

Fishery Management Report No. 19-27

**Report on Selected Sport Fisheries of the Kodiak
Management Area, 2009–2018**

by

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December 2019

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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

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MANAGEMENT AREA, 2009–2018**

by
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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 2009 through 2018, a summary of 2018 fisheries, a review of current management strategies, and recent fisheries performance. Escapement information is presented through 2019 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, *Oncorhynchus kisutch*, sockeye salmon, *Onchorhynchus nerka*, steelhead, rainbow trout, *Oncorhynchus 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 (KMA¹) 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 sport fisheries throughout both areas. Estimates of harvest for most fisheries are presented through 2018 (2019 estimates are unavailable at this time) and estimates of escapement in all salmon fisheries are presented through 2018. Weir and survey counts for salmon through 2019 are included to give the most recent information available. Many estimates of escapement for 2019 rely on harvest estimates so these will be presented in future reports, but those that do not rely on harvest estimates are presented through 2019. Fisheries occurring in 2019 are only discussed when complete information is available.

The guiding document for SF continues to be the Strategic Plan², which highlights key issues currently facing SF and acts as a guide for division leaders and managers in decision-making. 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 the Kodiak and Afognak Island groups. It is 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 (Figure 3). The Remote Zone

¹ The acronym KMA (Kodiak Management Area) is the terminology used for the commercial fishing management area and will be used here for consistency, but for the sport fisheries in regulation, the area is called just the Kodiak Area.

² 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>.

encompasses all other fresh waters and adjacent salt waters of the Kodiak and Afognak island groups.

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, as well as 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 the Southcentral Region and are based in the Kodiak Area Office. During the report years 2009–2019, 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 1.–Map of the Kodiak Management Area (KMA) and Alaska Peninsula–Aleutian Islands Area (APAIA).

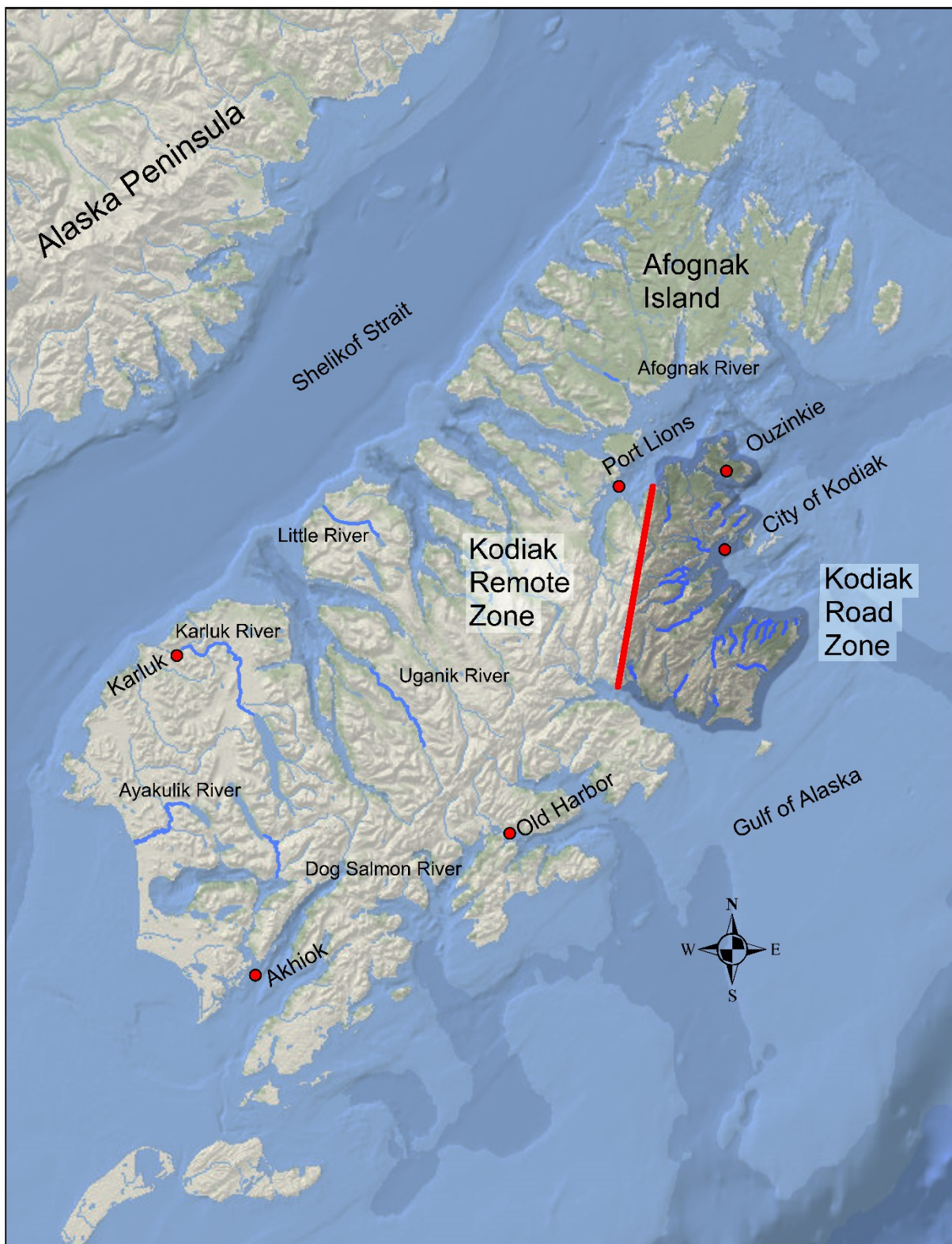


Figure 2.—Map of the Kodiak Management Area (KMA) including the Kodiak Road Zone (KRZ) and the Remote Zone.

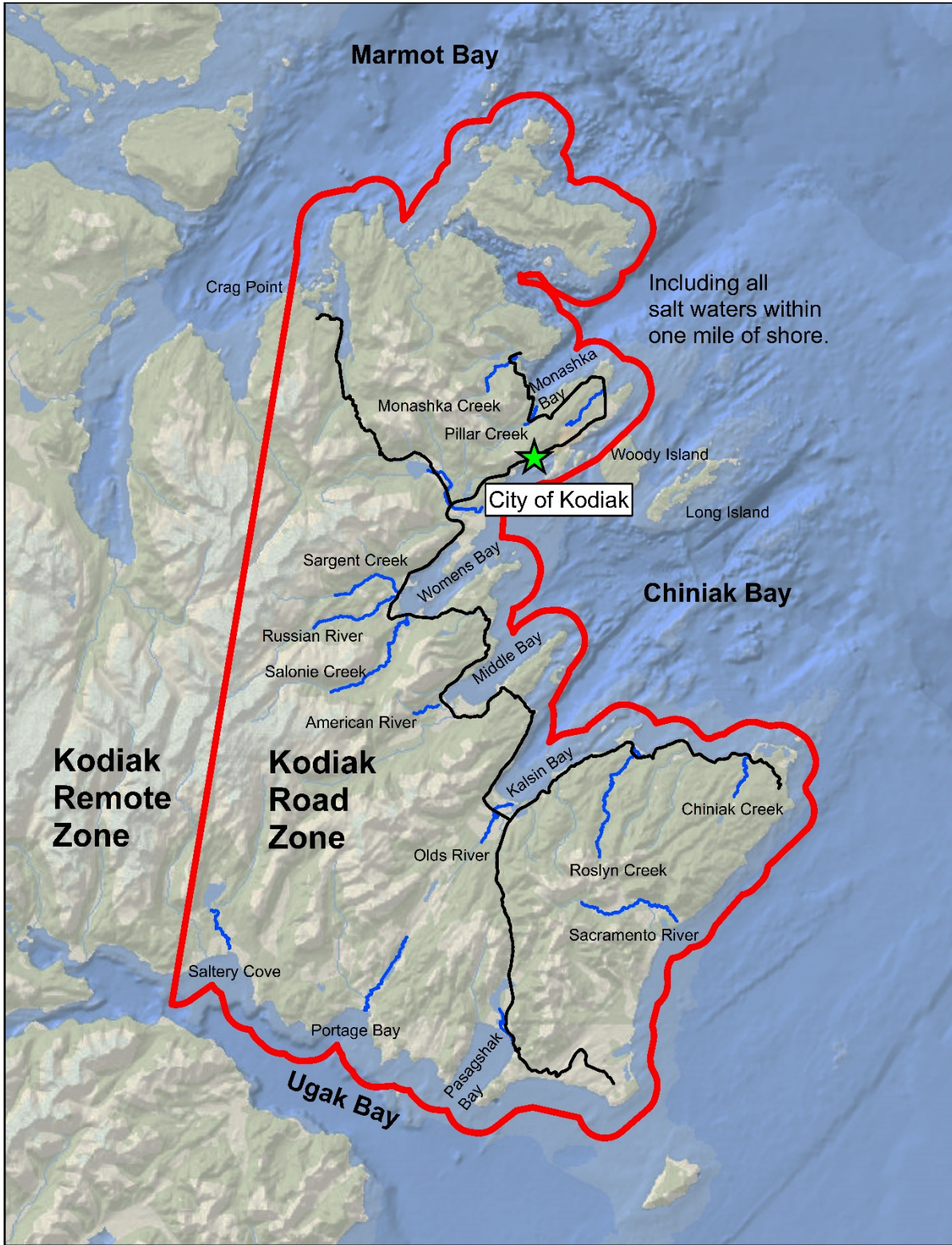


Figure 3.—Map of the Kodiak Road Zone (KRZ).

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 were addressed in February 2019. The next regularly scheduled BOF meeting for KMA sportfishing issues is in early 2020, and the next meeting for the APAIA is scheduled for 2022. Summaries of recent BOF regulatory actions are provided in Appendix A1.

MANAGEMENT PLANS

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 recipients³. 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 SWHS is designed to provide estimates of effort, harvest, and catch by fishing location, and although harvest and catch are available by species, the SWHS does not estimate effort by species. Harvest, catch, and effort are also reported by guided anglers in logbooks administered through the ADF&G Logbook Program and this source 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 only for saltwater fisheries due to the discontinuation of freshwater logbook reporting in 2018. Logbook information

³ 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/>

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 will not be presented to assure confidentiality.

The extent of the KMA is identical to reporting area Q in the SWHS. The APAIA is 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 2018, KMA anglers accounted for 76,209 angler-days of effort and APAIA anglers accounted for 19,456 angler-days (Table 1). From 2009 to 2018, an average of 93,493 angler-days of effort were expended annually by anglers fishing the KMA and 13,913 angler-days were expended on average in APAIA waters during the same time. The average effort expended by anglers in these areas has been about 5% of the average statewide total and 8% of the average Southcentral Region⁴ total between 2009 and 2018 (calculated from Table 1 and totals from the SWHS database). During this 10-year period, KMA angler effort peaked at 116,192 angler-days in 2013 and the APAIA peaked at 19,456 angler-days in 2018. In 2018, the combined KMA and APAIA effort represented about 8% of the total Southcentral Region angling effort and about 5% of the statewide effort (calculated from Table 1 and totals from the SWHS database). Anglers fishing the KMA represented 80% of the combined KMA and APAIA effort in 2018. During 2009 to 2018, average angler effort in the KMA was 87% of the combined average effort of KMA and APAIA (Table 1).

Most fisheries in the KMA occur in fresh and salt waters of the KRZ, and the 2009–2018 average of 68,740 angler-days of effort in the KRZ accounts for 74% of the KMA average effort (Tables 1 and 2). In 2018, the KRZ had 49,546 angler-days of effort, which was 65% 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 15,250 angler-days from 2009 to 2018 (Table 2). In 2018, anglers expended 9,471 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 13,913 angler-days of effort from 2009 to 2018 (Table 1). In 2018, anglers in this area accounted for 19,456 angler-days. Average effort in the APAIA is very low compared to the KMA and is 13% of the combined KMA–APAIA average effort in the most recent 10 years. In 2018, the APAIA represented 20% 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.

⁴ 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, 2009–2018.

Management area	Type of effort	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average 2009–2018
APAIA ^a												
	Salt water											
	Angler-days	7,303	5,297	4,616	9,037	5,241	7,848	7,768	5,018	2,833	8,668	6,363
	Percent of area	38%	42%	43%	61%	50%	49%	53%	47%	28%	45%	46%
	Fresh water											
	Angler-days	11,990	7,302	6,243	5,809	5,342	8,088	6,937	5,549	7,456	10,788	7,550
	Percent of area	62%	58%	57%	39%	50%	51%	47%	53%	72%	55%	54%
	Area total	19,293	12,599	10,859	14,846	10,583	15,936	14,705	10,567	10,289	19,456	13,913
	Percent of total	17%	13%	11%	15%	8%	13%	13%	12%	9%	20%	13%
KMA												
	Salt water											
	Angler-days	47,333	40,377	36,809	42,374	52,867	44,127	51,107	40,413	38,925	38,690	43,302
	Percent of area	49%	50%	44%	50%	45%	40%	50%	50%	39%	51%	46%
	Fresh water											
	Angler-days	49,619	41,082	47,620	43,032	63,325	66,858	51,787	39,657	61,405	37,519	50,190
	Percent of area	51%	50%	56%	50%	55%	60%	50%	50%	61%	49%	54%
	Area total	96,952	81,459	84,429	85,406	116,192	110,985	102,894	80,070	100,330	76,209	93,493
	Percent of total	83%	87%	89%	85%	92%	87%	87%	91%	91%	80%	87%
	Combined total	116,245	94,058	95,288	100,252	126,775	126,921	117,599	88,314	110,621	95,667	107,406

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 2019). 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, 2009–2018.

Management area	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average 2009–2018
KRZ											
Buskin River	18,775	13,399	13,977	13,996	21,545	20,276	13,704	8,141	19,218	9,471	15,250
Pasagshak River	8,550	5,170	7,855	8,498	6,840	5,612	5,534	5,160	6,063	5,125	6,441
Olds River	4,826	4,653	4,421	3,829	7,432	10,739	7,977	7,507	11,041	4,748	6,717
American River	3,760	4,362	4,601	2,850	5,448	5,236	5,947	4,038	4,247	1,379	4,187
Saltery Cove freshwater	3,204	3,453	3,947	2,101	5,601	6,644	3,693	3,038	2,527	2,523	3,673
Roadside lakes	605	617	1,658	806	2,266	1,546	2,660	–	461	510	1,237
Russian River and other roadside streams	3,484	3,634	5,358	5,195	8,391	7,084	7,084	5,401	4,859	5,005	5,550
Chiniak Bay boat	23,866	15,888	16,813	17,859	15,769	18,169	24,254	17,099	21,146	14,931	18,579
Ugak Bay boat	1,521	1,306	1,188	3,209	2,839	3,210	2,427	2,269	2,483	3,439	2,389
Roadside sites boat	–	–	–	–	–	1,633	3,067	1,814	1,457	1,326	1,859
Roadside shoreline	2,840	4,053	2,051	4,085	10,988	1,095	5,874	4,246	2,828	1,089	3,915
Total	71,431	56,501	61,869	62,428	87,119	81,244	82,221	58,713	76,330	49,546	68,740
Remote Zone											
Karluk River system	2,541	1,095	2,125	990	1,167	860	1,621	2,577	1,455	1,701	1,613
Ayakulik (Red) River system	1,210	960	–	–	–	2,066	–	–	–	–	1,412
Remote lakes	322	452	335	–	846	–	143	–	74	–	362
Remote streams	1,782	3,287	3,228	3,289	4,329	4,954	3,009	3,186	7,481	4,057	3,860
Afognak Island Area boat	4,521	6,199	3,619	3,629	6,968	5,471	3,413	3,921	3,213	3,633	4,459
Shuyak Area boat	1,924	–	837	–	–	–	–	–	–	–	1,381
Uyak Bay boat	3,415	2,933	1,627	–	3,475	3,389	2,862	2,257	1,723	1,943	2,625
Other remote boat	4,157	8,356	5,376	6,636	6,372	6,466	7,311	8,807	7,569	8,264	6,931
Other remote shore	789	1,632	1,052	–	–	779	–	–	–	–	1,063
Total	20,661	24,429	18,199	14,544	23,157	23,985	18,359	20,748	21,515	19,598	20,520

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

Note: Not all fisheries in the KMA are included in this table. An en dash means there were insufficient survey responses to generate an estimate.

Harvest

From 2009 to 2018, an average of 144,604 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 23% of all species, halibut (*Hippoglossus stenolepis*) and rockfish (*Sebastes* spp.) were the next most common at 16% each, and sockeye salmon (*O. nerka*) were also very common at 13% of the average harvest. In 2018, a total of 124,509 fish were harvested by anglers in combined KMA and APAIA waters and coho salmon and rockfish were the most commonly harvested species at 27% and 23% of the total harvest, respectively. Halibut and sockeye salmon were the next most commonly harvested species at 12% and 11% of the total harvest.

Other species harvested in relatively large numbers in 2018 included pink salmon (*O. gorbushka*) and Chinook salmon (*O. tshawytscha*), each representing 6% of the total harvest. In the most recent 10 years, both species have also represented 6% of the average harvest. 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 the average harvest.

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 2009 to 2018, an average of 2.5 fish were released for every 1 harvested (calculated from Tables 3 and 4). In 2018, rockfish and coho, sockeye, and pink salmon were the most commonly caught species, with halibut also caught in large numbers. Species with the highest catch-and-release rates in 2018 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 2018 were chum salmon, pink salmon, and Dolly Varden with relatively few fish harvested compared to the number caught and released. 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 are harvested at a much lower rate because they are generally less desirable species.

Table 3.—SWHS estimates of the number of fish harvested by anglers fishing both KMA and APAIA fresh and salt waters combined, 2009–2018.

Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average 2009–2018
Salmon											
Pink	13,856	6,253	7,159	11,676	10,542	7,705	13,630	7,244	7,321	6,961	9,235
Coho	39,669	30,047	30,843	25,204	32,788	39,376	44,421	22,821	29,251	33,368	32,779
Sockeye	14,438	14,004	12,087	16,157	26,213	28,844	23,068	19,783	19,368	14,274	18,824
Chinook	9,354	7,416	8,393	7,957	9,951	9,170	9,938	11,174	12,472	8,038	9,386
Chum	2,239	901	447	714	702	406	608	883	558	193	765
Groundfish and shellfish											
Clams	2,401	1,925	918	3,888	939	2,363	1,483	2,262	485	844	1,751
Halibut	34,839	25,415	23,089	26,690	28,520	26,387	19,104	15,778	18,132	14,780	23,273
Rockfish	16,512	20,660	15,907	20,747	21,113	31,177	27,872	27,053	23,787	28,406	23,323
Lingcod	3,978	4,013	4,248	4,105	4,543	5,022	3,065	2,847	2,428	3,970	3,822
Black cod		948	871	1,205	1,021	865	2,309	1,572	3,605	1,665	1,562
Smelt	0	178	1,214	0	346	92	0	0	140	0	197
Trout and char											
Dolly Varden	6,169	6,198	5,341	2,886	4,786	5,578	6,242	3,636	1,939	3,932	4,671
Rainbow trout	85	284	596	66	302	246	541	144	114	35	241
Steelhead	141	24	6	69	30	27	52	15	31	0	40
Other fish ^a	13,067	13,859	18,664	16,150	14,948	23,864	18,030	15,018	7,230	8,043	14,887
Total	156,748	132,125	129,783	137,514	156,744	181,162	170,363	130,230	126,861	124,509	144,604

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

Note: An en dash means there were insufficient survey responses to generate an estimate.

^a Includes lake trout, Pacific cod, sharks, Tanner crab, Dungeness crab, and other unspecified fish species.

Table 4.—SWHS estimates of Number of fish caught by anglers fishing both KMA and APAIA fresh and salt waters combined, 2009–2018.

Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average 2009–2018
Salmon											
Pink	83,153	39,001	47,319	65,563	82,822	43,109	76,220	39,952	57,053	46,388	58,058
Coho	80,133	53,129	55,147	42,028	54,100	77,351	97,046	48,041	56,980	69,021	63,298
Sockeye	30,668	22,277	25,808	25,855	42,188	44,672	32,418	29,804	33,869	28,441	31,600
Chinook	16,908	12,184	16,867	15,182	16,066	16,903	20,890	24,068	26,437	23,706	18,921
Chum	16,013	10,862	9,244	7,802	6,800	10,439	17,777	7,473	7,518	8,142	10,207
Groundfish and shellfish											
Clams	2,401	1,925	918	3,888	939	2,363	1,483	2,262	485	844	1,751
Halibut	59,787	43,589	44,235	43,698	44,874	41,922	31,505	26,052	27,784	24,345	38,779
Rockfish	42,675	49,729	33,216	40,667	35,429	49,978	47,431	48,499	34,821	45,193	42,764
Lingcod	7,897	6,369	7,254	6,323	6,353	7,493	6,044	4,492	3,890	5,424	6,154
Black cod	0	1,936	1,526	1,958	1,774	1,879	3,680	2,252	4,244	3,313	2,507
Smelt	0	178	1,339	19	346	301	0	0	140	0	232
Trout and char											
Dolly Varden	43,189	50,933	47,843	26,238	48,447	57,547	50,581	37,920	20,301	32,067	41,507
Rainbow trout	2,082	3,679	8,441	1,932	4,570	4,157	5,677	2,321	3,093	4,670	4,062
Steelhead	1,559	927	2,216	569	717	2,255	3,118	3,594	2,355	5,646	2,296
Other fish ^a	34,080	41,065	46,324	36,591	33,418	49,645	38,793	35,605	13,642	16,881	34,604
Total	420,545	337,783	347,717	318,369	378,843	411,704	432,663	312,354	292,612	314,081	356,667

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

Note: An en dash means there were insufficient survey responses to generate an estimate.

^a Includes lake trout, Pacific cod, sharks, Tanner crab, Dungeness crab, and other unspecified fish 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 Chinook salmon 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 the KMA Chinook salmon runs, interest is now minimal.

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

Management objectives for KMA and APAIA Chinook salmon stocks include achieving established escapement goals 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 or partial counts at weirs. To ensure escapement goals are attained, sport harvests may be limited or increased by adjusting daily or seasonal bag limits, prohibiting bait, and reducing time and areas open to fishing via emergency orders (EO; Appendix C1). Stocks that consistently fall below escapement goal levels may be closed to sport fishing. EOs are regularly used to meet escapement goal objectives for Chinook salmon runs in both the KMA and APAIA.

Since 2001, counts 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 but not as consistently or strongly as KMA stocks, and there have also been periods of relatively high abundance during this time. To meet escapement goals and rebuild declining runs, many Chinook salmon sport fisheries have been restricted, particularly in the Karluk and Ayakulik river 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 or nonexistent 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 run 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 salt water, and very little harvest occurs in either salt water or fresh water in the APAIA.

Chinook salmon typically return to the Karluk and Ayakulik rivers from late May through mid-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 or late 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 Chinook salmon bag limits of 2 fish per day, 2 in possession, with an annual limit of 5 that 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.

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 ownership of most of the uplands surrounding the drainage. The Karluk River 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 sport fishing effort (Appendix E1; Tracy and Polum 2015). At one time, both guided and unguided anglers frequented the river targeting Chinook salmon, and interest in the fishery was great enough that access was only allowed by a limited-use permit. 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. No Chinook salmon have been reported harvested in the Karluk River to the SWHS since 2007. A small number of Chinook salmon are caught and released annually during other fisheries, and from 2009 through 2018, this catch has averaged 78 Chinook salmon annually (Table 5).

Table 5.—Weir counts and number of Karluk River Chinook salmon caught and released, 2009–2019.

Year	Weir count	Caught and released
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	0
2019	3,898	NA
Average 2009–2018	2,581	78

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

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; however, escapements have generally increased since, with 2019 being the highest count in the last 10 years. The current biological escapement goal (BEG⁵) range is 3,000–7,000 and has been met 5 of the last 10 years, although management measures were taken to conserve escapements on an annual basis (Figure 4, Appendix E1). Weir counts are considered equal to escapement because there is currently no inriver harvest of Chinook salmon. The 2018 escapement of 3,155 and 2019 escapement of 3,898 Chinook salmon both achieved the BEG (Figure 4). Both were well above the 2009–2018 average of 2,581 fish (Figure 4, Table 5). The BEG was achieved too late in the season in both 2018 and 2019 to allow harvest of Karluk River Chinook salmon.

In addition to being closed to sport fishing since 2007, 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 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. Prior 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 for the whole KMA to try to meet the Karluk River Chinook salmon BEG.

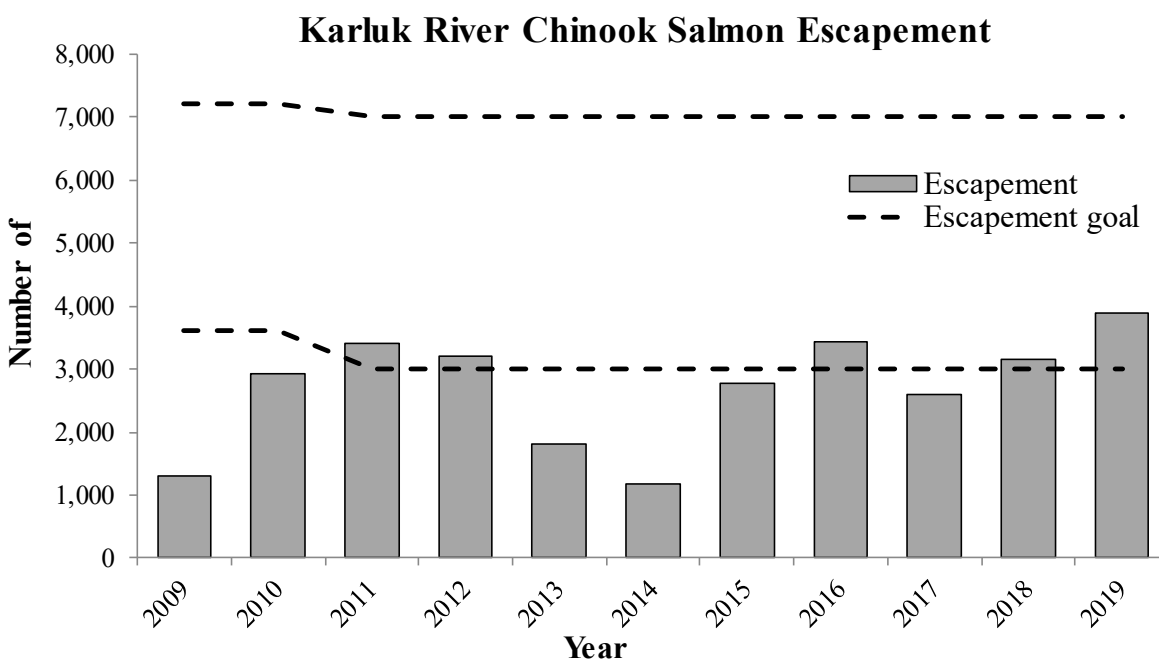


Figure 4.—Escapement of Karluk River Chinook salmon, 2009–2019.

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

⁵ The biological escapement goal is an estimate of escapement that most closely approximates the maximum sustainable productivity of a population.

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) from its confluence with Red River to the mouth. It is accessible almost exclusively 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 structure of 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 weir counts since 2001 and, like the Karluk River, has also seen a significant reduction in fishing effort since 2006 (Appendices D2 and E2). Until 2005, the Ayakulik River was also frequented by both guided and unguided anglers targeting Chinook salmon. 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 increased occurrence of limited access due to changes in access points on the lower river such that floatplanes can 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.

Harvest, catch, and effort information for Ayakulik River Chinook salmon are only intermittently available from the SWHS. From 2009 to 2018, the SWHS has only provided estimates in 3 years (Table 6). Most recent years have had little or no harvest due to conservative regulations aimed at achieving the BEG (which has been modified twice since 2009).

Table 6.—Weir counts and harvest estimates of Ayakulik River Chinook salmon, 2009–2019.

Year	Weir count	SWHS	
		Harvest	Released
2009	2,615	0	354
2010	5,301	104	729
2011	4,316	–	–
2012	4,760	–	–
2013	2,369	–	–
2014 ^a	917	0	96
2015	2,392	–	–
2016	4,594	–	–
2017 ^a	3,712	–	–
2018 ^a	2,149	0	0
2019	1,948	NA	NA
Average 2009–2018	3,442		

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

Note: An en dash means there were insufficient survey responses to generate an estimate. “NA” means data are not available. Catch (not shown) is harvest plus released.

^a Weir counts should be considered a minimum due to flooding events.

Escapement and Management

Ayakulik River Chinook salmon escapements have been monitored via a weir established in 1970 a short distance above the river mouth. The 2009–2018 average weir count was 3,442 fish. Since 2006, the weir counts of Ayakulik River Chinook salmon include some of the lowest on record; the lowest count of 917 fish occurred in 2014 (Table 6). 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. Counts have improved slightly since 2014 but the BEG was still only achieved half of the time in the last 10 years, although several weir counts are incomplete due to flooding events (Figure 5). The current BEG is 4,800 to 8,400 Chinook salmon and the 2018 and 2019 escapements were 2,149 and 1,948 fish, respectively, and did not achieve the BEG (Figure 5).

Annual estimates of harvest by anglers are typically unavailable due to low response rates in the SWHS. 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 based on records from the previously used freshwater logbooks. Weir counts have also included estimates of escapement during flooding events; in 2014 and 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 with additional harvest upstream of the weir, and in most years, a catch-and-release only fishery has progressed with restrictions on the use of bait until the regular season closure (Appendices C1 and E2). The fishery was closed completely on 4 occasions: 2013, 2014, 2015, and 2019. 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 2018, the fishery remained catch-and-release with no bait allowed for the duration of the season, and in 2019, the fishery closed when it was anticipated the BEG would not be achieved.

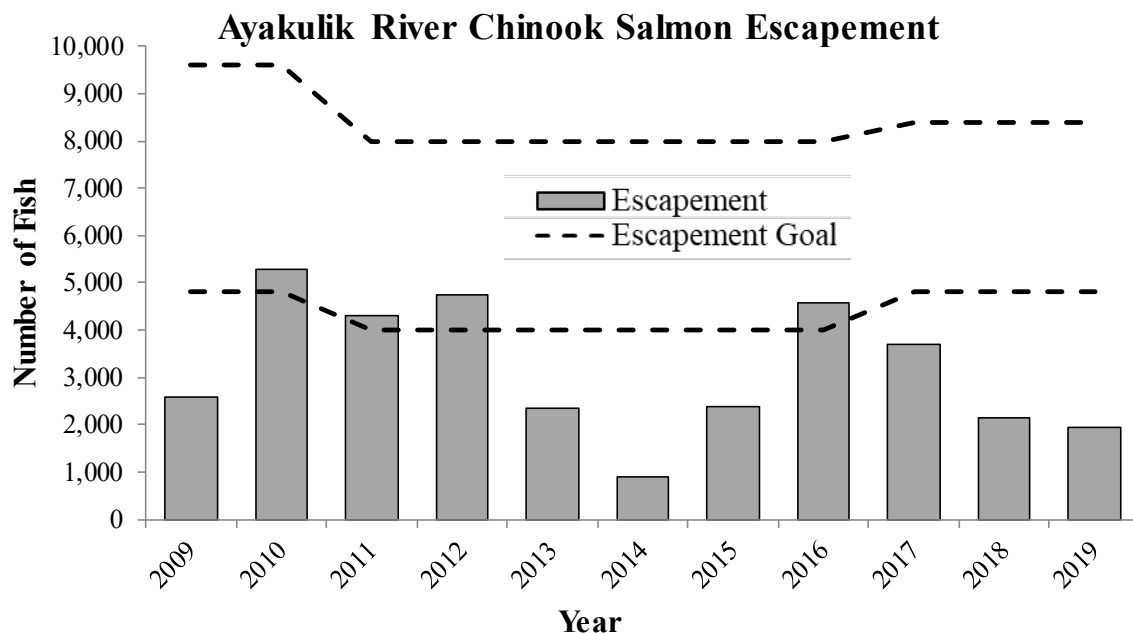


Figure 5.—Escapement of Ayakulik River Chinook salmon, 2009–2019.
 Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

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 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 two communities as well as nearby Chignik Bay. 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 to late 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, although 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. 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 according to previously available freshwater logbooks. Harvest in most years is 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, although 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. Due to a lack of available harvest information, a proxy of harvest is used to estimate escapement to account for harvest of Chinook salmon above the weir. To account for upriver harvest, 100 fish are subtracted from the weir count based on historical harvests and observations by ADF&G staff on the river. This number is also used by managers in season for making decisions about using EOs in the sport fishery.

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, although recent counts are still quite low. From 2009 to 2018, annual escapements (including the assumed harvest of 100 fish above the weir) averaged 1,954 fish; the lowest escapement on record was 725 fish in 2018, and the 2019 escapement achieved the BEG at 1,417 fish (Figure 6, Appendix D3). Escapements have not achieved the BEG 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 (see ADF&G Chinook Salmon Research Team 2013).

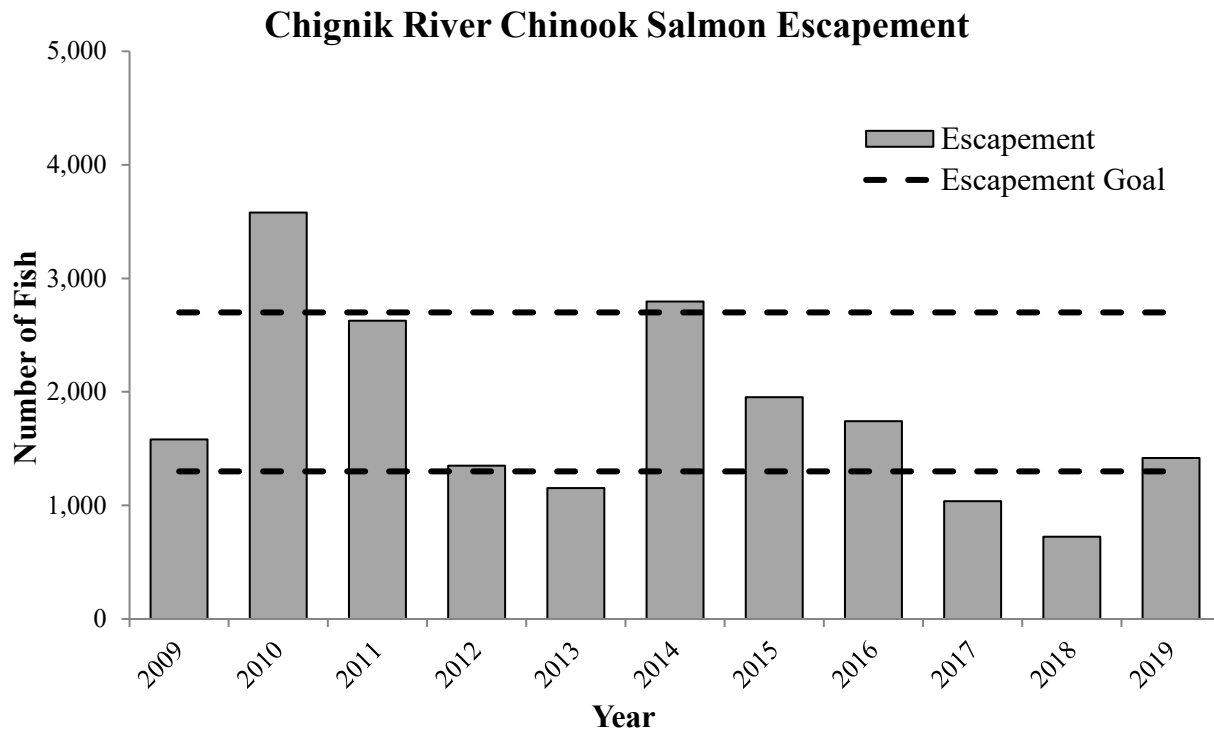


Figure 6.—Escapement of Chignik River Chinook salmon, 2009–2019.
Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

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, although it 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.

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 2009 to 2018, escapements averaged 2,717 fish. In 2018, the escapement was above the BEG of 2,400–4,400 at 5,022 fish, and in 2019, was much higher than the BEG at 11,853 fish (Figure 7, Appendix D4). Escapements have not achieved the BEG on several occasions with the record low escapement of 1,092 fish occurring in 2012, although recent runs have been strong and generally increasing. The sport fishery has been closed occasionally by EO to attempt to achieve the BEG, but there is little management power in restricting the sport fishery further.

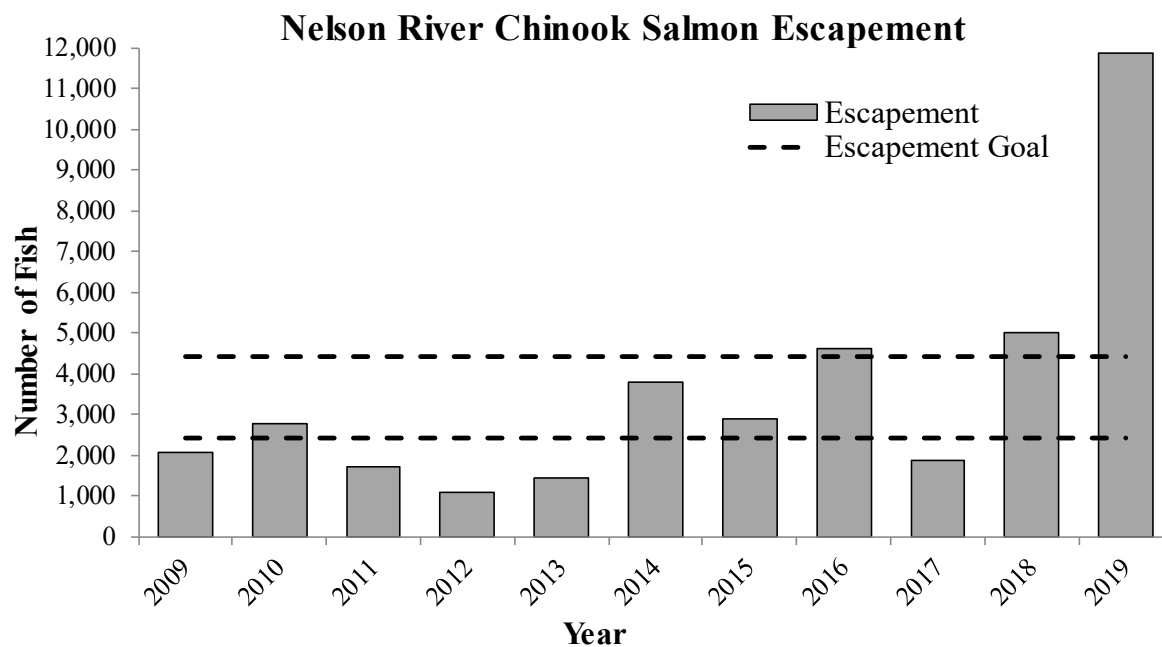


Figure 7.—Escapement of Nelson River Chinook salmon, 2009–2019.

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

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 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, although anglers only occasionally target them in APAIA waters and only about 150 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 the Kodiak marine waters 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 2009 to 2018, charter vessel clients have averaged 34% of the average 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 2009 and 2018, an average of 7,836 Chinook salmon were harvested by all anglers in the KMA (Table 7), and guided anglers accounted for an average harvest of 2,594 fish (Table 8).

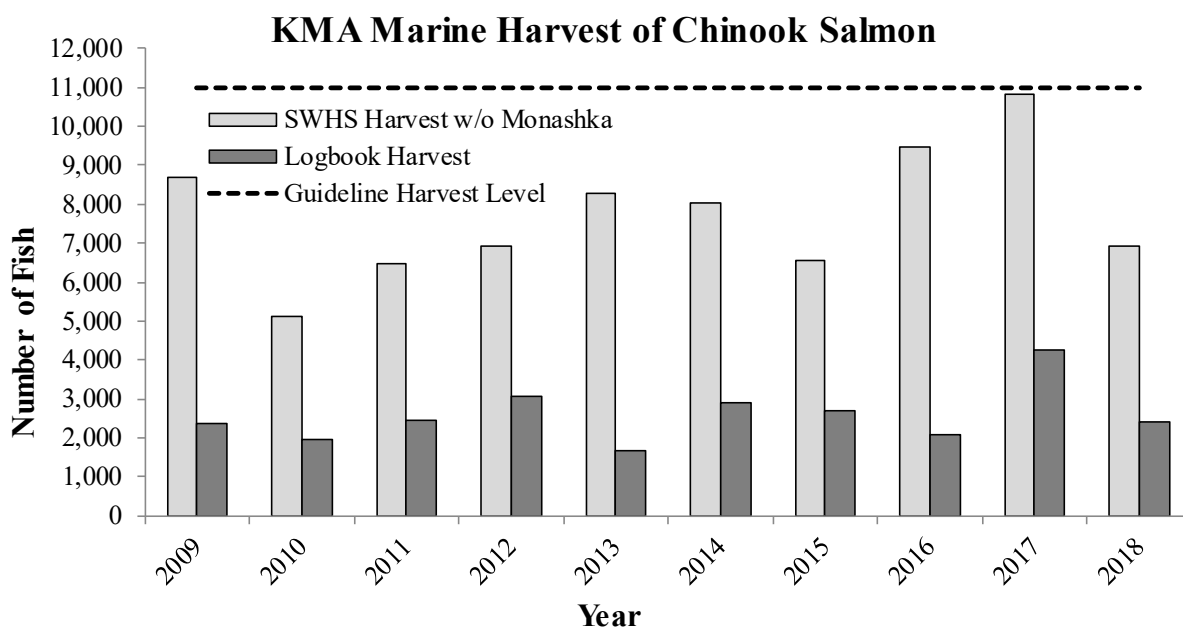


Figure 8.—Comparison of SWHS and logbook estimates of marine Chinook salmon harvest in the KMA, 2009–2019.

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>. Saltwater Logbook Database. (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed November 2019. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests]).

Note: SWHS estimates do not include Monashka Bay because these are excluded from the KMA Chinook salmon GHL.

Table 7.—SWHS estimates of KMA and APAIA marine Chinook salmon harvest and catch, 2009–2018.

Year	Harvest			Catch	
	APAIA	KMA	KMA without Monashka Bay ^a	APAIA	KMA
2009	36	8,773	8,699	118	11,694
2010	288	5,208	5,128	338	6,839
2011	17	6,491	6,458	17	8,122
2012	0	7,176	6,921	0	10,464
2013	30	8,452	8,287	45	11,844
2014	107	8,049	8,033	107	11,648
2015	172	6,709	6,562	771	9,492
2016	170	9,482	9,468	587	16,553
2017	235	11,065	10,840	366	17,240
2018	359	6,952	6,911	972	9,975
Average 2009–2018	141	7,836	7,731	332	11,387

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 The KMA saltwater Chinook salmon GHL excludes harvests in Monashka Bay due to local enhancement efforts.

Table 8.—Guided angler harvest and release of KMA marine Chinook salmon, 2009–2018.

Year	Chiniak Bay			Ugak Bay			Marmot Bay			Total KMA		
	Angler-days	Harvest	Release	Angler-days	Harvest	Release	Angler-days	Harvest	Release	Angler-days	Harvest	Release
2009	1,531	1,003	36	606	284	21	905	452	16	6,900	2,365	280
2010	1,150	412	13	777	228	6	665	161	2	7,044	1,969	318
2011	1,528	1,121	19	761	329	4	483	72	0	7,292	2,466	144
2012	1,245	984	20	931	818	31	537	191	2	6,273	3,076	186
2013	601	191	17	578	139	0	558	248	15	5,239	1,687	285
2014	604	298	16	1,387	1,169	38	441	112	4	6,787	2,915	343
2015	1,232	287	2	824	170	4	1,183	631	37	8,385	2,707	84
2016	1,232	465	2	595	362	11	868	408	11	5,386	2,061	65
2017	1,044	974	125	1,337	1,531	16	1,030	895	67	6,284	4,273	321
2018	878	377	2	912	536	15	1,486	485	16	7,112	2,419	171
Average												
2009–2018	1,105	611	25	871	557	15	816	366	17	6,670	2,594	220

Source: Saltwater Logbook Database. (Alaska Department of Fish and Game, Division of Sport Fish. 2006–present. Accessed November 2019. [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 2018 KMA Chinook salmon harvest was 6,952 and 6,911 excluding Monashka Bay harvests. The 2009–2018 average excluding Monashka Bay is 7,731 fish (Table 7). The 2018 guided Chinook salmon harvest was 2,419 fish, and the 2009–2018 average was 2,594 (Table 8). Since the management plan was established for the KMA Chinook salmon sport fishery in 2008, harvest levels have not exceeded and have stayed well below the current GHL with 1 exception: the 2017 harvest was near the GHL at 10,840 fish (Figure 8). 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 fall. Prior to this reporting period, harvest levels exceeded 10,000 in 2006 and 2007 but fell to a low of 5,128 in 2010 (Tracy and Polum 2015).

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 Fisheries⁶ (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 Chinook salmon runs native 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 with the intent to 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 from 2010 through 2018 have incorporated broodstock from all 4 drainages due to declining runs in Monashka Creek and beginning in 2019 have been solely from the American, Olds, and Salonie drainages. They have not included any wild stocks, such as the Karluk River stock, since returns began at Monashka Creek in 2005. Eggs and juvenile Chinook salmon are

⁶ Available at <http://www.adfg.alaska.gov/index.cfm?adfg=fishingSportStockingHatcheries.stockingPlan> (Accessed December 2019).

reared at PCH and smolt are currently released into the American, Olds, and Salonie river drainages. They are no longer released at Monashka Creek due to chronically low returns to Monashka Creek; no further brood collection is 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 2019 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), although 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 2008–2019 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 both the sport fishery and 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 2018, 117,548 smolt were stocked between the American and Olds rivers and Salonie Creek, although in 2019, no Chinook salmon smolt were released due to mortality of the entire brood during hatchery rearing. Stocking goals have not been achieved since 2015 due to low broodstock numbers as a result of low adult returns to the KRZ and significant mortality of captive broodstock 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 Salonie river drainages, although this can be as low as a few hundred fish depending on the year. Returns in both 2018 and 2019 were among the lowest that have been observed and the best available information indicates no more than 300 fish returned to each of these rivers in either year. Returns may have been affected by similar conditions as the wild Chinook salmon runs.

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. 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 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 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 accordingly.

Management of KMA and APAIA coho salmon stocks is generally passive and only 6 escapement goals are established between both areas. Because of run timing and associated environmental factors as well as budgetary constraints, few coho salmon runs are 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, although 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 largest harvests are shown in Table 9; other than the Karluk River, most are located in the KRZ. 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 in 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 Teed.

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 2009 to 2018, 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 selected locations, the largest harvests usually come from the Buskin River, with a 2009–2018 average harvest of 3,485 fish, which accounts for about 35% of the average harvest for those major fisheries, and about 15% of the average harvest from the KMA (Table 9). By comparison, the 2009–2018 average harvests for the Pasagshak, American, Olds, and Saltery river drainages individually ranged between 642 and 2,489 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.

In 2018, 1,793 coho salmon were harvested in the Buskin River; the Pasagshak River harvest was 1,508 fish; the American River harvest was 129 fish; and the Olds River harvest was 1,208 fish (Table 9). The Saltery River drainage, although it is in the KRZ, is only accessible by off-road vehicle or airplane, and access is more difficult than other KRZ drainages. The 2018 total harvest of coho salmon in Saltery River was 473 (Table 9). There is not an established escapement goal for coho salmon in the Saltery River and escapement is only monitored by aerial survey early in the coho salmon run, and these do not generally capture peak escapement because the survey is focused on counting pink salmon runs.

Escapement and Fishery Management

Because of higher 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; other streams are monitored by foot, small unmanned aerial vehicle (UAS), and fixed-wing aerial surveys.

Buskin River escapements have been monitored by SF since 1985 via operation of a salmon counting weir about a mile above the river mouth. Escapement is estimated by subtracting sport harvests occurring upstream of the weir from the weir count. Harvest occurring above the weir is estimated as a percentage of the SWHS-estimated coho salmon harvest for the Buskin River drainage. Annual harvest above the weir was estimated as 20% of the SWHS-estimated annual harvest during 2009–2016 and was estimated as 17% of the SWHS-estimated annual harvest during 2017 to present; this percentage was subtracted from the annual weir count, respectively (Murray 1987; Stratton and Evans *In prep*).

Table 9.—SWHS estimates of freshwater coho salmon harvest and catch for selected locations, 2009–2018.

Location	Estimate	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average 2009–2018
Buskin River (KRZ)												
	Harvest	5,207	2,847	3,640	1,926	4,926	5,388	4,889	1,895	2,337	1,793	3,485
	Catch	8,014	4,492	5,576	2,680	7,721	7,813	7,308	2,841	3,636	3,080	5,316
Pasagshak River (KRZ)												
	Harvest	2,287	2,417	3,864	2,125	2,336	3,020	2,849	2,145	2,336	1,508	2,489
	Catch	4,101	4,371	7,766	3,341	4,645	5,415	7,704	3,829	2,960	4,993	4,913
American River (KRZ)												
	Harvest	401	390	710	409	790	1,323	1,268	651	351	129	642
	Catch	659	1,533	1,499	779	1,203	2,245	2,253	1,599	351	390	1,251
Olds River (KRZ)												
	Harvest	1,864	1,253	1,351	734	1,047	5,343	2,634	3,452	2,206	1,208	2,109
	Catch	2,427	2,124	2,574	1,230	2,906	8,836	6,237	5,148	5,173	2,109	3,876
Saltery Cove (KRZ)												
	Harvest	798	1,142	1,301	533	1,574	2,010	2,303	617	712	473	1,146
	Catch	1,448	1,683	2,398	856	3,698	4,259	5,010	2,012	1,575	1,207	2,415
Karluk River (Remote Zone)												
	Harvest	1,872	710	721	694	1,200	447	866	557	505	569	814
	Catch	11,020	2,810	3,049	1,109	2,081	826	4,995	1,037	1,400	1,569	2,990
Total KMA ^a												
	Harvest	26,317	22,323	25,859	20,329	28,125	30,154	37,057	16,444	21,687	10,172	23,847
	Catch	52,611	34,421	43,179	20,731	42,323	42,823	93,511	45,257	70,015	26,369	47,124
Total APAIA												
	Harvest	6,257	3,351	2,510	2,517	1,950	4,288	3,250	2,727	3,673	4,787	3,531
	Catch	12,875	8,608	5,510	10,728	5,299	16,880	20,916	16,614	12,417	19,610	12,946

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

^a Includes all freshwater harvest in the KMA.

From 2009 to 2018, weir counts of Buskin River coho salmon ranged from a high of 10,624 fish in 2009 to a low of 2,513 fish in 2016 (Appendix D5). The average escapement was 5,203 fish during this time, and in 2018, estimated escapement was 4,218 fish, which did not achieve the BEG of 4,700–9,600 fish (Figure 9). The 2019 weir count was 5,537 coho salmon (Appendix D5) and is a preliminary escapement estimate. It is expected the BEG was still achieved due to low inriver harvest during the 2019 season. 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; for example, estimated days ranged from 8% of the total weir count to 69% during 2014–2017 (Stratton and Evans *In prep*). In 2019, no estimates were necessary while the weir was in operation, although a postweir estimate was added based on a survey conducted after the weir was pulled. This was only the second time this happened since the weir has been in operation. Recent escapements have shown a trend of decreased abundance beginning in 2010 that culminated in sport fishery closures in 2016 and again in 2019 (Figure 9). In general, however, there have been very few management actions taken in the Buskin River coho salmon sport fishery to date. A recent review and analysis of the Buskin River coho salmon escapement recommended changing the goal from a BEG of 4,700–9,600 fish to an SEG⁷ of 4,700–9,600 fish (Schaberg et al. 2019). This was primarily due to recognition that weir counts are often composed of a significant percentage of estimates due to flooding events and should represent an index of escapement rather than a census.

Buskin River Coho Salmon Escapement

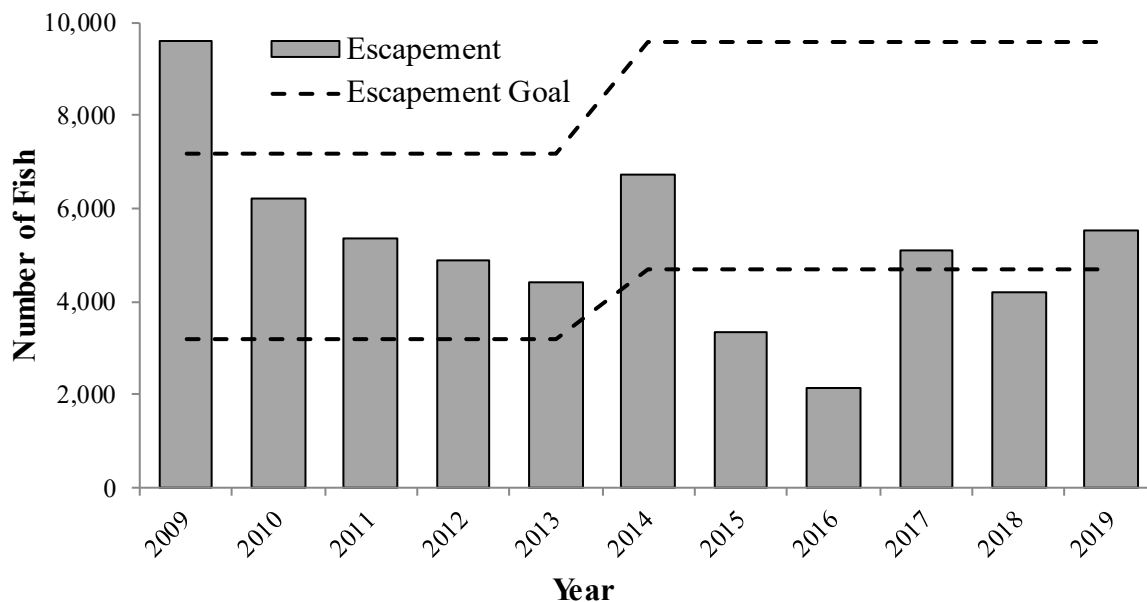


Figure 9.—Escapement of Buskin River coho salmon, 2009–2019.

Note: Escapements through 2016 include annual estimates of harvest above the weir based on 20% of the SWHS estimate, and escapements 2017 to present are based on 17% of the SWHS estimate. Estimates for 2019 are preliminary because SWHS estimates are unavailable.

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>; ADF&G Division of Commercial Fisheries, Kodiak, 2019.

⁷ SEG means sustainable escapement goal, which is a level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yield over a 5- to 10-year period.

Coho salmon runs in other KRZ drainages are monitored annually by postseason foot surveys and more recently, UAS surveys, to obtain index counts of escapement. In addition to the Buskin River, coho salmon escapement goals have been established for 3 other KRZ drainages. Lower bound SEGs are established for the Pasagshak River (1,200 coho salmon), American River (400 coho salmon), and Olds River (1,000 coho salmon). A summary of index counts obtained for these and other streams between 2009 and 2019 are provided in Table 10. Coho salmon counts in these drainages are an index of actual escapement into the streams. Escapement indices for the Pasagshak River drainage have averaged 2,150 fish from 2009 to 2018, whereas the American River has averaged 614 fish and the Olds River, 1,084 fish. 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 known 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, small run sizes, and associated potential for overharvest. KRZ coho salmon bag and possession limits are 2 fish per day through 15 September and 1 fish per day 16 September–31 December to limit harvest rates during times when most coho salmon runs are in river and through spawning. The only exceptions are the stocked returns to Monashka Bay, including Pillar and Monashka creeks, and Mill Bay and Mission beaches, 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, although 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.

Table 10.—Coho salmon escapement index counts in the KRZ, 2009–2019.

Location	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
American River	639	58	1,061	427	841	1,595	530	500	410	78	NS
Chiniak Creek	17	1	20	66	43	31	NS	3	1	NS	NS
Felton Creek	160	NS	633	17	50	22	33	27	62	0	NS
Monashka Creek ^a	132	37	36	300	679	230	100	60	66	210	46
Olds River	697	127	1,003	624	2,145	1,320	1,357	1,634	1,054	878	NS
Pasagshak River	2,385	1,971	1,083	3,132	1,648	4,934	1,790	667	701	3,186	488
Pillar Creek ^a	89	56	248	858	1,043	750	180	116	417	1,273	106
Roslyn Creek	NS	18	293	159	460	3,900	271	45	365	15	NS
Russian Creek	144	97	158	39	214	246	70	345	820	35	151
Salonie Creek	NS	90	942	304	286	509	215	218	502	6	NS
Sargent Creek	74	44	135	90	40	75	39	107	377	125	65
Total	4,337	2,499	5,612	6,016	7,449	13,612	4,585	3,722	4,775	5,806	856

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 2018, although in 2019, the coho salmon sport fishery was closed from 16 September to 3 October when it appeared escapement objectives would not be achieved (Appendix C1). In 2018, after the regulatory bag limit reduction

on 16 September, the only KRZ EO for coho salmon was issued on 22 September to increase the Pasagshak River bag limit to 2 fish per day (Appendix C1), after aerial and UAS surveys observed a large number of coho salmon in Lake Rose Teed. In 2018, only 78 fish were counted in the American River and 878 fish in the Olds River, both below their respective escapement goals. Spawning in 2018 occurred earlier than expected, however, and high water delayed survey efforts such that few fish were observed despite earlier observations of strong runs. In the Pasagshak River drainage, 3,186 fish were counted, which achieved the SEG and was above average. In 2019, high water for much of the month of October and into early November delayed survey efforts and several streams were not able to be surveyed. No surveys were conducted on the American and Olds rivers and only 1 survey was conducted on the Pasagshak River drainage, although it was probably conducted prior to peak spawning. A recent review and analysis of the Olds River coho salmon SEG recommended a change to the goal from a lower bound SEG of 1,000 to a lower bound SEG of 500 given several years of new escapement and harvest information since the last review (Schaberg et al. 2019).

UAS Surveys and Mark–Recapture Estimates of Abundance for Pasagshak River

Pasagshak River index counts have been difficult to obtain recently because physical changes in the upper portion of the lake have limited fish access to spawning grounds, resulting in sporadic, independent spawning events that coincide with periods of high rainfall. Historically, several foot surveys were conducted on spawning tributaries in the drainage around the peak spawn timing, and the peak count of those surveys was used to estimate an index of escapement. More recently, however, survey counts have captured discrete spawning events without a distinct “peak” that is representative of the relative size of the annual escapement and achievement of the escapement goal.

To more accurately estimate an index of escapement in the Pasagshak River watershed that is representative of total escapement, a mark–recapture study is being conducted in which fish are tagged in Lake Rose Teed and recovered with UAS and foot surveys. In 2019, a total of 224 coho salmon were captured in 3 tagging events. The fish were captured with a beach seine on the southwest portion of Lake Rose Teed. The tagging events were spaced approximately 1 week apart, and each event was characterized by a distinct tag color. Weekly surveys of the lake perimeter and river were conducted with the UAS in which the total number of fish observed was recorded as well as sightings of individual tags. Additionally, later in the season, UAS surveys were conducted in conjunction with foot surveys as coho salmon started to migrate to the spawning grounds. Through examination of the number of fish observed and the proportion of each tag color observed in sequential surveys, an estimation of the total population can be made. Raw counts of over 2,300 fish observed in the UAS surveys indicate that the SEG was achieved; however, quantitative analyses of study assumptions and a population estimate are still being conducted.

MARINE WATERS

Fishery Description and Historical Catch

Fishing for coho salmon in marine waters of the KMA is a popular sport fishery that, 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, although 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 PCH in the KRZ. About half of the harvest of coho salmon in the KMA as a whole is attributable to guided anglers but a larger portion of the harvest in waters near the City of Kodiak is attributed to unguided anglers.

KMA marine coho salmon harvests averaged 13,859 fish from 2009 to 2018, whereas APAIA harvests averaged 891 fish during the same time (Table 11). Relatively few fish were reported 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 2009 to 2018 averaged 6,784 fish (Table 12); the APAIA harvest is confidential due to less than 4 guide businesses operating in the area.

Table 11.—SWHS estimates of KMA and APAIA saltwater coho salmon harvest and catch, 2009–2018.

Year	Chiniak Bay		Afognak		Total KMA		APAIA	
	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
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
2018	7,524	9,392	845	1,346	17,535	21,558	1,335	2,297
Average								
2009–2018	5,285	6,510	2,223	3,058	13,859	18,097	891	1,503

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

Table 12.– Guided angler harvest of KMA saltwater coho salmon, 2009–2018.

Year	Chiniak Bay	Afognak	Total KMA
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
2018	1,432	2,101	9,232
Average 2009–2018	761	2,272	6,512

Source: Saltwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006 to present. Accessed November 2019. [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 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 that reduce 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 Bay, and Mill Bay and Mission beaches, due to stocked returns to these areas where the bag and possession limit is 2 per day year-round.

The 2018 coho salmon harvest was 17,535 fish in KMA marine waters and the harvest in Chiniak Bay was 7,524 fish (Table 11). Guided harvest in 2018 was 9,232 for the whole of the KMA, and it was 1,432 in Chiniak Bay (Table 12). 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 coho salmon releases specified in the current cooperative agreement. Production of coho salmon 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 and in the SSP. 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 beaches. 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 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 saltwaters of Monashka Bay, and Mill Bay and Mission beaches, as well as the freshwaters of Pillar and Monashka creeks (Figure 3). Releases since 2016 have occurred in all 4 stocking locations except that only Pillar and Monashka creeks were stocked in 2018. 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 estimated at greater than 4,000 fish annually. Hatchery-reared coho salmon are also caught in marine fisheries in Monashka Bay and in Chiniak Bay in the vicinity of Spruce Cape. 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.

The 2018 sport fisheries in Monashka Bay and Pillar and Monashka creeks were exceptionally strong with some of the largest returns seen to date as observed by ADF&G staff and angler reports. The 2018 coho salmon survey at Pillar Creek was the largest count on record as well. The 2019 sport fishery, however, had significantly smaller harvests and effort with what appeared to be a much smaller return of coho salmon. Persistent dry conditions for much of the summer and through early October likely impacted both harvest and effort as it appeared that coho salmon remained offshore until significant rainfall occurred in mid-October. It is likely returns were smaller than 2018 for unknown reasons, but run timing was also exceptionally late and most fish returned after most anglers stopped fishing for the season.

OTHER FISHERIES

Angler effort for coho salmon occurs in nearshore marine waters adjacent to numerous KMA drainages outside the KRZ, with the largest effort occurring near the numerous Afognak Island coho salmon–supporting drainages including 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 in both fresh and salt water. Although these are significant and important Remote Zone coho salmon saltwater fisheries, individually, these locations rarely support effort at levels that are adequately captured by the SWHS, and generally they have low exploitation rates on the affected coho salmon stocks. Saltwater areas near Afognak Island streams as an aggregate do produce SWHS estimates annually and harvests averaged 2,223 fish from 2009 to 2018 (Table 11). The 2018 harvest near Afognak Island was 845 fish. Guided angler effort at Afognak Island saltwater locations appears in the saltwater logbook database

records, and harvests have averaged 2,272 from 2009 to 2018 and was 2,101 in 2018, although individual locations are confidential due to the low number of guide business operating near specific drainages (Table 12).

Coho salmon fisheries in the APAIA, like those in the 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. Freshwater harvests of coho salmon in the APAIA averaged 3,531 fish from 2009 to 2018 and were 4,787 fish in 2018 (Table 9). Saltwater harvests for the whole of the APAIA averaged 891 coho salmon from 2009 to 2018 and the harvest in 2018 was 1,335 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 harvests from the KRZ account for more than 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 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, and 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 in addition to local anglers. 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 and the largest freshwater sport fishery by harvest in either the KMA or APAIA.

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. Peak harvest occurred in 2014 at 10,649 sockeye salmon (Tracy and Polum 2015), which accounted for nearly half of the total KMA sockeye salmon harvest at that time although more recently, harvests have fallen below 3,000 fish (Table 13). From 2009 to 2018, harvests averaged 5,641 fish and harvest was 2,793 fish in 2018. The 2018 and 2019

sockeye salmon runs were smaller than had been seen in several years (Fuerst *In Prep*) and harvests probably correspond to these abnormal run sizes.

Sport harvest of sockeye salmon from the Buskin River from 2009 to 2018 averaged 1,930 fish and harvest was 335 in 2018, one of the lowest harvests on record (Table 13). The Pasagshak River typically has somewhat smaller harvests than either the Buskin or Saltery rivers, averaging 1,088 fish from 2009 to 2018, and in 2018, harvest was just 262 fish, also one of the lowest harvests on record for that river. The 2018 SWHS-estimated freshwater KRZ sockeye salmon harvest of 3,390 fish was below the 2009–2018 average of 8,659 (calculated from Table 13) with relatively low harvest in all 3 drainages.

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 marine waters 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. 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 for the Buskin and Pasagshak rivers but 5 per day for the Saltery River, whereas in almost all other areas of the KMA and APAIA, the limits are 5 per day, 10 in possession while following 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). Weir counts in this drainage can be considered equal to escapement because no sport fishing for sockeye salmon occurs upstream of the weir. From 2009 to 2018, sockeye salmon escapements have ranged from 4,284 to 16,189 fish and averaged 10,008 (Table 14, Figure 10). Escapements in 2018 and 2019 were 4,284 and 12,297, respectively.

The Buskin River has seen both very strong and relatively weak runs since 2009. 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 achieved the BEG a few times, 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 locations in the drainage where sockeye salmon hold, the Buskin River sockeye salmon run can see large amounts of fishing effort even in years with small runs.

The 2018 Buskin River run was very weak, and the sport fishery was closed by EO on 16 June to attempt to achieve the BEG. The escapement of 4,284 sockeye salmon fell below the BEG of 5,000–8,000 fish, however, and the sport fishery remained closed for the season. The 2019 run appeared very weak through early June and was nearly closed, then a large amount of fish entered the river in late June through July and the sport fishery was liberalized to a bag limit of 5 per day on 28 June in anticipation of exceeding the BEG.

Table 13.—SWHS estimates of freshwater sockeye salmon harvest and catch in the KMA and APAIA, 2009–2018.

Location	Estimate	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average 2009–2018
Buskin River (KRZ)												
	Harvest	687	332	1,277	1,484	1,310	4,237	3,978	2,503	3,161	335	1,930
	Catch	1,417	699	2,352	1,938	2,395	6,201	5,807	3,247	4,701	487	2,924
Pasagshak River (KRZ)												
	Harvest	1,021	1,027	1,592	2,080	1,685	522	31	572	2,084	262	1,088
	Catch	1,431	1,351	2,801	2,972	2,577	771	255	572	3,270	439	1,644
Saltery River (KRZ)												
	Harvest	4,916	4,303	3,905	3,339	9,940	10,649	7,035	7,072	2,460	2,793	5,641
	Catch	7,418	6,082	6,146	4,031	15,103	13,590	8,289	9,512	3,511	6,755	8,044
Karluk River (Remote Zone)												
	Harvest	706	590	424	256	2,099	841	1,052	2,417	3,412	3,936	1,573
	Catch	4,945	1,527	1,642	1,864	4,215	2,123	2,036	3,319	7,359	4,522	3,355
KMA Total												
	Harvest	9,239	9,093	8,697	9,737	19,920	22,204	14,737	15,599	16,834	11,094	13,715
	Catch	22,571	16,111	16,718	17,016	33,092	35,230	21,044	23,551	29,244	23,525	23,810
APAIA												
	Harvest	3,311	1,229	1,012	818	179	1,425	1,138	342	926	1,088	1,147
	Catch	5,410	1,883	4,299	1,364	468	2,609	2,583	785	1,959	2,373	2,373

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

Table 14.—Sockeye salmon weir counts for selected locations within the KMA, 2009–2019.

Year	Buskin River	Saltery Creek	Pasagshak River ^a	Karluk River	Ayakulik River	Dog Salmon Creek
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
2018	4,284	22,845	2,019	633,279	266,333	201,161
Average						
2009–2018	10,008	36,632	6,645	524,535	291,934	148,847
2019	12,297	22,183	4,537	507,549	279,639	169,627

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

Note: “NA” means data not available.

^a The Pasagshak weir began operation in 2011.

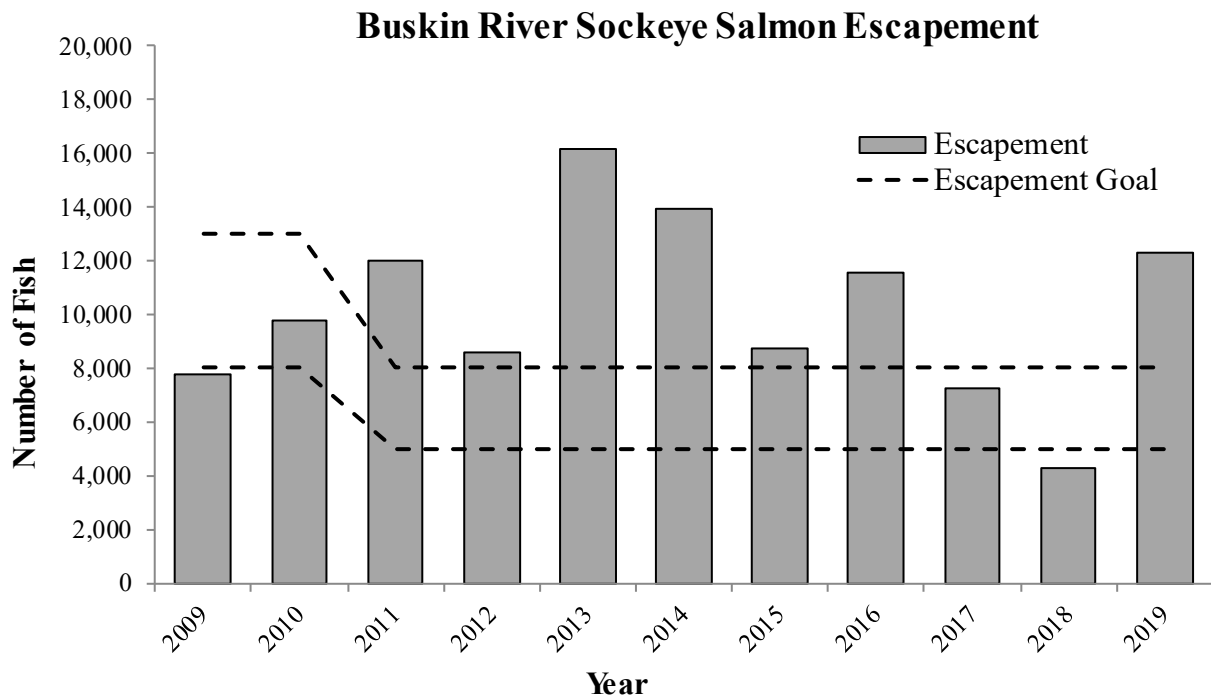


Figure 10.—Escapement of Buskin River sockeye salmon, 2009–2019.

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

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 2009 to 2018 averaged 36,632 fish and ranged from 22,845 to 57,867 (Table 14, Figure 11). The Saltery River run occurs later than the Buskin River but is very similar to the Pasagshak River in timing, usually peaking in mid-July (Appendix D7). Both the 2018 and 2019 escapements achieved the BEG at 22,845 fish and 22,183, respectively, although these were the lowest counts on record (Tracy and Polum 2015). Escapements have been within or above the BEG in all years (Figure 11).

The Saltery Cove sockeye salmon run has sustained liberalized bag limits and accordingly higher levels 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.

In 2018, in anticipation of a weaker than normal run strength, the sockeye salmon bag limit was reduced to 2 fish per day from 10 July to 31 July until the BEG was achieved (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 2019, the run was below average and sport harvests were restricted to 2 per day on 22 July when it appeared the BEG may not be achieved, and then the bag limit was restored to 5 per day on 9 August when the BEG was achieved. Run timing was later in 2019 than in 2018 due to chronic low water conditions.

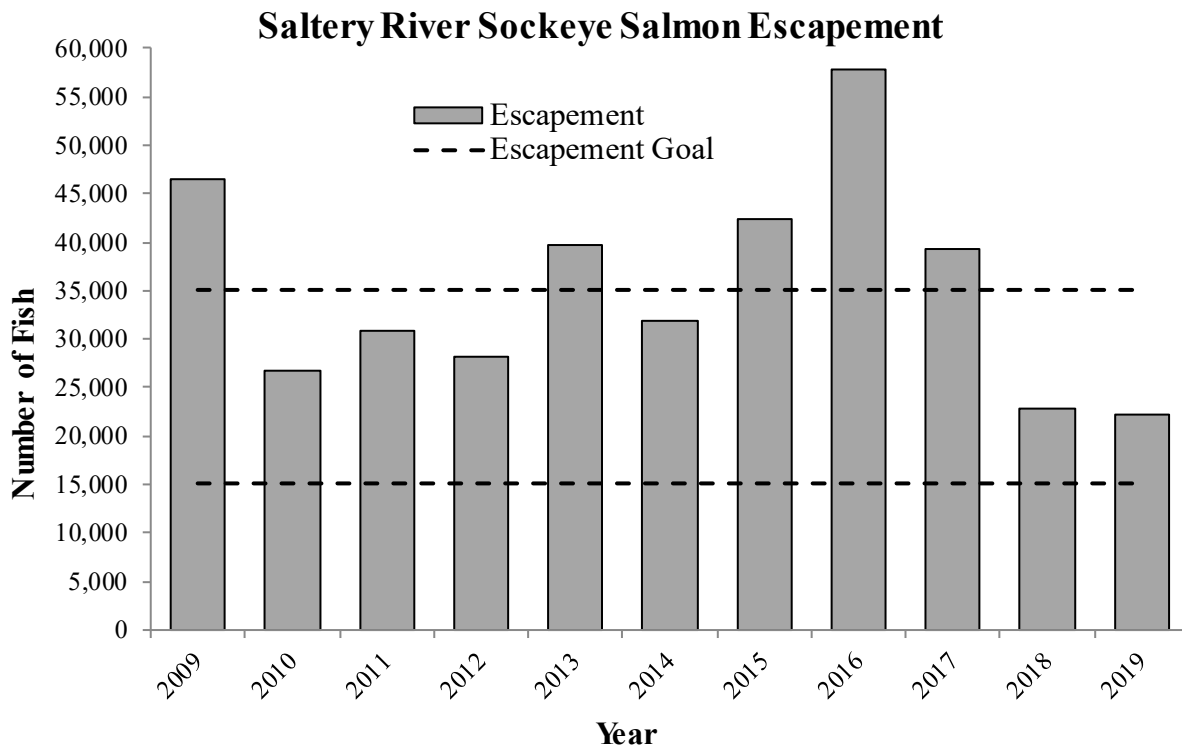


Figure 11.—Escapement of Saltery River sockeye salmon, 2009–2019.

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

Pasagshak River

The Pasagshak River sockeye salmon run has been monitored by weir since 2011, and counts from 2011 to 2018 have averaged 6,645, ranging from 1,582 to 13,402 (Table 14). Weir counts in the Pasagshak River can also be considered equal to escapement because no harvest of sockeye salmon occurs above the weir. The 2018 escapement of 2,019 was below the lower bound SEG of 3,000 fish, but the 2019 escapement achieved the SEG at 4,537 fish (Figure 12). 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.

The 2018 run at the Pasagshak River was very small, and fishery restrictions were implemented on 12 July that closed the drainage to fishing for sockeye salmon. No EOs were issued for Pasagshak River sockeye salmon in 2019 and the normal 2-fish bag limit was in effect for the season.

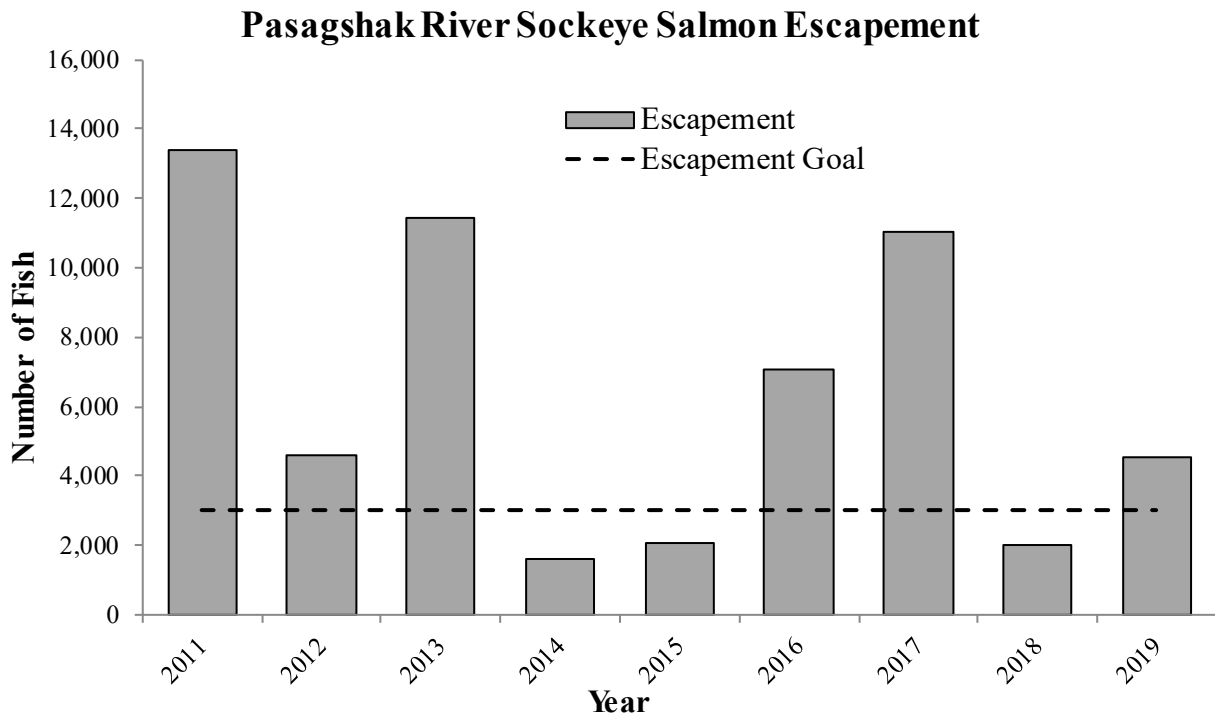


Figure 12.—Escapement of Pasagshak River sockeye salmon, 2009–2019.

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

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 the Afognak River where there is moderate unguided effort. The number 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 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 freshwater sockeye salmon harvest estimates are only available from the Karluk River and have averaged 1,573 fish from 2009 to 2018 (Table 13). Harvest at the Karluk River in 2018 was 3,936 fish and is the largest harvest during this time period. 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 2018 total Karluk River sockeye salmon weir count was 633,279 and the 2019 run was 507,549; the 2009–2018 average was 524,535 (Table 14). Weir counts are considered equal to escapement because little, if any, harvest occurs above the weir. The early-run BEG is 150,000–250,000 fish and this was achieved in both 2018 and 2019; the late-run BEG is 200,000–450,000 fish and this was also achieved in both years.

The Ayakulik River also has both early and late sockeye salmon runs; however, angler effort is spread throughout both runs. The 2018 and 2019 total Ayakulik sockeye salmon weir counts were 266,333 and 279,639, respectively; both were close to the 2009–2018 average of 291,934 fish. Weir counts are considered equal to escapement as little, if any, harvest occurs above the weir. The early-run BEG of 140,000–280,000 fish was achieved in 2018 and 2019; the late-run BEG of 60,000–120,000 fish was achieved in both 2018 and 2019 as well. 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 2018 count was 201,161 fish and the 2019 count was 169,627 fish. The 2009–2018 average was 148,847 fish. Weir counts at Frazer Lake are also considered equal to escapement as little, if any, harvest occurs above the pass.

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 affect local stocks. In 2018, the SWHS estimated a total freshwater harvest of 1,088 sockeye salmon in the APAIA and the 2009–2018 average harvest was 1,147 (Table 13).

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 with 2 in possession. 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 by most observations. Anglers do successfully harvest sockeye salmon in the salt waters of Summer Bay and to a lesser degree at Morris Cove and Iliuliuk River, although 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, the anadromous form of *O. mykiss*, 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 from 2017 through 2019 (Polum et al. 2017).

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 effort and harvest was previously recorded in freshwater logbooks but has not been available since 2016. 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 691 fish from 2009 to 2018 and an average harvest of 18 (Table 15). In 2018, the SWHS reported only 120 steelhead caught. 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 2009 have ranged from 836 to 4,624 and averaged 2,181 from 2009 to 2018 (Table 15). The 2018 and 2019 kelt counts were 3,148 and 2,877, respectively. Kelt counts can be a general indicator of abundance but they can be highly unreliable as an index for that 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. Preliminary estimates derived from the 2017–2019 project year indicate that the spawning population ranges from about 7,000 to 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 has the largest known steelhead run in the KMA or APAIA, but it probably varies considerably in size.

Table 15.—SWHS estimates of Karluk River steelhead harvest and catch, and kelt counts from a sockeye salmon weir, 2009–2019.

Year	SWHS		Karluk weir kelt counts
	Harvest	Catch	
2009	107	859	1,879
2010	6	216	2,203
2011	6	1,556	3,688
2012	0	236	836
2013	8	22	1,605
2014	7	108	1,381
2015	15	1,005	1,278
2016	15	2,709	1,168
2017	20	74	4,624
2018	0	120	3,148
Average			
2009–2018	18	691	2,181
2019	NA	NA	2,877

Source: Alaska Sport Fishing Survey database [Intranet], 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed November 2019, available from: https://intra.sf.adfg.state.ak.us/swhs_est/); ADF&G Division of Commerical Fisheries, Kodiak, 2019.

Note: “NA” means data not available.

OTHER FISHERIES

Smaller but significant steelhead fisheries exist on the Ayakulik, Buskin, and Sandy rivers, with only the Buskin River having enough effort for the SWHS to estimate annual numbers of steelhead caught. The Ayakulik and Sandy rivers fisheries primarily consist 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 500 from 2009 to 2018. In 2018, 460 steelhead kelts were counted and in 2019, 1,029 were counted (CF Kodiak unpublished data). 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, despite being very popular with some anglers.

The Buskin River has a small but highly popular steelhead run due to ease of access to the drainage for unguided anglers; the Buskin River is close to the City of Kodiak and has numerous access points from the road system. Angler effort is still low but does occur throughout the winter months into spring until spawning. The SWHS estimates that an average of 259 steelhead were caught in 2018 in the Buskin River, compared to an average of 271 caught from 2009 to 2018. 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.

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 Fort Richardson SF hatchery facility in Anchorage and subsequently transported to Kodiak Island shortly before being released. Since then, fertilized eggs from the current William J. Hernandez Sport Fish Hatchery (WJHSFH) in Anchorage 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. 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 2009, up to 18 KRZ lakes have been stocked with rainbow trout (Appendix F2). Yearly hatchery production of rainbow trout has varied between roughly 40,000 and 120,000 fish due to occasional losses resulting from transport and (or) release mortality and occasional surpluses of available fish. In 2018, 54,998 rainbow trout were stocked into 16 lakes, and in 2019, 40,182 were stocked into 10 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 when they are reared to 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 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 May and early September when the weather is best. All 3 species are harvested throughout both areas wherever anglers fish marine waters, although a majority of the harvest is taken from waters near the City of Kodiak in Chiniak, Marmot, and Ugak bays, with significant effort also occurring in the waters around Unalaska Island near Unalaska–Dutch Harbor. Most angler effort that is not within a short 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 and guided logbook databases. Halibut remains the most targeted groundfish species for both guided and unguided anglers and 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 for both charter boats and unguided anglers. Significant effort also occurs around Afognak Island and in many remote areas of the KMA, attributable to both remote lodges and residents of remote communities, but effort is less concentrated in these areas 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 2009 to 2018, annual halibut harvests in the SWHS averaged 21,561 in the KMA and 1,839 in the APAIA (Table 16). About a third of the combined harvest of halibut from the KMA and APAIA occurs within Chiniak Bay annually and harvests averaged 9,403 from 2009 to 2018 (Table 16).

Guided angler harvests of halibut in the KMA averaged 11,756 from 2009 to 2018 (Table 17). In Chiniak Bay during the same time, guided anglers harvested an average of 2,573 halibut. A significant amount of harvest also occurs in Afognak Island waters by guided anglers who harvested an average of 2,082 halibut from 2009 to 2018 (Table 17). 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).

Table 16.—SWHS estimates of halibut harvest and catch in the KMA and APAIA, 2009–2018.

Year	Chiniak Bay		KMA		APAIA	
	Harvest	Catch	Harvest	Catch	Harvest	Catch
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
2018	4,788	6,124	13,898	22,815	1,148	1,949
Average	9,403	14,191	21,561	35,937	1,839	3,077

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

Table 17.—Guided angler harvest and release of groundfish in the KMA, 2009–2018.

Year	Chiniak Bay		Afognak		Total KMA	
	Harvest	Release	Harvest	Release	Harvest	Release
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
2018	1,054	81	1,398	505	8,016	4,204
Average	2,573	1,429	2,082	2,278	11,756	10,930

Source: Saltwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006 to present. Accessed November 2019. [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 2018 SWHS-estimated harvest of halibut was 13,898 for the KMA and 1,148 for the APAIA (Table 16). In Chiniak Bay, anglers harvested 4,788 halibut in 2018. Guided anglers in 2018 harvested 8,016 halibut in the KMA, and APAIA harvests are confidential (Table 17). In Chiniak Bay, the 2018 harvest was 1,054 fish and the harvest in Afognak Island waters was 1,398 fish.

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. variabilis*) 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), although this trend has not been seen in the APAIA. APAIA harvest estimates were 1,970 rockfish in 2018 and averaged 1,235 from 2009 to 2018 (Table 18). SWHS estimates of KMA rockfish harvests doubled between 2001 and 2006 and then again from 2006 to 2014, reaching a high of 29,733 in 2014 (Figure 13). In response to these increased harvests, the BOF enacted bag limit reductions in both 2011 and 2017 to attempt to stop the increasing trend of harvest, particularly in the area of Chiniak and Marmot bays that see the greatest amount of effort. In Chiniak Bay, where much of the harvest has been concentrated, SWHS-estimated rockfish harvests have averaged 11,385 from 2009 to 2018, reaching a record high harvest of 17,843 in 2014 (Figure 13).

Table 18.—SWHS estimates of rockfish harvest in the APAIA, 2009–2018.

Year	APAIA rockfish harvest
2009	649
2010	763
2011	368
2012	2,455
2013	1,252
2014	1,444
2015	2,086
2016	1,023
2017	339
2018	1,970
Average	1,235

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

Rockfish Harvest in the KMA and Chiniak Bay

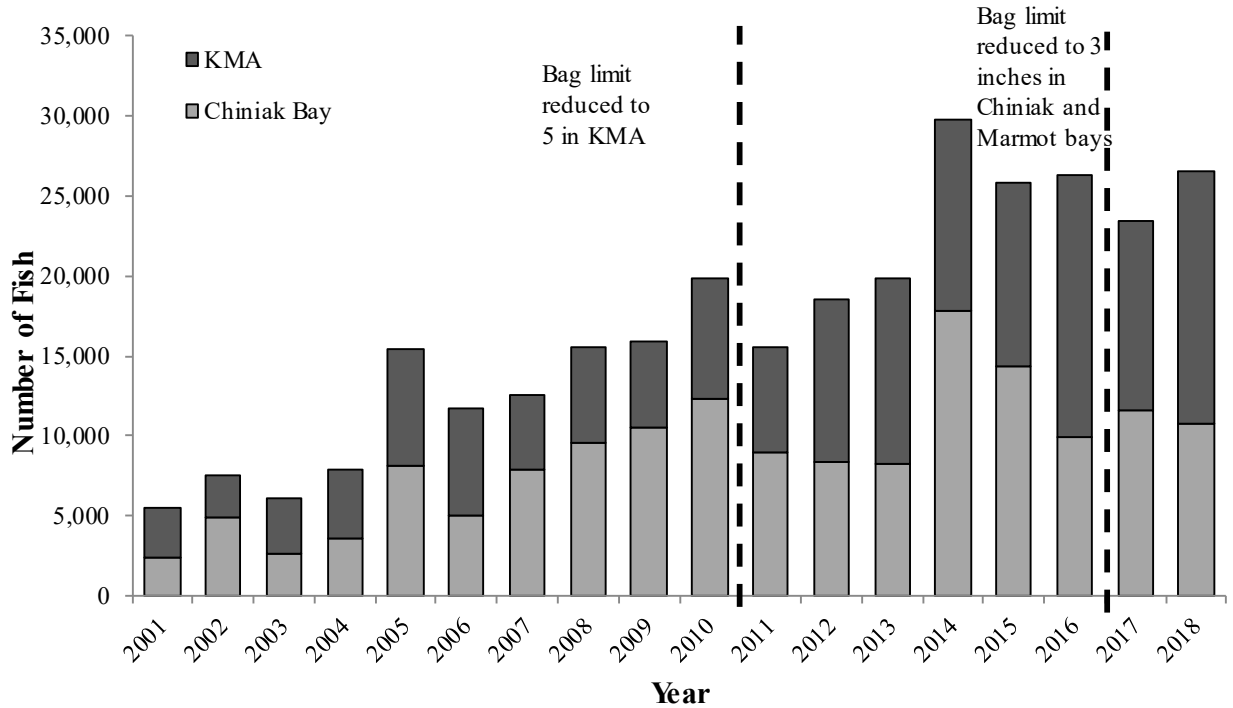


Figure 13.—SWHS—estimated harvest of rockfish in the KMA and Chiniak Bay, 2001–2018.

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

Except for Chiniak Bay, trends for guided anglers in the KMA are consistent with SWHS estimates, although there are discrepancies in the amount of harvest estimated. From 2009 to 2018, an average of 18,324 rockfish were harvested in the KMA by guided anglers, increasing from a low of 13,838 in 2011 to a high of 26,568 in 2016 (Table 19). In several recent years, logbook harvests have been higher than total SWHS estimates, indicating the unguided harvest is significantly underestimated (Table 19, Figure 13). Within Chiniak Bay, there have been no discernable trends in the guided angler harvests during the same period; harvest averaged 5,246 fish during the same time, indicating increasing harvest by unguided anglers as the reason for an overall harvest increase (Figure 13) and possibly dispersal of fishing effort in the charter fleet. Rockfish harvests by guided anglers in the APAIA are confidential due to the small number of charter boat businesses in the area.

Table 19.—Guided angler harvest and release of rockfish in the KMA, 2009–2018.

Year	Chiniak Bay		Afognak		Total KMA	
	Harvest	Release	Harvest	Release	Harvest	Release
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
2018	5,181	257	4,452	862	23,055	4,228
Average	5,246	776	2,932	1,401	18,324	5,472

Source: Saltwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006 to present. Accessed November 2019. (URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests).

Fishery Management and Performance

Long-lived and slow-reproducing species such as rockfish can be prone to overharvest. Rockfish are also highly aggressive, easy to catch, and susceptible to localized depletion. A conservative management approach is warranted with all rockfish fisheries and future management actions will be based on harvest rates and estimates of abundance from current and ongoing rockfish research in the KMA aimed at refining harvest and abundance estimates for local populations.

There are currently no specific fishery management objectives such as GHGs or other harvest targets for rockfish in the KMA or APAIA, although a joint CF and SF proposal will come before the BOF in 2020 that proposes to adopt a management plan for the KMA sport fishery and harvest caps for both commercial and sport harvests. 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 for use in annual management planning meetings between the two divisions. Results from these efforts are used annually to prosecute black rockfish fisheries with sustainable removal rates for both commercial and sport fisheries; however, inseason management is not currently practical in the sport fishery due to data limitations. A conservative management approach has been applied in both the sport and commercial fisheries in recognition of the vulnerability of rockfish to overharvest.

In 2011, to address concerns regarding increasing rockfish sport harvests, the BOF reduced the bag limit for KMA rockfish from 10 per day, 20 in possession, to 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. The goal of these regulations was to restrain growth in the fishery rather than reduce harvests; however, harvests continued to increase beyond what was seen up to 2010 (Figure 13). From 2011 to 2015, the harvest of KMA rockfish grew substantially again, and in response, during the 2017 Kodiak meeting, the BOF reduced the bag limit within Chiniak and Marmot bays to the current bag limits of 3 per day, 6 in possession (with the same nonpelagic limit) to specifically address the areas with greatest effort and potential harvest. In APAIA waters, the bag limit for all rockfish remains 10 per day and 20 in possession. There are no size or annual limits established for either area.

Because these new regulations were implemented beginning in the 2017 season, only 2 years of harvest information are available to measure the impact of these regulations. However, the proposed sport fishery management plan intends to keep current regulations in place as long as harvests remain stable but also allow SF EO authority to manage the fishery within a target range and be responsive to changes in harvests and rockfish abundance.

In 2018, the SWHS-estimated KMA rockfish harvest was 26,513 and the guided harvest was 23,055 (Figure 13 and Table 19). The 2018 KMA guided angler harvest of rockfish was above the 2009–2018 average of 18,324 (Table 19) and harvest by guided anglers continues to show an increasing trend despite SWHS estimates showing a varying harvest in the KMA by all anglers in recent years. In several years (2012 and 2016 for example), there has been a discrepancy between logbook harvests and SWHS harvest estimates; logbook harvests (guided anglers) have been larger than SWHS estimates for all anglers, so a new method was developed for estimating rockfish sport harvests for the KMA in conjunction with ongoing efforts in the KMA and through a statewide rockfish initiative to address concerns over increasing sport harvests and data limitations with sport harvest estimates.

Beginning in 2018, CF and SF staff began attempting to align commercial and sport harvest estimates by both area and rockfish species to estimate total removals and to compare to an index of abundance from an ongoing hydroacoustic project (Tschersich and Gaeuman 2019). Because estimates of rockfish harvest from the SWHS are only available for all rockfish and for only a few specific areas of the KMA, a new method of estimating rockfish harvest in the sport fishery aligns the target harvest areas and species to commercial harvests and species as well as corrects for inconsistencies observed in the SWHS estimates (Polum and Huang 2019). Sport harvest estimates are now available by commercial fishing districts used in the black rockfish commercial fishery as well as for black rockfish as a single species (Table 20) rather than as all rockfish (SWHS estimates) or as species assemblages (guide logbook data). These estimates are only available for most districts from 2011 to present; however, for the Northeast District, they are available from 2005 to present.

These revised harvest estimates show an average KMA harvest of 19,060 black rockfish from 2011 to 2018 and a 2018 harvest of 21,403 (Table 20). Harvests for black rockfish appear to have had a modest peak in 2016 but have largely remained stable since 2014. In the Northeast District, roughly equating to Chiniak Bay, harvests have averaged 9,950 black rockfish from 2011 to 2018, making up more than half of the KMA harvest on average. In 2018, the Northeast District black rockfish harvest was 8,781, which was slightly below the 2011–2018 average. Harvest trends in the Northeast District appear to show impacts from the 2017 bag limit reduction; however, several more years of data are needed to fully assess the impact.

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 (Polum and Worton 2018). Annual black rockfish management planning meetings are held between CF and SF staff in the Kodiak Office, and beginning in 2018, the meetings have incorporated these estimates of total removals to discuss appropriate management frameworks to ensure sustainable harvest rates, given the single stock that is being managed for both fisheries.

Table 20.—Estimated harvest of black rockfish by commercial fishing district, 2005–2018.

Year	KMA Total	Northeast	Afognak	Eastside	Westside	Other KMA harvest
2005		4,833				
2006		3,493				
2007		6,907				
2008		5,148				
2009		4,887				
2010		5,823				
2011	13,724	7,348	2,856	1,486	1,174	860
2012	17,282	8,059	3,105	2,805	2,193	1,119
2013	14,495	8,825	1,892	1,446	1,361	971
2014	20,999	12,384	2,889	2,854	2,186	686
2015	20,296	11,002	3,892	2,576	1,981	846
2016	24,581	14,945	3,733	2,535	2,564	804
2017	19,702	8,260	4,033	4,162	2,893	354
2018	21,403	8,781	4,921	3,199	3,749	753
Average 2011–2018	19,060	9,950	3,415	2,633	2,263	799

Source: Polum and Huang (2019).

OTHER GROUND FISH

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 3,688 fish between 2009 and 2018, and 3,930 lingcod were harvested in 2018 (Table 21). SWHS estimates for the APAIA averaged 150 lingcod during the same time, and 40 lingcod were harvested in 2018. Recent harvest trends show a decrease in harvest in the KMA through 2017 with the 2018 harvest being much higher than the previous 3 years. Logbook harvests of lingcod averaged 1,959 fish from 2009 to 2018 and the 2018 harvest was 2,453 fish (Table 22). 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 in guide logbook or SWHS estimates. There is increasing interest by anglers for other groundfish species besides rockfish and halibut, but it is unknown whether this will continue to be a trend like rockfish, or if anglers will focus on traditional species as targets and harvest other species opportunistically.

Table 21.—SWHS estimates of lingcod harvest and catch in the KMA and APAIA, 2009–2018.

Year	Chiniak Bay		KMA		APAIA	
	Harvest	Catch	Harvest	Catch	Harvest	Catch
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
2018	1,758	2,392	3,930	5,364	40	60
Average 2009–2018	1,689	2,456	3,688	5,789	150	393

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 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>.

Table 22.—Guided angler harvest and release of lingcod in the KMA, 2009–2018.

Year	Chiniak Bay		Afognak		Total KMA	
	Harvest	Release	Harvest	Release	Harvest	Release
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
2018	332	17	542	153	2,453	451
Average 2009–2018	359	41	661	178	1,959	498

Source: Saltwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006 to present. Accessed November 2019. [URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests.]

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

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 nonpelagic limit of 2 per day 4 in possession and a yelloweye limit of 1 per day 2 in possession.

2019 APAIA Board of Fisheries:

No changes to APAIA sport fisheries were made during this BOF cycle.

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

5 AAC 64.060. *Kodiak Area Salt Water King⁸ 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.

⁸ In the regulatory language, Chinook salmon are called "king" salmon, "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
2017–2019 FOR KMA AND APAIA FISHERIES**

2017 Emergency Orders:

- 1) EO 2-KS-4-5-17 restricted the Ayakulik River to retention of Chinook salmon and prohibited the use of bait for all sport fishing in the Ayakulik River 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 River drainage below Karluk Lake, effective 1 June–25 July.
- 3) EO 2-KS-4-7-17 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-4-27-17 restricted 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.
- 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 restricted the Ayakulik River to retention of Chinook salmon and prohibited the use of bait for all sport fishing in the Ayakulik River 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 River 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 closed 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.

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- 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.

2019 Emergency Orders:

- 1) EO 2-KS-4-7-19 restricted the Ayakulik River to retention of Chinook salmon and prohibited the use of bait for all sport fishing in the Ayakulik River drainage, effective 1 June–25 July.
- 2) EO 2-KS-4-8-19 closed the Karluk River to retention of Chinook salmon and prohibited the use of bait for all sport fishing in the Karluk River drainage below Karluk Lake, effective 1 June–25 July.
- 3) EO 2-KS-4-24-19 closed the Ayakulik River to retention of Chinook salmon, effective 26 June–25 July.
- 4) EO 2-RS-4-26-18 increased the Buskin River drainage sockeye salmon daily bag and possession limit from 2 to 5 fish, effective 28 June.
- 5) EO 2-RS-4-38-19 reduced the sockeye salmon bag limit in the Saltery River drainage to 2 fish, 2 in possession, effective 24 July.
- 6) EO 2-RS-4-45-19 increased the bag limit for sockeye salmon in the Saltery Creek drainage from 2 to 5 fish, effective 9 August.
- 7) EO 2-SS-4-52-19 closed sport fishing for coho salmon in the Buskin River drainage effective 18 September.
- 8) EO 2-SS-4-55-19 reopened sport fishing for coho salmon in the Buskin River drainage effective 4 October.

**APPENDIX D: KMA AND APAIA DAILY WEIR COUNTS,
2009–2019**

Appendix D1.–Karluk River Chinook salmon weir counts, 2009–2019.

Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
21 May	0	0	0	0	0	0	0	0	0	3	0
22 May	0	0	0	0	0	0	0	0	0	3	0
23 May	0	0	1	0	0	0	0	0	0	3	0
24 May	0	0	1	0	8	0	0	1	2	4	0
25 May	0	0	4	0	30	0	0	7	2	5	0
26 May	3	5	7	0	55	5	0	12	12	10	2
27 May	4	6	9	8	60	6	1	17	13	11	3
28 May	5	12	30	15	60	7	9	23	41	13	3
29 May	6	20	34	15	66	23	11	37	63	14	3
30 May	9	23	52	24	72	25	14	51	73	17	6
31 May	13	25	57	29	118	41	20	80	92	22	6
1 Jun	22	44	84	30	129	50	37	82	102	24	27
2 Jun	23	55	139	49	207	61	58	93	122	26	48
3 Jun	33	88	156	98	210	66	92	131	126	27	67
4 Jun	45	135	172	106	305	87	115	134	143	32	120
5 Jun	52	150	211	120	463	106	127	200	166	45	153
6 Jun	58	196	243	163	521	113	132	315	191	51	178
7 Jun	113	246	298	164	588	121	155	464	209	170	243
8 Jun	134	264	311	198	604	131	174	484	260	250	267
9 Jun	174	302	328	220	632	142	248	518	289	329	360
10 Jun	192	337	351	285	689	160	281	542	356	374	406
11 Jun	250	392	411	304	764	170	299	564	383	517	483
12 Jun	318	424	517	370	798	195	388	752	436	683	531
13 Jun	377	526	658	627	867	212	480	857	461	725	757
14 Jun	415	535	737	936	974	223	592	878	530	902	817
15 Jun	423	592	873	1,136	1,031	237	773	944	572	955	941
16 Jun	436	612	1,015	1,163	1,059	244	888	1,057	606	1,000	1,121
17 Jun	442	745	1,134	1,369	1,101	256	994	1,287	668	1,048	1,220
18 Jun	474	806	1,214	1,492	1,128	297	1,013	1,523	766	1,190	1,249
19 Jun	494	1,069	1,414	1,632	1,264	349	1,054	1,634	841	1,219	1,420
20 Jun	535	1,296	1,646	1,815	1,332	449	1,254	1,705	900	1,262	1,525
21 Jun	600	1,570	1,698	1,969	1,350	626	1,279	1,749	970	1,323	1,764
22 Jun	637	1,637	1,825	2,163	1,356	651	1,393	1,913	1,110	1,472	1,892
23 Jun	657	1,714	1,859	2,318	1,439	767	1,487	1,985	1,398	1,601	1,978
24 Jun	703	1,794	1,964	2,440	1,475	786	1,626	2,136	1,441	1,669	2,055
25 Jun	727	1,949	2,164	2,505	1,495	808	1,670	2,190	1,520	1,749	2,126
26 Jun	786	1,990	2,248	2,579	1,522	841	1,743	2,338	1,578	1,854	2,209
27 Jun	795	2,072	2,329	2,629	1,530	865	1,845	2,438	1,607	1,903	2,296
28 Jun	833	2,088	2,397	2,700	1,558	874	1,997	2,476	1,656	2,008	2,382
29 Jun	852	2,134	2,530	2,722	1,594	904	2,056	2,528	1,742	2,066	2,504
30 Jun	855	2,221	2,670	2,753	1,598	919	2,169	2,565	1,779	2,196	2,626

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Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1 Jul	946	2,230	2,734	2,891	1,629	930	2,207	2,602	1,813	2,260	2,681
2 Jul	990	2,363	2,849	2,894	1,629	955	2,238	2,782	1,890	2,295	2,766
3 Jul	994	2,442	2,931	2,935	1,648	963	2,360	2,806	1,930	2,385	2,963
4 Jul	994	2,472	3,003	2,953	1,668	973	2,421	2,874	1,967	2,433	3,052
5 Jul	1,011	2,531	3,062	2,988	1,675	1,005	2,464	2,941	2,001	2,477	3,082
6 Jul	1,014	2,545	3,114	3,020	1,686	1,021	2,475	2,975	2,107	2,492	3,151
7 Jul	1,023	2,571	3,140	3,057	1,718	1,040	2,525	3,026	2,126	2,523	3,293
8 Jul	1,025	2,635	3,156	3,075	1,721	1,044	2,538	3,039	2,166	2,540	3,343
9 Jul	1,028	2,647	3,175	3,082	1,725	1,052	2,559	3,073	2,180	2,566	3,377
10 Jul	1,028	2,665	3,186	3,089	1,725	1,076	2,569	3,121	2,258	2,606	3,487
11 Jul	1,040	2,671	3,198	3,089	1,726	1,084	2,574	3,148	2,303	2,648	3,525
12 Jul	1,071	2,678	3,225	3,099	1,731	1,098	2,580	3,168	2,315	2,685	3,573
13 Jul	1,071	2,700	3,248	3,105	1,735	1,133	2,593	3,180	2,332	2,796	3,626
14 Jul	1,071	2,708	3,272	3,116	1,735	1,138	2,608	3,200	2,354	2,803	3,651
15 Jul	1,071	2,724	3,277	3,122	1,736	1,149	2,620	3,211	2,373	2,853	3,669
16 Jul	1,072	2,730	3,288	3,124	1,743	1,157	2,664	3,214	2,383	2,868	3,681
17 Jul	1,073	2,743	3,298	3,126	1,745	1,158	2,674	3,226	2,388	2,884	3,689
18 Jul	1,073	2,744	3,306	3,128	1,748	1,158	2,678	3,292	2,398	2,894	3,691
19 Jul	1,075	2,751	3,314	3,131	1,748	1,159	2,687	3,307	2,400	2,905	3,694
20 Jul	1,086	2,757	3,324	3,134	1,750	1,162	2,689	3,316	2,404	2,925	3,704
21 Jul	1,086	2,763	3,327	3,138	1,750	1,162	2,697	3,317	2,419	2,939	3,714
22 Jul	1,087	2,763	3,330	3,139	1,750	1,163	2,698	3,326	2,420	2,959	3,733
23 Jul	1,088	2,763	3,333	3,140	1,754	1,167	2,703	3,342	2,424	2,962	3,745
24 Jul	1,088	2,765	3,334	3,145	1,754	1,168	2,704	3,351	2,440	2,980	3,764
25 Jul	1,088	2,769	3,335	3,147	1,756	1,168	2,706	3,353	2,456	2,990	3,768
26 Jul	1,090	2,791	3,338	3,148	1,759	1,169	2,712	3,358	2,462	2,993	3,775
27 Jul	1,098	2,793	3,341	3,153	1,761	1,174	2,718	3,360	2,491	2,995	3,786
28 Jul	1,098	2,796	3,343	3,159	1,762	1,174	2,720	3,361	2,494	2,997	3,789
29 Jul	1,098	2,815	3,346	3,160	1,766	1,176	2,724	3,364	2,504	3,006	3,798
30 Jul	1,098	2,831	3,359	3,166	1,767	1,176	2,726	3,366	2,528	3,024	3,800
31 Jul	1,100	2,841	3,365	3,167	1,767	1,177	2,733	3,371	2,530	3,061	3,807
1 Aug	1,100	2,851	3,367	3,167	1,769	1,177	2,737	3,373	2,532	3,066	3,816
2 Aug	1,100	2,851	3,378	3,172	1,772	1,177	2,742	3,377	2,535	3,067	3,825
3 Aug	1,101	2,853	3,384	3,174	1,772	1,177	2,745	3,378	2,542	3,070	3,828
4 Aug	1,104	2,856	3,385	3,177	1,772	1,177	2,751	3,384	2,546	3,080	3,833
5 Aug	1,110	2,870	3,385	3,181	1,772	1,178	2,753	3,385	2,548	3,088	3,834
6 Aug	1,110	2,875	3,385	3,183	1,787	1,178	2,757	3,391	2,552	3,091	3,835
7 Aug	1,112	2,877	3,389	3,184	1,788	1,178	2,761	3,395	2,561	3,093	3,836
8 Aug	1,112	2,877	3,390	3,185	1,789	1,178	2,761	3,396	2,567	3,094	3,837
9 Aug	1,113	2,893	3,390	3,186	1,795	1,178	2,765	3,396	2,577	3,096	3,839
10 Aug	1,122	2,896	3,392	3,187	1,796	1,179	2,765	3,396	2,577	3,098	3,841

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Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
11 Aug	1,126	2,899	3,398	3,187	1,797	1,179	2,765	3,396	2,577	3,101	3,842
12 Aug	1,129	2,901	3,399	3,187	1,800	1,179	2,767	3,396	2,578	3,133	3,843
13 Aug	1,145	2,902	3,399	3,187	1,803	1,180	2,768	3,396	2,578	3,146	3,843
14 Aug	1,146	2,904	3,402	3,187	1,804	1,180	2,768	3,398	2,579	3,148	3,844
15 Aug	1,163	2,906	3,403	3,187	1,805	1,181	2,768	3,398	2,579	3,148	3,847
16 Aug	1,165	2,908	3,404	3,188	1,805	1,181	2,768	3,401	2,580	3,148	3,848
17 Aug	1,166	2,911	3,407	3,189	1,805	1,181	2,772	3,409	2,585	3,149	3,848
18 Aug	1,167	2,911	3,408	3,189	1,809	1,181	2,777	3,411	2,585	3,149	3,848
19 Aug	1,167	2,912	3,411	3,189	1,811	1,181	2,777	3,411	2,586	3,150	3,849
20 Aug	1,183	2,912	3,413	3,191	1,815	1,182	2,777	3,411	2,587	3,150	3,849
21 Aug	1,195	2,913	3,413	3,191	1,817	1,182	2,777	3,413	2,587	3,152	3,849
22 Aug	1,197	2,913	3,413	3,191	1,820	1,182	2,777	3,416	2,587	3,152	3,850
23 Aug	1,222	2,913	3,414	3,196	1,820	1,182	2,777	3,418	2,591	3,152	3,850
24 Aug	1,226	2,914	3,414	3,197	1,820	1,182	2,777	3,419	2,592	3,152	3,850
25 Aug	1,253	2,916	3,420	3,197	1,820	1,182	2,777	3,421	2,595	3,153	3,850
26 Aug	1,262	2,916	3,420	3,197	1,820	1,182	2,777	3,424	2,596	3,153	3,850
27 Aug	1,268	2,916	3,420	3,197	1,820	1,182	2,777	3,430	2,597	3,153	3,852
28 Aug	1,269	2,916	3,420	3,197	1,820	1,182	2,777	3,430	2,597	3,154	3,852
29 Aug	1,294	2,916	3,420	3,197	1,820	1,182	2,777	3,430	2,597	3,154	3,858
30 Aug	1,299	2,916	3,420	3,197	1,820	1,182	2,777	3,430	2,597	3,154	3,867
31 Aug	1,299	2,916	3,420	3,197	1,820	1,182	2,777	3,431	2,598	3,154	3,868
1 Sep	1,299	2,916	3,420	3,197	1,823	1,182	2,777	3,431	2,598	3,154	3,870
2 Sep	1,301	2,916	3,420	3,197	1,824	1,182	2,777	3,433	2,599	3,154	3,875
3 Sep	1,302	2,916	3,420	3,197	1,824	1,182	2,777	3,433	2,599	3,155	3,876
4 Sep	1,306	2,916	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155	3,880
5 Sep	1,306	2,916	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155	3,883
6 Sep	1,306	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155	3,888
7 Sep	1,306	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155	3,889
8 Sep	1,306	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155	3,892
9 Sep	1,306	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155	3,896
10 Sep	1,306	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155	3,896
11 Sep	1,307	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155	3,896
Final	1,308	2,917	3,420	3,197	1,824	1,182	2,777	3,434	2,600	3,155	3,898

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

Appendix D2.–Ayakulik River Chinook salmon weir counts, 2009–2019.

Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
20 May	0	0	0	0	0	0	0	0	0	0	0
21 May	0	0	0	0	0	0	0	0	0	0	0
22 May	0	0	0	2	0	0	0	0	3	0	0
23 May	1	2	0	5	0	0	0	0	3	0	0
24 May	1	3	0	19	0	0	0	0	3	0	0
25 May	2	3	3	19	0	1	4	11	3	0	2
26 May	3	3	17	32	1	4	4	48	3	0	4
27 May	3	20	27	33	8	4	8	72	3	1	5
28 May	3	20	34	33	15	13	14	181	3	4	14
29 May	7	26	44	42	22	21	27	256	3	4	20
30 May	7	49	58	54	41	28	35	320	3	4	21
31 May	7	58	74	71	47	35	55	373	3	9	32
1 Jun	12	93	141	78	60	45	67	399	3	15	43
2 Jun	16	111	172	86	80	97	100	430	3	24	66
3 Jun	17	112	177	106	87	111	112	476	3	41	135
4 Jun	72	137	197	124	123	127	137	518	3	48	173
5 Jun	98	265	212	127	135	167	152	532	74	100	250
6 Jun	130	338	232	156	198	179	184	597	158	115	319
7 Jun	176	368	282	168	361	179	216	639	198	188	355
8 Jun	176	392	317	179	363	184	228	681	310	257	389
9 Jun	284	514	392	224	476	196	252	799	765	343	481
10 Jun	370	668	432	302	488	203	252	955	801	412	515
11 Jun	391	773	463	331	562	212	252	1,059	843	472	539
12 Jun	478	804	563	392	644	214	283	1,251	901	537	649
13 Jun	629	836	980	527	699	238	405	1,367	935	605	705
14 Jun	645	866	1,158	755	774	254	469	1,454	1,021	636	747
15 Jun	763	904	1,231	812	892	277	560	1,542	1,277	716	814
16 Jun	863	934	1,310	957	897	320	638	1,740	1,382	738	935
17 Jun	871	960	1,420	1,038	1,078	350	646	1,904	1,450	814	987
18 Jun	941	1,110	1,496	1,161	1,110	365	702	1,938	1,525	879	1,013
19 Jun	1,029	1,452	1,687	1,371	1,275	370	743	2,201	1,899	998	1,080
20 Jun	1,065	1,721	1,893	1,423	1,339	426	795	2,408	2,071	1,047	1,106
21 Jun	1,127	1,763	2,127	1,679	1,354	449	820	2,523	2,144	1,148	1,160
22 Jun	1,133	2,183	2,314	1,961	1,363	476	930	2,649	2,245	1,288	1,183
23 Jun	1,266	2,451	2,389	1,978	1,455	510	1,064	2,710	2,479	1,396	1,198
24 Jun	1,364	2,555	2,529	2,077	1,573	551	1,211	2,901	2,575	1,524	1,229
25 Jun	1,430	2,886	2,618	2,135	1,718	592	1,289	3,094	2,622	1,629	1,229
26 Jun	1,484	3,169	2,885	2,158	1,806	612	1,479	3,325	2,732	1,654	1,255
27 Jun	1,558	3,285	2,942	2,420	1,821	618	1,664	3,513	2,785	1,681	1,260
28 Jun	1,631	3,436	3,060	2,673	1,829	636	1,699	3,661	2,864	1,731	1,315
29 Jun	1,788	3,663	3,107	2,969	1,897	660	1,699	3,713	3,142	1,743	1,334
30 Jun	1,861	4,006	3,254	3,275	1,900	692	1,708	3,832	3,193	1,838	1,532

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Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1 Jul	1,882	4,175	3,410	3,391	1,939	702	1,721	3,942	3,198	1,858	1,590
2 Jul	2,009	4,217	3,570	3,498	1,964	703	1,756	4,039	3,251	1,887	1,634
3 Jul	2,058	4,442	3,704	3,702	1,964	713	1,825	4,079	3,283	1,906	1,655
4 Jul	2,163	4,703	3,774	3,765	1,988	727	1,909	4,145	3,319	1,933	1,656
5 Jul	2,235	4,840	3,849	3,873	2,009	745	1,940	4,164	3,359	1,967	1,715
6 Jul	2,250	4,900	3,888	4,273	2,009	820	1,990	4,198	3,398	1,972	1,748
7 Jul	2,300	5,015	3,910	4,325	2,055	825	2,006	4,248	3,429	2,035	1,749
8 Jul	2,357	5,061	3,973	4,356	2,096	831	2,034	4,266	3,454	2,043	1,767
9 Jul	2,396	5,082	4,039	4,389	2,114	849	2,049	4,285	3,474	2,043	1,789
10 Jul	2,478	5,125	4,061	4,444	2,142	882	2,078	4,318	3,509	2,048	1,804
11 Jul	2,492	5,184	4,084	4,482	2,249	891	2,100	4,328	3,536	2,056	1,808
12 Jul	2,516	5,186	4,150	4,539	2,249	895	2,105	4,361	3,556	2,066	1,810
13 Jul	2,523	5,189	4,160	4,565	2,249	896	2,141	4,379	3,571	2,073	1,820
14 Jul	2,541	5,240	4,183	4,572	2,255	899	2,168	4,409	3,573	2,079	1,823
15 Jul	2,561	5,240	4,194	4,620	2,258	901	2,185	4,430	3,577	2,081	1,837
16 Jul	2,564	5,251	4,215	4,621	2,263	905	2,201	4,464	3,588	2,090	1,857
17 Jul	2,572	5,259	4,225	4,622	2,283	905	2,253	4,480	3,606	2,092	1,861
18 Jul	2,576	5,272	4,227	4,623	2,283	907	2,281	4,491	3,613	2,097	1,867
19 Jul	2,580	5,272	4,227	4,635	2,286	907	2,289	4,506	3,621	2,103	1,869
20 Jul	2,587	5,274	4,232	4,651	2,299	907	2,299	4,517	3,631	2,111	1,869
21 Jul	2,589	5,280	4,237	4,655	2,302	908	2,323	4,519	3,637	2,111	1,869
22 Jul	2,592	5,283	4,248	4,657	2,303	910	2,338	4,529	3,641	2,116	1,877
23 Jul	2,592	5,283	4,270	4,667	2,307	912	2,361	4,532	3,646	2,117	1,904
24 Jul	2,596	5,283	4,275	4,689	2,307	913	2,371	4,532	3,655	2,117	1,910
25 Jul	2,597	5,283	4,280	4,693	2,324	913	2,375	4,545	3,660	2,131	1,918
26 Jul	2,597	5,287	4,281	4,693	2,337	913	2,380	4,546	3,663	2,131	1,923
27 Jul	2,597	5,291	4,284	4,696	2,338	914	2,380	4,550	3,667	2,132	1,926
28 Jul	2,597	5,291	4,289	4,706	2,340	914	2,380	4,557	3,669	2,137	1,936
29 Jul	2,597	5,292	4,292	4,707	2,340	914	2,384	4,577	3,672	2,137	1,936
30 Jul	2,602	5,293	4,294	4,716	2,342	914	2,384	4,578	3,674	2,137	1,938
31 Jul	2,609	5,295	4,297	4,719	2,343	914	2,385	4,578	3,679	2,139	1,939
1 Aug	2,609	5,296	4,297	4,719	2,345	914	2,385	4,591	3,680	2,144	1,940
2 Aug	2,609	5,296	4,299	4,721	2,345	914	2,386	4,594	3,680	2,147	1,940
3 Aug	2,609	5,298	4,300	4,728	2,345	914	2,387	4,594	3,680	2,147	1,940
4 Aug	2,612	5,298	4,300	4,728	2,345	914	2,387	4,594	3,680	2,147	1,940
5 Aug	2,612	5,298	4,300	4,732	2,345	914	2,388	4,594	3,680	2,147	1,940
6 Aug	2,612	5,300	4,300	4,733	2,357	914	2,388	4,594	3,683	2,148	1,940
7 Aug	2,612	5,300	4,301	4,737	2,362	914	2,390	4,594	3,684	2,148	1,940
8 Aug	2,612	5,300	4,301	4,742	2,362	914	2,391	4,594	3,685	2,148	1,940
9 Aug	2,612	5,300	4,301	4,743	2,362	915	2,391	4,594	3,689	2,148	1,940
10 Aug	2,613	5,300	4,301	4,746	2,362	915	2,392	4,594	3,690	2,148	1,940

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Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
11 Aug	2,614	5,300	4,301	4,748	2,362	915	2,392	4,594	3,690	2,149	1,940
12 Aug	2,614	5,300	4,301	4,751	2,362	916	2,392	4,594	3,692	2,149	1,940
13 Aug	2,614	5,301	4,302	4,751	2,362	916	2,392	4,594	3,692	2,149	1,941
14 Aug	2,614	5,301	4,315	4,752	2,363	916	2,392	4,594	3,695	2,149	1,941
15 Aug	2,614	5,301	4,315	4,757	2,365	916	2,392	4,594	3,701	2,149	1,941
16 Aug	2,614	5,301	4,316	4,758	2,367	916	2,392	4,594	3,704	2,149	1,941
17 Aug	2,614	5,301	4,316	4,760	2,367	916	2,392	4,594	3,709	2,149	1,942
18 Aug	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,709	2,149	1,942
19 Aug	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,710	2,149	1,942
20 Aug	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,710	2,149	1,943
21 Aug	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,712	2,149	1,943
22 Aug	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,712	2,149	1,943
23 Aug	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,712	2,149	1,943
24 Aug	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,712	2,149	1,943
25 Aug	2,615	5,301	4,316	4,760	2,369	916	2,392	4,594	3,712	2,149	1,944
26 Aug	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
27 Aug	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
28 Aug	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
29 Aug	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
30 Aug	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
31 Aug	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
1 Sep	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
2 Sep	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
3 Sep	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
4 Sep	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
5 Sep	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
6 Sep	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
7 Sep	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
8 Sep	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
9 Sep	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948
Final	2,615	5,301	4,316	4,760	2,369	917	2,392	4,594	3,712	2,149	1,948

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

Appendix D3.–Chignik River Chinook salmon weir counts, 2009–2019.

Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
8 Jun	0	0	0	0	0	0	0	0	6	0	0
9 Jun	0	0	0	0	0	0	0	0	6	6	0
10 Jun	0	0	0	0	0	0	0	0	6	12	0
11 Jun	0	0	0	0	0	0	0	0	6	18	0
12 Jun	0	0	0	0	0	0	0	0	6	18	0
13 Jun	0	0	0	0	0	0	0	0	6	18	0
14 Jun	0	0	0	0	0	0	0	0	6	18	0
15 Jun	0	0	0	0	0	0	0	0	6	18	0
16 Jun	0	0	6	0	12	12	24	12	6	18	0
17 Jun	0	6	6	0	12	36	42	12	6	18	0
18 Jun	0	6	18	0	12	42	60	18	6	18	12
19 Jun	18	6	18	0	12	60	60	18	6	18	12
20 Jun	18	6	18	0	18	66	78	18	6	18	24
21 Jun	18	18	18	0	24	72	84	30	6	18	24
22 Jun	18	24	24	6	30	90	84	66	6	18	30
23 Jun	18	30	31	12	36	103	84	90	6	48	42
24 Jun	18	30	43	12	36	127	96	108	6	66	48
25 Jun	18	30	43	12	36	165	114	144	12	78	54
26 Jun	42	31	61	18	60	195	126	186	12	79	54
27 Jun	48	31	85	18	60	267	146	198	36	97	54
28 Jun	48	55	115	18	84	291	212	228	55	109	60
29 Jun	48	61	115	18	90	339	212	276	67	121	72
30 Jun	72	61	139	30	90	405	260	306	85	127	84
1 Jul	84	73	181	48	90	465	284	372	127	127	108
2 Jul	120	157	248	55	120	561	326	450	157	139	156
3 Jul	162	205	302	68	120	633	375	498	199	157	193
4 Jul	180	247	350	86	133	723	400	576	235	163	265
5 Jul	237	319	398	94	171	875	505	636	277	170	307
6 Jul	253	355	494	118	195	1,067	621	750	303	176	349
7 Jul	345	463	650	156	219	1,199	759	855	306	184	439
8 Jul	387	499	729	181	243	1,283	831	933	309	202	489
9 Jul	429	595	738	211	263	1,435	904	1,017	327	215	531
10 Jul	543	799	813	241	299	1,554	952	1,095	352	229	639
11 Jul	597	895	885	298	347	1,722	1,000	1,143	394	261	747
12 Jul	706	1,225	990	352	413	1,789	1,144	1,198	430	315	813
13 Jul	713	1,399	1,259	478	503	1,879	1,216	1,246	478	345	885
14 Jul	755	1,537	1,393	532	546	1,934	1,294	1,300	538	358	945
15 Jul	773	1,735	1,621	634	612	1,970	1,338	1,348	587	418	999
16 Jul	779	1,759	1,669	652	649	1,994	1,380	1,390	629	466	1,059
17 Jul	827	1,841	1,771	736	709	2,114	1,410	1,438	653	509	1,083
18 Jul	863	1,944	1,867	838	727	2,190	1,417	1,450	672	545	1,113
19 Jul	989	2,002	1,951	911	781	2,312	1,448	1,504	678	605	1,119
20 Jul	1,055	2,170	2,071	929	835	2,397	1,460	1,516	702	641	1,155
21 Jul	1,157	2,404	2,150	969	854	2,475	1,467	1,536	732	653	1,209

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Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
22 Jul	1,337	3,141	2,456	1,151	1,035	2,672	1,685	1,650	931	721	1,348
23 Jul	1,367	3,207	2,475	1,200	1,053	2,686	1,740	1,668	931	739	1,384
24 Jul	1,385	3,243	2,487	1,236	1,065	2,716	1,758	1,668	937	757	1,408
25 Jul	1,403	3,328	2,505	1,261	1,101	2,722	1,764	1,698	949	763	1,420
26 Jul	1,403	3,358	2,535	1,261	1,119	2,735	1,788	1,716	973	775	1,427
27 Jul	1,409	3,382	2,553	1,273	1,155	2,742	1,814	1,740	985	781	1,463
28 Jul	1,421	3,406	2,595	1,309	1,162	2,755	1,844	1,752	1,009	782	1,487
29 Jul	1,457	3,412	2,613	1,309	1,162	2,761	1,856	1,752	1,009	788	1,493
30 Jul	1,488	3,442	2,619	1,321	1,174	2,777	1,886	1,777	1,009	788	1,493
31 Jul	1,506	3,454	2,625	1,333	1,174	2,791	1,904	1,777	1,015	794	1,493
1 Aug	1,518	3,454	2,625	1,346	1,180	2,791	1,929	1,783	1,027	794	1,493
2 Aug	1,529	3,479	2,631	1,352	1,180	2,799	1,941	1,795	1,027	794	1,493
3 Aug	1,547	3,497	2,636	1,364	1,186	2,799	1,971	1,795	1,045	794	1,493
4 Aug	1,571	3,515	2,641	1,376	1,192	2,808	1,983	1,795	1,045	794	1,493
5 Aug	1,571	3,533	2,642	1,382	1,216	2,820	2,007	1,801	1,051	806	1,499
6 Aug	1,571	3,539	2,649	1,394	1,223	2,838	2,019	1,825	1,057	818	1,505
7 Aug	1,577	3,539	2,673	1,400	1,223	2,844	2,019	1,831	1,069	825	1,505
8 Aug	1,577	3,539	2,673	1,400	1,223	2,850	2,024	1,837	1,069	825	1,511
9 Aug	1,577	3,551	2,685	1,412	1,229	2,862	2,024	1,837	1,081	825	1,511
10 Aug	1,577	3,569	2,685	1,412	1,235	2,881	2,030	1,843	1,093	825	1,517
11 Aug	1,578	3,581	2,697	1,418	1,235	2,881	2,036	1,843	1,111	825	1,517
12 Aug	1,584	3,599	2,703	1,424	1,235	2,887	2,042	1,843	1,111	825	1,517
13 Aug	1,596	3,623	2,703	1,424	1,235	2,887	2,054	1,843	1,117	825	1,517
14 Aug	1,602	3,629	2,703	1,424	1,241	2,887	2,054	1,843	1,118	825	1,517
15 Aug	1,614	3,629	2,709	1,424	1,247	2,887	2,054	1,843	1,130	825	1,517
16 Aug	1,620	3,629	2,716	1,430	1,247	2,887	2,054	1,843	1,130	825	1,517
17 Aug	1,620	3,629	2,716	1,430	1,247	2,887	2,054	1,843	1,130	825	1,517
18 Aug	1,620	3,629	2,716	1,443	1,247	2,887	2,054	1,843	1,130	825	1,517
19 Aug	1,626	3,647	2,716	1,449	1,247	2,889	2,054	1,843	1,130	825	1,517
20 Aug	1,626	3,649	2,716	1,449	1,247	2,889	2,054	1,843	1,131	825	1,517
21 Aug	1,644	3,661	2,716	1,449	1,247	2,889	2,054	1,843	1,137	825	1,517
22 Aug	1,662	3,661	2,716	1,449	1,247	2,895	2,054	1,843	1,137	825	1,517
23 Aug	1,668	3,661	2,716	1,449	1,247	2,895	2,054	1,843	1,137	825	1,517
24 Aug	1,674	3,661	2,716	1,449	1,247	2,895	2,054	1,843	1,137	825	1,517
25 Aug	1,674	3,679	2,716	1,449	1,247	2,895	2,054	1,843	1,137	825	1,517
26 Aug	1,680	3,679	2,716	1,449	1,247	2,895	2,054	1,843	1,137	825	1,517
27 Aug	1,680	3,679	2,722	1,449	1,247	2,895	2,054	1,843	1,137	825	1,517
28 Aug	1,680	3,679	2,728	1,449	1,253	2,895	2,054	1,843	1,137	825	1,517
29 Aug	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
30 Aug	1,337	3,141	2,456	1,151	1,035	2,672	1,685	1,650	931	721	1,348
31 Aug	1,367	3,207	2,475	1,200	1,053	2,686	1,740	1,668	931	739	1,384
1 Sep	1,385	3,243	2,487	1,236	1,065	2,716	1,758	1,668	937	757	1,408
Final	1,680	3,679	2,728	1,449	1,253	2,895	2,054	1,843	1,137	825	1,517

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019

Appendix D4.—Nelson River Chinook salmon weir counts, 2009–2019.

Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
16 Jun	0	0	0	0	0	0	0	0	0	0	1
17 Jun	0	0	0	0	0	0	0	0	0	0	12
18 Jun	0	0	0	0	0	0	0	0	0	0	12
19 Jun	0	0	0	0	0	0	0	0	0	0	33
20 Jun	0	0	0	0	0	0	0	0	0	0	33
21 Jun	22	6	190	0	106	603	186	237	52	19	34
22 Jun	43	9	230	0	138	780	204	237	60	19	205
23 Jun	93	48	270	0	155	932	241	264	72	19	206
24 Jun	165	131	300	0	204	1,618	246	265	76	20	210
25 Jun	227	154	307	1	254	1,654	281	265	84	20	210
26 Jun	288	172	360	9	271	1,729	292	290	159	43	210
27 Jun	354	180	406	10	322	1,777	330	291	227	82	210
28 Jun	375	204	431	17	417	1,794	339	291	248	183	211
29 Jun	549	277	511	25	440	1,829	365	292	275	199	211
30 Jun	588	289	552	31	456	1,867	366	369	302	253	338
1 Jul	640	338	571	45	476	1,876	395	387	416	369	362
2 Jul	653	398	627	85	533	1,934	396	389	429	373	544
3 Jul	677	517	656	98	620	1,974	455	525	435	680	554
4 Jul	704	578	947	115	681	1,997	628	556	436	782	554
5 Jul	713	604	1,005	123	762	2,039	668	559	442	1,135	559
6 Jul	735	611	1,087	146	831	2,075	779	575	454	2,275	598
7 Jul	751	612	1,146	170	851	2,102	850	609	521	2,645	609
8 Jul	768	622	1,202	211	872	2,120	945	612	710	3,660	688
9 Jul	812	625	1,222	243	929	2,162	1,189	622	744	4,076	877
10 Jul	937	638	1,248	344	943	2,216	1,679	634	766	4,275	998
11 Jul	957	685	1,257	447	1,032	2,235	1,811	1,009	815	4,308	1,105
12 Jul	957	695	1,279	513	1,082	2,253	1,911	1,038	824	4,349	1,465
13 Jul	958	696	1,293	541	1,123	2,260	1,993	1,087	828	4,400	1,591
14 Jul	975	739	1,299	576	1,184	2,269	2,023	1,203	869	4,541	2,258
15 Jul	978	751	1,344	599	1,197	2,280	2,086	1,254	891	4,555	3,096
16 Jul	987	763	1,346	607	1,202	2,291	2,090	1,442	902	4,563	3,202
17 Jul	1,009	779	1,354	610	1,203	2,334	2,095	1,556	925	4,598	3,364
18 Jul	1,018	791	1,354	627	1,208	2,350	2,145	1,760	941	4,608	4,543
19 Jul	1,019	806	1,354	629	1,208	2,370	2,206	1,931	981	4,728	5,075
20 Jul	1,020	870	1,359	635	1,208	2,394	2,226	2,119	1,003	4,829	5,265
21 Jul	1,024	889	1,359	645	1,216	2,449	2,265	2,164	1,030	4,850	6,230
22 Jul	1,025	894	1,367	742	1,220	2,496	2,275	2,245	1,172	4,890	9,052
23 Jul	1,036	897	1,369	815	1,221	2,517	2,312	2,305	1,202	4,894	9,308
24 Jul	1,048	901	1,380	874	1,221	2,622	2,372	2,433	1,204	4,929	9,690
25 Jul	1,089	905	1,380	903	1,221	2,822	2,409	2,708	1,286	4,937	10,592
26 Jul	1,089	914	1,381	949	1,221	2,851	2,421	2,971	1,312	4,972	10,663
27 Jul	1,106	921	1,390	986	1,221	2,899	2,425	3,440	1,368	5,009	10,677
28 Jul	1,113	1,112	1,403	992	1,221	2,901	2,437	3,550	1,415	5,022	11,103
29 Jul	1,113	1,704	1,404	992	1,221	2,901	2,440	3,735	1,479	5,022	11,136
30 Jul	1,218	2,252	1,404	992	1,221	2,901	2,440	4,039	1,494	5,022	11,171
31 Jul	1,248	2,370	1,404	992	1,221	2,901	2,440	4,618	1,502	5,022	11,649
Final ^a	2,048	2,769	1,704	1,092	1,421	3,801	2,890	4,618	1,852	5,022	11,853

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

^a Includes postweir aerial survey estimate of Chinook salmon spawning below the weir.

Appendix D5.–Buskin River coho salmon weir counts, 2009–2019.

Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1 Aug	0	0	0	0	0	0	0	0	0	0	0
2 Aug	0	0	0	0	0	0	0	0	0	1	0
3 Aug	2	0	0	0	3	0	0	0	0	1	0
4 Aug	6	0	0	0	7	0	0	0	0	5	0
5 Aug	8	0	0	0	9	0	0	2	0	9	1
6 Aug	8	0	0	0	10	0	0	3	0	26	5
7 Aug	17	0	0	0	10	0	0	10	0	49	10
8 Aug	27	5	0	0	10	0	0	12	0	52	10
9 Aug	33	20	0	0	18	3	0	12	0	59	10
10 Aug	35	31	0	0	38	3	0	16	0	82	10
11 Aug	52	40	0	3	54	4	0	16	0	96	11
12 Aug	70	44	0	17	59	6	70	18	0	106	12
13 Aug	81	49	0	50	75	7	70	21	0	154	13
14 Aug	91	60	0	109	79	463	72	51	0	200	13
15 Aug	94	79	0	147	93	463	74	63	0	217	14
16 Aug	115	109	0	166	110	473	74	69	1	220	17
17 Aug	131	139	0	207	129	511	75	86	1	224	19
18 Aug	160	221	10	213	165	521	78	121	1	245	19
19 Aug	179	267	13	300	177	540	82	137	1	495	19
20 Aug	207	284	21	334	193	573	85	160	2	745	19
21 Aug	232	298	31	339	206	573	87	189	4	752	19
22 Aug	251	398	56	346	280	576	87	220	8	817	19
23 Aug	260	419	69	347	367	586	88	324	9	875	20
24 Aug	267	461	81	358	486	678	92	358	13	879	22
25 Aug	280	492	255	363	613	762	102	410	25	882	22
26 Aug	297	523	396	368	727	854	108	418	42	886	41
27 Aug	357	546	679	372	823	1,072	117	480	54	900	44
28 Aug	626	561	826	375	855	1,112	133	487	61	929	44
29 Aug	894	578	963	384	1,533	1,146	137	574	61	933	45
30 Aug	1,113	584	1,121	397	2,033	1,203	141	660	61	941	89
31 Aug	1,253	605	1,250	415	2,439	1,308	144	669	61	943	106
1 Sep	1,354	612	1,367	428	2,488	1,337	147	687	63	943	108
2 Sep	1,424	619	1,462	433	2,686	1,417	149	707	64	945	108
3 Sep	1,678	634	1,583	443	2,745	1,580	151	745	64	947	108
4 Sep	1,874	719	1,711	450	2,850	2,442	153	863	64	948	110
5 Sep	2,075	922	1,814	469	3,011	2,779	153	883	64	950	110
6 Sep	2,317	943	1,907	471	3,354	2,997	153	970	64	950	112
7 Sep	2,663	1,091	2,022	473	3,697	3,043	158	975	64	957	113
8 Sep	3,436	1,171	2,148	474	3,840	3,228	160	992	94	972	114
9 Sep	3,771	1,441	2,309	479	4,073	3,305	165	1,007	114	972	118
10 Sep	4,041	1,471	2,439	482	4,306	3,427	180	1,017	119	998	120

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Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
11 Sep	4,323	1,475	2,574	506	4,441	3,820	189	1,285	3,171	1,059	125
12 Sep	4,605	1,488	2,720	526	4,560	4,298	196	1,329	3,204	1,066	169
13 Sep	4,777	1,492	2,833	529	4,763	4,917	197	1,360	3,250	1,066	177
14 Sep	5,146	1,538	2,988	532	4,788	5,048	201	1,377	3,410	1,066	179
15 Sep	5,602	1,545	3,109	788	4,840	6,397	209	1,441	3,515	1,076	181
16 Sep	5,602	1,551	3,191	1,023	4,849	6,940	212	1,483	3,693	1,080	195
17 Sep	5,911	1,553	3,312	1,079	4,856	7,403	214	1,507	3,718	1,084	197
18 Sep	6,583	1,556	3,499	1,424	4,890	7,711	217	1,511	3,731	1,090	212
19 Sep	7,248	1,576	3,740	1,974	4,949	7,917	217	1,530	3,798	1,103	221
20 Sep	8,567	1,578	3,934	2,361	5,009	8,044	219	1,551	3,889	1,105	413
21 Sep	8,860	1,598	4,062	2,591	5,124	8,192	220	1,934	3,904	1,107	459
22 Sep	9,390	1,901	4,239	2,891	5,269	8,195	221	2,114	3,929	1,111	503
23 Sep	9,715	1,946	4,399	3,191	5,284	8,214	221	2,325	3,953	1,112	2,368
24 Sep	9,810	2,819	4,657	3,491	5,285	8,216	221	2,360	4,023	1,115	3,398
25 Sep	10,244	3,064	4,908	3,791	5,323	8,219	221	2,451	4,063	1,118	3,520
26 Sep	10,304	3,174	5,073	4,091	5,327	8,222	223	2,486	4,065	1,119	4,100
27 Sep	10,502	3,260	5,407	4,391	5,386	8,332	226	2,513	4,911	2,065	4,223
28 Sep	10,573	3,301	5,753	4,691	5,386	8,413	232	2,513	5,127	2,065	4,287
29 Sep	10,624	3,307	5,915	4,991	5,386	8,413	974	2,513	5,343	2,112	4,561
30 Sep	10,624	3,309	5,941	5,291	5,386	8,413	987	2,513	5,559	2,168	4,626
1 Oct	10,624	5,794	5,961	5,291	5,386	8,413	987	2,513	5,559	2,168	5,037
2 Oct	10,624	6,028	5,969	5,291	5,386	8,413	1,223	2,513	5,559	2,187	5,537
3 Oct	10,624	6,237	5,982	5,291	5,386	8,413	1,890	2,513	5,559	2,396	5,537
4 Oct	10,624	6,537	6,026	5,291	5,386	8,413	1,920	2,513	5,559	2,744	5,537
5 Oct	10,624	6,766	6,026	5,291	5,386	8,413	1,920	2,513	5,559	2,859	5,537
6 Oct	10,624	6,803	6,026	5,291	5,386	8,413	2,220	2,513	5,559	2,888	5,537
7 Oct	10,624	6,808	6,026	5,291	5,386	8,413	2,652	2,513	5,559	2,889	5,537
Final	10,624	6,808	6,026	5,291	5,386	8,413	4,341	2,513	5,559	4,523	5,537

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

Appendix D6.–Buskin River sockeye salmon weir counts, 2009–2019.

Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
17 May	0	0	0	0	0	0	0	0	0	0	0
18 May	0	0	0	0	0	0	0	0	0	0	0
19 May	0	0	0	0	0	10	0	0	0	0	1
20 May	0	0	0	0	0	46	0	12	1	0	1
21 May	0	0	0	0	1	48	4	125	1	0	1
22 May	2	0	0	0	1	51	43	130	1	0	1
23 May	2	0	0	0	2	53	116	144	1	1	1
24 May	2	0	0	7	2	191	117	144	1	1	1
25 May	2	0	0	80	89	206	117	144	434	1	2
26 May	2	0	0	225	89	208	117	146	563	1	2
27 May	2	0	0	311	116	374	117	224	996	1	2
28 May	2	0	40	313	179	554	141	770	1,047	1	2
29 May	102	288	323	336	251	628	357	776	1,119	1	115
30 May	116	309	495	337	425	1,061	424	944	1,329	1	115
31 May	116	332	677	402	676	1,202	720	1,162	2,044	1	116
1 Jun	116	383	835	544	844	1,422	816	1,316	2,624	4	117
2 Jun	116	650	960	870	1,004	1,455	924	1,811	2,698	4	118
3 Jun	183	662	1,161	870	1,325	1,637	1,045	2,236	2,791	4	118
4 Jun	183	946	1,313	983	1,612	1,738	1,047	2,557	2,945	4	119
5 Jun	428	974	1,479	1,014	1,827	1,877	1,272	2,785	3,257	24	119
6 Jun	431	976	1,541	1,179	2,050	2,565	1,322	3,091	3,507	24	119
7 Jun	444	1033	2,340	1,569	2,696	2,565	1,445	3,317	3,803	34	234
8 Jun	448	1337	2,840	1,780	3,382	3,464	1,618	4,067	4,594	34	896
9 Jun	458	1531	2,982	1,870	3,836	4,260	2,113	4,397	4,629	38	1,275
10 Jun	1,258	1809	3,360	2,027	4,057	4,637	2,194	4,671	5,318	42	1,445
11 Jun	1,268	1998	3,540	2,489	4,790	4,977	2,299	4,840	5,377	44	1,574
12 Jun	1,268	2129	3,895	2,592	5,379	5,930	2,387	4,874	5,377	44	1,577
13 Jun	1,324	2515	4,256	2,813	5,933	6,639	2,387	4,876	5,382	54	1,831
14 Jun	1,805	2769	4,522	2,923	6,663	6,813	2,450	4,876	5,430	162	2,122
15 Jun	1,835	3054	5,310	3,080	7,450	7,172	2,593	4,882	5,479	163	3,363
16 Jun	1,860	3,083	5,659	3,344	7,813	7,516	2,647	4,914	5,487	267	3,392
17 Jun	2,937	3,210	6,381	4,286	9,125	7,949	2,734	4,947	5,648	269	3,887
18 Jun	3,107	3,806	6,972	4,395	9,880	8,450	2,734	5,077	5,672	443	4,143
19 Jun	3,143	3,951	7,537	4,472	10,278	8,882	2,735	5,138	5,973	443	4,146
20 Jun	3,556	4,256	7,752	4,494	10,841	9,267	2,761	5,220	6,005	641	4,553
21 Jun	3,821	4,516	8,064	4,666	10,969	9,339	2,769	5,720	6,032	650	5,434
22 Jun	4,129	4,557	8,383	5,317	11,240	9,603	2,796	5,826	6,464	915	5,483
23 Jun	4,237	4,721	8,517	5,624	11,883	9,733	3,012	6,146	6,514	964	5,578
24 Jun	4,352	4,799	8,806	5,632	12,270	9,897	3,025	6,158	6,521	1,041	5,828
25 Jun	4,476	5,264	9,055	5,885	12,509	10,015	3,195	6,299	6,529	1,079	5,891
26 Jun	4,640	5,797	9,183	5,938	12,797	10,144	3,396	6,352	6,615	1,079	7,114
27 Jun	4,979	6,006	9,273	6,215	13,064	10,208	3,461	6,453	6,619	1,167	7,234
28 Jun	5,242	6,074	9,562	6,236	13,629	10,353	3,633	6,456	6,941	1,242	7,316
29 Jun	5,370	6,126	9,619	6,357	13,792	10,470	3,736	6,456	6,941	1,242	7,647
30 Jun	5,642	6,174	9,773	6,624	13,925	10,547	4,032	6,573	6,941	1,244	7,966
1 Jul	5,666	6,201	9,791	6,699	14,039	10,631	4,183	6,865	6,941	1,247	8,016
2 Jul	5,746	6,582	9,810	6,753	14,124	10,680	4,350	6,881	6,980	1,254	8,192

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Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
3 Jul	5,753	7,131	9,822	6,836	14,224	10,746	4,570	6,881	7,026	1,263	8,671
4 Jul	5,756	7,131	10,059	6,910	14,272	10,825	4,717	6,924	7,026	1,308	8,677
5 Jul	5807	7,140	10,085	6,933	14,289	10,956	5,133	7,236	7,026	1,377	8,893
6 Jul	5825	7,310	10,180	6,947	14,318	11,018	5,516	7,311	7,027	1,378	8,994
7 Jul	5903	7,387	10,221	6,992	14,404	11,185	5,550	7,377	7,075	1,384	9,082
8 Jul	6,255	7,762	10,270	7,169	14,475	12,151	5,560	7,407	7,100	1,388	9,134
9 Jul	6,297	8,370	10,328	7,224	14,546	12,195	5,579	8,053	7,103	1,408	9,265
10 Jul	6,313	8,437	10,460	7,225	14,978	12,242	5,795	8,056	7,115	1,451	9,283
11 Jul	6,375	8,503	10,477	7,622	15,070	12,276	5,888	8,090	7,139	1,523	9,312
12 Jul	6,376	8,583	10,530	7,690	15,089	12,294	5,911	8,113	7,140	1,524	9,352
13 Jul	6,385	8,625	10,539	7,700	15,113	12,310	5,922	8,147	7,153	1,528	9,361
14 Jul	6,435	8,643	10,771	7,709	15,145	12,388	5,990	8,475	7,176	1,657	9,832
15 Jul	6,527	9,196	10,774	7,713	15,256	12,416	6,195	8,521	7,176	1,761	9,918
16 Jul	6,887	9,197	10,779	7,717	15,264	12,698	6,599	8,620	7,179	1,775	10,134
17 Jul	6,889	9,197	10,780	7,729	15,281	12,743	6,621	8,684	7,179	1,792	10,201
18 Jul	6,910	9,261	10,782	7,784	15,295	12,795	6,622	9,204	7,184	1,842	10,222
19 Jul	6,911	9,327	10,782	7,801	15,301	12,810	6,950	9,272	7,186	1,864	10,258
20 Jul	6,921	9,396	10,783	7,859	15,307	13,078	6,986	9,279	7,186	1,868	10,300
21 Jul	7,007	9,409	10,786	7,867	15,320	13,101	7,125	9,281	7,186	1,944	10,327
22 Jul	7,060	9,416	10,851	7,877	15,322	13,106	7,519	9,296	7,188	2,017	10,358
23 Jul	7,067	9,428	10,856	7,900	15,341	13,111	7,522	9,357	7,205	2,466	10,399
24 Jul	7,068	9,428	10,865	7,906	15,345	13,118	7,522	9,383	7,205	2,709	10,534
25 Jul	7,289	9,430	10,871	7,911	15,363	13,120	7,528	9,389	7,208	2,709	10,722
26 Jul	7,395	9,608	10,872	7,917	15,387	13,124	7,560	9,417	7,208	2,751	10,938
27 Jul	7,399	9,617	10,878	7,947	15,390	13,145	7,572	9,505	7,208	2,760	11,256
28 Jul	7,421	9,617	10,887	7,990	15,392	13,148	7,774	9,522	7,208	2,760	11,332
29 Jul	7,461	9,617	10,914	7,991	15,413	13,149	7,791	9,579	7,208	2,845	11,332
30 Jul	7,480	9,638	10,915	8,033	15,440	13,196	7,808	9,826	7,210	2,921	11,380
31 Jul	7,502	9,650	10,915	8,049	15,448	13,198	7,814	10,351	7,210	2,946	11,471
1 Aug	7,516	9,652	10,916	8,049	15,530	13,200	7,835	10,369	7,210	2,950	12,045
2 Aug	7,516	9,653	10,933	8,049	15,587	13,201	7,841	10,369	7,210	2,993	12,074
3 Aug	7,519	9,656	10,935	8,057	15,691	13,419	7,885	10,371	7,210	3,243	12,084
4 Aug	7,572	9,656	10,935	8,077	15,732	13,425	8,174	10,378	7,211	3,259	12,122
5 Aug	7,579	9,661	10,965	8,195	15,746	13,438	8,208	10,452	7,211	3,280	12,160
6 Aug	7,584	9,665	10,965	8,199	15,789	13,447	8,215	10,611	7,211	4,150	12,173
7 Aug	7,596	9,666	10,965	8,199	15,789	13,450	8,288	10,632	7,212	4,165	12,199
8 Aug	7,615	9,680	10,965	8,200	15,789	13,466	8,303	10,635	7,212	4,170	12,205
9 Aug	7,635	9,680	10,965	8,207	15,809	13,647	8,375	10,635	7,212	4,178	12,213
10 Aug	7,637	9,682	10,985	8,208	15,833	13,698	8,394	10,646	7,212	4,179	12,216
11 Aug	7,643	9,682	10,987	8,211	15,837	13,710	8,413	10,646	7,212	4,185	12,216
12 Aug	7,644	9,682	10,987	8,240	15,844	13,720	8,423	10,653	7,212	4,201	12,228
13 Aug	7,647	9,683	10,988	8,242	15,848	13,730	8,448	10,655	7,213	4,228	12,230
14 Aug	7,658	9,698	10,993	8,414	15,851	13,739	8,458	10,765	7,213	4,252	12,241
15 Aug	7,659	9,709	10,993	8,452	15,858	13,749	8,465	10,775	7,213	4,270	12,241
16 Aug	7,663	9,710	10,994	8,453	15,859	13,751	8,470	10,789	7,213	4,272	12,243

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Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
17 Aug	7,668	9,720	10,995	8,453	15,893	13,753	8,512	10,926	7,213	4,273	12,243
18 Aug	7,674	9,739	11,024	8,454	15,936	13,754	8,526	10,961	7,213	4,274	12,243
19 Aug	7,683	9,751	11,251	8,455	15,947	13,761	8,536	11,010	7,213	4,274	12,243
20 Aug	7,689	9,755	11,254	8,455	15,955	13,763	8,550	11,024	7,213	4,274	12,243
21 Aug	7,693	9,761	11,263	8,460	15,957	13,764	8,553	11,044	7,213	4,275	12,243
22 Aug	7,700	9,761	11,274	8,460	15,962	13,772	8,554	11,053	7,213	4,278	12,243
23 Aug	7,701	9,764	11,290	8,464	15,972	13,776	8,556	11,062	7,213	4,278	12,243
24 Aug	7,703	9,766	11,292	8,465	15,998	13,791	8,559	11,068	7,213	4,278	12,243
25 Aug	7,706	9,766	11,369	8,465	16,001	13,801	8,560	11,069	7,214	4,278	12,244
26 Aug	7,708	9,769	11,561	8,465	16,003	13,813	8,563	11,075	7,214	4,278	12,266
27 Aug	7,716	9,769	11,684	8,466	16,013	13,817	8,578	11,085	7,214	4,278	12,267
28 Aug	7,716	9,771	11,795	8,466	16,013	13,838	8,584	11,099	7,214	4,278	12,267
29 Aug	7,728	9,771	11,801	8,466	16,023	13,842	8,586	11,125	7,214	4,278	12,268
30 Aug	7,731	9,771	11,806	8,466	16,024	13,845	8,587	11,130	7,214	4,279	12,289
31 Aug	7,731	9,772	11,816	8,467	16,024	13,845	8,588	11,137	7,214	4,279	12,290
1 Sep	7,731	9,772	11,823	8,467	16,049	13,850	8,593	11,137	7,216	4,279	12,290
2 Sep	7,731	9,774	11,904	8,467	16,050	13,852	8,595	11,144	7,216	4,279	12,290
3 Sep	7,732	9,775	11,950	8,467	16,064	13,853	8,599	11,157	7,216	4,279	12,290
4 Sep	7,733	9,779	11,955	8,467	16,071	13,864	8,604	11,180	7,216	4,279	12,290
5 Sep	7,734	9,780	11,973	8,469	16,077	13,882	8,608	11,187	7,216	4,279	12,290
6 Sep	7,734	9,780	11,973	8,470	16,142	13,886	8,612	11,206	7,216	4,279	12,290
7 Sep	7,736	9,780	11,973	8,470	16,160	13,887	8,613	11,206	7,216	4,280	12,291
8 Sep	7,739	9,780	11,975	8,471	16,168	13,887	8,618	11,209	7,217	4,281	12,293
9 Sep	7,743	9,780	11,979	8,471	16,175	13,900	8,621	11,229	7,217	4,281	12,294
10 Sep	7,743	9,781	11,979	8,472	16,178	13,905	8,624	11,235	7,217	4,281	12,295
11 Sep	7,745	9,781	11,980	8,474	16,179	13,905	8,626	11,236	7,217	4,281	12,295
12 Sep	7,747	9,781	11,982	8,478	16,179	13,947	8,627	11,238	7,218	4,281	12,296
13 Sep	7,747	9,783	11,982	8,479	16,180	13,961	8,628	11,241	7,218	4,281	12,296
14 Sep	7,747	9,785	11,982	8,479	16,180	13,961	8,631	11,243	7,218	4,281	12,296
15 Sep	7,748	9,787	11,982	8,481	16,180	13,967	8,641	11,249	7,218	4,281	12,297
16 Sep	7,749	9,787	11,982	8,486	16,180	13,969	8,647	11,256	7,218	4,281	12,297
17 Sep	7,750	9,787	11,982	8,490	16,180	13,972	8,654	11,256	7,218	4,281	12,297
18 Sep	7,751	9,788	11,982	8,500	16,183	13,972	8,658	11,256	7,218	4,281	12,297
19 Sep	7,751	9,788	11,982	8,521	16,186	13,974	8,660	11,259	7,218	4,283	12,297
20 Sep	7,753	9,788	11,982	8,528	16,186	13,974	8,669	11,260	7,221	4,283	12,297
21 Sep	7,753	9,788	11,982	8,530	16,186	13,974	8,671	11,561	7,221	4,283	12,297
22 Sep	7,754	9,788	11,982	8,558	16,187	13,976	8,671	11,569	7,221	4,283	12,297
23 Sep	7,754	9,788	11,982	8,561	16,187	13,976	8,676	11,577	7,221	4,283	12,297
24 Sep	7,754	9,788	11,982	8,564	16,187	13,976	8,676	11,580	7,221	4,283	12,297
25 Sep	7,755	9,788	11,982	8,565	16,187	13,976	8,676	11,583	7,222	4,283	12,297
26 Sep	7,756	9,788	11,982	8,565	16,187	13,976	8,682	11,583	7,222	4,283	12,297
27 Sep	7,757	9,788	11,982	8,565	16,189	13,976	8,689	11,583	7,222	4,284	12,297
28 Sep	7,757	9,788	11,982	8,565	16,189	13,976	8,692	11,584	7,222	4,284	12,297
29 Sep	7,757	9,788	11,982	8,565	16,189	13,976	8,693	11,584	7,222	4,284	12,297
30 Sep	7,757	9,788	11,982	8,565	16,189	13,976	8,697	11,584	7,222	4,284	12,297
Final	7,757	9,800	11,982	8,565	16,189	13,976	8,719	11,584	7,222	4,284	12,297

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

Appendix D7.—Saltery River sockeye salmon weir counts, 2009–2019.

Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
17 Jun	0	0	0	0	0	0	0	0	22	76	0
18 Jun	0	0	0	0	0	0	0	0	137	102	5
19 Jun	0	0	19	0	1,033	24	269	1,338	255	134	23
20 Jun	0	0	128	0	1,261	104	308	1,416	562	146	25
21 Jun	0	0	492	246	1,284	172	442	1,442	1,076	187	29
22 Jun	0	0	775	451	1,427	275	491	1,503	1,190	241	43
23 Jun	0	63	912	860	1,538	375	503	2,049	1,464	284	82
24 Jun	141	509	1,175	1,380	2,232	398	558	2,393	1,645	354	116
25 Jun	658	610	1,212	2,143	3,043	405	1,434	3,356	1,659	428	121
26 Jun	1,691	674	1,421	2,974	5,949	507	1,537	4,724	2,087	538	129
27 Jun	2,222	739	1,624	3,427	7,652	641	1,656	5,652	2,714	646	129
28 Jun	2,704	1212	2,103	4,024	8,889	760	1,732	6,022	2,797	711	143
29 Jun	2,950	1494	2,276	4,277	9,347	814	1,886	6,798	3,442	994	165
30 Jun	3,265	1546	2,426	4,466	10,773	993	1,968	8,500	3,737	1,071	196
1 Jul	3,413	1,586	2,520	4,847	11,807	1,002	2,118	11,015	4,200	1,290	247
2 Jul	3,744	1,607	3,404	5,198	12,292	1,082	2,472	11,552	6,049	1,295	281
3 Jul	4,230	1,673	4,184	5,695	12,915	1,225	2,494	12,040	7,788	1,322	309
4 Jul	4,384	2,693	4,492	6,020	13,596	1,279	2,870	12,537	8,234	1,382	374
5 Jul	4,744	2,770	6,146	6,283	14,651	1,944	3,283	13,101	8,690	1,389	492
6 Jul	5,204	3,651	7,318	6,345	14,964	3,009	5,691	13,898	9,752	1,394	620
7 Jul	6,796	3,933	7,715	6,895	15,422	4,182	7,049	14,350	9,999	1,567	766
8 Jul	8,371	4,033	7,869	7,241	15,940	4,877	7,380	14,947	10,191	1,704	814
9 Jul	9,653	4,855	8,036	7,414	17,253	5,734	7,734	15,671	10,556	1,938	890
10 Jul	10,847	5,799	8,208	7,432	17,876	6,251	8,179	16,341	10,816	2,025	933
11 Jul	11,217	6,236	8,430	7,950	18,281	6,735	8,320	17,125	11,189	2,272	1,211
12 Jul	11,623	6,489	9,417	8,287	19,333	7,088	8,894	18,018	11,334	2,617	1,737
13 Jul	12,210	7,009	9,961	9,397	20,229	7,730	10,170	19,362	12,307	3,146	1,939
14 Jul	13,077	8,083	12,371	10,058	21,366	8,597	11,233	20,049	13,217	3,465	2,044
15 Jul	14,032	8,815	13,554	10,665	21,794	11,169	11,946	20,339	14,231	4,616	2,609
16 Jul	14,266	9,584	13,771	11,529	22,461	12,819	13,682	21,492	15,477	5,909	3,054
17 Jul	14,711	10,574	14,027	12,086	23,068	14,188	15,228	22,948	15,713	6,582	3,225
18 Jul	15,433	11,562	14,385	12,675	24,227	16,948	16,320	24,616	16,531	7,256	3,313
19 Jul	16,590	13,034	14,756	13,023	25,853	17,342	18,068	25,957	17,901	8,816	4,907
20 Jul	17,824	14,535	14,982	14,743	26,380	18,424	19,472	28,871	19,114	9,371	6,726
21 Jul	20,978	14,702	15,408	16,160	26,927	18,599	22,058	31,163	19,775	10,024	7,058
22 Jul	21,233	15,250	16,557	17,121	27,733	19,004	24,016	34,333	21,364	10,731	7,534
23 Jul	21,663	15,990	17,542	17,561	28,132	21,048	25,120	35,511	22,933	11,290	8,539
24 Jul	24,096	16,834	18,149	17,985	29,354	22,335	25,835	39,793	23,663	12,195	9,368
25 Jul	27,757	16,905	19,499	19,246	30,078	22,987	26,322	42,098	26,334	12,890	10,595
26 Jul	29,507	17,234	20,625	19,376	31,352	23,354	28,478	43,629	28,004	13,351	11,023
27 Jul	30,357	17,565	21,855	20,450	32,086	24,129	30,423	45,356	29,071	14,223	11,226
28 Jul	32,099	19,874	23,445	21,304	32,456	24,281	31,706	47,346	30,769	14,512	11,333
29 Jul	34,439	20,901	23,781	21,595	32,826	25,342	33,652	51,517	31,339	15,048	11,796
30 Jul	35,915	23,219	25,361	22,360	33,271	25,824	34,657	52,588	32,970	15,259	12,196

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Date	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
31 Jul	37,543	23,247	26,640	22,687	33,470	26,470	35,164	55,632	33,947	16,413	13,125
1 Aug	38,444	23,297	26,916	23,517	33,519	26,553	35,273	57,431	34,710	16,824	13,681
2 Aug	39,966	23,458	27,741	23,890	33,914	27,189	37,448	57,867	35,796	18,342	14,489
3 Aug	40,649	23,876	27,853	24,980	35,518	27,449	39,355	57,867	36,729	18,966	15,310
4 Aug	42,421	24,287	28,065	25,774	35,952	28,100	40,422	57,867	37,724	19,567	15,995
5 Aug	43,129	25,332	28,379	26,281	36,097	28,494	42,335	57,867	38,485	19,990	16,215
6 Aug	43,564	25,781	29,251	26,522	39,697	29,110	42,468	57,867	38,604	20,847	16,434
7 Aug	44,034	26,466	29,747	26,683	39,697	29,307	42,468	57,867	38,915	20,988	16,803
8 Aug	44,628	26,798	29,838	27,100	39,697	30,772	42,468	57,867	39,315	21,319	17,215
9 Aug	45,207	26,809	29,858	27,188	39,697	31,772	42,468	57,867	39,315	21,562	17,373
10 Aug	45,655	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,269	17,497
11 Aug	45,791	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,307	17,587
12 Aug	46,591	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,326	17,611
13 Aug	46,591	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,415	17,651
14 Aug	46,591	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,438	17,683
15 Aug	46,591	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,845	22,183
Final	46,591	26,809	30,768	28,188	39,697	31,772	42,468	57,867	39,315	22,845	22,183

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

Appendix D8.—Pasagshak River sockeye salmon weir counts, 2011–2019.

Date	2011	2012	2013	2014	2015	2016	2017	2018	2019
17 Jun	152	44	401	17	0	2	0	6	0
18 Jun	159	48	450	49	35	57	0	6	0
19 Jun	159	144	467	49	37	115	0	6	0
20 Jun	159	144	467	93	54	125	0	6	0
21 Jun	172	198	485	93	63	129	0	6	0
22 Jun	177	297	485	93	71	179	0	6	0
23 Jun	219	297	1,042	93	72	191	50	6	0
24 Jun	219	302	1,829	124	74	191	50	6	0
25 Jun	220	428	2,485	135	74	209	50	27	0
26 Jun	228	450	3,007	135	75	209	58	27	0
27 Jun	230	643	3,378	140	75	212	236	84	100
28 Jun	1,615	693	3,380	141	75	212	449	84	100
29 Jun	2,171	703	3,989	164	341	373	457	134	100
30 Jun	2,402	714	4,149	165	436	440	457	149	100
1 Jul	2,481	788	4,214	165	580	1,004	472	168	127
2 Jul	2,828	788	4,236	172	610	1,428	480	221	289
3 Jul	2,947	789	4,245	260	610	1,628	666	221	289
4 Jul	3,130	860	4,288	268	618	1,703	666	221	289
5 Jul	3,295	874	4,293	268	619	1,794	826	221	289
6 Jul	3,305	1,337	4,299	268	619	1,794	885	221	327
7 Jul	3,352	1,581	4,303	268	619	1,804	906	221	327
8 Jul	3,394	1,597	4,971	268	619	2,314	1,270	221	331
9 Jul	3,999	1,620	5,129	280	619	2,443	1,343	221	453
10 Jul	4,441	1,640	5,170	299	629	2,718	1,354	252	455
11 Jul	4,495	1,981	5,364	299	629	3,084	1,453	328	649
12 Jul	6,219	2,019	5,403	350	679	3,084	1,870	344	680
13 Jul	6,464	2,022	5,487	361	680	3,084	2,108	428	718
14 Jul	6,908	2,022	5,519	410	680	3,085	2,304	479	783
15 Jul	7,267	2,062	5,520	463	682	3,211	2,435	642	1,153
16 Jul	7,392	2,172	6,350	468	682	3,211	2,531	671	1,516
17 Jul	7,712	2,207	6,721	548	682	3,352	2,634	830	1,749
18 Jul	8,159	2,612	7,069	626	730	3,352	2,835	830	1,932
19 Jul	8,223	2,965	7,179	678	731	3,383	3,239	830	2,139
20 Jul	8,323	3,061	7,308	766	731	4,047	3,770	830	2,262
21 Jul	8,339	3,064	7,792	766	731	4,244	4,363	830	2,408
22 Jul	8,339	3,064	8,014	820	731	4,244	4,744	856	2,447
23 Jul	8,384	3,065	8,140	924	731	4,244	5,071	980	2,571
24 Jul	8,423	3,231	9,093	933	840	4,566	5,347	1,039	2,769
25 Jul	8,575	3,332	9,367	979	840	4,596	5,645	1,042	2,826

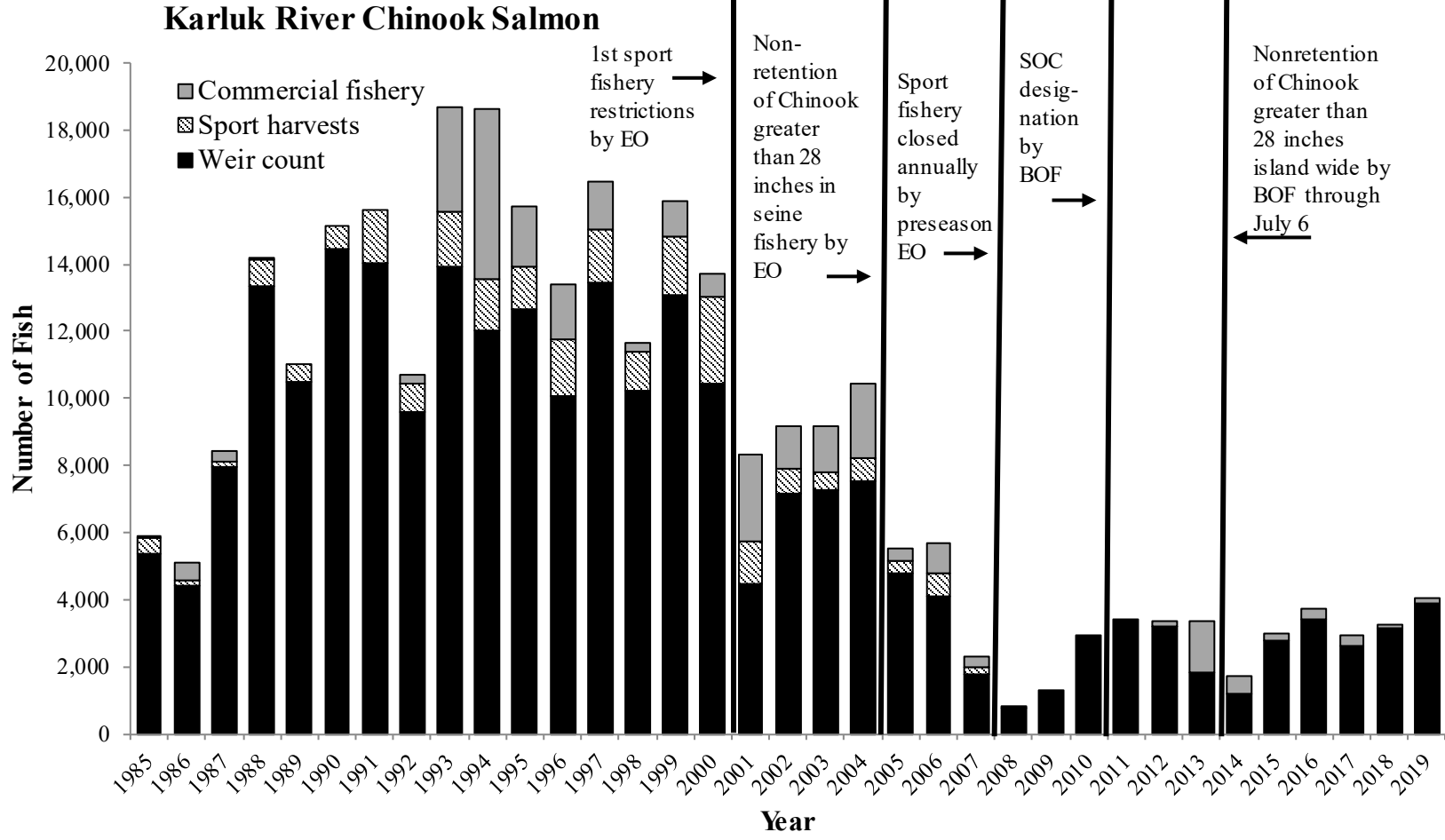
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Appendix D8.–Page 2 of 2.

Date	2011	2012	2013	2014	2015	2016	2017	2018	2019
26 Jul	8,889	3,338	9,778	982	840	4,798	5,705	1,047	2,830
27 Jul	9,026	3,456	9,899	998	840	4,837	5,802	1,106	2,877
28 Jul	9,915	3,467	10,002	998	1,009	4,938	6,563	1,192	2,920
29 Jul	10,144	3,476	10,138	1,185	1,013	5,336	6,987	1,206	2,992
30 Jul	11,150	3,891	10,280	1,185	1,013	5,368	7,290	1,260	3,432
31 Jul	11,153	3,987	10,283	1,201	1,103	5,373	7,581	1,292	3,669
1 Aug	11,227	4,096	10,320	1,201	1,134	5,373	7,611	1,292	3,739
2 Aug	11,400	4,380	10,324	1,201	1,215	5,401	7,615	1,447	3,938
3 Aug	11,690	4,413	10,776	1,201	1,221	5,404	7,659	1,494	3,999
4 Aug	11,690	4,413	10,913	1,201	1,317	5,404	7,837	1,529	4,067
5 Aug	11,720	4,413	10,921	1,203	1,317	5,542	8,247	1,531	4,146
6 Aug	11,862	4,430	11,021	1,288	1,327	5,542	8,736	1,626	4,243
7 Aug	11,897	4,430	11,421	1,309	1,333	5,542	8,946	1,638	4,250
8 Aug	11,954	4,505	11,421	1,413	1,339	5,542	9,146	1,686	4,259
9 Aug	12,241	4,513	11,421	1,480	1,411	5,732	9,243	1,688	4,260
10 Aug	12,288	4,514	11,421	1,482	1,481	5,909	9,332	1,750	4,260
11 Aug	12,358	4,514	11,421	1,550	1,496	6,092	9,676	1,809	4,275
12 Aug	12,448	4,514	11,421	1,582	1,505	6,092	9,900	1,898	4,396
13 Aug	12,553	4,515	11,421	1,582	1,600	6,092	10,080	1,948	4,434
14 Aug	12,632	4,515	11,421	1,582	1,626	6,302	10,695	1,984	4,481
15 Aug	12,745	4,585	11,421	1,582	1,627	6,323	10,875	2,019	4,487
Final	13,402	4,585	11,421	1,582	2,077	7,053	11,021	2,019	4,537

Source: ADF&G Division of Commercial Fisheries, Kodiak, 2019.

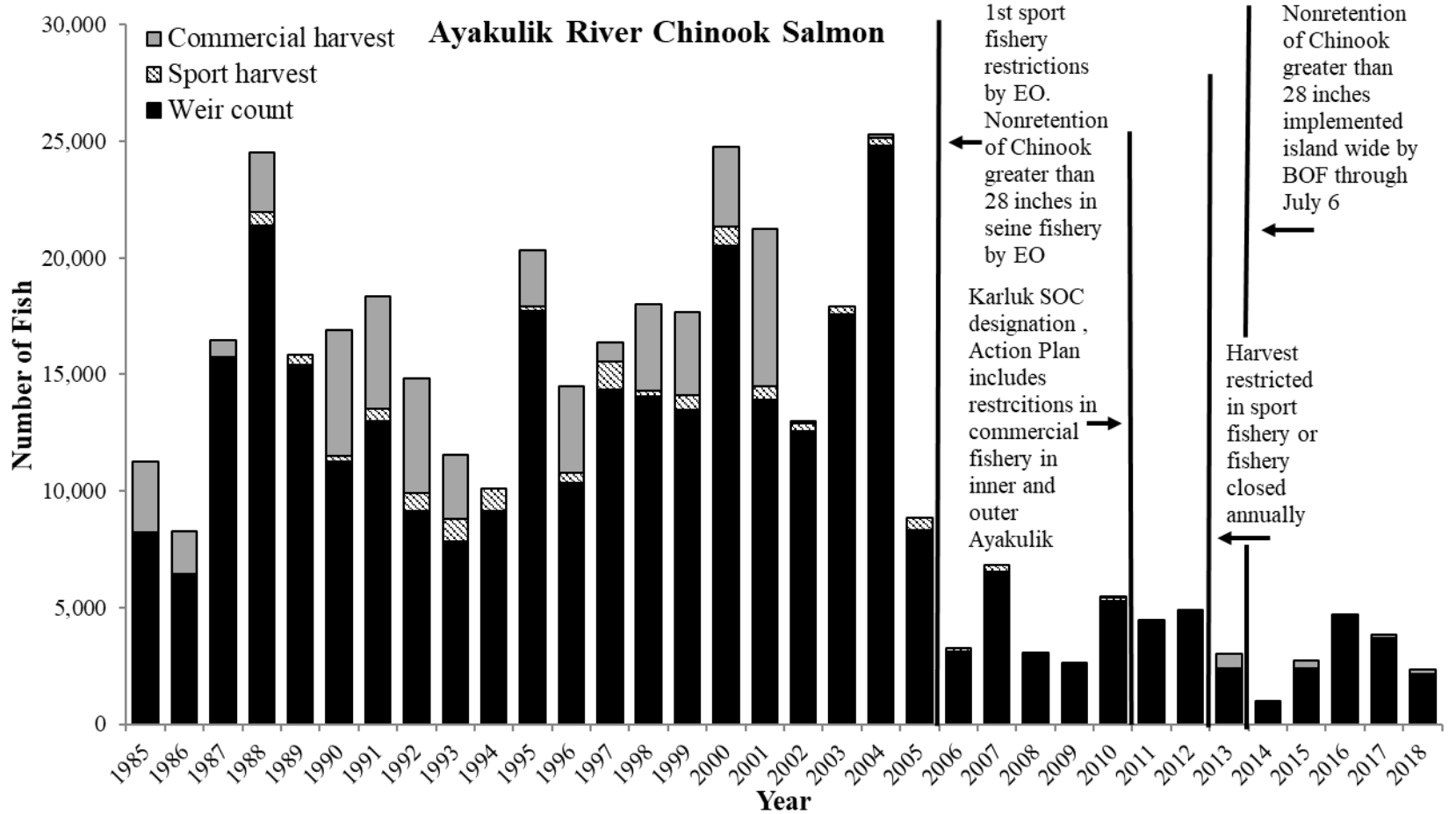
**APPENDIX E: KARLUK AND AYAKULIK RIVERS
CHINOOK SALMON WEIR COUNTS, SPORT AND
COMMERCIAL HARVESTS, AND BOF REGULATORY
ACTIONS, 1985–2019**



Appendix E1.–Karluk River Chinook salmon weir counts, sport and commercial harvests, and management history, 1985–2019.

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 November 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>; Schwarz et al. 2002; ADF&G Division of Commercial Fisheries, Kodiak 2019.

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, sport and commercial harvests, and management history, 1985–2019.

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 November 2019). Available from: <http://www.adfg.alaska.gov/sf/sportfishingsurvey>; Schwarz et al. 2002; ADF&G Division of Commercial Fisheries, Kodiak 2019.

Note: Sport harvests are typically unavailable for Ayakulik River through the SWHS and an estimate of 20 fish is used in years when harvest is allowed in the sport fishery. 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 king⁹ 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.

⁹ In the regulatory language, Chinook salmon are called “king” salmon, “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, 2009–2019.

Species and stage	Location	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Coho salmon fingerling												
	Dark L.	7,491	8,235	7,500	7,500	7,767	7,500	0	0	0	0	0
	Island L.	22,497	24,731	22,500	22,500	25,000	31,481	0	0	0	0	0
	Mayflower L.	6,836	7,150	6,500	6,500	6,488	6,500	0	0	0	0	0
	Mission L.	12,484	13,724	12,500	12,500	13,394	13,141	0	0	0	0	0
	Potatoe Patch L.	9,483	10,429	9,500	9,500	10,391	10,192	0	0	0	0	0
	Total	58,791	64,269	58,500	58,500	63,040	68,814	0	0	0	0	0
Coho salmon smolt												
	Island L.	0	0	0	0	0	0	0	30,056	50,137	0	30,085
	Mission	0	0	0	0	0	0	0	20,023	20,107	0	20,327
	Monashka Creek	0	0	45,216	34,765	28,020	0	0	99,582	75,021	46,132	74,768
	Pillar Creek	0	0	47,014	28,936	28,070	0	0	139,401	77,685	43,295	82,325
	Total	0	0	92,230	63,701	56,090	0	0	289,062	222,950	89,427	207,505
Chinook salmon smolt												
	Monashka Creek	79,000	82,000	39,000	39,279	51,207	70,000	73,272	0	0	0	0
	American River	51,000	80,000	10,000	39,740	50,072	70,000	75,272	0	26,561	26,561	0
	Olds River	52,000	80,000	10,000	39,300	40,000	70,000	75,044	0	45,015	45,015	0
	Salonie Creek	0	0	0	0	0	62,561	71,042	29,800	45,972	45,972	0
	Total	182,000	242,000	59,000	118,319	141,279	272,561	294,630	29,800	117,548	117,548	0

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

Appendix F2.–KRZ lakes rainbow trout stocking by location, 2009–2019.

Location	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Abercrombie	5,051	4,656	5,142	4,972	6,162	2,550	7,059	8,403	4,000	3,756	4,430
Aurel L.	4,095	3,964	4,169	3,975	3,464	0	6,400	7,563	3,700	3,820	0
Big–Kings Diner L.	4,914	4,824	5,003	4,185	4,915	2,747	8,847	10,084	5,065	4,626	5,405
Bull L.	2,730	2,685	2,779	2,643	3,038	3,312	4,471	5,294	2,500	2,285	2,826
Caroline L.	1,911	1,854	1,946	1,865	2,154	2,647	3,700	4,286	2,200	2,253	0
Cicely L.	1,638	1,587	1,668	1,826	1,138	2,794	4,050	4,538	2,350	3,000	0
Dark L.	0	0	5,003	4,879	6,123	2,535	8,824	10,588	5,240	4,626	5,488
Dolgoi L.	4,055	5,287	0	0	0	0	0	0	0	0	0
Dragonfly L.	2,184	2,110	2,224	2,215	2,215	1,471	4,353	5,294	3,000	2,285	2,826
Heitman L.	4,455	4,952	4,586	4,457	5,000	5,005	6,824	7,983	0	3,754	0
Horseshoe L.	1,365	1,326	1,390	1,336	1,408	0	2,824	6,723	1,700	1,554	1,843
Island L.	0	0	5,559	5,378	6,538	2,559	8,941	10,588	4,900	4,626	5,496
Jack L.	1,365	1,319	0	0	0	0	0	0	0	0	0
Jupiter L.	4,860	3,923	0	0	0	0	0	0	0	0	0
Lee L.	3,822	3,700	3,891	3,668	3,250	0	5,950	6,723	4,200	3,573	3,769
Lilly Pad L.	2,184	2,055	2,224	2,102	2,692	3,369	4,176	4,874	2,420	2,212	2,529
Long L.	3,658	3,556	6,580	4,220	4,398	4,371	7,100	8,403	3,876	3,946	0
Long Lagoon L.	0	0	0	2,451	3,571	4,731	0	0	0	0	0
Mosquito L.	0	0	3,335	1,576	1,490	2,191	2,800	1,681	0	0	0
Saturn L.	3,240	2,523	0	0	0	0	0	0	0	0	0
Tanignak L.	4,055	5,283	7,420	6,882	4,872	4,457	7,200	8,403	3,111	3,946	0
Twin L.	5,460	5,447	5,559	5,547	5,363	5,562	8,388	10,756	2,500	4,736	5,570
Total	61,042	61,051	68,478	64,177	67,791	50,301	101,907	122,184	50,762	54,998	40,182

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