Fishery Management Report No. 19-04

Report on Selected Sport Fisheries of the Kodiak Management Area, 2008–2017

by

Tyler Polum

Mark Witteveen

Michelle Stratton

and

Maryanne Evans

February 2019

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

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

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

FISHERY MANAGEMENT REPORT NO. 19-04

REPORT ON SELECTED SPORT FISHERIES OF THE KODIAK MANAGEMENT AREA, 2008–2017

by
Tyler Polum
Alaska Department of Fish and Game Division of Sport Fish, Kodiak
Mark Witteveen
Alaska Department of Fish and Game Division of Sport Fish, Kodiak
Michelle Stratton
Alaska Department of Fish and Game, Division of Sport Fish, Kodiak
and
Maryanne Evans
Alaska Department of Fish and Game, Division of Sport Fish, Kodiak

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

February 2019

This investigation was partially financed by the Federal Aid in Sport Fish Restoration Act (16 U.S.C. 777-777K) under Project F-10-29, 30; Job No. S-2-32, 34; and F-2-6.

The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/. This publication has undergone regional peer review.

Tyler Polum,
Alaska Department of Fish and Game, Division of Sport Fish,
351 Research Court, Kodiak, Alaska 99615, USA

Mark Witteveen,
Alaska Department of Fish and Game, Division of Sport Fish,
351 Research Court, Kodiak, Alaska 99615, USA

Michelle Stratton,
Alaska Department of Fish and Game, Division of Sport Fish,
351 Research Court, Kodiak, Alaska 99615, USA

and

Maryanne Evans
Alaska Department of Fish and Game, Division of Sport Fish,
351 Research Court, Kodiak, Alaska 99615, USA

This document should be cited as follows:
Polum, T., M. Witteveen, M. Stratton, and M. Evans. 2019. Report on selected sport fisheries of the Kodiak Management Area, 2008–2017. Alaska Department of Fish and Game, Fishery Management Report No. 19-04, Anchorage.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

This report provides a detailed summary of the sport fisheries occurring within the Kodiak and Alaska Peninsula–Aleutian Islands management areas and includes a description of the management areas and programs related to area management objectives. Included for each sport fishery are an historical overview covering 2008 through 2017, a summary of 2017 fisheries, a review of current management strategies, and recent fisheries performance. Escapement information is presented through 2018 for salmon fisheries when available.

Key words: Kodiak Management Area, Kodiak Regulatory Area, Alaska Peninsula–Aleutian Islands Regulatory Area, Kodiak Road Zone, Kodiak Remote Zone, stocked lakes, stocking projects, escapement, Chinook salmon, *Oncorhynchus tshawytscha*, coho salmon, *O. kisutch*, sockeye salmon, *O. nerka*, steelhead, rainbow trout, *O. mykiss*, halibut, *Hippoglossus stenolepis*, rockfish, *Sebastes* spp., lingcod, *Ophiodon elongatus*, Alaska Board of Fisheries

INTRODUCTION

This report provides a summary of the sport fisheries occurring within the Kodiak Area (KMA[1]) and the Alaska Peninsula–Aleutian Islands Area (APAIA), which are both managed out of the Alaska Department of Fish and Game (ADF&G), Division of Sportfish (SF) Kodiak office. Included is a description of the management areas and research programs related to area management objectives. Fisheries are described and organized by species, management areas, subunits, and specific drainages or fisheries locations. An historical overview and description of each fishery, historical harvests and salmon escapements, management objectives, and fishery performance are discussed for primary areas of recreational fisheries throughout both areas. Estimates of harvest for most fisheries are presented through 2017 (2018 estimates and 2017 freshwater guidebook logs are unavailable at this time) and estimates of escapement in all salmon fisheries are presented through 2017, except as otherwise noted where they are presented through 2018 because harvest estimates are unnecessary. Weir and survey counts for salmon through 2018 are included to give the most recent information available. Many estimates of escapement rely on harvest estimates and will be presented in future reports. Fisheries occurring in 2018 are only discussed when complete information is available.

The guiding document for SF continues to be the Strategic Plan, which highlights key issues currently facing SF and acts as a guide for division leaders and managers in decision-making (ADF&G 2015). The plan is also used to communicate internally as well as to the public regarding the most important issues for SF and the management of Alaska's sport fisheries, and it is updated periodically to reflect future issues and needed changes in strategic direction. Operational plans and budget submissions are also linked to this plan based on regional needs and priorities.

MANAGEMENT AREA DESCRIPTION

The KMA (Figure 1) includes all freshwater drainages and adjacent marine waters of Alaska circumjacent to the Kodiak and Afognak Island groups. It is further divided into 2 regulatory zones: the Kodiak Road Zone (KRZ) and the Kodiak Remote Zone (Figure 2; referred to as "Remote Zone" hereafter). The KRZ includes all fresh waters and salt waters within 1 mile of Kodiak and Spruce islands east of a line extending from Crag Point in the north to the westernmost point of Saltery Cove in the south and also including the fresh waters of Woody and Long islands

[1] The acronym KMA (Kodiak Management Area) is used to mirror terminology used for commercial fishing management areas for consistency in reporting, but for sport fisheries in regulation, the area is called just the Kodiak Area.

(Figure 3). The Remote Zone encompasses all other fresh waters and adjacent salt waters of the Kodiak and Afognak island groups.

Figure 1.–Map of the Kodiak Management Area (KMA) and Alaska Peninsula–Aleutian Islands Area (APAIA).

The APAIA includes all fresh and salt waters of Alaska on the south side of the Alaska Peninsula, including Pacific Ocean drainages west of the longitude of Cape Douglas, all waters on the north side of the Alaska Peninsula, including Bering Sea drainages south of the latitude of Cape Menshikof, and all fresh and salt waters within and surrounding the Aleutian Islands, including the Pribilof Islands. This area also has a subunit called the Unalaska–Dutch Harbor Road Zone.

Except for road-accessible fisheries located on Kodiak, Unalaska, and near the community of Cold Bay on the Alaska Peninsula, virtually all significant sport fishing opportunities in the KMA and APAIA are remote and relatively difficult to access. A coastal climate with high precipitation and mild temperatures characterizes much of both areas.

Principal land managers include the United States Fish and Wildlife Service (USFWS), National Park Service (NPS), various Alaska Native corporations, and the State of Alaska.

The communities of Kodiak and Unalaska–Dutch Harbor are the 2 largest communities in the 2 management areas, but the areas also encompass approximately 20 small villages.

Management and research operations for both areas are administered through ADF&G SF for Southcentral Region and are based in the Kodiak Area Office. During the report years 2008–2018, area staff members stationed in Kodiak included 3 permanent full-time Fishery Biologists, 1 Program Technician, and several seasonal Fish and Wildlife Technicians. Additional support for the Kodiak office is provided through the regional headquarters office based in Anchorage. Programmatic functions of the Kodiak office include operating salmon counting weirs, collecting and analyzing biological samples, conducting angler creel and salmon escapement surveys, and implementing sport fisheries stocking projects.

Figure 2.–Map of the Kodiak Management Area (KMA) including the Kodiak Road Zone (KRZ) and the Remote Zone.

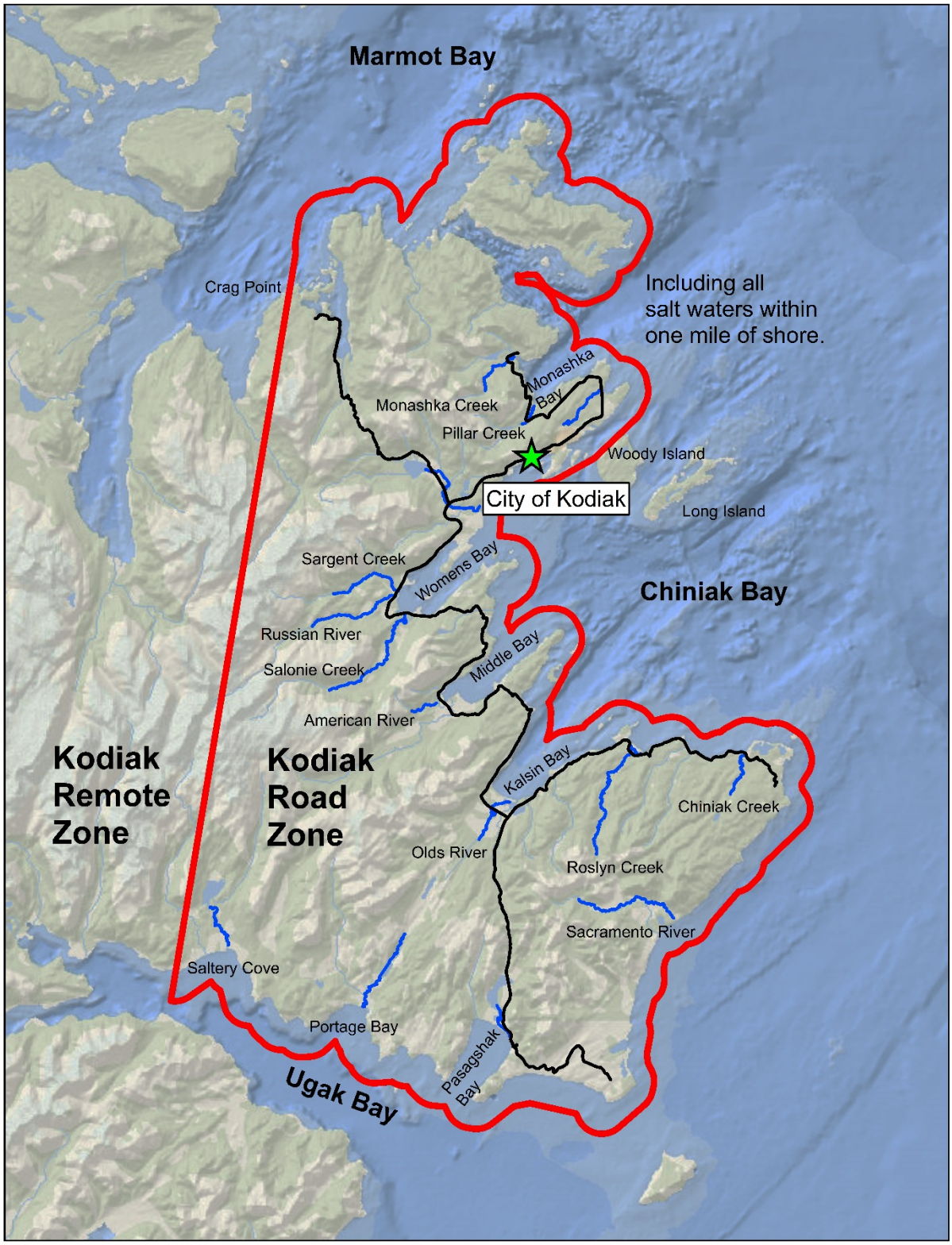


Figure 3.–Map of the Kodiak Road Zone (KRZ).

FISHERY DEVELOPMENT AND REGULATION

Codified regulations governing sport fisheries of the KMA are established in Chapter 64, Title 5 of the Alaska Administrative Code. Regulations pertaining to APAIA fisheries are contained in Chapter 65 of the same title. Regulatory provisions of both areas not specified in these 2 chapters may be found in the Chapter 75 administrative code pertaining to statewide regulation of Alaska sport fisheries.

Fisheries regulations are developed within the established Alaska Board of Fisheries (BOF) process. Public input concerning regulation changes and fishery allocation issues is accommodated in this process through various means including submission of proposals, direct testimony to the BOF, and participation in local fish and game advisory committee (AC) meetings. The ACs have been established throughout Alaska specifically to provide a conduit for public access to the BOF and to assist the BOF in addressing fisheries issues. SF serves as technical advisor at both AC and BOF meetings. In this way, the meetings provide for direct public interaction with ADF&G staff involved with fish resource issues of local concern. Within the KMA, there is one AC, which is called the Kodiak AC. In the APAIA there are 6 more ACs: Chignik, King Cove, False Pass, Nelson Lagoon, Sand Point, and Unalaska–Dutch Harbor. The BOF meets on a 3-year cycle for specific geographical areas and fish resource groupings. Regulatory proposals concerning KMA sport fisheries were most recently addressed in January 2017, and those concerning the APAIA where addressed in February 2016. The next regularly scheduled BOF meeting for KMA sportfishing issues is in early 2020, and the next meeting for the APAIA is scheduled for February 2019. Summaries of recent BOF regulatory actions are provided in Appendix A1.

MANAGEMENT PLANS

In order to resolve allocation conflicts between or within user groups while instituting effective conservation measures, the BOF may institute fishery-specific management plans and policies to guide ADF&G. These plans attempt to assure sustained yield of fish resources in conjunction with the establishment of allocations based on management actions and guidelines. A description of current regulatory management plans specific to sport fisheries occurring within the KMA and APAIA is provided in Appendix B1.

OVERALL SPORT FISHING EFFORT, HARVEST, AND CATCH

Since 1977, sport angler effort in the KMA and APAIA has been estimated using the Statewide Harvest Survey (SWHS), an annual mail-out survey that contacts approximately 10% of the state sport fishing license recipients [2]. The SWHS estimates total days of sport fishing effort (referred to as "angler-days") expended by all anglers (both guided and unguided) fishing Alaska waters, plus angler harvest and total catch by species. The survey is designed to provide estimates of effort, harvest, and catch by fishing location, but does not estimate effort directed toward individual species. Harvest, catch, and effort is also reported in guided angler logbooks for all guided anglers and is considered a census of guided effort due to mandatory reporting of harvest, catch, and effort of all trips made by guides with clients. Logbook information will be presented where applicable but in cases where 3 or less guide businesses report fishing in a particular area in the KMA and APAIA, the information is confidential and will not be presented.

[2] Alaska Sport Fishing Survey database [Internet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited November 2016). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/

The KMA is identical to reporting area Q in the SWHS. The APAIA is reported within the SWHS reporting Area R, which is the Naknek River drainage–Alaska Peninsula reporting area. Area R SWHS statistics pertinent to the APAIA include those from sport fisheries occurring within and around the Alaska Peninsula south of a line from Cape Douglas around the Alaska Peninsula to Cape Menshikof and including the Aleutian Islands.

Effort

In 2017, KMA anglers accounted for 100,330 angler-days of effort and APAIA anglers accounted for 11,042 angler-days (Table 1). From 2008 to 2017, an average of 96,076 angler-days of effort were expended annually by anglers fishing the KMA and 11,311 angler-days were expended on average in APAIA waters during the same time. The effort expended by anglers in these areas has averaged about 5% of the statewide total and 8% of the Southcentral Region[3] total between 2008 and 2017 (calculated from Table 1 and SWHS totals). During this 10-year period, KMA angler effort peaked at 116,192 angler-days in 2013 and the APAIA peaked at 16,627 angler-days in 2009. In 2017, the combined KMA and APAIA effort represented about 7% of the total Southcentral Region angling effort and about 5% of the statewide effort (calculated from Table 1 and SWHS totals). Anglers fishing the KMA represented 90% of the combined KMA and APAIA effort in 2017. During 2008 to 2017, anglers averaged 89% of the combined effort of the two areas (Table 1).

Most fisheries in the KMA occur in fresh and salt waters of the KRZ, and the 2008–2017 average of 70,929 angler-days of effort in the KRZ accounts for 73% of the area's total effort (Table 2). In 2017, the KRZ had 74,528 angler-days of effort, which was 74% of the KMA effort. The Buskin River, accessible from Kodiak's primary roadway, is the most heavily fished drainage in the KMA and APAIA, accounting for an average of 15,830 angler-days from 2008 to 2017 (Table 2). In 2017, anglers expended 19,218 angler-days in the Buskin River drainage. Other major fisheries within the KRZ include the Saltery, Olds, and Pasagshak rivers. Most of the KMA marine sport fisheries occur near the KRZ as well, near the community of Kodiak.

Anglers fishing the APAIA expended an average of 11,311 angler-days of effort from 2008 to 2017 (Table 1). In 2017, anglers in this area accounted for 11,042 angler-days. Effort in the APAIA is very low compared to the KMA and has averaged 11% of the combined KMA–APAIA average effort in the most recent 10 years. In 2017, the APAIA represented 10% of the effort of the combined areas. Major APAIA fisheries occur in the Chignik River drainage, rivers in the vicinity of Cold Bay, and in the Unalaska–Dutch Harbor Road Zone. Other relatively significant fisheries in the area consist of several drainages frequented by remote lodge operators based on the north side of the Alaska Peninsula. Due to the remote location and corresponding high cost to access most fishing destinations within the APAIA, overall angler effort is modest compared to the KMA to the extent that during most years, estimates of effort are unavailable in individual locations due to a lack of respondents to the SWHS.

[3] ADF&G, Division of Sport Fish, Southcentral Region (i.e., Region II) includes the following management areas: Anchorage Area, Bristol Bay, Kodiak–Aleutians, Lower Cook Inlet (Kenai), Northern Cook Inlet (Matanuska–Susitna), Prince William Sound Area, Seward–North Gulf Coast, and Upper Kenai Peninsula.

Table 1.–Total angler-days of sport fishing effort expended in KMA and APAIA waters, 2008–2017.

Management area		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average 2008–2017
APAIA[a]												
	Salt water											
	Angler-days	2,778	3,957	991	5,674	7,334	4,002	5,715	2,242	2,695	1,654	3,704
	% of area	25%	24%	11%	46%	56%	43%	41%	24%	33%	15%	33%
	Fresh water											
	Angler-days	8,117	12,310	7,983	6,677	5,674	5,342	8,088	6,937	5,549	9,388	7,607
	% of area	75%	76%	89%	54%	44%	57%	59%	76%	67%	85%	67%
	Area total	10,895	16,267	8,974	12,351	13,008	9,344	13,803	9,179	8,244	11,042	11,311
	% of total	10%	14%	10%	13%	13%	7%	11%	8%	9%	10%	11%
KMA												
	Salt water											
	Angler-days	52,219	47,333	40,377	36,809	42,374	52,867	44,127	51,107	40,413	38,925	44,655
	% of area	51%	49%	50%	44%	50%	45%	40%	50%	50%	39%	46%
	Fresh water											
	Angler-days	49,820	49,619	41,082	47,620	43,032	63,325	66,858	51,787	39,657	61,405	51,421
	% of area	49%	51%	50%	56%	50%	55%	60%	50%	50%	61%	54%
	Area total	102,039	96,952	81,459	84,429	85,406	116,192	110,985	102,894	80,070	100,330	96,076
	% of total	90%	86%	90%	87%	87%	93%	89%	92%	91%	90%	89%
	Combined total	112,934	113,219	90,433	96,780	98,414	125,536	124,788	112,073	88,314	111,374	107,386

Source: Statewide Harvest Survey (SWHS) estimates from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited November 2018). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

[a] Does not include the Ugashik, Naknek, or Egegik drainage streams reported in the SWHS as Alaska Peninsula Drainages, or unspecified areas in the Alaska Peninsula or Aleutian Islands.

Table 2.–Total angler-days of sport fishing effort expended in major fisheries of the KMA, 2008–2017.

Management area		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average 2008–2017
KRZ												
	Buskin River	15,271	18,775	13,399	13,977	13,996	21,545	20,276	13,704	8,141	19,218	15,830
	Pasagshak River	7,776	8,550	5,170	7,855	8,498	6,840	5,612	5,534	5,160	6,063	6,706
	Olds River	3,362	4,826	4,653	4,421	3,829	7,432	10,739	7,977	7,507	11,041	6,579
	American River	4,602	3,760	4,362	4,601	2,850	5,448	5,236	5,947	4,038	4,247	4,509
	Saltery Cove freshwater	4,127	3,204	3,453	3,947	2,101	5,601	6,644	3,693	3,038	2,527	3,834
	Roadside lakes	250	605	617	1,658	806	2,266	1,546	2,660	–	461	1,208
	Russian River and other roadside streams	5,142	3,484	3,634	5,358	5,195	8,391	7,084	7,084	5,401	4,859	5,563
	Chiniak Bay boat	32,098	23,866	15,888	16,813	17,859	15,769	18,169	24,254	17,099	21,146	20,296
	Ugak Bay boat	–	1,521	1,306	1,188	3,209	2,839	3,210	2,427	2,269	2,483	2,272
	Roadside sites boat	–	–	–	–	–	–	1,633	3,067	1,814	1,457	1,993
	Roadside shoreline [a]	1,393	2,840	4,053	2,051	4,085	10,988	1,095	5,874	4,246	2,828	3,945
	Total	74,021	71,431	56,501	61,869	62,428	87,119	81,244	82,221	57,928	74,528	70,929
Remote Zone												
	Karluk River system	2,302	2,541	1,095	2,125	990	1,167	860	1,621	2,577	1,455	1,673
	Ayakulik (Red) River system	1,905	1,210	960	–	–	–	2,066	–	–	–	1,535
	Remote lakes	604	322	452	335	–	846	–	143	–	74	397
	Remote streams	2,652	1,782	3,287	3,228	3,289	4,329	4,954	3,009	3,186	7,481	3,720
	Afognak Island Area boat	6,226	4,521	6,199	3,619	3,629	6,968	5,471	3,413	3,921	3,213	4,718
	Shuyak Area boat	–	1,924	–	837	–	–	–	–	–	–	1,381
	Uyak Bay boat	3,156	3,415	2,933	1,627	-	3,475	3,389	2,862	2,257	1,723	2,760
	Other remote boat	4,760	4,157	8,356	5,376	6,636	6,372	6,466	7,311	8,807	7,569	6,581
	Other remote shore	742	789	1,632	1,052	–	–	779	–	–	–	999
	Total	22,347	20,661	24,429	18,199	14,544	23,157	23,985	18,359	20,748	21,515	20,794

Source: Statewide Harvest Survey (SWHS) estimates from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited November 2018). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: An endash means insufficient survey responses to generate an estimate.

[a] Roadside shoreline includes Chiniak Bay shoreline and roadside shoreline sites.

Harvest

From 2008 to 2017, an average of 140,683 fish were harvested by anglers fishing the combined KMA and APAIA waters (Table 3). Coho salmon (*Oncorhynchus kisutch*) made up the largest portion of the average harvest at 21% of all species; halibut (*Hippoglossus stenolepis*) were the next most common at 17%; rockfish (*Sebastes sp.*) were third most common at 16%; and sockeye salmon (*O. nerka*) were also very common at 12% of the average harvest. In 2017, a total of 130,441 fish were harvested by anglers in combined KMA and APAIA waters and coho salmon and rockfish were the most commonly harvested species at 19% and 18% of the total harvest, respectively. Halibut and sockeye salmon were the next most commonly harvested species, both at 14% of the total harvest.

From 2008 to 2017, the average harvest of coho salmon was 29,089 fish, the harvest of rockfish averaged 22,231 fish, the harvest of halibut averaged 23,571 fish, and the harvest of sockeye salmon averaged 17,088 fish. In 2017, the coho salmon harvest was 25,360 fish, the rockfish harvest was 23,787 fish, halibut harvest was 17,834 fish, and the sockeye salmon harvest was 18,115 fish.

Other species harvested in relatively large numbers in 2017 included pink salmon (*O. gorbushka*) and Chinook salmon (*O. tshawytscha*), representing 5% and 9% of the harvest, respectively. In the most recent 10 years, both species have averaged 6% of the harvest, respectively. Other species harvested in smaller amounts are chum salmon (*O. keta*), lingcod (*Ophiogon elongatus*), blackcod (*Anoplopoma fimbria*), Dolly Varden (*Salvelinus malma*), rainbow trout and steelhead (*O. mykiss*), and miscellaneous shellfish species such as clams and crab. None of these individually represented more than 3% of annual harvests on average and none more than 2% in 2017.

Catch

Estimates available from the SWHS of the total number of fish caught (harvest plus release) by anglers fishing KMA and APAIA waters indicate that although release to harvest ratios vary substantially by species, overall from 2008 to 2017, an average of 2.6 fish were released for every 1 harvested (calculated from Tables 3 and 4). In 2017, coho, pink, and sockeye salmon were the most commonly caught species, and rockfish, Chinook salmon, and halibut were also caught in large numbers. Species with the highest catch-and-release rates in 2017 were steelhead and rainbow trout; almost all steelhead and rainbow trout were caught and released, and very few were harvested. The next most common catch-and-release species in 2017 were chum salmon (13 released to 1 harvested), pink salmon (8 released to 1 harvested), and Dolly Varden (31 released to 1 harvested). Steelhead and rainbow trout are the primary catch-and-release species targeted by anglers in both the KMA and APAIA, and both are targeted primarily in catch-and-release fisheries. Chum salmon, pink salmon, and Dolly Varden are most frequently caught incidentally while fishing for sockeye salmon, Chinook salmon, and coho salmon, but the former are harvested at a much lower rate because they are generally less desirable species.

Table 3.–Numbers of fish harvested by anglers fishing KMA and APAIA waters, 2008–2017.

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average 2008–2017
Salmon											
Pink	8,602	11,118	4,886	6,751	10,360	10,046	7,015	12,926	6,705	6,412	8,482
Coho	32,067	32,574	25,674	28,369	22,846	30,075	34,442	40,307	19,171	25,360	29,089
Sockeye	17,800	11,117	11,294	10,923	13,457	25,453	24,873	18,700	19,149	18,115	17,088
Chinook	9,466	8,854	2,010	7,926	7,558	9,333	8,854	9,387	10,658	11,708	8,575
Chum	–	–	–	–	–	–	300	591	731	397	505
Groundfish and shellfish											
Clams	1,184	201	1,925	574	3,557	297	2,363	1,483	1,919	485	1,399
Halibut	33,999	31,590	23,063	21,156	23,145	26,591	25,386	18,326	14,619	17,834	23,571
Rockfish	16,884	16,586	20,660	15,907	20,966	21,113	31,177	27,872	27,362	23,787	22,231
Lingcod	3,665	4,034	4,013	4,248	4,118	4,543	5,022	3,065	2,938	2,428	3,807
Black cod	–	–	815	871	1,205	1,009	856	2,309	1,616	3,193	1,484
Smelt	–	–	178	1,214	–	346	92	–	–	–	458
Trout and char											
Dolly Varden	8,116	3,246	5,157	3,534	2,416	3,710	5,164	5,070	3,343	1,536	4,129
Rainbow trout	193	85	284	596	66	302	209	521	144	114	251
Steelhead	52	141	24	6	69	30	27	52	15	31	45
Other fish [a]	6,142	10,844	12,594	16,724	12,309	12,291	22,234	16,686	13,158	19,041	14,202
Total	155,968	145,023	125,941	120,024	128,798	153,796	168,014	157,295	121,528	130,441	140,683

Source: Statewide Harvest Survey (SWHS) estimates from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited November 2018). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: An endash means insufficient survey responses to generate an estimate.

[a] Includes lake trout, skate, Pacific cod, tanner crab, Dungeness crab, and other unspecified species.

Table 4.–Numbers of fish caught by anglers fishing KMA and APAIA waters, 2008–2017.

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average 2008–2017
Salmon											
Pink	50,063	76,975	34,808	44,624	58,839	80,088	38,791	76,994	48,875	62,420	56,673
Coho	56,643	65,486	43,029	48,689	31,459	47,622	59,703	114,427	61,871	82,432	58,770
Sockeye	44,528	25,349	18,725	20,882	22,164	41,004	38,929	47,249	47,511	49,163	34,038
Chinook	12,645	13,002	9,400	13,093	13,095	14,600	13,070	24,824	33,460	32,229	16,354
Chum	6,504	7,213	5,761	3,560	4,377	5,795	5,536	19,711	9,078	13,357	7,504
Groundfish and shellfish											
Clams	1,184	201	1,925	574	3,557	297	2,363	1,483	2,262	720	1,457
Halibut	62,591	53,756	39,910	39,856	38,032	42,462	40,488	31,505	26,688	28,084	40,337
Rockfish	42,149	42,944	49,729	33,216	40,960	35,429	49,978	47,431	48,989	35,000	42,583
Lingcod	6,656	7,971	6,369	7,254	6,353	6,353	7,493	6,044	4,673	3,890	6,306
Black cod	–	–	1,787	1,526	1,958	1,736	1,870	3,680	2,386	3,420	4,244
Smelt	–	–	178	1,339	–	346	301	–	–	–	541
Trout and char											
Dolly Varden	60,270	27,453	40,578	37,219	16,672	34,635	45,879	81,292	61,343	48,090	45,343
Rainbow trout	1,960	567	3,339	7,408	1,714	4,364	3,580	42,597	51,741	51,481	16,875
Steelhead	3,102	1,559	780	2,216	569	717	1,562	3,118	3,669	2,603	1,990
Other fish[a]	19,871	34,148	41,846	36,612	28,810	27,805	43,628	38,730	35,288	14,167	32,091
Total	368,166	356,624	298,164	298,068	268,559	343,253	353,171	539,085	437,834	427,056	368,998

Source: Statewide Harvest Survey (SWHS) estimates from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited November 2018). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: An endash means insufficient survey responses to generate an estimate.

[a] Includes lake trout, skate, Pacific cod, tanner crab, Dungeness crab, and other unspecified species.

CHINOOK SALMON FISHERIES

Chinook salmon runs in the KMA and APAIA are made up of a relatively small number of stocks and collectively make a minor contribution to total Chinook salmon production in Alaska. Wild KMA stocks are found only in the Karluk River and Ayakulik River drainages but historically, these have been the most abundant populations between both management areas. Stocked Chinook salmon runs have now been developed for the KRZ. APAIA stocks are more numerous and include populations in the Chignik, King Salmon, Meshik, Nelson, Sandy, and Cinder rivers plus several other smaller drainages. Exploitation rates by anglers on APAIA stocks are low to the extent that during most years, SWHS estimates of catch and harvest by drainage are unavailable. By comparison, angler interest in the Karluk and Ayakulik rivers has been larger historically, which is probably a result of lower access costs and more convenient travel logistics. However, due to declining abundance of KMA Chinook salmon runs, interest is currently minimal.

Although a variety of users have historically harvested KMA and APAIA Chinook salmon runs, including freshwater and marine sport, commercial, and subsistence fisheries, the primary interest in utilizing these stocks has been from anglers. Currently, a guideline harvest level (GHL) for the Chinook salmon harvest has been established only for the marine waters sport fishery within the KMA (Appendix B1).

Management objectives for KMA and APAIA Chinook salmon stocks include achieving established escapement goals (EG) and within the KMA, managing for the established saltwater Chinook salmon GHL. The Karluk, Ayakulik, Nelson and Chignik Chinook salmon runs are monitored annually for escapement using weirs, whereas spawning assessment of other stocks has been limited to escapement index counts obtained from aerial surveys. To ensure EGs are attained, recreational harvests may be limited or increased by adjusting daily or seasonal bag limits, prohibiting bait, and reducing time and areas open to fishing (Appendix C1). Stocks that consistently fall below EG levels may be closed to sport fishing. Emergency orders (EOs) are regularly used to meet EG objectives in Chinook salmon runs in both the KMA and APAIA.

Since 2001, counts and indexes of freshwater KMA Chinook salmon runs have generally indicated decreasing abundance and some runs have fallen to record low levels. Measures of APAIA Chinook salmon runs have also decreased, however, not as consistently or strongly as KMA stocks, and there have also been periods of relatively high abundance during this time. To meet EGs and rebuild declining runs, many Chinook salmon sport fisheries have been restricted, particularly in the Karluk and Ayakulik drainages. Prior to 2001, Chinook salmon harvests had been a significant contributor to the overall sport harvest of salmon in both areas; however, more recently, harvests of Chinook salmon are small in almost all drainages in the KMA and APAIA and generally make up a small component of the overall angler effort. This is due in part to fishery restrictions and declining interest in Chinook salmon in areas with substantial declines but also due to increased interest in fishing for Chinook salmon as a catch-and-release species. The primary source of Chinook salmon harvest in the KMA is from saltwater, though very little occurs in either saltwater or freshwater in the APAIA.

Chinook salmon typically return to the Karluk and Ayakulik rivers from late May through early July with peak immigration typically occurring in mid-June (Appendices D1 and D2). Chignik and Nelson rivers have later run timing, with peak counts occurring in mid-July (Appendices D3 and D4). Both the KMA and APAIA have a Chinook salmon sport fishing season of 1 January through 25 July in regulation, although the Chignik River is an exception and the Chinook salmon season

does not close until 9 August. Both areas have areawide Chinook salmon bag limits of 2 fish per day, 2 in possession, though an annual limit of 5 applies to freshwater. There are 2 exceptions to this—the Nelson River is catch-and-release only by regulation, and the Sandy River has a bag limit of 1 fish per day, with a 2 fish annual limit by regulation.

Current freshwater Chinook salmon sport fisheries are very small and characterized by low participation rates, low harvest levels, and generally much less angler effort than historically. They are, however, subject to regular management actions by ADF&G and are still a focus of research and management efforts in both areas.

KARLUK RIVER

Fishery Description and Historical Catch

The Karluk River is located on the southwest end of Kodiak Island approximately 60 miles (97 km) from the City of Kodiak. The river runs approximately 22 miles (35 km) and is generally accessible to anglers only by aircraft. Access is further limited by private land ownership of most uplands surrounding the drainage. The Karluk River drainage supports 1 of 2 indigenous Chinook salmon populations in KMA waters, and it has historically supported the most popular Chinook salmon sport fishery between the KMA and APAIA.

The Karluk River Chinook salmon run has seen record low counts since 2001 and has also seen a dramatic reduction in fishing effort (Appendices D1 and E1). The fishery was at one time the most popular fishery between the KMA and APAIA and both guided and unguided anglers frequented the river targeting Chinook salmon. Historically, low runs to the Karluk River have persisted and restrictions on the fishery have been implemented to varying degrees since 2001 with the drainage being closed to sportfishing for Chinook salmon since 2007. Inconsistent fishing opportunity and generally small runs have caused a dramatic reduction in angler effort and currently few, if any, anglers fish the Karluk River during the Chinook salmon run. Some anglers do target sockeye salmon near the lagoon and in other locations, but fishing effort is generally limited during this time and is almost entirely by guided anglers.

Annual estimates of total effort and catch are currently generated from the SWHS, and since 2005, guided angler logbooks have been available from the ADF&G Freshwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2008–present. Accessed November 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests.]). No Chinook salmon have been reported harvested since 2007 in the Karluk River from either the SWHS or the logbook database due to fishery closures. A small number of Chinook salmon are caught and released annually during other fisheries and from 2008–2017, this catch has averaged 90 Chinook salmon annually (Table 5). Reported logbook catches are confidential due to the low number of guide businesses fishing the drainage (confidential when less than 4 businesses fish a drainage).

Table 5.–Weir counts, and number of Karluk River Chinook salmon released, 2008-2018.

Year	Weir count	Released
2008	752	114
2009	1,308	80
2010	2,917	12
2011	3,420	238
2012	3,197	342
2013	1,824	80
2014	1,182	11
2015	2,777	9
2016	3,434	10
2017	2,600	0
2018	3,155	NA
Average 2008–2017	2,341	90

Source: Statewide Harvest Survey (SWHS) estimates from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited November 2018). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/; ADF&G Division of Commercial Fisheries, Kodiak, 2018.

Note: "NA" means data not available.

Escapement and Management

Escapements of Karluk River Chinook salmon are monitored through operation of a salmon counting weir established in 1976 a short distance above the Karluk Lagoon. Annual weir counts of Karluk River Chinook salmon reached record lows in 2008 when just 752 fish were counted (Table 5). Escapements have generally increased since then; however, they often continue to fall short of the current biological escapement goal (BEG[4]) range of 3,000–6,000. This is despite management measures taken to conserve escapements on an annual basis (Figure 4, Appendices D1 and E1). The 2017 weir count of 2,600 Chinook salmon did not achieve the BEG, but in 2018, the BEG was achieved with a weir count of 3,155, which is well above the 2008–2017 average of 2,341 fish. Weir counts are considered equal to escapement because there is currently no inriver harvest of Chinook salmon. Though the BEG has been achieved on 4 occasions in the last 10 years, there has been no sport harvest of Karluk River Chinook salmon and significant restrictions in both commercial and subsistence fishing.

EOs have been issued for the sport fishery annually since 2005 (Appendix C1), with complete restrictions on harvest occurring annually since 2007 (Appendix E1). Additionally, in 2011, the BOF designated Karluk River Chinook salmon a "stock of concern" and adopted restrictions pertaining to the commercial fishery aimed at protecting Chinook salmon bound for the Karluk River (Appendix E3). This "action plan" prohibits retention of Chinook salmon larger than 28

[4] The biological escapement goal is an estimate of escapement that most closely approximates the maximum sustainable productivity of a population.

inches in length in commercial seine fisheries in the Inner and Outer Karluk and Ayakulik sections through 30 July. In 2014, the BOF took further action and prohibited the retention of Chinook salmon greater than 28 inches for the whole of the KMA by regulation through July 30. In addition to action by the BOF, since 2005, the Division of Commercial Fisheries (CF) has issued EOs prohibiting retention of Chinook salmon greater than 28 inches to try to meet the Karluk River Chinook salmon BEG.

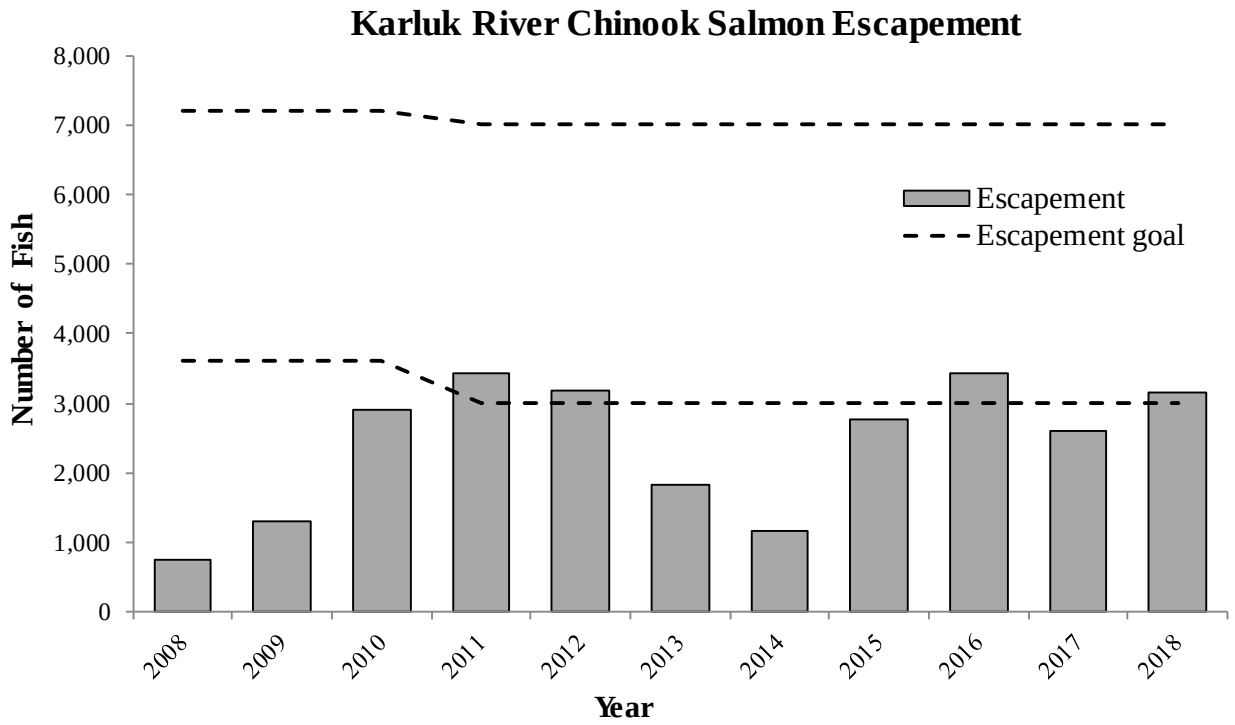


Figure 4.–Escapement of Karluk River Chinook salmon, 2008–2018.
Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

AYAKULIK RIVER

Fishery Description and Historical Catch

The Ayakulik River drainage is approximately 20 miles (32 km) south of the Karluk River and is the largest watershed within the KMA. The mainstem, where nearly all sport fishing occurs, extends approximately 13 miles (21 km) and is accessible via aircraft. Access to the lower 1 mile (1.6 km) of the river is limited due to private land ownership; however, the remainder of the drainage is part of the Kodiak National Wildlife Refuge and open to public access. Changes in the lower river also may limit aircraft access at times, whereas there are several consistently accessible locations further up the drainage. Historically, the Ayakulik River has sustained the second-largest native Chinook salmon population between both the KMA and APAIA and the second-most popular Chinook salmon sport fishery.

The Ayakulik River Chinook salmon run has seen record high and low counts since 2001 and has also seen a significant reduction in fishing effort since 2006 (Appendices D2 and E2). The Ayakulik River Chinook salmon fishery was at one time the second-most popular fishery in the KMA, next to the Karluk River Chinook salmon fishery, and both guided and unguided anglers frequented the river targeting Chinook salmon until about 2005. Since then, historically low runs

to the Ayakulik River have persisted and frequent restrictions in the fishery have resulted in reduced angler interest during the Chinook salmon run. This has also been coupled with more limited access due to the lagoon filling with sediment such that floatplanes could no longer land predictably to allow anglers to float the river via raft or boat and be picked up near the mouth of the river. With low runs, reduced fishing opportunity, and difficult access, angler effort is currently limited to a few primarily guided anglers who target Chinook salmon when the season is open but who are also fishing for sockeye salmon in various locations throughout the river. There are a few unguided anglers on the river every season, but there is a general lack of interest in the fishery for unguided trips due to the small runs and difficult access in recent years.

Harvest, catch, and effort information for Ayakulik River Chinook salmon are only intermittently available from the SWHS but more consistently from guided angler logbooks, though guided harvest and catch can only be reported for the entire drainage and not split into the upper and lower river, as done historically, due to the limited number of businesses in each sector of the drainage.

From 2008 to 2017, the SWHS estimated that anglers harvested an annual average of 26 Chinook salmon from the Ayakulik River, though harvest estimates are only available in 4 of these years due to low response rates (Table 6). Logbook harvests reported from guided anglers show an average of 12 Chinook salmon harvested annually during the same time. Although logbooks from 2017 are not available at this time, no fish were harvested in 2017 due to fishery restrictions.

Table 6.–Weir counts and harvest estimates of Ayakulik River Chinook salmon, 2008–2018.

		SWHS		Guided logbook	
Year	Weir count	Harvest	Released	Harvest	Released
2008	3,071	0	830	2	329
2009	2,615	0	354	0	83
2010	5,301	104	729	2	185
2011	4,316	−	−	65	454
2012	4,760	−	−	23	554
2013	2,369	−	−	18	299
2014	917	0	96	0	59
2015	2,392	−	−	0	82
2016	4,594 [a]	−	−	1	126
2017	3,712 [a]	–	−	0	NA
2018	2,149 [a]	NA	NA	0	NA
Average 2008–2017	3,405	26	502	12 [b]	241

Source: Statewide Harvest Survey (SWHS) estimates (Alaska Sport Fishing Survey database [Internet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish [cited November 2018]. Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/); Freshwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed November 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests.]); ADF&G Division of Commercial Fisheries, Kodiak, 2018.

Note: An en dash means insufficient survey responses to generate an estimate. "NA" means data are not available.

[a] Escapement should be considered minimum due to flooding events.

[b] Because the fishery was closed to harvest in 2017 and 2018, there are no associated release data, so the average was calculated through 2016 only.

Escapement and Management

Ayakulik River Chinook salmon escapements have been monitored via a weir established in 1970 a short distance above the river mouth. Since 2006, the weir counts of Ayakulik River Chinook

salmon include some of the lowest on record, and the lowest count of 917 fish occurred in 2014 (Table 6). Counts have improved slightly since then but the BEG was only met once since 2012—in 2016 with an escapement of 4,574 fish, although it was achieved late in the season (Figure 5, Appendix D2). The 2017 and 2018 escapements were 3,712 and 2,149 fish, respectively (Table 6). The 2008–2017 average was 3,405 fish. Weir counts are considered the escapement in years when no harvest is allowed in the sport fishery, and in years when harvest is allowed, 20 fish are subtracted from the weir count to account for sport harvest above the weir and to estimate final escapement. Annual estimates of harvest by anglers are only available through the freshwater logbook database and estimates are confidential due to the low number of businesses operating above the weir. Annual harvests above the weir are very small, however, and "20 fish" is used as a proxy by managers inseason when making decisions regarding the sport fishery. Weir counts have also included estimates of escapement during flooding events; from 2016 to 2018, significant and prolonged floods occurred during the historical peak of Chinook salmon migration (Fuerst *In prep*). Escapement estimates during years with flooding events should be considered minimums.

Harvest has only been allowed when escapements meet the BEG with enough extra fish that the BEG will still be achieved, and in most years, a catch-and-release fishery has progressed with restrictions for the use of bait until the regular season closure (Appendices C1 and E2). The fishery was closed completely on 3 occasions: 2013, 2014, and 2015 (Tracy and Polum 2015). Preseason EOs are issued annually for Ayakulik River Chinook salmon to restrict the sport fishery depending on anticipated run strength for the coming season. Since 2015, the Chinook salmon fishery has started as catch-and-release only with a prohibition on the use of bait. In 2016, a limited harvest was allowed late in the season when escapement objectives were achieved, but in 2017 and 2018, the fishery remained catch-and-release with no bait allowed for the duration of the season.

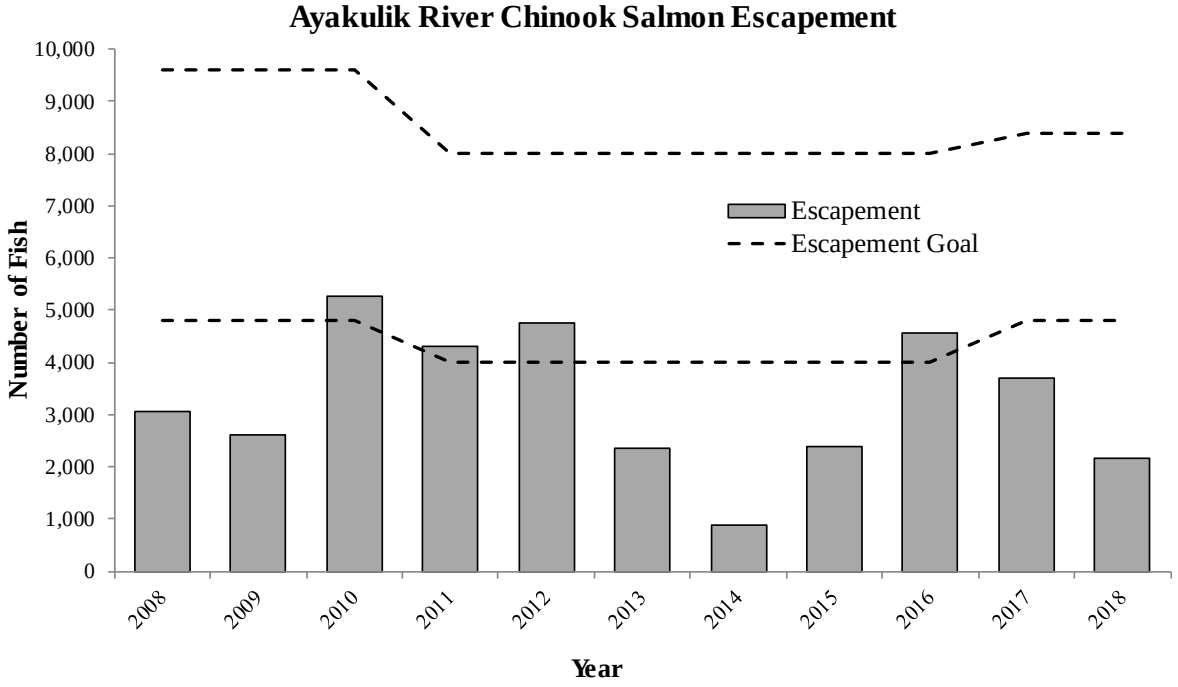


Figure 5.–Escapement of Ayakulik River Chinook salmon, 2008–2018.
Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

CHIGNIK RIVER

Fishery Description and Historical Catch

The Chignik River drainage is located within the APAIA on the south side of the Alaska Peninsula, adjacent to the village communities of Chignik Lagoon and Chignik Lake. The Chignik River extends approximately 2.5 miles (4 km) from Chignik Lake to Chignik Lagoon and is mainly accessible by boat from the villages. Because of its accessibility and proximity to one of the area's larger communities, the Chignik River historically has supported the largest APAIA Chinook salmon sport fishery. Chinook salmon normally return to the Chignik River between late June and mid-August, with peak immigration during mid-July (Appendix D3). Anglers target Chinook salmon in the Chignik River but also in the upper parts of Chignik Lagoon. The sport harvest is generally composed of harvest from guided anglers, though there is some harvest attributable to local residents and ADF&G staff at the Chignik River weir.

Due to a relatively low level of angler effort, published catch and harvest estimates for Chignik River Chinook salmon are rarely available from the SWHS, and fewer than 4 guide businesses operate on the drainage so guided logbook harvest information is confidential. Harvests of Chinook salmon from the Chignik River are small, like most Chinook salmon harvests from runs in both the APAIA and the KMA, where recent harvests never exceed 300 fish in a single drainage annually. Harvest in most years in less than 100 Chinook salmon in all APAIA and KMA drainages.

Escapement and Management

Chignik River Chinook salmon escapements have been monitored with a weir that was established in 1922 and operated by ADF&G since 1959. The weir is located just above the Chignik Lagoon and is primarily used to count returning sockeye salmon, though it also covers the entirety of the Chinook salmon run. Currently, daily weir counts are extrapolated from timed counts using underwater video for the first 10 minutes of each hour the weir is in operation. Because harvest information above the weir is only available from freshwater logbooks and these are confidential due to the small number of businesses in the drainage, a proxy of harvest is used to estimate escapement. To account for upriver harvest of Chinook salmon, 100 fish are subtracted from the weir count. This number is also used by managers in season for making decisions about using EOs in the sport fishery.

From 2008 to 2017, annual escapements (including the assumed harvest of 100 fish above the weir) averaged 1,945 fish, and the lowest escapements on record occurred in 2017 and 2018 with 1,037 and 725 fish, respectively (Figure 6, Appendix D3). The Chignik River Chinook salmon run in the APAIA differs from KMA Chinook salmon runs because there have been fewer instances of small runs resulting in sport fishery restrictions, though recent counts are still quite low. Counts have only fallen short of the BEG range of 1,300–2,700 fish on 3 occasions: 2013, 2017, and 2018 (Figure 6). In response to these low runs, the sport fishery was closed in each of these years by EO to try to achieve the BEG (Appendix C1). Despite a recent trend in low abundance and periodic declines, the Chignik River Chinook salmon run has not generally followed the pronounced declining trends of other Gulf of Alaska Chinook salmon stocks.

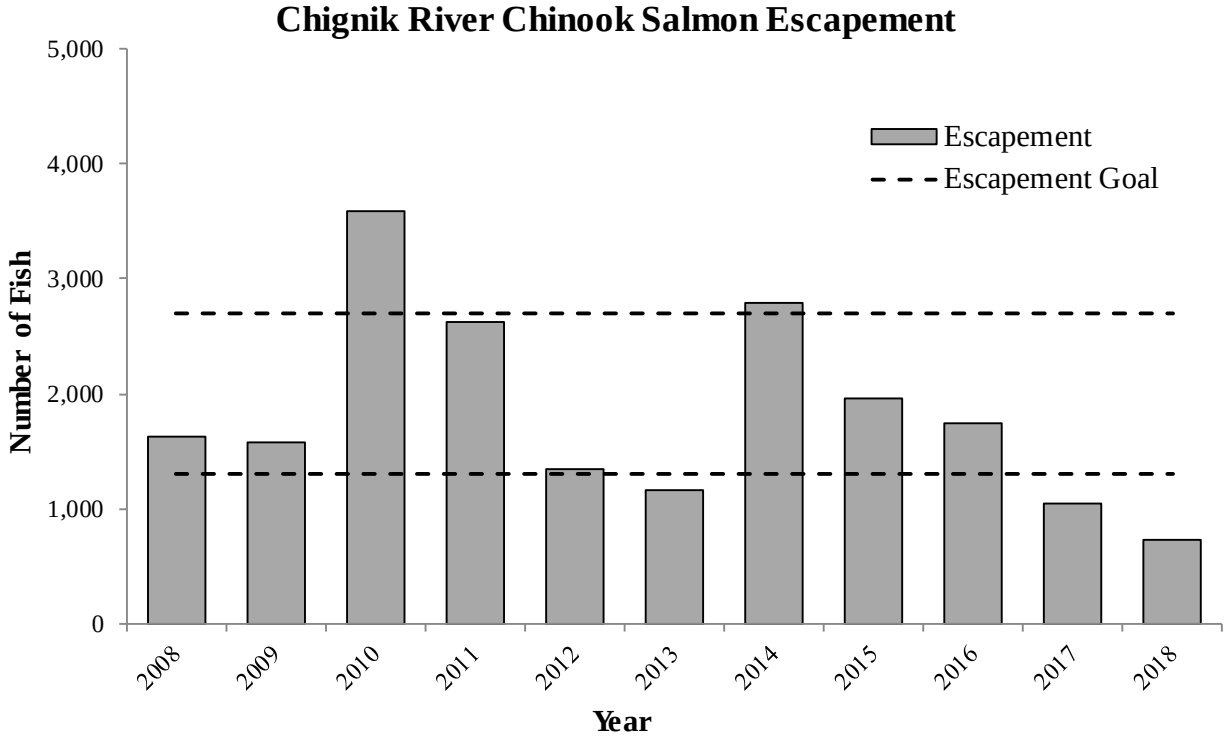


Figure 6.–Escapement of Chignik River Chinook salmon, 2008–2018.

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

NELSON RIVER

Fishery Description and Historical Catch

The Nelson River is located within the APAIA on the north side of the Alaska Peninsula, near the village of Nelson Lagoon. The Nelson River is mainly accessible by boat from Nelson Lagoon or airplane via one of the guide services in the area. It is the only Chinook salmon run on the north side of the Alaska Peninsula with an established escapement goal, though is among the most remote rivers in Alaska and access is difficult. Anglers fish Chinook salmon in many parts of the river, and nearly all sport fishing effort on the drainage is by guided anglers.

Since 2011, the Nelson River has been a catch-and-release only Chinook salmon fishery by regulation and no sport harvest of Chinook salmon occurs in the river. Due to the low level of angler effort, published catch estimates are only occasionally available from the SWHS and fewer than 4 guide businesses operate on the drainage so guided logbook information is confidential.

Escapement and Management

Nelson River Chinook salmon escapements are monitored through operation of a weir established in 1989 about 10 miles upriver from Nelson Lagoon. Some Chinook salmon spawning does occur below the weir, and annual postweir aerial survey estimates of these Chinook salmon are added to weir counts to get a total estimated escapement.

From 2008 to 2017, escapements averaged 2,716 fish. In 2017, the escapement was below the BEG at 1,807 fish, and in 2018, was much higher than both the average and the BEG (2,400 fish) at 5,022 fish (Figure 7, Appendix D4). The Nelson River Chinook salmon run has generally

declined in abundance like other Chinook salmon runs but has also seen strong runs in recently in 2016 and 2018. Counts have fallen short of the BEG range of 2,400–4,400 fish on several occasions with the record low count of 992 fish occurring in 2012. The sport fishery has been closed occasionally by EO to attempt to achieve the BEG, however there is little management power in restricting the sport fishery further.

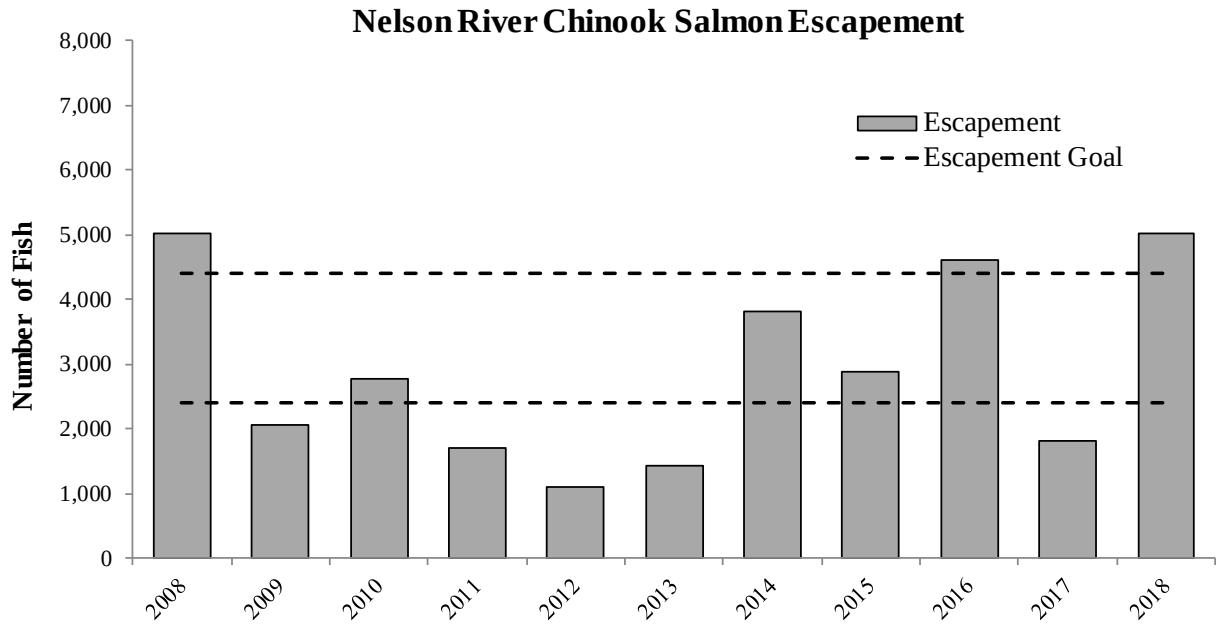


Figure 7.–Escapement of Nelson River Chinook salmon, 2008–2018.

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

KMA MARINE WATERS

Fishery Description and Historical Catch

A significant marine Chinook salmon sport fishery occurs in the KMA, mostly in waters adjacent to the City of Kodiak but also in many other areas of the KMA accessible from more remote ports. Waters surrounding the Kodiak Archipelago and Alaska Peninsula provide ocean rearing areas for Chinook salmon populations across the North Pacific, though anglers rarely target them in APAIA waters and only about 100 are harvested annually. Recoveries of coded-wire-tagged fish harvested near Kodiak Island identified wild and hatchery-reared stocks of origin not only in Alaska but also Canada and the Pacific Northwest (Schwarz et al. 2002). More recently, ADF&G has collected genetics samples from Chinook salmon harvested in Kodiak marine waters from the sport fishery to apportion the harvest by stock of origin (Shedd et al. 2016). Results are similar to Schwarz et al. (2002) showing harvested fish originating from the same primary areas of Alaska, Canada, and the Pacific Northwest. Both guided and unguided marine sport harvest of Chinook salmon occurs, and from 2008 to 2017, charter vessel clients have averaged 34% of the annual harvest (Figure 8).

Marine harvest estimates for Chinook salmon are provided by the SWHS. Guided angler statistics for charter vessel trips are also available from ADF&G's Saltwater Logbook Database. Between 2008 and 2017, an average of 8,083 Chinook salmon were harvested by all anglers in the KMA (Table 7), and guided anglers accounted for an average harvest of 2,726 fish (Table 8).

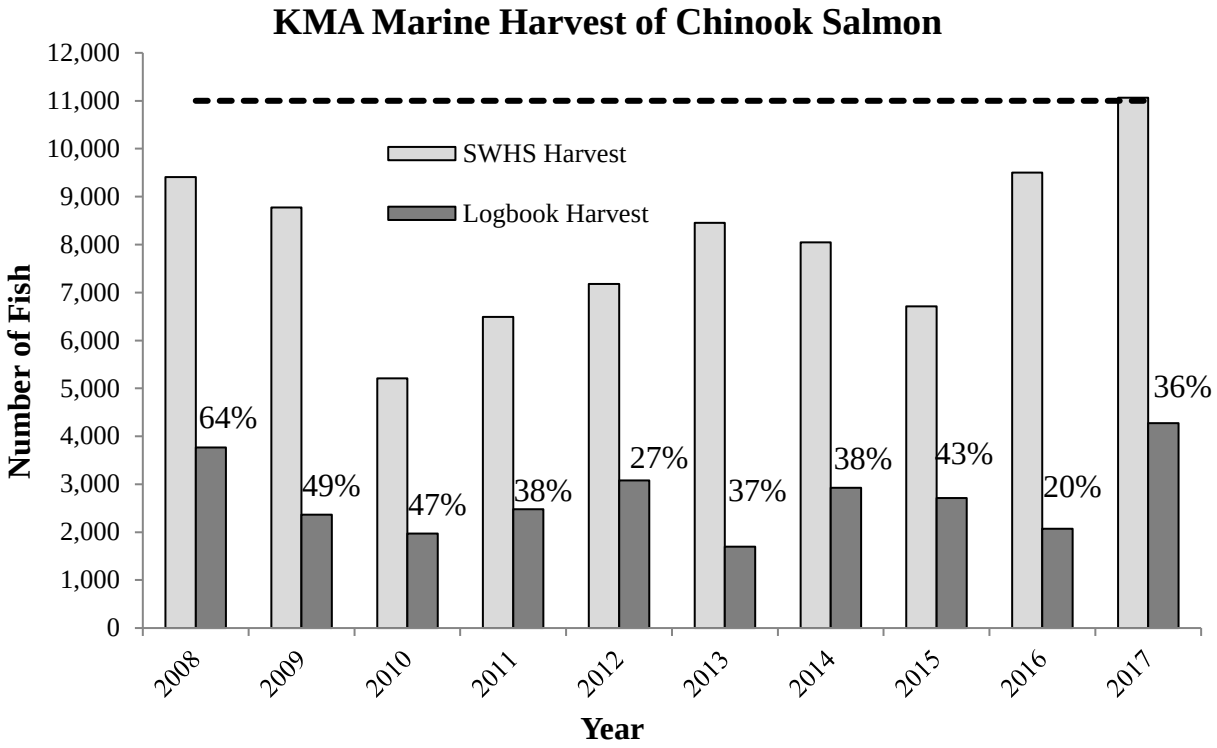


Figure 8.–Comparison of SWHS and logbook estimates of harvests of marine Chinook salmon in the KMA, 2008–2017.

Source: Statewide Harvest Survey (SWHS) estimates (Alaska Sport Fishing Survey database [Internet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish [cited November 2018]. Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/); Freshwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed November 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests.]).

Table 7.–SWHS estimates of KMA and APAIA marine Chinook salmon harvest and catch, 2008–2017.

	Harvest		Catch	
Year	APAIA	KMA	APAIA	KMA
2008	63	9,408	140	11,499
2009	36	8,773	118	11,694
2010	288	5,208	338	6,839
2011	17	6,491	17	8,122
2012	0	7,176	0	10,464
2013	30	8,452	45	11,844
2014	107	8,049	107	11,648
2015	172	6,709	771	9,492
2016	170	9,499	587	16,570
2017 [a]	235	11,065	366	17,253
Average 2008–2017	112	8,083	249	11,543

Source: Statewide Harvest Survey (SWHS) estimates (Alaska Sport Fishing Survey database [Internet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish [cited November 2018]. Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/).

[a] KMA harvests include the Monashka Bay Chinook salmon harvests excluded from the KMA saltwater Chinook salmon GHL.

Table 8.–Guided angler harvest and release of KMA marine Chinook salmon, 2008–2017.

	Chiniak Bay			Afognak			Total KMA		
Year	Angler-days	Harvest	Release	Angler-days	Harvest	Release	Angler-days	Harvest	Release
2008	2,001	1,554	174	3,432	1,715	232	8,173	3,736	519
2009	1,531	1,003	36	3,009	1,232	106	6,900	2,365	280
2010	1,150	412	13	2,731	775	177	7,044	1,969	318
2011	1,528	1,121	19	3,110	1,322	46	7,292	2,466	144
2012	1,245	984	20	2,438	1,178	27	6,273	3,076	186
2013	601	191	17	1,706	461	220	5,239	1,687	285
2014	604	298	16	1,878	492	148	6,787	2,915	343
2015	1,232	287	2	2,798	702	31	8,385	2,707	84
2016	1,232	465	2	1,445	245	13	5,386	2,061	65
2017	1,044	974	125	2,446	1,704	274	6,284	4,273	321
Average 2008–2017	1,217	729		2,499	983	127	6,776	2,726	255

Source: Saltwater Logbook Database. (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed November 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests]).

Management and Fishery Performance

The KMA marine waters Chinook salmon fishery has the only management plan established for a sport fishery in either the KMA or the APAIA. This management plan was established in 2005 and amended in 2008 and prescribes an annual GHL of 11,000 fish for the KMA with the exclusion of Chinook salmon caught in Monashka Bay (Appendix B1). Additional provisions stipulate periodic review of the plan by the BOF when harvest trends in the KMA exceed the GHL between BOF cycles. Achievement of the GHL is measured by the SWHS. Angler effort for marine waters Chinook salmon in the APAIA is not governed by a management plan and both effort and harvest are very low. The daily bag and possession limits for Chinook salmon in all marine waters of the KMA and APAIA are currently set at 2 with no annual limit.

The 2017 KMA Chinook salmon harvest was 11,065 and includes harvest in Monashka Bay, so it is likely the GHL was not exceeded though it is very close (Table 7, Figure 8). The 2017 guided Chinook salmon harvest was 4,273 fish, and the respective 2008–2017 average was 2,726 (Table 8). Since the management plan was established for the KMA Chinook salmon sport fishery in 2008, harvest levels have not exceeded the GHL. Harvests are largely dependent on summertime nearshore ocean conditions and the availability of bait fish that schooling Chinook salmon feed on. In times when food is abundant, Chinook salmon harvests are generally high and consistent, but in years when these conditions do not occur, harvests generally fall. Prior to this reporting period, harvest levels exceeded 10,000 in 2006 and 2007 but more recently fell to a low of 5,208 in 2010. Harvests have generally increased since then due to increased accessibility of Chinook salmon near the community of Kodiak.

STOCKED CHINOOK SALMON FISHERIES

To increase road-accessible harvest opportunities of Chinook salmon, in 2000, SF began a cooperative program with Kodiak Regional Aquaculture Association (KRAA) to stock Chinook salmon at Monashka Creek with Chinook salmon reared at their Pillar Creek Hatchery (PCH) facility (Figure 3). All stocking is conducted in accordance with current guidelines set forth in the

SF Statewide Stocking Plan for Recreational Fisheries[5] (SSP), which is a 5-year stocking document updated annually to reflect stocking needs based on funding, changes in land status, or other considerations.

There are no native Chinook salmon runs to the KRZ and Chinook salmon stocking is intended to provide relatively easy and low-cost access to Chinook salmon fishing where they were not previously available. KRZ Chinook salmon stocking has occurred several times since the 1970s and Chignik River Chinook salmon were used as a brood source in the 1970s and 1980s. For the current project, Karluk River Chinook salmon were originally used as a brood source to stock Monashka Creek and sustain continued egg collection there. From 2005 to 2010, Chinook salmon egg takes solely utilized hatchery-reared fish in the Monashka Creek run. Chinook salmon releases were expanded in 2007 to include the American and Olds rivers, and then expanded again in 2014, when Salonie Creek was designated as an additional release location. Egg takes since 2010 have incorporated brood stock from all 4 drainages due to declining runs in Monashka Creek, but have not included any wild stocks, such as Karluk, since returns began at Monashka Creek in 2005. Eggs and juvenile Chinook salmon are reared at PCH but as of 2016, are currently only released into the American, Olds, and Salonie drainages due to chronic low production at Monashka Creek; no further egg takes are planned at Monashka Creek.

All stocked Chinook salmon are released as smolt. Current provisions of the SF–KRAA cooperative agreement and SSP goals identify a target release size of 15 g, although actual average smolt size through 2018 has ranged from 11 to 30 g depending on temperatures at the hatchery during rearing. Smolt are stocked annually during May and June, after 2 years of hatchery rearing. They are imprinted in holding pens in their destination drainage for up to 2 weeks prior to release. Males return in small numbers as ocean-age-1 and -2 males, and both males and females return in larger numbers at ocean-age 3 and 4. Any returning adult Chinook salmon not harvested by the sport fishery or other users are collected as broodstock for the egg take and little, if any, natural spawning has been observed.

Smolt releases into Monashka Creek have been as high as 82,000 fish (2010), though stocking was discontinued after 2015 due to a lack of production from this drainage (Appendix F1). Releases at the American and Olds rivers and Salonie Creek during 2008–2018 have varied from about 10,000 to 80,000 depending on the availability of surviving smolt. There have been some years when stocking has been concentrated in only 1 drainage due to low survival at the hatchery.

Although large adult fish from Monashka Creek have been available for the sport fishery and project egg takes since 2005, runs to the American and Olds rivers did not include full-sized adult fish until 2011 and more recently in Salonie Creek in 2017. In 2017, 73,547 Chinook salmon smolt were stocked into the American, Olds and Salonie drainages, and in 2018, 117,548 smolt were stocked. Stocking goals have not been achieved since 2015 due to low brood stock numbers as a result of variable adult returns to the KRZ and significant mortality of captive brood stock held for the egg take.

Estimates of effort and catch attributable to stocking have been intermittently available through the SWHS for locations where Chinook salmon have been stocked. Anecdotes from both freshwater and marine anglers targeting KRZ Chinook salmon runs and observations from ADF&G staff indicate that up to 1,000 Chinook salmon return to each of the American, Olds and

[5] Available at http://www.adfg.alaska.gov/static/fishing/pdfs/hatcheries/15region2.pdf (Accessed December 2015).

Salonie drainages, though this can be as low as a few hundred fish depending on the year. Returns to Monashka Creek have declined to the point that Monashka Creek and Bay have been closed to sport fishing since 2014 to try to increase brood stock numbers for the project. ADF&G has operated a weir and trap designed to catch all incoming Chinook salmon in Monashka Creek during annual runs and only 20 Chinook salmon were counted in 2017 despite the sport fishery closure. The trap was not operated in 2018 though the creek was monitored frequently by foot surveys and no Chinook salmon were observed in Monashka Creek in 2018.

Anglers targeting Chinook salmon within the KRZ are subject to the same freshwater and marine bag, possession, and annual limits in effect for the remainder of the KMA. However, Chinook salmon harvested in Monashka Bay are excluded from the current marine waters guideline harvest level.

OTHER FISHERIES

Although relatively large runs of Chinook salmon are present in several APAIA drainages, the remote location and associated high cost of accessing these fisheries has largely limited current angling effort to clients at a small number of remote lodges offering virtually exclusive services. Very few unguided anglers frequent any of these fisheries and low effort precludes reliable estimates for catch and harvest from the SWHS. The limited number of guide operators utilizing these Chinook salmon stocks requires that logbook catches remain confidential, and therefore are not presented in this report. Drainages in the APAIA supporting Chinook salmon populations currently utilized by anglers include the Cinder, Sandy, Meshik, and King Salmon rivers.

COHO SALMON FISHERIES

Coho salmon runs to the KMA and APAIA include a large number of stocks that together support the most popular sport fishery for both areas for resident and nonresident anglers. The greatest angler effort is concentrated near population centers where the easiest and least expensive access to the sport fishery is available. Accordingly, drainages adjacent to the KRZ are the most heavily exploited and are consequently prioritized for escapement monitoring and management. The marine coho salmon sport fishery is also highly popular near the KRZ, particularly within the area of Chiniak Bay. Other heavily utilized coho salmon fisheries include streams in the Unalaska–Dutch Harbor Road Zone and near Cold Bay. Significant remote coho salmon fisheries occur in nearshore marine waters next to streams draining Afognak Island and on nearby Shuyak Island, the Karluk and Ayakulik rivers, nearly all Olga Bay streams, and numerous locations on the Alaska Peninsula. Harvests of coho salmon in remote areas are generally small compared to the run abundance and estimates of catch and harvest by individual locations are rarely available from the SWHS for most locations of the KMA and APAIA because of this small effort.

Management of KMA and APAIA coho salmon stocks is generally passive and only 6 EGs are established between both areas. Because of run timing and associated environmental factors as well as budgetary constraints, few coho salmon runs are annually monitored for escapement using weirs and most monitoring is conducted through foot and aerial surveys. To ensure stocks are conserved, when necessary, angler harvests can be limited by reducing daily and seasonal bag limits, prohibiting bait, and reducing time and areas open to fishing, though this is primarily conducted in areas with the most robust monitoring. Coho salmon sport fishing regulations in the KRZ have been both liberalized and restricted by EO to achieve escapement objectives on several occasions.

Freshwater drainages with the greatest harvests are shown in Table 9 and are mostly located in the KRZ, with the Karluk River also having significant harvests. Harvests of coho salmon in the Unalaska–Dutch Harbor Road Zone and near Cold Bay can also be significant relative to local run sizes; however, the fisheries are too small to generate estimates of harvest and effort in the SWHS due to low response rates. Other coho salmon harvest and catch information for the APAIA is not available for the same reasons.

KRZ FISHERIES

Fishery Description and Historical Catch

With logistically convenient access and a historically high abundance of fish, the freshwaters of the KRZ are in aggregate the largest coho salmon sport fishery between the KMA and APAIA. Kodiak roads are intersected by 15 fishable streams supporting modest to large coho salmon runs plus 3 nearby drainages accessible by off-road vehicle and aircraft. Some of the more historically productive KRZ coho salmon stocks are the Buskin, Pasagshak, Saltery, Olds, Roslyn, Miam, and American rivers (Figure 3).

Coho salmon runs in KRZ streams typically start in early to mid-August and, in some drainages, continue through early November. Spawning begins in late October and can continue through December but typically peaks in early to mid-November. Spawning areas include both mainstem stream sections above intertidal zones as well as almost all tributary creeks. Some shoal spawning also occurs within the Pasagshak River drainage in Lake Rose Tead.

Uplands surrounding KRZ streams targeted by coho salmon anglers include municipal, state, and private land ownership. Angler access to the sport fishery is limited in some areas of private land ownership but a land use permit for fishing can be obtained for a small fee.

From 2008 to 2017, SWHS estimates of freshwater harvest and catch of KRZ coho salmon have been consistently available only for the Buskin, Pasagshak, American, Olds, and Saltery river drainages. Among these individual locations, the largest harvests usually come from the Buskin River, with an average harvest of 3,731 fish, which accounts for about 15% of the KMA harvest during this time period and about 36% of the harvest from the 5 major coho salmon drainages in the KRZ (Table 9). By comparison, the 2008–2017 average harvests for the Pasagshak, American, Olds, and Saltery river drainages ranged between 709 and 2,622 fish (Table 9). Annual harvests in each of these drainages fluctuate significantly and are most closely tied to run timing and environmental conditions prevalent during the coho salmon runs. Anglers can harvest more fish early in the season during low water conditions when fish are concentrated in intertidal zones; however, if low water conditions prevail late into the season, fishing slows due to the inactivity of coho salmon waiting to access fresh waters. For all 5 locations, anglers reported releasing about 1 coho salmon for each 1 they harvested on average. Logbook harvests from 2008 to 2016 for the KRZ include guided angler activity primarily at Saltery River, with relatively low effort in other KRZ drainages. Guided angler harvests at the Saltery River averaged 359 fish from 2008 to 2016 (Table 10). Harvest data for other drainages in the KRZ are confidential, but for the rest of the KRZ combined, excluding the Saltery River, guided anglers have harvested an average of 104 coho salmon from 2008 to 2016. Guided anglers report releasing about twice as many coho salmon as unguided anglers for each coho salmon they harvest (Table 11).

Table 9.–SWHS estimates of freshwater coho salmon harvest and catch for selected locations, 2008–2017.

Location	Estimate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average 2008–2017
Buskin River (KRZ)												
	Harvest	4,259	5,207	2,847	3,640	1,926	4,926	5,388	4,889	1,895	2,337	3,731
	Catch	6,498	8,014	4,492	5,576	2,680	7,721	7,813	7,308	2,841	3,636	5,658
Pasagshak River (KRZ)												
	Harvest	2,836	2,287	2,417	3,864	2,125	2,336	3,020	2,849	2,145	2,336	2,622
	Catch	5,588	4,101	4,371	7,766	3,341	4,645	5,415	7,704	3,829	2,960	4,972
American River (KRZ)												
	Harvest	799	401	390	710	409	790	1,323	1,268	651	351	709
	Catch	1,339	659	1,533	1,499	779	1,203	2,245	2,253	1,599	351	1,346
Olds River (KRZ)												
	Harvest	696	1,864	1,253	1,351	734	1,047	5,343	2,634	3,452	2,206	2,058
	Catch	1,938	2,427	2,124	2,574	1,230	2,906	8,836	6,237	5,148	5,173	3,859
Saltery Cove (KRZ)												
	Harvest	823	798	1,142	1,301	533	1,574	2,010	2,303	617	712	1,181
	Catch	1,771	1,448	1,683	2,398	856	3,698	4,259	5,010	2,012	1,575	2,471
Karluk River (Remote Zone)												
	Harvest	1,236	1,872	710	721	694	1,200	447	866	557	505	881
	Catch	4,755	11,020	2,810	3,049	1,109	2,081	826	4,995	1,037	1,400	3,308
Total KMA												
	Harvest	27,426	26,317	22,323	25,859	20,329	28,125	30,154	37,057	16,444	21,687	25,572
	Catch	41,621	52,611	34,421	43,179	20,731	42,323	42,823	93,511	45,257	70,015	48,649
Total APAIA												
	Harvest	4,641	6,257	3,351	2,510	2,517	1,950	4,288	3,250	2,727	3,673	3,516
	Catch	15,022	12,875	8,608	5,510	10,728	5,299	16,880	20,916	16,614	12,417	12,487

Source: Statewide Harvest Survey (SWHS) estimates from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited November 2018). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Table 10.–Guided freshwater coho salmon harvest for selected KMA and APAIA streams, 2008–2017.

Area	Location	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2008–2016
Kodiak remote zone											
	Afognak Island streams	79	124	499	464	372	809	524	435	248	395
	Ayakulik River	184	216	199	477	295	289	232	582	97	286
	Dog Salmon River (Frazer)	0	92	306	210	109	128	263	489	438	226
	Westside Kodiak streams [a]	154	167	115	155	92	247	184	453	181	194
	Karluk River	604	595	100	134	533	320	98	18	112	279
KRZ											
	Saltery River	484	295	236	565	340	347	343	378	241	359
	Other KRZ streams	157	78	34	204	54	98	113	87	107	104
APAIA											
	APAIA streams	1,697	1,918	1,612	1,787	1,381	1,546	1,387	1,393	1,081	1,534

Source: Freshwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed October 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests.]).

[a] Includes all streams draining into the Shelikof Straight east of the Karluk River to the Kupreanof Peninsula.

Table 11.–Guided freshwater coho salmon released for selected KMA and APAIA streams, 2008–2017.

Area	Location	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2008–2016
Kodiak remote zone											
	Afognak Island streams	43	54	240	85	189	183	107	80	40	113
	Ayakulik River	1743	1932	1483	2000	1142	1503	3313	2,573	1,124	1,868
	Dog Salmon River (Frazer)	60	51	149	82	67	72	56	172	111	91
	Westside Kodiak streams [a]	397	361	298	609	223	1,310	259	1,161	667	587
	Karluk River	423	571	196	510	131	380	81	570	124	332
KRZ											
	Saltery River	283	479	94	1145	366	1088	562	255	111	487
	Other KRZ streams	260	419	91	427	138	167	252	361	92	245
APAIA											
	Alaska Peninsula streams	7,148	6,191	6,502	7,885	5,604	4,041	5,839	7,540	7,474	6,469

Source: Freshwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed October 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests.]).

[a] Includes all streams draining into the Shelikof Straight east of the Karluk River to the Kupreanof Peninsula.

In 2017, 2,337 coho salmon were harvested in the Buskin River; the Pasagshak River harvest was 2,336 fish; the American River harvest was 351 fish; and the Olds River harvest was 2,206 fish (Table 9). Guided logbook harvests from 2017 were unavailable at the time of this publication. The only other drainage in the KRZ that has harvest estimates available annually through the SWHS is the Saltery River. Although it is in the KRZ, the drainage is only accessible by off-road vehicle or airplane and access is more difficult than other KRZ drainages. The 2017 total harvest of coho salmon in Saltery River was 712 (Tables 9). There is not an established escapement goal for coho salmon in the Saltery River and escapement is only monitored by aerial surveys early in the coho salmon run that do not generally capture peak escapement because the surveys are focused on counting pink salmon runs.

Escapement and Fishery Management

Because of high exploitation rates by anglers, coho salmon escapements to the KRZ are monitored more closely than those for other stocks within the KMA and APAIA. The Buskin River has the only weir established for coho salmon in the KRZ though other streams are monitored by foot and aerial surveys.

Buskin River escapements are monitored by SF through operation of a salmon counting weir established in 1985 about a mile above the river mouth. Harvests in the sport fishery occurring upstream of the weir are subtracted from the total count to estimate annual escapement by taking 20% of the SWHS-estimated coho salmon harvest in the drainage and subtracting it from the weir count (Murray 1987). Thus, the escapement for 2018 is not available because the SWHS harvest for 2018 is not available yet. From 2008 to 2017, weir counts of Buskin River coho salmon ranged from a high of 10,624 in 2009 to a low of 2,513 in 2016 (Appendix D5). The 2008–2017 average escapement was 5,599 and ranged from 2,134 to 9,611 (Figure 9). The weir count in most years includes estimates that substitute for daily counts lost as a result of high-water events that rendered the weir inoperable; estimated days ranged from 8% of the total weir count to 69% during 2014–2017 (Stratton and Evans *In prep*). Recent escapements have shown a trend of decreased abundance beginning in 2010 that culminated in a sport fishery closure in 2016 (Figure 9). In general, however, there have been very few management actions taken in the Buskin River coho salmon sport fishery to date and abundance has historically been high. Even with the recent downward trend in abundance of spawning fish, Buskin River coho salmon escapements have historically achieved the Buskin River coho salmon BEG, which is currently 4,700 to 8,700 fish.

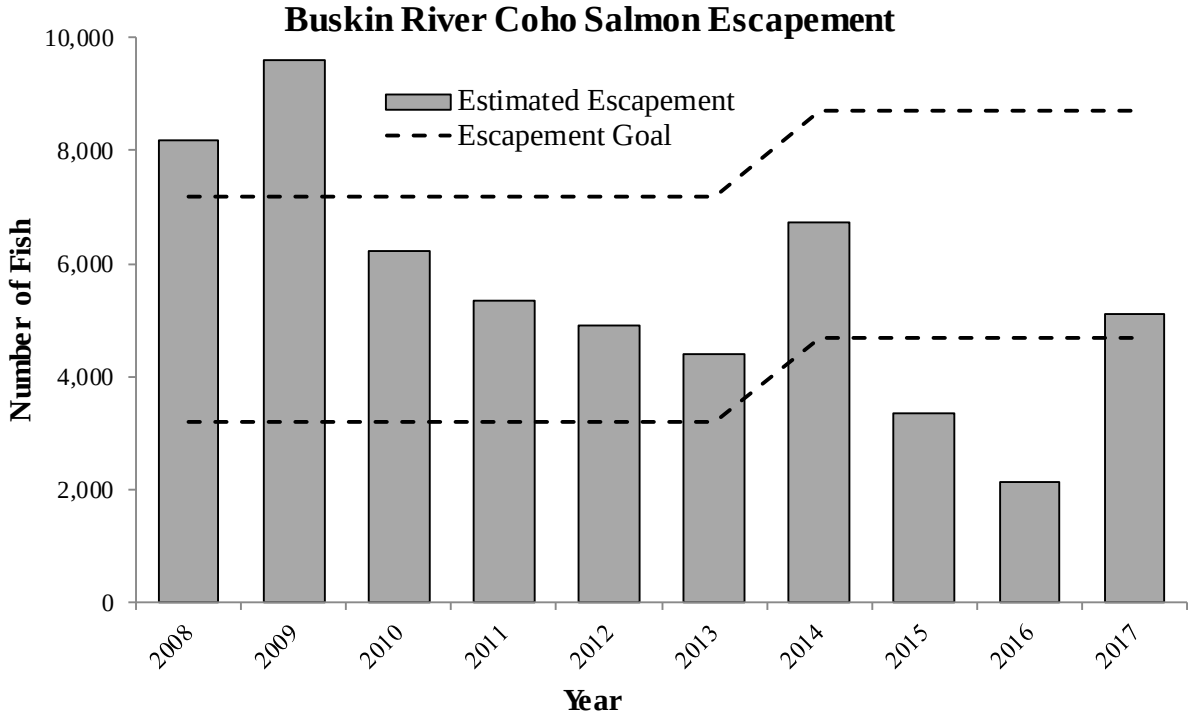


Figure 9.–Escapement of Buskin River coho salmon, 2008–2017.

Source: Statewide Harvest Survey (SWHS) estimates from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited November 2018). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/; ADF&G Division of Commercial Fisheries, Kodiak, 2018.

Coho salmon runs in other KRZ drainages are monitored annually by postseason foot surveys to obtain index counts of escapement and in addition to the Buskin River, coho salmon escapement goals have been established for 3 other KRZ drainages. These are lower bound SEGs established for the Pasagshak River (1,200), American River (400), and Olds River (1,000). A summary of index counts obtained for these and other streams between 2008 and 2018 are provided in Table 12. Coho salmon counts in these drainages are an index of actual escapement into the streams. Escapement indices for the Pasagshak River drainage have averaged 2,219 fish from 2008 to 2017, whereas the American has averaged 676 and the Olds, 1,062. Attempts are made to count fish during peak spawning and under ideal observation conditions; however, given variable weather and timing of spawning, counts may underestimate the number of fish present. Survey counts should be used to observe trends in abundance rather than assessing abundance for a particular year.

Regulations for the KRZ coho salmon sport fishery are more restrictive than elsewhere in the KMA and APAIA due to the relatively high levels of angler effort and associated potential for overharvest. New coho salmon regulations were implemented in the 2017 BOF meeting for the KMA. KRZ coho salmon bag and possession limits were formerly 2 fish per day year-round with seasonal closure for a large portion of the KRZ through 15 September. Bag and possession limits are now 2 fish per day through 15 September and then 1 fish per day from 16 September to 31 December to limit harvest rates during times when most coho salmon runs are in river and approaching spawning. The only exceptions are the stocked returns to Monashka Bay, including

Pillar and Monashka creeks, and Mill Bay and Mission Beach, all of which have a bag and possession limit of 2 per day year-round. Because Buskin River runs are monitored by weir, bag limits can be restricted or liberalized in season as needed to achieve the BEG. A lack of inseason run strength information for the other KRZ streams has meant taking a more passive management approach, though EOs have been issued at times to restrict portions of specific rivers or to allow liberalized harvests in specific rivers when inseason information on run timing and strength has been available. Reductions in harvest in most KRZ drainages in 2017 compared to the previous several years may be a result of the recent regulation changes.

Table 12.–Coho salmon index counts in the KRZ, 2008–2018.

Location	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
American River	700	639	58	1,061	427	841	1,595	530	500	410	78
Chiniak Creek	21	17	1	20	66	43	31	ns	3	1	ns
Felton Creek	232	160	ns	633	17	50	22	33	27	62	0
Monashka Creek [a]	19	132	37	36	300	679	230	100	60	66	210
Olds River	656	697	127	1,003	624	2,145	1,320	1,357	1,634	1,054	878
Pasagshak River	3,875	2,385	1,971	1,083	3,132	1,648	4,934	1,790	667	701	3,186
Pillar Creek [a]	78	89	56	248	858	1,043	750	180	116	417	1,273
Roslyn Creek	87	ns	18	293	159	460	3,900	271	45	365	15
Russian Creek	262	144	97	158	39	214	246	70	345	820	35
Salonie Creek	970	ns	90	942	304	286	509	215	218	502	6
Sargent Creek	264	74	44	135	90	40	75	39	107	377	125
Total	7,164	4,337	2,499	5,612	6,016	7,449	13,612	4,585	3,722	4,775	5,806

Source: Data archives, ADF&G Division of Sport Fish, Kodiak Area Office.

Note: The abbreviation "ns" means not surveyed.

[a] Monashka and Pillar creeks coho salmon runs have been influenced by the release of hatchery fish since 2012.

No EOs were issued for the Buskin River coho salmon run in 2017 or for any other KRZ coho salmon runs. In 2018, the only KRZ EO issued for coho salmon was to increase the Pasagshak River bag limit to 2 fish per day on 22 September, after the regulatory bag limit reduction on 16 September (Appendix C1). In 2017, the Olds and American rivers met EGs with 1,054 and 410 fish, respectively, though these only just met the lower bound SEGs of 1,000 and 400 fish. In 2018, however, both fell short at 878 fish in the Olds River and 78 fish in the American River. The Pasagshak River did not meet the lower bound SEG of 1,200 in 2017 and had a final index count of 701 coho salmon. In 2018, the index survey counted 3,186 coho salmon. Pasagshak River index counts have been difficult to obtain recently because changes in the drainage have resulted in a prolonged and bimodal spawning event. In the past, several surveys were conducted of spawning areas in the drainage, and the peak count was used to measure escapement. More recently, however, index counts have captured discrete spawning events without a distinct 'peak' for measuring achievement of escapement goals. New methods of monitoring escapement in this drainage are currently being tested.

MARINE WATERS

Fishery Description and Historical Catch

Trolling for coho salmon in marine waters of the KMA is a popular sport fishery which, like the marine Chinook salmon fishery, largely occurs in nearshore waters adjacent to the KRZ. The APAIA has a much smaller marine coho salmon fishery primarily occurring in Unalaska Bay, though the SWHS only occasionally has estimates of harvest due to low response rates. Harvests of coho salmon in the remainder of the APAIA are small, typically accounting for less than 10% of the combined annual KMA and APAIA harvest estimated by the SWHS.

Angler reports indicate that although the KMA marine waters coho salmon fishery generally lasts from early July through mid-September, peak effort occurs during late July and early August. Many harvested fish taken later in the season as the freshwater runs start are probably stocks of local origin, whereas those caught earlier may also consist of a larger portion of migratory fish. Fishing opportunity in this fishery may also be supplemented by annual coho salmon returns to the Kitoi Bay Hatchery on Afognak Island and to the PCH in the KRZ. About half of the harvest of coho salmon in the KMA is attributable to guided anglers but a larger part of the harvest in waters near the City of Kodiak is attributed to unguided anglers.

KMA marine coho salmon harvests averaged 13,971 fish from 2008 to 2017, whereas APAIA harvests averaged 790 fish during the same time (Table 13). Relatively few fish were reported as released during any years, averaging less than 1 fish released for every 1 harvested for both areas. Guided angler coho salmon harvests reported in logbooks from 2008 to 2017 averaged 6,760 fish (Table 14); the APAIA harvest is confidential due to less than 4 guide businesses operating in the area.

Table 13.–SWHS estimates of KMA and APAIA marine coho salmon harvest and catch, 2008–2017.

	Chiniak Bay		Afognak		Total KMA		APAIA	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
2008	10,820	13,372	3,136	4,250	18,652	24,578	325	1,716
2009	8,244	9,821	2,531	4,101	17,612	23,978	1,010	3,039
2010	4,202	4,822	3,857	4,814	14,569	18,591	1,022	1,492
2011	5,347	7,403	2,826	4,282	13,735	18,416	582	1,177
2012	4,906	5,769	2,211	2,993	12,897	15,328	718	1,361
2013	3,126	3,513	4,594	5,665	13,428	17,448	763	1,179
2014	3,087	3,385	1,915	2,589	10,391	13,874	646	768
2015	7,730	10,049	1,879	2,868	20,189	28,681	864	983
2016	3,087	4,004	609	620	7,429	9,119	969	1,324
2017	5,593	6,946	961	1,298	10,807	13,979	1,004	1,407
Average 2008–2017	5,614	6,908	2,452	3,348	13,971	18,399	790	1,445

Source: Statewide Harvest Survey (SWHS) estimates from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited November 2018). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Table 14.–Guided angler harvest of KMA marine coho salmon, 2008–2017.

Year	Chiniak Bay	Afognak	Total KMA
2008	1,827	4,289	8,993
2009	1,142	4,018	9,222
2010	596	3,454	8,909
2011	1,104	1,446	9,924
2012	819	2,238	4,192
2013	247	1,687	3,371
2014	189	1,894	5,216
2015	1,112	4,298	12,413
2016	121	640	1,443
2017	846	942	3,916
Average 2008–2017	800	2,491	6,760

Source: Saltwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed October 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests.]).

Fishery Management and Performance

The KMA and APAIA marine waters coho salmon fishery is managed passively through the establishment of daily bag and possession limits applied uniformly in all waters except within 1 mile of the coastline bordering the KRZ and Spruce Island, where more restrictive limits prevail to provide a conservation buffer for local coho salmon stocks. The daily bag and possession limits for coho salmon outside the 1-mile boundary are 5 fish, whereas inside the KRZ, the bag and possession limits are currently set at 2 fish and follow KRZ freshwater limits recently enacted by the BOF which reduced the daily bag and possession limit to 1 per day from 16 September through 31 December. The only exceptions to this are the salt waters of Monashka and Mill bays and Mission Beach due to stocked returns to these areas.

The 2017 coho salmon harvest was 10,807 fish in KMA marine waters and the harvest in Chiniak Bay was 5,593 fish (Table 13). Harvests of coho salmon in Chiniak Bay can fluctuate depending on nearshore conditions much the way marine Chinook salmon fisheries do. If food is available for coho salmon in areas where anglers are able target them, harvests generally increase; however, there are times when fishing is poor in marine waters near the KRZ but the coho salmon runs to freshwater drainages are still quite good. Fishing opportunity in this fishery is probably driven more by nearshore ocean conditions than the actual abundance of coho salmon returning to nearby drainages.

STOCKED COHO SALMON FISHERIES

Both anadromous and landlocked releases of coho salmon have occurred at several KRZ locations intermittently since the 1980s. Coho salmon fingerlings were stocked in landlocked locations until 2014, when this program was discontinued due to changes in the SF–KRAA cooperative agreement that specified coho salmon smolt would only be produced for anadromous releases to supplement shortfalls in Chinook salmon stocking in the KRZ. Coho salmon smolt had been produced to specifically address this purpose since 2005 but these are now the only releases

specified in the current cooperative agreement. Shortfall supplementation has occurred annually since 2016 due to the continued shortfalls in Chinook salmon production and the establishment of a coho salmon brood source at Pillar Creek large enough to sustain the hatchery project.

Release locations for coho salmon smolt are outlined in the ADF&G SSP and the SF–KRAA cooperative agreement. Releases occur at Pillar and Monashka creeks annually, and when surplus fish are available, they are also released in Island and Mission lakes, producing returns to Mill Bay and Mission Beach. Target release sizes for coho salmon smolt specified in the cooperative agreement are set at 15 g, and smolt releases usually occur in May. Unlike Chinook salmon releases, coho salmon smolt are not generally held in situ for imprinting, although the timing of stocking promotes a reasonable period of acclimation and natural rearing. Adults return at ocean-age-1, and some are known to survive long enough to spawn in the drainages where they return.

Sport fishing effort in this fishery occurs in the nearshore marine waters of Monashka and Mill bays, Mission Beach, as well as the freshwaters of Pillar and Monashka creeks (Figure 3). Releases since 2016 have occurred in all 4 stocking locations; however, only Pillar and Monashka creeks were stocked in 2018. Since 2016, releases have ranged from a high of 289,062 smolt in 2016 to a low of 89,247 smolt in 2018 (Appendix F1). Returns have generally been very strong and interest in this fishery has quickly grown. Smolt-to-adult survival rates can be up to 10% and adult returns to Pillar and Monashka creeks have been greater than 4,000 fish annually. Hatchery-reared coho salmon are also caught in marine fisheries in Monashka Bay and in Chiniak Bay. It is likely that these releases have enhanced the marine fisheries in many nearby areas because anglers report excellent coho salmon fishing into late September, which has only occurred recently in conjunction with these returns of hatchery-reared coho salmon.

OTHER FISHERIES

Angler effort for coho salmon occurs in nearshore marine waters adjacent to numerous KMA drainages outside the KRZ, with the largest occurring near the numerous Afognak Island coho salmon–supporting drainages which include the Afognak, Pauls, and Portage rivers. Shuyak Island streams and the Uganik, Karluk, and Ayakulik rivers along the west side of Kodiak Island also support relatively large coho salmon fisheries. Although these are significant and important coho salmon fisheries relative to the area, individually, these locations rarely support effort at levels that are adequately captured by the SWHS, and generally have low exploitation rates on the affected coho salmon stocks. Afognak Island streams as an aggregate do produce SWHS estimates annually and harvests averaged 2,452 fish from 2008 to 2017 (Table 13). The 2017 harvest on Afognak Island was 961 fish. Guided angler effort at Afognak Island locations appears in the saltwater logbook database records, and harvests for these locations have ranged between 79 and 809 fish from 2008 to 2016, though individual locations are confidential due to the low number of guide business operating near specific drainages (Table 10). Guided coho salmon harvest for westside Kodiak Island drainages in aggregate ranged from 92 to 453 fish during the same time period (Table 10). As previously noted, guided angler data for 2017 was not available at the time of this publication. Unguided anglers also frequently target coho salmon in these and other remote locations, although where available, guided angler logbook harvest statistics generally represent a majority of the total effort due to difficulty of access and because there are generally accessible coho salmon runs in other parts of the KMA prioritized by unguided anglers.

Coho salmon fisheries in the APAIA, like those in the KMA Remote Zone, are characterized by relatively low effort and exploitation rates spread throughout a number of very remote drainages.

Guided anglers generally make up most of the effort due to the difficult access, although there are exceptions near the communities of Unalaska–Dutch Harbor and Cold Bay. Annual estimates of harvest and catch are not available from specific areas in the APAIA due to low response rates and guided harvests for specific drainages are confidential. Harvests for the whole of the APAIA averaged 3,516 coho salmon from 2008 to 2017 and the harvest in 2017 was 3,673 fish (Table 9). Harvests of coho salmon by guided anglers for the APAIA averaged 1,534 from 2008 to 2016 (Table 10). One difference in this fishery from the KMA coho salmon fisheries is the large number of coho salmon released by guided anglers. Guided anglers released 7,474 coho salmon in 2016 and from 2008 to 2016, the number of released coho salmon has averaged 6,469 fish (Table 11).

SOCKEYE SALMON FISHERIES

Although there are many individual KMA and APAIA sockeye salmon stocks of interest to anglers, most sport fishing for this species occurs within the KRZ and targets stocks at the Saltery, Pasagshak, and Buskin rivers (Figure 3). Average annual harvests from the KRZ account for more than one-half of the KMA and APAIA combined total. Exploitation rates by anglers fishing these streams are significant enough to warrant formal consideration of sport harvests for inseason fisheries management and stock assessment purposes. All other KMA and most APAIA stocks are lightly exploited by anglers relative to the size of the runs. In the APAIA, the one exception to this is the sockeye salmon returns to the Unalaska Bay area where there are several road-accessible sockeye salmon runs near the community of Unalaska–Dutch Harbor. These sockeye salmon runs are small but also lightly exploited because of significant restrictions on sport fishing for sockeye salmon in the Unalaska Bay area as well as in specific drainages within this area such as the Unalaska Lake–Illiuliuk River drainage and the Summer Bay Lake drainage.

KRZ FISHERIES

Fishery Description and Historical Catch

The Saltery, Pasagshak, and Buskin rivers are the only sockeye salmon runs in the KRZ and these are highly utilized by anglers. The Buskin River sport fishery occurs primarily in June due to its earlier run timing, whereas the Pasagshak and Saltery rivers sport fisheries occur in July. The Buskin River sockeye salmon run is the only salmon run in the KRZ that occurs in the early part of the summer, so it is highly popular among anglers, which are primarily unguided anglers that are residents of the City of Kodiak. It is also very close to the City of Kodiak and has excellent angler access to many parts of the river. The Pasagshak and Saltery rivers are also highly popular among local anglers but attract a larger number of anglers from off island. Access to the Saltery River is by off-road vehicle (typically ATV) and is more difficult to get to than the Buskin or Pasagshak rivers, but it is the most popular sockeye salmon sport fishery in the KMA.

The Saltery River has been gaining popularity due to improvements the capabilities of off-road vehicles used to access the drainage, large run sizes, relatively liberal bag limits, and increasing interest by guides in taking clients to the drainage. The 5-year average harvest from 2008 to 2012 was 4,431 fish, whereas the more recent 5-year average from 2013 to 2017 increased to 7,431 fish (calculated from Table 15). Peak harvest occurred in 2014 at 10,649 sockeye salmon, which accounted for nearly half of the total KMA sockeye salmon harvest at that time (Table 15). From 2008 to 2017, harvests averaged 5,931. Guided harvests of sockeye salmon from the Saltery River have averaged 1,331 during 2008 through 2016 (Table 16).

Table 15.–SWHS estimates of freshwater sockeye salmon harvest and catch in the KMA and APAIA, 2008–2017.

Location	Estimate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average 2008–2017
Buskin River												
	Harvest	1,159	687	332	1,277	1,484	1,310	4,237	3,978	2,503	3,161	2,013
	Catch	1,560	1,417	699	2,352	1,938	2,395	6,201	5,807	3,247	4,701	3,032
Pasagshak River												
	Harvest	3,218	1,021	1,027	1,592	2,080	1,685	522	31	572	2,084	1,383
	Catch	4,527	1,431	1,351	2,801	2,972	2,577	771	255	572	3,270	2,053
Saltery River												
	Harvest	5,693	4,916	4,303	3,905	3,339	9,940	10,649	7,035	7,072	2,460	5,931
	Catch	15,802	7,418	6,082	6,146	4,031	15,103	13,590	8,289	9,512	3,511	8,948
Karluk River												
	Harvest	638	706	590	424	256	2,099	841	1,052	2,417	3,412	1,244
	Catch	4,145	4,945	1,527	1,642	1,864	4,215	2,123	2,036	3,319	7,359	3,318
KMA Total												
	Harvest	13,392	9,239	9,093	8,697	9,737	19,920	22,204	14,737	15,599	16,834	13,945
	Catch	39,200	22,571	16,111	16,718	17,016	33,092	35,230	21,044	23,551	29,244	25,378
APAIA												
	Harvest	1,377	3,311	1,229	1,012	818	179	1,425	1,138	342	926	1,176
	Catch	3,588	5,410	1,883	4,299	1,364	468	2,609	2,583	785	1,959	2,495

Source: Statewide Harvest Survey (SWHS) estimates (Alaska Sport Fishing Survey database [Internet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish [accessed October 2018]. Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/).

Table 16.–Guided freshwater sockeye salmon harvest and release in the KMA and APAIA, 2008–2017.

Location	Estimate	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2008–2016
Ayakulik River											
	Harvest	619	848	434	384	718	396	544	935	810	632
	Release	2,551	2,190	1,061	653	2,185	733	710	1,162	1,218	1,385
Dog Salmon River											
	Harvest	894	796	782	790	709	679	576	370	416	668
	Release	1,181	628	701	761	946	615	439	234	312	646
Karluk River											
	Harvest	611	642	64	8	364	132	54	81	149	234
	Release	892	933	127	56	397	319	50	80	47	322
Saltery River											
	Harvest	1,150	868	1,305	2,278	1,335	1,225	1,207	1,131	1,476	1,331
	Release	894	218	926	1,757	788	620	827	526	604	796
Total KMA											
	Harvest	3,523	3,312	2,838	3,496	2,802	2,745	2,907	2,859	3,157	3,071
	Release	5,829	4,103	2,949	3,065	3,776	2,384	2,276	2,078	2,321	3,198
APAIA											
	Harvest	409	900	896	717	575	483	492	448	195	568
	Release	514	496	1,270	973	1,024	805	1,285	853	388	845

Source: Freshwater Logbook Database. (Alaska Department of Fish and Game, Division of Sport Fish. 2006 to present. Accessed December 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests]).

The Buskin River has seen consistently strong runs since 2010 and some of the highest harvests on record. Sport harvest of sockeye salmon from the Buskin River from 2008 to 2017 averaged 2,013 fish (Table 15). Guided harvests are confidential but are very low compared to other drainages.

The Pasagshak River has somewhat smaller harvests than either the Buskin or Saltery rivers, averaging 1,383 fish from 2008 to 2017. Some of the lowest harvests on record have occurred at Pasagshak River in the last 10 years. Guided angler harvests are also confidential for the Pasagshak River due to the low number of guides fishing the drainage.

The 2017 SWHS-estimated KRZ sockeye salmon harvest was below the 2008–2017 average (calculated from Table 15) due to decreased harvest at Saltery Cove, which was 2,460 fish (Table 15). The 2017 guided angler harvest is unavailable at the time of publication, but the 2016 guided angler harvest was 1,476 sockeye salmon (Table 16). The 2017 total harvest of Buskin River sockeye salmon was 3,161, and the 2017 total harvest of Pasagshak River sockeye salmon was 2,084 (Table 15).

The ratio of sockeye salmon released to those harvested in the KRZ has remained relatively consistent with very few fish released relative to the number caught. For both guided and unguided anglers, on average less than 1 fish has been released for every 1 harvested from 2008 to 2017 (Tables 15 and 16). This contrasts with the Remote Zone (Karluk, Ayakulik, and Dog Salmon rivers), where 1 or more fish are released for every 1 that is caught.

Escapement and Fishery Management

Sockeye salmon runs in the KRZ are monitored primarily for management of sport and subsistence fisheries in the Buskin and Pasagshak rivers, whereas the Saltery River also has a modest commercial fishery in addition to sport and subsistence fisheries. Regulations for sockeye salmon sport fisheries in the KRZ are generally more restrictive than the Remote Zone or APAIA regulations. Due to higher levels of angler effort and the potential for overexploitation of relatively small sockeye salmon runs, the bag and possession limits in the KRZ are 2 sockeye salmon per day, whereas in almost all other areas of the KMA and APAIA the limits are 5 per day, 10 in possession and follow the general salmon bag limits established in both areas.

Buskin River

SF operates a counting weir annually on the Buskin River to count the sockeye salmon run and permit inseason management of the sport and subsistence fisheries. Annual weir counts and accounting of removals by the various user groups have allowed establishment and periodic review of a Buskin River sockeye salmon BEG that is currently 5,000–8,000 fish. Timing of the Buskin River run typically peaks during the month of June and is historically 95% complete by the end of July (Appendix D6). From 2008 to 2017, sockeye salmon escapements have ranged from 5,900 to 16,189 fish and averaged 10,169 (Figure 10). Escapements in 2017 and 2018 were 7,222 and 4,284, respectively. Weir counts in this drainage can be considered equal to escapement because no sport fishing for sockeye salmon occurs upstream of the weir.

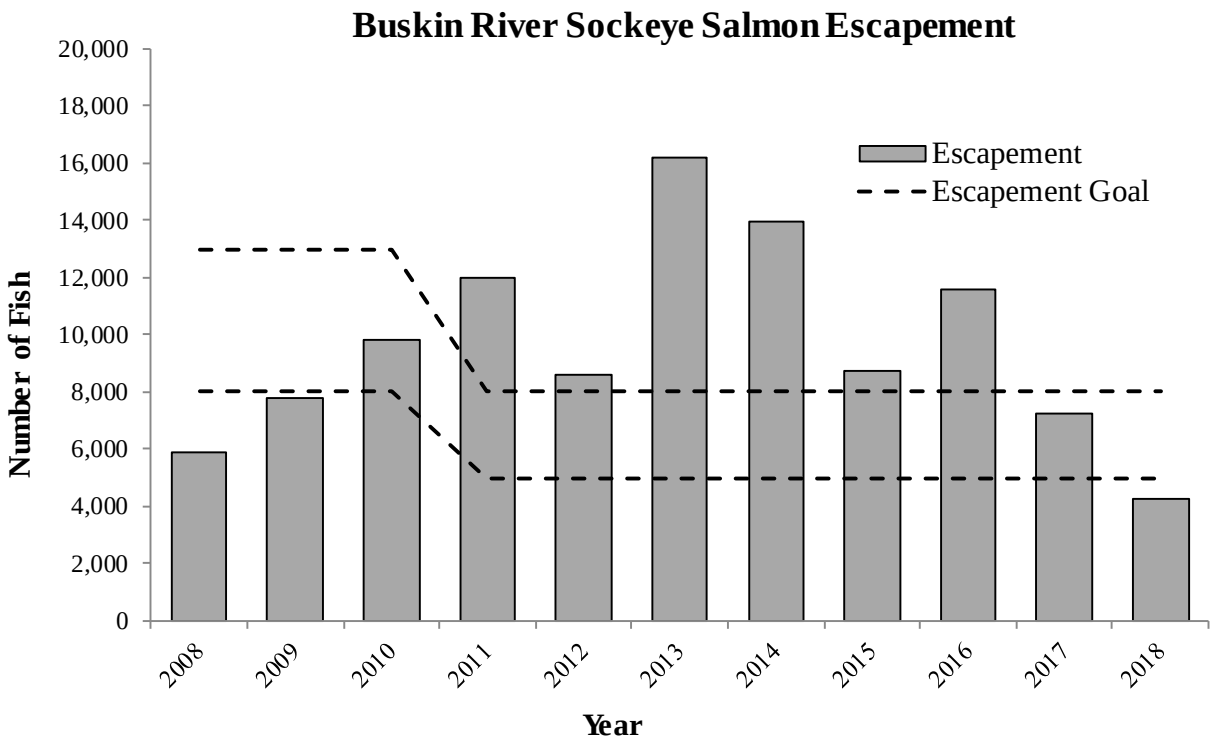


Figure 10.–Escapement of Buskin River sockeye salmon, 2008–2018.

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

The Buskin River has seen both very strong and relatively weak runs since 2008. The run rebounded from very small runs in 2008 and 2009 to consistently large runs from 2010 to 2016. More recent escapements have been smaller, however. Escapements have only been within the BEG for a few years, with most exceeding the BEG and 2008, 2009 and 2018 falling below. Angler interest in the Buskin River sockeye salmon run generally fluctuates with escapement, but due to its proximity to the City of Kodiak, road access to the majority of the drainage, and there being just a few spots in the drainage where sockeye salmon hold, the Buskin River sockeye salmon run can see intense fishing pressure even in years with small runs.

The 2017 Buskin River run was relatively early, and anglers were able to reliably catch sockeye salmon by mid-May. The bag limit was increased by EO in early June to 5 sockeye salmon per day as had been done in the previous 3 years, and this is reflected in the harvest estimates. The 2018 run was very weak and was the lowest on record. The sport fishery was closed early in the season when it became apparent that the run would not meet the BEG.

Saltery River

Saltery River sockeye salmon escapements are also monitored by a weir established just below Saltery Lake. Very little sport harvest of sockeye salmon occurs above the weir and weir counts can be considered equal to escapement. The escapement goal for Saltery River sockeye salmon is a BEG with a range of 15,000–35,000 fish. Escapements from 2008 to 2017 averaged 39,274 fish and ranged from 22,845 to 57,867 (Figure 11). The Saltery River run peaks later than the Buskin River run but is very similar to the Pasagshak River run in timing, usually peaking in mid-July (Appendix D7). Both the 2017 and 2018 escapements were within the BEG at 39,315 and 22,845

fish, though the 2018 count was the lowest on record. Escapements since 2008 have seen both record highs and lows; the record high escapement occurred in 2016 and escapements have been within or above the BEG in all years (Figure 11).

The only exception to the more restrictive bag limit for the KRZ is the Saltery Cove drainage, where the bag and possession limit is 5 fish. The Saltery Cove sockeye salmon run is able to sustain this level of harvest due to relatively more difficult access as well as being the largest sockeye salmon run in the KRZ. Management of the fishery occurs in season and limits have been both restricted and liberalized based on inseason weir counts.

Although harvests of Saltery River sockeye salmon fluctuate from year to year, the 2017 run was not as strong as the previous year and did not see a liberalized bag limit (10 fish per day) until the latter part of July (Appendix C1). In contrast, in the previous 4 years, an EO was issued early in the season to increase the bag limit to 10 per day, and this is reflected in harvest estimates. Similarly, for 2018, the run was below average and sport harvests were restricted to 2 per day early in the season when it appeared the BEG may not be achieved. However, it was subsequently restored to 5 per day later in the season.

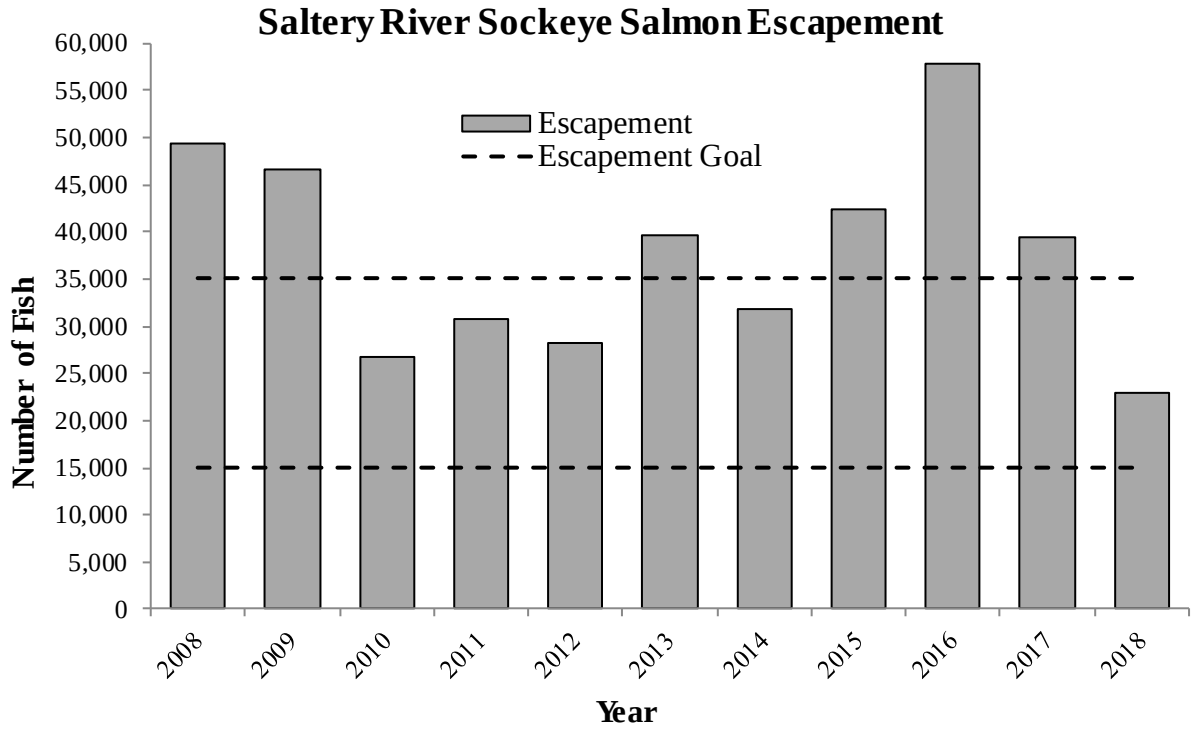


Figure 11.–Escapement of Saltery River sockeye salmon, 2008–2018.

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

Pasagshak River

The Pasagshak River sockeye salmon run has been monitored by weir since 2011 and counts from 2011 to 2017 have averaged 7,306, ranging from 2,019 to 13,402 (Figure 12). The 2017 escapement of 11,021 was well above the lower bound SEG of 3,000 fish, but the 2018 escapement was below the SEG at 2,019 fish. Recent escapements have been both very high and very low and the Pasagshak River has seen more variable run sizes than the Saltery or Buskin rivers. In 2014

and 2015, runs of sockeye salmon fell short of the SEG; however, the SEG was met in 2016. Weir counts in the Pasagshak River can also be considered equal to escapement because no harvest of sockeye salmon occurs above the weir.

The 2017 run at the Pasagshak River was large and similar to the 2011 and 2013 runs. After the fishery restrictions implemented during 2014–2016, anglers were able to take advantage of the large run size and lack of inseason restrictions in 2017. No EOs were issued for Pasagshak River sockeye salmon in 2017. The 2018 run was very small and, like the Buskin River, the Pasagshak River was closed to sport fishing for sockeye salmon early in the run when it became apparent escapement goals would not be met.

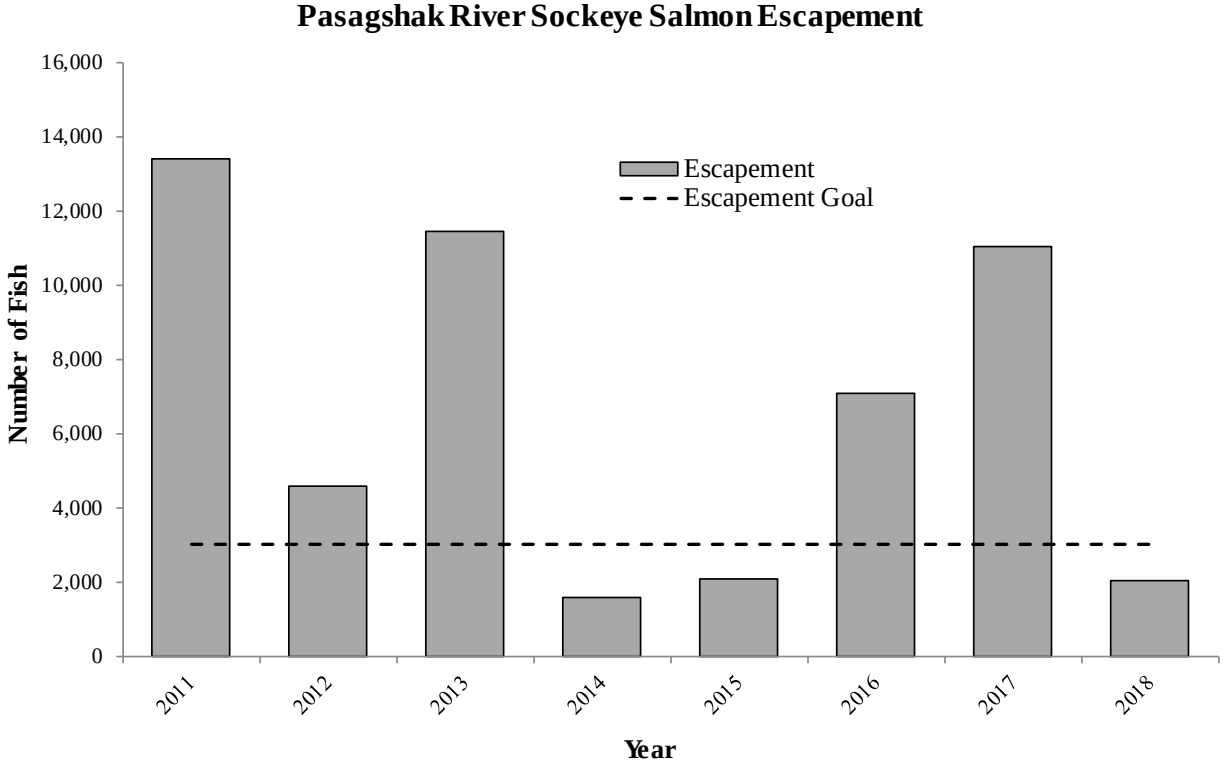


Figure 12.–Escapement of Pasagshak River sockeye salmon, 2008–2018.

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

OTHER FISHERIES

There are several streams in the KMA remote zone that are popular with sockeye salmon anglers and these include the Karluk, Ayakulik, and Dog Salmon rivers and to a lesser extent the Afognak River and several Olga Bay streams. Due to remote locations and more difficult access, most angler effort is guided, with the exception of Afognak River where there is more unguided effort. The numbers of sockeye salmon that are caught and subsequently released are higher in comparison to rates documented for KRZ streams. Anglers accessing these more remote rivers will more often catch and release sockeye salmon after filling their bag limits.

These runs are lightly exploited by anglers and sport harvests have a relatively small impact on escapements due to the relative size difference between the escapements and harvests. For weir-monitored stocks, inseason restrictions can still be imposed when necessary despite the low harvest

rates, and bag limits can be liberalized to allow additional angling opportunity when warranted. Sockeye salmon sport fisheries occurring in KMA and APAIA waters without inseason escapement monitoring are managed passively through relatively conservative bag limits established for each area. In addition to low angler effort, this generally provides adequate measures for conserving individual stocks.

Annual SWHS sockeye salmon harvest estimates are only available from the Karluk River and have averaged 1,244 fish from 2008 to 2017 (Table 15). Total harvest at the Karluk River in 2017 was 3,412 fish and is the largest harvest during this time period. Anglers reported releasing 2 sockeye salmon for every 1 they harvested at the Karluk River, which reflects general trends in most Remote Zone rivers.

Freshwater logbooks have harvest estimates that have been available more consistently across years than SWHS estimates for many Remote Zone drainages such as the Ayakulik and Dog Salmon rivers in addition to the Karluk River. Most of the KMA and APAIA logbook harvests for individual drainages are confidential, however. Guided harvests of sockeye salmon in the Ayakulik River are unavailable for 2017 but have averaged 632 from 2008 to 2016. The 2017 guided harvest of sockeye salmon is not yet available for the Dog Salmon and Karluk rivers but averaged 668 and 234 fish, respectively, during 2008 through 2016 (Table 16).

Escapements of sockeye salmon to most Remote Zone rivers are typically very large compared to KRZ drainages, and because sport harvests are relatively small in comparison, they have a negligible impact on escapements. The Karluk River has both early and late sockeye salmon runs and sport fishing is generally concentrated on the early run but does continue through the late run to some degree. The 2017 total Karluk River sockeye salmon escapement was 628,495 and the 2018 run of 633,279 was similar; the 2008–2017 average was 485,856 (Table 17). The early run BEG is 150,000–250,000 fish and was achieved in both 2017 and 2018; the late run BEG is 200,000–450,000 fish and was also achieved in both years.

Table 17.–Sockeye salmon weir counts for selected locations within the KMA, 2008–2018.

Year	Buskin River	Saltery Creek	Pasagshak River [a]	Karluk River	Ayakulik River	Dog Salmon Creek
2008	5,900	49,266	NA	246,490	162,888	105,363
2009	7,757	46,591	NA	330,077	315,154	101,845
2010	9,800	26,809	NA	348,102	262,327	94,680
2011	11,982	30,768	13,402	317,322	261,141	134,642
2012	8,565	28,188	4,585	502,690	328,254	148,884
2013	16,189	39,697	11,421	571,359	282,164	136,059
2014	13,976	31,772	1,582	795,566	297,711	200,296
2015	8,719	42,468	2,077	629,654	326,435	219,093
2016	11,584	57,867	7,053	488,809	254,967	122,585
2017	7,222	39,315	11,021	628,495	324,858	129,227
Average 2008–2017	10,169	39,274	7,306	485,856	281,590	139,267
2018	4,284	22,845	2,019	633,279	266,333	201,161

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

Note: "NA" means data not available.

[a] The Pasagshak weir began operation in 2011.

The Ayakulik River also has both early and late sockeye salmon runs; however, angler effort is spread throughout both runs. The 2017 and 2018 total Ayakulik sockeye salmon escapements were 324,858 and 266,333, respectively; the 2018 abundance was closer to the 2008–2017 average of 281,590 fish. The early run BEG of 140,000–280,000 fish was exceeded in 2017 but achieved in 2018 and the late run BEG of 60,000–120,000 fish was achieved in both 2017 and 2018. The Dog Salmon River has 1 sockeye salmon run and is monitored for escapement at a fish pass near Frazer Lake. This river has a BEG of 75,000–170,000 fish. The 2017 run was 129,227 fish, and the 2008–2017 average was 139,267 fish. The 2018 run of 201,161 fish was above these.

Sport fishing effort for sockeye salmon in the APAIA is very low compared to the KMA, with just a few significant sockeye salmon fisheries on the Unalaska–Dutch Harbor Road Zone that have potential to impact local stocks. In 2017, the SWHS estimated a total harvest of 926 sockeye salmon in the APAIA and the 2008–2017 average harvest was 1,176 (Table 15). Similarly, harvest information for guided anglers obtained from logbooks show an average harvest of 568 fish during 2008–2016 (Table 16). Both guided and unguided anglers in the area reported releasing about 1 sockeye salmon for each harvested.

The Unalaska Road Zone has several very small and mostly unmonitored sockeye salmon runs. Due to the relatively large community in Unalaska–Dutch Harbor, there is potential for anglers to significantly impact these runs; however, restrictions are in place to protect returning sockeye salmon. Sockeye salmon return to the Iliuliuk River drainage (also called Town Creek or Unalaska Lake drainage), Summer Bay Lake, and Morris Cove and are targeted primarily by subsistence users, but small saltwater sport fisheries have developed at Summer Bay and Morris Cove. Fresh- and saltwater anglers in the Unalaska–Dutch Harbor Road Zone have similar regulations to the KRZ—they can harvest 2 sockeye salmon per day. There are also sport fishing closures in place for portions of the Summer Bay Lake and Iliuliuk River drainages to protect holding sockeye salmon as they enter the drainages. In addition, the entire Iliuliuk River drainage is closed to sport fishing for sockeye salmon. These runs are generally small with Summer Bay being the largest at a few thousand fish. Anglers do successfully harvest sockeye salmon in the salt waters of Summer Bay and to a lesser degree at Morris Cove and Iliuliuk River, though harvest estimates are unavailable due to low response rates in the SWHS.

STEELHEAD–RAINBOW TROUT FISHERIES

Most angling effort on wild rainbow trout and steelhead populations within the KMA and APAIA target steelhead, although several streams on both Kodiak and Afognak islands support some targeted fishing for resident rainbow trout. Anglers that target other species also annually report incidental catches of resident rainbow trout in many streams throughout both areas. The Karluk River is the most popular stream for anglers targeting steelhead, and most of the fishing effort occurs during the month of October through early November. Other KMA drainages supporting steelhead runs include the Ayakulik, Dog Salmon, Little, Afognak, Buskin, and Saltery rivers. In the APAIA, steelhead are targeted annually by anglers fishing the Sandy, Nelson, Cinder, and King Salmon river drainages.

Annual stock assessment of steelhead populations is currently limited to documenting kelts migrating out of drainages where weirs are otherwise used to monitor salmon. Steelhead research conducted previously on KMA stocks has included mark–recapture experiments to estimate single-year spawning abundance of Ayakulik and Little rivers populations (Kevin VanHatten, Fishery Biologist, Kodiak National Wildlife Refuge; personal communication), and a multiyear study of

the Karluk River run in order to estimate total spawning population during any year using kelt age composition and abundance (Begich 1999). More recently, ADF&G has conducted a similar mark-recapture study aimed at estimating the spawning population size of Karluk River steelhead (Polum et al. 2017). This project began in 2017 and will continue through 2019.

The current management strategy for steelhead sport fisheries relies on conservative regulations, and rainbow trout and steelhead share a common bag limit. Restrictions on harvest include year-round catch-and-release only fishing within the KRZ and the Sandy River drainage, and an annual limit of 2 fish over 20 inches in all other KMA and APAIA fresh waters. Where harvest is allowed, the daily bag limit for steelhead is 2, only 1 of which may be longer than 20 inches. Historical harvest statistics available from logbooks and the SWHS indicate that anglers rarely retain steelhead even when it is permissible. Angler reports and observations by ADF&G staff suggest that most of the targeted steelhead fishery comprises anglers seeking only to catch and release steelhead, usually using fly-fishing gear.

Resident rainbow trout are periodically sought by anglers in just a few KMA locations, including the Buskin, Uganik, Saltery, and Afognak rivers. Most angler interest in resident populations within KMA waters is limited to those introduced through stocking in KRZ lakes.

KARLUK RIVER

The Karluk River steelhead sport fishery is the most popular steelhead sport fishery within the KMA and APAIA. Angler effort is extensive enough to be captured annually in SWHS statistics, which is rare for remote fisheries in both areas. Guided angler activity is also recorded in freshwater logbooks. Most effort occurs near the Karluk River Portage, approximately 10 miles below Karluk Lake and is primarily conducted during the month of October when steelhead are returning from the ocean. Estimates of catch from the SWHS show anglers caught an average of 898 fish from 2008 to 2017 and an average harvest of 20 (Table 18). In 2017, the SWHS reported only 74 steelhead caught, however. Guided angler logbook records reports are not available for 2017 yet; however, there were 824 steelhead released in 2016 and an annual average of 551 released from 2008 to 2016 (Table 18). By angler reports, steelhead fishing can vary dramatically between years depending on the size and timing of the run as well as environmental conditions. Fish become less active when colder temperatures prevail in October even though there could be a sizeable run, but warmer conditions and smaller run sizes could also produce less than ideal fishing.

Karluk River steelhead kelt counts since 2008 have ranged from 836 to 4,624 and averaged 2,009 from 2008 to 2017 (Table 18). The 2017 and 2018 kelt counts were 4,624 and 3,148, respectively. Kelt counts can be a general indicator of abundance but they can be highly unreliable as an index of a particular year's spawning population because of variable spawning survival rates as well as timing of weir installation in the spring. For these reasons, SF has been using mark-recapture methods to estimate the size of the spawning population of Karluk River steelhead (Polum et al. 2017). Steelhead are tagged with visual tags prior to spawning in the spring near known wintering and spawning areas of the drainage and recaptured during normal weir operations at the Karluk weir. Estimates derived from the 2017 project year indicate that the spawning population was about 9,000 steelhead. Past estimates of spawning abundance have ranged from about 3,500 steelhead to more than 10,000 (Begich 1997). The Karluk River may have the largest steelhead run in the KMA or APAIA, but it can vary considerably in size.

Table 18.–SWHS estimates of steelhead harvest and catch, logbook harvest and release, and kelt counts for the Karluk River, 2008–2017.

	SWHS		Logbook		Karluk weir kelt
Year	Harvest	Catch	Harvest	Release	counts
2008	18	2,196	6	342	1,429
2009	107	859	6	702	1,879
2010	6	216	2	665	2,203
2011	6	1,556	5	447	3,688
2012	0	236	6	503	836
2013	8	22	2	248	1,605
2014	7	108	3	485	1,381
2015	15	1,005	2	740	1,278
2016	15	2,709	0	824	1,168
2017	20	74	NA	NA	4,624
Average 2008–2017	20	898	4	551	2,009
2018	NA	NA	NA	NA	3,148

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2018). Available from: https://intra.sf.adfg.state.ak.us/swhs_est/; Freshwater Logbook Database. (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed December 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests]); ADF&G Division of Commercial Fisheries, Kodiak, 2018.

Note: "NA" means data not available.

OTHER FISHERIES

Smaller but significant steelhead fisheries exist on the Ayakulik, Buskin, and Sandy rivers; however, they are too small to be captured by the SWHS, and logbook information is confidential. The Ayakulik and Sandy rivers fisheries are primarily made up of guided anglers and runs to these rivers are probably the next largest steelhead runs to the Karluk River. Kelt counts are available from the Ayakulik River weir and have averaged 533 from 2008 to 2017. In 2017, 478 steelhead kelts were counted and in 2018, 460 were counted. Estimates of spawning abundance or total population size for either the Ayakulik or Sandy rivers are not available but fisheries in these areas are relatively small though very popular with some anglers.

The Buskin River has a small but highly popular steelhead run due to ease of access to the drainage. Because the Buskin River is close to the City of Kodiak and has numerous access points from the road system, it is very popular with unguided anglers. Angler effort is still low but does occur throughout the winter months into spring until spawning. The SWHS estimates that an average of 257 steelhead were caught between 2008 and 2017 in the Buskin River, though not all catch of steelhead in the Buskin River is from directed effort and steelhead are often intercepted by anglers targeting sockeye salmon and Dolly Varden in the spring and coho salmon in the fall. In 2017, an estimated 78 steelhead were caught according to the SWHS.

Steelhead fishing also occurs in numerous other drainages to some degree. Some of the more notable locations are the Dog Salmon, Afognak, and Saltery rivers in the KMA and the Nelson River in the APAIA. In general, effort is very low, and fisheries primarily consist of a few guided anglers.

STOCKED RAINBOW TROUT FISHERIES

KMA and APAIA rainbow trout stocking became widespread as early as 1953 and at times has extended as far geographically as Adak Island. Historically, the broodstock has come from steelhead in the Karluk River and rainbow trout populations in various locations in Alaska, as well as rainbow trout from hatcheries located in Montana and Washington. Prior to 2007, all stocked fish were reared at the former SF Fort Richardson hatchery facility in Anchorage and subsequently transported to Kodiak Island shortly before being released. Since then, fertilized eggs from the current Anchorage facility, the William J. Hernandez Sport Fish Hatchery (WJHSFH), have been transported to PCH and the resultant rainbow trout fry have been reared locally.

All stocking is conducted in accordance with current guidelines set forth in the SSP, which is a 5-year stocking document updated annually to reflect stocking needs based on funding, changes in land status, or other considerations. Annual hatchery production dictates the numbers of fish that are stocked into lakes each year. All stocked landlocked lakes represent new sport fisheries because stocked species were not present before stocking occurred. Most stocking is directed toward road-accessible lakes that offer alternative opportunity to angling for local wild salmon and Dolly Varden.

Since 2008, up to 18 KRZ lakes have been stocked with rainbow trout (Appendix F2). Yearly hatchery production of rainbow trout has varied between roughly 55,000 and 120,000 fish due to occasional losses resulting from transport–release mortality and occasional surpluses of available fish. In 2017, 50,762 rainbow trout were stocked into 15 lakes, and in 2018, 54,998 were stocked into 16 lakes. About half of the lakes can be stocked via SF truck because they are very near the road, whereas the rest require either a boat, hiking, or aircraft for access. SF staff have annually assembled volunteers to hike fish into the more remote lakes, used the SF skiff to haul fish to outlying island lakes, and gathered air support from the Alaska Wildlife Troopers and United States Coast Guard.

All rainbow trout are stocked as fingerlings and, historically, fish have been released as small as 0.5 g, but currently the stocking target is 1 g. Releases occur within the egg-take brood year, typically in the months of July or August. Past age composition studies have shown that fingerlings released at less than 1 g reach catchable size (100 g) within 2–3 years after being released.

Current SSP objectives for rainbow trout releases in the KRZ include providing anglers at least 1,000 additional days of sport fishing effort annually. Estimates of total catch from the SWHS are unreliable due to relatively small numbers of respondents captured by the survey; however, anecdotal evidence suggests that most fishing effort is attributable to local residents who frequent the stocked lakes on a regular basis but consequently make up too small of an angler demographic to be adequately represented by SWHS sampling. Regulations for enhanced rainbow trout allow a daily bag and possession limit of 10 fish, only 1 of which may exceed 20 inches in length with no annual limit. Anglers harvest stocked rainbow trout regularly and target them both in open water and through the ice.

GROUNDFISH FISHERIES

Halibut is the groundfish species mostly commonly targeted by sport fishing anglers in KMA and APAIA marine waters, but rockfish are also highly popular as well as lingcod to a lesser degree. Angler effort primarily occurs between late April and early September when the weather is best. All three species are harvested throughout both areas wherever anglers' fish marine waters, though

a majority of the harvest is taken from waters near the City of Kodiak in Chiniak, Marmot, and Ugak bays, with significant effort in the waters around Unalaska Island near Unalaska–Dutch Harbor. Most angler effort that is not within an easy boat ride from the City of Kodiak or Unalaska–Dutch Harbor can be attributed to guided anglers, whereas unguided effort in the more remote areas is generally limited to anglers in remote villages in the KMA and APAIA.

HALIBUT

Fishery Description and Historical Catch

Because of the popularity of this fishery and widespread angler effort, there are robust estimates for the KMA and APAIA through the SWHS harvest survey and guided logbook database. Halibut remains the most targeted groundfish species for both guided and unguided anglers but is entirely under federal management. Halibut fishing occurs in most marine waters of the KMA and APAIA, although it is concentrated in waters near the City of Kodiak by both charter boats and unguided anglers. Significant effort also occurs around Afognak Island, Shuyak Island, and in many remote areas of the KMA attributable to both remote lodges and residents of remote communities but is less concentrated than in the more populated locations of the KMA. Some effort also occurs by anglers traveling from Cook Inlet to the KMA and from the KMA to the APAIA.

From 2008 to 2017, annual halibut harvests in the SWHS averaged 23,571 in the KMA and 2,096 in the APAIA (Table 19). Anglers report releasing about 1 halibut for every 1 that they harvest. This is probably because very small and very large halibut are released and there is virtually no targeted catch-and-release fishing of halibut in either the KMA or APAIA. About a third of the combined harvest of halibut from the KMA and APAIA occurs within Chiniak Bay annually and harvests averaged 10,739 from 2008 to 2017 (Table 19). Harvest restrictions on guided anglers implemented by the North Pacific Fisheries Management Council may have resulted in the reduced harvests of halibut seen recently; however, unguided anglers appear to be catching fewer halibut as well.

Table 19.–SWHS estimates of halibut harvest and catch in the KMA and APAIA, 2008–2017.

	Chiniak Bay		KMA		APAIA	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch
2008	18,145	29,775	33,999	62,591	3,719	8,788
2009	16,865	26,705	31,590	53,756	3,300	6,149
2010	10,581	16,323	23,063	39,910	2,352	3,679
2011	9,555	16,532	21,156	39,856	2,034	4,564
2012	10,000	16,298	23,145	38,032	3,625	5,884
2013	9,227	15,007	26,591	42,462	2,025	2,823
2014	10,784	14,299	25,386	40,488	1,063	1,496
2015	8,800	10,891	18,326	30,459	778	1,046
2016	5,885	9,228	14,619	24,082	1,657	2,606
2017	7,545	10,506	17,834	27,510	409	574
Average 2008–2017	10,739	16,556	23,571	39,915	2,096	3,761

Source: Statewide Harvest Survey (SWHS) estimates (Alaska Sport Fishing Survey database [Internet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish [accessed October 2018]. Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/).

Annual guided angler harvests of halibut in the KMA averaged 12,798 from 2008 to 2017 (Table 20). In Chiniak Bay during the same time, guided anglers harvested an average of 3,013 halibut. A significant amount of harvest also occurs in Afognak Island waters by guided anglers and they harvested an average of 2,257 halibut from 2008 to 2017. Guided harvests of halibut in the APAIA are confidential due to the low number of saltwater charter businesses in the area. Guided angler halibut harvests have decreased steadily in Chiniak Bay since 2008 and throughout the KMA since about 2011, and guided harvest of halibut is now about half of what it was in the previous 10 years (Tracy and Polum 2015). Guided anglers also released about 1 halibut for every 1 harvested.

Table 20.–Guided angler harvest and release of groundfish in the KMA, 2008–2017.

	Chiniak Bay		Afognak		Total KMA	
Year	Harvest	Release	Harvest	Release	Harvest	Release
2008	5,453	4,620	3,149	4,131	18,441	21,344
2009	3,788	3,947	2,942	4,092	14,477	19,430
2010	3,818	2,152	3,145	3,515	14,669	15,344
2011	4,805	3,341	3,119	3,486	16,058	18,558
2012	2,337	1,441	2,398	1,988	14,889	13,866
2013	2,542	911	1,961	2,100	13,764	11,341
2014	2,454	638	1,895	2,681	12,912	9,558
2015	2,137	702	1,549	1,138	9,218	4,779
2016	1,664	716	1,588	1,662	9,035	8,197
2017	1,128	358	824	1,612	4,520	4,019
Average 2008–2017	3,013	1,883	2,257	2,641	12,798	12,644

Source: Saltwater Logbook Database. (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed December 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests]).

Fishery Management and Performance

Halibut stocks throughout Alaska are managed by the federal government through an international treaty with Canada. Direct regulatory authority rests with the International Pacific Halibut Commission (IPHC) and by delegation from the commission to the North Pacific Fishery Management Council (NPFMC). All regulations adopted for the halibut sport fishery by the State of Alaska must reflect those previously established in federal law.

Part of the KMA lies within the federal management area 3A, which has more restrictive regulations for guided halibut anglers than the rest of the KMA and APAIA. The rest of the KMA and APAIA is encompassed by areas 3B, 4A, and 4B. Within these subareas, sport fishing regulations for guided and unguided anglers are the same, with a daily bag limit of 2 halibut and a possession limit of 4. Area 3A has an annually changing set of regulations for guided anglers including size limits, annual limits, 1 or more days per week closed, restrictions on the number of trips charter boats may take daily, and a limited entry permit requirement. Unguided anglers in this area do not fall under this regulatory structure but have a bag limit of 2 fish per day and possession limit of 4. Recent declines of halibut biomass have prompted increased restrictions in the guided sport harvest of halibut, and annual changes in regulations for guided anglers attempt to reduce harvest levels to meet harvest targets set by the IPHC and NPFMC.

The 2017 harvest of halibut estimated in the SWHS was 17,834 for the KMA and 409 for the APAIA (Table 19). In Chiniak Bay, anglers harvested 7,545 halibut in 2017. Guided anglers in

2017 harvested 4,520 halibut in the KMA, and APAIA harvests are confidential (Table 20). In Chiniak Bay, the 2017 harvest was 1,128 fish and the harvest in Afognak Island waters was 824 fish. All sources of harvest data show a decline in recent halibut harvests, much of which can be attributed to restrictions in the guided halibut fishery.

ROCKFISH

Fishery Description and Historical Catch

Both pelagic and nonpelagic rockfish are harvested in KMA and APAIA waters. Catches of pelagic species consist primarily of black (*S. melanops*) and dusky (*S. ciliates*) rockfish, whereas nonpelagic catches consist mainly of yelloweye rockfish (*S. ruberrimus*). Pelagic species historically have constituted most of the rockfish catch in both areas. Although a portion of annual rockfish catches are taken incidentally by anglers targeting halibut and salmon, there is also directed effort for these species.

In the KMA, SWHS estimates of rockfish harvest since 2001 have followed a strong upward trend (Tracy and Polum 2015), though this trend has not been seen in the APAIA. Estimates of KMA rockfish harvests doubled between 2001 and 2006 and then again from 2006 to 2014, reaching a high of 29,733 (Table 21). From 2008 to 2017, an average of 21,065 rockfish were harvested in the KMA. In Chiniak Bay, where much of the harvest has been concentrated, rockfish harvests have averaged 11,275 from 2008 to 2017, reaching a record high harvest of 17,843 in 2014. APAIA harvest estimates are much smaller, averaging 1,167 from 2008 to 2017. Anglers report releasing about 1 rockfish for each they harvested on average during this time in both areas.

Table 21.–SWHS estimates of rockfish harvest and catch in the KMA and APAIA, 2008–2017.

	Chiniak Bay		KMA		APAIA	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch
2008	9,635	21,674	15,596	38,964	1,288	3,185
2009	10,538	22,494	15,937	40,569	649	2,375
2010	12,294	27,206	19,897	46,404	763	3,325
2011	8,975	20,812	15,539	32,262	368	954
2012	8,372	15,752	18,511	34,202	2,455	6,758
2013	8,229	14,697	19,861	33,739	1,252	1,690
2014	17,843	24,628	29,733	47,182	1,444	2,796
2015	15,334	22,471	25,786	40,974	2,086	6,457
2016	9,955	16,268	26,339	44,230	1,023	4,759
2017	11,572	16,191	23,448	34,442	339	558
Average 2008–2017	11,275	20,219	21,065	39,297	1,167	3,286

Source: Statewide Harvest Survey (SWHS) estimates (Alaska Sport Fishing Survey database [Internet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish [accessed October 2018]. Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/).

Except for Chiniak Bay, trends for guided anglers in the KMA were consistent with SWHS estimates. From 2008 to 2017, an average of 17,374 rockfish were harvested by guided anglers, increasing from a low of 13,562 in 2008 to a high of 26,568 in 2016 (Table 22). Within Chiniak Bay, there have been no discernable trends in the guided angler harvests during the same period; harvest averaged 5,261 fish without discernable trends. Rockfish harvests by guided anglers in the APAIA are confidential due to the small number of charter boat businesses in the area. The relative

number of rockfish released by guided anglers has remained similar across years despite the increasing harvest, resulting in fewer fish released per fish harvested; anglers typically harvest many more rockfish than they release, and they released fewer rockfish in Chiniak Bay in 2017 than in 2008, indicating an increasing interest in rockfish as a targeted species.

Table 22.–Guided angler harvest and release of rockfish in the KMA, 2008–2017.

	Chiniak Bay		Afognak		Total KMA	
Year	Harvest	Release	Harvest	Release	Harvest	Release
2008	5,333	1,182	2,146	963	13,562	5,133
2009	5,362	1,123	3,346	1,265	15,098	4,542
2010	6,284	764	2,757	1,277	15,627	4,276
2011	5,302	774	2,559	2,140	13,838	4,747
2012	3,217	512	2,614	1,051	15,958	3,542
2013	5,035	385	1,909	1,249	17,674	4,133
2014	6,634	460	2,474	1,763	21,339	5,444
2015	7,036	522	2,907	980	21,724	4,128
2016	5,981	467	4,498	979	26,568	5,605
2017	2,423	2,497	1,802	2,448	12,356	14,073
Average 2008–2017	5,261	869	2,701	1,412	17,374	5,562

Source: Saltwater Logbook Database. (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed December 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests]).

Fishery Management and Performance

Current KMA sport fishing regulations for rockfish (including black rockfish, which are considered a pelagic species) consist of a daily bag limit of 5 and a possession limit of 10, of which only 2 per day and 4 in possession may be nonpelagic species and only 1 per day or 2 in possession may be a yelloweye rockfish, which is also considered a nonpelagic species. In the waters of Chiniak and Marmot bays, however, there is a more restrictive limit of 3 per day, 6 in possession with the same nonpelagic limit. In APAIA waters, the bag limit for all rockfish is 10 per day and 20 in possession. There are no size or annual limits established for either area.

There are no specific fishery management objectives such as GHLs or other harvest targets for rockfish in the KMA or APAIA currently, though CF has been developing a population assessment for KMA black rockfish and a collaborative effort is underway between SF and CF to account for total removals of black rockfish. Results from this will be used to prosecute black rockfish fisheries with sustainable removal rates. To date, however, because rockfish are generally long-lived and reproduce slowly, a conservative management approach has been applied in both the sport and commercial fisheries. In 2011, the BOF reduced the bag limit for KMA rockfish to the current areawide regulations in response to rapidly increasing sport harvests and recognition that rockfish can be particularly vulnerable to increasing harvest pressures. The goal of these regulations is to restrain growth in the fishery rather than reduce harvests; however, harvests continued to increase beyond what was seen in 2010 and previously (Figure 13). From 2011 to 2015, the harvest of KMA rockfish nearly doubled again and in response during the 2017 Kodiak area meeting, the BOF reduced the bag limit of rockfish to 3 per day, 6 in possession within Chiniak and Marmot bays and kept the nonpelagic limit the same areawide. Because these new regulations were implemented beginning in the 2017 season, only 1 year of harvest information is available and 1

or 2 more years of data are needed to see if the harvest stabilizes at 2017 levels or continues to increase.

In 2017, the SWHS-estimated KMA rockfish harvest of 23,448 was lower than any harvest since 2014 but was still relatively large compared to 2011 and previous levels (Table 21). In 2017, the Chiniak Bay harvest was 11,572, which was slightly above the 2016 harvest but still below peak harvests in 2014. APAIA rockfish harvests continue to be very small and the 2017 harvest was 339.

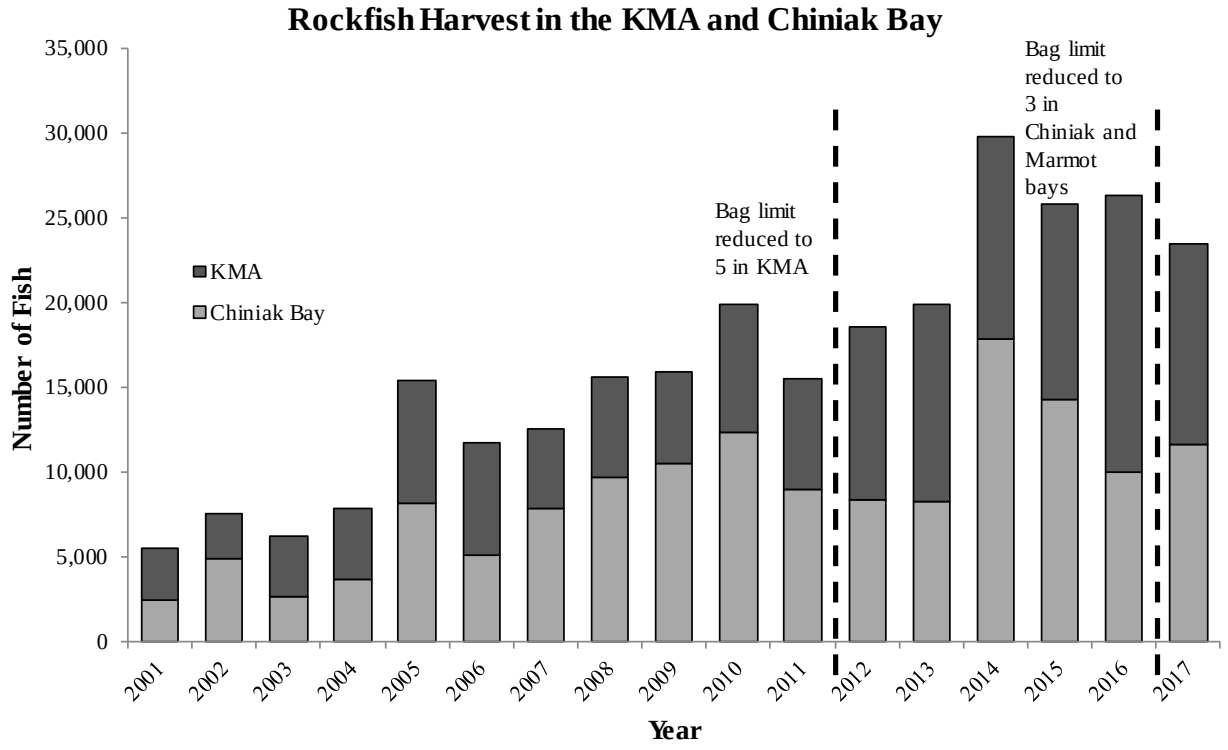


Figure 13.–Harvest of rockfish in the KMA and Chiniak Bay, 2001–2017.

Source: Statewide Harvest Survey (SWHS) estimates (Alaska Sport Fishing Survey database [Internet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish [accessed October 2018]. Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/).

The 2017 KMA guided angler harvest of rockfish was 12,356, which was below the 2008–2017 average (Table 22). Harvest by guided anglers continues to show an increasing trend despite SWHS estimates showing a varying harvest by all anglers in recent years. In Chiniak Bay, the 2017 guided harvest of rockfish was 2,423 fish. Guided harvests in Chiniak Bay have been generally similar across years, showing that harvests outside of Chiniak Bay are driving trends of increasing guided harvest in the KMA. Harvests of rockfish in Afognak Island waters generally show an increasing trend as well, and the 2017 harvest was 1,802 fish, which was below the recent average.

Harvest trends in Chiniak Bay waters indicate similar guided harvest levels across years, yet increasing total harvest shows that there is an increasing interest in rockfish by unguided anglers, particularly those in the communities of the KRZ. Guided angler harvests are increasing in the rest of the KMA and are generally driving overall harvest trends in the Remote Zone. Concerns over

the growth of the sport fishery stem partially from the limited information about fishery harvest rates relative to population sizes in KMA waters which is why SF and CF have the common goal of compiling total removals and comparing them to abundance estimates to determine current harvest rates (e.g., Polum and Worton 2018). Long-lived and slow-reproducing species such as rockfish can be prone to overharvest and it may take more than 30 years to replace age classes that are fished out. Rockfish are also highly aggressive and easy to catch and are prone to localized depletion and concerns stem from the overharvest observed currently in U.S. west coast rockfish populations. A conservative management approach is warranted with rockfish and future management actions will be based on harvest rates and estimates of abundance from current and ongoing rockfish research in the KMA.

OTHER GROUNDFISH

In addition to halibut and rockfish, the other groundfish species primarily targeted in the KMA and APAIA is lingcod. Although a portion of annual lingcod catches are taken incidentally by anglers targeting halibut, rockfish, and salmon, there is also some directed effort for lingcod.

Lingcod catches in KMA waters historically have remained much lower than those of other groundfish species. SWHS estimates average 3,647 fish harvested annually between 2008 and 2017, and 2,428 lingcod were harvested in 2017 (Table 23). SWHS estimates for the APAIA averaged 161 lingcod during the same time, and 0 lingcod were harvested in 2017. Recent harvest trends show a decrease in harvest in the KMA since 2014, and the 2017 harvest is about half of the 2014 harvest. Logbook harvests of lingcod averaged 1,974 fish from 2008 to 2017 and the 2017 harvest was 782 fish (Table 24). APAIA logbook harvests are confidential.

Other groundfish species such as pacific cod, kelp greenling, and Atka mackerel (*Pleurogrammus monopterygius*) are harvested in KMA and APAIA waters; however, harvests are very small and mostly unaccounted. There is increasing interest by anglers for other groundfish species besides rockfish and halibut, but it is unknown whether this will be a continued trend like rockfish, or if anglers will focus on traditional species as targets and harvest other species opportunistically.

Table 23.–SWHS estimates of lingcod harvest and catch in the KMA and APAIA, 2008–2017.

	Chiniak Bay		KMA		APAIA	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch
2008	1,748	2,516	3,518	6,201	147	455
2009	1,660	2,520	3,736	6,812	298	1,159
2010	2,408	3,766	3,966	6,274	47	95
2011	2,430	3,479	4,233	7,087	15	167
2012	1,519	2,246	3,969	6,118	149	235
2013	1,416	2,201	4,344	6,137	199	216
2014	2,252	2,663	4,434	6,600	588	893
2015	1,591	2,766	2,945	5,493	120	551
2016	981	1,365	2,896	4,116	42	557
2017	873	1,157	2,428	3,890	0	0
Average 2008–2017	1,688	2,468	3,647	5,873	161	433

Source: Statewide Harvest Survey (SWHS) estimates (Alaska Sport Fishing Survey database [Internet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish [accessed October 2018]. Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/).

Table 24.–Guided angler harvest and release of lingcod in the KMA, 2008–2017.

	Chiniak Bay		Afognak		Total KMA	
Year	Harvest	Release	Harvest	Release	Harvest	Release
2008	619	176	1,074	305	2,606	1,046
2009	366	131	897	318	2,031	758
2010	808	114	866	266	2,571	731
2011	604	32	726	152	2,327	544
2012	236	31	1,060	260	2,458	498
2013	334	22	687	181	2,256	597
2014	279	17	790	161	1,800	327
2015	271	19	387	51	1,437	476
2016	225	11	404	140	1,473	361
2017	132	15	247	97	782	238
Average 2008–2017	387	57	714	193	1,974	558

REFERENCES CITED

ADF&G (Alaska Department of Fish and Game). 2015. Division of Sport Fish Strategic Plan 2015-2019. Alaska Department of Fish and Game Division of Sport Fish. Available at http://www.adfg.alaska.gov/static/fishing/PDFs/sport/StrategicPlan2015Final.pdf:

Begich, R. N. 1997. Assessment of the 1995 return of Steelhead to the Karluk River, Alaska. Alaska Department of Fish and Game, Fishery Data Series No. 97-6., Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/fds97-06.pdf

Begich, R. N. 1999. Population ecology of adult steelhead trout (*Oncoryhnchus mykiss*) of the Karluk River, Alaska. Master's thesis, University of Idaho.

Fuerst, B. A. *In prep*. Kodiak Management Area weir descriptions and salmon escapement report, 2018. Alaska Department of Fish and Game, Fisheries Management Report, Anchorage.

Murray, J. B. 1987. Sport effort, harvest, and escapement of coho salmon (*Oncorhynchus kisutch*) in the Buskin River, Kodiak, Alaska, 1986. Alaska Department of Fish and Game, Fishery Data Series No. 3, Juneau. http://www.adfg.alaska.gov/FedAidPDFs/fds-003.pdf

Polum, T. B., M. J. Witteveen, and A. Reimer. 2017. Karluk River steelhead population assessment operational plan, 2017. Alaska Department of Fish and Game, Regional Operational Plan ROP.SF.2A.2017.05, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/ROP.SF.2A.2017.05.pdf

Polum, T. B., and C. Worton. 2018. Northeast District Kodiak rockfish sampling operational plan: collaborative Commercial and Sport Fisheries divisions project. Anchorage., Alaska Department of Fish and Game, Regional Operational Plan ROP.SF.2A.2018.18.

Schwarz, L., D. Tracy, and S. Schmidt. 2002. Area management report for the recreational fisheries of the Kodiak and Alaska Peninsula/Aleutian Islands regulatory areas, 1999 and 2000. Alaska Department of Fish and Game, Fishery Management Report No. 02-02, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/fmr02-02.pdf

Shedd, K. R., M. B. Foster, M. Wattum, T. Polum, M. Witteveen, M. Stratton, T. H. Dann, H. A. Hoyt, and C. Habicht. 2016. Genetic stock composition of the commercial and sport harvest of Chinook salmon in Westward Region, 2014–2016. Alaska Department of Fish and Game, Fishery Manuscript Series No. 16-11, Anchorage.

Stratton, M., and D. Evans. *In prep*. Stock assessment of Buskin River coho salmon, 2014–2017. Alaska Department of Fish and Game, Fishery Data Series, Anchorage.

Tracy, D. A., and T. Polum. 2015. Report on selected sport fisheries of the Kodiak Management Area, 2014. Alaska Department of Fish and Game, Fishery Management Report No. 15-48, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/FMR15-48.pdf

APPENDIX A: RECENT BOARD OF FISHERIES REGULATORY ACTIONS FOR THE KMA AND APAIA

2016 APAIA Board of Fisheries:

1) 5AAC 65.020—Bag limits, possession limits, annual limits, and size limits for Alaska Peninsula and Aleutian Islands Area; and 5 AAC 65.022—Special provisions for methods and means in the Alaska Peninsula and Aleutian Islands Area.

   The BOF established a single-hook, no-bait sport fishery for Chinook salmon in the Sandy River drainage with a bag and possession limit of 1 fish per day over 20 inches.

2) 5AAC 65.020—Bag limits, possession limits, annual limits, and size limits Alaska Peninsula and Aleutian Island Area.

   The BOF increased the freshwater possession limit for salmon, other than Chinook salmon, over 20 inches in length to 10 fish per day and established a bag and possession limit for salmon, other than Chinook salmon, under 20 inches in length of 10 fish.

3) 5AAC 65.051—Waters closed to sport fishing in the Alaska Peninsula and Aleutian Islands Area.

   The BOF amended the closed waters in Swanson lagoon to a seasonal closure from January 1 through July 31 and implemented a year-round closure for sport fishing for sockeye salmon.

4) 5AAC 65.020—Bag limits, possession limits, annual limits, and size limits Alaska Peninsula and Aleutian Island Area.

   The BOF reduced the possession limit for Illiuliuk Creek coho salmon from 4 to 2 to bring the limits in line with the remainder of Unalaska Bay.

2017 KMA Board of Fisheries:

1) 5AAC 64.022—Waters; seasons; bag, possession, annual, and size limits; and special provisions for the Kodiak Area.

   The BOF repealed existing closed waters in the KRZ that restricted sport fishing for salmon upstream of the Chiniak Highway in all drainages flowing into Chiniak Bay from 1 August through 15 September. The BOF established a new seasonal coho salmon bag limit in the KRZ that reduces the coho salmon bag limit to 1 per day, 1 in possession on 16 September through 31 December except for stocked coho salmon returns in Monashka Bay, Pillar and Monashka creeks, Mill Bay and Mission Beach.

2) 5AAC 64.022—Waters; seasons; bag, possession, annual, and size limits; and special provisions for the Kodiak Area.

   The BOF reduced the bag limit for rockfish to 3 per day, with 6 in possession in the waters of Chiniak and Marmot bays, with a non-pelagic limit of 2 per day 4 in possession and a yelloweye limit of 1 per day 2 in possession.

APPENDIX B: CURRENT FISHERY MANAGEMENT PLANS FOR THE KMA AND APAIA

5 AAC 64.060. *Kodiak Area Salt Water King*[6] *Salmon Sport Fishery Management Plan.*

(a) The purpose of the management plan under this section is to meet the Board of Fisheries' goal of stabilizing the sport harvest of king salmon in the salt waters of the Kodiak Area.

(b) In the Kodiak Area salt water king salmon sport fishery,

(1) the guideline harvest level is 11,000 king salmon;

(2) the sport harvest will be estimated annually by the department's statewide harvest survey;

(3) king salmon taken in Monashka Bay will not count towards the guideline harvest level established in (1) of this subsection;

(4) the bag and possession limit for king salmon is two fish, with no size limit;

(5) the annual limit and harvest record specified in 5 AAC 64.022 and 5 AAC 64.025 do not apply.

(c) If the guideline harvest level is exceeded, the board will consider restrictions that may be necessary to avoid exceeding the guideline harvest level at a regularly scheduled meeting for the Kodiak Area. If the board finds that restrictions are necessary, the board will adopt one or more of the following restrictions in the following order:

(1) reduce the nonresident bag and possession limit for king salmon in salt waters to one fish;

(2) prohibit a sport fishing guide from taking a king salmon while a client is present or is within the guide's control or responsibility;

(3) allow only king salmon 28 inches or greater in length to be retained;

(4) reduce the resident bag and possession limit for king salmon in salt waters to one fish.

[6] In the regulatory language, Chinook salmon are called "king" salmon and "the board" refers to the Alaska Board of Fisheries and "the department" refers to the Alaska Department of Fish and Game.

APPENDIX C: EMERGENCY ORDERS ISSUED IN 2016–2018 FOR KMA AND APAIA FISHERIES

Appendix C1.–KMA and APAIA emergency orders (EOs), 2016–2018.

2016 Emergency Orders:

1) EO 2-KS-4-9-16 restrict the Ayakulik River to retention of chinook salmon and prohibited the use of bait for all sport fishing in the Ayakulik Drainage, effective 1 June–25 July.
2) EO 2-KS-4-10-16 closed the Karluk River to retention of chinook salmon and prohibited the use of bait for all sport fishing in the Karluk Drainage below Karluk Lake, effective 1 June–25 July.
3) EO 2-KS-4-11-16 prohibited the filleting, mutilating, and deheading of chinook salmon at sea by marine boat anglers returning to Kodiak road system ports from 31 May to 31 August.
4) EO 2-KS-4-12-16 closed the Monashka Creek drainage and all saltwater's of Monashka Bay inside a line from Miller Point to Termination Point to sport fishing for chinook salmon. In Monashka Creek, only 1, unbaited single hook was to be used, effective 1 June–1 August.
5) EO 2-KS-4-32-16 opened fishing for chinook salmon in the Ayakulik River drainage but prohibits retention of chinook salmon and the use of bait for all sport fishing in the Ayakulik Drainage, effective 6 July–25 July.
6) EO 2-RS-4-16-16 increased the Afognak River drainage sockeye salmon daily bag limit from 5 to 10 fish, effective 4 June–31 December.
7) EO 2-RS-4-17-16 increased the Buskin River drainage sockeye salmon daily bag and possession limit from 2 to 5 fish, effective 9 June–31 December.
8) EO 2-RS-4-27-16 closed the Pasagshak River drainage to sport fishing for sockeye salmon, effective 2 July–31 December.
9) EO 2-RS-4-30-16 increased the bag and possession limit for sockeye salmon in the Saltery Creek drainage from 5 to 10 fish, effective 6 July–31 December.
10) EO 2-RS-4-34-16 reopened the Pasagshak River drainage to sport fishing for sockeye salmon, effective 2 July–31 December.
11) EO 2-SS-4-41-16 closed the Buskin River drainage to sport fishing for coho salmon, effective 16 September–31 December.

2017 Emergency Orders:

1) EO 2-KS-4-5-17 restrict the Ayakulik River to retention of chinook salmon and prohibited the use of bait for all sport fishing in the Ayakulik Drainage, effective 1 June–25 July.
2) EO 2-KS-4-6-17 closed the Karluk River to retention of chinook salmon and prohibited the use of bait for all sport fishing in the Karluk Drainage below Karluk Lake, effective 1 June–25 July.
3) EO 2-KS-4-7-17 closed the Monashka Creek drainage and all saltwater's of Monashka Bay inside a line from Miller Point to Termination Point to sport fishing for chinook salmon. In Monashka Creek, only 1, unbaited single hook was to be used, effective 1 June–1 August.
4) EO 2-KS-4-27-17 restrict the Chignik River to retention of chinook salmon and prohibited the use of bait for all sport fishing in the Chignik River drainage, effective 14 July.

-continued-

5) EO 2-KS-4-32-17 close the Chignik River to sport fishing for chinook salmon and prohibited the use of bait for all sport fishing in the Chignik River drainage, effective 23 July.
6) EO 2-RS-4-12-17 increased the Karluk River drainage sockeye salmon daily bag and possession limit from 5 to 10 fish, effective 7 June.
7) EO 2-RS-4-13-17 increased the Buskin River drainage sockeye salmon daily bag and possession limit from 2 to 5 fish, effective 7 June.
8) EO 2-RS-4-31-17 increased the bag limit for sockeye salmon in the Saltery Creek drainage from 5 to 10 fish, effective 19 July.

2018 Emergency Orders:

1) EO 2-KS-4-6-18 restrict the Ayakulik River to retention of chinook salmon and prohibited the use of bait for all sport fishing in the Ayakulik Drainage, effective 1 June–25 July.
2) EO 2-KS-4-7-18 closed the Karluk River to retention of chinook salmon and prohibited the use of bait for all sport fishing in the Karluk Drainage below Karluk Lake, effective 1 June–25 July.
3) EO 2-KS-4-8-18 closed the Monashka Creek drainage and all saltwaters of Monashka Bay inside a line from Miller Point to Termination Point to sport fishing for chinook salmon. In Monashka Creek, only 1, unbaited single hook was to be used, effective 1 June–1 August.
4) EO 2-KS-4-33-18 close the Chignik River to sport fishing for chinook salmon and prohibited the use of bait for all sport fishing in the Chignik River drainage, effective 13 July.
5) EO 2-RS-4-17-18 closed the Afognak River drainage to sport fishing for sockeye salmon, effective 16 June.
6) EO 2-RS-4-16-18 closed the Buskin River drainage to sport fishing for sockeye salmon, effective 16 June.
7) EO 2-RS-4-34-18 closed the Pasagshak River drainage to sport fishing for sockeye salmon, effective 12 July.
8) EO 2-RS-4-35-18 reduced the sockeye salmon bag limit in the Saltery River drainage to 2 fish, 2 in possession, effective 12 July.
9) EO 2-RS-4-47-18 increased the bag limit for sockeye salmon in the Saltery Creek drainage from 2 to 5 fish, effective 31 July.
10) EO 2-SS-4-59-18 increased the bag limit for coho salmon in the Pasagshak River drainage from 1 to 2 fish, effective 22 September.

APPENDIX D: 2008–2018 KMA AND APAIA DAILY WEIR COUNTS

Appendix D1.–Karluk River Chinook salmon cumulative weir counts, 2008–2018.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
21 May	0	0	0	0	0	0	0	0	0	–	3
22 May	0	0	0	0	0	0	0	0	0	–	3
23 May	0	0	0	1	0	0	0	0	0	–	3
24 May	0	0	0	1	0	8	0	0	1	2	4
25 May	1	0	0	4	0	30	0	0	7	2	5
26 May	2	3	5	7	0	55	5	0	12	12	10
27 May	2	4	6	9	8	60	6	1	17	13	11
28 May	2	5	12	30	15	60	7	9	23	41	13
29 May	2	6	20	34	15	66	23	11	37	63	14
30 May	2	9	23	52	24	72	25	14	51	73	17
31 May	8	13	25	57	29	118	41	20	80	92	22
1 Jun	10	22	44	84	30	129	50	37	82	102	24
2 Jun	10	23	55	139	49	207	61	58	93	122	26
3 Jun	10	33	88	156	98	210	66	92	131	126	27
4 Jun	10	45	135	172	106	305	87	115	134	143	32
5 Jun	13	52	150	211	120	463	106	127	200	166	45
6 Jun	14	58	196	243	163	521	113	132	315	191	51
7 Jun	14	113	246	298	164	588	121	155	464	209	170
8 Jun	29	134	264	311	198	604	131	174	484	260	250
9 Jun	38	174	302	328	220	632	142	248	518	289	329
10 Jun	42	192	337	351	285	689	160	281	542	356	374
11 Jun	53	250	392	411	304	764	170	299	564	383	517
12 Jun	63	318	424	517	370	798	195	388	752	436	683
13 Jun	68	377	526	658	627	867	212	480	857	461	725
14 Jun	94	415	535	737	936	974	223	592	878	530	902
15 Jun	126	423	592	873	1,136	1,031	237	773	944	572	955
16 Jun	134	436	612	1,015	1,163	1,059	244	888	1,057	606	1,000
17 Jun	144	442	745	1,134	1,369	1,101	256	994	1,287	668	1,048
18 Jun	203	474	806	1,214	1,492	1,128	297	1,013	1,523	766	1,190
19 Jun	245	494	1,069	1,414	1,632	1,264	349	1,054	1,634	841	1,219
20 Jun	288	535	1,296	1,646	1,815	1,332	449	1,254	1,705	900	1,262
21 Jun	320	600	1,570	1,698	1,969	1,350	626	1,279	1,749	970	1,323
22 Jun	320	637	1,637	1,825	2,163	1,356	651	1,393	1,913	1,110	1,472
23 Jun	343	657	1,714	1,859	2,318	1,439	767	1,487	1,985	1,398	1,601
24 Jun	364	703	1,794	1,964	2,440	1,475	786	1,626	2,136	1,441	1,669
25 Jun	394	727	1,949	2,164	2,505	1,495	808	1,670	2,190	1,520	1,749
26 Jun	411	786	1,990	2,248	2,579	1,522	841	1,743	2,338	1,578	1,854
27 Jun	453	795	2,072	2,329	2,629	1,530	865	1,845	2,438	1,607	1,903
28 Jun	453	833	2,088	2,397	2,700	1,558	874	1,997	2,476	1,656	2,008
29 Jun	475	852	2,134	2,530	2,722	1,594	904	2,056	2,528	1,742	2,066
30 Jun	520	855	2,221	2,670	2,753	1,598	919	2,169	2,565	1,779	2,196

-continued-

Appendix D1.–Page 2 of 3.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1 Jul	526	946	2,230	2,734	2,891	1,629	930	2,207	2,602	1,813	2,260
2 Jul	530	990	2,363	2,849	2,894	1,629	955	2,238	2,782	1,890	2,295
3 Jul	548	994	2,442	2,931	2,935	1,648	963	2,360	2,806	1,930	2,385
4 Jul	553	994	2,472	3,003	2,953	1,668	973	2,421	2,874	1,967	2,433
5 Jul	562	1,011	2,531	3,062	2,988	1,675	1,005	2,464	2,941	2,001	2,477
6 Jul	570	1,014	2,545	3,114	3,020	1,686	1,021	2,475	2,975	2,107	2,492
7 Jul	573	1,023	2,571	3,140	3,057	1,718	1,040	2,525	3,026	2,126	2,523
8 Jul	575	1,025	2,635	3,156	3,075	1,721	1,044	2,538	3,039	2,166	2,540
9 Jul	579	1,028	2,647	3,175	3,082	1,725	1,052	2,559	3,073	2,180	2,566
10 Jul	582	1,028	2,665	3,186	3,089	1,725	1,076	2,569	3,121	2,258	2,606
11 Jul	582	1,040	2,671	3,198	3,089	1,726	1,084	2,574	3,148	2,303	2,648
12 Jul	585	1,071	2,678	3,225	3,099	1,731	1,098	2,580	3,168	2,315	2,685
13 Jul	585	1,071	2,700	3,248	3,105	1,735	1,133	2,593	3,180	2,332	2,796
14 Jul	586	1,071	2,708	3,272	3,116	1,735	1,138	2,608	3,200	2,354	2,803
15 Jul	586	1,071	2,724	3,277	3,122	1,736	1,149	2,620	3,211	2,373	2,853
16 Jul	586	1,072	2,730	3,288	3,124	1,743	1,157	2,664	3,214	2,383	2,868
17 Jul	588	1,073	2,743	3,298	3,126	1,745	1,158	2,674	3,226	2,388	2,884
18 Jul	588	1,073	2,744	3,306	3,128	1,748	1,158	2,678	3,292	2,398	2,894
19 Jul	590	1,075	2,751	3,314	3,131	1,748	1,159	2,687	3,307	2,400	2,905
20 Jul	594	1,086	2,757	3,324	3,134	1,750	1,162	2,689	3,316	2,404	2,925
21 Jul	598	1,086	2,763	3,327	3,138	1,750	1,162	2,697	3,317	2,419	2,939
22 Jul	598	1,087	2,763	3,330	3,139	1,750	1,163	2,698	3,326	2,420	2,959
23 Jul	599	1,088	2,763	3,333	3,140	1,754	1,167	2,703	3,342	2,424	2,962
24 Jul	602	1,088	2,765	3,334	3,145	1,754	1,168	2,704	3,351	2,440	2,980
25 Jul	683	1,088	2,769	3,335	3,147	1,756	1,168	2,706	3,353	2,456	2,990
26 Jul	686	1,090	2,791	3,338	3,148	1,759	1,169	2,712	3,358	2,462	2,993
27 Jul	686	1,098	2,793	3,341	3,153	1,761	1,174	2,718	3,360	2,491	2,995
28 Jul	688	1,098	2,796	3,343	3,159	1,762	1,174	2,720	3,361	2,494	2,997
29 Jul	690	1,098	2,815	3,346	3,160	1,766	1,176	2,724	3,364	2,504	3,006
30 Jul	691	1,098	2,831	3,359	3,166	1,767	1,176	2,726	3,366	2,528	3,024
31 Jul	692	1,100	2,841	3,365	3,167	1,767	1,177	2,733	3,371	2,530	3,061
1 Aug	699	1,100	2,851	3,367	3,167	1,769	1,177	2,737	3,373	2,532	3,066
2 Aug	704	1,100	2,851	3,378	3,172	1,772	1,177	2,742	3,377	2,535	3,067
3 Aug	705	1,101	2,853	3,384	3,174	1,772	1,177	2,745	3,378	2,542	3,070
4 Aug	706	1,104	2,856	3,385	3,177	1,772	1,177	2,751	3,384	2,546	3,080
5 Aug	707	1,110	2,870	3,385	3,181	1,772	1,178	2,753	3,385	2,548	3,088
6 Aug	728	1,110	2,875	3,385	3,183	1,787	1,178	2,757	3,391	2,552	3,091
7 Aug	728	1,112	2,877	3,389	3,184	1,788	1,178	2,761	3,395	2,561	3,093
8 Aug	733	1,112	2,877	3,390	3,185	1,789	1,178	2,761	3,396	2,567	3,094
9 Aug	734	1,113	2,893	3,390	3,186	1,795	1,178	2,765	3,396	2,577	3,096
10 Aug	734	1,122	2,896	3,392	3,187	1,796	1,179	2,765	3,396	2,577	3,098

-continued-

Appendix D1.–Page 3 of 3.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
11 Aug	734	1,126	2,899	3,398	3,187	1,797	1,179	2,765	3,396	2,577	3,101
12 Aug	734	1,129	2,901	3,399	3,187	1,800	1,179	2,767	3,396	2,578	3,133
13 Aug	734	1,145	2,902	3,399	3,187	1,803	1,180	2,768	3,396	2,578	3,146
14 Aug	734	1,146	2,904	3,402	3,187	1,804	1,180	2,768	3,398	2,579	3,148
15 Aug	735	1,163	2,906	3,403	3,187	1,805	1,181	2,768	3,398	2,579	3,148
16 Aug	735	1,165	2,908	3,404	3,188	1,805	1,181	2,768	3,401	2,580	3,148
17 Aug	736	1,166	2,911	3,407	3,189	1,805	1,181	2,772	3,409	2,585	3,149
18 Aug	736	1,167	2,911	3,408	3,189	1,809	1,181	2,777	3,411	2,585	3,149
19 Aug	736	1,167	2,912	3,411	3,189	1,811	1,181	2,777	3,411	2,586	3,150
20 Aug	739	1,183	2,912	3,413	3,191	1,815	1,182	2,777	3,411	2,587	3,150
21 Aug	740	1,195	2,913	3,413	3,191	1,817	1,182	2,777	3,413	2,587	3,152
22 Aug	740	1,197	2,913	3,413	3,191	1,820	1,182	2,777	3,416	2,587	3,152
23 Aug	740	1,222	2,913	3,414	3,196	1,820	1,182	2,777	3,418	2,591	3,152
24 Aug	741	1,226	2,914	3,414	3,197	1,820	1,182	2,777	3,419	2,592	3,152
25 Aug	742	1,253	2,916	3,420	3,197	1,820	1,182	2,777	3,421	2,595	3,153
26 Aug	743	1,262	2,916	3,420	3,197	1,820	1,182	2,777	3,424	2,596	3,153
27 Aug	743	1,268	2,916	3,420	3,197	1,820	1,182	2,777	3,430	2,597	3,153
28 Aug	745	1,269	2,916	3,420	3,197	1,820	1,182	2,777	3,430	2,597	3,154
29 Aug	745	1,294	2,916	3,420	3,197	1,820	1,182	2,777	3,430	2,597	3,154
30 Aug	745	1,299	2,916	3,420	3,197	1,820	1,182	2,777	3,430	2,597	3,154
31 Aug	745	1,299	2,916	3,420	3,197	1,820	1,182	2,777	3,431	2,598	3,154
1 Sep	745	1,299	2,916	3,420	3,197	1,823	1,182	2,777	3,431	2,598	3,154
2 Sep	745	1,301	2,916	3,420	3,197	1,824	1,182	2,777	3,433	2,599	3,154
3 Sep	746	1,302	2,916	3,420	3,197	1,824	1,182	2,777	3,433	2,599	3,155
4 Sep	746	1,306	2,916	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155
5 Sep	746	1,306	2,916	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155
6 Sep	746	1,306	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155
7 Sep	746	1,306	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155
8 Sep	746	1,306	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155
9 Sep	746	1,306	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155
10 Sep	746	1,306	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155
11 Sep	748	1,307	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155
Final	752	1,308	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

Appendix D2.–Ayakulik River Chinook salmon cumulative weir counts, 2008–2018.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
20 May	0	0	0	0	0	0	0	0	0	0	-
21 May	0	0	0	0	0	0	0	0	0	0	-
22 May	0	0	0	0	2	0	0	0	0	3	-
23 May	0	1	2	0	5	0	0	0	0	3	-
24 May	0	1	3	0	19	0	0	0	0	3	-
25 May	0	2	3	3	19	0	1	4	11	3	-
26 May	0	3	3	17	32	1	4	4	48	3	-
27 May	0	3	20	27	33	8	4	8	72	3	1
28 May	0	3	20	34	33	15	13	14	181	3	4
29 May	0	7	26	44	42	22	21	27	256	3	4
30 May	0	7	49	58	54	41	28	35	320	3	4
31 May	0	7	58	74	71	47	35	55	373	3	9
1 Jun	0	12	93	141	78	60	45	67	399	3	15
2 Jun	1	16	111	172	86	80	97	100	430	3	24
3 Jun	1	17	112	177	106	87	111	112	476	3	41
4 Jun	10	72	137	197	124	123	127	137	518	3	48
5 Jun	11	98	265	212	127	135	167	152	532	74	100
6 Jun	16	130	338	232	156	198	179	184	597	158	115
7 Jun	16	176	368	282	168	361	179	216	639	198	188
8 Jun	17	176	392	317	179	363	184	228	681	310	257
9 Jun	31	284	514	392	224	476	196	252	799	765	343
10 Jun	36	370	668	432	302	488	203	252	955	801	412
11 Jun	88	391	773	463	331	562	212	252	1,059	843	472
12 Jun	98	478	804	563	392	644	214	283	1,251	901	537
13 Jun	122	629	836	980	527	699	238	405	1,367	935	605
14 Jun	209	645	866	1,158	755	774	254	469	1,454	1,021	636
15 Jun	216	763	904	1,231	812	892	277	560	1,542	1,277	716
16 Jun	411	863	934	1,310	957	897	320	638	1,740	1,382	738
17 Jun	481	871	960	1,420	1,038	1,078	350	646	1,904	1,450	814
18 Jun	499	941	1,110	1,496	1,161	1,110	365	702	1,938	1,525	879
19 Jun	547	1,029	1,452	1,687	1,371	1,275	370	743	2,201	1,899	998
20 Jun	920	1,065	1,721	1,893	1,423	1,339	426	795	2,408	2,071	1,047
21 Jun	1,084	1,127	1,763	2,127	1,679	1,354	449	820	2,523	2,144	1,148
22 Jun	1,216	1,133	2,183	2,314	1,961	1,363	476	930	2,649	2,245	1,288
23 Jun	1,248	1,266	2,451	2,389	1,978	1,455	510	1,064	2,710	2,479	1,396
24 Jun	1,495	1,364	2,555	2,529	2,077	1,573	551	1,211	2,901	2,575	1,524
25 Jun	1,495	1,430	2,886	2,618	2,135	1,718	592	1,289	3,094	2,622	1,629
26 Jun	1,588	1,484	3,169	2,885	2,158	1,806	612	1,479	3,325	2,732	1,654
27 Jun	1,653	1,558	3,285	2,942	2,420	1,821	618	1,664	3,513	2,785	1,681
28 Jun	1,888	1,631	3,436	3,060	2,673	1,829	636	1,699	3,661	2,864	1,731
29 Jun	2,128	1,788	3,663	3,107	2,969	1,897	660	1,699	3,713	3,142	1,743
30 Jun	2,232	1,861	4,006	3,254	3,275	1,900	692	1,708	3,832	3,193	1,838

-continued-

Appendix D2.–Page 2 of 3.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1 Jul	2,346	1,882	4,175	3,410	3,391	1,939	702	1,721	3,942	3,198	1,858
2 Jul	2,367	2,009	4,217	3,570	3,498	1,964	703	1,756	4,039	3,251	1,887
3 Jul	2,468	2,058	4,442	3,704	3,702	1,964	713	1,825	4,079	3,283	1,906
4 Jul	2,490	2,163	4,703	3,774	3,765	1,988	727	1,909	4,145	3,319	1,933
5 Jul	2,564	2,235	4,840	3,849	3,873	2,009	745	1,940	4,164	3,359	1,967
6 Jul	2,569	2,250	4,900	3,888	4,273	2,009	820	1,990	4,198	3,398	1,972
7 Jul	2,572	2,300	5,015	3,910	4,325	2,055	825	2,006	4,248	3,429	2,035
8 Jul	2,583	2,357	5,061	3,973	4,356	2,096	831	2,034	4,266	3,454	2,043
9 Jul	2,588	2,396	5,082	4,039	4,389	2,114	849	2,049	4,285	3,474	2,043
10 Jul	2,605	2,478	5,125	4,061	4,444	2,142	882	2,078	4,318	3,509	2,048
11 Jul	2,652	2,492	5,184	4,084	4,482	2,249	891	2,100	4,328	3,536	2,056
12 Jul	2,740	2,516	5,186	4,150	4,539	2,249	895	2,105	4,361	3,556	2,066
13 Jul	2,823	2,523	5,189	4,160	4,565	2,249	896	2,141	4,379	3,571	2,073
14 Jul	2,832	2,541	5,240	4,183	4,572	2,255	899	2,168	4,409	3,573	2,079
15 Jul	2,860	2,561	5,240	4,194	4,620	2,258	901	2,185	4,430	3,577	2,081
16 Jul	2,910	2,564	5,251	4,215	4,621	2,263	905	2,201	4,464	3,588	2,090
17 Jul	2,960	2,572	5,259	4,225	4,622	2,283	905	2,253	4,480	3,606	2,092
18 Jul	2,960	2,576	5,272	4,227	4,623	2,283	907	2,281	4,491	3,613	2,097
19 Jul	2,974	2,580	5,272	4,227	4,635	2,286	907	2,289	4,506	3,621	2,103
20 Jul	2,982	2,587	5,274	4,232	4,651	2,299	907	2,299	4,517	3,631	2,111
21 Jul	2,985	2,589	5,280	4,237	4,655	2,302	908	2,323	4,519	3,637	2,111
22 Jul	2,985	2,592	5,283	4,248	4,657	2,303	910	2,338	4,529	3,641	2,116
23 Jul	2,985	2,592	5,283	4,270	4,667	2,307	912	2,361	4,532	3,646	2,117
24 Jul	2,986	2,596	5,283	4,275	4,689	2,307	913	2,371	4,532	3,655	2,117
25 Jul	2,989	2,597	5,283	4,280	4,693	2,324	913	2,375	4,545	3,660	2,131
26 Jul	3,000	2,597	5,287	4,281	4,693	2,337	913	2,380	4,546	3,663	2,131
27 Jul	3,038	2,597	5,291	4,284	4,696	2,338	914	2,380	4,550	3,667	2,132
28 Jul	3,048	2,597	5,291	4,289	4,706	2,340	914	2,380	4,557	3,669	2,137
29 Jul	3,048	2,597	5,292	4,292	4,707	2,340	914	2,384	4,577	3,672	2,137
30 Jul	3,054	2,602	5,293	4,294	4,716	2,342	914	2,384	4,578	3,674	2,137
31 Jul	3,054	2,609	5,295	4,297	4,719	2,343	914	2,385	4,578	3,679	2,139
1 Aug	3,057	2,609	5,296	4,297	4,719	2,345	914	2,385	4,591	3,680	2,144
2 Aug	3,060	2,609	5,296	4,299	4,721	2,345	914	2,386	4,594	3,680	2,147
3 Aug	3,060	2,609	5,298	4,300	4,728	2,345	914	2,387	4,594	3,680	2,147
4 Aug	3,060	2,612	5,298	4,300	4,728	2,345	914	2,387	4,594	3,680	2,147
5 Aug	3,062	2,612	5,298	4,300	4,732	2,345	914	2,388	4,594	3,680	2,147
6 Aug	3,063	2,612	5,300	4,300	4,733	2,357	914	2,388	4,594	3,683	2,148
7 Aug	3,065	2,612	5,300	4,301	4,737	2,362	914	2,390	4,594	3,684	2,148
8 Aug	3,066	2,612	5,300	4,301	4,742	2,362	914	2,391	4,594	3,685	2,148
9 Aug	3,066	2,612	5,300	4,301	4,743	2,362	915	2,391	4,594	3,689	2,148
10 Aug	3,066	2,613	5,300	4,301	4,746	2,362	915	2,392	4,594	3,690	2,148

-continued-

Appendix D2.–Page 3 of 3.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
11 Aug	3,067	2,614	5,300	4,301	4,748	2,362	915	2,392	4,594	3,690	2,149
12 Aug	3,067	2,614	5,300	4,301	4,751	2,362	916	2,392	4,594	3,692	2,149
13 Aug	3,067	2,614	5,301	4,302	4,751	2,362	916	2,392	4,594	3,692	2,149
14 Aug	3,067	2,614	5,301	4,315	4,752	2,363	916	2,392	4,594	3,695	2,149
15 Aug	3,069	2,614	5,301	4,315	4,757	2,365	916	2,392	4,594	3,701	2,149
16 Aug	3,070	2,614	5,301	4,316	4,758	2,367	916	2,392	4,594	3,704	2,149
17 Aug	3,071	2,614	5,301	4,316	4,760	2,367	916	2,392	4,594	3,709	2,149
18 Aug	3,071	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,709	2,149
19 Aug	3,071	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,710	2,149
20 Aug	3,071	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,710	2,149
21 Aug	3,071	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,712	2,149
22 Aug	3,071	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,712	2,149
23 Aug	3,071	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,712	2,149
24 Aug	3,071	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,712	2,149
25 Aug	3,071	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,712	2,149
26 Aug	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
27 Aug	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
28 Aug	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
29 Aug	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
30 Aug	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
31 Aug	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
1 Sep	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3712	2149
2 Sep	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
3 Sep	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
4 Sep	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
5 Sep	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
6 Sep	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
7 Sep	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
8 Sep	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
9 Sep	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149
Final	3,071	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

Appendix D3.–Chignik River Chinook salmon cumulative weir counts, 2008–2018.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
8 Jun	0	0	0	0	0	0	0	0	0	6	0
9 Jun	0	0	0	0	0	0	0	0	0	6	6
10 Jun	0	0	0	0	0	0	0	0	0	6	12
11 Jun	0	0	0	0	0	0	0	0	0	6	18
12 Jun	0	0	0	0	0	0	0	0	0	6	18
13 Jun	0	0	0	0	0	0	0	0	0	6	18
14 Jun	0	0	0	0	0	0	0	0	0	6	18
15 Jun	0	0	0	0	0	0	0	0	0	6	18
16 Jun	0	0	0	6	0	12	12	24	12	6	18
17 Jun	0	0	6	6	0	12	36	42	12	6	18
18 Jun	0	0	6	18	0	12	42	60	18	6	18
19 Jun	6	18	6	18	0	12	60	60	18	6	18
20 Jun	6	18	6	18	0	18	66	78	18	6	18
21 Jun	6	18	18	18	0	24	72	84	30	6	18
22 Jun	6	18	24	24	6	30	90	84	66	6	18
23 Jun	6	18	30	31	12	36	103	84	90	6	48
24 Jun	6	18	30	43	12	36	127	96	108	6	66
25 Jun	18	18	30	43	12	36	165	114	144	12	78
26 Jun	18	42	31	61	18	60	195	126	186	12	79
27 Jun	18	48	31	85	18	60	267	146	198	36	97
28 Jun	18	48	55	115	18	84	291	212	228	55	109
29 Jun	24	48	61	115	18	90	339	212	276	67	121
30 Jun	30	72	61	139	30	90	405	260	306	85	127
1 Jul	30	84	73	181	48	90	465	284	372	127	127
2 Jul	36	120	157	248	55	120	561	326	450	157	139
3 Jul	66	162	205	302	68	120	633	375	498	199	157
4 Jul	108	180	247	350	86	133	723	400	576	235	163
5 Jul	114	237	319	398	94	171	875	505	636	277	170
6 Jul	144	253	355	494	118	195	1,067	621	750	303	176
7 Jul	162	345	463	650	156	219	1,199	759	855	306	184
8 Jul	180	387	499	729	181	243	1,283	831	933	309	202
9 Jul	228	429	595	738	211	263	1,435	904	1,017	327	215
10 Jul	241	543	799	813	241	299	1,554	952	1,095	352	229
11 Jul	265	597	895	885	298	347	1,722	1,000	1,143	394	261
12 Jul	308	706	1,225	990	352	413	1,789	1,144	1,198	430	315
13 Jul	353	713	1,399	1,259	478	503	1,879	1,216	1,246	478	345
14 Jul	384	755	1,537	1,393	532	546	1,934	1,294	1,300	538	358
15 Jul	482	773	1,735	1,621	634	612	1,970	1,338	1,348	587	418
16 Jul	560	779	1,759	1,669	652	649	1,994	1,380	1,390	629	466
17 Jul	709	827	1,841	1,771	736	709	2,114	1,410	1,438	653	509
18 Jul	829	863	1,944	1,867	838	727	2,190	1,417	1,450	672	545
19 Jul	927	989	2,002	1,951	911	781	2,312	1,448	1,504	678	605
20 Jul	1,019	1,055	2,170	2,071	929	835	2,397	1,460	1,516	702	641
21 Jul	1,110	1,157	2,404	2,150	969	854	2,475	1,467	1,536	732	653

-continued-

Appendix D3.–Page 2 of 2.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
22 Jul	1,146	1,229	2,609	2,216	1,017	890	2,493	1,473	1,560	769	659
23 Jul	1,172	1,259	2,687	2,276	1,053	927	2,552	1,534	1,578	799	672
24 Jul	1,220	1,283	2,759	2,366	1,065	957	2,609	1,576	1,608	823	678
25 Jul	1,251	1,301	2,933	2,390	1,113	987	2,628	1,601	1,626	847	690
26 Jul	1,288	1,331	3,065	2,420	1,133	1,005	2,630	1,661	1,632	901	708
27 Jul	1,343	1,337	3,141	2,456	1,151	1,035	2,672	1,685	1,650	931	721
28 Jul	1,391	1,367	3,207	2,475	1,200	1,053	2,686	1,740	1,668	931	739
29 Jul	1,423	1,385	3,243	2,487	1,236	1,065	2,716	1,758	1,668	937	757
30 Jul	1,461	1,403	3,328	2,505	1,261	1,101	2,722	1,764	1,698	949	763
31 Jul	1,486	1,403	3,358	2,535	1,261	1,119	2,735	1,788	1,716	973	775
1 Aug	1,498	1,409	3,382	2,553	1,273	1,155	2,742	1,814	1,740	985	781
2 Aug	1,504	1,421	3,406	2,595	1,309	1,162	2,755	1,844	1,752	1,009	782
3 Aug	1,516	1,457	3,412	2,613	1,309	1,162	2,761	1,856	1,752	1,009	788
4 Aug	1,540	1,488	3,442	2,619	1,321	1,174	2,777	1,886	1,777	1,009	788
5 Aug	1,564	1,506	3,454	2,625	1,333	1,174	2,791	1,904	1,777	1,015	794
6 Aug	1,572	1,518	3,454	2,625	1,346	1,180	2,791	1,929	1,783	1,027	794
7 Aug	1,578	1,529	3,479	2,631	1,352	1,180	2,799	1,941	1,795	1,027	794
8 Aug	1,584	1,547	3,497	2,636	1,364	1,186	2,799	1,971	1,795	1,045	794
9 Aug	1,590	1,571	3,515	2,641	1,376	1,192	2,808	1,983	1,795	1,045	794
10 Aug	1,596	1,571	3,533	2,642	1,382	1,216	2,820	2,007	1,801	1,051	806
11 Aug	1,603	1,571	3,539	2,649	1,394	1,223	2,838	2,019	1,825	1,057	818
12 Aug	1,609	1,577	3,539	2,673	1,400	1,223	2,844	2,019	1,831	1,069	825
13 Aug	1,628	1,577	3,539	2,673	1,400	1,223	2,850	2,024	1,837	1,069	825
14 Aug	1,629	1,577	3,551	2,685	1,412	1,229	2,862	2,024	1,837	1,081	825
15 Aug	1,629	1,577	3,569	2,685	1,412	1,235	2,881	2,030	1,843	1,093	825
16 Aug	1,629	1,578	3,581	2,697	1,418	1,235	2,881	2,036	1,843	1,111	825
17 Aug	1,636	1,584	3,599	2,703	1,424	1,235	2,887	2,042	1,843	1,111	825
18 Aug	1,666	1,596	3,623	2,703	1,424	1,235	2,887	2,054	1,843	1,117	825
19 Aug	1,678	1,602	3,629	2,703	1,424	1,241	2,887	2,054	1,843	1,118	825
20 Aug	1,694	1,614	3,629	2,709	1,424	1,247	2,887	2,054	1,843	1,130	825
21 Aug	1,700	1,620	3,629	2,716	1,430	1,247	2,887	2,054	1,843	1,130	825
22 Aug	1,706	1,620	3,629	2,716	1,430	1,247	2,887	2,054	1,843	1,130	825
23 Aug	1,718	1,620	3,629	2,716	1,443	1,247	2,887	2,054	1,843	1,130	825
24 Aug	1,718	1,626	3,647	2,716	1,449	1,247	2,889	2,054	1,843	1,130	825
25 Aug	1,724	1,626	3,649	2,716	1,449	1,247	2,889	2,054	1,843	1,131	825
26 Aug	1,730	1,644	3,661	2,716	1,449	1,247	2,889	2,054	1,843	1,137	825
27 Aug	1,730	1,662	3,661	2,716	1,449	1,247	2,895	2,054	1,843	1,137	825
28 Aug	1,730	1,668	3,661	2,716	1,449	1,247	2,895	2,054	1,843	1,137	825
29 Aug	1,730	1,674	3,661	2,716	1,449	1,247	2,895	2,054	1,843	1,137	825
30 Aug	1,730	1,674	3,679	2,716	1,449	1,247	2,895	2,054	1,843	1,137	825
31 Aug	1,730	1,680	3,679	2,716	1,449	1,247	2,895	2,054	1,843	1,137	825
1 Sep	1,730	1,680	3,679	2,722	1,449	1,247	2,895	2,054	1,843	1,137	825
Final	1,730	1,680	3,679	2,728	1,449	1,253	2,895	2,054	1,843	1,137	825

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018

Appendix D4.–Nelson River Chinook salmon cumulative weir counts, 2008–2018.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
16 Jun	37	22	6	190	0	106	603	186	237	52	19
17 Jun	46	43	9	230	0	138	780	204	237	60	19
18 Jun	51	93	48	270	0	155	932	241	264	72	19
19 Jun	143	165	131	300	0	204	1,618	246	265	76	20
20 Jun	304	227	154	307	1	254	1,654	281	265	84	20
21 Jun	445	288	172	360	9	271	1,729	292	290	159	43
22 Jun	541	354	180	406	10	322	1,777	330	291	227	82
23 Jun	625	375	204	431	17	417	1,794	339	291	248	183
24 Jun	715	549	277	511	25	440	1,829	365	292	275	199
25 Jun	748	588	289	552	31	456	1,867	366	369	302	253
26 Jun	843	640	338	571	45	476	1,876	395	387	416	369
27 Jun	973	653	398	627	85	533	1,934	396	389	429	373
28 Jun	1,025	677	517	656	98	620	1,974	455	525	435	680
29 Jun	1,084	704	578	947	115	681	1,997	628	556	436	782
30 Jun	1,195	713	604	1,005	123	762	2,039	668	559	442	1,135
1 Jul	1,306	735	611	1,087	146	831	2,075	779	575	454	2,275
2 Jul	1,464	751	612	1,146	170	851	2,102	850	609	521	2,645
3 Jul	1,562	768	622	1,202	211	872	2,120	945	612	710	3,660
4 Jul	1,625	812	625	1,222	243	929	2,162	1,189	622	744	4,076
5 Jul	1,681	937	638	1,248	344	943	2,216	1,679	634	766	4,275
6 Jul	1,768	957	685	1,257	447	1,032	2,235	1,811	1,009	815	4,308
7 Jul	1,983	957	695	1,279	513	1,082	2,253	1,911	1,038	824	4,349
8 Jul	2,099	958	696	1,293	541	1,123	2,260	1,993	1,087	828	4,400
9 Jul	2,196	975	739	1,299	576	1,184	2,269	2,023	1,203	869	4,541
10 Jul	2,246	978	751	1,344	599	1,197	2,280	2,086	1,254	891	4,555
11 Jul	2,266	987	763	1,346	607	1,202	2,291	2,090	1,442	902	4,563
12 Jul	2,292	1,009	779	1,354	610	1,203	2,334	2,095	1,556	925	4,598
13 Jul	2,307	1,018	791	1,354	627	1,208	2,350	2,145	1,760	941	4,608
14 Jul	2,585	1,019	806	1,354	629	1,208	2,370	2,206	1,931	981	4,728
15 Jul	2,649	1,020	870	1,359	635	1,208	2,394	2,226	2,119	1,003	4,829
16 Jul	3,001	1,024	889	1,359	645	1,216	2,449	2,265	2,164	1,030	4,850
17 Jul	3,032	1,025	894	1,367	742	1,220	2,496	2,275	2,245	1,172	4,890
18 Jul	3,072	1,036	897	1,369	815	1,221	2,517	2,312	2,305	1,202	4,894
19 Jul	3,528	1,048	901	1,380	874	1,221	2,622	2,372	2,433	1,204	4,929
20 Jul	4,022	1,089	905	1,380	903	1,221	2,822	2,409	2,708	1,286	4,937
21 Jul	4,286	1,089	914	1,381	949	1,221	2,851	2,421	2,971	1,312	4,972
22 Jul	4,350	1,106	921	1,390	986	1,221	2,899	2,425	3,440	1,368	5,009
23 Jul	4,430	1,113	1,112	1,403	992	1,221	2,901	2,437	3,550	1,415	5,022
24 Jul	4,434	1,113	1,704	1,404	992	1,221	2,901	2,440	3,735	1,479	5,022
25 Jul	4,484	1,218	2,252	1,404	992	1,221	2,901	2,440	4,039	1,494	5,022
26 Jul	4,609	1,248	2,370	1,404	992	1,221	2,901	2,440	4,618	1,502	5,022
27 Jul	4,612	1,248	2,406	1,404	992	1,221	2,901	2,440	4,618	1,502	5,022
28 Jul	4,612	1,248	2,500	1,404	992	1,221	2,901	2,440	4,618	1,502	5,022
29 Jul	4,612	1,248	2,547	1,404	992	1,221	2,901	2,440	4,618	1,502	5,022
30 Jul	4,612	1,248	2,569	1,404	992	1,221	2,901	2,440	4,618	1,502	5,022
31 Jul	4,612	1,248	2,569	1,404	992	1,221	2,901	2,440	4,618	1,502	5,022
Final [a]	5,012	2,048	2,769	1,704	1,092	1,421	3,801	2,890	4,618	1,807	5,022

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

[a] Includes post-weir aerial survey estimate of Chinook salmon spawning below the weir.

Appendix D5.–Buskin River coho salmon cumulative weir counts, 2008–2018.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1 Aug	1	0	0	0	0	0	0	0	0	0	0
2 Aug	1	0	0	0	0	0	0	0	0	0	1
3 Aug	2	2	0	0	0	3	0	0	0	0	1
4 Aug	3	6	0	0	0	7	0	0	0	0	5
5 Aug	8	8	0	0	0	9	0	0	2	0	9
6 Aug	8	8	0	0	0	10	0	0	3	0	26
7 Aug	8	17	0	0	0	10	0	0	10	0	49
8 Aug	16	27	5	0	0	10	0	0	12	0	52
9 Aug	26	33	20	0	0	18	3	0	12	0	59
10 Aug	34	35	31	0	0	38	3	0	16	0	82
11 Aug	50	52	40	0	3	54	4	0	16	0	96
12 Aug	85	70	44	0	17	59	6	70	18	0	106
13 Aug	103	81	49	0	50	75	7	70	21	0	154
14 Aug	210	91	60	0	109	79	463	72	51	0	200
15 Aug	251	94	79	0	147	93	463	74	63	0	217
16 Aug	392	115	109	0	166	110	473	74	69	1	220
17 Aug	476	131	139	0	207	129	511	75	86	1	224
18 Aug	512	160	221	10	213	165	521	78	121	1	245
19 Aug	571	179	267	13	300	177	540	82	137	1	495
20 Aug	653	207	284	21	334	193	573	85	160	2	745
21 Aug	741	232	298	31	339	206	573	87	189	4	752
22 Aug	790	251	398	56	346	280	576	87	220	8	817
23 Aug	959	260	419	69	347	367	586	88	324	9	875
24 Aug	1,107	267	461	81	358	486	678	92	358	13	879
25 Aug	1,185	280	492	255	363	613	762	102	410	25	882
26 Aug	1,304	297	523	396	368	727	854	108	418	42	886
27 Aug	1,380	357	546	679	372	823	1,072	117	480	54	900
28 Aug	1,466	626	561	826	375	855	1,112	133	487	61	929
29 Aug	1,486	894	578	963	384	1,533	1,146	137	574	61	933
30 Aug	1,519	1,113	584	1,121	397	2,033	1,203	141	660	61	941
31 Aug	1,785	1,253	605	1,250	415	2,439	1,308	144	669	61	943
1 Sep	2,006	1,354	612	1,367	428	2,488	1,337	147	687	63	943
2 Sep	2,494	1,424	619	1,462	433	2,686	1,417	149	707	64	945
3 Sep	2,583	1,678	634	1,583	443	2,745	1,580	151	745	64	947
4 Sep	2,861	1,874	719	1,711	450	2,850	2,442	153	863	64	948
5 Sep	3,138	2,075	922	1,814	469	3,011	2,779	153	883	64	950
6 Sep	3,438	2,317	943	1,907	471	3,354	2,997	153	970	64	950
7 Sep	3,738	2,663	1,091	2,022	473	3,697	3,043	158	975	64	957
8 Sep	4,038	3,436	1,171	2,148	474	3,840	3,228	160	992	94	972
9 Sep	4,528	3,771	1,441	2,309	479	4,073	3,305	165	1,007	114	972
10 Sep	5,017	4,041	1,471	2,439	482	4,306	3,427	180	1,017	119	998

-continued-

Appendix D5.–Page 2 of 2.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
11 Sep	5,328	4,323	1,475	2,574	506	4,441	3,820	189	1,285	3,171	1,059
12 Sep	5,662	4,605	1,488	2,720	526	4,560	4,298	196	1,329	3,204	1,066
13 Sep	6,127	4,777	1,492	2,833	529	4,763	4,917	197	1,360	3,250	1,066
14 Sep	6,266	5,146	1,538	2,988	532	4,788	5,048	201	1,377	3,410	1,066
15 Sep	6,406	5,602	1,545	3,109	788	4,840	6,397	209	1,441	3,515	1,076
16 Sep	6,583	5,602	1,551	3,191	1,023	4,849	6,940	212	1,483	3,693	1,080
17 Sep	6,614	5,911	1,553	3,312	1,079	4,856	7,403	214	1,507	3,718	1,084
18 Sep	7,155	6,583	1,556	3,499	1,424	4,890	7,711	217	1,511	3,731	1,090
19 Sep	7,678	7,248	1,576	3,740	1,974	4,949	7,917	217	1,530	3,798	1,103
20 Sep	7,962	8,567	1,578	3,934	2,361	5,009	8,044	219	1,551	3,889	1,105
21 Sep	7,999	8,860	1,598	4,062	2,591	5,124	8,192	220	1,934	3,904	1,107
22 Sep	8,087	9,390	1,901	4,239	2,891	5,269	8,195	221	2,114	3,929	1,111
23 Sep	8,312	9,715	1,946	4,399	3,191	5,284	8,214	221	2,325	3,953	1,112
24 Sep	8,398	9,810	2,819	4,657	3,491	5,285	8,216	221	2,360	4,023	1,115
25 Sep	8,699	10,244	3,064	4,908	3,791	5,323	8,219	221	2,451	4,063	1,118
26 Sep	8,834	10,304	3,174	5,073	4,091	5,327	8,222	223	2,486	4,065	1,119
27 Sep	8,939	10,502	3,260	5,407	4,391	5,386	8,332	226	2,513	4,911	2,065
28 Sep	9,003	10,573	3,301	5,753	4,691	5,386	8,413	232	2,513	5,127	2,065
29 Sep	9,028	10,624	3,307	5,915	4,991	5,386	8,413	974	2,513	5,343	2,112
30 Sep	9,028	10,624	3,309	5,941	5,291	5,386	8,413	987	2,513	5,559	2,168
1 Oct	9,028	10,624	5,794	5,961	5,291	5,386	8,413	987	2,513	5,559	2,168
2 Oct	9,028	10,624	6,028	5,969	5,291	5,386	8,413	1,223	2,513	5,559	2,187
3 Oct	9,028	10,624	6,237	5,982	5,291	5,386	8,413	1,890	2,513	5,559	2,396
4 Oct	9,028	10,624	6,537	6,026	5,291	5,386	8,413	1,920	2,513	5,559	2,744
5 Oct	9,028	10,624	6,766	6,026	5,291	5,386	8,413	1,920	2,513	5,559	2,859
6 Oct	9,028	10,624	6,803	6,026	5,291	5,386	8,413	2,220	2,513	5,559	2,888
7 Oct	9,028	10,624	6,808	6,026	5,291	5,386	8,413	2,652	2,513	5,559	2,889
Final	9,028	10,624	6,808	6,026	5,291	5,386	8,413	4,341	2,513	5,559	4,523

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

Appendix D6.–Buskin River sockeye salmon cumulative weir counts, 2008–2018.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
17 May	0	0	0	0	0		0		0	0	0
18 May	0	0	0	0	0		0		0	0	0
19 May	0	0	0	0	0		10	0	0	0	0
20 May	0	0	0	0	0		46	0	12	1	0
21 May	0	0	0	0	0	1	48	4	125	1	0
22 May	0	2	0	0	0	1	51	43	130	1	0
23 May	0	2	0	0	0	2	53	116	144	1	1
24 May	0	2	0	0	7	2	191	117	144	1	1
25 May	0	2	0	0	80	89	206	117	144	434	1
26 May	0	2	0	0	225	89	208	117	146	563	1
27 May	0	2	0	0	311	116	374	117	224	996	1
28 May	0	2	0	40	313	179	554	141	770	1,047	1
29 May	0	102	288	323	336	251	628	357	776	1,119	1
30 May	0	116	309	495	337	425	1,061	424	944	1,329	1
31 May	0	116	332	677	402	676	1,202	720	1,162	2,044	1
1 Jun	4	116	383	835	544	844	1,422	816	1,316	2,624	4
2 Jun	4	116	650	960	870	1,004	1,455	924	1,811	2,698	4
3 Jun	4	183	662	1,161	870	1,325	1,637	1,045	2,236	2,791	4
4 Jun	13	183	946	1,313	983	1,612	1,738	1,047	2,557	2,945	4
5 Jun	13	428	974	1,479	1,014	1,827	1,877	1,272	2,785	3,257	24
6 Jun	79	431	976	1,541	1,179	2,050	2,565	1,322	3,091	3,507	24
7 Jun	81	444	1033	2,340	1,569	2,696	2,565	1,445	3,317	3,803	34
8 Jun	106	448	1337	2,840	1,780	3,382	3,464	1,618	4,067	4,594	34
9 Jun	231	458	1531	2,982	1,870	3,836	4,260	2,113	4,397	4,629	38
10 Jun	289	1,258	1809	3,360	2,027	4,057	4,637	2,194	4,671	5,318	42
11 Jun	467	1,268	1998	3,540	2,489	4,790	4,977	2,299	4,840	5,377	44
12 Jun	680	1,268	2129	3,895	2,592	5,379	5,930	2,387	4,874	5,377	44
13 Jun	764	1,324	2515	4,256	2,813	5,933	6,639	2,387	4,876	5,382	54
14 Jun	805	1,805	2769	4,522	2,923	6,663	6,813	2,450	4,876	5,430	162
15 Jun	964	1,835	3054	5,310	3,080	7,450	7,172	2,593	4,882	5,479	163
16 Jun	1,020	1,860	3,083	5,659	3,344	7,813	7,516	2,647	4,914	5,487	267
17 Jun	1,036	2,937	3,210	6,381	4,286	9,125	7,949	2,734	4,947	5,648	269
18 Jun	1,242	3,107	3,806	6,972	4,395	9,880	8,450	2,734	5,077	5,672	443
19 Jun	1,385	3,143	3,951	7,537	4,472	10,278	8,882	2,735	5,138	5,973	443
20 Jun	1,430	3,556	4,256	7,752	4,494	10,841	9,267	2,761	5,220	6,005	641
21 Jun	1,517	3,821	4,516	8,064	4,666	10,969	9,339	2,769	5,720	6,032	650
22 Jun	1,783	4,129	4,557	8,383	5,317	11,240	9,603	2,796	5,826	6,464	915
23 Jun	1,859	4,237	4,721	8,517	5,624	11,883	9,733	3,012	6,146	6,514	964
24 Jun	1,945	4,352	4,799	8,806	5,632	12,270	9,897	3,025	6,158	6,521	1,041
25 Jun	2,583	4,476	5,264	9,055	5,885	12,509	10,015	3,195	6,299	6,529	1,079

-continued-

Appendix D6.–Page 2 of 4.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
26 Jun	2,608	4,640	5,797	9,183	5,938	12,797	10,144	3,396	6,352	6,615	1,079
27 Jun	2,830	4,979	6,006	9,273	6,215	13,064	10,208	3,461	6,453	6,619	1,167
28 Jun	3,008	5,242	6,074	9,562	6,236	13,629	10,353	3,633	6,456	6,941	1,242
29 Jun	3,069	5,370	6,126	9,619	6,357	13,792	10,470	3,736	6,456	6,941	1,242
30 Jun	3,648	5,642	6,174	9,773	6,624	13,925	10,547	4,032	6,573	6,941	1,244
1 Jul	3,745	5,666	6,201	9,791	6,699	14,039	10,631	4,183	6,865	6,941	1,247
2 Jul	3,802	5,746	6,582	9,810	6,753	14,124	10,680	4,350	6,881	6,980	1,254
3 Jul	4,150	5,753	7,131	9,822	6,836	14,224	10,746	4,570	6,881	7,026	1,263
4 Jul	4,235	5,756	7,131	10,059	6,910	14,272	10,825	4,717	6,924	7,026	1,308
5 Jul	4,235	5807	7,140	10,085	6,933	14,289	10,956	5,133	7,236	7,026	1,377
6 Jul	4,244	5825	7,310	10,180	6,947	14,318	11,018	5,516	7,311	7,027	1,378
7 Jul	4,281	5903	7,387	10,221	6,992	14,404	11,185	5,550	7,377	7,075	1,384
8 Jul	4,302	6,255	7,762	10,270	7,169	14,475	12,151	5,560	7,407	7,100	1,388
9 Jul	4,401	6,297	8,370	10,328	7,224	14,546	12,195	5,579	8,053	7,103	1,408
10 Jul	4,402	6,313	8,437	10,460	7,225	14,978	12,242	5,795	8,056	7,115	1,451
11 Jul	4,403	6,375	8,503	10,477	7,622	15,070	12,276	5,888	8,090	7,139	1,523
12 Jul	4,587	6,376	8,583	10,530	7,690	15,089	12,294	5,911	8,113	7,140	1,524
13 Jul	4,658	6,385	8,625	10,539	7,700	15,113	12,310	5,922	8,147	7,153	1,528
14 Jul	4,658	6,435	8,643	10,771	7,709	15,145	12,388	5,990	8,475	7,176	1,657
15 Jul	4,664	6,527	9,196	10,774	7,713	15,256	12,416	6,195	8,521	7,176	1,761
16 Jul	4,680	6,887	9,197	10,779	7,717	15,264	12,698	6,599	8,620	7,179	1,775
17 Jul	4,770	6,889	9,197	10,780	7,729	15,281	12,743	6,621	8,684	7,179	1,792
18 Jul	4,777	6,910	9,261	10,782	7,784	15,295	12,795	6,622	9,204	7,184	1,842
19 Jul	4,777	6,911	9,327	10,782	7,801	15,301	12,810	6,950	9,272	7,186	1,864
20 Jul	4,777	6,921	9,396	10,783	7,859	15,307	13,078	6,986	9,279	7,186	1,868
21 Jul	4,785	7,007	9,409	10,786	7,867	15,320	13,101	7,125	9,281	7,186	1,944
22 Jul	4,787	7,060	9,416	10,851	7,877	15,322	13,106	7,519	9,296	7,188	2,017
23 Jul	4,787	7,067	9,428	10,856	7,900	15,341	13,111	7,522	9,357	7,205	2,466
24 Jul	4,990	7,068	9,428	10,865	7,906	15,345	13,118	7,522	9,383	7,205	2,709
25 Jul	5,043	7,289	9,430	10,871	7,911	15,363	13,120	7,528	9,389	7,208	2,709
26 Jul	5,044	7,395	9,608	10,872	7,917	15,387	13,124	7,560	9,417	7,208	2,751
27 Jul	5,045	7,399	9,617	10,878	7,947	15,390	13,145	7,572	9,505	7,208	2,760
28 Jul	5,050	7,421	9,617	10,887	7,990	15,392	13,148	7,774	9,522	7,208	2,760
29 Jul	5,412	7,461	9,617	10,914	7,991	15,413	13,149	7,791	9,579	7,208	2,845
30 Jul	5,441	7,480	9,638	10,915	8,033	15,440	13,196	7,808	9,826	7,210	2,921
31 Jul	5,466	7,502	9,650	10,915	8,049	15,448	13,198	7,814	10,351	7,210	2,946
1 Aug	5,486	7,516	9,652	10,916	8,049	15,530	13,200	7,835	10,369	7,210	2,950
2 Aug	5,503	7,516	9,653	10,933	8,049	15,587	13,201	7,841	10,369	7,210	2,993
3 Aug	5,521	7,519	9,656	10,935	8,057	15,691	13,419	7,885	10,371	7,210	3,243
4 Aug	5,538	7,572	9,656	10,935	8,077	15,732	13,425	8,174	10,378	7,211	3,259
5 Aug	5,562	7,579	9,661	10,965	8,195	15,746	13,438	8,208	10,452	7,211	3,280
6 Aug	5,570	7,584	9,665	10,965	8,199	15,789	13,447	8,215	10,611	7,211	4,150
7 Aug	5,578	7,596	9,666	10,965	8,199	15,789	13,450	8,288	10,632	7,212	4,165
8 Aug	5,589	7,615	9,680	10,965	8,200	15,789	13,466	8,303	10,635	7,212	4,170

-continued-

Appendix D6.–Page 3 of 4.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
9 Aug	5,592	7,635	9,680	10,965	8,207	15,809	13,647	8,375	10,635	7,212	4,178
10 Aug	5,608	7,637	9,682	10,985	8,208	15,833	13,698	8,394	10,646	7,212	4,179
11 Aug	5,639	7,643	9,682	10,987	8,211	15,837	13,710	8,413	10,646	7,212	4,185
12 Aug	5,660	7,644	9,682	10,987	8,240	15,844	13,720	8,423	10,653	7,212	4,201
13 Aug	5,661	7,647	9,683	10,988	8,242	15,848	13,730	8,448	10,655	7,213	4,228
14 Aug	5,858	7,658	9,698	10,993	8,414	15,851	13,739	8,458	10,765	7,213	4,252
15 Aug	5,862	7,659	9,709	10,993	8,452	15,858	13,749	8,465	10,775	7,213	4,270
16 Aug	5,875	7,663	9,710	10,994	8,453	15,859	13,751	8,470	10,789	7,213	4,272
17 Aug	5,878	7,668	9,720	10,995	8,453	15,893	13,753	8,512	10,926	7,213	4,273
18 Aug	5,882	7,674	9,739	11,024	8,454	15,936	13,754	8,526	10,961	7,213	4,274
19 Aug	5,882	7,683	9,751	11,251	8,455	15,947	13,761	8,536	11,010	7,213	4,274
20 Aug	5,882	7,689	9,755	11,254	8,455	15,955	13,763	8,550	11,024	7,213	4,274
21 Aug	5,883	7,693	9,761	11,263	8,460	15,957	13,764	8,553	11,044	7,213	4,275
22 Aug	5,883	7,700	9,761	11,274	8,460	15,962	13,772	8,554	11,053	7,213	4,278
23 Aug	5,886	7,701	9,764	11,290	8,464	15,972	13,776	8,556	11,062	7,213	4,278
24 Aug	5,887	7,703	9,766	11,292	8,465	15,998	13,791	8,559	11,068	7,213	4,278
25 Aug	5,889	7,706	9,766	11,369	8,465	16,001	13,801	8,560	11,069	7,214	4,278
26 Aug	5,889	7,708	9,769	11,561	8,465	16,003	13,813	8,563	11,075	7,214	4,278
27 Aug	5,890	7,716	9,769	11,684	8,466	16,013	13,817	8,578	11,085	7,214	4,278
28 Aug	5,890	7,716	9,771	11,795	8,466	16,013	13,838	8,584	11,099	7,214	4,278
29 Aug	5,890	7,728	9,771	11,801	8,466	16,023	13,842	8,586	11,125	7,214	4,278
30 Aug	5,890	7,731	9,771	11,806	8,466	16,024	13,845	8,587	11,130	7,214	4,279
31 Aug	5,892	7,731	9,772	11,816	8,467	16,024	13,845	8,588	11,137	7,214	4,279
1 Sep	5,894	7,731	9,772	11,823	8,467	16,049	13,850	8,593	11,137	7,216	4,279
2 Sep	5,894	7,731	9,774	11,904	8,467	16,050	13,852	8,595	11,144	7,216	4,279
3 Sep	5,898	7,732	9,775	11,950	8,467	16,064	13,853	8,599	11,157	7,216	4,279
4 Sep	5,898	7,733	9,779	11,955	8,467	16,071	13,864	8,604	11,180	7,216	4,279
5 Sep	5,898	7,734	9,780	11,973	8,469	16,077	13,882	8,608	11,187	7,216	4,279
6 Sep	5,898	7,734	9,780	11,973	8,470	16,142	13,886	8,612	11,206	7,216	4,279
7 Sep	5,898	7,736	9,780	11,973	8,470	16,160	13,887	8,613	11,206	7,216	4,280
8 Sep	5,898	7,739	9,780	11,975	8,471	16,168	13,887	8,618	11,209	7,217	4,281
9 Sep	5,898	7,743	9,780	11,979	8,471	16,175	13,900	8,621	11,229	7,217	4,281
10 Sep	5,898	7,743	9,781	11,979	8,472	16,178	13,905	8,624	11,235	7,217	4,281
11 Sep	5,898	7,745	9,781	11,980	8,474	16,179	13,905	8,626	11,236	7,217	4,281
12 Sep	5,898	7,747	9,781	11,982	8,478	16,179	13,947	8,627	11,238	7,218	4,281
13 Sep	5,898	7,747	9,783	11,982	8,479	16,180	13,961	8,628	11,241	7,218	4,281
14 Sep	5,898	7,747	9,785	11,982	8,479	16,180	13,961	8,631	11,243	7,218	4,281
15 Sep	5,898	7,748	9,787	11,982	8,481	16,180	13,967	8,641	11,249	7,218	4,281
16 Sep	5,898	7,749	9,787	11,982	8,486	16,180	13,969	8,647	11,256	7,218	4,281
17 Sep	5,898	7,750	9,787	11,982	8,490	16,180	13,972	8,654	11,256	7,218	4,281
18 Sep	5,898	7,751	9,788	11,982	8,500	16,183	13,972	8,658	11,256	7,218	4,281
19 Sep	5,898	7,751	9,788	11,982	8,521	16,186	13,974	8,660	11,259	7,218	4,283
20 Sep	5,898	7,753	9,788	11,982	8,528	16,186	13,974	8,669	11,260	7,221	4,283

-continued-

Appendix D6.–Page 4 of 4.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
21 Sep	5,898	7,753	9,788	11,982	8,530	16,186	13,974	8,671	11,561	7,221	4,283
22 Sep	5,898	7,754	9,788	11,982	8,558	16,187	13,976	8,671	11,569	7,221	4,283
23 Sep	5,898	7,754	9,788	11,982	8,561	16,187	13,976	8,676	11,577	7,221	4,283
24 Sep	5,899	7,754	9,788	11,982	8,564	16,187	13,976	8,676	11,580	7,221	4,283
25 Sep	5,899	7,755	9,788	11,982	8,565	16,187	13,976	8,676	11,583	7,222	4,283
26 Sep	5,900	7,756	9,788	11,982	8,565	16,187	13,976	8,682	11,583	7,222	4,283
27 Sep	5,900	7,757	9,788	11,982	8,565	16,189	13,976	8,689	11,583	7,222	4,284
28 Sep	5,900	7,757	9,788	11,982	8,565	16,189	13,976	8,692	11,584	7,222	4,284
29 Sep	5,900	7,757	9,788	11,982	8,565	16,189	13,976	8,693	11,584	7,222	4,284
30 Sep	5,900	7,757	9,788	11,982	8,565	16,189	13,976	8,697	11,584	7,222	4,284
Final	5,900	7,757	9,800	11,982	8,565	16,189	13,976	8,719	11,584	7,222	4,284

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

Appendix D7.–Saltery River sockeye salmon cumulative weir counts, 2008–2018.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
17 Jun	0	0	0	0	0	0	0	0	0	22	76
18 Jun	0	0	0	0	0	0	0	0	0	137	102
19 Jun	0	0	0	19	0	1,033	24	269	1,338	255	134
20 Jun	0	0	0	128	0	1,261	104	308	1,416	562	146
21 Jun	0	0	0	492	246	1,284	172	442	1,442	1,076	187
22 Jun	0	0	0	775	451	1,427	275	491	1,503	1,190	241
23 Jun	0	0	63	912	860	1,538	375	503	2,049	1,464	284
24 Jun	0	141	509	1,175	1,380	2,232	398	558	2,393	1,645	354
25 Jun	0	658	610	1,212	2,143	3,043	405	1,434	3,356	1,659	428
26 Jun	0	1,691	674	1,421	2,974	5,949	507	1,537	4,724	2,087	538
27 Jun	200	2,222	739	1,624	3,427	7,652	641	1,656	5,652	2,714	646
28 Jun	399	2,704	1212	2,103	4,024	8,889	760	1,732	6,022	2,797	711
29 Jun	589	2,950	1494	2,276	4,277	9,347	814	1,886	6,798	3,442	994
30 Jun	749	3,265	1546	2,426	4,466	10,773	993	1,968	8,500	3,737	1,071
1 Jul	3,473	3,413	1,586	2,520	4,847	11,807	1,002	2,118	11,015	4,200	1,290
2 Jul	8,711	3,744	1,607	3,404	5,198	12,292	1,082	2,472	11,552	6,049	1,295
3 Jul	9,354	4,230	1,673	4,184	5,695	12,915	1,225	2,494	12,040	7,788	1,322
4 Jul	9,921	4,384	2,693	4,492	6,020	13,596	1,279	2,870	12,537	8,234	1,382
5 Jul	10,638	4,744	2,770	6,146	6,283	14,651	1,944	3,283	13,101	8,690	1,389
6 Jul	10,906	5,204	3,651	7,318	6,345	14,964	3,009	5,691	13,898	9,752	1,394
7 Jul	11,194	6,796	3,933	7,715	6,895	15,422	4,182	7,049	14,350	9,999	1,567
8 Jul	11,654	8,371	4,033	7,869	7,241	15,940	4,877	7,380	14,947	10,191	1,704
9 Jul	12,970	9,653	4,855	8,036	7,414	17,253	5,734	7,734	15,671	10,556	1,938
10 Jul	13,820	10,847	5,799	8,208	7,432	17,876	6,251	8,179	16,341	10,816	2,025
11 Jul	14,440	11,217	6,236	8,430	7,950	18,281	6,735	8,320	17,125	11,189	2,272
12 Jul	15,754	11,623	6,489	9,417	8,287	19,333	7,088	8,894	18,018	11,334	2,617
13 Jul	19,080	12,210	7,009	9,961	9,397	20,229	7,730	10,170	19,362	12,307	3,146
14 Jul	20,990	13,077	8,083	12,371	10,058	21,366	8,597	11,233	20,049	13,217	3,465
15 Jul	21,770	14,032	8,815	13,554	10,665	21,794	11,169	11,946	20,339	14,231	4,616
16 Jul	22,592	14,266	9,584	13,771	11,529	22,461	12,819	13,682	21,492	15,477	5,909
17 Jul	23,684	14,711	10,574	14,027	12,086	23,068	14,188	15,228	22,948	15,713	6,582
18 Jul	24,371	15,433	11,562	14,385	12,675	24,227	16,948	16,320	24,616	16,531	7,256
19 Jul	24,917	16,590	13,034	14,756	13,023	25,853	17,342	18,068	25,957	17,901	8,816
20 Jul	26,972	17,824	14,535	14,982	14,743	26,380	18,424	19,472	28,871	19,114	9,371
21 Jul	27,913	20,978	14,702	15,408	16,160	26,927	18,599	22,058	31,163	19,775	10,024
22 Jul	28,403	21,233	15,250	16,557	17,121	27,733	19,004	24,016	34,333	21,364	10,731
23 Jul	29,350	21,663	15,990	17,542	17,561	28,132	21,048	25,120	35,511	22,933	11,290
24 Jul	31,960	24,096	16,834	18,149	17,985	29,354	22,335	25,835	39,793	23,663	12,195
25 Jul	34,628	27,757	16,905	19,499	19,246	30,078	22,987	26,322	42,098	26,334	12,890
26 Jul	34,883	29,507	17,234	20,625	19,376	31,352	23,354	28,478	43,629	28,004	13,351
27 Jul	35,262	30,357	17,565	21,855	20,450	32,086	24,129	30,423	45,356	29,071	14,223
28 Jul	36,934	32,099	19,874	23,445	21,304	32,456	24,281	31,706	47,346	30,769	14,512
29 Jul	39,110	34,439	20,901	23,781	21,595	32,826	25,342	33,652	51,517	31,339	15,048
30 Jul	40,030	35,915	23,219	25,361	22,360	33,271	25,824	34,657	52,588	32,970	15,259
31 Jul	40,831	37,543	23,247	26,640	22,687	33,470	26,470	35,164	55,632	33,947	16,413

-continued-

Appendix D7.–Page 2 of 2.

Date	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1 Aug	43,231	38,444	23,297	26,916	23,517	33,519	26,553	35,273	57,431	34,710	16,824
2 Aug	43,621	39,966	23,458	27,741	23,890	33,914	27,189	37,448	57,867	35,796	18,342
3 Aug	44,077	40,649	23,876	27,853	24,980	35,518	27,449	39,355	57,867	36,729	18,966
4 Aug	45,578	42,421	24,287	28,065	25,774	35,952	28,100	40,422	57,867	37,724	19,567
5 Aug	46,978	43,129	25,332	28,379	26,281	36,097	28,494	42,335	57,867	38,485	19,990
6 Aug	47,266	43,564	25,781	29,251	26,522	39,697	29,110	42,468	57,867	38,604	20,847
7 Aug	47,266	44,034	26,466	29,747	26,683	39,697	29,307	42,468	57,867	38,915	20,988
8 Aug	49,266	44,628	26,798	29,838	27,100	39,697	30,772	42,468	57,867	39,315	21,319
9 Aug	49,266	45,207	26,809	29,858	27,188	39,697	31,772	42,468	57,867	39,315	21,562
10 Aug	49,266	45,655	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,269
11 Aug	49,266	45,791	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,307
12 Aug	49,266	46,591	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,326
13 Aug	49,266	46,591	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,415
14 Aug	49,266	46,591	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,438
15 Aug	49,266	46,591	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,845
Final	49,266	46,591	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,845

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

Appendix D8.–Pasagshak River sockeye salmon cumulative weir counts, 2011–2018.

Date	2011	2012	2013	2014	2015	2016	2017	2018
17 Jun	152	44	401	17	0	2	0	6
18 Jun	159	48	450	49	35	57	0	6
19 Jun	159	144	467	49	37	115	0	6
20 Jun	159	144	467	93	54	125	0	6
21 Jun	172	198	485	93	63	129	0	6
22 Jun	177	297	485	93	71	179	0	6
23 Jun	219	297	1,042	93	72	191	50	6
24 Jun	219	302	1,829	124	74	191	50	6
25 Jun	220	428	2,485	135	74	209	50	27
26 Jun	228	450	3,007	135	75	209	58	27
27 Jun	230	643	3,378	140	75	212	236	84
28 Jun	1,615	693	3,380	141	75	212	449	84
29 Jun	2,171	703	3,989	164	341	373	457	134
30 Jun	2,402	714	4,149	165	436	440	457	149
1 Jul	2,481	788	4,214	165	580	1,004	472	168
2 Jul	2,828	788	4,236	172	610	1,428	480	221
3 Jul	2,947	789	4,245	260	610	1,628	666	221
4 Jul	3,130	860	4,288	268	618	1,703	666	221
5 Jul	3,295	874	4,293	268	619	1,794	826	221
6 Jul	3,305	1,337	4,299	268	619	1,794	885	221
7 Jul	3,352	1,581	4,303	268	619	1,804	906	221
8 Jul	3,394	1,597	4,971	268	619	2,314	1,270	221
9 Jul	3,999	1,620	5,129	280	619	2,443	1,343	221
10 Jul	4,441	1,640	5,170	299	629	2,718	1,354	252
11 Jul	4,495	1,981	5,364	299	629	3,084	1,453	328
12 Jul	6,219	2,019	5,403	350	679	3,084	1,870	344
13 Jul	6,464	2,022	5,487	361	680	3,084	2,108	428
14 Jul	6,908	2,022	5,519	410	680	3,085	2,304	479
15 Jul	7,267	2,062	5,520	463	682	3,211	2,435	642
16 Jul	7,392	2,172	6,350	468	682	3,211	2,531	671
17 Jul	7,712	2,207	6,721	548	682	3,352	2,634	830
18 Jul	8,159	2,612	7,069	626	730	3,352	2,835	830
19 Jul	8,223	2,965	7,179	678	731	3,383	3,239	830
20 Jul	8,323	3,061	7,308	766	731	4,047	3,770	830
21 Jul	8,339	3,064	7,792	766	731	4,244	4,363	830
22 Jul	8,339	3,064	8,014	820	731	4,244	4,744	856
23 Jul	8,384	3,065	8,140	924	731	4,244	5,071	980
24 Jul	8,423	3,231	9,093	933	840	4,566	5,347	1,039
25 Jul	8,575	3,332	9,367	979	840	4,596	5,645	1,042
26 Jul	8,889	3,338	9,778	982	840	4,798	5,705	1,047
27 Jul	9,026	3,456	9,899	998	840	4,837	5,802	1,106
28 Jul	9,915	3,467	10,002	998	1,009	4,938	6,563	1,192
29 Jul	10,144	3,476	10,138	1,185	1,013	5,336	6,987	1,206
30 Jul	11,150	3,891	10,280	1,185	1,013	5,368	7,290	1,260
31 Jul	11,153	3,987	10,283	1,201	1,103	5,373	7,581	1,292

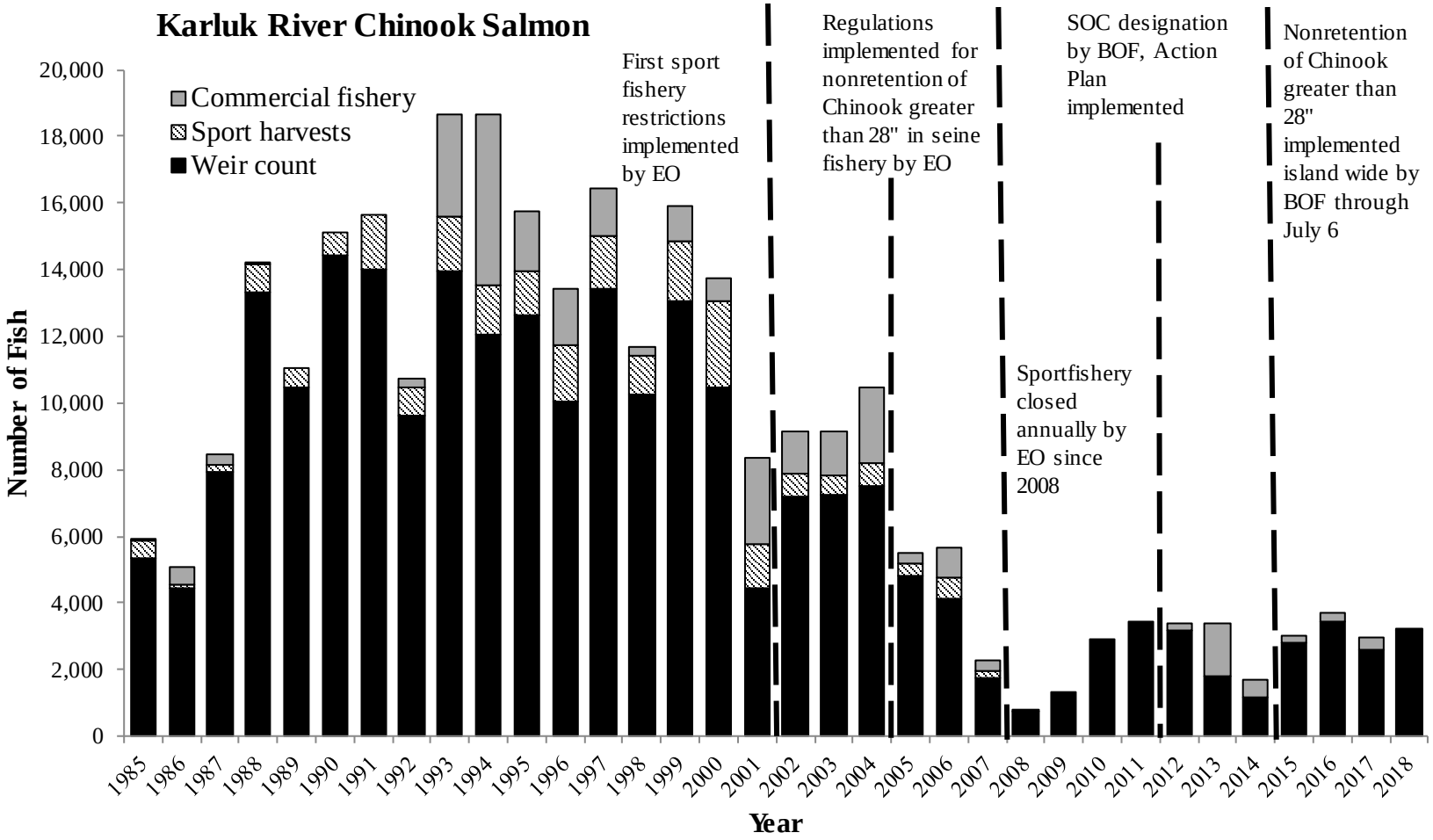
-continued-

Appendix D8.–Page 2 of 2.

Date	2011	2012	2013	2014	2015	2016	2017	2018
1 Aug	11,227	4,096	10,320	1,201	1,134	5,373	7,611	1,292
2 Aug	11,400	4,380	10,324	1,201	1,215	5,401	7,615	1,447
3 Aug	11,690	4,413	10,776	1,201	1,221	5,404	7,659	1,494
4 Aug	11,690	4,413	10,913	1,201	1,317	5,404	7,837	1,529
5 Aug	11,720	4,413	10,921	1,203	1,317	5,542	8,247	1,531
6 Aug	11,862	4,430	11,021	1,288	1,327	5,542	8,736	1,626
7 Aug	11,897	4,430	11,421	1,309	1,333	5,542	8,946	1,638
8 Aug	11,954	4,505	11,421	1,413	1,339	5,542	9,146	1,686
9 Aug	12,241	4,513	11,421	1,480	1,411	5,732	9,243	1,688
10 Aug	12,288	4,514	11,421	1,482	1,481	5,909	9,332	1,750
11 Aug	12,358	4,514	11,421	1,550	1,496	6,092	9,676	1,809
12 Aug	12,448	4,514	11,421	1,582	1,505	6,092	9,900	1,898
13 Aug	12,553	4,515	11,421	1,582	1,600	6,092	10,080	1,948
14 Aug	12,632	4,515	11,421	1,582	1,626	6,302	10,695	1,984
15 Aug	12,745	4,585	11,421	1,582	1,627	6,323	10,875	2,019
Final	13,402	4,585	11,421	1,582	2,077	7,053	11,021	2,019

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2018.

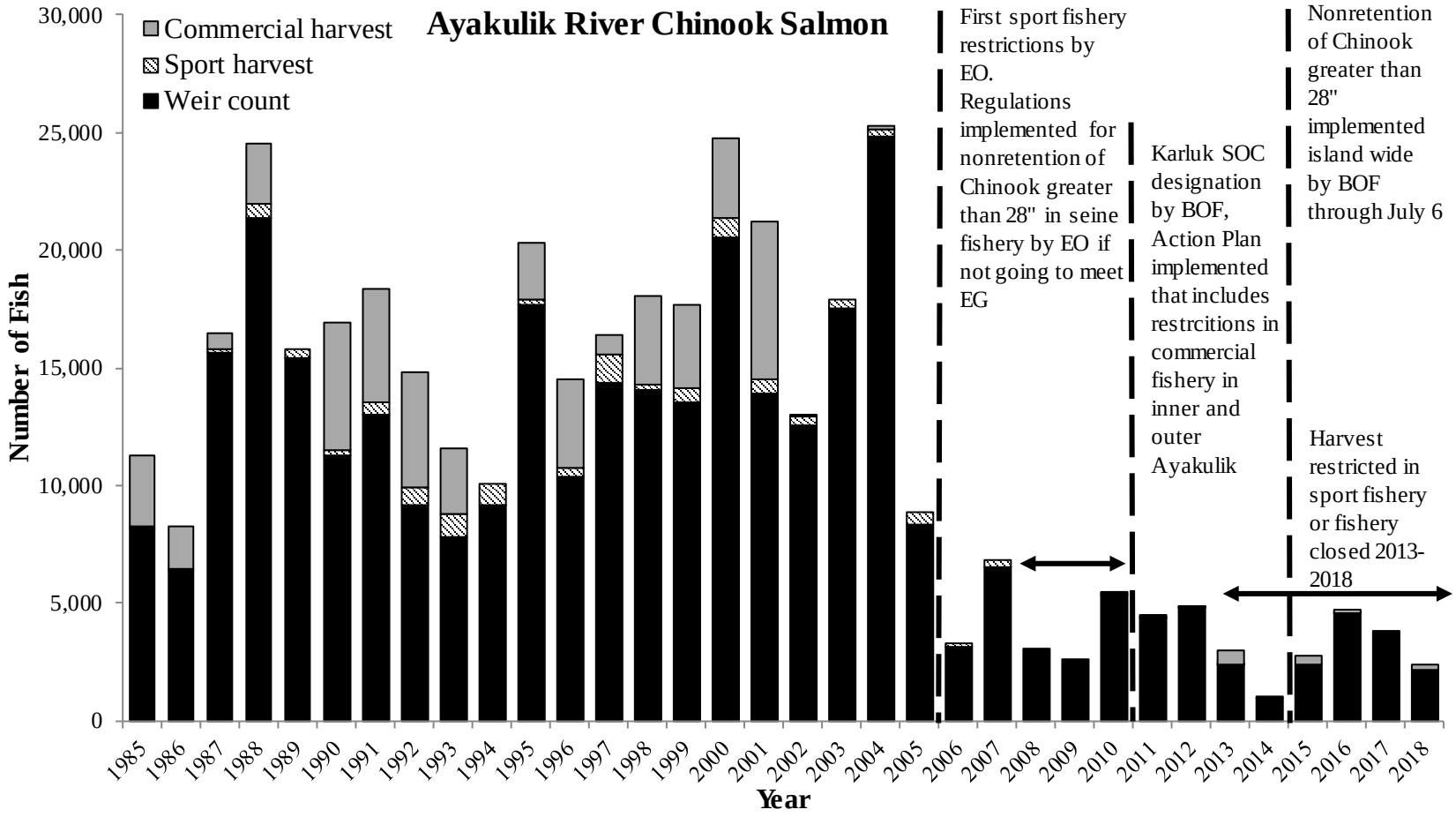
APPENDIX E: KARLUK AND AYAKULIK RIVERS CHINOOK SALMON WEIR COUNTS, SPORT AND COMMERCIAL HARVESTS, AND BOF REGULATORY ACTIONS, 1985–2018



Appendix E1.–Karluk River Chinook salmon weir counts and sport and commercial harvests, 1985–2018.

Source: Statewide Harvest Survey (SWHS) estimates from the Alaska Sport Fishing Survey database [Internet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 2018). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/; Schwarz et al. 2002; ADF&G Division of Commercial Fisheries, Kodiak 2018.

Note: Sport harvests represent total sport harvests. Commercial harvest from Inner and Outer Karluk sections through 15 July are assumed bound for the Karluk River.



Appendix E2.–Ayakulik River Chinook salmon weir counts and sport and commercial harvests, 1985–2018.

Source: Statewide Harvest Survey (SWHS) estimates from the Alaska Sport Fishing Survey database [Internet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 2018). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/; Schwarz et al. 2002; Freshwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed November 2018. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests.]); ADF&G Division of Commercial Fisheries, Kodiak 2018.

Note: Sport harvests represent total sport harvests, which are unavailable for 2018. Commercial harvest from Inner and Outer Ayakulik sections through July 15 are assumed to be bound for the Ayakulik River.

Appendix E3.–Actions taken by the BOF to address declining Chinook salmon runs to the Karluk River and the "stock of concern" designation.

5AAC 18.395. Retention of king[7] salmon taken in a commercial fishery. a) In the Inner Karluk, Outer Karluk, Inner Ayakulik, and Outer Ayakulik Sections, if the department determines that the king salmon runs will not meet seasonal escapement goals, the commissioner may, by emergency order, close the commercial salmon fishery and immediately reopen the commercial salmon fishery, during which king salmon 28 inches or greater in length may not be retained, and king salmon 28 inches or greater in length taken incidentally in the commercial salmon fishery must be returned to the water unharmed.

(b) Before July 30, if the department projects that the Karluk River biological escapement goal will not be met and the sport fishery is restricted in the Karluk watershed to the nonretention of king salmon or the sport fishery for king salmon is closed, the commissioner shall, by emergency order, close the commercial salmon seine fishery season in the waters south of a line from Cape Kuliuk at lat 57° 48.20′N, to the southern boundary of the Inner Ayakulik Section by the latitude of Low Cape, and immediately reopen a commercial salmon seine fishery season during which

(1) king salmon 28 inches or greater in length may not be retained; and

(2) king salmon 28 inches or greater in length taken incidentally must be returned to the water unharmed.

(c) In addition to the other provisions in this section, in the Kodiak Area, from June 1 through July 5, king salmon 28 inches or greater in length taken during the commercial salmon seine fishery may not be retained and must be immediately returned to the water. The provisions of this subsection do not apply after December 31, 2016.

5 AAC 28.450. Closed waters in Kodiak Area.

(e) The waters of Alaska in the Kodiak Area that are approximately three miles on either side of the mouth of the Karluk River bounded on the north by a line from lat 57°36.26′N, lon 154°23.73′W, to a point at the state waters boundary at lat 57°38.51′N, lon 154°27.92′W, and bounded on the south by a line from lat 57°32.34′N, lon 154°32.15′W, to a point at the state waters boundary at lat 57°34.84′N, lon 154°36.80′W are closed to fishing with trawl gear.

[7] In the regulatory language, Chinook salmon are called "king" salmon and "the board" refers to the Alaska Board of Fisheries and "the department" refers to the Alaska Department of Fish and Game.

APPENDIX F: ADF&G AND KRAA SPORTFISH ENHANCEMENT IN THE KRZ

Appendix F1.–KRZ anadromous waters stocking by species and location, 2008–2018.

Species and stage	Location	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Coho salmon fingerling												
	Dark L.	7,495	7,491	8,235	7,500	7,500	7,767	7,500	0	0	0	0
	Island L.	22,495	22,497	24,731	22,500	22,500	25,000	31,481	0	0	0	0
	Mayflower L.	6,469	6,836	7,150	6,500	6,500	6,488	6,500	0	0	0	0
	Mission L.	12,482	12,484	13,724	12,500	12,500	13,394	13,141	0	0	0	0
	Potatoe Patch L.	9,484	9,483	10,429	9,500	9,500	10,391	10,192	0	0	0	0
	Total	58,425	58,791	64,269	58,500	58,500	63,040	68,814	0	0	0	0
Coho salmon smolt												
	Island L.	0	0	0	0	0	0	0	0	30,056	50,137	0
	Mission	0	0	0	0		0	0	0	20,023	20,107	0
	Monashka Creek	0	0	0	45,216	34,765	28,020	0	0	99,582	75,021	46,132
	Pillar Creek	0	0	0	47,014	28,936	28,070	0	0	139,401	77,685	43,295
	Total	0	0	0	92,230	63,701	56,090	0	0	289,062	222,950	89,427
Chinook salmon smolt												
	Monashka Creek	68,100	79,000	82,000	39,000	39,279	51,207	70,000	73,272	0	0	0
	American River	40,000	51,000	80,000	10,000	39,740	50,072	70,000	75,272	0	26,561	26,561
	Olds River	40,000	52,000	80,000	10,000	39,300	40,000	70,000	75,044	0	45,015	45,015
	Salonie Creek	0	0	0	0	0	0	62,561	71,042	29,800	45,972	45,972
	Total	148,100	182,000	242,000	59,000	118,319	141,279	272,561	294,630	29,800	117,548	117,548

Source: ADF&G SF, Kodiak Area Office data archives.

Appendix F2.–KRZ lakes rainbow trout stocking by location, 2008–2018.

Location	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Abercrombie	4,810	5,051	4,656	5,142	4,972	6,162	2,550	7,059	8,403	4,000	3,756
Aurel L.	3,900	4,095	3,964	4,169	3,975	3,464	0	6,400	7,563	3,700	3,820
Big–Kings Diner L.	4,680	4,914	4,824	5,003	4,185	4,915	2,747	8,847	10,084	5,065	4,626
Bull L.	2,600	2,730	2,685	2,779	2,643	3,038	3,312	4,471	5,294	2,500	2,285
Caroline L.	1,820	1,911	1,854	1,946	1,865	2,154	2,647	3,700	4,286	2,200	2,253
Cicely L.	1,560	1,638	1,587	1,668	1,826	1,138	2,794	4,050	4,538	2,350	3,000
Dark L.	0	0	0	5,003	4,879	6,123	2,535	8,824	10,588	5,240	4,626
Dolgoi L.	5,200	4,055	5,287	0	0	0	0	0	0	0	0
Dragonfly L.	2,080	2,184	2,110	2,224	2,215	2,215	1,471	4,353	5,294	3,000	2,285
Heitman L.	4,932	4,455	4,952	4,586	4,457	5,000	5,005	6,824	7,983	0	3,754
Horseshoe L.	1,300	1,365	1,326	1,390	1,336	1,408	0	2,824	6,723	1,700	1,554
Island L.	0	0	0	5,559	5,378	6,538	2,559	8,941	10,588	4,900	4,626
Jack L.	1,300	1,365	1,319	0	0	0	0	0	0	0	0
Jupiter L.	3,702	4,860	3,923	0	0	0	0	0	0	0	0
Lee L.	3,640	3,822	3,700	3,891	3,668	3,250	0	5,950	6,723	4,200	3,573
Lilly Pad L.	1,430	2,184	2,055	2,224	2,102	2,692	3,369	4,176	4,874	2,420	2,212
Long L.	4,680	3,658	3,556	6,580	4,220	4,398	4,371	7,100	8,403	3,876	3,946
Long Lagoon L.	0	0	0	0	2,451	3,571	4,731	0	0	0	0
Mosquito L.	0	0	0	3,335	1,576	1,490	2,191	2,800	1,681	0	0
Saturn L.	3,005	3,240	2,523	0	0	0	0	0	0	0	0
Tanignak L.	5,200	4,055	5,283	7,420	6,882	4,872	4,457	7,200	8,403	3,111	3,946
Twin L.	5,200	5,460	5,447	5,559	5,547	5,363	5,562	8,388	10,756	2,500	4,736
Total	61,039	61,042	61,051	68,478	64,177	67,791	50,301	101,907	122,184	50,762	54,998

Source: ADF&G SF, Kodiak Area Office data archives.

.