harvest of salmon surplus to escapement requirements.

One Chinook salmon stock in the CMA natal to the Chignik River has a BEG (1,300 to 2,700 fish) established in 2002 (Appendix A). Reviews of the goal in 2013, 2015, 2018, and 2022 found no compelling evidence to support changing the goal. However, the stock received a management stock-of-concern designation in 2023 for failing to meet its escapement goal for 3 consecutive years between 2020 and 2022, which followed fishing restrictions in 2012 (sport), 2013 (commercial), and 2018 (commercial, sport, and subsistence; Burnside and Polum *In prep*). Chinook salmon escapement is enumerated through the Chignik River weir. Recent reductions in escapement age samples have probably introduced greater uncertainty to the overall age composition estimate and subsequently in returns by age. Harvest has occurred during directed sport and subsistence fisheries and incidentally in commercial fisheries targeting sockeye, pink, and chum salmon.

Two sockeye salmon stocks in the CMA have escapement goals (Appendix B). Both of these stocks return to the Chignik River watershed (Figure 2). The majority of the early run (Black Lake stock) enters the watershed from June to July and spawns in Black Lake and its tributaries (Pappas et al. 2003). The majority of the late run (Chignik Lake stock) enters the watershed in July and August and typically spawns in Chignik Lake tributaries and Chignik Lake shoal areas (Pappas et al. 2003). Although the peak periods of passage for each stock are usually a month apart, there is a period of overlap when both stocks are entering the watershed.

Sockeye salmon bound for Black and Chignik Lakes are harvested primarily in commercial and subsistence fisheries. Escapement of both stocks is enumerated as they transit Chignik River through a weir outfitted with a video camera system. Achievement of escapement goals for the early and late runs has relied on estimates of the numbers of each stock in the daily escapement. Stock apportionment has been determined using various methods over time. Prior to 1980, time-of-entry relationships based on tagging studies and age groups were employed to divide the catch and escapement between the 2 runs (Dahlberg 1968). From 1980 to 2003, excluding 1982, stock separation was accomplished using scale pattern analysis (Witteveen and Botz 2004). Beginning in 2004, an estimate of the early-run escapement was based on weir counts through July 4. After July 4, the fish that passed upstream through the weir were assumed to be late-run fish.¹ Harvest was assigned to a stock relative to the arrival date at the weir accounting for travel time from the harvest location. Stock apportionment estimated by this method was not notably different than those from scale pattern analysis. Between 2014 and 2020, genetic stock identification was used to separate the early- and late-run stocks. In 2021, department research staff reassessed the Chignik sockeye salmon run reconstruction by applying genetic stock information to CMA harvest and an expectation-maximization algorithm to determine stock apportionment (Finkle and Power 2023).

Sockeye salmon escapement goals were first established for the Chignik early and late runs in 1968 (early run 300,000–400,000; late run 200,000–250,000); however, those goals were not formally reviewed in the BOF process until 2001, after which minor changes were made to the early-run goal in 2004 and 2013 and to the late-run goal in 2007. Notably, in 1998, management objectives to allow the escapement of 25,000 fish in August and 25,000 fish September 1–15 were established. These objectives were reclassified as Inriver Run Goals (IRRGs; BOF-generated objectives to allow harvest upstream of escapement estimation) in 2007 and put into regulation in 2013. The September IRRG increased to 50,000 fish in 2015 and later the overall IRRG was reduced to 20,000 fish in 2019. In April of 2022, the BOF designated Chignik River early-run sockeye salmon as a stock of management concern after an Agenda Change Request was taken up out of cycle at the BOF meeting for the Cook Inlet, Kodiak, Westward, Arctic Shellfish and Shellfish General Provisions and Prince William Sound Shrimp in Anchorage. At that time, the Chignik River sockeye salmon early run had failed to make the escapement goal for 4 of the previous 5 years (based on stock apportionment methods at the time; Table 2) despite specific management measures taken by the department to reduce harvest in the commercial fisheries since 2018. Following the 2022 review, the department recommended a total run BEG of 450,000–800,000 sockeye salmon; however, the BOF implemented an early-run optimal escapement goal (OEG) of 300,000–400,000 fish and a late-run OEG of 240,000–360,000 fish and discontinued the IRRGs. Since 2022, the Chignik River sockeye salmon early run has surpassed the lower bound of the escapement goal every year, exceeding the upper bound in 2 of the past 3 years. It is important to note that the EGP identifies that justification for OEGs is provided by the BOF.

For both Chignik River Chinook and early-run sockeye salmon, the BOF reviewed and approved actions plans at the 2023 meeting to address the stock-of-concern status of each stock. The BOF

¹ Witteveen, M. J. Chignik River inseason run apportionment. Alaska Department of Fish and Game, Kodiak, memorandum addressed to Denby S. Lloyd, dated May 28, 2004.

will receive updated stock status and action plans for Chinook salmon² and early-run sockeye salmon³ for further consideration at the Alaska Peninsula, Aleutian Island, and Chignik finfish 2026 meeting.

The department manages pink salmon in the CMA to achieve escapement goals based on an aggregate of index streams (Tables 1 and 2; Appendix C). Separate areawide BEGs were established for odd and even years during the 2004 review (Witteveen et al. 2005) and amended to SEGs during the 2007 review (Witteveen et al. 2007). These aggregate SEGs were revised in 2015 and were composed of the respective sums of peak aerial survey escapement estimates for 8 individual index streams (even years: 170,000–280,000 fish, odd years: 260,000–450,000 fish; Schaberg et al. 2015). The 2018 and 2022 reviews did not indicate that the aggregate SEGs should change.

The department manages chum salmon in the CMA to achieve an escapement goal based on an aggregate of index streams, similar to pink salmon (Tables 1 and 2; Appendix D). This aggregate SEG (45,000–110,000 fish) was revised in 2015 and was composed of the respective sums of peak aerial survey escapement estimates for 6 individual index streams (Appendix D1; Schaberg et al. 2015). The 2018 and 2022 reviews did not indicate the SEG should change.

Due to the late run timing of coho salmon returns to the CMA, there are no established coho salmon escapement goals. The vast majority of coho salmon escapement occurs in September after the Chignik River weir is pulled for the season and inclement fall weather precludes reliable aerial surveys for estimating escapement.

OVERVIEW OF GENERAL ESCAPEMENT GOAL REVIEW METHODS

The general framework for reviewing escapement goals proceeds as follows:

1. Compile all available escapement harvest and age information since the last review.
2. Review the methods used to establish the existing goals, consider alternatives, and determine most appropriate methods to evaluate salmon stocks with existing goals.
3. Determine the most appropriate goal type (BEG or SEG) based on quality and quantity of available data.
4. Conduct analysis or reanalysis of existing goals.
5. Consider additional stocks that may have sufficient data to develop a goal.
6. Eliminate or discontinue goals for stocks for which an escapement goal is no longer appropriate.
7. Come to a consensus on goal changes or updates if needed.
8. Present escapement goal change findings to the directors of the divisions of Commercial Fisheries and Sport Fish for approval.

The current escapement goal review primarily examined recent (2022–2024) data and updated previous analyses. In February 2025, the department formed an interdivisional team including

² Burnside, C., and T. Polum. *In prep.* Chignik River Chinook salmon stock status and action plan, 2026: A report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report, Kodiak. Hereafter cited in text as Burnside and Polum *In prep.*

³ Scholze, M., C. Burnside, and T. Polum. *In prep.* Chignik River sockeye salmon stock status and action plan, 2026: A report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report, Kodiak.

staff from the divisions of Commercial Fisheries and Sport Fish (hereafter referred to as “the team”) to review the existing CMA salmon escapement goals.

The team compiled escapement, harvest, and age data associated with each stock or combination of stocks to be examined from research reports, management reports, and unpublished historical databases. Salmon escapement estimates were calculated through weir counts or aerial surveys in the CMA. Commercial fishery fish ticket receipts primarily provided salmon harvest estimates but also incorporated personal use (commercial harvest retained but not sold) and subsistence fishery estimates in addition to sport fishery estimates from the annual Statewide Harvest Survey, creel surveys, and guide logbooks. Limnological and spawning habitat data were compiled for each system when available. The team analyzed all escapement goals for the CMA, evaluating the type, quality, and amount of data for each stock according to the SSFP and EGP. This evaluation assisted in determining the appropriate type of escapement goal to apply to each stock.

The team evaluated escapement goals for each stock differently depending on the type of goal and type and quality of data available. Typically, those systems with estimates of escapement, age composition and stock-specific harvest are analyzed using spawner-recruit models and result in BEGs. Those systems with available escapement estimates but lacking both estimates of harvest and age composition are suited for SEGs and primarily accommodate the percentile approach (Clark et al. 2014). A detailed review of general methods used for those different types of goal is listed below.

The team assessed the initial analysis results to indicate if further review is needed. Following the teams recommendation for further review, a comprehensive analysis was conducted to indicate that changing a goal was warranted for systems with goals that have not been reviewed with the updated methodology, systems that did not have escapement within the escapement goal range over the previous 3 years and were not yet listed as a stock of concern, systems that have changed escapement monitoring methodology (e.g. weir vs. aerial survey), or systems that have had other significant changes in habitat quality or availability. Additional considerations for modifying an escapement goal for a system include an analysis indicating that an increase in yield could result from changing the goal, that the current goal has become unmanageable, or that there is no directed fishery on the stock.

ANALYSIS METHODS

Spawner Recruit Analysis

ADF&G develops most salmon BEGs using Ricker (1954) spawner-recruit models (Munro and Gatt 2025). Spawner-recruit model calculations were done within the framework of a Bayesian spawner-recruit web-based app.⁴ As defined in the SSFP (5 AAC 39.222), BEGs are estimates of the number of spawners that provide the greatest potential for maximum sustained yield (S_{MSY}). For this review, most ranges surrounding S_{MSY} were calculated as the escapement estimates that produced yields of at least 90% of MSY (CTC 1999; Hilborn and Walters 1992). The carrying capacity, defined as S_{EQ} , was estimated by the Ricker model as the escapement level (abundance of spawners) that provides an equivalent level of return or replacement when the stock has not been exploited (Quinn and Deriso 1999). Estimates of S_{MSY} and S_{EQ} were not used if the model

⁴ Hamazaki, T. 2022. Pacific salmon escapement goal analyses. Source: https://hamachan.shinyapps.io/Spawner_Recruit_Bayes/

fit the data poorly or if critical model assumptions were violated. Hilborn and Walters (1992), Quinn and Deriso (1999), and the Chinook Technical Committee (CTC 1999) provide good descriptions of the Ricker model and diagnostics to assess model fit. All Ricker models assumed a multiplicative error structure and were tested for residual autocorrelation, which was not corrected for if present based on the recommendations of Korman et al. (1995) for Alaska sockeye salmon stocks. When auxiliary data were available (e.g., limnology or smolt abundance, age, and size), they were summarized and biological trends were compared to estimates of adult production.

Percentile Approach

Sustainable escapement goals are developed using several methods, depending on the system, species, and type of data available. Recently, the department reviewed and updated all goals based on the Percentile Approach with the updated Percentile Approach (Clark et.al. 2014, Finkle et al. 2022, Schaberg et al. 2019). The Percentile Approach is based on the principle that a range of observed or indexed escapements that have been sustained over a period of time represents an SEG for a stock that has been fished and has probably sustained some unknown level of yields over the same time period. Thus, maintaining escapements of a stock within some range of percentiles observed over the time series of escapements represents a proxy for maintaining escapements within a range that encompasses S_{MSY} (Clark et al. 2014). This method considers the measurement error of the data collection method (i.e., weirs and towers have lower measurement error than aerial or foot surveys), the contrast of the escapement data (i.e., the ratio of highest observed escapement to the lowest observed escapement), and the exploitation rate of the stock. Based on these criteria, a tier system designates what percentiles should define the SEG range.

Tier	Escapement contrast	Measurement error	Harvest rate	SEG range
1	>8	High (aerial and foot surveys)	Low to moderate (< 0.40)	20th to 60th percentile
2	>8	Low (weirs and towers)	Low to moderate (< 0.40)	15th to 65th percentile
3	≤8	-	Low to moderate (< 0.40)	5th to 65th percentile

Other Methodologies

For this review, as previously noted, the team used the updated Percentile Approach (Clark et al. 2014) or the spawner-recruit model (Ricker 1954; described above) to develop most SEGs. Some historical methods used to corroborate salmon escapement goals are listed below. These methods include yield analysis (Hilborn and Walters 1992), the euphotic volume model (Koenings and Kyle 1997) and the zooplankton biomass model (Koenings and Kyle 1997). For systems with current limnological data, the team updated these analyses, whereas for systems that lack current limnological data, these methods are referenced in the individual stock appendices.

The yield analysis, like that used by Hilborn and Walters (1992), applies a tabular approach to examine escapement versus yield relationships. Using this methodology, escapements are arranged into size intervals. Multiple ranges for the size intervals are used to provide varying aggregations of escapements. For each escapement interval, several measures of yield from the observed escapements in that interval are calculated: specifically, the average and median return per spawner, average and median surplus yield (estimated as the return minus parental spawning

escapement), and average and median observed harvest. The average and median are both calculated because averages are highly influenced by large or small values.

The euphotic volume model, following the methods of Koenings and Kyle (1997), estimates adult escapement in part by determining the volume of lake water capable of primary production that could sustain a rearing population of juvenile sockeye salmon. The euphotic volume indicates a level of phytoplankton forage (primary production) available to zooplankton, and thus a level of zooplankton forage available for rearing juvenile fish. The model assumes that shallower light penetration would result in lower adult production compared to lakes with deeper light penetration because lakes with less photosynthetic capacity would not have the primary production necessary to sustain a larger rearing population. The euphotic volume model assumes there is no primary productivity below depths at which light has been attenuated by 99%.

The zooplankton biomass model, as described in Witteveen et al. (2009), estimates smolt production based on an available zooplankton biomass fed upon by smolt of a targeted threshold size, in a lake of known size (Koenings and Kyle 1997). The zooplankton biomass model, like the euphotic volume model, uses the premise that the availability of forage could affect survival of juvenile fish and subsequent adult production. Adult production is calculated using species fecundity and marine survival rates. The zooplankton biomass model assumes zooplankton is the only available forage.

Results from these models are generally used to corroborate sockeye salmon escapement goals as alternative analyses of production that are less dependent on adult fish count data. Results from the euphotic volume and zooplankton biomass models are reported as generally corroborating or not corroborating the primary analysis.

FINDINGS

For this review, the team fully analyzed all CMA escapement goals regardless of findings from the past review cycle. This document discusses in detail only systems where goals were modified, created, or eliminated. The general overview of methods and criteria warranting modification are listed above. Detailed information concerning stock status, methodology, goal history and current analysis are described in the individual appendices below.

The Chignik River Chinook salmon goal was implemented in 2002. Because of the lack of recent age composition data for Chignik River Chinook salmon and the inability to maintain the brood table, the team analyzed the escapement time series using the Percentile Approach (Appendix A), which corroborated the current BEG, indicating no reason to change the goal. The team determined no changes were warranted for the Chignik River total run sockeye salmon BEG because findings from updated spawner-recruit and habitat-based model analyses that incorporated new data from 2022 to 2024 corroborated the existing goal (Appendices B1 and B8). Additionally, changes to the Chignik sockeye salmon OEGs are at the discretion of the BOF as defined in the EGP. Chignik pink and chum salmon goals were last revised in 2016 (Schaberg et al. 2015); the team determined that updated percentile approach analyses presented no new findings using additional years of new data (Appendices C and D).

The team determined that, based on findings from the review, no changes are warranted to any of the existing goals, nor did any new goals warrant being added or existing goals discontinued. All Chignik salmon stocks have not incurred any significant changes since the last review and analyses from this review corroborated existing goals. Because of this, there are no findings to

report and there will be no discussion of the analyses; historical goal changes and supporting information are referenced for all systems in system-specific appendices as listed in Table 1.

SUMMARY OF STAFF FINDINGS TO DIRECTORS

In summary, this comprehensive review of the 6 existing escapement goals in the Chignik Management Areas resulted in all goals remaining unchanged.

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TABLES AND FIGURES

Table 1.–Chignik Management Area salmon escapement goals analyzed, species, system, year adopted, changed criteria and relevant appendix link.

Species	System	Year Adopted	Change	Change Criteria ^a	Appendix
Chinook	Chignik	2002	None	NA	A
Sockeye (total run)	Chignik	2023	None	NA	B
Pink (even)	CMA	2016	None	NA	C
Pink (odd)	CMA	2016	None	NA	C
Chum	CMA	2016	None	NA	D

^a Change criteria codes:

1. Analysis indicates increase in yield by changing escapement goal.
2. Current goal is unmanageable and new escapement goal is needed.
3. No directed fishery on stock.
4. Changes in enumeration methods (i.e., peak aerial survey to weir).
5. Significant revisions to datasets used to assess escapement goals.
6. Long-term or consistent changes in habitat quality/availability.

Table 2.–Chignik Management Area salmon escapements (2015–2024), current escapement goals, and review recommendations for 2025.

Salmon species	2024 goal range		Type	Initial year	Escapements ^a											2025 findings
	Lower	Upper			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		
Chinook																
Chignik River	1,300	2,700	BEG	2002	1,942	1,743	1,079	769	1,417	1,223	1,135	724	267	1,166	No change	
Sockeye ^b																
Chignik River																
Early run	300,000	400,000	OEG	2023	421,848	416,711	420,497	182,974	387,110	178,785	295,726	412,228	431,283	372,831		
Late run	240,000	360,000	OEG	2023	702,051	356,464	372,064	356,724	294,889	152,192	345,216	395,858	457,071	354,749		
Total run ^c	450,000	800,000	BEG	2023	-	-	-	-	-	-	-	-	888,354	727,580	No change	
Pink ^{d,e,f}																
CMA even years	170,000	280,000	SEG	2016	-	68,100	-	42,000	-	118,675	-	303,600	-	262,700	No change	
CMA odd years	260,000	450,000	SEG	2016	404,000	-	586,300	-	415,300	-	392,000	-	621,500	-	No change	
Chum ^{d,g,h}																
CMA	45,000	110,000	SEG	2016	123,400	69,900	96,900	33,400	98,000	35,455	107,000	73,200	183,000	83,100	No change	

^a Cells highlighted grey had escapements that did not meet the goal established in that year. Bold text for aggregate goals represents years that lacked peak escapements from all index streams and were not included in the escapement goal analysis. En dash (-) = not applicable.

^b From 2015 to 2022, the early-run BEG was 350,000-450,000 and the late-run SEG was 200,000-400,000 fish; stock apportionment between 2015 and 2020 was determined using genetic stock identification and from 2021 to the present using a run timing distribution (RTD) model in an expectation maximization algorithm. All sockeye salmon data presented here are from the RTD model. The 2019 escapement based on genetics (345,919 fish) was below the lower bound of the early goal at the time, which would have been 4 consecutive years of the early run not meeting its goal.

^c The total run goal did not exist until 2023, at which time the board established OEGs for each run in lieu of a single run BEG.

^d All counts are peak stream counts from index streams; observed counts from mouths and bays are not included.

^e The pink salmon even-year SEG was 200,000-600,000 fish and the odd-year SEG was 500,000-800,000 fish prior to 2016.

^f Although an escapement of 42,000 pink salmon was observed in 2018, all 8 index streams could not be surveyed and are not included in escapement goal analysis.

^g Prior to 2016, the chum salmon goal was an SEG threshold of 57,400 fish.

^h Although an escapement of 32,000 chum salmon was observed in 2018, all 8 index streams could not be surveyed and are not included in this analysis.

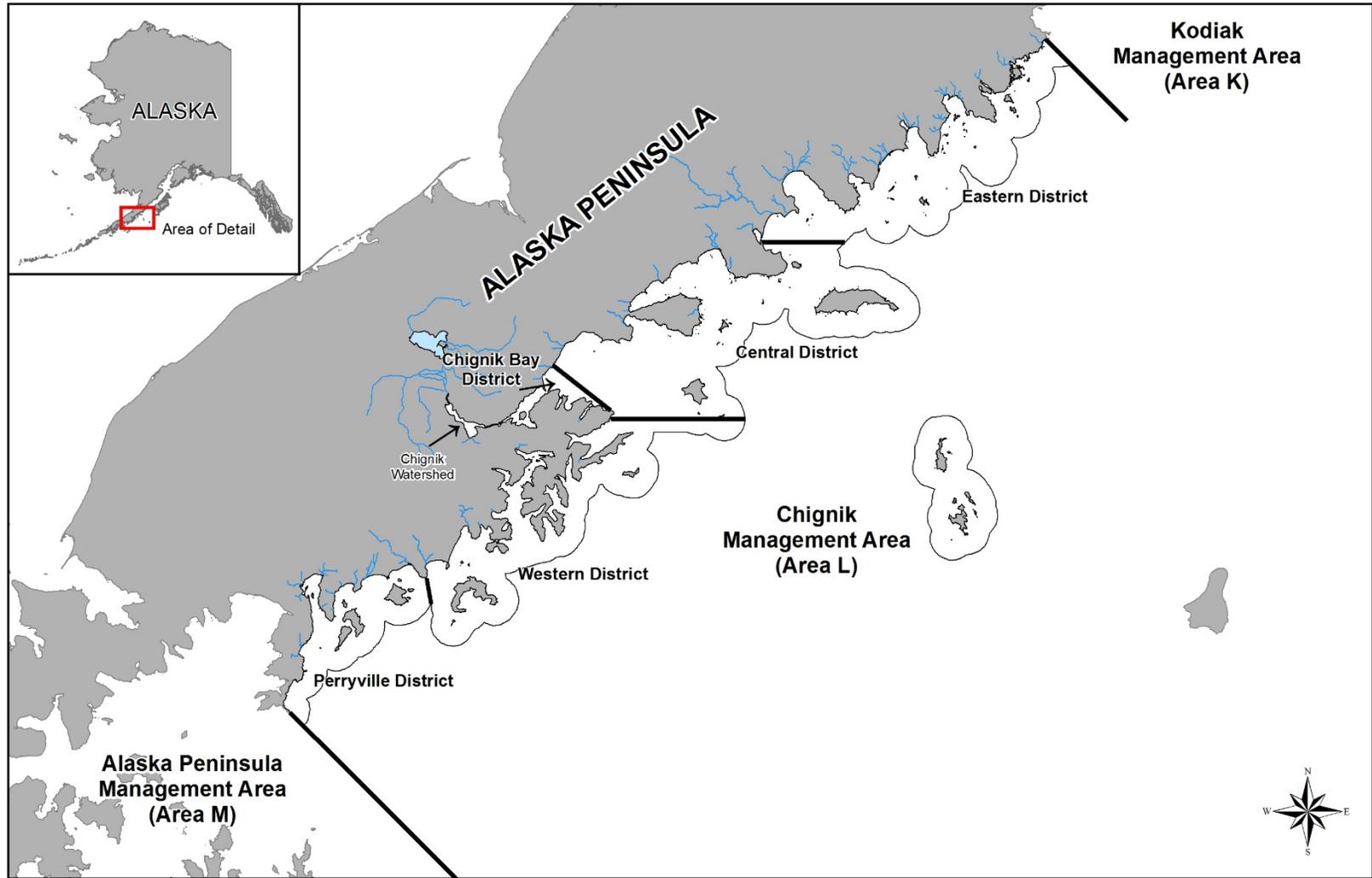


Figure 1.—The Chignik Management Area with the Eastern, Central, Chignik Bay, Western, and Perryville Districts depicted.

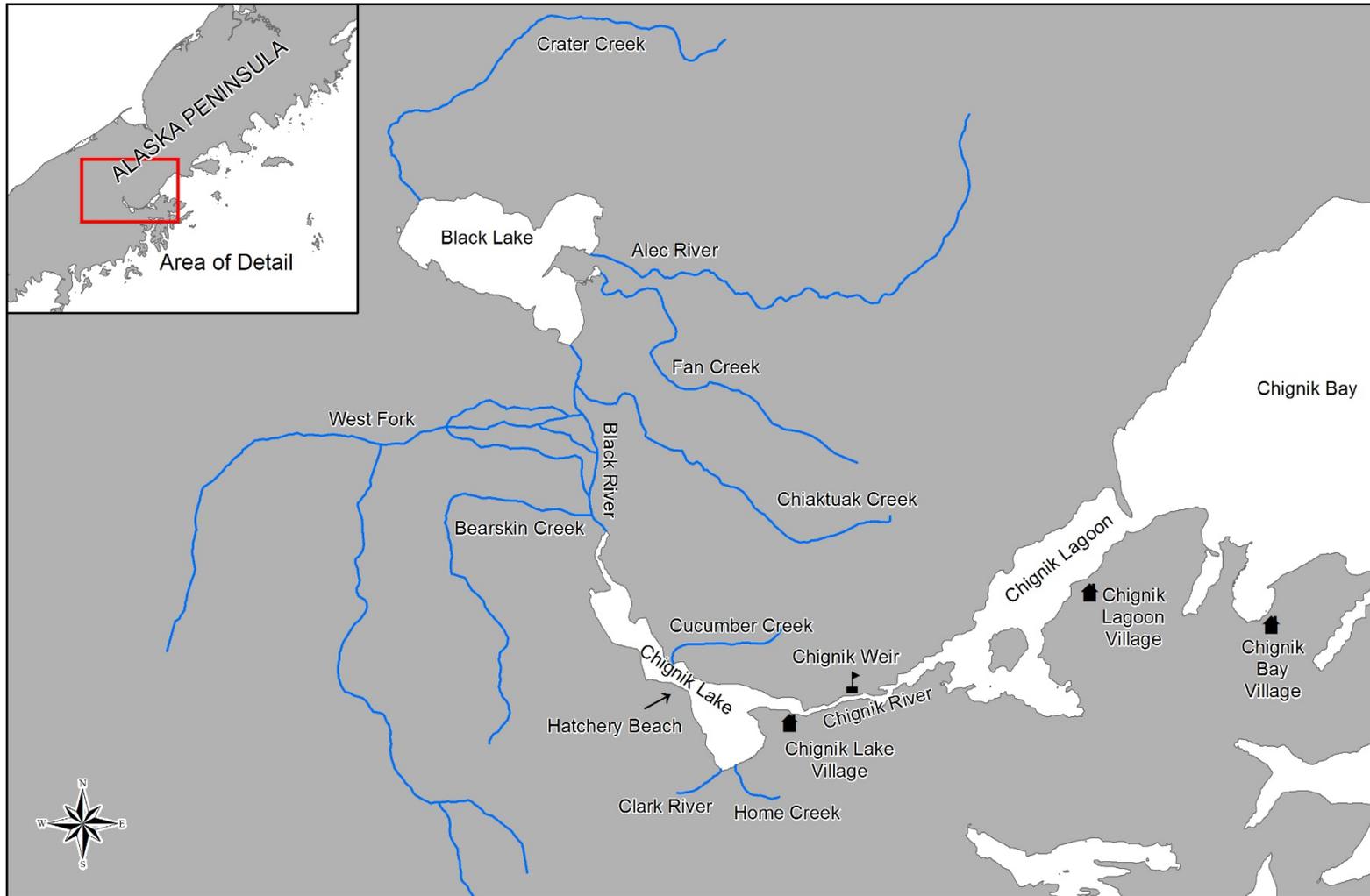


Figure 2.—The Chignik River watershed, showing Black and Chignik Lakes, Black and Chignik Rivers, and Chignik Lagoon.

**APPENDIX A. SUPPORTING INFORMATION FOR THE
CHIGNIK RIVER CHINOOK SALMON ESCAPEMENT
GOAL**

Appendix A1.–Description of stock and escapement goal for Chignik River Chinook salmon.

Stream location:	Chignik Management Area; Chignik River 271-103A
Fishery:	Sport, commercial, and subsistence
Current escapement goal:	BEG: 1,300–2,700 fish (2002)
Updated escapement goal:	No change
Optimal escapement goal:	None
Inriver run goal:	None
SOC status (type and year):	Stock of Management Concern (2023)
Escapement enumeration type	Weir
Data available:	
Counts:	Weir counts, 1978 to present
Age composition:	Escapement 1993–2015
Stock specific harvest:	Annual subsistence harvests were estimated from returns of completed permits (2012–2024). Commercial harvests include all Chinook salmon harvested within the CMA. Sport harvests were historically estimated by the ADF&G creel surveys and guided harvest log books.
Smolt information:	None
Limnology:	1991, 2000–2024
Data contrast:	1978–2024: 28.6
Methodology:	Simple spawner-recruit analysis, Parken habitat model (unpublished), Bayesian age-structured spawner-recruit analysis, percentile approach (15th and 65th percentiles)
Criteria for updated goal (Table 1)	None
Goal history:	Escapement goal originally based on historical escapements starting in 1992 (1,750–3,000) and modified in 1994 (1,450–2,700), and 2002 (1,300–2,700).
Comments:	2025 percentile analysis: 1,129–3,115 fish

Appendix A2.–Chignik River Chinook salmon escapement and harvest information, 1978 to 2024.

Year	Comm harvest ^a	Subs harvest ^b	Weir count	Total run	Sport harvest above weir ^c	Escapement ^d
1978	1,386	50	1,197	2,633	207	990
1979	856	14	1,050	1,920	207	843
1980	929	6	876	1,811	207	669
1981	2,006	0	1,603	3,609	207	1,396
1982	3,269	3	2,412	5,684	207	2,205
1983	3,560	0	1,943	5,503	207	1,736
1984	3,696	23	5,548	9,267	207	5,341
1985	1,810	1	3,144	4,955	207	2,937
1986	2,592	4	3,612	6,208	207	3,405
1987	1,931	10	2,624	4,565	207	2,417
1988	4,331	9	4,868	9,208	233	4,635
1989	3,532	24	3,316	6,872	181	3,135
1990	3,719	103	4,364	8,186	207	4,157
1991	1,993	42	4,545	6,580	207	4,338
1992	3,179	55	3,806	7,040	207	3,599
1993	5,240	122	1,946	7,308	207	1,739
1994	1,804	165	3,016	4,985	207	2,809
1995	3,008	98	4,288	7,394	207	4,081
1996	1,579	48	3,485	5,112	207	3,278
1997	1,289	28	3,824	5,141	207	3,617
1998	1,700	91	3,075	4,866	207	2,868
1999	2,101	243	3,728	6,072	207	3,521
2000	581	163	4,285	5,029	207	4,078
2001	1,142	171	2,992	4,305	207	2,785
2002	920	74	3,028	4,022	207	2,821
2003	2,834	0	6,412	9,246	207	6,205
2004	2,337	0	7,840	10,177	207	7,633
2005	2,442	0	6,486	8,928	361	6,125
2006	1,941	0	3,535	5,476	245	3,290
2007	641	0	2,000	2,641	198	1,802
2008	208	0	1,730	1,938	65	1,665
2009	496	0	1,680	2,176	103	1,577
2010	1,480	0	3,679	5,159	215	3,464
2011	1,382	0	2,728	4,110	265	2,463
2012	303	37	1,449	1,789	61	1,388
2013	545	10	1,253	1,808	83	1,170
2014	353	34	2,895	3,282	88	2,807
2015	1,572	37	2,054	3,663	112	1,942
2016	664	1	1,843	2,508	100	1,743
2017	410	4	1,137	1,551	58	1,079
2018	0	1	825	826	56	769
2019	1,137	1	1,517	2,655	100	1,417
2020	0	13	1,278	1,291	55	1,223
2021	38	0	1,172	1,210	37	1,135
2022	27	2	761	790	37	724
2023	130	0	267	397	0	267
2024	34	2	1,166	1,202	0	1,166

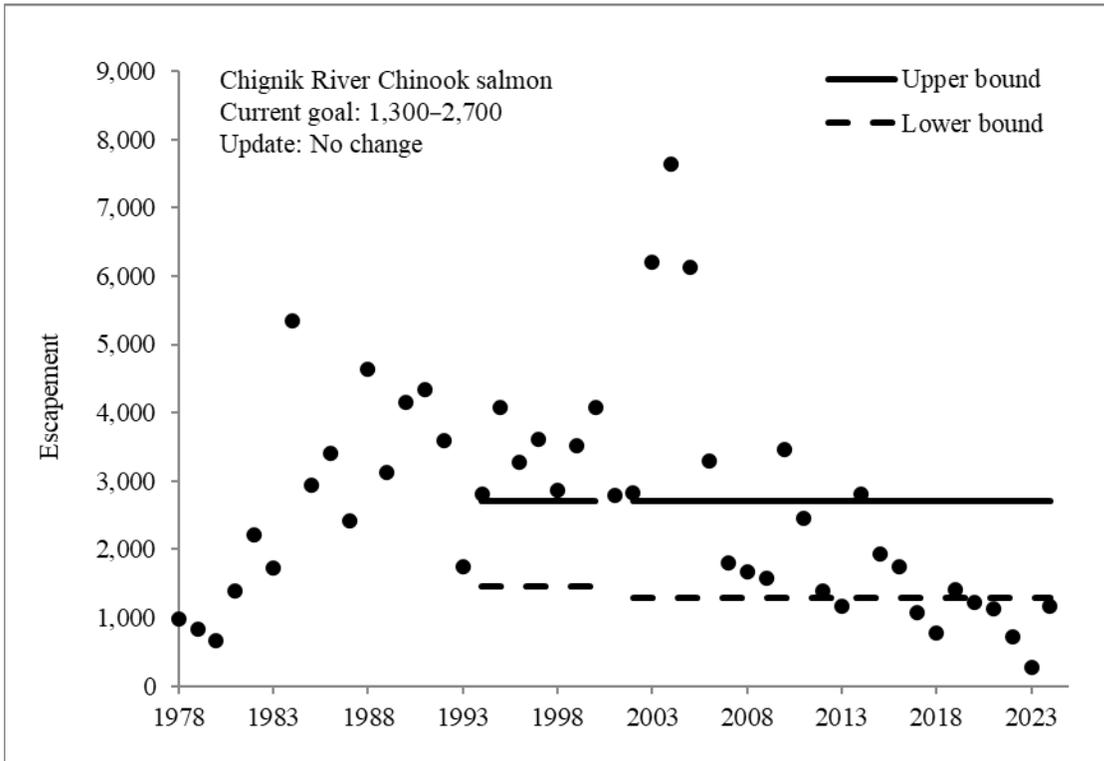
^a Commercial harvest is the commercial harvest of Chinook salmon from the Chignik Lagoon statistical area (271-10). This does not include personal use or test fishery harvest.

^b Subsistence harvest is from Chignik Lagoon as reported on subsistence permit reports.

-continued-

- ^c Sport harvest in 1988 and 1989 was estimated from an onsite creel survey (Schwarz 1990). Recreational harvest through 2004 is the average of 1988 and 1989. Sport harvest from 2005–2015 is estimated using guided logbook harvest from above and below the weir. From 2016–present, harvest information is unavailable and estimated to be 100 fish harvested above the weir based on historical harvests unless the fishery was closed to harvest and then the harvest is based on the percent of days the fishery was open from the first fish passage to the regulatory close of the season.
- ^d Escapement is weir count minus sport harvest above the weir.
- ^e Subsistence and commercial harvest for Chignik Lagoon is not available for 2025 at this time.

Appendix A3.—Annual escapements and escapement goals for Chignik River Chinook salmon, 1978 to 2024.

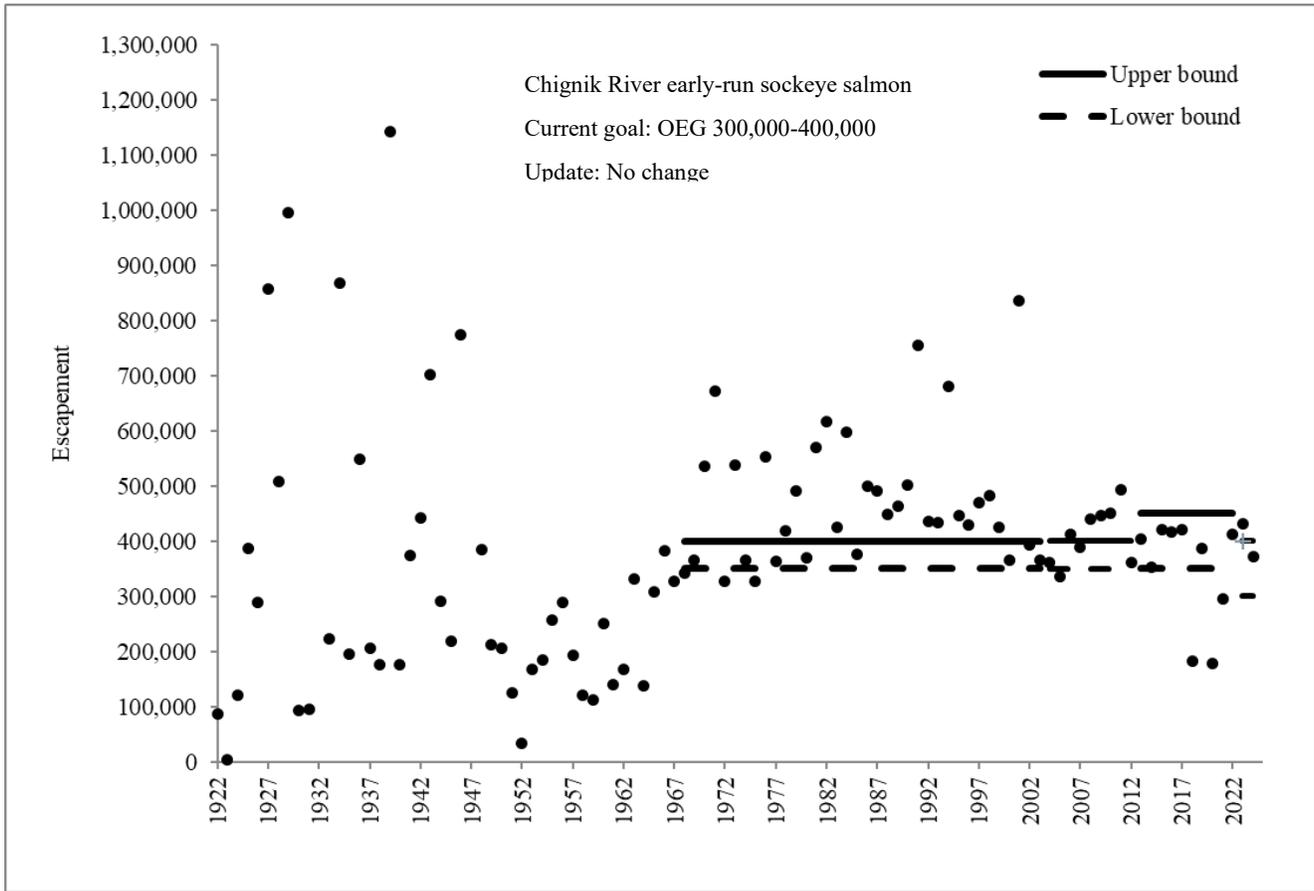


**APPENDIX B. SUPPORTING INFORMATION FOR
CHIGNIK RIVER SOCKEYE SALMON ESCAPEMENT
GOALS**

Appendix B1.—Description of stocks and escapement goals for Chignik River sockeye salmon.

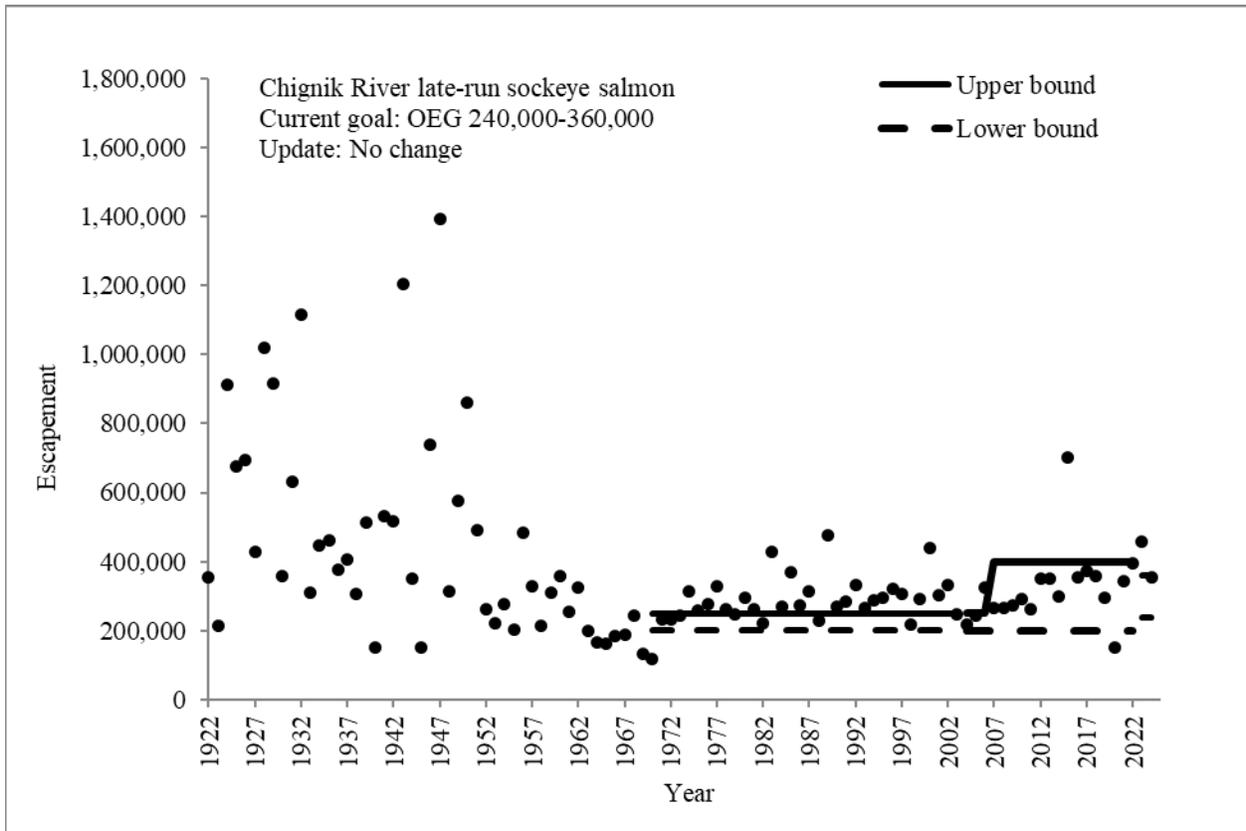
Stream location:	Chignik Management Area; Chignik River 271-103A
Fishery:	Sport, commercial, and subsistence
Current escapement goal:	System-wide BEG: 450,000–800,000 fish
Updated escapement goal:	No change
Optimal escapement goal:	Early run: 300,000–400,000 Late run: 240,000–360,000
Inriver goal:	None
SOC status (type and year):	Stock of Management Concern (2022)
Escapement enumeration type	Weir
Data available:	
Counts:	Weir counts 1922, 1923, 1925–1930, 1932, 1933, 1935–1937, 1939, 1949–1950, 1952 to present
Age composition:	Escapement 1922–2024
Stock specific harvest:	Annual subsistence harvests were estimated from returns of completed permits (2012–2024). Commercial harvests include all sockeye salmon harvested within the CMA and percentages of harvest in Igvak and SEDM Districts up to July 5 and July 25 respectively. Sport harvests were historically estimated by the ADF&G Statewide Harvest Survey.
Smolt information:	Smolt trap: 1994–2016, beach seine: 2000–2016, 2019–present
Limnology:	1991, 2000–2024
Data contrast:	1983–2024: Early run 4.67, Late run 4.61, Total run 4.64
Methodology:	Spawner-recruit model, yield analysis, euphotic volume model, zooplankton biomass model
Criteria for updated goal (Table 1)	None
Goal history:	Early run 1968: 300,000–400,000, 2013: 350,000–450,000, 2023: 300,000–400,000 (OEG); Late run 1968: 200,000–250,000, 1998: management objectives August 25,000 and September 25,000, 2007: 200,000–400,000, 2015: September IRRG 50,000, 2019: total IRRG 20,000, 2023: 240,000–360,000 (OEG) and IRRG discontinued; Total run 2023: 450,000–800,000
Comments:	All Chignik watershed streams are 271-103A. A run timing distribution model has been used since 2020 to reconstruct Chignik sockeye salmon returns by stock; this method was applied to historical catch and escapement data back to 1983, which had daily age composition data available. In 2022, a time-varying alpha Ricker model was run in addition to a simple Ricker stock-recruit model to identify changes in productivity. For the 2025 review, the simple Ricker estimated S_{MSY} at 575,858 fish using data from 1983 to 2017, which approximates the midpoint of the current goal. The lower bound of 450,000 fish and upper bound of 800,000 fish is approximated by the zooplankton biomass model (433,000 and 649,000 fish respectively).

Appendix B2.—Annual escapements for Chignik River early-run sockeye salmon, 1922–2024.



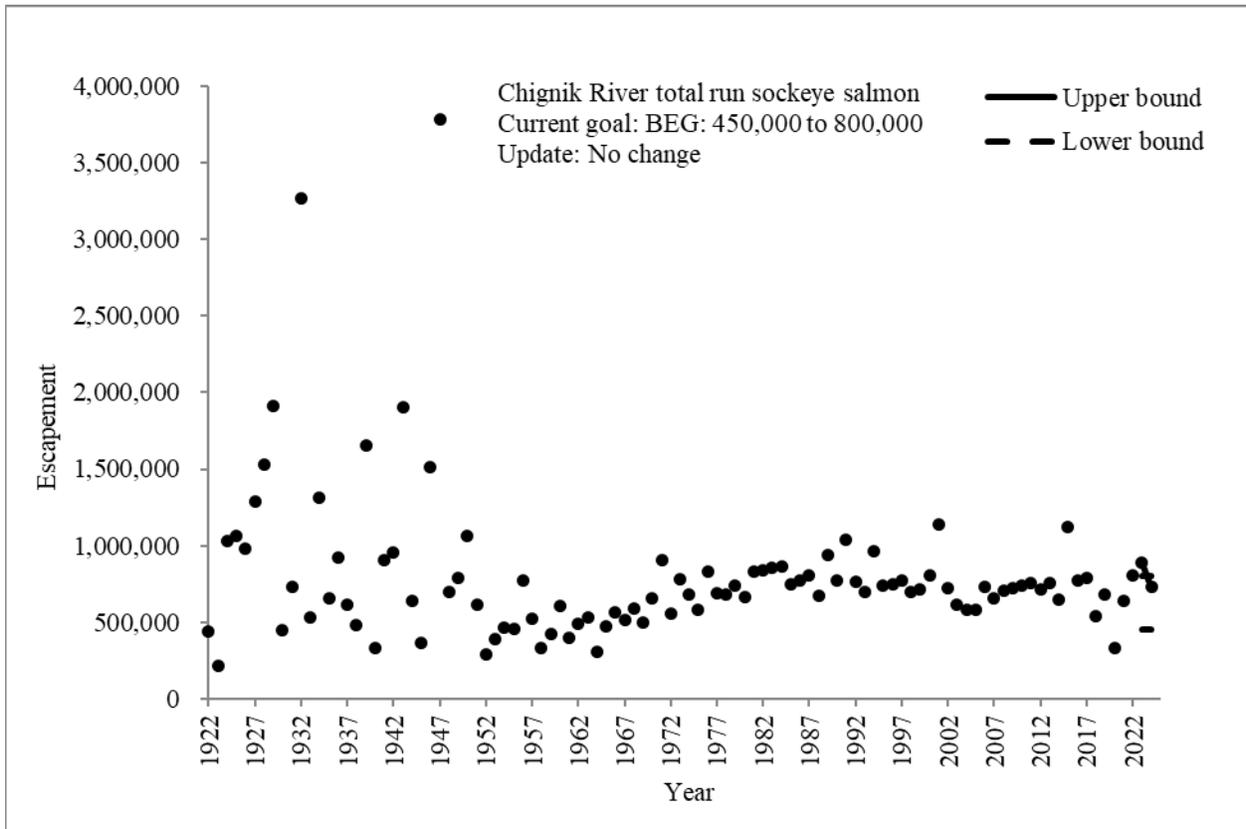
Note: A single-run BEG of 450,000–800,000 fish exists for the total run.

Appendix B3.—Annual escapements for Chignik River late-run sockeye salmon, 1922–2024.



Note: A single-run BEG of 450,000–800,000 fish exists for the total run.

Appendix B4.—Annual escapements for Chignik River total run sockeye salmon, 1922–2024.



Appendix B5.—Brood table for Chignik River early-run sockeye salmon.

Year	Esc	Return Ages																		Total		
		0.1	0.2	1.1	0.3	1.2	2.1	1.3	2.2	3.1	0.4	1.4	2.3	3.2	4.1	2.4	3.3	4.2	2.5		3.4	4.3
1983	426,178	0	0	0	17,466	73,043	2,206	242,100	28,031	0	193	283	236,127	1	0	1,970	641	0	0	0	0	602,060
1984	597,713	0	559	1,778	1,323	48,740	1,190	401,078	51,277	0	0	2,321	278,456	643	0	710	2,147	0	0	0	0	790,222
1985	376,578	191	193	449	604	50,974	464	391,503	62,324	0	876	23,658	367,608	1,783	0	1,361	11,317	0	0	0	0	913,305
1986	498,818	385	441	1,731	5,048	391,094	0	2,006,912	63,743	9	9	3,408	277,157	15,578	0	5,196	1,038	0	0	0	0	2,771,750
1987	490,454	0	956	2,259	1,139	186,751	1,087	893,253	95,484	44	1,021	10,059	393,664	2,634	0	5,049	2,913	0	0	67	0	1,596,382
1988	447,972	0	0	1,975	775	94,108	2,052	538,727	119,891	292	0	3,415	705,857	1,298	0	489	188	0	0	0	0	1,469,066
1989	463,544	0	47	8,258	5,441	217,894	2,753	713,505	91,351	0	282	4,811	236,100	984	0	1,080	10,919	0	0	189	1	1,293,614
1990	500,770	0	1,362	574	32,453	127,729	3,094	569,663	219,793	0	758	5,396	530,005	1	0	3,985	7,871	0	0	0	0	1,502,684
1991	755,846	0	1,568	529	2,526	129,796	336	1,168,205	31,026	0	755	1,531	130,140	1,227	0	209	2,929	0	0	0	0	1,470,778
1992	435,594	0	2,472	684	114,842	48,586	1,792	451,183	69,267	6	535	1,307	189,572	2,151	0	0	3,217	0	0	0	0	885,615
1993	432,935	0	3,262	9	13,224	53,727	1,579	211,610	106,230	0	183	643	404,776	1,383	0	977	392	0	0	0	0	797,997
1994	680,548	0	338	796	0	100,592	737	1,043,909	171,623	0	0	7,966	277,779	0	0	485	38	0	0	0	0	1,604,266
1995	446,160	0	1,919	879	27,999	428,388	0	1,076,855	12,920	0	0	6,137	66,992	0	0	817	894	0	0	0	0	1,623,800
1996	429,463	0	7,388	383	56,447	41,927	0	1,216,247	10,544	0	650	12,172	258,814	536	0	576	1,229	0	0	0	0	1,606,913
1997	468,840	0	7	0	7,842	52,614	826	480,563	37,131	0	16	3,872	155,114	14	0	57	1,001	0	0	0	0	739,057
1998	482,890	0	182	916	2,877	202,127	0	627,411	41,574	0	0	3,096	123,598	1,382	0	0	0	0	0	0	0	1,003,163
1999	424,534	0	1,994	56	19,041	98,261	334	562,015	78,024	0	0	779	163,607	0	0	1,469	891	0	0	0	0	926,471
2000	366,082	0	1,530	18	14,222	243,298	720	972,742	42,599	0	0	10,559	216,493	0	0	5,827	2,783	0	0	0	0	1,510,790
2001	835,060	0	2,713	7	51,309	68,775	0	594,874	18,997	0	1,117	13,130	221,082	146	0	3,567	134	0	0	0	0	975,850
2002	393,196	0	0	0	8,655	39,895	0	258,918	7,569	0	529	3,945	71,538	0	0	0	0	0	0	0	0	391,048
2003	365,050	0	1,704	4	72,596	56,108	0	493,454	19,327	0	887	3,101	69,163	86	0	59	141	0	0	0	0	716,627
2004	362,033	0	7,092	133	123,626	45,878	0	732,679	36,012	0	869	2,130	140,464	0	0	2,426	389	0	0	0	0	1,091,698
2005	335,061	0	386	128	25,393	128,093	357	882,077	12,945	0	0	2,664	478,930	6,424	0	358	25,975	0	0	539	0	1,564,270
2006	411,786	0	1,192	1,125	14,468	205,239	764	2,184,030	114,347	0	0	34,706	587,271	0	0	4,417	8,663	0	0	0	0	3,156,223
2007	389,781	0	2,155	251	14,513	38,654	976	313,684	71,379	0	1,067	1,198	410,848	0	0	992	181	0	0	0	0	855,897
2008	440,697	0	354	30	10,332	423,187	1	1,840,839	3,871	0	0	4,822	62,680	0	0	0	1,196	0	0	0	0	2,347,312
2009	446,383	0	0	238	3,599	45,188	69	95,228	38,498	0	544	333	104,941	1,546	0	4	3,535	0	0	1,195	0	294,919
2010	450,518	0	0	1,143	0	171,035	877	352,782	70,841	0	0	858	312,747	858	0	2,394	4,506	0	0	0	0	918,042
2011	492,557	0	0	2,824	537	200,128	792	776,098	68,683	0	0	6,656	323,775	73	0	1,511	292	0	0	0	0	1,381,370
2012	360,709	0	0	1,699	386	107,712	430	569,061	25,297	0	0	3,057	18,657	0	0	864	435	0	0	0	0	727,598
2013	404,753	0	0	491	40,025	37,552	53	57,462	22,330	0	296	1,097	102,155	0	0	370	0	0	0	0	0	261,831
2014	353,798	0	3,832	553	10,722	50,420	0	123,219	11,075	0	729	1,322	30,904	153	0	0	0	0	0	0	0	232,930
2015	421,848	0	17,911	342	131,267	44,160	183	89,129	29,673	0	361	245	60,187	0	0	381	128	0	0	0	0	373,969
2016	416,711	0	1,530	1,099	558	22,782	1,493	109,027	16,623	0	53	180	61,685	487	0	368	0	0	0	0	0	215,886

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Appendix B5.–Page 2 of 2.

Year	Escapement	Return Ages																			Total			
		0.1	0.2	1.1	0.3	1.2	2.1	1.3	2.2	3.1	0.4	1.4	2.3	3.2	4.1	1.5	2.4	3.3	4.2	2.5		3.4	4.3	
2017	420,497	0	887	1,152	2,949	92,386	76	157,373	11,009	0	0	1,790	22,168	0	0	0	0	0	0	0	0	0	0	0
2018	182,974	0	12,664	1,693	34,676	126,780	5	369,048	15,406	0	308	1,097	21,384	0	0									
2019	387,110	0	32,650	877	128,344	148,201	0	297,548	7,057	0	0													
2020	178,785	487	2,090	3,235	1,205	90,899	0																	
2021	295,726	0	1,460	1,458																				
2022	412,228	0																						
2023	431,283																							
2024	372,831																							

Note: The updated run reconstruction (Finkle and Power 2023) was retroactively applied to catch and escapement back to 1983.

Appendix B6.—Brood table for Chignik River late-run sockeye salmon.

Year	Esc	Return Ages																			Total	
		0.1	0.2	1.1	0.3	1.2	2.1	1.3	2.2	3.1	0.4	1.4	2.3	3.2	4.1	2.4	3.3	4.2	2.5	3.4		4.3
1983	428,034	0	0	0	2,754	11,219	3,531	98,450	94,832	0	67	1	990,756	774	0	10,582	8	0	168	0	0	1,213,140
1984	268,495	0	370	1,505	339	22,986	8,673	54,207	290,887	0	0	2,247	1,316,305	1,629	0	7,280	4,856	0	0	0	0	1,711,283
1985	369,260	122	67	475	10	6,634	13,543	118,217	140,920	0	531	686	277,513	719	0	2,770	381	0	0	0	0	562,587
1986	274,501	133	1	1,582	12,885	92,066	920	91,510	120,805	66	66	593	294,513	2,316	0	8,855	585	0	0	302	0	627,197
1987	313,289	0	6,060	97	594	28,763	6,913	207,827	148,805	203	84	3,955	716,709	2,945	0	5,896	79,544	0	0	91	0	1,208,487
1988	227,785	0	0	1,685	661	27,011	2,190	180,590	75,461	46	0	3,088	356,442	3,370	0	8,031	5,401	0	0	237	265	664,478
1989	477,631	0	488	4,818	5,869	107,580	2,914	452,821	117,762	377	754	1,815	983,343	5,833	0	10,600	82,894	137	0	36	0	1,778,040
1990	269,640	0	264	334	7,331	30,010	2,741	207,504	120,923	0	6	2,044	500,976	1,202	0	1,416	13,010	0	0	248	0	888,010
1991	284,252	0	154	265	657	67,777	1,717	254,854	99,394	0	125	320	401,404	2,579	0	4,990	3,805	0	0	0	0	838,040
1992	331,009	0	14	1,165	13,778	18,379	10,763	122,108	178,486	3,296	5	1,978	564,845	59,607	0	1,198	19,420	0	0	0	0	995,042
1993	264,442	0	159	554	1,783	19,487	16,258	100,934	295,456	0	2	1,939	1,018,154	4,499	0	1,262	178	0	0	0	0	1,460,666
1994	286,361	0	24	816	0	41,950	7,151	469,141	290,796	0	0	5,113	605,758	270	0	2,428	1,363	1,164	0	0	0	1,425,974
1995	293,760	0	35	2,200	5,613	196,988	0	510,178	42,545	132	0	3,070	688,336	14,283	68	12,267	12,491	0	0	0	0	1,488,207
1996	319,674	0	950	85	71,946	57,377	268	525,710	93,661	206	181	7,266	526,242	3,736	0	3,095	6,688	0	0	0	0	1,297,411
1997	306,778	0	3,555	132	2,053	26,606	2,107	187,487	106,317	0	420	1,693	531,344	2,239	0	3,892	2,725	0	0	213	0	870,783
1998	218,238	0	179	1,442	2,244	46,062	131	221,804	35,544	0	0	604	158,613	256	0	404	827	0	0	0	0	468,111
1999	291,432	0	594	83	8,715	51,382	2,501	135,312	42,008	0	0	1,925	120,981	106	0	1,934	617	0	0	0	0	366,160
2000	439,155	0	159	1,274	3,393	62,220	1,121	553,117	19,690	0	0	5,826	390,459	0	0	7,310	5,266	0	0	0	0	1,049,836
2001	301,858	0	17	350	11,644	15,139	1,036	272,176	41,331	0	1,166	13,990	382,954	573	0	6,103	156	0	0	0	0	746,635
2002	331,120	0	0	404	7,861	28,266	0	280,212	24,251	0	190	3,376	263,721	272	0	3,563	1,956	0	0	0	0	614,072
2003	246,939	0	923	334	36,498	44,298	266	224,081	38,120	0	45	3,111	339,252	216	0	3,127	2,454	0	0	0	0	692,723
2004	216,227	0	4,236	858	35,644	15,899	543	321,924	140,623	0	221	1,344	452,340	0	0	7,906	8,897	0	0	0	0	990,435
2005	245,396	0	512	0	11,473	53,279	1,078	362,571	48,116	0	0	2,167	283,064	31,696	0	3,177	23,754	0	0	5,560	0	826,449
2006	323,706	0	1,718	757	10,795	60,773	2,880	249,542	173,160	188	0	4,193	855,641	851	0	12,506	34,871	0	0	0	0	1,407,874
2007	265,192	0	2,260	1,134	11,698	13,656	900	62,119	91,442	0	17	1	622,115	0	0	4,651	1,213	0	0	0	0	811,207
2008	265,359	0	741	2,991	2,958	188,796	652	301,686	37,622	0	0	1,352	342,358	0	0	0	9,392	0	0	0	0	888,548
2009	273,679	0	0	1,196	178	30,764	3,036	104,386	193,186	0	2,136	1,535	860,229	6,336	0	575	3,948	0	0	146	0	1,207,649
2010	293,395	0	0	3,103	592	62,018	14,992	582,703	141,842	0	0	924	356,406	1,114	0	12,310	4,389	0	0	0	0	1,180,392
2011	261,259	0	0	6,404	753	118,759	11,428	435,909	59,868	0	0	5,276	317,091	223	0	2,225	456	0	0	0	0	958,393
2012	351,682	0	0	4,416	1,283	35,951	1,708	200,028	35,511	0	0	1,986	40,610	429	0	548	1,861	0	0	0	0	324,330
2013	351,349	0	436	926	8,181	48,359	4,131	100,126	113,014	0	1	771	389,664	0	0	901	0	0	0	0	0	666,511
2014	297,812	0	951	2,966	10,873	73,532	228	228,512	26,373	0	917	286	53,489	70	0	0	0	0	0	0	0	398,196
2015	702,051	0	11,834	1,448	73,891	13,682	17,373	37,609	50,036	0	99	8	287,019	954	0	2,803	697	0	0	0	0	497,453
2016	356,464	0	466	4,540	580	8,015	829	67,937	28,766	0	1,156	1	115,545	8	0	2,690	700	0	0	0	0	231,233

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Year	Escapement	Return Ages																			Total			
		0.1	0.2	1.1	0.3	1.2	2.1	1.3	2.2	3.1	0.4	1.4	2.3	3.2	4.1	1.5	2.4	3.3	4.2	2.5		3.4	4.3	
2017	372,064	0	135	144	10,282	52,008	1,723	133,845	31,193	0	0	79	125,226	0	0	0	603	0	0					355,238
2018	356,724	0	9,800	6,327	15,675	354,965	6,266	811,316	202,419	0	0	1,970	111,509	0	0									
2019	294,889	0	6,137	6,570	23,037	95,998	2,342	232,794	54,695	0	0													
2020	152,192	8	3,452	8,376	3,961	145,574	1,236																	
2021	345,216	0	1,146	4,651																				
2022	395,858	0																						
2023	457,071																							
2024	354,749																							

Note: The updated run reconstruction (Finkle and Power 2023) was retroactively applied to catch and escapement back to 1983.

Appendix B7.—Brood table for Chignik River total run sockeye salmon.

Year	Esc	Return Ages																			Total	
		0.1	0.2	1.1	0.3	1.2	2.1	1.3	2.2	3.1	0.4	1.4	2.3	3.2	4.1	2.4	3.3	4.2	2.5	3.4		4.3
1983	854,212	0	0	0	20,220	84,262	5,737	340,550	122,863	0	260	284	1,226,882	774	0	12,552	648	0	168	0	0	1,815,200
1984	866,208	0	929	3,282	1,661	71,726	9,862	455,285	342,164	0	0	4,568	1,594,761	2,273	0	7,990	7,003	0	0	0	0	2,501,505
1985	745,838	312	260	924	614	57,607	14,007	509,720	203,243	0	1,408	24,344	645,120	2,503	0	4,131	11,698	0	0	0	0	1,475,892
1986	773,319	519	441	3,314	17,933	483,161	920	2,098,422	184,548	75	75	4,000	571,670	17,894	0	14,051	1,623	0	0	302	0	3,398,947
1987	803,743	0	7,016	2,355	1,733	215,514	8,000	1,101,080	244,289	247	1,105	14,015	1,110,374	5,580	0	10,946	82,457	0	0	158	0	2,804,869
1988	675,757	0	0	3,660	1,436	121,120	4,242	719,318	195,352	339	0	6,503	1,062,298	4,668	0	8,520	5,588	0	0	237	265	2,133,544
1989	941,175	0	535	13,076	11,310	325,474	5,667	1,166,326	209,113	377	1,035	6,627	1,219,443	6,817	0	11,681	93,813	137	0	224	1	3,071,655
1990	770,410	0	1,626	908	39,785	157,739	5,834	777,166	340,716	0	764	7,440	1,030,982	1,203	0	5,402	20,882	0	0	248	0	2,390,694
1991	1,040,098	0	1,722	793	3,183	197,573	2,053	1,423,059	130,420	0	880	1,851	531,544	3,806	0	5,200	6,734	0	0	0	0	2,308,818
1992	766,603	0	2,486	1,850	128,620	66,965	12,555	573,291	247,753	3,302	540	3,285	754,417	61,759	0	1,198	22,637	0	0	0	0	1,880,657
1993	697,377	0	3,421	563	15,008	73,214	17,837	312,545	401,687	0	185	2,582	1,422,930	5,882	0	2,239	571	0	0	0	0	2,258,663
1994	966,909	0	362	1,613	0	142,543	7,888	1,513,050	462,419	0	0	13,080	883,537	270	0	2,913	1,401	1,164	0	0	0	3,030,240
1995	739,920	0	1,954	3,079	33,612	625,376	0	1,587,033	55,464	132	0	9,207	755,327	14,283	68	13,085	13,385	0	0	0	0	3,112,007
1996	749,137	0	8,338	468	128,394	99,305	268	1,741,956	104,205	206	830	19,439	785,057	4,272	0	3,671	7,917	0	0	0	0	2,904,324
1997	775,618	0	3,563	132	9,894	79,220	2,933	668,050	143,448	0	436	5,565	686,458	2,252	0	3,950	3,726	0	0	213	0	1,609,840
1998	701,128	0	361	2,358	5,121	248,189	131	849,215	77,118	0	0	3,700	282,211	1,638	0	404	827	0	0	0	0	1,471,274
1999	715,966	0	2,588	139	27,756	149,643	2,836	697,327	120,033	0	0	2,704	284,588	106	0	3,403	1,508	0	0	0	0	1,292,631
2000	805,237	0	1,688	1,292	17,614	305,517	1,841	1,525,859	62,289	0	0	16,385	606,953	0	0	13,138	8,049	0	0	0	0	2,560,626
2001	1,136,918	0	2,730	357	62,953	83,914	1,036	867,050	60,328	0	2,283	27,121	604,035	719	0	9,670	290	0	0	0	0	1,722,485
2002	724,316	0	0	404	16,516	68,161	0	539,130	31,820	0	719	7,321	335,259	272	0	3,563	1,956	0	0	0	0	1,005,120
2003	611,989	0	2,627	337	109,093	100,405	266	717,534	57,447	0	932	6,212	408,414	302	0	3,185	2,595	0	0	0	0	1,409,350
2004	578,260	0	11,328	991	159,270	61,777	543	1,054,602	176,635	0	1,090	3,474	592,804	0	0	10,332	9,287	0	0	0	0	2,082,133
2005	580,457	0	899	128	36,867	181,372	1,435	1,244,648	61,061	0	0	4,832	761,994	38,120	0	3,535	49,729	0	0	6,099	0	2,390,719
2006	735,492	0	2,910	1,881	25,263	266,012	3,645	2,433,572	287,506	188	0	38,900	1,442,912	851	0	16,924	43,535	0	0	0	0	4,564,097
2007	654,973	0	4,415	1,386	26,210	52,310	1,876	375,802	162,821	0	1,083	1,200	1,032,964	0	0	5,643	1,394	0	0	0	0	1,667,104
2008	706,056	0	1,095	3,022	13,290	611,983	652	2,142,525	41,493	0	0	6,174	405,038	0	0	0	10,588	0	0	0	0	3,235,861
2009	720,062	0	0	1,434	3,777	75,952	3,104	199,614	231,684	0	2,680	1,869	965,170	7,882	0	579	7,482	0	0	1,340	0	1,502,568
2010	743,913	0	0	4,246	592	233,053	15,869	935,485	212,683	0	0	1,782	669,153	1,972	0	14,704	8,896	0	0	0	0	2,098,434
2011	753,816	0	0	9,228	1,290	318,887	12,220	1,212,007	128,552	0	0	11,932	640,866	297	0	3,736	748	0	0	0	0	2,339,762
2012	712,391	0	0	6,116	1,669	143,663	2,138	769,089	60,808	0	0	5,043	59,267	429	0	1,412	2,296	0	0	0	0	1,051,928
2013	756,102	0	436	1,417	48,206	85,911	4,184	157,589	135,344	0	297	1,868	491,819	0	0	1,271	0	0	0	0	0	928,342
2014	651,610	0	4,783	3,519	21,595	123,952	228	351,730	37,448	0	1,646	1,608	84,394	223	0	0	0	0	0	0	0	631,126
2015	1,123,899	0	29,745	1,790	205,157	57,842	17,557	126,738	79,709	0	460	253	347,206	954	0	3,184	825	0	0	0	0	871,421
2016	773,175	0	1,996	5,639	1,138	30,796	2,323	176,964	45,389	0	1,209	181	177,230	495	0	3,058	700	0	0	0	0	447,118

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Appendix B7.–Page 2 of 2.

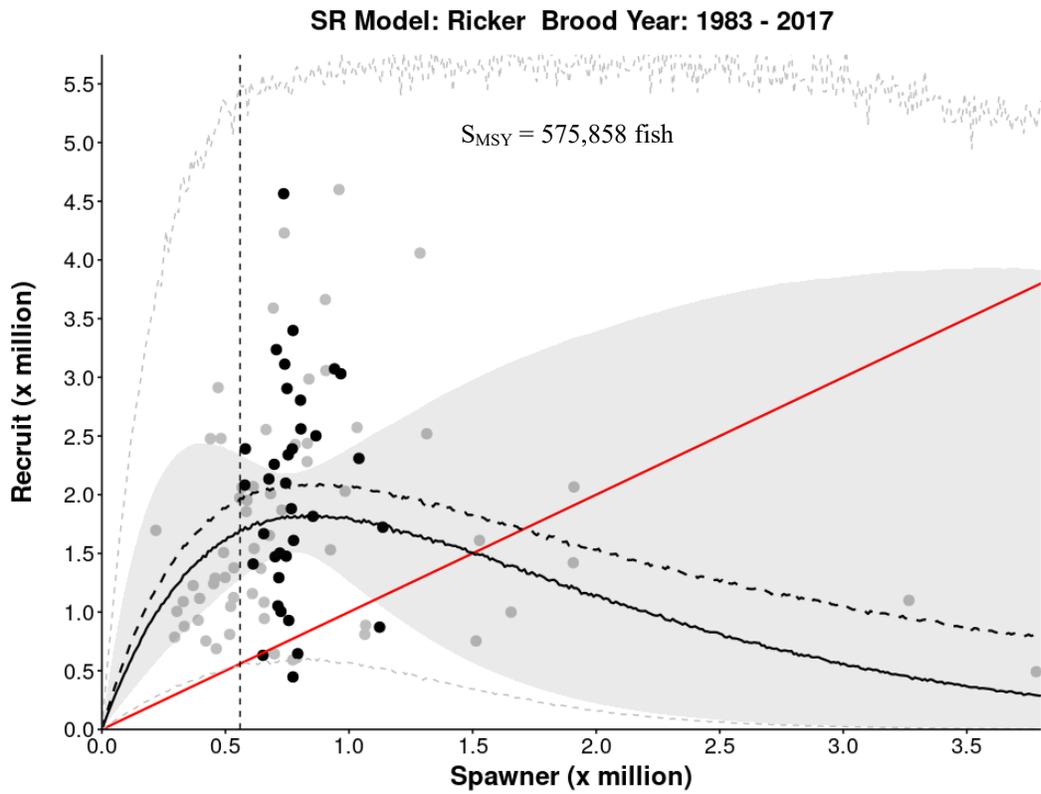
Year	Esc	Return Ages																		Total		
		0.1	0.2	1.1	0.3	1.2	2.1	1.3	2.2	3.1	0.4	1.4	2.3	3.2	4.1	2.4	3.3	4.2	2.5		3.4	4.3
2017	792,561	0	1,021	1,296	13,230	144,394	1,800	291,218	42,202	0	0	1,869	147,394	0	0	603	0	0	0	0	0	645,029
2018	539,698	0	22,464	8,019	50,351	481,745	6,271	1,180,365	217,824	0	308	3,067	132,893	0	0	0	0	0				
2019	681,999	0	38,787	7,447	151,381	244,199	2,342	530,342	61,752	0	0	2,220	150,115	0	0							
2020	330,978	495	5,542	11,611	5,166	236,473	1,236	1,445,222	34,882	0	0											
2021	640,942	0	2,606	6,109	12,536	301,908	3,490															
2022	808,086	0	1,245	21,234																		
2023	888,354	0																				
2024	727,580																					

Note: The updated run reconstruction (Finkle and Power 2023) was retroactively applied to catch and escapement back to 1983.

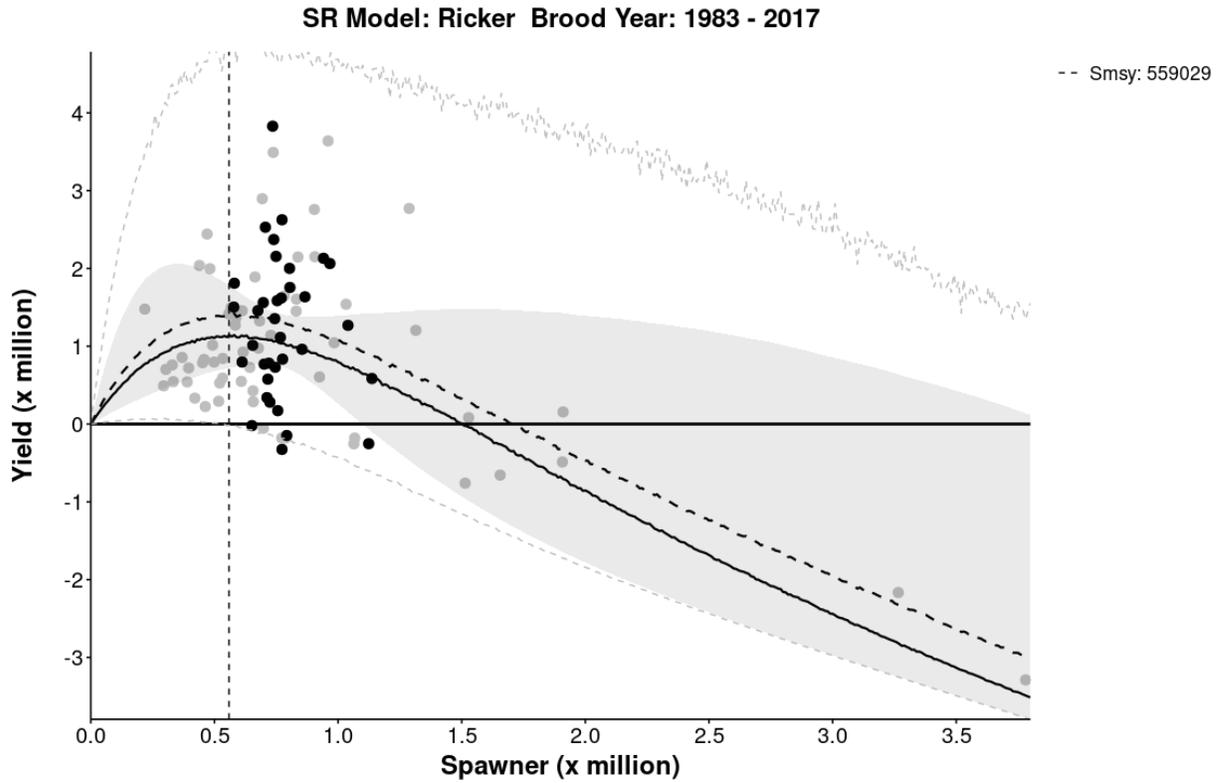
Appendix B8.—Summary of models evaluated for Chignik River sockeye salmon using data from 1983 to 2024.

Stock	Data set and analysis	Data range	$\ln \alpha$	β	Midpoint	Lower	Upper
Total run	Current BEG				625,000	450,000	800,000
	Zooplankton biomass	2000 to 2024	NA	NA	540,875	432,700	649,050
	Euphotic volume	2000 to 2024	NA	NA	194,634	155,707	233,561
	Simple Ricker ^a	1983 to 2017	1.728	0.113	575,858	341,357	1,665,777

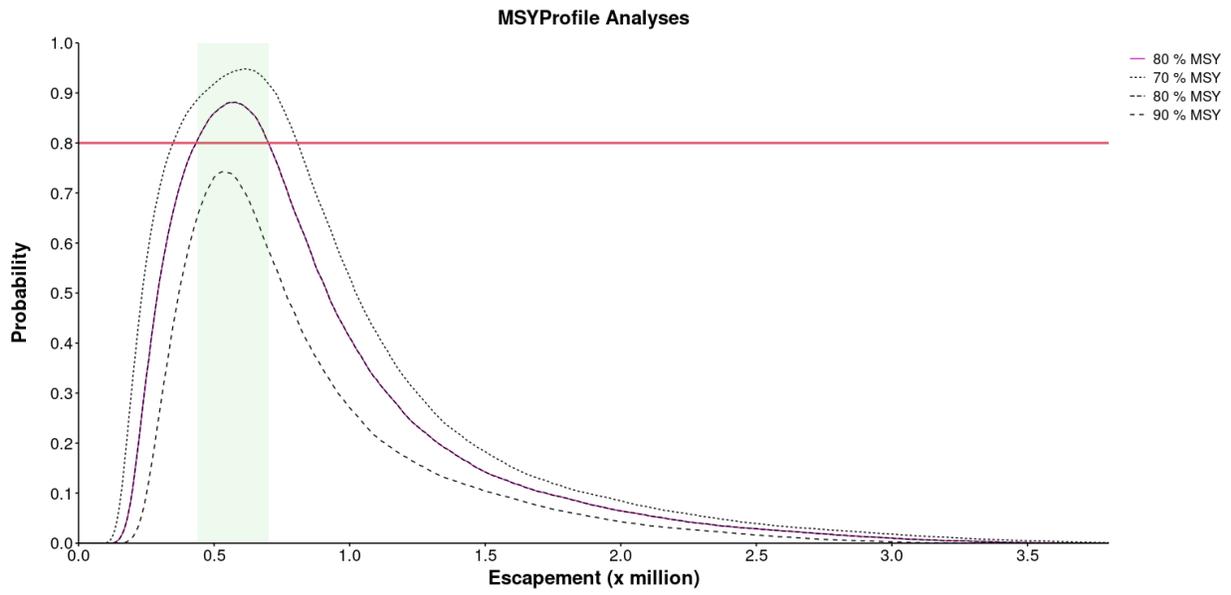
^a For the simple Ricker model, the midpoint estimate in this table is S_{MSY} and the lower and upper bounds are the 5th and 95th percentiles of the median of S_{MSY} .



Note: Light grey dots and line are for data points prior to 1983 not included in the model fit, solid line = median, dashed line = mean, vertical dashed line= SSMY, grey fill = 95% Bayesian credible interval.



Note: Light grey dots and line are for data points prior to 1983 not included in the model fit, solid line = median, dashed line = mean, vertical dashed line= SSMY, grey fill = 95% Bayesian credible interval.



Note: An escapement range of 450,000–800,000 fish is estimated to achieve 80% of MSY, 80% of the time.

**APPENDIX C. SUPPORTING INFORMATION FOR
CHIGNIK MANAGEMENT AREA PINK SALMON
ESCAPEMENT GOALS**

Appendix C1.–Description of stock and escapement goal for Chignik pink salmon.

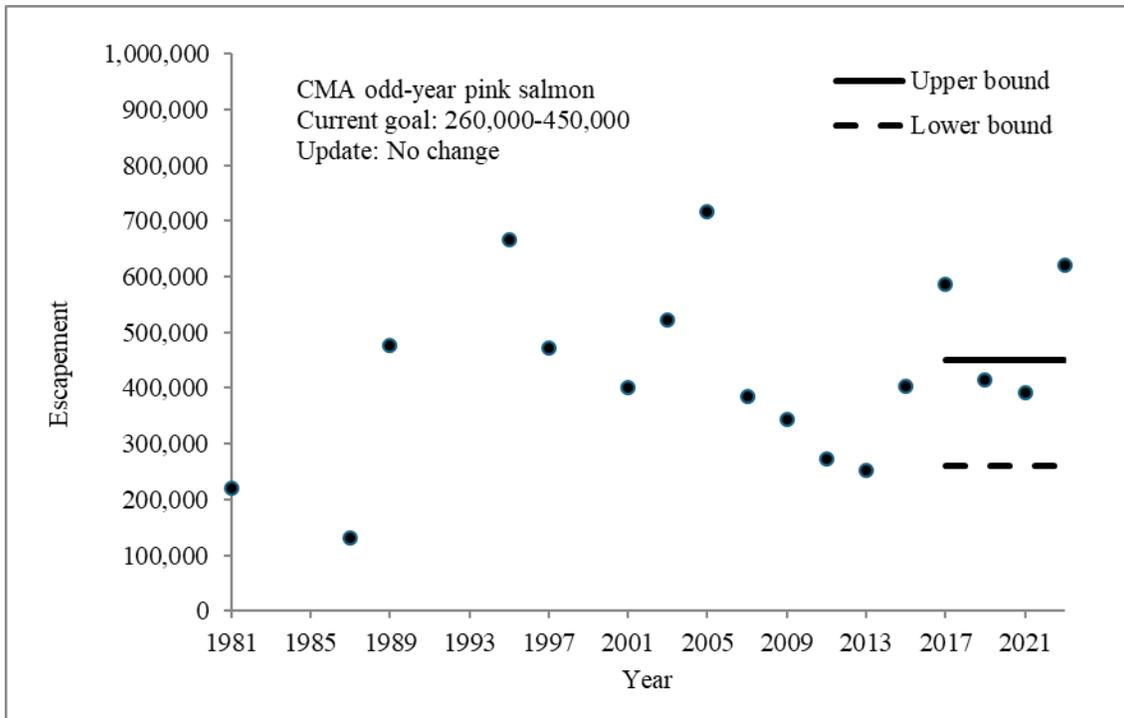
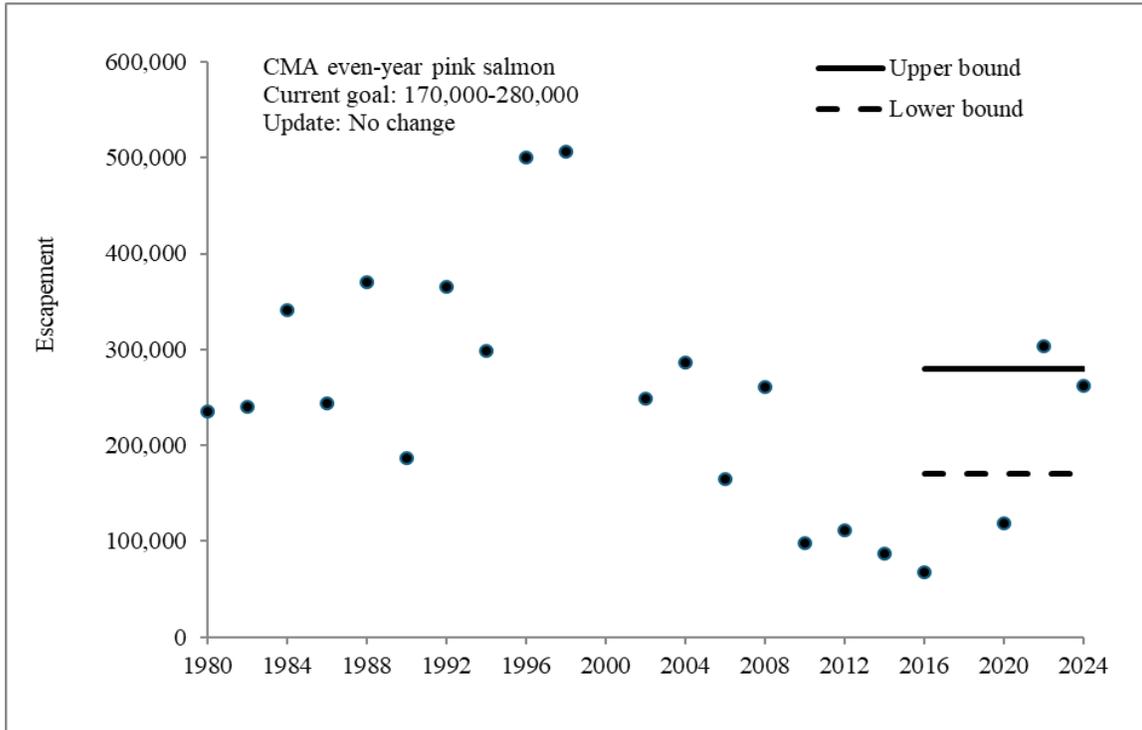
Stream location:	Chignik Management Area
Fishery:	Commercial
Current escapement goal:	SEG (even years): 170,000–280,000 (2016) SEG (odd years): 260,000–450,000 (2016)
Updated escapement goal:	No change
Optimal escapement goal:	None
Inriver goal:	None
SOC status (type and year):	None
Escapement enumeration type	Aerial survey, 1980 to present.
Data available:	
Counts:	Peak aerial survey counts 1980–2024 from index streams.
Age composition:	None
Stock specific harvest:	1980–2024, estimated by combined district harvests in the CMA.
Smolt information:	None
Limnology:	None
Data contrast:	1980–2024: Even 7.4, Odd 5.5
Methodology:	Percentile (20th and 60th percentiles)
Criteria for updated goal (Table 1)	None
Goal History:	District goals established in 1999. Aggregate even and odd year goals established in 2004 (even 327,000–737,000, odd 541,000–1,177,000). Goals increased in 2007 (even 200,000–600,000, odd 500,000–800,000). In 2015, peak aerial survey counts from index streams were used (even 170,000–280,000, odd 260,000–450,000).
Comments:	Data from 1980–2024 were used from systems with complete survey histories, in years with a majority of systems surveyed, and indicator streams selected based on contribution to district and area-wide escapement estimates. Eight area-wide systems were chosen to represent an indexed escapement goal: Aniakchak River 272-605, Main Creek 272-702, Chiginagak Bay East 272-905, Kumlium Creek 272-501, North Fork River 272-514, Ivan River 273-722, Ivanof River 275-406, Humpback Creek 275-502. 2025 percentile approach results: even year 127,900–277,280 odd year 286,450–449,620

Appendix C2.–Chignik pink salmon escapement as peak aerial survey (PAS) index, in selected indicator streams 1980–2024.

Year	Ivanof River	Humpback Creek	Ivan River	Kumlium Creek	North Fork River	Aniakchak River	Main Creek	Chiginagak Bay East	Index Total
1980	38,000	10,000	28,000	2,500	38,500	40,000	50,000	28,000	235,000
1981	18,000	39,000	80,000	35,000	14,000	2,700	5,800	25,000	219,500
1982	2,700	3,500	21,000	900	12,000	130,000	36,000	34,000	240,100
1983	20,000	8,500	12,000	–	–	1,000	9,000	3,100	53,600
1984	61,000	15,000	98,000	3,000	25,000	28,400	8,500	102,000	340,900
1985	150,000	20,000	20,000	–	4,500	–	13,600	15,000	223,100
1986	5,400	2,000	9,600	30,000	27,000	1,500	85,000	84,000	244,500
1987	16,900	15,500	12,800	46,900	5,500	2,500	11,100	20,000	131,200
1988	91,000	24,000	39,000	22,000	58,000	52,000	33,000	51,000	370,000
1989	161,000	51,000	32,000	63,000	23,000	5,000	53,000	89,000	477,000
1990	35,000	5,000	12,800	2,500	21,000	15,000	48,000	47,000	186,300
1991	150,300	96,300	42,200	115,300	–	–	–	5,700	409,800
1992	43,110	25,290	31,400	9,800	38,300	96,600	25,600	95,140	365,240
1993	80,170	123,300	17,300	82,000	24,500	–	25,500	10,000	362,770
1994	53,000	40,000	30,000	20,000	31,000	60,000	30,000	35,000	299,000
1995	145,000	100,000	120,000	114,000	45,000	70,000	66,000	7,000	667,000
1996	159,000	44,000	75,000	5,000	40,000	125,000	47,000	5,000	500,000
1997	35,000	46,000	92,000	125,000	33,000	68,000	70,000	3,500	472,500
1998	125,000	20,000	70,000	13,000	32,000	150,000	90,000	6,000	506,000
1999	130,000	14,000	14,000	107,000	45,000	1,000	31,900	–	342,900
2000	25,000	12,000	51,000	150	27,000	197,000	28,000	23,000	363,150
2001	32,000	24,000	71,000	150,000	20,000	41,000	12,000	52,000	402,000
2002	8,000	10,500	53,000	14,000	8,000	93,900	27,000	34,000	248,400
2003	38,000	19,000	20,000	117,000	52,000	102,000	30,000	144,000	522,000
2004	37,000	20,000	37,000	14,000	40,000	100,000	19,000	20,000	287,000
2005	72,000	82,300	150,000	175,000	27,500	140,400	69,000	1,100	717,300
2006	7,000	50,000	20,000	3,500	11,300	57,600	14,400	1,000	164,800
2007	100,000	35,000	56,000	37,000	54,000	29,500	64,000	9,000	384,500
2008	51,200	22,000	50,000	10,500	14,000	68,100	33,000	12,000	260,800
2009	65,550	24,200	89,100	51,300	15,300	44,300	32,200	22,300	344,250
2010	2,000	4,800	4,500	600	4,500	51,000	21,000	10,000	98,400
2011	37,000	42,000	30,000	52,000	22,000	31,000	29,000	29,000	272,000
2012	3,000	20,000	14,400	1,200	32,400	20,000	15,000	5,000	111,000
2013	10,000	18,900	37,600	75,000	6,700	38,000	18,600	47,000	231,800
2014	3,840	11,000	36,600	3,500	8,500	2,800	7,900	13,100	87,240
2015	53,600	21,200	39,200	136,000	15,700	65,300	37,000	36,000	404,000
2016	15,300	2,900	14,100	1,900	9,500	7,100	7,500	9,800	68,100
2017	106,000	44,200	76,900	153,100	81,300	44,100	57,700	23,000	586,300
2018	21,000	5,000	4,800	600	1,100	–	4,500	5,000	42,000
2019	72,500	10,500	12,600	150,300	25,500	75,000	67,900	1,000	415,300
2020	23,000	9,450	37,600	8,100	6,675	4,000	23,430	6,420	118,675
2021	20,000	30,000	85,000	140,000	30,000	30,000	56,000	1,000	392,000
2022	50,000	6,300	100,000	3,300	6,000	55,000	80,000	3,000	303,600
2023	90,000	35,000	170,000	94,000	40,000	80,000	107,000	5,000	621,000
2024	63,000	10,000	144,000	1,100	17,400	1,000	25,000	1,200	262,700

Note: Systems not successfully surveyed in a survey year are indicated with a dash. If 1 or more systems in a survey year were not successfully surveyed, the Index Total was emboldened.

Appendix C3.–Chignik Management Area aggregate pink salmon escapement, 1980–2024, with current escapement goals.



Note: Prior goals are not included due to a reduction in index streams used to estimate escapement.

**APPENDIX D. SUPPORTING INFORMATION FOR THE
CHIGNIK MANAGEMENT AREA CHUM SALMON
ESCAPEMENT GOAL**

Appendix D1.–Description of stocks and escapement goal for chum salmon in the entire CMA.

Stream location:	Chignik Management Area
Fishery:	Commercial
Current escapement goal:	SEG: 45,000–110,000 (2016)
Updated escapement goal:	No change
Optimal escapement goal:	None
Inriver goal:	None
SOC status (type and year):	None
Escapement enumeration type	Aerial survey, 1980 to present.
Data available:	
Counts:	Peak aerial survey counts (1981–2024) from index streams.
Age composition:	None
Stock specific harvest:	1981–2024, estimated by combined district harvests in the CMA.
Smolt information:	None
Limnology:	None
Data contrast:	1981–2024: 10.9
Methodology:	Percentile (20th and 60th percentiles)
Criteria for updated goal (Table 1)	None
Goal History:	District goals established in 1999. Aggregate SEG threshold established in 2004 (50,400). Goal increased in 2007 (57,400). In 2015, peak aerial survey counts from index streams were used (SEG 45,000–110,000).
Comments:	Data from 1981–2024 were used from systems with complete survey histories, in years with a majority of systems surveyed, and indicator streams selected based on contribution to district and area-wide escapement estimates. Six areawide systems were chosen to represent an indexed escapement goal: Aniakchak River 272-605, Nakililok River 272-804, Chiginagak River 272-903a; Central District: North Fork River 272-514; Portage Creek 273-842; Ivanof River 275-406.
	2025 percentile approach results: 45,660–107,520

Appendix D2.–Chignik chum salmon escapement as peak aerial survey (PAS) index for selected indicator streams 1981–2024.

Year	North						Total Index
	Nakalilok River	Aniakchak River	Chiginangak River	Fork River	Portage Creek	Ivanof River	
1981	5,500	20,000	16,000	15,000	16,800	9,000	82,300
1982	–	47,000	8,500	2,000	6,000	6,100	69,600
1983	3,200	2,665	8,700	–	5,500	4,000	24,065
1984	32,000	42,000	34,850	10,500	12,600	38,000	169,950
1985	–	2,500	–	–	2,200	10,000	14,700
1986	1,000	500	2,000	5,000	2,500	6,700	17,700
1987	2,500	1,700	15,700	3,700	6,400	4,745	34,745
1988	1,600	17,000	9,400	12,100	7,200	23,000	70,300
1989	4,100	2,500	3,400	1,200	1,600	4,000	16,800
1990	9,800	8,000	7,800	700	6,100	20,000	52,400
1991	4,100	5,600	–	2,900	18,700	167,500	198,800
1992	11,160	50,100	4,300	54,000	3,120	14,000	136,680
1993	3,000	7,500	–	8,000	7,200	21,000	46,700
1994	5,000	40,000	3,000	1,200	6,000	65,000	120,200
1995	400	50,000	2,000	15,000	5,000	65,000	137,400
1996	7,000	50,000	2,000	9,000	5,000	65,000	138,000
1997	12,000	7,500	30,000	5,000	15,000	56,000	125,500
1998	7,500	50,000	5,000	4,000	7,000	65,000	138,500
1999	15,000	6,900	3,000	2,000	1,600	6,000	34,500
2000	25,000	39,400	5,000	8,000	2,000	6,000	85,400
2001	10,000	46,000	31,000	2,000	600	53,000	142,600
2002	27,000	17,100	24,000	4,000	4,800	10,000	86,900
2003	7,000	15,000	4,000	13,000	1,500	28,000	68,500
2004	15,000	100,000	10,000	7,600	–	10,000	142,600
2005	–	15,600	–	75,000	9,000	500	100,100
2006	4,000	8,420	8,800	1,200	1,000	18,000	41,420
2007	8,700	10,500	4,200	2,000	14,500	100,000	139,900
2008	1,100	24,900	–	–	14,240	76,800	117,040
2009	32,000	19,000	14,800	9,600	3,900	29,000	108,300
2010	12,000	3,500	19,125	4,000	2,000	62,000	102,625
2011	38,000	6,000	18,000	12,000	3,000	42,000	119,000
2012	5,000	5,000	3,000	3,600	2,200	7,500	26,300
2013	8,500	8,000	1,400	5,000	6,000	81,000	109,900
2014	1,100	6,300	1,720	1,000	8,600	28,000	46,720
2015	30,100	29,000	12,000	12,500	7,500	32,300	123,400
2016	8,500	6,400	19,600	4,000	5,400	26,000	69,900
2017	24,700	16,500	9,300	12,400	6,000	28,000	96,900
2018	–	3,500	1,000	3,200	5,200	20,500	33,400
2019	18,700	24,000	17,400	12,400	4,700	20,800	98,000
2020	12,500	1,800	3,250	2,225	1,680	14,000	35,455
2021	9,000	19,000	30,000	15,000	9,000	25,000	107,000
2022	5,000	20,000	23,000	3,700	2,500	19,000	73,200
2023	29,000	14,000	13,000	22,000	15,000	90,000	183,000
2024	6,000	0	3,000	4,100	5,000	65,000	83,100

Note: Systems not successfully surveyed in a survey year are indicated with a dash. If 1 or more systems in a survey year were not successfully surveyed, the Index Total was displayed in bold text.

Appendix D3.–Chignik Management Area chum salmon escapement, 1981–2024, with current escapement goal.

