Fishery Management Report No. 22-24

Sport Fisheries in the Bristol Bay Management Area, 2018–2022

by

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and

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November 2022

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

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

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

FISHERY MANAGEMENT REPORT NO. 22-24

SPORT FISHERIES IN THE BRISTOL BAY MANAGEMENT AREA, 2018–2022

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ABSTRACT

This report summarizes the major sport fisheries in the Bristol Bay Management Area during 2018, 2019, 2020, and 2021. Fisheries include Chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), and sockeye salmon (*O. nerka*); rainbow trout (*O. mykiss*), Arctic char (*Salvelinus alpinus*), Dolly Varden (*Salvelinus malma*), Arctic grayling (*Thymallus arcticus*), and northern pike (*Esox lucius*). Significant sport fisheries are described, and estimates of sport fishing effort, catch, and harvest, and salmon escapements are provided. Overviews of the management for each fishery are provided, including sport fishing regulations and management plans.

Keywords: Bristol Bay Sport Fish Management Area, Alaska Board of Fisheries, management plan, Nushagak River, Togiak River, Naknek River, rainbow trout, *Oncorhynchus mykiss*, Chinook salmon, *Oncorhynchus tshawytscha*, coho salmon, *Oncorhynchus kisutch*, sockeye salmon, *Oncorhynchus nerka*

INTRODUCTION

MANAGEMENT AREA DESCRIPTION

The Bristol Bay Sport Fish Management Area (BBMA) is part of the Southcentral Region (Region II) of the Alaska Department of Fish and Game, Division of Sport Fish. BBMA includes all waters and drainages flowing into Bristol Bay between Cape Newenham in the northwest to Cape Menshikof in the southeast (Figure 1).

The sport fisheries of this large region are divided into 3 geographic sections for convenience: Eastern, Central, and Western (Figure 1). The section boundaries, which encompass 1 or more adjacent drainages, are located somewhat arbitrarily. However, for some species, particularly rainbow trout, the section boundaries delineate distinct differences in the character of the fisheries or the biology of local stocks.

The Eastern Section includes all drainages from the Kvichak River to the area's southern boundary at Cape Menshikof (Figure 1). Major federal jurisdictions in the Eastern Section include the Lake Clark National Park and Preserve, Katmai National Park and Preserve, and the Becharof National Wildlife Refuge. The Central Section is composed of the drainages entering Nushagak Bay and is dominated by the Nushagak River and Wood River systems. The Wood–Tikchik State Park falls within the Central Section boundary. The Western Section includes all drainages from Cape Constantine on the Nushagak Peninsula west to Cape Newenham and contains portions of the Togiak National Wildlife Refuge. The Togiak River is the major drainage within the section.

Major communities located within the area include Togiak, Dillingham, Iliamna, King Salmon, Naknek, Egegik, and Pilot Point. The management area is not linked to the State of Alaska highway system, although local roads provide sport anglers with limited access near the major communities. Float-equipped aircraft, and to a lesser extent boats, are commonly used to access the area's many remote fisheries.

Although the Alaska Department of Fish and Game (ADF&G) has management jurisdiction for sport fisheries in the BBMA, the United States Fish and Wildlife Service (USFWS), National Park Service (NPS), and United States Geological Survey (USGS) manage federal public lands and conduct research in the area.

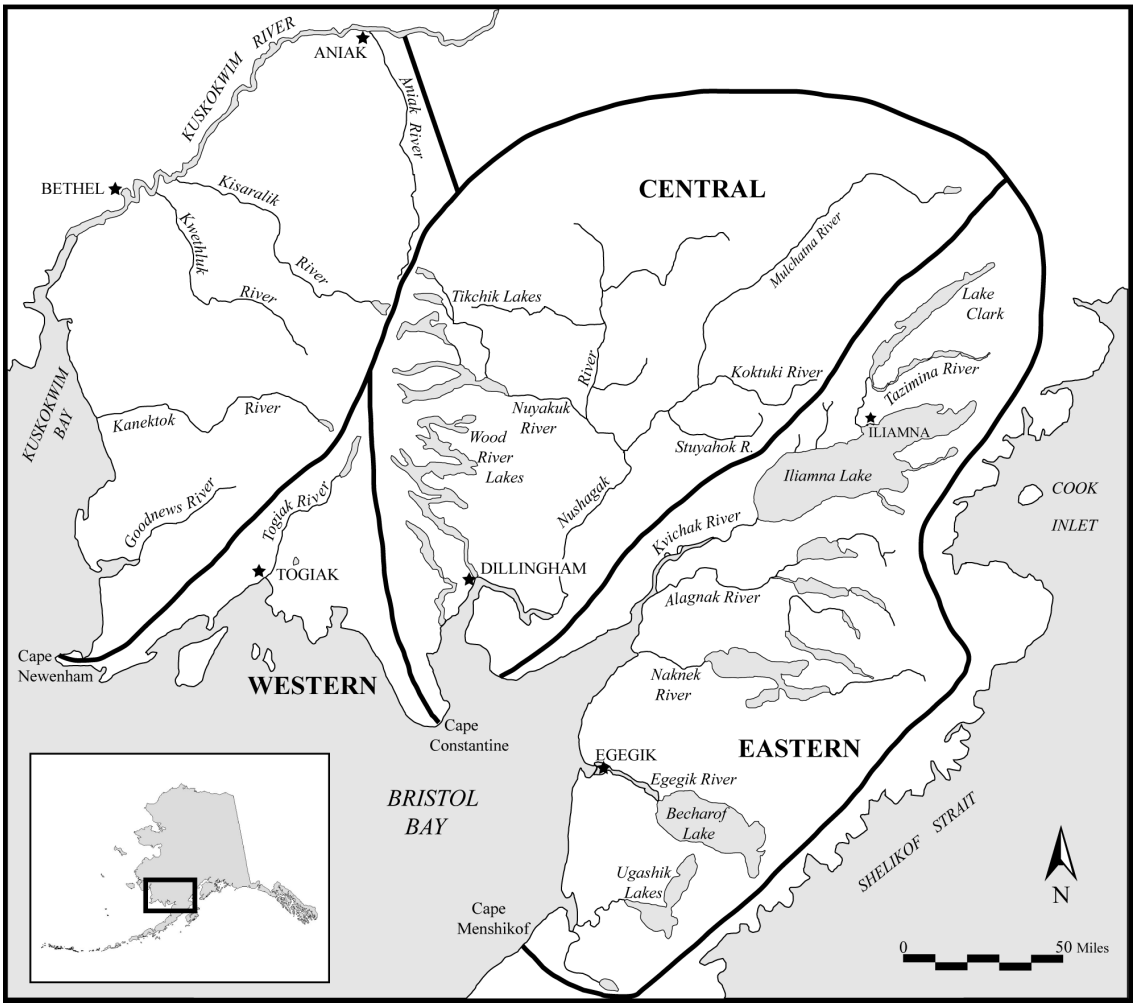

Figure 1.–Bristol Bay Sport Fish Management Area showing the Eastern, Central, and Western sections.

INFORMATION SOURCES FOR MANAGEMENT

ADF&G utilizes several sources of information to manage fisheries in the BBMA. One of the primary means for monitoring sport fishing effort, catch, and harvest is a mail survey by ADF&G called the Statewide Harvest Survey (SWHS[1]; Mills 1979–1980, 1981a, 1981b, 1982–1991, 1992a, 1992b, 1993, 1994; Howe et al. 1995, 1996). This annual survey began in 1977 and estimates the number of angler-days of sport fishing effort expended by anglers in Alaskan waters (residents as well as nonresidents) and harvest by species. The survey provides estimates of both effort and harvest by general location, but it is not designed to provide estimates of effort directed toward a single species. Beginning in 1990, the survey was modified to include estimates of catch (release plus harvest) by site. The BBMA includes portions of the SWHS Area R (the Naknek River Drainage–Alaska Peninsula Area excluding the saltwater fisheries and freshwater fisheries of Cold Bay and the Aleutian Islands), and the entirety of Areas S (Kvichak Area) and Area T (Nushagak Area). SWHS estimates were available through 2021 for this report.

[1] Hereafter, "SWHS" will refer to these references for 1977–1995 data and to the Alaska Sport Fishing Survey database [Internet] Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish for data 1996–present. Recent SWHS estimates are available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

In addition to the SWHS, ADF&G Division of Sport Fish (SF) operated a freshwater logbook program from 2006 to 2018, which required sport fishing guide businesses to record freshwater sport fishing effort, catch, and harvest by commercially guided clients (Sigurdsson and Powers 2009–2014; ADF&G freshwater logbook database). This program was discontinued after 2018; this report presents estimates made available from 2007 through 2016.

Creel surveys have been selectively used to ground truth the SWHS and the freshwater logbook program for fisheries of interest or for fisheries that require more detailed information or inseason management. For BBMA, these include creels surveys of the Alagnak River (Brookover 1989; Dunaway 1990a, 1994; Naughton and Gryska 2000; Collins and Dye 2003), the Kvichak River (Dunaway and Fleischman 1996b), Lower Talarik Creek (Russell 1977; Minard 1990; Minard et al. 1992; and unpublished data[2]), and the Nushagak River (Dye 2012).

ADF&G also conducts stock assessment projects. For example, on the Nushagak and Mulchatna Rivers, significant monitoring and stock assessment projects have been conducted intermittently since 1986 (Minard 1987; Minard and Brookover 1988a; Dunaway et al. 1991; Dunaway and Bingham 1992; Dunaway and Fleischman 1995; Minard et al. 1998; Dye 2005; Cappiello and Dye 2006; Dye 2012; Borden and Dye *In prep*).

Commercial and subsistence harvests of salmon are monitored and reported by the ADF&G Division of Commercial Fisheries (Elison et al. 2022). For larger fisheries, forecasts of each season's run are provided by the Division of Commercial Fisheries and are reported in a statewide salmon forecast summary (Brenner et al. 2022). Commercial and subsistence harvest estimates were available through 2021 for this report

Escapements of some salmon stocks are monitored by counting towers, sonar, or aerial index surveys. For example, in the Nushagak River, escapement is estimated by sonar as the salmon migrate upriver (Elison et al. 2022). Historically, aerial index surveys of Chinook salmon (*Oncorhynchus tshawytscha*) in the drainages of the Nushagak, Togiak, Alagnak, and Naknek Rivers were also conducted. Due to budget shortfalls, most of these aerial index surveys were suspended from 2009 through 2022.

SPORT FISHING EFFORT AND HARVEST

The BBMA contains some of the most productive waters in the world for Pacific salmon (*Oncorhynchus* spp.), rainbow trout (*O. mykiss*), Arctic grayling (*Thymallus arcticus*), Arctic char (*Salvelinus alpinus*), and Dolly Varden (*S. malma*). The area has been acclaimed for its sport fisheries since the 1930s. Total sport fishing effort in the BBMA increased from about 25,000 angler-days in 1977 to a peak of more than 116,000 angler-days in 1995 (SWHS). From 2016 through 2020, total annual effort in the BBMA averaged 70,073 angler-days, and effort during 2021 was 74,243 angler-days (Table 1). From 2012 through 2016, guided sport fishing effort averaged 33,091 angler-days (Table 2). Based on recent trends and current economic stability, sport fishing effort is expected to stabilize or slowly increase during the foreseeable future.

[2] Memos summarizing the Lower Talarik Creek rainbow trout projects, located at Alaska Department of Fish and Game, Division of Sport Fish, Dillingham are as follows: 1997 data from J. Dye, dated October 15, 1997, Dillingham; 1998 data from C. Schwanke, dated December 1, 1998; 1999 data from J. Dye to Bob Clark, dated November 15, 2000; 2000 data from J. Dye and M. Cavin to Bob Clark, dated November 15, 2000; 2001 data from J. Dye to Bob Clark, dated January 2002; 2003 data from C. Collins to James Hasbrouck, dated August 12, 2004; 2004 data from T. Jaecks to James Hasbrouck, dated January 23, 2005.

Table 1.–Sport fishing effort in angler-days by section and drainage, Bristol Bay Management Area, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Naknek River	14,465	12,704	12,723	16,202	14,621	15,813	14,851	14,279	13,973	7,850	13,353	13,756
Brooks River	4,227	3,607	3,426	3,696	2,265	2,994	2,326	2,125	1,695	1,694	2,167	2,186
Kvichak River	6,045	5,313	4,080	4,132	3,767	4,850	4,227	3,607	3,254	2,863	3,760	4,584
Copper River	2,246	2,625	3,082	3,424	2,269	2,564	2,653	1,979	1,997	1,475	2,134	2,367
Alagnak River	5,669	5,039	4,782	6,013	6,908	5,668	7,001	9,550	6,095	5,242	6,711	7,356
Newhalen River	1,048	540	1,498	429	4,033	2,049	2,860	974	3,911	854	2,130	1,611
Lake Clark	1,586	965	3,193	3,336	3,827	3,814	3,831	3,132	2,718	955	2,890	3,421
Other	16,182	12,417	10,745	12,757	10,310	11,704	11,662	13,564	10,564	10,972	11,693	13,305
Subtotal[a]	51,468	43,148	43,529	49,989	48,000	49,456	49,411	49,210	44,207	31,905	44,838	48,586
Central												
Nushagak River	11,329	14,973	16,082	17,576	13,766	17,737	13,299	13,705	12,292	3,723	12,151	11,917
Mulchatna River	1,548	1,573	1,415	1,338	2,949	1,169	1,806	1,841	4,595	837	2,050	948
Agulowak River	2,065	1,136	1,176	1,991	1,346	935	1,660	865	1,201	1,025	1,137	725
Agulukpak River	2,480	738	689	796	678	1,131	1,026	599	389	159	661	668
Wood River Lakes[b]	9,146	2,953	7,988	6,665	3,683	2,434	3,754	4,065	3,301	2,230	3,157	2,992
Tikchik–Nuyakuk	4,255	1,353	1,485	2,958	1,624	636	3,030	3,052	1,283	342	1,669	1,876
Other	629	1,087	619	397	691	237	645	424	270	108	337	1,536
Subtotal[a]	31,452	23,813	29,454	31,721	24,737	24,279	25,220	24,551	23,331	8,424	21,161	20,662
Western												
Togiak River	4,326	9,526	3,170	8,098	4,129	3,159	4,960	3,803	3,188	2,155	3,453	3,688
Other	1,094	415	439	237	533	348	1,510	969	279	0	621	1,307
Subtotal[a]	5,420	9,941	3,609	8,335	4,662	3,507	6,470	4,772	3,467	2,155	4,074	4,995
Total	88,340	76,902	76,592	90,045	77,399	77,242	81,101	78,533	71,005	42,484	70,073	74,243

Source: Estimates from Alaska Statewide Harvest Survey (SWHS) were obtained from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: ADF&G, Division of Sport Fish (cited October 16, 2022), http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1979–1980, 1981a, 1981b, 1982–1994) and Howe et al. (1995, 1996).

Note: "Angler-day" is the time spent fishing by 1 person for any part of a day.

[a] Subtotals of averages may not be the sum of the drainages because information for some drainages is not available for some years.

[b] Wood River Lakes includes Lake Nunavaugaluk through 1998. Prior to 1997, Agulowak and Agulukpak Rivers were also included in Wood River Lakes.

Table 2.–Total guided sport fishing effort in angler-days in selected waters of the Bristol Bay Management Area, 2007–2016.

Drainage	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2012–2016
Ugashik River	434	339	216	302	406	285	298	369	335	284	314
Naknek River	3,993	4,273	3,923	3,160	4,162	3,444	3,784	3,814	4,039	4,188	3,854
Brooks River	858	833	664	751	1,090	1,155	1,021	1,051	952	843	1,004
Alagnak River	4,732	4,152	3,057	2,809	2,954	2,462	2,780	2,703	3,319	3,019	2,857
Kvichak River	1,927	2,218	1,585	2,538	1,451	1,030	988	1,598	1,798	1,907	1,464
Newhalen River	254	314	120	159	46	220	186	253	373	410	288
Lower Talarik Creek	123	143	101	129	123	151	116	201	175	217	172
Nushagak River downstream of Mulchatna River	7,632	7,738	5,539	3,920	4,056	6,208	6,799	7,297	8,185	7,334	7,165
Nushagak River upstream of Mulchatna River	715	330	100	630	732	544	601	731	773	723	674
Togiak River	2,211	1,818	1,223	873	1,094	1,429	1,470	1,924	1,518	1,824	1,633
All Bristol Bay drainages	38,573	37,879	29,906	26,739	29,658	29,373	30,841	34,741	35,274	35,227	33,091

Source: ADF&G freshwater logbook database; Sigurdsson and Powers (2009–2014).

Historically, more than 60% (1977–2006 average) of the sport fishing effort has occurred in the Eastern Section of the BBMA (Figure 2). Effort is still predominantly in the Eastern Section and the percentage has increased slightly to an average of 64% in recent years (2016–2020; Figure 2). The Central Section typically accounts for the second largest portion of effort, followed by the Western Section. Distribution of effort among sections during 2021 was similar to other recent seasons (Figure 2).

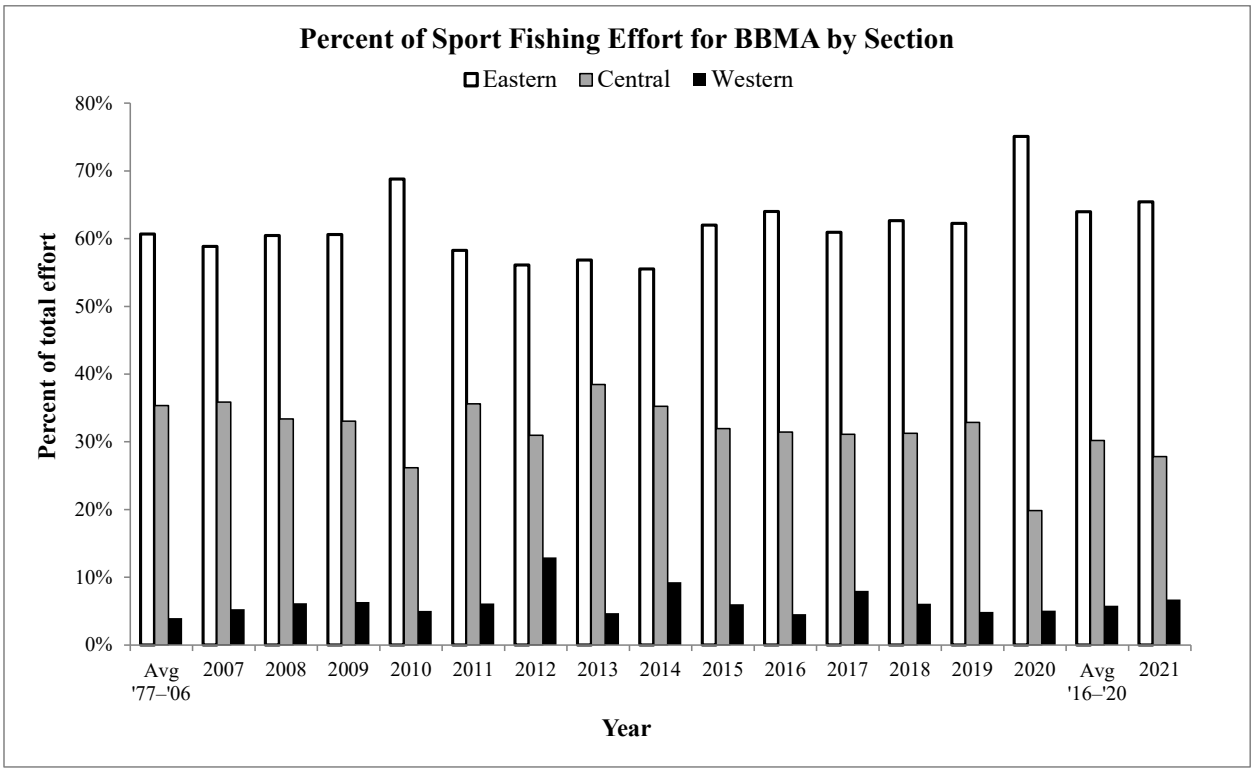

Figure 2.–Percent of total sport fishing effort by section for the Bristol Bay Management Area, 2007–2021, including 1977–2006 and 2016–2020 averages.

Source: Calculated from Alaska Statewide Harvest Survey (SWHS) estimates obtained from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: ADF&G, Division of Sport Fish (cited October 16, 2022), http://www.adfg.alaska.gov/sf/sportfishingsurvey/ and prior data from Mills (1979–1980, 1981a, 1981b, 1982–1994) and Howe et al. (1995, 1996).

Sockeye salmon (*O. nerka*), Chinook salmon (*O. tshawytscha*; referred to as "king salmon" in regulatory language), and coho salmon (*O. kisutch*) are the most harvested species in the BBMA, with less harvest of chum (*O. keta*) and pink (*O.gorbuscha*) salmon, Dolly Varden, Arctic char, Arctic grayling, and rainbow trout taken annually (Tables 3 and 4). It is likely the apparent decline in harvests of nonsalmon species is due in part to the accepted catch-and-release ethic among sport anglers as well as bag limit reductions for Dolly Varden and Arctic char, northern pike (*Esox lucius*), and Arctic grayling adopted by the Alaska Board of Fisheries (BOF) in 1997, 2001, and 2006.

Table 3.–Numbers of fish harvested by species in sport fisheries in the Bristol Bay Management Area, 2011–2021.

Species	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Sockeye salmon	14,068	14,341	13,539	14,866	18,837	15,535	23,500	19,696	19,052	16,418	18,840	33,052
Chinook salmon	10,412	10,009	9,929	10,745	9,578	11,873	9,844	12,806	9,866	3,138	9,505	5,873
Coho salmon	13,499	16,722	12,380	20,816	18,145	14,178	19,794	24,725	16,832	9,084	16,923	13,480
Dolly Varden/ Arctic char	2,594	1,470	1,679	2,138	2,602	1,588	1,282	1,006	1,379	656	1,182	2,177
Rainbow trout	1,961	652	323	329	1,025	694	498	865	520	647	645	406
Arctic grayling	999	809	640	802	1,243	827	790	734	784	90	645	555
Pink salmon	79	1,430	124	1,082	60	849	101	77	0	61	218	745
Lake trout	1,370	188	719	598	736	542	411	238	349	50	318	55
Chum salmon	1,267	1,497	2,946	1,348	939	1,412	1,746	1,467	2,007	17	1,330	728
Northern pike	780	442	917	671	869	216	409	202	745	160	346	765
Total	47,029	47,560	43,196	53,395	54,034	47,714	58,375	61,816	51,534	30,321	49,952	57,836

Source: Estimates from Alaska Statewide Harvest Survey (SWHS) were obtained from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: ADF&G, Division of Sport Fish (cited October 16, 2022), http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1979–1980, 1981a, 1981b, 1982–1994) and Howe et al. (1995, 1996).

Table 4.–Total guided sport fishing harvest by species in selected waters of the Bristol Bay Management Area, 2007–2016.

Drainage	Species	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2012–2016
Ugashik River												
	Chinook salmon	4	0	4	6	1	1	2	2	0	0	1
	Coho salmon	190	73	97	58	48	84	112	124	58	114	98
	Sockeye salmon	25	1	15	3	9	2	24	7	0	20	11
	Rainbow trout	0	0	0	0	0	0	0	0	0	0	0
Naknek River												
	Chinook salmon	910	790	661	469	608	608	768	642	622	898	708
	Coho salmon	1,891	3,081	2,125	960	1,880	1,819	2,014	2,232	1,682	1,520	1,853
	Sockeye salmon	2,656	2,513	1,980	2,142	2,068	2,109	2,505	2,376	3,651	2,745	2,677
	Rainbow trout	52	12	24	13	9	21	32	31	21	3	22
Brooks River												
	Chinook salmon	5	0	0	1	0	0	2	0	0	1	1
	Coho salmon	0	1	3	0	0	0	0	0	0	0	0
	Sockeye salmon	21	10	8	8	4	1	18	0	5	0	5
	Rainbow trout	67	0	0	5	6	7	40	0	0	0	9
Alagnak River												
	Chinook salmon	540	308	150	254	345	290	284	349	410	229	312
	Coho salmon	601	663	558	609	442	493	849	1,326	864	848	876
	Sockeye salmon	3,903	3,787	2,494	2,522	2,686	2,182	1,686	1,430	3,012	2,421	2,146
	Rainbow trout	322	13	7	14	3	3	17	0	3	1	5
Kvichak River												
	Chinook salmon	4	66	7	3	1	0	0	0	20	0	4
	Coho salmon	260	357	335	599	254	194	139	170	210	224	187
	Sockeye salmon	1,446	2,267	1,319	2,156	1,476	1,255	1,049	1,341	1,907	1,934	1,497
	Rainbow trout	141	29	12	39	13	4	2	7	0	1	3
Newhalen River												
	Chinook salmon	0	0	1	0	0	8	0	0	0	0	2
	Coho salmon	2	3	16	10	4	9	64	34	11	34	30
	Sockeye salmon	459	1,099	392	533	167	663	499	515	975	1,131	757
	Rainbow trout	0	0	0	0	0	6	0	0	0	0	1

-continued-

Table 4.–Page 2 of 2.

Drainage	Species	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2012–2016
Lower Talarik Creek												
	Chinook salmon	0	0	0	0	0	0	0	0	0	0	0
	Coho salmon	0	5	9	32	2	14	3	0	2	0	4
	Sockeye salmon	0	0	0	6	12	65	11	8	0	6	18
	Rainbow trout	0	0	0	0	0	0	0	0	0	0	0
Nushagak River and Mulchatna River												
	Chinook salmon	4,324	4,621	3,030	1,567	2,140	3,827	3,823	4,095	4,613	4,273	4,126
	Coho salmon	1,159	2,135	1,704	1,723	1,723	1,993	2,993	1,823	3,194	1,664	2,333
	Sockeye salmon	89	264	29	53	81	139	388	239	315	200	256
	Rainbow trout	216	24	2	19	12	9	16	10	23	16	15
Togiak River												
	Chinook salmon	1,078	685	539	477	455	521	543	841	515	728	630
	Coho salmon	1,353	1,945	887	597	878	1,407	1,603	2,142	2,064	2,447	1,933
	Sockeye salmon	140	269	44	2	22	70	28	32	77	64	54
	Rainbow trout	13	10	0	9	0	1	3	4	0	4	2
All Bristol Bay drainages												
	Chinook salmon	6,865	6,470	4,392	2,777	3,550	5,255	5,422	5,929	6,180	6,129	5,783
	Coho salmon	5,456	8,263	5,734	4,588	5,231	6,013	7,777	7,851	8,085	6,851	7,315
	Sockeye salmon	8,739	10,210	6,281	7,425	6,525	6,486	6,208	5,948	9,942	8,521	7,421
	Rainbow trout	811	88	45	99	43	51	110	52	47	25	57

Source: ADF&G freshwater logbook database.

MANAGEMENT PLANS AND POLICIES

The following section is a list of the various management plans adopted or implemented by the BOF that guide ADF&G's management of Bristol Bay sport fisheries. For those plans specifically adopted as a regulation, the Alaska Administrative Code (AAC) is provided. Additional information is provided later in the pertinent fishery sections. There are other management plans addressing commercial salmon fisheries that do not directly address sport fisheries management but may affect sport fisheries to some extent. These plans are more fully discussed under the specific sport fishery affected.

Nushagak–Mulchatna King Salmon Management Plan

Management of the subsistence, commercial, and sport fisheries for Nushagak Chinook salmon stocks is governed by the *Nushagak–Mulchatna King Salmon Management Plan* (5 AAC 06.361). The plan was first adopted by the BOF in January 1992 and most recently modified during the December 2018 meeting.

Nushagak River Coho Salmon Management Plan

Management of the subsistence, commercial, and sport fisheries for Nushagak coho salmon stocks is governed by the *Nushagak River Coho Salmon Management Plan* (5 AAC 06.368). The plan was first adopted by the BOF during the December 1995 meeting and was updated at the December 2015 meeting. The purpose of this plan is to provide management guidelines to ensure an adequate spawning escapement of coho salmon into the Nushagak River system.

Kvichak River Drainage Sockeye Salmon Management Plan

To ensure biological spawning escapement requirements of sockeye salmon into the Kvichak River drainage, the BOF adopted the *Kvichak River Drainage Sockeye Salmon Management Plan* (5 AAC 67.025) during the January 2001 meeting. The impetus for this plan was the poor sockeye salmon runs of 1999 and 2000. This is an inriver plan that addresses sport and subsistence fisheries only.

Southwest Alaska Rainbow Trout Management Plan

In February 1990, the BOF overhauled nearly all regulations for rainbow trout fisheries in the 2 management areas now known as the Bristol Bay Management Area and the Kuskokwim–Goodnews Sport Fish Management Area. The new regulations implemented the *Southwest Alaska Rainbow Trout Management Plan*[3] without adopting the plan's language into regulation. However, the BOF recognized the plan as a guiding policy to achieve and maintain a more orderly and comprehensive mix of rainbow trout angling opportunities throughout the 2 areas. The overriding philosophy of the *Southwest Alaska Rainbow Trout Management Plan* is one of conservative wild stock management. In 1998, the BOF adopted *Criteria for Establishing Special Management Areas for Trout* (5 AAC 75.013; subsequently amended as 5 AAC 75.210). This regulation embodies most of the original criteria that are still used in the *Southwest Alaska Rainbow Trout Management Plan*.

[3] ADF&G. 1990. Southwest Alaska rainbow trout management plan. Located at: Alaska Department of Fish and Game, Division of Sport Fish, 333 Raspberry Road, Anchorage.

Statewide Policy and Plan for Management of Sustainable Wild Rainbow Trout Fisheries

The BOF adopted the *Policy for the Management of Sustainable Wild Trout Fisheries* (5 AAC 75.222), and *Statewide Management Standards for Wild Trout* (5 AAC 75.220) in March 2003. The policy provides principles and criteria to ensure conservation, sustainability, and optimal sustained yield and benefits for wild trout, and provides direction to the BOF and ADF&G as to how those principles and criteria are to be applied in the regulatory process. The plan ensures conservative management of wild trout fisheries while recognizing existing plans and policies that guide management of wild trout on a regional basis.

In most areas of the state, conservative management for wild rainbow trout, cutthroat trout, and steelhead, in combination, means a bag and possession limit of 2 fish, of which only 1 may be 20 inches or greater in length, with an annual limit of 2 fish 20 inches or greater in length. The plan recognizes existing plans and policies that guide management of wild trout by region and allows the BOF to adopt regulations that deviate from the plans as necessary to address sustainability or optimal sustained yield issues, establish special management areas, or liberalize harvest opportunities in specific water bodies under other criteria.

Sustainable Salmon Fisheries Policy for Alaska

In March 2000, the BOF adopted the *Policy for the Management of Sustainable Salmon Fisheries* (5 AAC 39.222), which became an integral part of the BOF's yearly review of the state's salmon fisheries. The policy contains 5 fundamental principles for sustainable salmon management, each with criteria that are to be used by ADF&G and the BOF to evaluate the health of the state's salmon fisheries and to address any conservation issues and problems as they arise. The 5 fundamental principles of the policy are as follows:

1) Wild salmon populations and their habitats must be protected to maintain resource productivity.
2) Fisheries shall be managed to allow escapements within ranges necessary to conserve and sustain potential salmon production and maintain normal ecosystem functioning.
3) Effective salmon management systems should be established and applied to regulate human activities that affect salmon.
4) Public support and involvement for sustained use and protection of salmon resources must be maintained.
5) In the face of uncertainty, salmon stocks, fisheries, artificial propagation, and essential habitats must be managed conservatively.

The policy requires that ADF&G describe the extent to which salmon fisheries and their habitats conform to explicit principles and criteria. In response to these reports, the BOF must review fishery management plans or create new ones. If a salmon stock of concern is identified in this review, the management plan will contain measures to address the concern, including needed research, habitat improvements, or new regulations.

EMERGENCY ORDERS ISSUED IN 2019 THROUGH 2022

There were 7 emergency orders issued in 2019, 2 in 2020, 5 in 2021, and 6 in 2022 (Table 5).

Table 5.–Emergency orders for 2019–2022.

Year	Emergency order	Date issued	Effective		
			Time	Day	Date
2019					
	2-KS-5-27-19	1 Jul	12:01 AM	Wednesday	3 Jul
	2-RS-5-31-19	3 Jul	12:01 AM	Friday	5 Jul
	2-RS-5-32-19	3 Jul	12:01 AM	Friday	5 Jul
	2-RS-5-33-19	8 Jul	12:01 AM	Wednesday	10 Jul
	2-KS-5-34-19	8 Jul	12:01 AM	Wednesday	10 Jul
	2-RS-5-35-19	15 Jul	12:01 AM	Tuesday	16 Jul
	2-RS-5-40-19	25 Jul	12:01 AM	Saturday	27 Jul
2020					
	2-KS-5-31-20	8 Jul	12:01 AM	Friday	10 Jul
	2-RS-5-32-20	9 Jul	12:01 AM	Saturday	11 Jul
2021					
	2-KS-5-30-21	24 Jun	12:01 AM	Sunday	27 Jun
	2-RS-5-32-21	29 Jun	12:01 AM	Wednesday	30 Jun
	2-RS-5-36-21	6 Jul	12:01 AM	Wednesday	7 Jul
	2-RS-5-37-21	6 Jul	12:01 AM	Wednesday	7 Jul
	2-RS-5-40-21	12 Jul	12:01 AM	Tuesday	13 Jul
2022					
	2-RS-5-39-22	27 Jun	12:01 AM	Wednesday	29 Jun
	2-RS-5-40-22	29 Jun	12:01 AM	Friday	1 Jul
	2-KS-5-47-22	5 Jul	12:01 AM	Thursday	7 Jul
	2-RS-5-49-22	7 Jul	12:01 AM	Saturday	9 Jul
	2-KS-5-51-22	11 Jul	12:01 AM	Wednesday	13 Jul
	2-KS-5-57-22	19 Jul	12:01 AM	Thursday	21 Jul

Note: All emergency orders expired on 31 July (for Chinook salmon) or 31 December (all other species) at 11:59 PM of the year of issue unless superseded by a subsequent emergency order.

2019

EMERGENCY ORDER 2-KS-5-27-19 reduced the bag, possession, and annual limits for Chinook salmon 20 inches or greater in length in the waters of the Nushagak–Mulchatna drainage from 2 per day, only 1 of which may be 28 inches or greater in length, with an annual limit of 4, to 1 per day, 20 inches or greater in length, with an annual limit of 2.

Justification: The passage of Chinook salmon was projected to fall below the escapement goal range.

EMERGENCY ORDER 2-RS-5-31-19 increased the bag and possession limits for sockeye salmon from 5 to 10 fish in all waters of the Nushagak–Mulchatna River drainage, excluding the Wood River drainage. The bag limit for other salmon, except Chinook and sockeye salmon, remained at 5 per day, 5 in possession. These limits were in combination with the more liberal limits for sockeye salmon.

Justification: The passage of sockeye salmon was projected to exceed the escapement goal for the Nushagak River drainage.

EMERGENCY ORDER 2-RS-5-32-19 increased the bag and possession limits for sockeye salmon from 5 per day to 10 per day in all waters of the Wood River drainage. The limits for other salmon, except Chinook and sockeye salmon, remained at 5 per day, 5 in possession. These limits were in combination with the more liberal limit for sockeye salmon.

Justification: The passage of sockeye salmon was projected to exceed the escapement goal for the Wood River drainage.

EMERGENCY ORDER 2-RS-5-33-19 increased the bag and possession limits for sockeye salmon from 5 fish to 10 fish in all waters of the Naknek River drainage. The bag and possession limits for salmon, other than Chinook and sockeye salmon, remained at 5 fish. These limits were in combination with the more liberal limit for sockeye salmon.

Justification: The passage of sockeye salmon was projected to exceed the escapement goal for the Naknek River drainage.

EMERGENCY ORDER 2-KS-5-34-19 prohibited retention of Chinook salmon of any size and prohibited the use of bait in all waters of the Nushagak–Mulchatna River drainage effective 12:01 AM Wednesday, July 10, through 11:59 PM Wednesday, July 31, 2019. To comply with this emergency order, Chinook salmon could not be retained or possessed, and Chinook salmon incidentally caught while fishing for other species could not be removed from the water and had to be released immediately.

Justification: The passage of Chinook salmon was projected to fall below the escapement goal range.

EMERGENCY ORDER 2-RS-5-35-19 increased the bag and possession limits for sockeye salmon from 5 fish to 10 fish in all waters of the Alagnak River drainage. The bag and possession limits for salmon, other than Chinook, coho, and sockeye salmon, remained at 5 fish. These limits were in combination with the more liberal limit for sockeye salmon.

Justification: The passage of sockeye salmon had exceeded the minimum escapement threshold for the Alagnak River drainage.

EMERGENCY ORDER 2-RS-5-40-19 increased the bag and possession limits for sockeye salmon from 5 to 10 fish in all waters of the Togiak River drainage. The bag and possession limits for other salmon, except Chinook and sockeye salmon, remained at 5 fish. These limits were in combination with the more liberal limit for sockeye salmon.

Justification: The passage of sockeye salmon was projected to exceed the escapement goal for the Togiak River drainage.

2020

EMERGENCY ORDER 2-KS-5-31-20 reduced the bag, possession, and annual limits for Chinook salmon 20 inches or greater in length in the waters of the Nushagak–Mulchatna drainage from 2 per day, only 1 of which may be 28 inches or greater in length, with an annual limit of 4, to 1 per day, 20 inches or greater in length, with an annual limit of 2.

Justification: The passage of Chinook salmon was projected to fall below the escapement goal range.

EMERGENCY ORDER 2-RS-5-32-20 increased the bag and possession limits for sockeye salmon from 5 to 10 fish in all waters of the Alagnak, Naknek, Nushagak–Mulchatna, and Wood River drainages. The bag and possession limit for other salmon, except Chinook, sockeye, and coho salmon on the Alagnak River, remained at 5 fish. These limits were in combination with the more liberal limit for sockeye salmon.

Justification: The passage of sockeye salmon was projected to exceed the escapement goal for the Alagnak, Naknek, Nushagak–Mulchatna, and Wood River drainages.

2021

EMERGENCY ORDER 2-KS-5-30-21 reduced the bag, possession, and annual limits for Chinook salmon 20 inches or greater in length in the waters of the Nushagak–Mulchatna drainage from 2 per day, only 1 of which may be 28 inches or greater in length, with an annual limit of 4, to 1 per day, 20 inches or greater in length, with an annual limit of 2.

Justification: The passage of Chinook salmon was projected to fall below the escapement goal range.

EMERGENCY ORDER 2-RS-5-32-21 increased the bag and possession limits for sockeye salmon from 5 to 10 fish in all waters of the Nushagak–Mulchatna River drainage, excluding the Wood River drainage. The bag and possession limit for other salmon, except Chinook and sockeye salmon, remained at 5 fish. These limits were in combination with the more liberal limit for sockeye salmon.

Justification: The passage of sockeye salmon had exceeded the escapement goal for the Nushagak River drainage.

EMERGENCY ORDER 2-RS-5-36-21 increased the bag and possession limits for sockeye salmon from 5 to 10 fish in all waters of the Wood River drainage. The bag and possession limit for other salmon, except Chinook and sockeye salmon, remained at 5 fish. These limits were in combination with the more liberal limit for sockeye salmon.

Justification: The passage of sockeye salmon had exceeded the escapement goal for the Wood River drainage.

EMERGENCY ORDER 2-RS-5-37-21 increased the bag and possession limits for sockeye salmon from 5 to 10 fish in all waters of the Alagnak River drainage. The bag and possession limit for other salmon, except Chinook, coho, and sockeye salmon, remained at 5 fish. These limits were in combination with the more liberal limit for sockeye salmon.

Justification: The passage of sockeye salmon had exceeded the escapement goal for the Alagnak River drainage.

EMERGENCY ORDER 2-RS-5-40-21 increased the bag and possession limits for sockeye salmon from 5 to 10 fish in all waters of the Naknek River drainage. The bag and possession limit for other salmon, except Chinook and sockeye salmon, remained at 5 fish. These limits were in combination with the more liberal limit for sockeye salmon.

Justification: The passage of sockeye salmon had exceeded the escapement goal for the Naknek River drainage.

2022

EMERGENCY ORDER 2-RS-5-39-22 increased the bag and possession limit for sockeye salmon from 5 to 10 fish in all waters of the Nushagak–Mulchatna River drainage, excluding the Wood River drainage. The bag and possession limit for other salmon, except Chinook and sockeye salmon, remained at 5 fish. These limits for salmon, other than Chinook and sockeye salmon, were in combination with the more liberal limits for sockeye salmon.

Justification: The passage of sockeye salmon had exceeded the escapement goal for the Nushagak River drainage.

EMERGENCY ORDER 2-RS-5-40-22 increased the bag and possession limits for sockeye salmon from 5 to 10 fish in all waters of the Wood River drainage. The bag and possession limit for other salmon, except Chinook and sockeye salmon, remained at 5 fish. These limits for salmon, other than Chinook and sockeye salmon, were in combination with the more liberal limits for sockeye salmon.

Justification: The passage of sockeye salmon was projected to exceed the escapement goal for the Wood River drainage.

EMERGENCY ORDER 2-KS-5-47-22 reduced the bag, possession, and annual limits for Chinook salmon 20 inches or greater in length in the waters of the Nushagak–Mulchatna drainage to 1 per day and in possession, 20 inches or greater in length, with an annual limit of 2 fish. The bag and possession limit for Chinook salmon under 20 inches in length remained at 5 fish with no annual limit. Up to 2 Chinook salmon recorded before Thursday, July 7, 2022, on the harvest portion of an Alaska sport fishing license or harvest record card did not count against the Chinook salmon, 20 inches or greater in length, 2 fish annual limit for harvest on or after July 7.

Justification: The passage of Chinook salmon was projected to fall below the escapement goal range.

EMERGENCY ORDER 2-RS-5-49-22 increased the bag and possession limits for sockeye salmon from 5 to 10 fish in all waters of the Alagnak River drainage. The bag and possession limit for other salmon, except Chinook, coho, and sockeye salmon, remained at 5 fish. These limits were in combination with the more liberal limit for sockeye salmon.

Justification: The passage of sockeye salmon had exceeded the escapement goal for the Alagnak River drainage.

EMERGENCY ORDER 2-KS-5-51-22 prohibited the retention of Chinook salmon of any size and prohibited the use of bait in all waters of the Nushagak–Mulchatna River drainage. To comply with this emergency order, Chinook salmon could not be retained or possessed, and Chinook salmon could not be removed from the water and had to be released immediately. Only 1 unbaited, single-hook, artificial lure was allowed.

Justification: The passage of Chinook salmon was projected to fall below the escapement goal range.

EMERGENCY ORDER 2-KS-5-57-22 reduced the annual limit for Chinook salmon 20 inches or greater in length in all fresh and salt waters of Bristol Bay that were currently open to retention of Chinook salmon to 1 fish. In fresh waters, the bag and possession limits for Chinook salmon under 20 inches in length remained at 10 fish, no annual limit; in salt water, the bag and possession limits for Chinook salmon under 20 inches in length remained at 3 fish, no annual limit. Up to 4 Chinook salmon recorded before Thursday, July 21, 2022, on the harvest portion of an Alaska sport fishing license or harvest record card did not count against the 1 Chinook salmon, 20 inches or greater in length, annual limit for harvest on or after July 21.

Justification: The passage of Chinook salmon was projected to fall below the escapement goal range.

CHINOOK SALMON FISHERIES

AREAWIDE FISHERY DESCRIPTION

The Bristol Bay commercial fishery, in contrast to the sport and subsistence fisheries, generally takes the majority of the area's annual Chinook salmon harvest. Most of these Chinook salmon are harvested during the sockeye salmon commercial fishery. From 2001 through 2010, total annual commercial harvest in Bristol Bay ranged from 15,750 to 114,280 Chinook salmon, with an average of 49,527 fish (Elison et al. 2022, page 62). Since 2010, the commercial take has ranged from 6,944 (2021; latest published estimate) to 57,243 (2015) with a 2011–2020 average of 30,611 fish annually (Elison et al. 2022, page 62). Average annual subsistence harvest from 2011 through 2020 was 13,480 Chinook salmon, ranging from a low of 10,151 (2020; latest published estimate) fish to a high of 18,787 fish (2016; calculated from Tiernan et al. 2021, page 97).

Bristol Bay is home to several world-class Chinook salmon sport fisheries. The peak of these sport fisheries occurs from mid-June to late July in the lower reaches of the Alagnak, Nushagak, Naknek, and Togiak Rivers, as well as several smaller rivers (Figure 3). In the BBMA, the Chinook salmon sport fisheries, like the sport fisheries for most other species, are fished primarily by guided anglers. With few exceptions, the guided to unguided angler ratio is about 3 to 1. Anglers usually keep less than 50% of the fish they catch, especially since the adoption of areawide annual bag limits (see *Areawide Fishery Management and Objectives* section).

Chinook salmon typically account for approximately 20–30% of the sport salmon harvest in Bristol Bay (based on Table 3). From comparable data since 1991, sport fishing harvests of Chinook salmon in the Eastern and Central drainages of the BBMA reached an historical peak of 16,841 fish in 1994, with the next highest peak at only 12,320 fish in 2007 (calculated from Dunaway and Sonnichsen 2001; Dye et al. 2006; Dye and Borden 2018; SWHS [cited 2022]). The 2016–2020 sport harvest estimate for the entire BBMA averaged 9,505 Chinook salmon, and the 2021 sport harvest for the entire Bristol Bay Management Area was 5,873 Chinook salmon (Table 6) compared to the 2021 commercial harvest of 6,944 Chinook salmon (Elison et al. 2022).

AREAWIDE FISHERY MANAGEMENT AND OBJECTIVES

Since 1960, bag limits for Chinook salmon in the Bristol Bay Management Area have become increasingly conservative and complex (Table 7). The most conservative and sweeping regulatory changes to the area's Chinook salmon fisheries were adopted during the November and December 1997 BOF meetings. A Bristol Bay–wide annual limit of 5 Chinook salmon was adopted, and in the Nushagak River drainage, anglers were further restricted to an annual limit of 4 Chinook salmon. The daily bag limits in several other major fisheries were reduced slightly. Season closures after July 24 or July 31 were adopted for all Bristol Bay waters to protect spawning Chinook salmon.

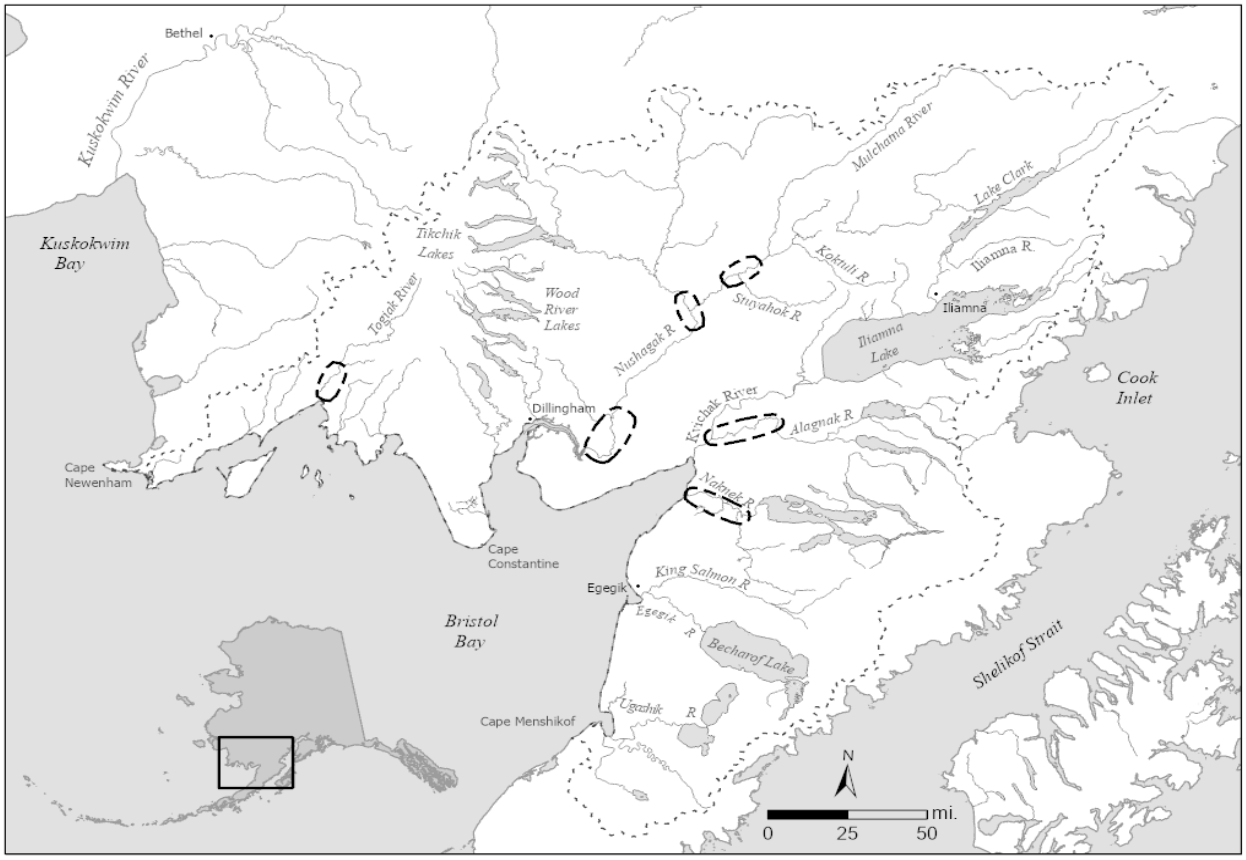

Figure 3.–Popular Chinook salmon sport fisheries (delineated with black dashes) in the Bristol Bay Sport Fish Management Area (delineated with dots).

Table 6.–Sport harvest of Chinook salmon by section and drainage in the Bristol Bay Management Area, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Naknek River	2,416	2,288	1,242	1,071	1,096	2,070	2,073	2,029	1,192	686	1,610	723
Brooks River	0	0	0	0	0	14	0	0	0	0	3	0
Kvichak River	110	56	111	41	0	17	263	82	179	8	110	0
Copper River	0	307	0	0	0	0	0	0	59	0	12	0
Alagnak River	1,317	512	823	983	206	385	394	1,596	261	16	530	180
Newhalen River	0	0	0	0	0	0	0	0	0	0	0	0
Lake Clark	0	0	0	0	0	0	0	0	0	0	0	0
Other	40	42	15	134	379	465	100	61	0	0	125	0
Subtotal[a]	3,883	3,205	2,191	2,229	1,681	2,951	2,830	3,768	1,691	710	2,390	903
Central												
Nushagak River	4,762	5,276	6,332	5,796	6,988	8,328	5,671	7,778	6,055	1,832	5,933	3,960
Mulchatna River	82	351	236	337	138	83	95	250	140	107	135	87
Agulowak River	0	0	0	16	0	17	0	0	37	0	11	0
Agulukpak River	22	0	0	0	0	0	0	0	0	0	0	0
Wood River Lakes[b]	8	14	0	0	0	0	21	0	111	64	39	22
Tikchik–Nuyakuk	50	304	117	0	108	0	82	164	111	0	71	0
Other	32	0	0	127	59	68	147	0	0	0	43	65
Subtotal[a]	4,956	5,945	6,685	6,276	7,293	8,496	6,016	8,192	6,454	2,003	6,232	4,134
Western												
Togiak River	1,438	859	900	2,166	983	787	978	641	1,617	425	890	836
Other	135	0	18	0	0	0	20	0	104	0	25	0
Subtotal[a]	1,573	859	918	2,166	983	787	998	641	1,721	425	914	836
Total	10,412	10,009	9,794	10,671	9,957	12,234	9,844	12,601	9,866	3,138	9,537	5,873

Source: Estimates from Alaska Statewide Harvest Survey (SWHS) were obtained from the Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: ADF&G, Division of Sport Fish (cited October 16, 2022), http://www.adfg.alaska.gov/sf/sportfishingsurvey /. Prior data can be found in Mills (1979–1980, 1981a, 1981b, 1982–1994) and Howe et al. (1995, 1996).

[a] Subtotals of averages may not be the sum of the drainages because information for some drainages is not available for some years.

[b] Wood River Lakes includes Lake Nunavaugaluk through 1998. Prior to 1997, Agulowak and Agulukpak Rivers were also included in Wood River Lakes.

Table 7.–Bag limit regulatory changes affecting Chinook salmon in the Bristol Bay Management Area.

Effective year	Regulation
1965	10 salmon (all species combined) per day, no size limit
1972	5 king per day, only 2 may be over 26 inches
1976	5 king per day, only 2 may be over 28 inches
1988	3 king per day, only 2 may be over 28 inches
1998	Daily bag and possession limits on several waters reduced to 3 per day, only 2 over 28 inches.
	Annual limit of 5 king salmon.
	Spawning closures for all waters.
2001	Daily bag and possession limits on most Eastern and most Central section waters (except Nushagak and Wood River drainages) reduced to 3 per day, only 1 over 28 inches.
	All waters except Nushagak drainage allow harvest of 10 per day under 20 inches.
	All fish released must remain in the water from Cape Menshikof to Cape Constantine.
2003	All fish released must remain in the water from Cape Menshikof to Cape Pierce.
	Harvest of 5 per day under 20 inches allowed in the Nushagak drainage.
2012	Bag and possession limit for king salmon in all drainages from Cape Constantine to Cape Newenham changed to 3, only 1 fish over 28 inches in length.

Note: Chinook salmon are referred to as king salmon in the regulatory language.

In 2001, a statewide regulation (5 AAC 67.010 [b]) created a daily bag and possession limit for Chinook salmon under 20 inches of 10 per day in all fresh waters open to Chinook salmon sport fishing, except for the Nushagak River drainage. Chinook salmon under 20 inches do not count toward the annual limit and are in addition to the daily bag limit for Chinook salmon 20 inches or longer. The only exception is the Nushagak River daily bag and possession limit of 5 Chinook salmon under 20 inches per day.

In the Alagnak, Egegik, Kvichak, Igushik, Naknek, Snake, Togiak, and Ugashik River drainages, the bag and possession limits for Chinook salmon are all 3 per day, 1 of which may exceed 28 inches in length (5 AAC 67.020 [1]).

Anglers are prohibited from removing a Chinook salmon from the water before releasing the fish in all fresh waters of Bristol Bay. Any Chinook salmon removed from the water must be kept and becomes part of an angler's daily bag limit. The goal of this regulation is to improve survival of released Chinook salmon and to encourage anglers to be more careful with the fish they release.

NAKNEK RIVER

Fishery Description

The Naknek River (Figure 3) is located on the Alaska Peninsula near the communities of King Salmon, Naknek, and South Naknek. The Naknek River Chinook salmon sport fishery commences May 1 and continues through July 31, when it closes by regulation to protect spawning fish. The peak angling weeks are from about June 22 to July 15. Effort is concentrated in a 15-mile stretch of the Naknek River adjacent to the community of King Salmon.

This fishery is one of the most popular sport fisheries in the area and accounts for roughly 17% of all the Chinook salmon harvested by sport anglers in the BBMA. Several factors contribute to the popularity of the Naknek River, including ease of access and regularly scheduled airline service into King Salmon. This fishery has a significant amount of unguided effort, reasonably good catch rates, and a relatively high retention rate.

The estimated Naknek River drainage Chinook salmon sport harvest from 2016 through 2020 ranged from a high of 2,073 in 2017 to a low of 686 in 2020, with an average of 1,610 fish (Table 6). Angler effort for all species on the Naknek River has decreased from highs of over 20,000 angler-days in the early 2000s to a 5-year (2016–2020) average of 13,353 (Dye et al. 2006; Table 1).

Based on the freshwater logbook data from 2007 through 2016 (Table 2), guided effort has remained close to the recent 5-year average (2012–2016) of 3,854 angler-days since the inception of the program (Table 2).

Fishery Management and Objectives

Concern over low escapements and increasing sport harvest prompted the 1987 BOF to adopt regulations addressing Naknek River Chinook salmon. The key elements were as follows:

1) Establish a season for Chinook salmon (May 1 to July 31).
2) Designate artificial-lure-only.
3) Reduce bag and possession limits to 3 per day, 1 of which may be over 28 inches.

Beginning in the early 1990s, increasing portions of Pauls and King Salmon Creeks were closed to Chinook salmon fishing to protect spawning stocks in these waters. In 1995, the outlets of Pauls and King Salmon Creeks into the Naknek River were closed to angling to protect important holding areas for Chinook salmon.

In 1997, closures to Chinook salmon angling in Pauls and King Salmon Creeks were clarified, and an annual limit of 5 Chinook salmon per angler was adopted for this fishery. This annual harvest limit was also areawide in the BBMA and required anglers to record the date and location of each Chinook salmon taken.

With the advent of the annual limit on Chinook salmon, local anglers expressed strong interest in taking smaller Chinook salmon on the Naknek River. In January 2001, the BOF added the opportunity to harvest 10 Chinook salmon per day under 20 inches in length and prohibited anglers from removing Chinook salmon from the water if the fish were to be released.[4] During the January 2001 meeting, the BOF also restricted most of Big Creek to catch-and-release angling for Chinook salmon. The Big Creek regulation grew from a locally generated proposal addressing concerns for the Big Creek Chinook salmon escapement. In 2013, Big Creek and waters of the Naknek River drainage within a ¼-mile radius of its confluence with Big Creek were closed to sport fishing for Chinook salmon. Big Creek was reopened to catch-and-release sport fishing after the 2015 BOF meeting, and the ¼-mile area from the confluence of Big Creek with the Naknek River was reopened to sport fishing for Chinook salmon.

In the drainages of the Alagnak, Egegik, Kvichak, Igushik, Naknek, Snake, Togiak, and Ugashik Rivers, the current bag and possession limits for Chinook salmon are all 3 per day, 1 of which may exceed 28 inches in length (5 AAC 67.020 [1]). Anglers are prohibited from removing a Chinook salmon from the water before releasing the fish in all fresh waters of Bristol Bay. Any Chinook salmon removed from the water must be kept and becomes part of an angler's daily bag limit. The goal of this regulation is to improve survival of released Chinook salmon and to encourage anglers to be more careful with the fish they release.

[4] Southwest Alaska sport fishing regulations summary, 2022 (effective until the 2023 summary is issued) Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

Historically, escapement of Chinook salmon for the Naknek River was indexed by fixed-wing aerial surveys of the 4 primary spawning areas during the presumed peak of spawning in early to mid-August. Aerial counts were left unexpanded and were considered minimum estimates of escapement. These escapement surveys indicated the mainstem of the Naknek River, along with Big Creek, composes approximately 90% of the observed escapement.

Surveys to estimate abundance for Naknek River Chinook salmon ceased in 2009 due to budget shortfalls, and the escapement goal was dropped in 2015 due to concerns over the ability to reliably estimate abundance via aerial surveys (Table 8; Erickson et al. 2015). Sport harvests and effort are estimated through the SWHS. Commercial and subsistence harvests are monitored by the Division of Commercial Fisheries (CF) and are reported in the ADF&G Fishery Management Report series (e.g., Elison et al. 2022). The Division of Sport Fish (SF) has also conducted monitoring and stock assessment projects for Naknek River Chinook salmon (Coggins and Bingham 1993; Gryska and Naughton 2001; Schwanke and Reed 2011).

Some Naknek River anglers have been concerned about the management of the Naknek–Kvichak District commercial sockeye salmon fishery with respect to its impacts on the Chinook salmon sport fishery. When conservation concerns for the Kvichak River sockeye salmon stocks require area restrictions in the Naknek–Kvichak District, commercial fishing may be allowed in the lower reaches of the Naknek River under the terms of the *Naknek River Sockeye Salmon Special Harvest Area Plan* (NRSHA; 5 AAC 06.360). This plan, adopted by the BOF in 1986, can result in a higher percentage of the Naknek River Chinook salmon escapement being exposed to gillnets, raising the concern of some guides and anglers. The BOF has amended the plan several times and in 2001, adopted amendments to address the quality of salmon of all species escaping through the NRSHA openings.

2021 and 2022 Seasons

Of the estimated sport catch of 1,846 Chinook salmon in 2021, 723 or nearly 39% were kept (Table 8; SWHS [cited October 16, 2022]). Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported that sport fishing for Chinook salmon on the Naknek River was below normal in 2022. Commercial harvest of Chinook salmon in the Naknek–Kvichak District during 2021 and 2022 was below average at approximately 990 and 1,129 fish, respectively (Table 8). Due to indications of below normal returns of Chinook salmon to Bristol Bay in 2022, bag and possession limits for Chinook salmon were restricted by emergency order in all salt and fresh waters of Bristol Bay on July 21.

Table 8.–Chinook salmon commercial, subsistence, and sport harvest plus escapement for the Naknek River, 1995–2022, including the 1985–1994 average.

	Harvest				
Year	Commercial[a]	Subsistence[b]	Sport[c]	Total	Escapement index[d]
1995	5,130	1,431	4,153	10,714	4,960
1996	4,273	1,574	2,984	8,831	5,010
1997	3,132	2,764	4,231	10,127	10,453
1998	2,722	2,433	3,443	8,598	5,505
1999	1,439	1,567	2,856	5,862	NA
2000	1,077	894	2,105	4,076	3,233
2001	995	869	2,656	4,520	6,340
2002	1,002	837	2,170	4,009	7,503
2003	611	1,221	2,412	4,244	6,081
2004	1,496	1,075	3,004	5,575	12,878
2005	1,458	1,047	2,140	4,645	NA
2006	2,333	881	2,558	5,772	NA
2007	1,520	672	1,431	3,623	5,498
2008	1,344	719	1,285	3,348	6,559
2009	1,026	392	2,279	3,697	NA
2010	1,060	422	1,266	2,748	NA
2011	1,962	550	2,416	4,928	NA
2012	2,306	785	2,288	5,379	NA
2013	1,360	502	1,242	3,104	NA
2014	1,648	562	1,071	3,127	NA
2015	2,926	678	1,096	4,700	NA
2016	2,797	936	2,070	5,803	NA
2017	2,477	757	2,073	5,307	NA
2018	2,398	943	2,029	5,370	NA
2019	2,743	590	1,192	4,525	NA
2020	816	306[e]	686	1,808	NA
Average [% Total]					
1985–1994	5,508	1,329	4,362	11,199	6,065
1995–2020	2,002 [39%]	977 [19%]	2,198 [42%]	5,177	6,729
2016–2020	2,246 [49%]	706 [15%]	1,610 [35%]	4,563	NA
2021	990	195[e]	723	1,908	NA
2022	1,129	NA	NA	NA	NA

Source: **Commercial**: 1985–1997:Westing et al. (2005: Appendix A4); 1995-2000 Jones et al. (2014: Appendix A4); 2001–2021 Elison et al. (2022: Appendix A4); 2022: Bristol Bay Salmon Season Summary https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1438246231.pdf.

Subsistence: 1985–2015: Halas and Neufeld (2018: Appendix A1); 2016–2021: Jones and Neufeld (*In prep*).

Sport: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1986–1994) and Howe et al. (1995, 1996).

Escapement: 1985–2009: Erickson et al. (2015: Appendix A2).

Note: "NA" means data not available.

[a] Naknek–Kvichak district commercial harvests probably include Naknek, Alagnak, and Kvichak stocks. The harvests reported for Naknek River stocks are therefore considered maximums.

[b] Naknek–Kvichak District harvests.

[c] Sport fish harvest numbers from Naknek River drainage.

[d] Actual raw counts made from fixed-wing aerial surveys. No escapement surveys were conducted 2009–2022 due to budget constraints.

[e] Subsistence harvest estimates preliminary.

ALAGNAK (BRANCH) RIVER

Fishery Description

The Alagnak River (Figure 3), known locally as the Branch River, is located in the Kvichak River drainage, approximately 40 miles north of the community of King Salmon. The Alagnak River's proximity to the community of King Salmon makes it an attractive alternative to fishing the more crowded Naknek River. In addition, it is the closest Chinook salmon fishery for many lodges near Iliamna Lake, where few Chinook salmon spawn. The Chinook salmon fishery in the Alagnak River occurs mainly in the lower 15 miles of the river and peaks in mid- to late July, roughly 2 weeks later than other Chinook salmon fisheries in the area. Chinook salmon returning to the Alagnak River are typically larger than those found in other systems. Effort is primarily guided (about 80%) and nonresident (more than 90%; Dunaway 1990a, 1994; Naughton and Gryska 2000). Most anglers either fly in with float-equipped aircraft for 1-day trips or base themselves in one of several lodges located along the river. Retention rates for Chinook salmon average approximately 20% (Dunaway 1990a, 1994; Naughton and Gryska 2000), typical of most of the area's Chinook salmon fisheries.

From 2016 through 2020, the largest estimated annual harvest of Chinook salmon from the Alagnak River was 1,596 fish in 2018 (Table 6). From 2016 through 2020, the average harvest of Chinook salmon in the Alagnak River was 530 fish (Table 6).

Based on freshwater logbook data from 2007 through 2016, annual guided effort has remained close to the 2012–2016 average of 2,857 angler-days (Table 2).

Since 2009, only 3 unexpanded escapement index counts of Chinook salmon were conducted in the Alagnak River, averaging 902 fish (Table 9).

Fishery Management and Objectives

Alagnak River drainage Chinook salmon fisheries were historically managed to achieve a sustainable escapement goal (SEG) of 2,700 Chinook salmon as assessed by aerial survey. This goal was dropped after the 2018 Bristol Bay BOF meeting, and aerial surveys were discontinued.

Sport harvests and effort are estimated through the SWHS. Commercial and subsistence harvests are monitored by CF and are reported in the ADF&G Fisheries Management Report series (e.g., Elison et al. 2022). Commercial harvests are reported for the Naknek–Kvichak District, which is a mixed-stock fishery composed of Kvichak, Naknek, and Alagnak River stocks. It is not possible to separate the commercial harvests by river of origin. SF has conducted significant monitoring and stock assessment projects on the Alagnak River in the recent past (Brookover 1989; Dunaway 1990a, 1994; Naughton and Gryska 2000, Collins and Dye 2003, Collins and Dye 2005).

Management concerns for Chinook salmon stocks of the Alagnak River drainage center on an inability to estimate total exploitation rates. Allocation of commercial catches from the Naknek–Kvichak District to the river of origin is not yet possible, and the lack of inseason assessment of escapement makes it difficult to effectively manage this stock. Run timing of Chinook salmon stocks to the Alagnak River coincides with peak periods of commercial sockeye salmon fishing in the Naknek–Kvichak District. When sockeye salmon runs are sufficient to allow for liberal fishing schedules, substantial harvest of the Alagnak River Chinook salmon stocks is possible.

Table 9.–Unexpanded escapement counts and total sport fishing effort and harvest of Chinook salmon in the Alagnak River, 1995–2022, including the 1985–1994 average.

Year	Index count[a]	Sport effort[b]	Sport harvest[b]
1995	6,860	13,232	891
1996	9,885	8,121	931
1997	15,210	11,062	972
1998	4,148	7,715	1,531
1999	2,178	6,411	592
2000	2,220	7,589	501
2001	5,458	4,391	508
2002	3,765	7,886	305
2003	8,209	9,956	334
2004	6,755	8,267	1,146
2005	5,084	11,228	1,008
2006	4,278	11,747	1,052
2007	3,455	8,881	1,007
2008	1,825	8,652	394
2009	1,957	5,541	199
2010[c]	NA	6,459	405
2011	NA	5,669	1,317
2012	NA	5,039	572
2013	NA	4,782	823
2014	NA	6,013	983
2015	NA	6,908	206
2016[d]	1,283[d]	5,668	385
2017[d]	435[d]	7,001	394
2018[d]	988[d]	9,550	1,596
2019	NA	6,095	261
2020	NA	5,242	16
Average			
1985–1994	4,362	6,715	945
1995–2020	4,666	7,658	705
2016–2020	902	6,711	530
2021	NA	7,356	180
2022	NA	NA	NA

Source: **Total effort and harvest**: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1986–1994) and Howe et al. (1995, 1996).

Index counts: 1985–2018: Erickson et al. (2018: Appendix A1).

Note: "NA" means data not available.

[a] Maximum index count; escapement goal is 2,700. Counts were discontinued after 2018.

[b] Sport harvest and effort for Alagnak River only.

[c] Emergency order issued July 15 reducing the bag limit to 1 fish over 20 inches and the seasonal limit to 3.

[d] Escapement survey considered a minimum estimate.

In 2015, a management plan was developed at the Bristol Bay BOF meeting to create an inriver sockeye salmon fishery to harvest surplus Alagnak River sockeye salmon. The plan stipulated that for the sockeye salmon fishery to occur, Alagnak River Chinook salmon needed to be surveyed in the previous year and the escapement goal achieved. However, index counts since 2015 were some of the lowest on record, and yet estimated sport catch and catch-per-unit effort from the SWHS was well above average in these same years, casting doubt on the ability to consistently estimate Chinook salmon spawning escapement in the Alagnak River via aerial survey. At the 2018 Bristol Bay BOF meeting, the goal was dropped partly based on these concerns, and so the aerial surveys were discontinued.

Terminal tackle in this river system has been restricted to single-hook artificial lures only for many years to protect rainbow trout. Through 1988, the bag and possession limits for Chinook salmon in the Alagnak River were 5 fish, only 2 over 28 inches in length. From 1989 through 1997, the limits were 3 fish, only 2 over 28 inches in length. Finally, in addition to a 5 fish annual limit and a spawning season closure on July 31, the BOF established a daily bag and possession limit of 3 fish, only 1 of which could exceed 28 inches in length.[5] In January 2001, the BOF added the opportunity to harvest 10 Chinook salmon under 20 inches in length per day and prohibited anglers from removing Chinook salmon from the water if the fish were to be released.

2021 and 2022 Seasons

Based on recent returns and relatively low productivity of Chinook salmon stocks statewide, a below average run of Chinook salmon was expected to the Alagnak River drainage. Throughout the 2021 and 2022 seasons, reports of below normal fishing success by commercial sport fishing operators on the river served to confirm the preseason expectation. The 2021 harvest of 180 fish was below the recent average (Table 6), but the 2021 total estimated effort of 7,356 angler-days exceeded the 2016–2020 average effort of 6,711 angler-days (Table 1). Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported that sport fishing for Chinook salmon on the Alagnak River was below normal in 2022. Due to indications of below normal returns of Chinook salmon to Bristol Bay in 2022, bag and possession limits for Chinook salmon were restricted by emergency order in all salt and fresh waters of Bristol Bay on July 21.

NUSHAGAK AND MULCHATNA RIVERS

Fishery Description

The Nushagak River drainage (Figure 3) supports the largest sport, commercial, and subsistence fisheries for Chinook salmon in the BBMA (Tables 6 and 10). Sport fishing effort is concentrated in 3 areas: the lower Nushagak River near the village of Portage Creek, the middle section of the Nushagak River near the village of Ekwok, and the midsection of the Mulchatna River between the Stuyahok and Koktuli Rivers.

[5] Southwest Alaska sport fishing regulations summary, 2022 (effective until the 2023 summary is issued) Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

Table 10.–Chinook salmon commercial, subsistence, and sport harvests, and escapement for the Nushagak River drainage, 1995–2022, including the 1985–1994 average.

		Harvests below sonar			Inriver sonar	Harvests above sonar		Spawning	
Year	Total run[a]	Commercial[b]	Subsistence[c]	Sport[d]	estimate	Subsistence[e]	Sport[f]	escapement[g]	Total harvest
1995	271,127	79,943	10,800	2,238	178,146	2,419	2,713	173,014	98,113
1996	193,141	72,123	10,217	2,346	108,456	3,063	3,045	102,348	90,793
1997	247,327	64,390	11,397	931	170,610	2,981	2,567	165,062	82,265
1998	371,638	117,820	7,717	1,640	244,461	4,429	4,188	235,845	135,793
1999	149,248	11,178	7,450	934	129,686	2,477	3,304	123,906	25,342
2000	138,044	12,120	7,247	1,389	117,288	1,979	4,628	110,682	27,362
2001	213,306	11,746	7,972	1,600	191,988	3,372	4,299	184,317	28,989
2002	229,485	40,039	6,946	1,193	181,307	4,103	2,500	174,704	54,781
2003	225,594	43,485	13,399	2,203	166,507	4,448	3,752	158,307	67,287
2004	356,240	100,846	10,644	2,567	242,183	4,422	4,339	233,422	122,818
2005	307,701	62,764	7,951	2,863	234,123	4,471	5,702	223,950	83,751
2006	218,861	84,881	6,131	3,166	124,683	3,012	4,307	117,364	101,497
2007	125,435	51,831	9,564	3,581	60,459	3,411	6,088	50,960	74,475
2008	128,752	18,968	9,149	3,305	97,330	2,571	3,395	91,364	37,388
2009	117,936	24,693	9,312	2,451	81,480	2,796	3,903	74,781	43,155
2010	94,245	26,056	6,345	1,659	60,185	1,845	2,248	56,092	38,153
2011	145,232	26,927	8,485	1,542	108,278	2,981	3,302	101,995	43,237
2012	195,106	11,952	7,236	1,833	174,085	2,398	4,098	167,589	27,517
2013	132,782	10,213	6,889	1,971	113,709	4,201	4,714	104,794	27,988
2014	96,639	11,868	11,942	2,369	70,460	3,890	3,891	62,679	33,960
2015	160,713	50,675	9,505	2,514	98,019	2,209	4,720	91,090	69,623
2016	167,540	24,937	14,182	3,053	125,368	1,933	5,358	118,077	49,463
2017	102,083	33,376	8,912	2,834	56,961	1,827	3,161	51,973	50,110
2018	147,742	36,626	10,427	3,450	97,239	1,408	4,742	91,089	56,653
2019	80,250	22,725	7,162	3,600	46,763	2,967	2,706	41,090	39,160
2020	57,968	7,452	5,988	1,496	43,032	2,265	454	40,313	17,655

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Year	Total run[a]	Harvests below sonar: Commercial[b]	Harvests below sonar: Subsistence[c]	Harvests below sonar: Sport[d]	Inriver sonar estimate	Harvests above sonar: Subsistence[e]	Harvests above sonar: Sport[f]	Spawning escapement[g]	Total harvest
Average [% Total harvest]									
1985–1994	229,487	47,839 [74%]	8,532 [13%]	1,630 [3%]	171,486	3,124 [5%]	3,155 [5%]	165,207	64,280
1995–2020	179,774	40,755 [69%]	8,960[15%]	2,259 [4%]	127,800	2,995 [5%]	3,774 [6%]	121,031	58,743
2016–2020	111,117	25,023 [59%]	9,334[22%]	2,887 [7%]	73,873	2,080 [5%]	3,284 [8%]	68,508	42,608
2021	65,539	4,820	3,922	1,575	55,222	1,297	2,472	51,453	14,086
2022	62,086	5,431	NA	NA	44,434	NA	NA	NA	NA

Source: **Commercial (total Nushagak District)**: 1985–1992:Westing et al. (2005: Appendix A19); 1993–2000: Jones et al. (2014: Appendix A19); 2001–2021 Elison et al. (2022: Appendix A17); 2022: Data provided by Jordan Head, Division of Commercial Fisheries, Region II, Anchorage.

Subsistence (above and below sonar. Data for 1985–2021 provided by Jordan Head, Division of Commercial Fisheries, Region II, Anchorage.

Sport harvests (above and below sonar): Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1986–1994) and Howe et al. (1995, 1996).

Sonar estimates: 1985–2000, Buck et al. (2012: Table 10); 2001–2021 Elison et al. (2022: Appendix A17); 2022: Bristol Bay Salmon Season Summary https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1438246231.

[a] Run refers to an aggregation of salmon of all ages returning from ocean feeding grounds to spawn in any given year.

[b] Total Nushagak District commercial harvest. 2001 to present includes personal use reported from commercial harvest.

[c] Includes Nushagak River bound Chinook salmon harvests from below the sonar site.

[d] Sport harvest total for 1985–1996 is 50% of the Nushagak River system sport harvest. Sport harvest total for 1997–2021 is Nushagak River sport harvest from Black Point to sonar.

[e] Includes Ekwok area, Iowithla River, Klutuk River, Koliganek area, New Stuyahok area, Portage Creek area, Kokwok area, Mulchatna River, and an unknown Nushagak River watershed site.

[f] Sport harvest total for 1985–1996 is 50% of the Nushagak River system sport harvest plus the Mulchatna River system, Tikchik–Nuyakuk Rivers, and Koktuli River sport harvests. Sport harvest total for 1997 to 2001 is 50% of the Nushagak River harvest plus the Black Point to Iowithla River, Nushagak River upstream of Iowithla River, Mulchatna River system, Tikchik–Nuyakuk Rivers and the Koktuli River harvests. Sport harvest total for 2002–2021 is Nushagak River drainage excluding Black Point to sonar.

[g] Spawning escapement for 1985–1996 and 1998–2021 are sonar estimates minus subsistence and sport harvest above sonar. 1997 estimate is expanded from arial survey data, minus subsistence and sport harvest above sonar.

Between 1992 and 1997, effort in the Ekwok area was highly variable. Since about 1999, the lower river fishery has begun to expand steadily upriver to Ekwok, and the 2 areas are merging into a single fishery. The amount of angling for Chinook salmon in the middle section of the Mulchatna River seems to have diminished since bait was prohibited there in 1992. Although sport fishing for Chinook salmon does occur in some tributaries of the drainage, the overall impact on harvest is considered slight.

The uplands along much of the Nushagak River are privately owned. Choggiung Limited, an Alaska Native village corporation, administers a recreational land management program. Since its inception in the mid-1980s, this program has grown to include the lands of the adjoining villages of Ekwok, New Stuyahok, and in some years, Koliganek. Private and commercial land-use permits sold by the program allow anglers access to desirable campsites while engaged in sport fishing and hunting.

Chinook salmon escapement into the Nushagak and Mulchatna Rivers was estimated by aerial surveys beginning in 1967. Since 1987, sonar has been used to estimate the inriver run of Chinook salmon to the Nushagak River drainage. The sonar is considered an improvement over the aerial survey program because it gives a real-time estimate of escapement on which management decisions can be based.

Sonar counts of the Chinook salmon stocks in the Nushagak–Mulchatna drainage have been low in recent years. The 2017, 2019, 2020, and 2021 runs were well below average and did not achieve the lower end of the escapement goal once harvest upriver from the sonar was taken into account. The 2013, 2015, 2016, and 2018 runs exceeded the inriver goal. The 2017 count indicated a below-average run; however, several inseason factors confounded the 2017 counts, including extremely low water levels and a record run of sockeye salmon. These factors, coupled with inseason catches and anecdotal information indicating an average return, resulted in ADF&G deciding to fly postseason aerial spawning ground surveys to get additional assessments of spawning escapement. Although the counts were incomplete and the total spawning escapement was not estimated, these aerial counts indicated that the escapement was near average and probably greater than the sonar indicated. Total runs of Nushagak–Mulchatna Rivers Chinook salmon averaged 111,117 fish from 2016 through 2020, ranging from 167,540 fish in 2016 to 57,968 in 2020 (Table 10).

Total harvest by commercial, subsistence, and sport fisheries averaged 42,608 Chinook salmon from 2016 through 2020 (Table 10). The majority (59%) of the total harvest was taken by the commercial fishery, 27% was taken by the subsistence fishery, and 15% by sport anglers. Sport harvest of Chinook salmon averaged 6,171 fish from 2016 through 2020 (calculated from Table 10).

Based on freshwater logbook data from 2007 through 2016, guided effort downstream of the Mulchatna River has varied from 3,920 angler-days in 2010 to 8,185 angler-days in 2015. From 2012 through 2016, effort averaged 7,165 angler-days (Table 2).

Fishery Management and Objectives

Under the *Nushagak and Mulchatna King Salmon Management Plan* (5 AAC 06.361; adopted January 1992 and amended 6 times), Chinook salmon are managed to attain an inriver run of 95,000 fish, which is expected to provide 55,000 to 120,000 spawning fish per year, a reasonable opportunity to harvest Chinook salmon in the inriver subsistence fishery, and a guideline harvest level in the sport fishery of 5,000 fish (Table 11). If the inriver run exceeds 95,000 Chinook

salmon, then the guideline harvest level does not apply. If the inriver run projection falls below 55,000 Chinook salmon, the sport fishery shall be restricted to nonretention with the use of bait prohibited, and the sockeye salmon commercial fishery in the Nushagak District is closed until the projected sockeye salmon escapement into the Wood River exceeds 100,000 fish; the subsistence fishery may be restricted.

Table 11.–A chronology of significant regulation changes for the Nushagak and Mulchatna Rivers.

Effective year	Regulation
1990	Sport season established from January 1 to July 25 upstream of and including the Iowithla River. Spawning season closure adopted to afford drainagewide protection to spawning king salmon stocks.
1992	Gear restricted to single-hook artificial lures for the portion of the Mulchatna River between the Koktuli and Stuyahok Rivers. *Nushagak and Mulchatna King Salmon Management Plan* (5 AAC 06.361) is adopted, capping the sport harvest at 5,000 fish and establishing an escapement projection of 65,000 as the trigger for inseason restrictions in the sport fishery.
1994	*Nushagak and Mulchatna King Salmon Management Plan* (5 AAC 06.361) is amended, setting the sport allocation as a guideline harvest rather than a cap.
1997	*Nushagak and Mulchatna King Salmon Management Plan* (5 AAC 06.361) was amended, by establishing an escapement projection of 55,000 king salmon below which inseason restrictions in the sport fishery must be imposed. The 55,000 fish "trigger" was adopted when analysis showed this escapement level was not likely to show a difference in the expected productivity versus that expected at the 65,000 fish trigger. In addition, the 65,000 fish "trigger" had become quite disruptive to the sport fishery by precipitating frequent inseason restrictions. The daily bag and possession limits were reduced to 2 king per day, only 1 over 28 inches. An annual harvest limit of 4 king salmon was adopted for the whole Nushagak–Mulchatna River drainage. Guides were prohibited from retaining any species of fish while guiding (all Bristol Bay.) The Kokwok River and the Nushagak River upstream from its confluence with Harris Creek were closed to angling for king salmon. A July 31 spawning season closure was adopted for the Nushagak River drainage downstream from the Iowithla River outlet. The commercial fishery was to be managed to allow pulses of king salmon to enter the Nushagak River untouched.

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Effective year	Regulation
2001	The BOF amended the management plan to allow a catch-and-release fishery when the final inriver abundance is projected to be below 55,000 fish but above 40,000 fish. The amended plan also stipulates that when the king salmon sport fishery is restricted to catch-and-release or is closed for conservation, the use of bait must be prohibited. A regulation allowing a daily bag limit of 10 king salmon less than 20 inches total length (508 mm TL) statewide, specifically excluded the Nushagak–Mulchatna River drainages until ADF&G could study the potential effects of the regulation on the spawning populations and the escapement goal. As with most other Bristol Bay drainages, the Nushagak River drainage was included in the regulation prohibiting anglers from removing king salmon from the water if the fish were to be released.
2003	A daily bag and possession limit for king salmon under 20 inches of 5 per day is implemented on the Nushagak drainage. King salmon under 20 inches do not count toward the annual limit of 4 and are in addition to the bag limit for king salmon 20 inches or longer. The *Nushagak and Mulchatna King Salmon Management Plan* (5 AAC 06.361) was amended so that if inriver projections fall below 75,000, a bag limit of 1 per day, 1 in possession, no size limit, is imposed on the sport fishery. The seasonal limit would not be adjusted.
2012	The BOF adopted the following regulations: from May 1 to July 31, only 1 single-hook or single-hook lure may be used and the use of bait is allowed until an angler harvests a daily bag limit of king salmon 20 inches or greater in length, then that angler can only fish with 1 unbaited, single-hook or single-hook lure for the remainder of that day. Additionally, the numbers in the *Nushagak and Mulchatna King Salmon Management Plan* were updated to reflect counts from the new dual frequency identification sonar counter.
2018	The BOF repealed 5 AAC 06.361 (d)(2) & (3) at the 2018 meeting. The repealed language dictated that if the inriver run fell below 95,000 Chinook salmon, restrictive actions were required for the sport fishery and the directed Chinook salmon commercial fishery would close. If the inriver run fell below 70,000 Chinook salmon, then additional restrictive actions were required for the sport fishery. If the inriver run fell below 55,000 Chinook salmon, the sport fishery was to be closed, and the sockeye salmon commercial fishery in the Nushagak District would close until the projected sockeye salmon escapement into the Wood River exceeds 100,000 fish.

Note: Chinook salmon are referred to as king salmon in the regulatory language.

Since 1972, smaller runs and increasing sport fishing effort have prompted restrictive actions on the inshore commercial and sport fisheries. To remain within the sport fishery guideline harvest level of 5,000 fish, the bag and possession limit is 2 Chinook salmon per day, of which only 1 may be longer than 28 inches in length (ADF&G 2009). Only 4 of the 5 Chinook salmon allowed in an angler's Bristol Bay annual harvest may come from the Nushagak–Mulchatna drainage. Additionally, in the Nushagak–Mulchatna drainage, there is a bag and possession limit of 5 per day for Chinook salmon under 20 inches. Chinook salmon under 20 inches do not count toward the annual limit of 4 and are in addition to the daily bag limit for Chinook salmon 20 inches or longer. Due to concerns over catch-and-release mortality, the BOF adopted regulations in 2012 requiring anglers to use single hooks and, after harvesting a bag limit, to use only unbaited, single-hook, artificial lures for the remainder of that day.

Due to continued concerns regarding catch-and-release mortality of Chinook salmon caught in the Nushagak River sport fishery, SF began a 2-year study in 2017 estimating the 5-day survival of Chinook salmon caught and released on sport tackle in the lower Nushagak River. Preliminary

results indicate that the 5-day mortality of catch-and-release Chinook salmon in the Nushagak River sport fishery is approximately 6.6% (Borden and Dye *In prep*).

Sport harvests and effort are estimated through the SWHS. Commercial and subsistence harvests are monitored by CF and are reported in the ADF&G Fisheries Management Report series (e.g., Elison et al. 2022).

2021 and 2022 Seasons

Due to uncertainty with past estimates of escapement, there was no preseason forecast for the 2021 and 2022 Nushagak–Mulchatna Rivers Chinook salmon runs. However, inriver escapement projections remained below the inriver goal throughout both seasons and, in accordance with the *Nushagak and Mulchatna King Salmon Management Plan*, inseason restrictions were implemented on the sport fishery during both years. The preliminary total estimate of Chinook salmon passing the sonar was 55,222 for 2021 and 44,434 for 2022 (Table 10). No directed Chinook salmon commercial fishing periods allowing large mesh gillnets occurred in the Nushagak District. A total of 4,820 and 5,431 Chinook salmon were harvested during the 2021 and 2022 commercial sockeye salmon fishery openings, respectively (Table 10). Total harvests in the sport and subsistence fisheries in 2021 were 4,047 and 5,219, respectively. Harvest estimates for the 2022 sport and subsistence fisheries are not yet available, but anecdotal information suggests that normal to above-normal harvests occurred in both fisheries. By assuming that the total sport harvest in 2022 was near the 2016–2020 average of 6,171 fish and that a subsistence harvest near the average of 11,414 fish occurred, the 2022 total run was probably about 62,086 Chinook salmon (calculated from Table 10). This total is smaller than the 2016–2020 average total run of 111,117 Chinook salmon (Table 10).

TOGIAK RIVER

Fishery Description

The Togiak River (Figure 3) is 1 of 3 major river systems within the Togiak National Wildlife Refuge. The Chinook salmon sport fishery on the Togiak River is concentrated along the lower 15 miles of the river and runs from late June through the month of July. The Togiak River supports the second largest Chinook salmon run in Bristol Bay, but its remote location, refuge regulations on guides, and ongoing friction between user groups have limited development of the fishery.

Based on SWHS estimates, the Chinook salmon sport harvest from 2016 through 2020 has ranged from a high of 1,617 in 2019 to a low of 425 in 2020 with an average of 890 fish from the Togiak River drainage (Table 12). From 2016 through 2020, angler effort for the Togiak River drainage peaked in 2017 with a high of 4,960 angler days; average effort for 2016–2020 was 3,453 angler-days (Table 1).

Based on freshwater logbook data from 2007 through 2016, guided angler-days have ranged from 873 in 2010 to 2,211 in 2007, with an average of 1,633 angler-days from 2012 through 2016 (Table 2).

Fishery Management and Objectives

Escapement of Chinook salmon into the Togiak River has been estimated inconsistently by aerial survey from fixed-wing aircraft since 1980. Aerial counts are expanded to account for missed fish and therefore represent total escapement estimates. Due to budget constraints, aerial Chinook salmon counts were not conducted by SF from 2010 through 2022. In 2006, the escapement goal

for Togiak River Chinook salmon became a sustainable escapement goal (SEG) of 9,300 fish; however, lacking annual escapement information, this goal was dropped in 2012.

Sport harvests and effort are estimated through the SWHS. Commercial and subsistence harvests are monitored by CF and are reported in the ADF&G Fisheries Management Report series (e.g., Elison et al. 2022). SF has conducted significant monitoring and stock assessment projects (Dunaway 1990b; Gryska and Naughton 2000, Schwanke 2013).

In 1997, the BOF adopted several regulation changes that affected the Togiak River Chinook salmon sport fishery. The May 1 through July 31 Chinook salmon sport fishery season was established by the BOF to protect spawning salmon. An annual limit of 5 Chinook salmon for sport anglers throughout Bristol Bay waters was adopted. In addition, guides were no longer allowed to harvest fish while guiding. These measures were designed to moderate the brief fishing season throughout the Bristol Bay drainage and to spread the harvest among more anglers. In 2012, the BOF reduced the area open to commercial fishing near the outlet of the Togiak River to minimize harvest of Chinook salmon.

2021 and 2022 Seasons

During 2021, there were 3,688 angler-days of sport fishing effort and 836 Chinook salmon were harvested in the sport fishery (Tables 1 and 12). Commercial harvest was 729 in 2021 and 1,371 in 2022, both below the 2016–2020 average of 3,253 (Table 12). Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported that sport fishing for Chinook salmon on the Togiak River was below normal in 2022. Due to indications of below normal returns of Chinook salmon to Bristol Bay in 2022, bag and possession limits for Chinook salmon were restricted by emergency order in all salt and freshwaters of Bristol Bay on July 21.

Table 12.–Escapement and commercial (Togiak District), subsistence, and sport harvests of Chinook salmon from the Togiak River, 1995–2022, including 1985–1994 average.

	Harvest				
Year	Commercial[a]	Subsistence[a]	Sport[b]	Total	Escapement[c]
1995	11,982	448	581	13,011	16,438
1996	8,603	471	790	9,864	11,476
1997	6,074	667	1,165	7,906	11,495
1998	14,132	782	763	15,677	11,666
1999	11,932	1,244	644	13,820	12,263
2000	7,862	1,116	470	9,448	16,897
2001	1,021	1,612	1,006	3,639	13,110
2002	2,801	703	76	3,580	9,515
2003	3,231	1,208	706	5,145	3,050[d]
2004	9,310	1,094	1,388	11,792	12,324
2005	10,759	1,528	1,734	14,021	10,200
2006	16,225	1,630	1,064	18,919	NA[e]
2007	7,769	1,234	1,501	10,504	NA[e]
2008	3,087	1,337	892	5,316	2,140[d]
2009	4,602	827	606	6,035	NA[e]
2010	5,553	1,162	591	7,306	10,096[f]
2011	6,731	966	1,438	9,135	2,140[f]

-continued-

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Year	Harvest				Escapement[c]
	Commercial[a]	Subsistence[a]	Sport[b]	Total	
2012	4,829	933	859	6,621	1,503
2013	2,718	691	900	4,309	NA[e]
2014	1,841	607	2,166	4,614	3,994
2015	2,663	876	983	4,522	2,922
2016	3,831	1,141	787	5,759	NA[e]
2017	4,643	959	978	6,580	NA[e]
2018	3,457	481	641	4,579	NA[e]
2019	3,568	599	1,617	5,784	NA[e]
2020	767	672[g]	425	1,864	NA[e]
Average [% Total]					
1985–1994	15,232 [94%]	698 [4%]	274 [2%]	16,204	12,112
1995–2020	6,154 [76%]	961 [12%]	953 [12%]	8,067	8,896
2016–2020	3,253 [66%]	770 [16%]	890 [18%]	4,913	NA
2021	729	114[g]	836	1,679	NA
2022	1,371	NA	NA	NA	NA

Source: **Commercial**: 1985–1994:Westing et al. (2005: Appendix A4); 1995–2000: Jones et al. (2014: Appendix A4); 2001–2021: Elison et al. (2022: Appendix A4). 2022: Bristol Bay Salmon Season Summary https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1438246231.pdf.

Subsistence: 1985-2015: Halas and Neufeld (2018: Appendix A1); 2016-2021: Jones and Neufeld (*In prep*).

Sport: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1986–1994) and Howe et al. (1995, 1996).

Escapement: 1985–1994:Westing et al. (2005: Appendix A20); 1995–2000: Jones et al. (2014: Appendix A20); 2001–2021: Elison et al. (2022: Appendix A18). 2022: Bristol Bay Salmon Season Summary https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1438246231.pdf.

Note: NA means not available.

[a] Commercial and subsistence harvest from Togiak District.

[b] Sport harvest from Togiak River system.

[c] Togiak River drainage total estimated by aerial survey and expanded for missed fish.

[d] Aerial survey was incomplete; 3 sections of the mainstem and 2 tributaries were not surveyed.

[e] No survey conducted due to poor weather/pilot availability.

[f] U.S. Fish and Wildlife Service radiotelemetry-derived escapement estimate.

[g] Subsistence numbers preliminary.

COHO SALMON FISHERIES

AREAWIDE FISHERY DESCRIPTION

Coho salmon are a very popular component of the Bristol Bay sport fishery. Coho salmon fisheries occur from late July through September with some isolated runs of fish available into October. While many BBMA anglers pursue coho salmon with the assistance of a guide, this readily caught species is quite popular with unguided anglers. Given the run timing, this species often serves as a popular activity for hunters and rainbow trout anglers visiting the area. Significant fisheries occur in the Alagnak, Egegik, Mulchatna, Naknek, Nushagak, Togiak, and Ugashik Rivers, as well as a host of smaller, lesser-known waters (Figure 4).

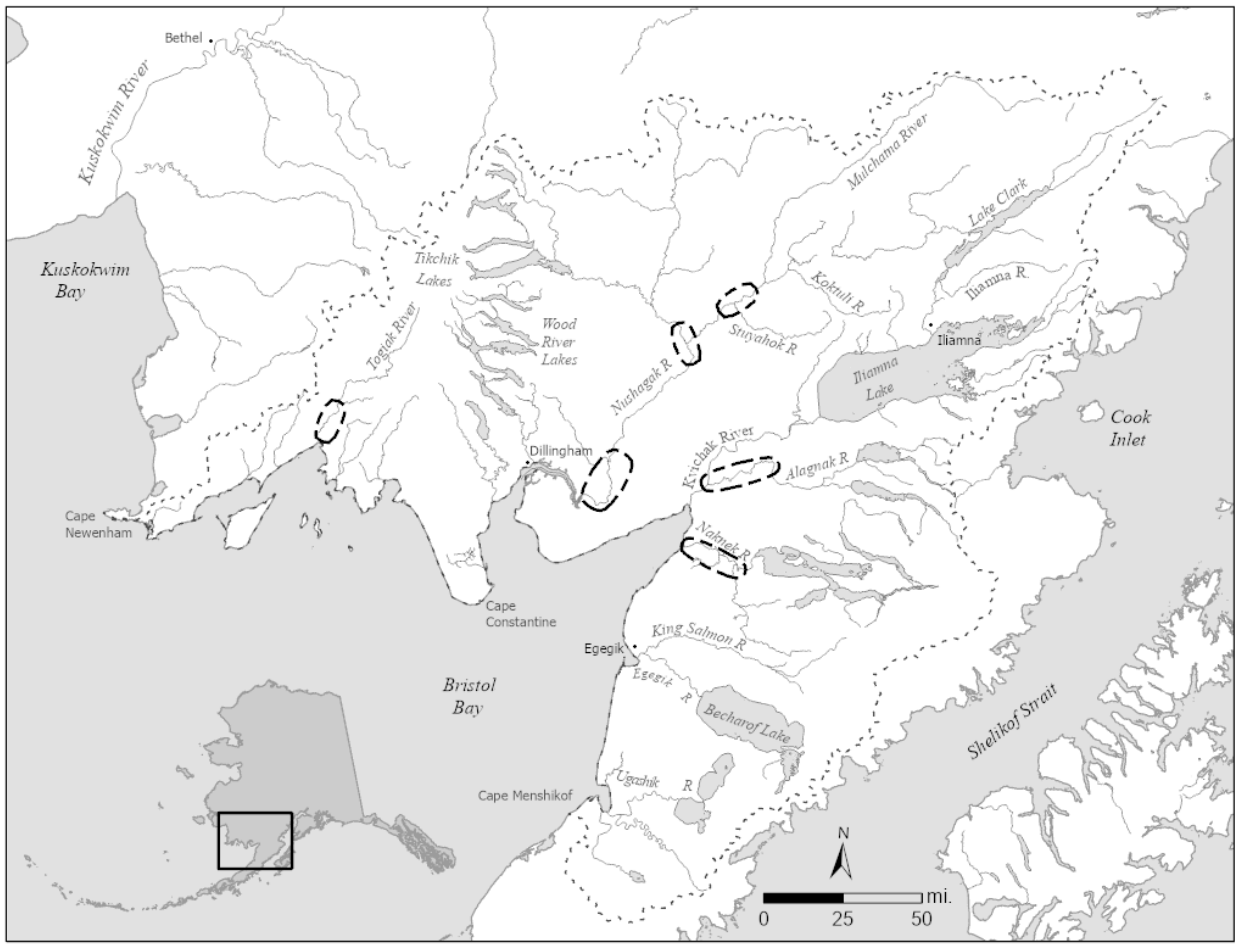

Figure 4.–Popular coho salmon sport fisheries (delineated with black dashes) in the Bristol Bay Management Area (delineated with dots).

The Bristol Bay commercial fishery generally takes the majority of the area's annual coho salmon harvest. Since 2002, the annual commercial harvest has ranged from 8,410 to 287,292 coho salmon with an average (2002–2021) of 95,583 fish harvested annually (Elison et al. 2018, page 65). Subsistence harvests from 2001 through 2020 averaged 7,022 coho salmon annually (Tiernan et al. 2021, page 97). From 2016 through 2020, the annual estimated sport harvest averaged 16,934 coho salmon and peaked at 24,725 fish in 2018 (Table 13). In 2021, anglers harvested 13,480 fish (Table 13).

Table 13.–Sport harvest of coho salmon from the waters of the Bristol Bay Management Area by fishery, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Naknek River	2,879	3,239	2,987	6,026	3,942	3,346	5,521	5,497	3,741	1,618	3,945	2,329
Brooks River	0	0	0	13	0	0	102	24	95	0	44	13
Kvichak River	1,212	1,300	715	235	485	632	385	780	1,516	830	829	650
Copper River	36	0	0	64	128	0	0	0	102	292	79	0
Alagnak River	819	892	1,030	1,754	660	741	2,034	2,867	1,698	623	1,593	1,672
Newhalen River	0	0	115	0	148	127	80	288	362	69	185	81
Lake Clark	9	0	0	41	83	206	70	0	0	23	60	0
Other	2,494	2,959	848	3,051	2,315	2,588	4,570	4,867	3,962	2,211	3,640	3,044
Subtotal[a]	7,449	8,390	5,695	11,184	7,761	7,640	12,762	14,323	11,476	5,666	10,373	7,789
Central												
Nushagak River	2,997	5,076	3,318	5,319	3,260	2,529	1,420	4,737	3,247	278	2,442	1,488
Mulchatna River	127	106	114	246	779	353	247	1,593	72	28	459	315
Agulowak River	100	19	23	0	84	57	23	0	68	0	30	0
Agulukpak River	0	0	57	0	0	0	243	0	0	0	49	20
Wood River Lakes[b]	1,038	482	1,479	410	1,242	754	12	922	838	688	643	482
Tikchik–Nuyakuk	46	0	0	20	24	0	500	23	0	0	105	0
Other	199	19	11	194	201	0	1,354	385	0	0	348	805
Subtotal[a]	4,507	5,702	5,002	6,189	5,590	3,693	3,799	7,660	4,225	994	4,074	3,110
Western												
Togiak River	1,232	2,506	1,534	3,319	4,653	2,719	2,985	2,519	1,120	2,424	2,353	2,333
Other	347	124	149	7	141	183	248	223	11	0	133	248
Subtotal[a]	1,579	2,630	1,683	3,326	4,794	2,902	3,233	2,742	1,131	2,424	2,486	2,581
Total	13,535	16,722	12,380	20,699	18,145	14,235	19,794	24,725	16,832	9,084	16,934	13,480

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1979–1980, 1981a, 1981b, 1982–1994) and Howe et al. (1995, 1996).

[a] Subtotals of averages may not be the sum of the drainages because information for some drainages is not available for some years.

[b] Wood River Lakes includes Lake Nunavaugaluk. Prior to 1998, Agulowak and Agulukpak Rivers were included in Wood River Lakes.

AREAWIDE MANAGEMENT AND OBJECTIVES

Except for the Kvichak River drainage, where the limit is 2 coho salmon per day, and the Alagnak River drainage, where the limit is 3 per day, the limits for coho salmon are 5 salmon per day with no size limit. The 5-per-day limit has been in effect since 1972. The lower limits for the Kvichak and Alagnak drainages were adopted during the 1997 BOF meetings (first effective in the 1998 season) to protect the small runs in the Kvichak River system and to address modest runs and large angling effort on the Alagnak River. The lack of escapement data to establish escapement goals and harvest strategies for all user groups continues to be a concern.

UGASHIK RIVER DRAINAGE

Fishery Description

The Ugashik River drainage (Figure 4) is located on the Alaska Peninsula about 128 km south of the community of King Salmon. Much of the drainage is within the boundaries of the Alaska Peninsula National Wildlife Refuge. The local population center of Pilot Point, at the outlet of the Ugashik River, has a long history of a commercial fishing and a subsistence-based economy. The drainage is well known for producing some of the biggest Arctic grayling in Alaska, as well as providing good angling for sockeye and coho salmon, Dolly Varden, and Arctic char. The Ugashik Lakes area is accessible only by float plane or by boat from the village of Ugashik and Pilot Point, 40 km downstream from the Lower Ugashik Lake outlet. Most angler effort is nonresident guided anglers who access the river by flying out from nearby area lodges for day-fishing trips.

Coho salmon angling is popular in the drainage from mid-August through early September and combines well with anglers seeking a mixed bag of Dolly Varden, Arctic char, and Arctic grayling. Available information suggests peak coho salmon run timing to the Ugashik River drainage occurs in late August. The most popular fishing sites are the "Narrows," a short stream connecting upper and lower Ugashik Lake, the outlet of lower Ugashik Lake, and the outlets of larger streams where they flow into the big lakes.

The Ugashik River drainage has historically been a popular destination for coho salmon anglers from lodges in Bristol Bay; however, recent angling effort in the drainage has decreased from over 2,000 angler-days during 1999–2001 to a 2016–2020 average of 1,287 angler-days (Table 14). Since 1995, the sport harvest of coho salmon decreased from a high of 921 in 2005 to a 2016–2020 average of 218 fish (Table 14).

Based on freshwater logbook data from 2012 through 2016, the average estimated coho salmon harvest by guided anglers was 98 fish from the Ugashik River drainage, which includes the Ugashik, King Salmon, and Dog Salmon Rivers (Table 4). Annual guided effort during the same period was close to the average of 314 angler-days (Table 2).

Table 14.–Angler sport fishing effort and coho salmon harvest plus escapement for the Ugashik River drainage, 1995–2022, with 1985–1994 average.

		Harvest				
Year	Sport effort[a]	Sport[a]	Commercial[b]	Subsistence[b]	Total	Escapement
1995	905	346	13,454	290	14,090	NA
1996	2,098	392	13,163	298	13,853	8,275
1997	2,551	631	7,156	311	8,098	9,400
1998	1,534	223	13,007	485	13,715	1,459
1999	2,008	830	2,289	271	3,390	10,210
2000	2,403	513	1,269	467	2,249	12,070
2001	2,471	690	976	357	2,023	4,540
2002	1,350	724	464	460	1,648	3,805
2003	1,317	529	994	392	1,915	19,670
2004	1,017	408	4,744	234	5,386	5,440
2005	882	921	8,162	249	9,332	9,850
2006	541	571	3,087	339	3,997	20,100
2007	1,393	336	1,954	281	2,571	3,500
2008	615	74	2,220	222	2,516	6,240
2009	868	233	2,602	131	2,966	NA
2010	1,390	251	407	135	793	NA
2011	1,844	72	84	136	292	4,900
2012	1,756	116	0	228	344	NA
2013	1,471	411	479	106	996	NA
2014	1,019	604	435	224	1,263	NA
2015	887	271	2,533	217	3,021	NA
2016	1,169	156	171	199	526	NA
2017	984	249	7	113	369	NA
2018	1,467	184	1,633	293	2,110	NA
2019	1,642	119	550	57	726	NA
2020	1,172	383	818	38[c]	1,239	NA
Average [% Total]						
1977–1994	1,403	288 [1%]	32,063 [98%]	376 [1%]	32,727	9,907
1995–2020	1,414	394 [10%]	3,179 [83%]	251 [7%]	3,824	8,533
2016–2020	1,287	218 [22%]	636 [64%]	140 [14%]	994	NA
2021	1,478	81	151	12[c]	244	NA
2022	NA	NA	11	NA	NA	NA

Source: **Effort and sport harvest**: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1986–1994) and Howe et al. (1995, 1996).

Commercial: 1985–1994: Westing et al. (2005: Appendix A7); 1995–2000: Jones et al. (2014: Appendix A7); 2001–2021: Elison et al. (2022: Appendix A7); 2022: Bristol Bay Salmon Season Summary https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1438246231.pdf.

Subsistence: 1985–2015: Halas and Neufeld (2018: Appendix A1); 2016–2021: Jones and Neufeld (*In prep*).

Escapement: Estimates from ADF&G-Division of Commercial Fisheries Salmon Spawning Ground Surveys in the Bristol Bay, Alaska.

Note: "NA" means data not available.

[a] Sport effort and harvest from Ugashik System

[b] Commercial and subsistence harvest from Ugashik District.

[c] Subsistence harvests preliminary.

Fishery Management and Objectives

Escapement of coho salmon in the Ugashik River drainage had been estimated with aerial surveys since 1981. Estimated escapement has ranged from 400 in 1991 to 20,100 in 2006; however, during many years the drainage survey was not completed due to budget constraints, poor weather, and poor survey conditions (e.g., see Table 14). As a result, survey results are minimum estimates of escapement and do not provide a reliable index to assess Ugashik River drainage coho salmon escapement.

Sport harvests and effort are estimated through the SWHS. Commercial and subsistence harvests are monitored by CF and are reported in the ADF&G Fisheries Management Report series (e.g., Elison et al. 2022).

2021 and 2022 Seasons

During 2021, estimated sport fishery effort was above average at 1,478 angler-days; however, the resulting harvest was below average at 81 coho salmon (Table 14). Effort, catch, and harvest for 2022 will not be available until 2023; however, reports from anglers during the 2022 season indicated a normal coho salmon run. An aerial survey was not conducted to assess coho salmon escapement.

NAKNEK RIVER

Fishery Description

The Naknek River coho salmon sport fishery (Figure 4) occurs in late July and continues well into September. The peak fishing period is normally from August 7 to August 21. Effort is concentrated along a 12-mile stretch of the Naknek River adjacent to the community of King Salmon, but significant and possibly increasing effort occurs upstream from Rapids Camp to Lake Camp. This fishery is the most popular coho salmon fishery in the area and provides significant recreational opportunity and economic benefit for the community of King Salmon. Most anglers in the coho salmon fishery are unguided and are not Alaskan residents (Gryska and Naughton 2001).

Harvests of coho salmon by the sport fishery averaged 3,903 fish during 2016–2020 (Table 15). Sport harvests of coho salmon from the Naknek River since 2011 have ranged from a high of 6,026 coho salmon in 2014 to a low of 1,490 in 2020 (Table 15).

Based on freshwater logbook data from 2007 through 2016, guided effort has remained close to the recent 5-year average of 3,854 angler-days (2012–2016; Table 2).

In recent years, the fall commercial fishery has not been active and its impact on coho salmon has been modest to nonexistent. Most of the commercial take is incidental to the sockeye salmon fishery. Subsistence harvests of coho salmon have varied since 2011, reaching a low of 399 in 2013 and increasing to 1,346 in 2017 (Table 15).

Fishery Management and Objectives

No biological escapement goal (BEG) has been established for Naknek River coho salmon stocks. Because of the lack of escapement information, it is impossible to assess fishery impacts on the total run. In addition, the commercial harvest occurs on stocks returning to 3 different major rivers, further confounding ADF&G's ability to calculate the spawner–return relationships needed to develop an escapement goal.

Table 15.–Coho salmon commercial, subsistence, and sport harvests from the Naknek River, 1995–2022, with the 1985–1994 average.

	Harvest			
Year	Commercial[a]	Subsistence[a]	Sport[b]	Total
1995	1,105	1,791	1,788	4,684
1996	3,601	1,482	4,754	9,837
1997	718	1,457	3,879	6,054
1998	1,587	1,592	2,547	5,726
1999	303	856	3,672	4,831
2000	952	937	3,549	5,438
2001	3	740	4,795	5,538
2002	0	943	4,756	5,699
2003	42	812	6,393	7,247
2004	2,142	566	7,333	10,041
2005	3,314	1,224	2,714	7,252
2006	5,163	720	4,015	9,898
2007	2,180	1,104	4,218	7,502
2008	7,059	1,437	5,830	14,326
2009	732	669	4,325	5,726
2010	901	645	4,970	6,516
2011	633	690	2,879	4,202
2012	431	485	3,239	4,155
2013	467	399	2,987	3,853
2014	646	573	6,026	7,245
2015	1,253	796	3,942	5,991
2016	1,110	603	3,346	5,059
2017	4,754	1,346	5,521	11,621
2018	11,549	1,155	5,438	18,142
2019	1,418	552	3,718	5,688
2020	1,033	645[c]	1,490	3,168
Average [% Total]				
1971–1994	13,406 [78%]	1,237 [7%]	2,559 [15%]	17,201
1995–2020	2,042 [29%]	932 [13%]	4,159 [58%]	7,132
2016–2020	3,973 [45%]	860 [10%]	3,903 [45%]	8,736
2021	1,053	561[c]	2,302	3,916
2022	1,003	NA	NA	NA

Source: **Commercial (Naknek–Kvichak District)**: 1985–1994: Westing et al. (2005: Appendix A7); 1995–2000: Jones et al. (2014: Appendix A7); 2001–2021: Elison et al. (2022: Appendix A7); 2022: Bristol Bay Salmon Season Summary https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1438246231.pdf.

Subsistence (Naknek–Kvichak District): 1985–2015: Halas and Neufeld (2018: Appendix A1); 2016–2021: Jones and Neufeld (*In prep*).

Sport (Naknek River): Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1986–1994) and Howe et al. (1995, 1996).

Note: "NA" means data not available.

[a] Commercial and subsistence harvest from Naknek-Kvichak District

[b] Sport harvest from Naknek River and tributaries excluding Naknek Lake and tributaries.

[c] Subsistence harvest preliminary

Sport harvests and effort are estimated through the SWHS. Commercial and subsistence harvests are monitored by CF and are reported in the ADF&G Fisheries Management Report series (e.g., Elison et al. 2022). SF has conducted significant monitoring and stock assessment projects in the recent past (Minard and Brookover 1988b; Minard 1989a; Coggins 1992; Dunaway and Fleischman 1996a; Gryska and Naughton 2001).

The present bag and possession limits for coho salmon on the Naknek River are 5 fish per day with no size limit; the same limits have been in effect since 1972. No adjustments to the Naknek River coho salmon fishery bag and possession limits have occurred by inseason emergency order since 1999. In 1999, the coho salmon runs were so poor throughout Bristol Bay that the coho salmon sport fishery was restricted by emergency order to 1 coho salmon per day beginning on August 23.

Management concerns for this fishery include the lack of escapement data and the lack of a management goal or target for this fishery. Without a clearer management target, justification for adjusting fishing time in the various fisheries is tenuous.

2021 and 2022 Seasons

During 2021, estimated sport fishery effort for the Naknek River was above average at 13,756 angler-days (Table 1). The 2021 sport harvest of 2,302 coho salmon was below the recent 5-year average of 3,903 (2016–2020; Table 15). Sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, reports from anglers during the 2022 season indicated a normal coho salmon run. Harvests in the commercial fishery were 1,053 and 1,003 fish in 2021 and 2022, respectively (Table 15). No aerial escapement survey was conducted during 2022.

NUSHAGAK–MULCHATNA DRAINAGE

Fishery Description

The Nushagak–Mulchatna River drainages (Figure 4) produce the largest runs of coho salmon in Bristol Bay. Within the drainage, there are 4 areas of concentrated sport fishing effort: the lower 15 miles of the Nushagak River near the village of Portage Creek, the middle section of the Nushagak River near the village of Ekwok, the section of the Mulchatna River between the Stuyahok and Koktuli Rivers, and the upper Nushagak River from the outlet of Nuyakuk River upstream to the outlet of the King Salmon River (Figure 4). Of these areas, the lower portion of the Nushagak River and the fishery in the immediate vicinity of the Nuyakuk River outlet have long been the most significant. Although sport fishing for coho salmon occurs in some of the tributaries of the drainage, the overall harvest is considered slight. The lower Nushagak River provides fishing opportunity for early coho salmon in late July and early August when other coho salmon fisheries have not yet begun. Increased guided rainbow trout angling as well as caribou and moose hunting in the upper Nushagak River area may contribute to increased coho salmon angling in this remote portion of the drainage. Combination hunting and fishing (coho salmon, rainbow trout) float trips have been popular for years in the Mulchatna River drainage.

Most recently (2016–2020), sport fishing harvest has averaged 3,005 fish or 3% of the total harvest of Nushagak–Mulchatna coho salmon (Table 16). Commercial harvest accounted for 92% and subsistence was 5% of the total annual harvest for the same period. Subsistence harvest has varied between 2,642 and 7,717 fish since 1995. At current levels, the coho salmon sport fishery has little impact on the overall productivity of Nushagak–Mulchatna Rivers coho salmon stocks.

Table 16.–Coho salmon commercial, subsistence, and sport harvest, plus inriver abundance for the Nushagak River drainage, 1995–2022 with the 1985–1994 average.

Year	Commercial harvest[a]	Subsistence harvest[a]	Sport harvest[b]	Total	Inriver abundance[c]	Spawning escapement[d]
1995	4,181	3,905	725	8,811	53,510	51,519
1996	11,401	5,217	3,761	20,379	235,007	231,147
1997	4,110	3,433	500	8,043	46,243	44,552
1998	22,703	5,316	1,368	29,387	127,199	124,325
1999	2,836	3,993	618	7,447	38,697	36,714
2000	112,852	5,983	2,219	121,054	219,328	215,801
2001	3,218	5,993	2,425	11,636	86,822	83,203
2002	93	4,565	1,530	6,188	53,775	51,155
2003	583	5,432	1,055	7,070	NA	NA
2004	47,706	4,240	3,436	55,382	152,613	149,312
2005	42,456	5,596	2,094	50,146	NA	NA
2006	44,385	3,590	2,392	50,367	NA	NA
2007	29,578	3,050	2,907	35,535	NA	NA
2008	76,932	5,133	6,496	88,561	NA	NA
2009	35,171	6,777	3,478	45,426	NA	NA
2010	72,909	2,983	2,820	78,712	NA	NA
2011	4,712	5,746	3,170	13,628	NA	NA
2012	97,382	2,642	5,182	105,206	329,946	326,582
2013	124,182	7,717	3,432	135,331	207,222	202,428
2014	242,604	7,463	5,600	255,667	483,219	477,602
2015	6,614	5,644	4,063	16,321	NA	NA
2016	79,538	4,766	2,882	87,186	NA	NA
2017	167,347	5,720	2,167	175,234	NA	NA
2018	84,320	4,735	6,353	95,408	111,455	106,687
2019	33,018	5,229	3,319	41,566	51,852	48,176
2020	76,133	4,320[e]	306	80,759	NA	NA
Average [%Total]						
1980–1994	34,918 [81%]	7,065 [16%]	906 [2%]	42,183	72,519	69,091
1995–2020	54,883 [88%]	4,969 [8%]	2,858 [5%]	62,710	156,921	153,514
2016–2020	88,071 [92%]	4,954 [5%]	3,005 [3%]	96,031	81,654	77,432
2021	27,467	5,133[e]	1,803	34,403	NA	NA
2022	1,789	NA	NA	NA	NA	NA

Source: **Commercial**: 1985–1994: Westing et al. (2005: Appendix A7); 1995–2000: Jones et al. (2014: Appendix A7); 2001–2021: Elison et al. (2022: Appendix A7). 2022: Bristol Bay Salmon Season Summary https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1438246231.pdf.

Subsistence: 1985–2012: Halas and Neufeld (2018: Appendix A1); 2013-2021: Jones and Neufeld (*In prep*).

Sport: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1986–1994) and Howe et al. (1995, 1996).

Escapement: 1985–1994: Westing et al. (2005: Appendix A23); 1995-2021: Bristol Bay Annual Management Reports, Commercial Fish division https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareabristolbay.salmon#management; 2022: Bristol Bay Salmon Season Summary https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1438246231.pdf.

Note: "NA" means data not available.

[a] Total Nushagak District commercial and subsistence harvest.

[b] Sport harvest from Nushagak River drainage.

[c] Inriver abundance estimated by sonar counter at Portage Creek.

[d] Estimated spawning escapement calculated from sonar estimates.

[e] Subsistence harvests preliminary

Based on freshwater logbook data from 2007 through 2016, guided effort downstream of the Mulchatna River has varied from 3,920 angler-days in 2010 to 8,185 angler-days in 2015. From 2012 through 2016, total effort averaged 7,165 angler-days (Table 2).

Fishery Management and Objectives

There are currently no conservation concerns for Nushagak River coho salmon stocks. Since 1995, the 60,000–120,000 fish escapement goal was achieved in 9 of those years, although the sonar did not operate during the coho salmon run in 14 of those years due to budget shortfalls (Table 16). In the past, significant restrictions have been placed on all fisheries, including closure of the subsistence fishery, to reduce exploitation on this stock in poor years (e.g., in 1999, when the inriver sonar estimate was the lowest on record since 1987; Table 16). Recent runs have been well above average and the inriver and escapement goals have been exceeded. Current management of Nushagak–Mulchatna Rivers coho salmon is governed by 5 AAC 06.368 *Nushagak River Coho Salmon Management Plan* and was adopted by the BOF in December 1995. The plan calls for managing the commercial fishery for an inriver run of 70,000–130,000 coho salmon, providing a spawning escapement of 60,000–120,000 fish, a reasonable opportunity in the subsistence fishery, and a 2,000-fish guideline harvest in the sport fishery. The plan addresses management actions to take if the inriver run falls short of the goal. If the inriver run falls below 95,000 fish, then ADF&G may implement restrictions on the sport fishery to maintain the sport harvest below 2,000 fish. If the inriver run is less than 70,000 fish, then closure of the sport fishery is required. Along with sport fishery management actions, the plan directs ADF&G to take actions in the commercial and subsistence fisheries; all fisheries must close when the inriver run falls below 60,000 coho salmon.

Sport harvests and effort are estimated through the SWHS. Commercial and subsistence harvests are monitored by CF and are reported in the ADF&G Annual Management Report series (e.g., Elison et al. 2022). Inriver abundance of coho salmon in the Nushagak River is estimated by side-scan sonar operated near the village of Portage Creek. Sport and subsistence harvests are assumed to occur above the sonar site; therefore, estimated spawning escapement is equal to the sonar count minus sport and subsistence harvests.

From 1984 through 1992, Nushagak River coho salmon stocks were managed to achieve a biological escapement goal (BEG) of 150,000 fish, estimated by sonar at Portage Creek. However, spawning escapements during that period consistently fell short of the goal, averaging 89,214 fish (Westing et al. 2005). Subsequent spawner–recruit analysis suggested the 150,000 fish goal was higher than necessary to manage for maximum sustained yield, so the BEG was reduced to 90,000 spawners in 1992 (Dunaway and Sonnichsen 2001). The present bag and possession limits for coho salmon on the Nushagak–Mulchatna drainage are 5 fish per day with no size limit,[6] which has been in effect since 1972 for most of the region.

2021 and 2022 Seasons

During the 2021 season, estimated effort in the Nushagak River sport fishery was 11,917 angler-days, which is slightly below the recent 5-year average of 12,151 angler-days (2016–2020; Table 1). Sport Harvest was 1,803 coho salmon, which was also below the recent average (2016–2020; Table 16) Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported below normal sport fishing. Inriver escapement was not

[6] Southwest Alaska sport fishing regulations summary, 2022 (effective until the 2023 summary is issued) Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

monitored during either the 2021 or 2022 seasons and no inseason restrictions were implemented on the sport fishery. The 2021 and 2022 commercial harvests were 27,467 and 1,789 fish, respectively (Table 16).

TOGIAK RIVER

Fishery Description

The bulk of the Togiak River coho salmon fishery occurs in the lower 20 miles of the Togiak River (Figure 4) below the Wilderness boundary of the Togiak National Wildlife Refuge. The sport fishery occurs from early August to the middle of September. The best angling usually occurs between August 21 and September 7 when coho salmon enter in the greatest abundance. Angler effort is largely nonresident guided anglers who access the river by flying out from nearby lodges to fish for the day. In addition, there are 2 river-based lodges that cater to nonresident anglers, one of which is owned by the local native corporation in Togiak and leased to a concession group.

Sport harvest of coho salmon from the Togiak River averaged 2,353 fish annually from 2016 through 2020, or about 7% of the total Togiak River coho salmon harvest (Table 17). Annual sport harvest peaked in 2015 at 4,653 fish. A high degree of voluntary catch-and-release angling has been documented for this fishery and ranges up to 60% of the catch (Gryska and Naughton 2000). Given previous studies (Vincent-Lang et al. 1993), concern over hook-induced mortality prompted staff to evaluate the potential catch-and-release mortality in this fishery. ADF&G concluded that although the released proportion of the catch was large, the total number of fish caught is small relative to total run size. Therefore, catch-and-release is believed to affect only a small proportion of fish and is expected to have only a minor impact on the overall abundance of the stocks. In addition, Vincent-Lang et al. (1993) and Stuby (2002) have demonstrated that the mortality of released coho salmon is low when catches are made above the intertidal area, as is the case for much of the Togiak River fishery.

Based on freshwater logbook data from 2007 through 2016, guided angler-days have ranged from 873 in 2010 to 2,211 in 2007, with an average of 1,633 angler-days from 2012 through 2016 (Table 2).

Since 1995, commercial catches in the Togiak Section have varied, ranging from a high of 58,978 fish in 1996 to a low of 8 in 2005. The annual average commercial harvest from 2016 through 2020 was 28,993 fish, accounting for 92% of the total Togiak coho salmon harvest (Table 17).

From 2016 through 2020, subsistence harvests were variable and ranged from 98 to 545 fish per year with an average of 336 fish (Table 17).

Table 17.–Coho salmon commercial, subsistence, and sport harvest plus escapement for the Togiak River, 1995–2022, with the 1985–1994 average.

	Harvest					
Year	Commercial[a]	Subsistence[a]	Sport[b]	Total	Escapement[c]	Total run
1995	8,871	703	408	9,982	NA	NA
1996	58,978	199	1,382	60,559	64,980	125,539
1997	2,970	260	780	4,010	20,625	24,635
1998	58,688	310	1,020	60,018	25,335	85,353
1999	2,653	217	1,109	3,979	3,855	NA
2000	2,758	342	840	3,940	NA	NA
2001	284	388	1,004	1,676	NA	NA
2002	754	241	1,475	2,470	NA	NA
2003	1,047	883	2,086	4,016	6,900	10,916
2004	15,463	204	2,321	17,988	NA	NA
2005	8	295	1,959	2,262	NA	NA
2006	449	408	2,214	3,071	NA	NA
2007	157	110	1,970	2,237	NA	NA
2008	1,159	541	3,420	5,120	NA	NA
2009	9,209	272	1,556	11,037	NA	NA
2010	24,065	514	772	25,351	NA	NA
2011	7,605	545	1,232	9,382	NA	NA
2012	15,977	293	2,506	18,776	NA	NA
2013	11,420	208	1,534	13,162	NA	NA
2014	32,134	486	3,319	35,939	NA	NA
2015	26,080	650	4,653	31,383	NA	NA
2016	9,346	521	2,719	12,586	NA	NA
2017	54,503	545	2,985	58,033	NA	NA
2018	43,243	181	2,519	45,943	NA	NA
2019	27,778	98	1,120	28,996	NA	NA
2020	10,095	333[d]	2,424	12,852	NA	NA
Average [% Total]						
1977–1994	28,490 [73%]	1,060 [3%]	838 [2%]	39,260	31,876	71,136
1995–2020	16,373 [88%]	375 [2%]	1,897 [10%]	18,645	24,339	61,611
2016–2020	28,993 [92%]	336 [1%]	2,353 [7%]	31,682	NA	NA
2021	3,583	585[d]	2,333	6,501	NA	NA
2022	1,099	NA	NA	NA	NA	NA

Source: **Commercial:** 1985–1994: Westing et al. (2005: Appendix A7); 1995–2000: Jones et al. (2014: Appendix A7); 2001–2021 Elison et al. (2022: Appendix A7); 2022: Bristol Bay Salmon Season Summary https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1438246231.pdf.

Subsistence: 1985–2015: Halas and Neufeld (2018: Appendix A1); 2016–2021: Jones and Neufeld (*In prep*).

Sport: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1986–1994) and Howe et al. (1995, 1996).

Escapement: 1985–2003: Westing et al. (2005: Appendix A24).

Note: "NA" means data not available.

[a] Total Togiak District commercial and subsistence harvest.

[b] Sport harvest from Togiak River drainage.

[c] Escapement estimates are based on fixed wing aerial surveys. Peak counts are expanded by a factor of 3 to account for missed fish. In 1985–1987, expansion factors were greater due to incomplete surveys or poor survey conditions. There were partial counts in 1999 and 2003.

[d] Subsistence harvest preliminary.

Fishery Management and Objectives

Currently, there is no escapement goal for Togiak River coho salmon due to a lack of annual escapement information. Coho salmon runs have been highly variable; weather frequently prohibits escapement assessment, and occasional illegal fishing with unknown harvest has confounded ADF&G's ability to consistently collect accurate run size information.

Sport fishery harvests and effort are estimated through the SWHS. Commercial and subsistence harvests are monitored by CF and are reported in the ADF&G Fisheries Management Report series (e.g., Elison et al. 2022). SF conducted significant monitoring and stock assessment projects in 1984 and 1989 (Minard and Lisac 1984; Dunaway 1990b). A creel survey to estimate catch and harvest rates in the sport fishery was conducted in 1999 (Gryska and Naughton 2000) and 2007 (Dye and Schwanke 2012). When weather and water conditions permit, CF estimates annual spawning escapement of Togiak River coho salmon by conducting aerial escapement index counts.

Since 1972, the bag and possession limits for coho salmon on the Togiak River have been 5 per day with no size limit.[7] For years when spawner escapements have been adequate (e.g., 1996), the current bag limit of 5 has been satisfactory, but in poor years, ADF&G has responded with emergency orders to restrict the bag limit to reduce overall harvest. Prior to 1999, the limit was restricted 4 times in response to conservation concerns. There were no inseason restrictions placed on this fishery from 2016 through 2020.

2021 and 2022 Seasons

During the 2021 season, estimated effort in the sport fishery was 3,688 angler-days, which is slightly above the recent 5-year average of 3,453 angler-days (2016–2020; Table 1). Sport harvest was 2,333 coho salmon which was roughly average (2016–2020; Table 17). Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported normal sport fishing. Aerial surveys were not conducted during either the 2021 or 2022 seasons and no inseason restrictions were implemented on the sport fishery. The 2021 and 2022 commercial harvests were 3,583 and 1,099 fish, respectively, both well below the recent average of 28,993 coho salmon (Table 17).

SOCKEYE SALMON FISHERIES

Sockeye salmon is the most numerous of the Pacific salmon species to spawn in Bristol Bay, which is the world's largest producer of sockeye salmon. Their prized eating qualities make sockeye salmon the most popular species of salmon on the commercial market. Sockeye salmon are often indifferent to most fishing lures, making them difficult to catch. Since the late 1960s, however, anglers have discovered innovative ways to legally catch sockeye salmon with customary sport gear, and the species has rapidly gained favor as a hard-fighting and delectable game fish. The most popular fisheries exist in the Naknek and Kvichak River drainages, but effort is growing in other waters of the BBMA as well (Figure 5).

[7] Southwest Alaska sport fishing regulations summary, 2022 (effective until the 2023 summary is issued) Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

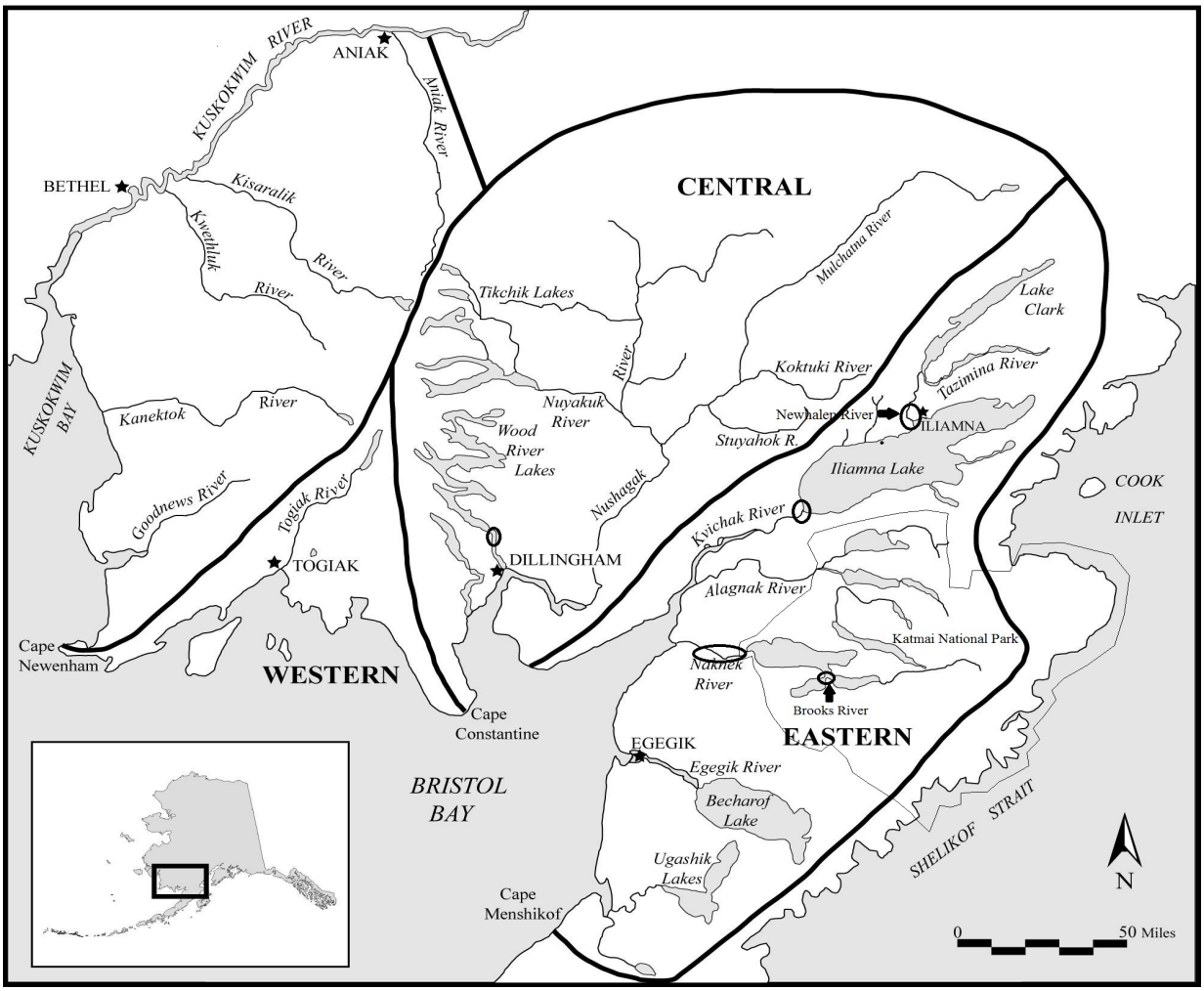

Figure 5.–Popular sockeye salmon sport fisheries (circled) in the Bristol Bay Management Area.

Sport harvest of sockeye salmon in the BBMA has averaged 18,909 from 2016 through 2020 (Table 18) with an estimated peak of 23,842 fish taken in 2017 and a low of 15,535 fish in 2016. The most active sport fisheries occur in the Eastern section of the management area, where an average (2016–2020) of 15,616 fish or about 83% of the annual harvest was taken. The Central section fishery harvest has averaged 2,938 sockeye salmon per year and harvest in the Western section has averaged 354 fish annually (Table 18). Even at its highest levels, the sport harvest is around 0.05% of the 2011 through 2020 average annual run of 47.2 million sockeye salmon (Elison et al. 2022). Subsistence fishers have harvested approximately 0.2% of the annual sockeye salmon run from 2010 through 2019 (Tiernan et al. 2021).

Sockeye salmon share the same bag and possession limits with all salmon except Chinook salmon: 5 salmon per day with no size limit. This regionwide limit has been in effect since 1972. ADF&G's ability to manage for sustained yield is essentially unaffected by the sport harvest of sockeye salmon. Several adjustments were made to the bag and possession limits in the 2019, 2020, 2021, and 2022 seasons in the form of emergency orders to liberalize bag limits in several drainages (see the *Emergency Orders Issued in 2019 through 2022* section in the *Introduction*). Sockeye salmon continue to play an important role in the development and expansion of the sport fishery in the BBMA.

Table 18.–Sport harvest of sockeye salmon by section for the Bristol Bay Management Area, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Naknek River	3,324	5,924	4,586	4,939	5,904	4,935	4,932	5,042	5,635	6,537	5,610	5,637
Brooks River	584	23	411	93	241	270	39	19	38	318	131	313
Kvichak River	1,689	1,244	2,427	1,947	2,997	2,061	2,634	2,941	1,259	1,063	2,179	4,740
Copper River	517	123	657	277	180	351	277	298	250	562	313	217
Alagnak River	2,770	611	1,032	2,821	2,134	1,874	3,575	4,821	2,039	3,393	3,192	5,668
Newhalen River	772	2,182	559	4,598	734	1,769	6,024	529	4,064	1,522	2,575	2,153
Lake Clark	243	630	181	337	519	382	468	820	144	224	435	724
Other	2,028	1,204	1,188	1,474	1,095	1,398	389	1,736	1,528	1,158	1,181	2,365
Subtotal[a]	11,927	11,941	11,041	16,486	13,804	13,040	18,338	16,206	14,957	14,777	15,616	21,817
Central												
Nushagak River	344	403	209	462	250	334	2,346	1,572	755	291	1,043	6,140
Mulchatna River	164	445	446	497	150	340	211	184	374	225	229	267
Agulowak River	702	91	317	424	192	345	545	202	486	123	310	227
Agulukpak River	169	14	0	112	31	65	0	0	0	0	6	72
Wood River Lakes[b]	236	80	2,356	418	60	630	1,636	1,462	1,596	855	1,122	2,640
Tikchik–Nuyakuk	120	14	0	0	0	27	132	37	147	0	63	241
Other	11	111	94	0	386	120	0	0	442	0	166	0
Subtotal[a]	1,746	1,158	3,422	1,913	1,069	1,862	4,870	3,457	3,800	1,494	2,938	9,587
Western												
Togiak River	668	119	284	438	647	431	594	33	295	147	343	1,648
Other	0	0	0	0	15	3	40	0	0	0	11	0
Subtotal[a]	668	119	284	438	662	434	634	33	295	147	354	1,648
Total	14,341	13,218	14,747	18,837	15,535	15,336	23,842	19,696	19,052	16,418	18,909	33,052

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1979–1980, 1981a, 1981b, 1982–1994) and Howe et al. (1995, 1996).

[a] Subtotals of averages may not be the sum of the drainages because information for some drainages is not available for some years.

[b] Wood River Lakes includes Lake Nunavaugaluk. Prior to 1998, Agulowak and Agulukpak Rivers were included in Wood River Lakes.

BROOKS RIVER

Fishery Description

The Brooks River, which drains Brooks Lake into Naknek Lake (Figure 5), is a 2-mile long stretch of water located within the boundaries of Katmai National Park and Preserve. This river is cherished by some anglers because of its classic pool-and-riffle structure and excellent fishing opportunities. Brooks Camp, located on Naknek Lake, was established in 1960 by Northern Consolidated Airlines as primarily a sport fishing facility, but in recent years it has also become popular with tourists for hiking and bear viewing opportunities. Access to Brooks River and Brooks Camp is by float-equipped aircraft or boat. In addition to guest cabins, a campground facility is available for overnight visitors. At the lower end of Brooks River is a footbridge that allows visitors to cross between the south and north shores without wading. The sport fishery for sockeye salmon generally takes place below the bridge in the lower ¼ mile of the river where it empties into Naknek Lake. The sockeye salmon fishery begins in late June when the first salmon arrive and peaks over the Fourth of July weekend. The sport fishery occupies waters also used by brown bears fishing for salmon. This overlap has caused management problems and conflicts for ADF&G and the National Park Service. At issue is the safety of visitors and priority in access for different groups (bear viewers, sport anglers, hikers).

Since 2011, annual estimates of sport harvests of Brooks River sockeye salmon have ranged from a low of 19 in 2018 to a high of 584 in 2012 (Table 18). The recent 5-year (2016–2020) average annual harvest of 131 fish (Table 18) is easily sustained by this run, which is part of the Naknek escapement of about 2 million fish.

Based on freshwater logbook data from 2012 through 2016, guided effort has been slowly decreasing, with an average of 1,004 angler-days (Table 2).

Fishery Management and Objectives

The abundance of sockeye salmon at Brooks River is a function of the escapement into the Naknek River. The Naknek River drainage escapement goal is 800,000 to 2 million sockeye salmon (Elison et al. 2022). The magnitude of the escapement is such that variations in inriver abundance have little effect on sport fishery performance in the Brooks River.

Sport fishery harvests and effort are estimated through the SWHS. Commercial and subsistence harvests are monitored by CF and are reported in the ADF&G Fisheries Management Report series (e.g., Elison et al. 2022). SF has not conducted any significant monitoring or stock assessment projects for this fishery in recent seasons. Forecasts of next season's run are provided by CF and are reported in a statewide salmon forecast summary (Brenner et al. 2022). Escapement of sockeye salmon in the Brooks River is estimated from fixed-wing aerial surveys during the presumed peak of spawning.

There has been a complicated history of regulations regarding this sport fishery. The current regulations are the result of the BOF overhauling the regulations in 1990 as part of the development of a rainbow trout management plan for the area. The regulation allowing catch-and-release fishing only for all species for the Brooks River from Brooks Lake downstream to the foot bridge was adopted during the fall of 1997 to address bear–human concerns raised by the National Park Service. From the bridge downstream to Naknek Lake, anglers may keep 1 fish per day and in possession except rainbow trout, which are managed for catch-and-release fishing for the entire

river.[8] Anglers are restricted to single-hook artificial lures below the footbridge and unbaited single-hook artificial flies above the bridge. Over the years, significant restrictions to sport fishing have been made under the premise of ensuring the safety of sport anglers using the Brooks River. These concessions include reductions in bag limits from 5 sockeye salmon to 1, restrictions in terminal tackle to include single-hook artificial lures below the bridge, and the previously mentioned catch-and-release only, fly-fishing-only, restrictions above the bridge.

Brooks River is managed to provide a diversity of angling opportunity by providing a special management area restricted to unbaited, single-hook, artificial flies.

2021 and 2022 Seasons

During the 2021 season, estimated effort in the sport fishery was about average at 2,186 angler-days (Table 1). The sport harvest of 313 sockeye salmon was above the recent 5-year average of 131 fish (2016–2020; Table 18). Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported normal sport fishing. In 2021 and 2022, escapement of sockeye salmon into the Naknek River drainage totaled 2,796,534 and 1,921,296, respectively, exceeding and meeting the goal of 800,000 to 2 million fish. The large sockeye salmon escapement into the Naknek River system provided plenty of fish for anglers in Brooks River and for anglers throughout the Naknek River drainage. No inseason restrictions were imposed on the sport fishery.

KVICHAK RIVER

Fishery Description

The Kvichak River drainage (Figure 5) hosts one of the largest sockeye salmon runs in the world and the river is a popular destination for anglers targeting this species. Two locations within the drainage support the biggest sport fisheries for sockeye salmon in Bristol Bay. The first is the fishery on the Kvichak River at the outlet of Lake Iliamna. The other, often larger, fishery occurs on the Newhalen River near the community of Iliamna. Smaller tributaries within the drainage are fished less intensively and sport harvests are relatively minor comparatively.

Sockeye salmon first appear in the Kvichak River during the last week of June. The run peaks in the first week of July, then declines steadily until late July or early August. In peak years, the sport fishery may be active for much of the month of July.

A modern airstrip and trail system in the village of Igiugig provides easy access to the river where it drains out of Lake Iliamna, and floatplanes can land on the lake or on the river. Although much of the sport fishing effort is from nonresident guided anglers, a growing component is the resident unguided angler arriving from Anchorage in private, chartered, or scheduled aircraft. The Igiugig Native Corporation owns most of the uplands along the upper Kvichak River, and charges anglers modest daily fees for access. Commercial operators are charged more substantial fees for annual leases.

Historically, the Bristol Bay commercial salmon fleet harvests roughly half of the annual Kvichak River sockeye salmon run and from 1985 to 1994, the subsistence fishery took an average of

[8] Alaska sport fishing regulations summary—Bristol Bay drainages (effective April 15, 2015, through April 14, 2016) Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

approximately 72,000 fish annually, or about 0.5% of the total run (calculated from Table 19). From 1995 to 2020, the annual subsistence harvest has averaged 42,524 fish.

Estimates of sockeye salmon sport harvest from the Kvichak River drainage since 1995 have ranged from 2,215 in 2002 to 15,135 in 1995 (Table 19). From 2016 through 2020, the annual sport harvest averaged 2,179 fish from Kvichak River alone (from Table 18). On average, the sport harvest accounts for less than 0.1% of the total Kvichak drainage harvest. From 2016 through 2020, average annual sport fishing effort in the Kvichak River was about 3,760 angler-days (effort is for all species, though anglers mainly fish for rainbow trout and sockeye salmon at the Kvichak River; Table 1). At such low levels, the sport fishery has little effect on ADF&G's ability to manage for sustained yield.

Based on freshwater logbook data from 2012 through 2016, guided effort averaged 1,464 angler-days (Table 2).

Fishery Management and Objectives

Kvichak River sockeye salmon stocks are managed to achieve a sustainable escapement goal (SEG) range of 2 million to 10 million fish (Elison et al. 2022).

The sport fishery is managed with the *Kvichak Drainage Sockeye Salmon Management Plan* (5 AAC 67.025). This plan provides increased participation and opportunity and reduces potential conflicts between sport and subsistence users. Participation in this fishery could grow quickly by improving access to desirable fishing sites, promoting the fishery as a destination, and ensuring necessary facilities are provided to accommodate growth in a responsible manner. To this end, ADF&G has worked closely with the Igiugig City Council on a project to build trails to desirable fishing locations close to the village airfield. For example, a trail was completed from the village road system to a prime sockeye salmon fishing site along the Kvichak River in fall 2001.

Sport fishery harvests and effort are estimated through the SWHS. Commercial and subsistence harvests are monitored by CF and are reported in the ADF&G Fisheries Management Report series (e.g., Elison et al. 2022).

2021 and 2022 Seasons

The 2021 and 2022 sockeye salmon run to the Kvichak River achieved the minimum SEG of 2.0 million fish. Approximately 4.7 million and 4.2 million sockeye salmon were counted at the Igiugig tower in 2021 and 2022, respectively (Table 19).

Preliminary 2021 subsistence harvest was below the recent 5-year average with a harvest of 16,160 fish (2016–2020; Table 19). Although no estimate is available at this time, we expect the 2022 subsistence harvest to be within the normal historical range of 40,000 to 60,000 sockeye salmon.

During the 2021 season, estimated effort in the Kvichak River sport fishery was 4,584 angler-days, which is above the recent 5-year average of 3,760 angler-days (2016–2020; Table 1). The sport harvest of 9,716 sockeye salmon was above the recent average (2016–2020; Table 19). Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported above normal sport fishing.

Table 19.–Sockeye salmon harvests and escapements for the Kvichak River, 1995–2022, with the 1985–1994 average.

	Harvest				
Year	Commercial[a]	Subsistence[b]	Sport[c]	Total	Escapement[d]
1995	20,280,970	54,679	15,135	20,350,784	10,038,720
1996	8,215,474	54,872	7,965	8,278,311	1,450,578
1997	589,545	59,508	7,875	656,928	1,503,732
1998	2,596,490	53,656	13,119	2,663,265	2,296,074
1999	9,454,109	57,723	12,760	9,524,592	6,196,914
2000	4,728,095	36,990	8,479	4,773,564	1,827,780
2001	5,281,837	32,808	4,502	5,319,147	1,095,348
2002	1,419,630	33,001	2,215	1,454,846	703,884
2003	3,350,656	38,525	3,068	3,392,249	1,686,804
2004	4,716,715	53,225	5,098	4,775,038	5,500,134
2005	6,730,812	48,263	4,292	6,783,367	2,320,422
2006	7,151,741	49,850	4,899	7,206,490	3,068,226
2007	9,027,161	47,538	4,172	9,078,871	2,810,208
2008	10,385,172	49,563	6,496	10,441,231	2,757,912
2009	8,517,450	46,771	7,510	8,571,731	2,266,140
2010	10,861,016	40,688	5,522	10,907,226	4,207,410
2011	9,019,372	45,226	5,487	9,070,085	2,264,352
2012	10,152,917	52,369	3,770	10,209,056	4,164,444
2013	4,853,030	42,556	4,772	4,900,358	2,088,576
2014	13,791,053	41,016	4,802	13,836,871	4,458,540
2015	16,531,193	39,279	8,007	16,578,479	7,349,712
2016	13,466,245	30,257	5,525	13,502,027	4,462,728
2017	8,256,304	27,847	9,450	8,293,601	3,163,404
2018	8,917,710	25,764	6,307	8,949,781	4,398,708
2019	11,527,837	21,835	7,009	11,556,681	2,371,242
2020	14,311,035	21,826[e]	4,205	14,337,066	4,030,968
Average [% Total]					
1974–1994	9,572,717 [99%]	72,090 [<1%]	10,723 [<1%]	9,655,530	5,512,064
1995–2020	8,620,522 [99%]	42,524 [<1%]	6,632 [<1%]	8,669,679	3,403,191
2016–2020	11,295,826 [>99%]	25,506 [<1%]	6,499 [<1%]	11,327,831	3,685,410
2021	9,253,721	16,160[e]	9,716	9,279,597	4,703,520
2022	14,172,393	NA	NA	NA	4,224,882

Source: **Commercial**: 1985–1994: Westing et al. (2005: Appendix A12); 1995–2000: Jones et al. (2014: Appendix A11); 2001–2021 Elison et al. (2022: Appendix A12); 2022: Bristol Bay Salmon Season Summary https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1438246231.pdf.

Subsistence: 1985–2015: Halas and Neufeld (2018: Table 2-2); 2016–2021: Jones and Neufeld (*In prep*).

Sport: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1986–1994) and Howe et al. (1995, 1996).

Escapement: 1985–1994: Westing et al. (2005: Appendix A12); Jones et al. (2014: Appendix A11); 2001–2021 Elison et al. (2022: Appendix A12); 2022: Bristol Bay Salmon Season Summary https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1438246231.pdf.

[a] Estimated Kvichak River fish captured in Naknek–Kvichak District commercial fishery.

[b] Harvests are extrapolated for all permits issued, based on those returned. Harvest estimates prior to 1991 are rounded to the nearest hundred fish. Harvest estimates prior to 1990 are based on the community where the permit was issued; estimates from 1990 to the present are based on community of residence and include fish caught only in the Kvichak District.

[c] Sport harvest from Kvichak River drainage excluding the Alagnak River drainage.

[d] Tower counts conducted at Igiugig.

[e] Subsistence harvest preliminary.

NEWHALEN RIVER

Fishery Description

The Newhalen River is the largest tributary in the Kvichak River drainage. It flows from Lake Clark into the north side of Lake Iliamna near the communities of Iliamna and Newhalen (Figure 5). Because it is farther inland, sockeye salmon reach the Newhalen River a few days later than the Kvichak River, and the best angling usually occurs during the middle 2 weeks of July.

The Newhalen River is more easily accessed than the Kvichak River and supports a large run of sockeye salmon. Several businesses and lodges in the town of Iliamna cater to anglers' needs, and a large runway serviced by regularly scheduled commercial airlines provides economical access from Anchorage. From the runway, a mile-long trail leads to the river. The trail ends near a series of cascades where large numbers of sockeye salmon congregate on their way to spawning grounds in the Lake Clark drainage. The sockeye salmon entering the Newhalen River are one segment of the large Kvichak River run. Hence, comments on the character of the commercial and subsistence harvests for the Kvichak River apply equally for the Newhalen River stocks. The sport fishery on the Newhalen River is unique in the BBMA due to the large component of unguided anglers and for its history of regularly producing up to 25% of the entire BBMA's annual sport harvest of sockeye salmon (Table 18). For the period 2016 through 2020, the annual sport harvest averaged 2,575 sockeye salmon (Table 18). ADF&G has not conducted any onsite studies of this fishery to evaluate angler catch and harvest distribution, angler demographics, or to conduct bag limit analysis.

Based on freshwater logbook data from 2012 through 2016, there has been some increase in guided effort with an average of 288 angler-days (Table 2).

Fishery Management and Objectives

Newhalen River sockeye salmon escapement is addressed by achieving the biological escapement goal (BEG) for the Kvichak River.

Sport fishery harvests and effort are estimated through the SWHS. Commercial and subsistence harvests are monitored by CF and are reported in the ADF&G Fisheries Management Report series (e.g., Elison et al. 2022). SF has not conducted any significant monitoring or stock assessment projects for this fishery. Escapement is estimated by counts made from towers at the village of Igiugig as the salmon migrate up the Kvichak River. Escapement distribution is assessed by aerial index surveys of drainage tributaries by CF.

2021 and 2022 Seasons

The preceding segment on the Kvichak River sockeye salmon sport fishery thoroughly describes the 2021 and 2022 seasons. Sport fishing was reported as normal to above normal throughout both seasons.

CENTRAL SECTION SOCKEYE SALMON FISHERIES

About 15% of Bristol Bay sockeye salmon return to the Central Section. Anglers do not fish this section heavily for sockeye salmon, and sport harvests have averaged 2,938 fish, or 16% of BBMA's total annual sport harvest for 2016–2020 (Table 18). Angler harvest of sockeye salmon

from the Central Section in 2021 totaled 9,587 fish and was the highest reported since 2006.[9] The stocks are generally abundant enough to be virtually unaffected by the sport harvest, and there is a lot of potential for this fishery to grow. The subsistence and sport harvests are each less than 1% of the run. The waters most commonly used by sport anglers are the Nushagak River, Mulchatna River, and the Wood River Lakes system.

RAINBOW TROUT FISHERIES

AREAWIDE FISHERY DESCRIPTION

Wild rainbow trout stocks are a cornerstone of the multimillion-dollar BBMA sport fishing industry. Sport fishing opportunity for both guided and unguided anglers occurs primarily during the ice-free season, generally from June through October, although fisheries in early and late winter are gaining some popularity. Found throughout the area, the most popular rainbow trout waters include tributaries of the Kvichak River drainage, the Naknek River drainage, portions of the Nushagak–Mulchatna drainage, and streams of the Wood River Lakes system (Figure 6).

The rainbow trout fisheries within the BBMA underwent rapid growth from the late 1970s to mid-1980s, with annual harvests averaging 4,905 fish from 1977 through 2003 (SWHS [cited October 16, 2022]). From 2016 through 2020, annual harvests averaged 645 fish (Table 20). However, the importance of this species to the sport fishery is not adequately described by estimates of harvest. The SWHS, as well as field studies, show clearly that during the last 20 to 25 years, the retention rate (number of fish kept from the total catch), has declined steadily, whereas total effort and catch have remained stable or increased (Minard 1989b, 1990; Brookover 1989; Dunaway 1993; SWHS [cited October 16, 2022]). Estimates of catch (number of fish harvested plus fish released) were first available from the SWHS for rainbow trout in 1990 and averaged 247,060 annually from 1991 through 2003 (Figure 7). From 2016 through 2020, the annual catch averaged 155,665 rainbow trout (Table 21, Figure 7). It is evident the angling public has embraced the concept of catch-and-release for rainbow trout and has voluntarily reduced harvests throughout the area.

Prior to 1993, rainbow trout were explicitly excluded from harvest under the subsistence priority. The status of rainbow trout as a subsistence species was changed in 1993 when the BOF allowed rainbow trout caught incidentally to other species to be retained by subsistence users. In 1994, the BOF recognized subsistence use of rainbow trout among all other finfish in Bristol Bay (5 AAC 01.336). The subsistence taking of rainbow trout from non-navigable waters located within federal land holdings (National Wildlife Refuges and National Parks) has been allowed since December 1991. In 2002, the Federal Subsistence Board adopted regulations allowing rod and reel subsistence harvest of rainbow trout in federally managed subsistence fisheries in the Bristol Bay area.

Many quality rainbow trout sport fisheries exist throughout the BBMA. Other smaller rainbow trout fisheries not discussed herein include Brooks River, Moraine Creek, Funnel Creek, American Creek, Gibraltar River, Copper River, Upper Talarik Creek, Tazimina River, Mulchatna River, and Togiak River.

[9] Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish [cited October 16, 2022] http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

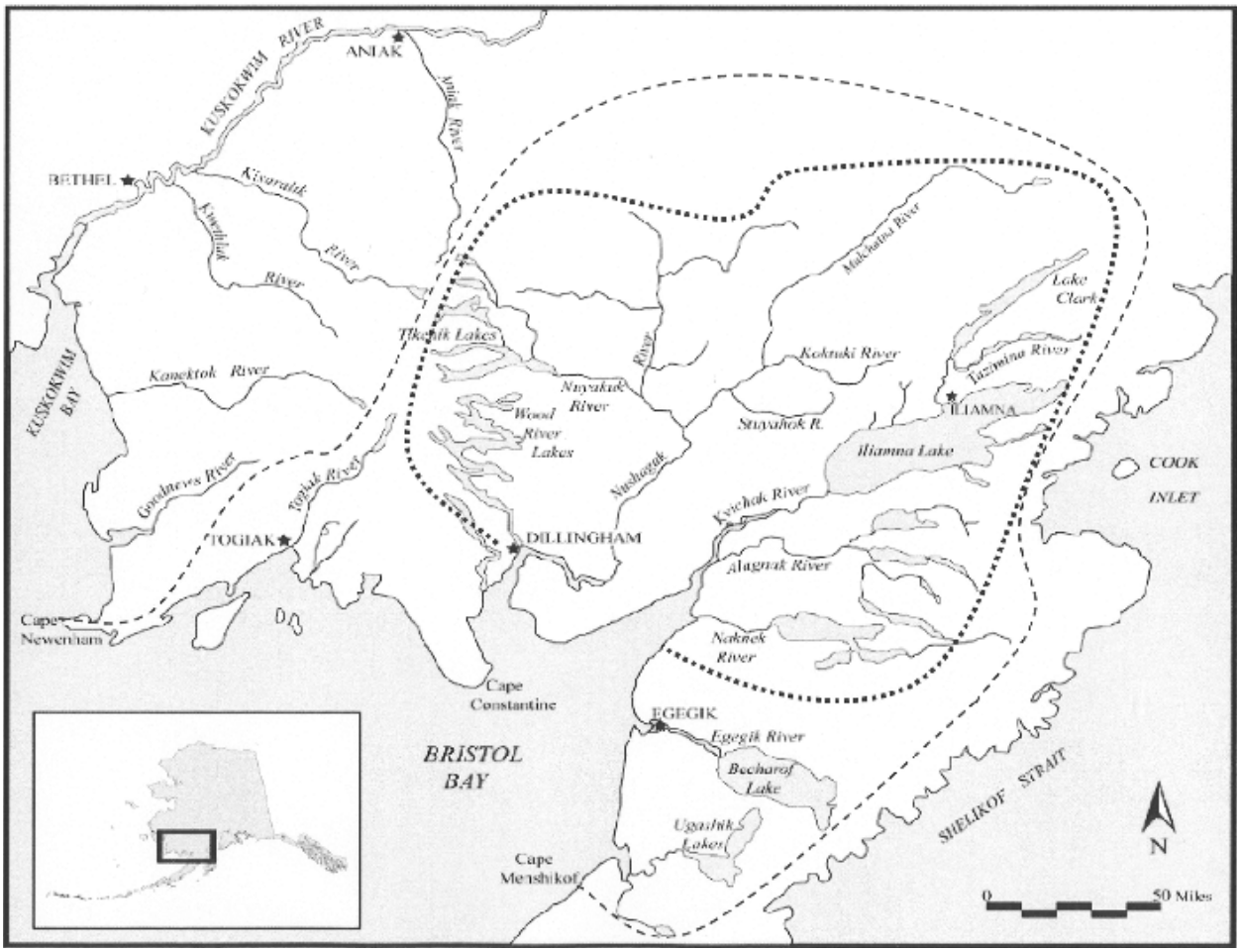

Figure 6.–Popular rainbow trout sport fisheries (delineated with black dots) in the Bristol Bay Sport Fish Management Area (delineated with dashed line).

Table 20.–Sport harvest of rainbow trout by section and drainage in the Bristol Bay Management Area, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Naknek River	589	48	47	95	416	101	150	89	88	158	117	14
Brooks River	0	0	22	0	33	129	0	0	0	53	36	0
Kvichak River	20	0	0	102	0	179	23	0	127	21	70	108
Copper River	0	133	0	320	205	0	0	0	0	0	0	54
Alagnak River	20	0	124	64	0	72	0	0	0	0	14	0
Newhalen River	0	21	35	0	20	80	0	95	68	0	49	0
Lake Clark	0	0	24	0	0	0	0	0	0	0	0	0
Other	971	0	13	32	44	0	84	304	154	104	129	54
Subtotal[a]	1,600	202	265	596	718	561	258	488	437	336	416	230
Central												
Nushagak River	98	17	0	0	20	64	41	68	0	148	64	0
Mulchatna River	96	309	0	0	39	0	43	63	42	76	45	0
Agulowak River	67	17	58	52	0	0	33	0	0	0	7	0
Agulukpak River	0	0	0	0	0	0	0	0	0	0	0	0
Wood River Lakes[b]	33	50	0	0	0	32	106	193	41	0	74	162
Tikchik–Nuyakuk	0	0	0	0	43	0	0	0	0	0	0	0
Other	20	0	0	0	0	0	0	0	0	53	11	0
Subtotal[a]	314	393	58	52	102	96	223	324	83	277	201	162
Western												
Togiak River	47	57	0	0	205	37	18	53	0	34	28	14
Other	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal[a]	47	57	0	0	205	37	18	53	0	34	28	14
Total	1,961	652	323	665	1,025	694	498	865	520	647	645	406

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1979–1980, 1981a, 1981b, 1982–1994) and Howe et al. (1995, 1996).

[a] Subtotals of averages may not be the sum of the drainages because information for some drainages is not available for some years.

[b] Wood River Lakes includes Lake Nunavaugaluk. Prior to 1998, Agulowak and Agulukpak Rivers were included in Wood River Lakes.

Table 21.–Sport catch of rainbow trout by section and drainage in the Bristol Bay Management Area, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Naknek River	21,869	15,794	15,779	19,876	21,311	36,277	21,257	11,724	19,927	14,339	20,705	11,246
Brooks River	16,144	14,896	15,513	12,243	7,954	8,500	17,100	8,665	5,398	4,933	8,919	8,322
Kvichak River	13,753	11,429	16,827	19,837	21,906	13,259	15,825	9,212	10,426	13,768	12,498	16,654
Copper River	18,247	29,479	30,317	30,138	27,942	23,328	20,923	15,082	14,724	6,128	16,037	10,749
Alagnak River	12,536	6,735	9,411	8,483	30,038	15,266	21,851	12,512	22,122	4,202	15,191	9,220
Newhalen River	1,317	31	1,317	603	1,358	3,017	4,671	378	2,237	745	2,210	2,606
Lake Clark	20	177	383	178	1,147	418	857	88	113	32	302	14
Other	48,267	36,002	49,384	70,949	47,585	68,482	60,769	48,137	57,718	55,620	58,145	50,104
Subtotal[a]	132,153	114,543	138,931	162,307	159,241	168,547	162,819	105,798	132,168	99,767	134,006	108,915
Central												
Nushagak River	3,937	5,256	3,497	3,302	4,003	4,727	2,592	3,781	5,748	2,060	3,782	3,537
Mulchatna River	795	735	419	735	2,499	2,395	2,045	2,354	1,431	857	1,816	925
Agulowak River	2,567	1,726	2,292	5,079	2,918	6,259	8,069	2,528	5,092	2,513	4,892	3,823
Agulukpak River	5,744	1,803	1,902	4,526	6,840	6,145	7,344	3,408	2,999	663	4,112	1,587
Wood River Lakes[b]	5,403	578	3,344	3,015	7,791	728	2,205	1,250	4,101	1,482	1,953	1,970
Tikchik–Nuyakuk	1,083	813	1,116	1,135	2,611	1,026	2,056	1,019	5,101	230	1,886	1,710
Other	841	352	211	685	1,053	522	993	0	34	233	356	0
Subtotal[a]	20,370	11,263	12,781	18,477	27,715	21,802	25,304	14,340	24,506	8,038	18,798	13,552
Western												
Togiak R.	3,242	2,741	1,318	1,889	2,605	2,086	4,113	1,710	2,490	2,226	2,525	1,294
Other	0	27	58	64	176	0	865	707	106	0	336	450
Subtotal[a]	3,242	2,768	1,376	1,953	2,781	2,086	4,978	2,417	2,596	2,226	2,861	1,744
Total	155,765	128,574	153,088	182,737	189,737	192,435	193,535	122,555	159,767	110,031	155,665	124,211

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Data from prior years can be found in Mills (1992, 1993) and Howe et al. (1994, 1995).

[a] Subtotals of averages may not be the sum of the drainages because information for some drainages is not available for some years.

[b] Wood River Lakes includes Lake Nunavaugaluk. Prior to 1998, Agulowak and Agulukpak Rivers were included in Wood River Lakes.

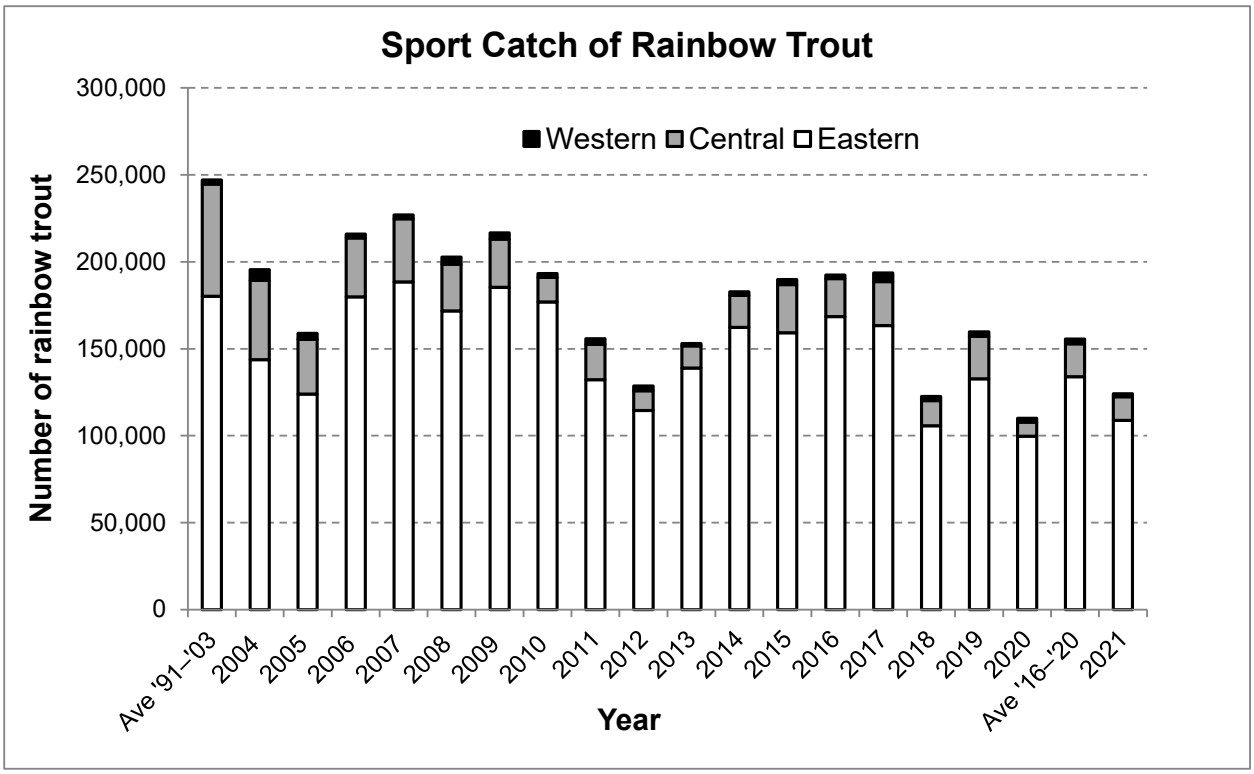

Figure 7.–Sport catch of rainbow trout by section for the Bristol Bay Sport Fish Management Area, 2004–2017, with averages for 1991–2003 and 2016–2020.

SOUTHWEST ALASKA RAINBOW TROUT MANAGEMENT PLAN

In February 1990, the BOF adopted regulations implementing a comprehensive management plan for rainbow trout in the area previously known as the Southwest Alaska Management Area. This area included the BBMA, the waters flowing into Kuskokwim Bay from Cape Newenham to the outlet of the Kuskokwim River, and the Kuskokwim River and tributaries from the Aniak River to Kuskokwim Bay.[10] Still in force, this plan is not a regulation but is used as a policy for guiding the BOF and the public. It provides a clear understanding of the underlying principles by which rainbow trout stocks are to be managed and provides guidance for the BOF in developing future regulations. In 1998, the BOF adopted *Criteria for Establishing Special Management Areas for Trout* (5 AAC 75.013). This regulation embodies most of the criteria that originated, and are still used, in the *Southwest Alaska Rainbow Trout Management Plan*.

Guiding Policies

The intent of the *Southwest Alaska Rainbow Trout Management Plan* is one of conservative wild stock management. Conservative wild stock management does not necessarily preclude limited harvest of rainbow trout for food or trophies. However, maximum yield principles that emphasize harvest are ruled out. Additionally, under a principle that emphasizes wild trout management, mitigating losses of wild stocks through enhancement or stocking is not considered a desirable management alternative.

[10] ADF&G. 1990. Southwest Alaska rainbow trout management plan. Located at: Alaska Department of Fish and Game, Division of Sport Fish, 333 Raspberry Road, Anchorage.

Conservative wild stock management is guided by both biological considerations and social concerns. Growth in the region's rainbow trout sport fisheries is inevitable, but by managing the area's wild rainbow trout stocks conservatively, the potential for serious long-term resource problems is minimized. From a social perspective, conservative wild stock management is consistent with the priorities of most of the public presently using the resource. The *Southwest Alaska Rainbow Trout Management Plan* contains 3 policies that are intended to protect the biological integrity of the region's wild trout stocks and maximize their recreational benefit and economic potential. The policies guide the development of sport fishing regulations and provide ADF&G management biologists, BOF members, and the public with clear direction as to how rainbow trout fisheries in the BBMA should be managed. The 3 policies are as follows:

1) Native rainbow trout populations will be managed to maintain historical size and age compositions and at population levels sufficient such that stocking is not needed to enhance or supplement the wild population.

2) A diversity of sport fishing opportunities for wild rainbow trout should be provided through establishment of special management areas by regulation. Selection of areas for special management will be based on criteria to be adopted by the BOF.

3) Management strategies should be consistent with the prudent economic development of the state's sport fishing industry while at the same time acknowledging the intrinsic value of this fishery resource to the people of Alaska.

Plan Implementation

Regulations based on the *Southwest Alaska Rainbow Trout Management Plan* were adopted by the BOF in February 1990. These regulations were designed to implement the 3 management policies contained in the rainbow trout management plan. Specifically, the BOF did as follows:

1) Expanded the Wild Trout Zone from the Iliamna drainage to include the drainages of Bristol Bay and Kuskokwim Bay and the Kuskokwim River from Aniak River downstream.
2) Established 8 catch-and-release areas in the BBMA and 3 catch-and-release areas in the Lower Kuskokwim Management Area (Figure 8).
3) Established 6 artificial fly-only, catch-and-release-only areas (Figure 9).
4) Established 11 unbaited single-hook artificial lure only areas to protect rainbow trout stocks (Figure 10).

Adoption of regulations implementing the management policies contained in this plan was not expected to be a one-time effort. Rather, policy implementation was understood to be a long-term process, with the policies used as the framework to develop a very important and unique resource. Special management regulations were adopted using this process during the BOF meetings held in the fall and winter of 1997 for the Kvichak River in Bristol Bay, and the Kanektok, Kwethluk, Kasigluk, and Kisaralik Rivers in the Kuskokwim area. This plan has also proved to be a useful guide for rainbow trout management in other parts of the state.

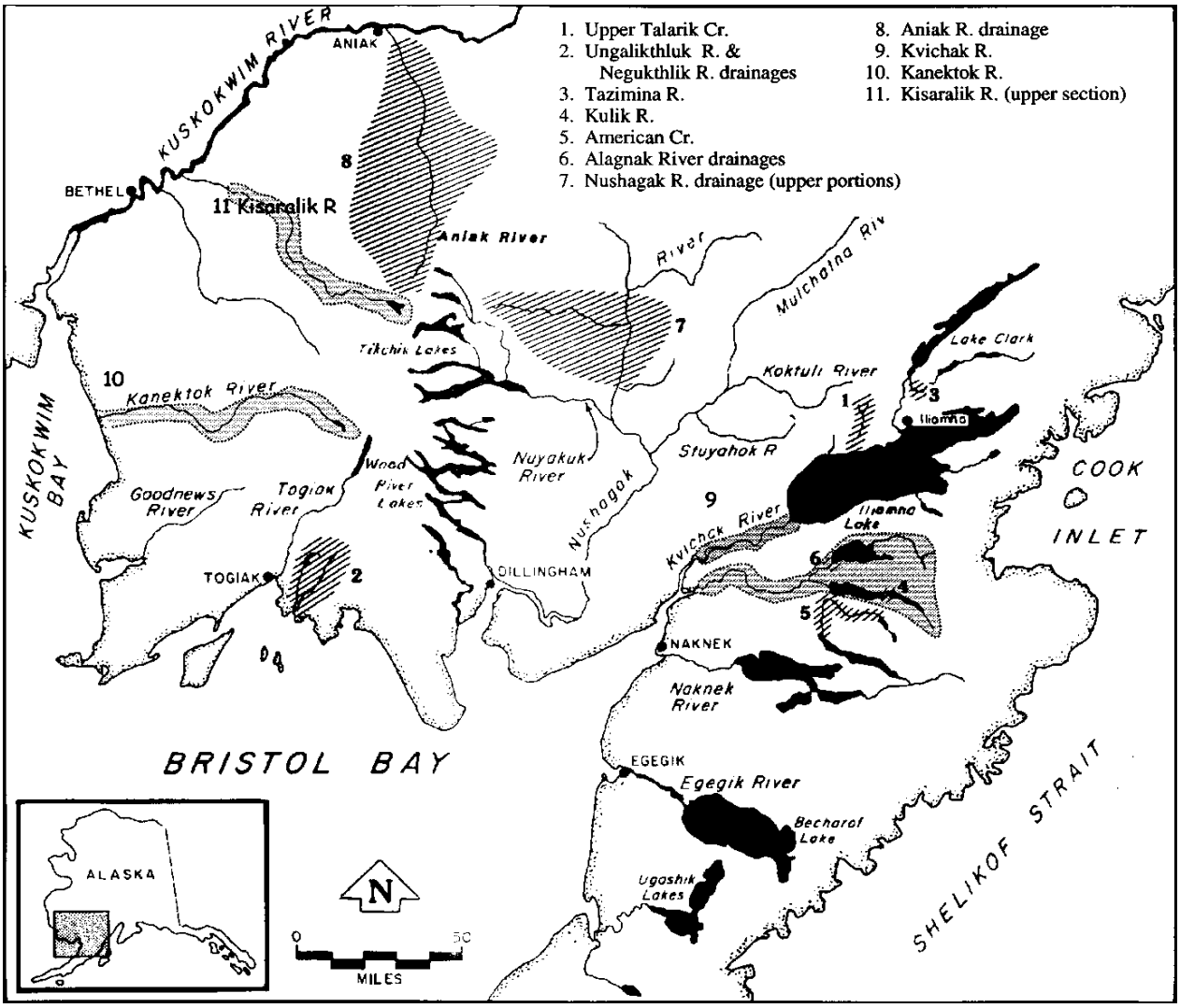

Figure 8.–Catch-and-release special management areas for rainbow trout (line-shaded areas) in the Bristol Bay Sport Fish Management Area.

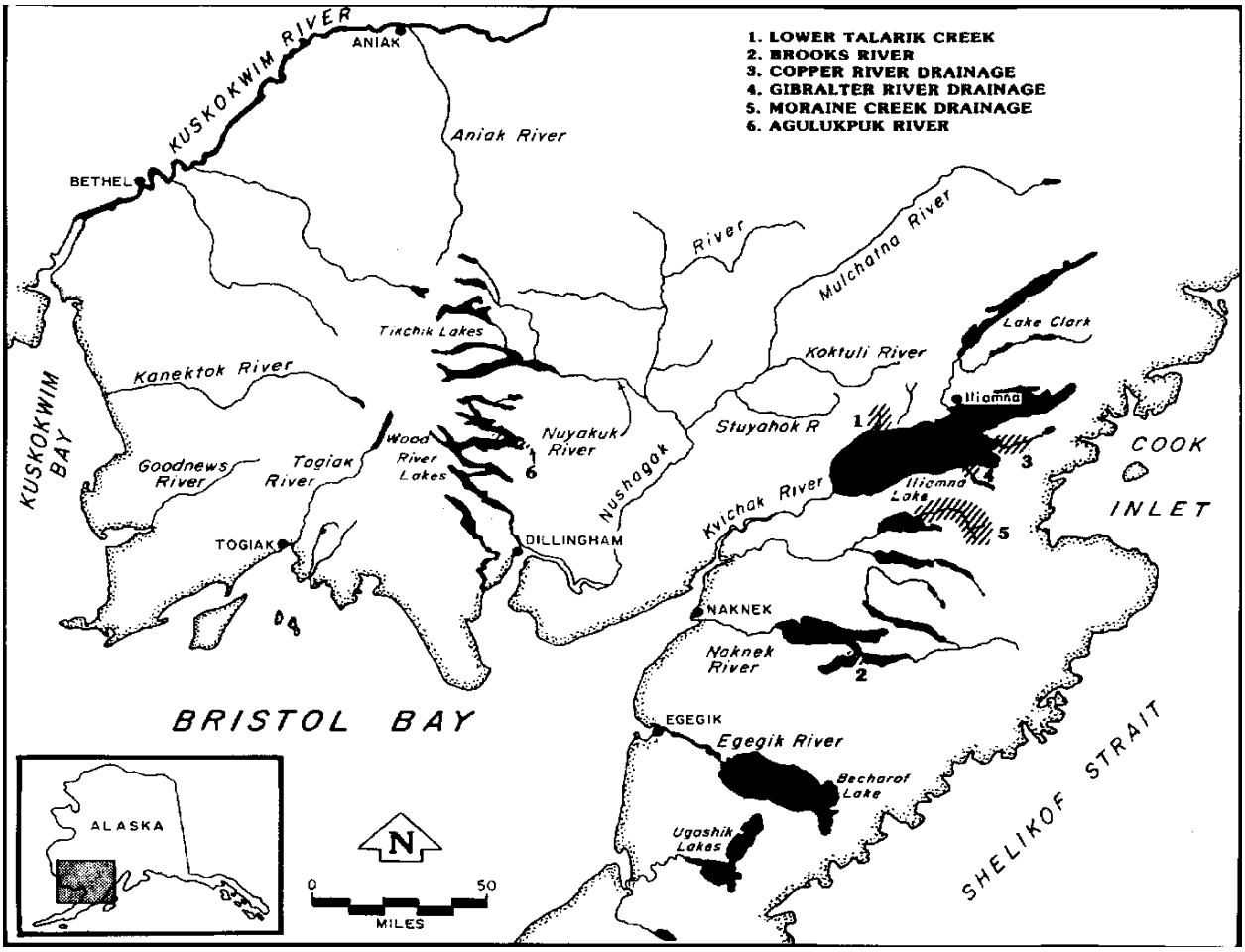

Figure 9.–Fly-only, catch-and-release special management areas for rainbow trout (line-shaded areas) in the Bristol Bay Sport Fish Management Area.

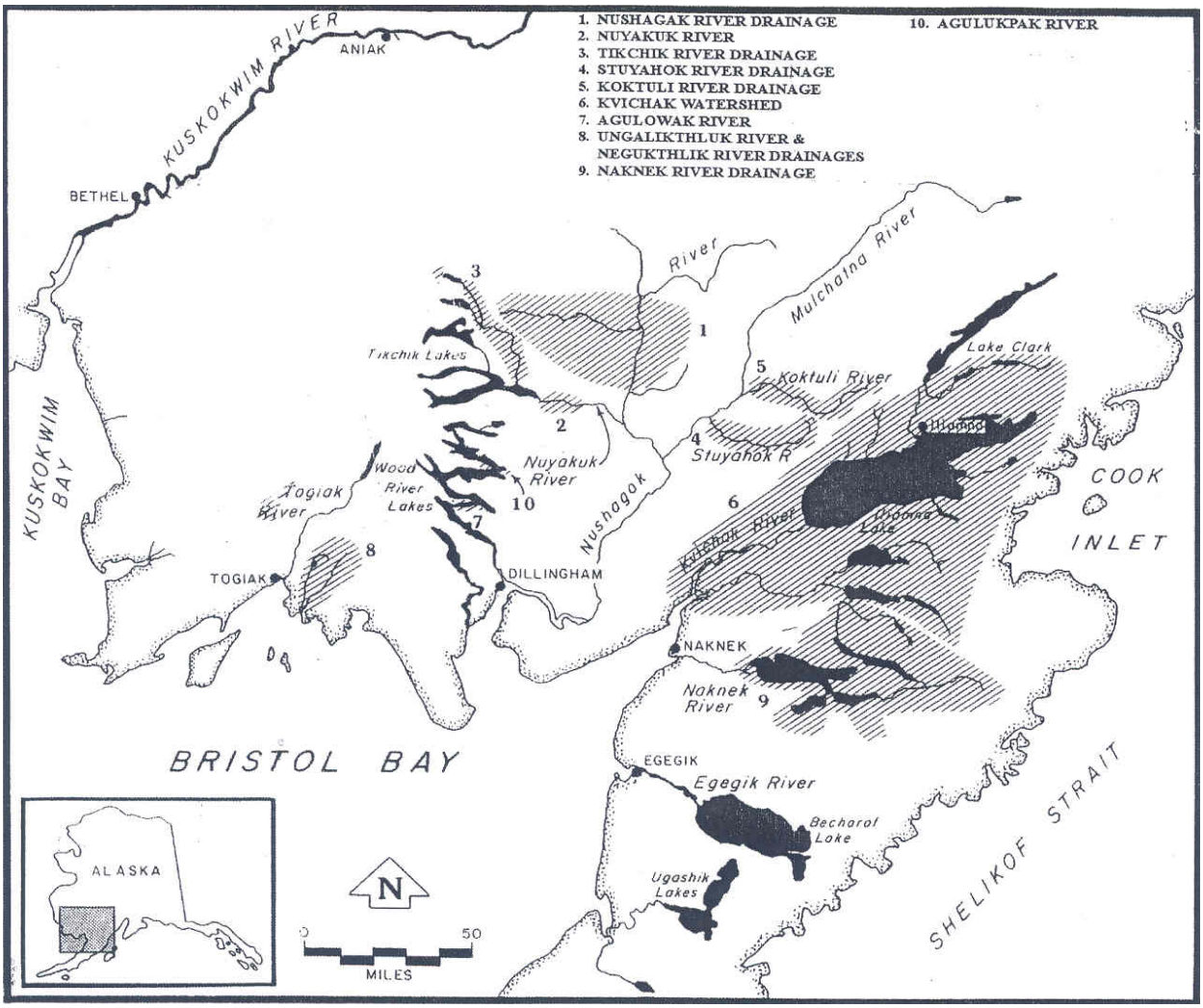

Figure 10.–Unbaited single-hook artificial lure special management areas for rainbow trout (line-shaded areas) in the Bristol Bay Sport Fish Management Area.

LOWER TALARIK CREEK

Fishery Description

Lower Talarik Creek, located at the northwest corner of Lake Iliamna, is renowned for its high-quality rainbow trout sport fishery. The creek is relatively small and most anglers only fish along the first 2 miles above its entrance into Lake Iliamna. The large fish, for which Lower Talarik Creek is so famous, enter the creek from Iliamna Lake to feed on salmon eggs and salmon carcasses in the fall. The sport fishery takes advantage of this migration and is most active from mid-August until late September or October. Most anglers fishing Lower Talarik Creek are guided nonresidents who make daily fly-in trips from the many lodges operating in the Lake Iliamna area (Table 2). As many as 30 anglers at a time can be accommodated at popular lower portion of the creek.

In 1992, a Native land claim had the potential to eliminate public access to this world-class rainbow trout fishery. Through an agreement with the claimant, The Nature Conservancy (TNC) obtained the land and coordinated a land management agreement with ADF&G and the Alaska Department of Natural Resources (DNR). One stipulation of the agreement was to create a Special Use Area

along the lower reaches of Lower Talarik Creek that would allow public access. After extensive discussions with local leaders, the Special Use Area was created in August 1999. In the spring of 2001, TNC initiated a process to convey these lands to the state for management, and the DNR-Realty Section finalized the transfer.

Fisheries managers first estimated angler effort and harvest on Lower Talarik Creek rainbow trout with onsite creel surveys from 1970 through 1976. Annual harvest ranged from a high of 433 fish in 1971 to 73 fish in 1974 (Table 22). The SWHS has measured effort (angler-days) since 1977 and harvest since 1990 (Mills 1979–1980, 1981a–b, 1982–1994; Howe et al. 1995, 1996; Alaska Sport Fishing Survey Database http://www.adfg.alaska.gov/sf/sportfishingsurvey/). Onsite creel surveys conducted during the fall fisheries of 1989–1991 and 1993–2001 found effort was similar to the upper range of levels observed in the 1970s (Table 22). Small estimates of catch and effort in 1997 and 2001 are due to the short duration of those surveys (Table 22).

Based on freshwater logbook data from 2012 through 2016, guided effort at Lower Talarik Creek has remained close to the average of 172 angler-days (Table 2).

Fishery Management and Objectives

The Lower Talarik Creek rainbow trout fishery is managed to maintain historical age and size composition and a diversity of angling opportunity by maintaining the special management designation with artificial fly-only, catch-and-release.

Lower Talarik Creek was designated a special management area in 1990 as part of the implementation of the *Southwest Alaska Rainbow Trout Management Plan*. Sport fishing is restricted to unbaited artificial flies, and the area is catch-and-release only for rainbow trout. A season closure from April 10 through June 7 provides protection for spawning rainbow trout during this critical life stage.

Sport fishery harvests and effort are estimated through the SWHS. Subsistence harvest data are collected by CF with onsite surveys that yield detailed estimates of angler use and success. Biological information and demographic information are also collected. Significant stock assessment and creel survey results are reported by Russell (1977), Minard (1990), Minard et al. (1992).

Lower Talarik Creek's small size, accessibility, and abundant and large rainbow trout garnered early regulatory attention. A synopsis of significant regulation changes can be found in Table 23.

A Native Allotment claim that could have jeopardized public access to the Lower Talarik Creek fishery has recently been resolved. TNC of Alaska acquired title to the claim, which included the land adjacent to the most popular fishing sites along Lower Talarik Creek, through a special agreement with the claimant. In December 1995, TNC coordinated a 3-way land management agreement with ADF&G and DNR. One stipulation of the agreement was to establish a Special Use Area (SUA) for the lower reaches of Lower Talarik Creek and nearby uplands. This was completed in August 1999 with some controversy and after extensive discussions with local municipalities and leaders. Finalizing the SUA allowed the DNR to enter into an Interagency Land Management Agreement (ILMA) with ADF&G for the land on which an ADF&G-owned cabin sits. The ILMA was completed at about the same time as the SUA. The next steps in the agreement were to obtain Critical Habitat status for the drainage and the eventual conveyance of the TNC holdings to the State of Alaska for long-term management. During the spring of 2001, TNC

advised the State of Alaska of its interest in conveying its lands to the state but there was little movement until late in the year. The conveyance is now complete.

In 2018, a commercial sport fishing operator purchased a private inholding on the east fork of Lower Talarik Creek within the SUA and applied for permits to install a float plane dock and construct bridges for ATV trails to provide clients with easy access to Lower Talarik Creek. A DNR Land Use Permit was issued to the commercial operator for the installation and use of a float plane dock on Char Lake immediately adjacent to the SUA. Installation of this dock allows for ATV travel from Char Lake throughout the SUA, including the private inholding as well as popular fishing locations.

Table 22.–Angler effort, catch, catch per angler-hour, harvest, and retention rate for rainbow trout in Lower Talarik Creek, 1970–1976, 1986, 1987, 1990, 1991, 1993–2005.

Year	Survey dates	Angler-hours	Catch	Catch/hour[a]	Mean angler-hours per day	Harvest	Percent retained
1970	26 Aug–11 Oct	1,315	600	0.46	27.4	119	20%
1971	8 Jun–30 Sep	2,604	2,300	0.88	26.3	433	19%
1972	8 Jun–30 Sep	1,718	834	0.49	17.4	141	17%
1973	8 Jun–30 Sep	1,376	780	0.57	13.9	113	14%
1974	8 Jun–30 Sep	1,037	498	0.48	10.5	73	15%
1975	8 Jun–30 Sep	1,048	1,648	1.57	10.6	127	8%
1976	8–15 Jun; 12–23 Sep	438	843	1.92	21.9	92	11%
1986	8–15 Jun; 15 Aug–9 Oct	2,063	2,389	1.16	62.5	16	1%
1987	22 Aug–22 Sep	1,893	2,844	1.50	59.2	4	1%
1990	1–27 Sep	2,086	2,910	1.40	77.3	0	NA[b]
1991	30 Aug–25 Sep	1,729	2,363	1.37	64.0	0	NA
1993	10–20 Sep	1,080	699	0.65	98.2	0	NA
1994	2–29 Sep	2,462	3,273	1.33	87.9	0	NA
1995	1–29 Sep	2,496	3,200	1.28	86.1	0	NA
1996	3–30 Sep	1,930	1,655	0.86	68.9	0	NA
1997[c]	1–15 Sep	1,210	1,794	1.48	80.7	0	NA
1998	31 Aug–21 Sep	2,596	1,698	0.65	118.0	0	NA
1999	29 Aug–23 Sep	2,121	1,192	0.57	81.6	0	NA
2000	28 Aug–23 Sep	2,813	4,868	1.73	104.2	0	NA
2001[c]	2–13 Sep	934	692	0.74	77.8	0	NA
2002[c]	5–19 Sep	1014	770	0.76	67.6	0	NA
2003[c]	1–13 Sep	789	685	0.87	60.7	0	NA
2004	1–29 Sep	1,321	1,044	0.84	45.8	0	NA
2005	2–29 Sep	1,002	2,100	2.10	35.8	0	NA
Average							
All years		1,628	1,737	1.07	58.5	47	NA
2001–2005		1,012	1,058	1.06	57.5	0	NA

Source: Russell (1977); Minard (1990); Minard et al. (1992); T. Jaecks, Fishery Biologist, ADF&G, Division of Sport Fish, Dillingham, unpublished data for 2005.

[a] Unstratified catch per unit effort, recalculated from total catch and hours in original reports.

[b] Lower Talarik Creek became a catch-and-release fishery beginning in 1990.

[c] Small total catch and effort is due to the short duration of the survey.

Table 23.–A chronology of significant regulation changes for Lower Talarik Creek rainbow trout.

Effective year	Regulation
1965	Spawning season closure imposed on Lower Talarik Creek. Lower Talarik Creek closed to all fishing from April 10 to June 8.
1968	Lower Talarik Creek was included in the "Bristol Bay Trophy Fish Area."
1969	Bag and possession limits reduced to 5 trout, only 1 over 20 inches in length. Helicopter access was forbidden, single hooks were required on tackle.
1974	The use of bait was prohibited during the summer months.
1977	Trophy Fish Area renamed the Bristol Bay Wild Trout Area, retaining the regulations accumulated since 1965.
1981	Gear was limited to single-hook artificial flies from June to October.
1984	Reduced the bag and possession limit to 2 rainbow trout, 1 over 20 inches.
1985	Reduced the bag limit to 1 rainbow trout during the summer.
1990	Adopted the Southwest Alaska Rainbow Trout Management Plan. Lower Talarik Creek was designated as a special management area to be managed under fly-fishing-only, catch-and-release restrictions.
1999	Alaska Department of Natural Resources (DNR) designated as a Special Use Area, the 5 sections of state-owned land immediately surrounding the lower reaches of Lower Talarik Creek. Guidelines for overnight camping and commercial activities were established.
	The DNR entered into an Interagency Land Management Agreement (ILMA) for approximately 2 acres of land on which stands the Division of Sport Fish (SF) cabin.
2001	The Nature Conservancy transferred its privately held lands to the DNR with management responsibilities to be delegated to ADF&G SF.

Research

From 2009 through 2015, a weir was operated each season from breakup in April or May until approximately June 7 (Fo 2015). Consecutive years of weir data were collected to assess spawning abundance, length composition, and life history of Lower Talarik Creek rainbow trout. Weir counts of spawning rainbow trout ranged from 49 to 181 moving upstream and 163 to 794 moving downstream during the 2009–2015 seasons (Table 24). Comparisons of weir counts, visual counts, and length compositions with past data indicate fewer mature rainbow trout and fewer large rainbow trout than observed in the 1970s and 1997 (Russell 1977).

2021–2022 Seasons

Anglers reported normal sport fishing for rainbow trout during 2021 and moderate to good sport fishing for rainbow trout in 2022 at Lower Talarik Creek.

Table 24.–Lower Talarik Creek rainbow trout weir counts, 2009–2015.

	Upstream passage			Downstream passage		
Year	Spawner	Nonspawner	Total	Spawner	Nonspawner	Total
2009	98	86	184	271	261	532
2010	78	99	177	511	152	663
2011	103	125	228	330	169	499
2012	99	27	126	456	745	1,201
2013	49	169	218	163	170	333
2014	32	39	71	435	983	1,418
2015	181	63	244	794	857	1,651

Source: I. Fo, Fishery Biologist, ADF&G Division of Sport Fish, Dillingham, unpublished data

KVICHAK RIVER

Fishery Description

The Kvichak River (Figure 1) is recognized around the world for its large rainbow trout. Presently, the river is one of the few waters in Southwest Alaska where anglers may still harvest large rainbow trout. Studies (unpublished) by ADF&G of rainbow trout in the Kvichak River provide opportunity to examine changes in abundance, recruitment, survival, and age and length compositions of a moderately exploited wild Alaskan rainbow trout population. Additionally, as part of a regionwide comprehensive management planning exercise, SF is developing concise, measurable management objectives for this important fishery. Stock status information is needed to develop specific management objectives for this fishery.

In late winter and spring, rainbow trout aggregate in the upper Kvichak River near the outlet of Lake Iliamna. From 1987 through 1997, ADF&G conducted a mark–recapture study to estimate the abundance and survival of fish in this aggregation (ADF&G, Dillingham, unpublished data). Findings from this study have raised questions about the nature of the aggregation (i.e., whether it is composed of overwintering fish from several natal streams or prespawning fish from the Kvichak River only). If some rainbow trout marked at the upper Kvichak River during a spring sampling event subsequently emigrate and spawn in other streams in future years, then survival estimates from the mark–recapture study are a measure of both mortality and emigration. Radiotelemetry data from sexually mature Lower Talarik Creek rainbow trout suggest the majority of rainbow trout that spawn in Lower Talarik Creek are not susceptible to angling pressure on the Kvichak River and do not appear to significantly contribute to the prespawning population of rainbow trout in the Kvichak River.

Fishery Management and Objectives

Sport fishery harvests and effort are estimated through the SWHS.

The Kvichak River rainbow trout fishery is managed to maintain historical abundance and size composition of rainbow trout.

2021–2022 Seasons

During 2021, estimated sport fishing effort was 4,584 angler-days (Table 1) and rainbow trout catch was 16,654 (Table 21), which anglers reported as normal. Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported that sport fishing for rainbow trout in the Kvichak River was good in 2022.

ALAGNAK (BRANCH) RIVER

Fishery Description

The Alagnak River, locally referred to as the Branch River, is located in the eastern section of the BBMA and flows into the Kvichak River approximately 40 miles north of King Salmon. The Alagnak River originates in Katmai National Park and Preserve, and the upper 55 miles have been designated a Wild and Scenic River.

Two large lakes, Kukaklek and Nonvianuk, feed this drainage. Kukaklek Lake is drained by the Alagnak River, whereas the Nonvianuk River flows 11 miles from Nonvianuk Lake to join the Alagnak River from the south. The Nonvianuk River is a wide, relatively gently flowing river (class 2 or less) that provides the most convenient float trip access to the upper drainage. The upper Alagnak River is characterized by a narrow canyon and class 3 rapids that provide a more rigorous boating experience. Below its confluence with the Nonvianuk River, the Alagnak River is slower and easily navigated. At the proper water levels, both rivers can be navigated their entire lengths with power boats. The water is clear throughout its length, though the lower 20 miles are colored lightly from silt and bog-stained runoff.

In the lower portion of the drainage, anglers pursue Chinook, sockeye, chum, and coho salmon. In the upper reaches, rainbow trout are the big attraction, with some lake trout (*Salvelinus namaycush*) at headwater lakes, and Arctic char and Arctic grayling in the river, adding diversity to the angling experience. The fisheries are accessed with power boats, particularly the lower one-half to two-thirds of the river, whereas float trips are the most common access in the upper reaches. Several lodges are based along the river and many other lodges from the surrounding area fly clients to the river for day-trip fishing.

The easy access and abundant fish populations of the Alagnak River are major reasons the popularity of this river has grown quickly. Rainbow trout from the Alagnak River drainage, like those of the nearby Kvichak and Naknek River drainages, are known for their abundance and large size.

In terms of angler effort, the Alagnak River is among the top 3 most popular fishing destinations in Southwest Alaska, along with the Naknek and Nushagak Rivers (Tables 1 and 2). Estimates of effort and harvest for rainbow trout from the Alagnak River were first available in 1981 from the SWHS. Historically, effort averaged 6,982 angler-days annually from 1977 through 2006 (SWHS [cited October 16, 2022]). Effort peaked at 9,550 angler-days in 2018 and has since decreased with a recent 5-year average from 2016 through 2020 of 6,711 angler-days (Table 1). Since estimates of catch were first made in 1991, the annual average sport catch (fish released plus fish harvested) of rainbow trout from 1991 through 2003 was estimated at 34,518 fish, giving the sport fishery in the Alagnak River the largest catch of rainbow trout in the BBMA during that time (SWHS [cited October 16, 2022]). The 2016–2020 average rainbow trout catch for the Alagnak River is 15,191 (Table 21). Harvest rates have dropped dramatically since 1998, when catch-and-release only regulations were instituted to address concerns for the rainbow trout population. No rainbow trout have been harvested in the Alagnak River since 2017 (Table 20).

Fishery Management and Objectives

The Alagnak River rainbow trout fishery is managed to maintain historical abundance and size composition.

Sport fishery effort, catch, and harvest are estimated through the SWHS. Subsistence harvests are considered slight but are not well monitored. Onsite surveys yield detailed estimates of angler use and success as well as data on angler demographics and biological samples from the catch. Significant stock assessment and creel survey results, focused on the lower river salmon fisheries but containing some rainbow trout data, have been collected and reported by Brookover (1989), Dunaway (1990a, 1994), and by Naughton and Gryska (2000). Surveys of the spring sport fisheries were conducted jointly with the National Park Service and ADF&G in 1996 at the outlet of Nonvianuk Lake and at the outlet of Kukaklek Lake in 1997 (Jaenicke 1998a–b).

Located between the Kvichak and Naknek River drainages, the Alagnak–Nonvianuk Rivers rainbow trout fishery has been managed like adjacent fisheries. For quite some time, the sport fishing season has featured a spring spawning closure from April 10 through June 7 and single-hook artificial lure only restrictions. Until 1998, regulations for the open water season allowed the retention of 1 rainbow trout per day with no size limit.

In the 1997 fall BOF meeting, the Alagnak River rainbow trout fishery was restricted by regulation to catch-and-release only out of concerns for the stock. This no-harvest regulation for the period of June 8 through October 31 has been in effect in the Alagnak and Nonvianuk Rivers ever since.[11] From November 1 through April 9, anglers may retain 5 rainbow trout less than 18 inches in length. The new regulations were generally well received by anglers and are expected to provide a measure of protection to this population until better information becomes available. The relatively large rainbow trout and salmon fisheries, coupled with significant float trip and motorboat use, has been a concern of the National Park Service (NPS), nearby communities, and some anglers. NPS has designated the 55-mile portion of the river as a Wild and Scenic River. Human impacts to uplands, stock status of fish populations, and boat wake erosion are high priority issues.

2021–2022 Seasons

In 2021, effort for the Alagnak River increased above the 2016–2020 average to 7,356 angler-days (Table 1). An estimated 9,220 rainbow trout were caught, and no harvest took place (Tables 20 and 21). Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported that sport fishing for rainbow trout was above normal in 2022.

UPPER NUSHAGAK RIVER

Fishery Description

The upper Nushagak River consists of the stretch of river upstream of the confluence with the Nuyakuk River. The upper Nushagak River provides an attractive alternative to more crowded rainbow trout fisheries in the area. The rainbow trout are not as large as those in other area rivers, but they are abundant. There are approximately 5 camps situated in this section of river that are operated by sport guide services. In addition, this section of the river is popular for float trips.

Sport fishing effort in the Nushagak River upstream of the Mulchatna River has averaged 1,529 angler-days from 2016 through 2020, with a low of 716 angler days in 2019 (SWHS [cited October 16, 2022]).

[11] Southwest Alaska sport fishing regulations summary, 2022 (effective until the 2023 summary is issued) Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

Fishery Management and Objectives

The upper Nushagak River rainbow trout fishery is managed to maintain historical abundance and size composition of rainbow trout. The upper Nushagak River upsteam of Harris Creek, including the King Salmon River, has been designated as a special management area, restricted to unbaited single-hook tackle and catch-and-release for rainbow trout since 1990.

Sport fishery effort, catch, and harvest for the upper Nushagak River are estimated via the SWHS. Subsistence harvests are not well monitored, and the best information is obtained from a household survey of freshwater fish harvest conducted by the Division of Subsistence.

Size composition data for rainbow trout between Harris Creek and the Chichitnok River was collected by SF in 1999 and 2006. The average size of fish was approximately 16 inches, and no fish larger than 23 inches were sampled.

2021–2022 Seasons

The 2021 sport fishing effort for the upper Nushagak River was down from recent years with 818 angler-days (SWHS [cited October 16, 2022]). Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported that sport fishing for rainbow trout was moderate to good in 2022.

NAKNEK RIVER

Fishery Description

The first significant recreational use of Naknek River rainbow trout stocks occurred in the mid-1950s when 2 recreational camps were constructed by the military for use by military personnel. The camps, one located at the outlet of Naknek Lake (Lake Camp) and one at the lower reach of the rapids (Rapids Camp), provided a base for significant sport fishing opportunity until 1974. During that time, civilians also discovered the bountiful fish resources and effort continued to grow. By the mid-1980s, there were approximately 12 guiding services working the river regularly, with others less frequently. Boat rental and lodging services, available in King Salmon, provided the necessary support needed by the unguided angler.

Most of the rainbow trout sport fishery takes place in the upper reach of the river from Rapids Camp upstream to the outlet of Naknek Lake and has 3 periods of activity: March to April 10, June 8 to June 30, and August 15 to freeze-up in October. Although rainbow trout may be found during July and early August, the huge influx of salmon during this time tends to depress rainbow trout angling. A few determined anglers seek rainbow trout whenever there is open water, and fishing through the ice is a popular activity for some anglers and some subsistence users.

Guided sport fishing effort on the Naknek River varied little from 2007 to 2016, ranging from a low of 3,160 angler-days in 2010 to a high of 4,273 angler-days in 2008, and averaging 3,854 between 2012 and 2016 (Table 2). Total sport fishing effort in the Naknek River has also varied little from the historical average (1977–2006) of 14,147 angler-days to the recent average (2016–2020) of 13,353 angler-days (SWHS [cited October 16, 2022]; Table 1). Rainbow trout catch in the Naknek River between 2016 and 2020 has ranged from a low of 11,724 fish in 2018 to a high of 36,501 fish in 2016 (Table 25).

Following the 2018 season, ADF&G received reports that the quality of the experience was declining due to overcrowding. SF staff traveled to King Salmon in late September 2018 to observe

the rainbow trout sport fishery. On September 28th, a boat survey from Rapids Camp to Lake Camp counted 22 boats and 62 anglers. Concerns about overcrowding generated a larger than usual number of BOF proposals to address this issue for the Naknek River.

Fishery Management and Objectives

Naknek River rainbow trout stocks are managed to maintain the historical abundance and size composition reported in the early 1980s. Sport catch and harvest of rainbow trout in the Naknek River, as well as angler reports strongly suggest the rainbow trout population is currently near historical abundance and size composition (Table 25).

There is a long history of special regulations for Naknek River rainbow trout stocks dating back to statehood. Seasons, limits, and gear restrictions were initially liberal. However, as effort increased, reports of declining catch rates and smaller size of the catchable population increased. ADF&G studies conducted in the late 1980s verified the suspected decline (Minard and Brookover 1988b). Recent catch and harvest data and public opinion indicate the stocks are near historical levels (Table 25). Current regulations still reflect the remedial actions adopted in 1990 and allow for harvest of 1 rainbow trout per day less than 18 inches in length during summer and fall, and a winter season harvest of 5 per day less than 18 inches in length. The spawning season closure is in effect from April 10 to June 7, and only single-hook artificial lures may be used in the area above Rapids Camp. In 1997, the BOF restricted hook gap size to ½ inch or less March 1–April 9 and June 8–July 31 to protect rainbow trout.

In the late 1990s, growing interest in the spring fishery that occurs prior to April 9 sparked heated public requests for more intensive management during this time. Some anglers supported managing portions of the river for quality of experience by advocating restrictions to angler access. Other management suggestions included managing for a particular size composition in the sport catch with emphasis on providing very large fish. Another group of anglers was convinced that growth of the rainbow trout fishery on the Naknek River required a spawning season closure earlier than April 10 to maintain the biological integrity of the population. Regardless of this perspective, it appears clear that the angling public is extremely interested in maintaining and enhancing this fishery.

Strong fishery performance seems to have allayed the concerns of some individuals. Angler success throughout the recent seasons has been good and there are numerous accounts of large rainbow trout being caught.

Table 25.–Naknek River sport fishing effort and rainbow trout harvest and catch, 1996–2022.

Year	Total effort (angler-days)	Harvest	Catch
1996	11,971	603	16,888
1997	13,673	246	13,737
1998	13,988	388	12,795
1999	21,189	343	17,946
2000	22,529	450	30,738
2001	12,401	160	16,198
2002	21,020	760	30,635
2003	13,398	171	26,183
2004	16,956	272	20,497
2005	12,699	175	16,431
2006	14,928	196	15,555
2007	18,943	307	25,692
2008	15,444	175	19,886
2009	16,850	60	31,097
2010	16,828	226	22,555
2011	14,465	589	21,869
2012	12,704	48	15,794
2013	12,723	47	15,779
2014	16,202	95	21,640
2015	14,621	416	21,311
2016	15,813	101	36,501
2017	14,851	150	21,257
2018	14,279	89	11,724
2019	13,973	88	19,927
2020	7,850	158	14,339
Average			
1996–2020	15,212	253	20,679
2016–2020	13,353	117	20,750
2021	13,756	14	11,246
2022	NA	NA	NA

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1986–1994) and Howe et al. (1995, 1996).

Note: "NA" means data not available. Effort, harvest and catch estimates for Naknek drainage exclude Brooks River and American Creek.

2021–2022 Seasons

During the 2021 season, estimated effort in the Naknek River sport fishery was 13,756 angler-days, which is slightly above the recent 5-year average of 13,353 angler-days (2016–2020; Table 25). Sport catch was 11,246 rainbow trout which was below average (2016–2020; Table 25). Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported that sport fishing for rainbow trout was good throughout the 2022 season.

OTHER SPECIES FISHERIES

The BBMA offers diverse sport fishing opportunities for a large variety of species that often go unnoticed because of the publicity given to the more popular species. Arctic char or Dolly Varden, Arctic grayling, lake trout, northern pike, and chum and pink salmon are 6 species that contribute to the sport fishing enjoyment of many anglers who fish the area. Catch and harvest estimates are made annually for these other species and trends in catch are followed for the more popular sport species (Appendices A4 and A5).

WOOD RIVER LAKES SYSTEM ARCTIC CHAR

Fishery Description

The Wood River Lakes system is a series of 5 large, connected lakes north of Dillingham that drain into Wood River and Nushagak Bay at Dillingham (Figure 1). All of these lakes, except the eastern two-thirds of Lake Aleknagik, are included in the boundaries of the Wood–Tikchik State Park. This lake system sustains large populations of Dolly Varden and Arctic char, which are very popular with sport anglers and subsistence users. The most popular angling sites are the Agulowak River, which connects Lake Nerka with Lake Aleknagik, and the Agulukpak River connecting Lake Beverly with Lake Nerka (Figure 1). There are many other good fishing spots throughout the system but these 2 rivers (often called "wak" and "pak") and the outlets of other tributaries into Lake Aleknagik probably support most of the Arctic char angling effort in the system.

By both catch and harvest, the sport fishery for Dolly Varden and Arctic char in the Wood River Lakes is one of the largest fisheries for these species in the BBMA (Table 26 and Appendix A4). The most recent 5-year average estimated effort from 2016 through 2020 is 3,157 angler-days (Table 1). Much of the effort is aimed at Arctic char and Dolly Varden, and most sport harvest for these 2 species occurs at the mouths of the Agulowak and Agulukpak Rivers.

A stock assessment project conducted in 1993 found the abundance of Arctic char at the mouth of the Agulowak River had declined from 12,000 to 5,000 fish over a 10-year period (Minard and Hasbrouck 1994). Sport harvests during the period of decline are thought to have been excessive. This prompted an emergency order reduction in bag limits for the 1994 season. Restrictive regulations addressing this fishery were adopted by the BOF in January 1995. The new regulations reduced the daily bag limit from 10 to 2 fish per day and in possession and required the use of single-hook artificial lures. Additionally, a single-hook artificial lure restriction was adopted for the portion of Lake Aleknagik within a ½-mile radius of the outlet of the Agulowak River. These restrictions have been in place since the 1994 season (by emergency order in 1994, and by regulation since 1995). Public acceptance and compliance have been good. Overall, the Arctic char stocks at the Agulowak River appear to have recovered, suggesting that the regulatory changes have allowed recovery to previous levels. High effort at the outlet of the Agulowak River continues and may require ongoing attention.

Since the BOF action, harvests of Dolly Varden and Arctic char for the Wood River Lake system (Wood River Lakes, Agulowak River, and Agulukpak River) have stayed less than 1,000 fish per year since 2011, except in 2021 (Table 26). Most of the harvest occurs at the mouth of the Agulowak River at the inlet to Aleknagik Lake; the fishery at the Agulukpak River is primarily catch-and-release.

Fishery Management and Objectives

The management objective for this fishery is to maintain the Agulukpak–Agulowak Rivers stocks at the abundance and sizes previously documented in the 1980s. Sport fishery effort, catch, and harvest are estimated through the SWHS. Subsistence harvests are not well monitored and are managed by the Division of Commercial Fisheries. Onsite surveys yield detailed estimates of angler use and success. Biological information and demographic information are also collected. Significant stock assessment and creel survey results have been reported by Minard (1989b), and Minard and Hasbrouck (1994).

2021–2022 Seasons

During the 2021 season, estimated effort in the Wood River Lakes sport fishery was 2,992 angler-days, which is slightly below the recent 5-year average of 3,157 angler-days (2016–2020; Table 1). Sport catch of Dolly Varden and Arctic char was 6,211 fish, which was above the recent average, and harvest was 1,348, which was well above the recent average (2016–2020; Appendix A4, Table 26). Estimates of sport fishery effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported that sport fishing for Dolly Varden and Arctic char was excellent throughout the 2022 season.

UGASHIK LAKES ARCTIC GRAYLING

The Ugashik Lakes are located on the Alaska Peninsula 560 km southwest of Anchorage and are within the Alaska Peninsula National Wildlife Refuge. Two popular sport fishery areas are the Ugashik Narrows, which connect the Upper and Lower Ugashik Lakes, and the Outlet, which includes the upper 2 km of the Ugashik River between Lower Ugashik Lake and a large lagoon. The Ugashik Narrows is approximately 0.5 km long and consists of 2 main channels with moderately fast water. The Outlet consists of shallow, braided channels with moderately fast water. The Ugashik Lakes area is accessible only by float plane or by boat from the village of Ugashik and Pilot Point, 40 km downstream from the Outlet.

Fishery Description

Angler effort in the Ugashik Lakes area is concentrated at the Narrows and Outlet, with limited effort expended in other parts of the drainage. Due to the inclement weather of the Alaska Peninsula and the remote nature of the Ugashik Narrows, fishing pressure is moderate. Three active and 1 inactive sport fishing lodges are located in the Ugashik Lakes area. In addition, several lodges in the King Salmon area fly guests to the Ugashik Lakes for day fishing trips.

Species of interest in the sport fishery include Arctic grayling, coho and sockeye salmon, Arctic char and Dolly Varden, and lake trout. Annual sport fishery harvest and catch are estimated for the drainage through the SWHS. Rainbow trout have never been officially documented in the drainage, but reports of catches and harvests of this species routinely appear in the SWHS.

The primary attraction in the drainage has been the Ugashik Narrows, which harbors a population of very large Arctic grayling. Studies indicate that the Arctic grayling at this site are an accumulation of old large fish (Meyer 1991). From 1967 through 1998, 66 trophy fish certificates or honorary catch-and-release certificates were issued for Arctic grayling in the Ugashik River drainage (Havens, ADF&G, Division of Sport Fish, Juneau, personal communication). From 2016 through 2020, the Ugashik drainage fisheries for all species had an average annual effort of 1,287

angler-days and an average catch of 863 Arctic grayling (SWHS [cited October 16, 2022]; Appendix A5). The 2016–2020 average harvest was zero (SWHS [cited October 16, 2022]).

Fishery Management and Objectives

Sport fishing regulations are intended to assure the sport fishery does not negatively impact Arctic grayling populations and gives the populations sufficient opportunity to reproduce and possibly increase in abundance.

Management of the sport fishery for Arctic grayling in the Ugashik River drainage has been conservative since 1969, when the bag limit was reduced to 2 fish per day. The entire drainage was closed to the taking of Arctic grayling during 1990 through 1994 after studies found declining and very low grayling populations with old fish and poor recruitment (Meyer 1991; Villegas 1993). In 1995, the BOF allowed a sport harvest in portions of the drainage again, with a 5 fish per day daily bag limit in the Ugashik River drainage, excluding the Ugashik Narrows and Ugashik River, for the period of 1995 through 1997. The Ugashik Narrows has been designated as a catch-and-release Arctic grayling fishery since 1995. The Ugashik River has been closed to Arctic grayling fishing since 1990. During their 1997 winter meeting, the BOF reduced the daily harvest limit to 2 fish per day, with no size restrictions in areas where harvest is allowed.[12]

During much of the early and mid-1990s, there was controversy over public access easements at the Ugashik Narrows, which is a popular angling site. The state sought to preserve a site easement on Lower Ugashik Lake and a trail easement running north along the west side of the Narrows to public lands along Upper Ugashik Lake. Fly-in anglers had a tradition of getting dropped off on the shores of one lake, angling along the shores of the Narrows, and then getting picked up at the other lake at the end of the day. Frequent and rapid weather changes often made the different drop-off and pick-up sites a necessity for safe air travel. A Native corporation sought to obtain control of the lands along the Narrows and objected to the establishment of easements. From 1992 through 1997, there were extensive legal discussions. The state accumulated extensive documentation establishing historical use of the site and trail, and showed its determination to secure these easements through litigation or a negotiated agreement. In August 1997, the Native corporation chose to relinquish its selection of these lands, thereby allowing the lands to remain as public lands under the management of the Alaska Peninsula–Becharof National Wildlife Refuge. The Narrows and landing sites at both lakes continue to be accessible to the public. However, a portion of land on the southeast side of the outlet has been conveyed to a private, Native allotment applicant.

2021–2022 Season

During the 2021 season, overall harvest of Arctic grayling in the BBMA in 2021 was 555 fish (Table 27). Estimated effort in the Ugashik Lakes sport fishery was 1,478 angler-days, which is slightly above the recent 5-year average of 1,287 angler-days (2016–2020; SWHS [cited October 16, 2022]). Estimated sport catch and harvest for Ugashik Lakes were both zero fish (SWHS [cited October 16, 2022]). Estimates of sport fishing effort, catch, and harvest for 2022 will not be available until 2023; however, anglers reported that sport fishing for Arctic grayling in the Ugashik Lakes was normal in 2022.

[12] Southwest Alaska sport fishing regulations summary, 2022 (effective until the 2023 summary is issued) Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

Table 26.–Sport harvest of Dolly Varden and Arctic char from the waters of the Bristol Bay Management Area by fishery, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Ugashik	434	0	44	0	20	0	15	0	71	0	17	0
Egegik–Becharof	46	24	0	225	0	16	15	97	20	14	32	219
Naknek River	269	122	49	86	521	32	55	74	156	41	72	22
Naknek Lake	0	32	0	30	0	0	0	102	0	0	20	0
Bay of Islands	0	0	0	0	0	0	291	0	0	0	58	0
Brooks River	0	16	0	0	0	0	40	0	0	0	8	0
Brooks Lake	0	0	0	0	0	0	0	0	0	0	0	0
American Creek	123	88	0	107	28	0	80	0	18	30	26	83
King Salmon River (Ushagik)	0	0	0	0	0	0	0	0	0	0	0	0
Kvichak River	48	16	16	17	34	23	0	81	0	0	21	0
Copper River	0	0	0	389	0	0	0	0	0	0	0	0
Alagnak River	0	27	99	81	78	106	0	0	0	12	24	22
Newhalen River	44	0	0	0	20	68	0	54	0	0	24	21
Lower Talarik Creek	0	0	0	0	0	0	0	0	0	0	0	0
Lake Clark	58	11	0	49	70	66	17	11	0	17	22	0
Lake Iliamna	455	0	0	0	0	16	0	159	0	0	35	21
Kulik River	0	0	0	0	0	0	0	0	0	0	0	0
Tazimina River	0	0	0	0	0	0	0	0	0	0	0	0
Moraine Creek	0	0	0	17	20	12	0	0	0	0	2	0
Other	0	0	87	15	895	157	0	0	0	0	31	0
Subtotal[a]	1,477	336	295	1,016	1,686	496	513	578	265	114	393	388
Central												
Nushagak River	235	163	197	61	239	237	23	0	208	45	103	21
Mulchatna River	83	32	53	135	236	374	65	54	107	25	125	43
Agulowak River	112	53	88	132	156	137	0	0	0	0	27	13
Agulukpak River	48	11	16	0	0	0	0	0	0	0	0	0
Wood River Lakes[b]	319	279	154	381	226	100	95	334	542	329	280	1,348
Tikchik–Nuyakuk	0	0	0	68	230	0	268	20	78	42	82	25
Koktuli River	0	159	0	61	0	0	15	0	0	63	16	0
Other	97	391	47	61	0	0	0	0	0	0	0	0
Subtotal[a]	894	1,088	555	899	1,087	848	466	408	935	504	632	1,450

-continued-

Table 26.–Page 2 of 2.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Western												
Togiak	196	33	153	122	724	401	274	20	179	38	182	55
Other	27	13	37	0	0	0	0	0	0	0	0	284
Subtotal[a]	223	46	190	122	724	401	274	20	179	38	182	339
Total	2,594	1,470	1,040	2,037	3,497	1,745	1,253	1,006	1,379	656	1,208	2,177

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1979–1980, 1981a, 1981b, 1982–1994) and Howe et al. (1995, 1996).

[a] Subtotals of averages may not be the sum of the drainages because information for some drainages is not available for some years.

[b] Wood River Lakes includes Lake Nunavaugaluk. Prior to 1998, Agulowak and Agulukpak Rivers were included in Wood River Lakes.

Table 27.–Sport harvest of Arctic grayling from the waters of Bristol Bay Management Area by fishery, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2012–2016	2021
Eastern												
Naknek River	0	0	0	10	264	16	14	17	0	13	12	0
Brooks River	0	0	0	0	0	0	0	61	0	0	12	0
Kvichak River	49	0	0	21	33	23	24	57	20	0	25	16
Copper River	0	0	0	0	0	0	0	0	0	0	0	0
Alagnak River	0	0	0	10	124	106	0	61	99	0	53	0
Newhalen River	97	14	67	24	45	68	154	80	361	0	133	57
Lake Clark	96	70	42	41	121	66	299	294	0	22	136	25
Other	99	0	72	465	84	28	40	20	24	0	22	110
Subtotal[a]	341	84	181	571	671	307	531	590	504	35	393	208
Central												
Nushagak River	261	380	37	98	38	0	68	52	17	0	27	293
Mulchatna River	139	251	22	60	46	54	112	32	107	13	64	18
Agulowak River	14	0	0	0	0	0	0	0	0	0	0	0
Agulukpak River	0	0	17	0	0	0	0	0	0	0	0	0
Wood River Lakes[b]	215	66	254	19	0	0	23	0	34	0	11	36
Tikchik–Nuyakuk	0	0	56	21	204	0	12	60	42	0	23	0
Other	0	0	45	20	0	0	0	0	0	0	0	0
Subtotal[a]	629	697	431	218	288	54	215	144	200	13	125	347
Western												
Togiak River	0	0	9	10	118	0	44	0	80	42	33	0
Other	29	28	0	0	0	0	0	0	0	0	0	0
Subtotal[a]	29	28	9	10	118	0	44	0	80	42	33	0
Total	999	809	621	799	1,077	361	790	734	784	90	552	555

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Prior data can be found in Mills (1979–1980, 1981a, 1981b, 1982–1994) and Howe et al. (1995, 1996).

[a] Subtotals of averages may not be the sum of the drainages because information for some drainages is not available for some years.

[b] Wood River Lakes includes Lake Nunavaugaluk. Prior to 1998, Agulowak and Agulukpak Rivers were included in Wood River Lakes.

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APPENDIX A: CATCH TABLES

Appendix A1.–Sport catch of Chinook salmon from the Bristol Bay Management Area by fishery, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Ugashik	0	69	74	109	0	48	524	61	0	0	127	26
Egegik–Becharof	277	65	148	564	218	238	99	1245	39	139	352	65
Naknek River	5,667	5,731	2,846	3,482	3,716	8,758	4,422	6,390	7,824	1,878	5,854	1,803
Naknek Lake	0	0	29	0	18	0	0	44	74	0	24	0
Bay of Islands	17	0	0	216	36	0	0	0	0	82	16	43
Brooks River	45	0	0	264	0	158	142	40	189	0	106	26
Brooks Lake	0	0	0	0	0	0	0	0	0	0	0	0
King Salmon River	0	0	0	0	0	0	0	0	0	172	34	0
Kvichak River	246	70	372	79	0	527	733	102	328	19	342	651
Copper River	0	755	15	0	0	0	0	0	59	0	12	0
Alagnak River	4,416	1,249	3,502	4,265	4,299	5,613	3,673	5,125	1,852	873	3,427	1,384
Newhalen River	0	0	0	0	43	0	0	0	0	0	0	0
Lake Clark	0	0	0	0	0	0	0	0	0	0	0	0
Lake Iliamna	0	0	0	109	0	18	0	123	0	0	28	0
Kulik River	0	0	0	0	20	0	0	0	37	11	10	0
Tazimina River	0	0	15	0	0	16	0	0	0	0	3	0
Other	170	340	0	47	0	0	18	0	0	0	4	0
Subtotal	10,838	8,279	7,001	9,135	8,350	15,376	9,611	13,130	10,402	3,174	10,339	3,998
Central												
Nushagak River	37,959	33,974	30,807	24,465	31,993	45,893	24,345	41,828	23,043	8,491	28,720	15,612
Mulchatna River	1,477	1,254	997	1,034	716	253	231	940	319	346	418	651
Agulowak River	0	0	0	31	0	34	125	0	632	0	158	26
Agulukpak River	245	0	0	0	0	0	42	0	0	0	8	0
Wood River Lakes	42	56	184	357	688	51	118	0	427	150	149	22
Tikchik–Nuyakuk	703	2,097	350	659	108	0	224	1342	914	0	496	91
Koktuli River	0	151	0	0	138	187	73	0	37	58	71	0
Other	1,253	0	0	20	215	52	636	0	0	0	138	117
Subtotal	41,679	37,532	32,338	26,566	33,858	46,470	25,794	44,110	25,372	9,045	30,158	16,519

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Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2012–2016	2021
Western												
Togiak	9,096	6,719	6,392	10,671	5,620	5,405	5,320	4,014	4,495	2,679	4,383	2,341
Other	545	0	106	69	258	254	456	0	269	0	196	0
Subtotal	9,641	6,719	6,498	10,740	5,878	5,659	5,776	4,014	4,764	2,679	4,578	2,341
Total	62,158	52,530	45,837	46,441	48,086	67,505	41,181	61,254	40,538	14,898	45,075	22,858

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Data from prior years can be found in Howe et al. (1995, 1996).

Appendix A2.–Sport catch of coho salmon from the Bristol Bay Management Area by fishery, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Ugashik	688	893	1,187	2,426	4,759	559	358	6,586	551	1,246	1,860	351
Egegik–Becharof	3,693	4,281	2,309	4,797	3,932	6,706	10,993	17,990	6,942	5,471	9,620	8,696
Naknek River	6,416	6,391	3,359	10,130	6,892	5,113	11,176	10,213	5,291	2,324	6,823	4,618
Naknek Lake	0	39	114	28	506	148	58	94	23	52	75	40
Bay of Islands	0	0	31	120	33	16	947	0	0	391	271	27
Brooks River	18	29	61	293	17	202	195	270	166	85	184	107
Brooks Lake	0	0	0	0	0	171	0	12	0	0	37	0
American Creek	0	0	240	0	0	0	0	0	19	0	4	47
King Salmon River	27	0	11	386	1,147	34	869	0	1,749	69	544	0
Kvichak River	3,797	2,734	2,828	1,493	1,287	968	1,551	3,437	2,013	1,679	1,930	2,260
Copper River	181	14	101	521	535	69	104	0	102	558	167	0
Alagnak River	3,551	2,958	5,446	10,663	3,368	1,438	6,219	9,689	8,214	1,077	5,327	3,544
Newhalen River	60	0	144	52	722	127	220	614	373	77	282	81
Lower Talarik Creek	0	0	172	10	118	0	550	0	0	86	127	0
Lake Clark	27	0	15	179	225	776	139	0	0	46	192	0
Lake Iliamna	202	27	0	31	1,013	137	64	456	172	63	178	81
Kulik River	27	127	229	112	71	0	58	83	0	34	35	0
Tazimina River	0	0	0	0	0	0	0	332	0	6	68	0
Moraine Creek	27	0	0	153	118	0	0	0	0	75	15	0
Other	678	647	486	20	0	582	233	392	318	1,453	596	27
Subtotal	19,257	18,140	16,733	31,414	24,743	17,046	33,734	50,168	25,933	14,792	28,335	19,879
Central												
Nushagak River	5,981	10,220	9,811	14,124	8,181	6,716	2,355	6,904	7,608	464	4,809	3,919
Mulchatna River	563	389	1,717	1,900	3,004	560	2,193	4,656	514	131	1,611	315
Agulowak River	237	156	106	198	84	137	209	96	68	29	108	0
Agulukpak River	36	0	275	593	12	0	324	0	57	0	76	40
Wood River Lakes	1,350	627	2,864	2,036	2,349	1,354	3,543	1,555	1,193	1,424	1,814	670
Tikchik–Nuyakuk	846	0	122	204	556	297	2,012	372	432	0	623	201
Other	369	97	92	254	574	0	131	481	0	17	126	2,281
Subtotal	9,382	11,489	14,987	19,309	14,760	9,064	10,767	14,064	9,872	2,065	9,166	7,426

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Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Western												
Togiak	5,007	17,424	4,258	10,051	14,672	15,017	16,541	17,670	6,139	10,978	13,269	9,240
Other	2,860	764	984	778	3,195	1,884	2,726	3,236	318	0	1,633	507
Subtotal	7,867	18,188	5,242	10,829	17,867	16,901	19,267	20,906	6,457	10,978	14,902	9,747
Total	36,506	47,817	36,962	61,552	57,370	43,011	63,768	85,138	42,262	27,835	52,403	37,052

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Data from prior years can be found in Howe et al. (1995, 1996).

Appendix A3.–Sport catch of sockeye salmon from the Bristol Bay Management Area by fishery, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Ugashik	932	1,824	1,022	504	1,325	180	265	863	258	841	481	259
Egegik–Becharof	641	397	178	2,116	444	227	442	976	538	290	495	733
Naknek River	7,739	8,610	6,977	8,521	9,095	11,103	8,439	10,443	9,609	11,239	10,167	14,342
Naknek Lake	158	138	445	1,065	1,182	1,901	342	119	878	417	731	128
Bay of Islands	[a]	0	114	0	63	175	80	0	0	533	158	0
Brooks River	1,725	2,119	2,103	5,032	1,788	2,638	2,299	1,071	1,088	660	1,551	918
Brooks Lake	[a]	261	303	890	353	157	0	0	0	0	31	259
American Creek	572	240	719	2,089	319	164	2,979	161	420	64	758	762
King Salmon River	[a]	0	19	0	0	35	0	0	184	42	52	0
Kvichak River	8,911	4,478	3,367	7,076	3,288	9,242	8,930	6,140	2,887	4,352	6,310	9,229
Copper River	2,296	1,864	2,145	3,118	2,034	990	812	1,874	917	1,687	1,256	1,327
Alagnak River	5,900	8,730	5,107	2,280	12,163	5,890	9,156	8,961	3,801	7,602	7,082	11,224
Newhalen River	1,406	2,553	3,913	1,295	6,270	1,648	6,604	1,227	5,064	2,111	3,331	3,202
Lower Talarik Creek	[a]	68	256	427	133	0	121	0	0	253	75	129
Lake Clark	429	471	1,024	734	811	919	1,425	1,371	236	743	939	2,396
Lake Iliamna	1,171	811	0	4,828	2,559	1,042	40	2,576	1,031	710	1,080	725
Kulik River	799	1,405	264	1,227	80	0	1,406	446	387	462	540	179
Tazimina River	[a]	0	530	0	197	0	0	0	0	21	4	149
Moraine Creek	945	1,765	1,958	704	455	401	891	1,569	748	808	883	2,821
Other	67	1,186	2,157	1,070	41	2,731	612	2,404	2,422	2,030	2,040	4,719
Subtotal	21,991	36,920	32,601	42,976	42,600	39,443	44,843	40,201	30,468	34,865	37,964	53,501
Central												
Nushagak River	576	954	786	753	1,671	1,097	3,716	4,474	920	397	2,121	13,885
Mulchatna River	1,164	686	720	464	1,284	361	753	776	447	352	538	949
Agulowak River	784	1,276	600	2,063	676	437	1,743	383	1,580	502	929	757
Agulukpak River	2,323	310	203	347	540	178	916	290	111	0	299	314
Wood River Lakes	3,222	982	3,423	6,575	2,638	444	3,223	3,087	2,832	1,964	2,310	8,366
Tikchik–Nuyakuk	277	614	204	583	250	175	508	363	531	131	342	1,058
Koktuli River	[a]	27	0	0	199	105	0	0	213	650	194	0
Other	1,165	112	132	348	60	638	0	0	589	11	248	259
Subtotal	9,511	4,961	6,068	11,133	7,318	3,435	10,859	9,373	7,223	4,007	6,979	25,588

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Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Western												
Togiak	654	2,110	191	636	1,146	2,838	1,575	578	1,301	661	1,391	4,605
Other	0	50	360	435	299	160	80	423	92	0	151	0
Subtotal	654	2,160	551	1,071	1,445	2,998	1,655	1,001	1,393	661	1,542	4,605
Total	32,156	44,041	39,220	55,180	51,363	45,876	57,357	50,575	39,084	39,533	46,485	83,694

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Data from prior years can be found in Howe et al. (1995, 1996).

[a] Unpublished estimates from SWHS for sites with less than 12 responses

Appendix A4.–Sport catch of Dolly Varden and Arctic char from the Bristol Bay Management Area by fishery, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Ugashik	3,846	2,277	3,153	11,013	4,588	2,648	7,259	3,760	4,549	2,459	4,135	2,603
Egegik–Becharof	4,402	8,180	3,698	12,144	5,357	7,634	4,695	7,199	4,268	3,443	5,448	2,974
Naknek River	5,665	5,465	5,837	5,673	7,034	6,815	3,468	3,859	4,949	1,037	4,026	855
Naknek Lake	128	1,151	1,522	1,969	626	771	43	921	468	450	531	82
Bay of Islands	400	0	56	0	71	0	608	0	0	23	126	0
Brooks River	1,112	1,892	2,131	1,094	924	1,215	731	982	254	197	676	22
Brooks Lake	62	182	0	0	97	0	0	0	267	0	53	0
American Creek	9,651	5,584	9,848	8,260	9,140	2,723	10,622	2,757	4,291	1,849	4,448	3,201
King Salmon River	0	0	70	0	0	754	363	0	80	151	270	0
Kvichak River	1,130	1,205	1,232	1,511	1,877	1,069	1,169	1,288	472	590	918	669
Copper River	1,326	5,873	2,055	7,131	3,132	3,059	933	102	297	407	960	894
Alagnak River	1,118	1,137	1,919	2,248	6,555	1,909	1,556	2,199	1,165	385	1,443	978
Newhalen River	180	0	431	17	295	850	659	346	567	30	490	109
Lower Talarik Creek	21	0	0	67	0	481	44	0	0	15	108	44
Lake Clark	409	1,207	133	717	1,329	340	569	540	991	168	522	1,557
Lake Iliamna	749	2,854	347	4,145	6,005	11,216	8,806	182	927	330	4,292	21
Kulik River	207	689	678	745	465	530	1,213	20	139	113	403	103
Tazimina River	0	0	106	0	78	0	201	0	15	0	43	0
Moraine Creek	435	806	750	1,724	2,694	519	143	815	1,234	255	593	351
Other	2,882	410	9,742	4,602	2,874	2,238	946	16,421	6,208	1,093	5,381	4,018
Subtotal	33,723	38,912	43,708	63,060	53,141	44,771	44,028	41,391	31,141	12,995	34,865	18,481
Central												
Nushagak River	4,329	7,170	9,724	11,001	15,224	12,263	1,147	7,683	2,416	236	4,749	1,307
Mulchatna River	1,439	121	504	338	3,608	2,896	580	759	199	236	934	190
Agulowak River	2,241	861	2,551	4,129	4,602	6,397	5,909	1,508	2,273	1,234	3,464	604
Agulukpak River	4,486	1,612	2,395	1,560	1,297	1,460	1,176	1,437	694	276	1,009	1,199
Wood River Lakes	6,793	4,710	14,260	5,479	9,351	5,481	5,879	3,329	7,601	3,345	5,127	6,211
Tikchik–Nuyakuk	1,662	310	828	2,178	4,733	181	3,236	815	2,877	179	1,458	1,261
Koktuli River	41	558	0	1,218	1,072	2,422	165	0	1,787	247	924	0
Other	263	2,043	346	307	1,350	521	527	53	438	61	320	85
Subtotal	21,254	17,385	30,608	26,210	41,237	31,621	18,619	15,584	18,285	5,814	17,985	10,857

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Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Western												
Togiak	9,087	4,165	2,085	7,528	12,486	3,479	4,728	8,286	6,012	1,345	4,770	1,060
Other	213	308	322	322	169	642	581	0	0	0	245	955
Subtotal	9,300	4,473	2,407	7,850	12,655	4,121	5,309	8,286	6,012	1,345	5,015	2,015
Total	64,277	60,770	76,723	97,120	107,033	80,513	67,956	65,261	55,438	20,154	57,864	31,353

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Data from prior years can be found in Mills (1992, 1993) and Howe et al. (1994, 1995).

Appendix A5.–Sport catch of Arctic grayling from the waters of the Bristol Bay Management Area by fishery, 2011–2021.

Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Eastern												
Ugashik	766	207	561	708	251	319	180	970	2,838	8	863	0
Egegik–Becharof	2,021	857	2,847	1,107	1,130	1,015	457	3,485	279	763	1,200	2,422
Naknek River	1,369	1,886	2,100	1,811	3,606	2,054	1,137	2,326	1,448	418	1,477	563
Naknek Lake	0	81	144	89	0	21	0	172	417	8	124	0
Bay of Islands	0	0	23	0	0	0	0	0	0	8	2	0
Brooks River	89	315	1,429	204	368	308	860	135	40	0	269	128
Brooks Lake	118	0	0	89	166	0	0	0	208	0	42	37
American Creek	261	31	423	110	1,664	31	2,265	155	20	4	495	55
King Salmon River	0	0	0	0	0	0	0	0	0	0	0	0
Kvichak River	3,876	7,873	6,091	6,746	12,383	2,939	2,133	2,023	2,630	1,322	2,209	1,299
Copper River	49	151	515	955	83	77	206	121	20	778	240	18
Alagnak River	3,333	4,274	7,114	1,588	6,557	716	1,502	2,612	3,364	212	1,681	2,315
Newhalen River	274	211	1,888	706	6,277	1,450	7,490	1,247	1,934	480	2,520	797
Lower Talarik Creek	245	0	36	203	0	95	153	0	63	29	68	18
Lake Clark	3,647	1,501	3,799	2,496	3,319	3,649	4,415	4,106	6,325	1,368	3,973	7,358
Lake Iliamna	196	637		4,266	674	2,547	293	85	201	305	686	0
Kulik River	0	172	1,489	48	705	157	168	2,950	521	10	761	144
Tazimina River	49	344	1,606	91	0	111	681	683	1,344	101	584	758
Moraine Creek	396	1,204	969	1,143	2,400	251	550	832	838	261	546	162
Other	2,172	632	969	4,499	336	219	1,104	2,902	1,493	90	1,162	220
Subtotal	18,861	20,376	32,003	23,144	34,932	12,550	21,820	24,804	23,983	6,165	18,901	16,294
Central												
Nushagak River	3,423	7,034	7,801	4,926	10,038	2,988	3,608	4,679	5,565	54	3,379	3,436
Mulchatna River	1,771	1,360	504	292	2,808	1,106	2,651	2,031	188	483	1,292	286
Agulowak River	1,157	275	1,065	1,563	1,187	1,378	3,480	1,181	2,521	292	1,770	432
Agulukpak River	1,191	1,206	1,453	872	1,616	817	3,044	633	746	27	1,053	92
Wood River Lakes	3,446	2,052	6,873	1,732	5,586	285	809	778	2,967	788	1,125	1,030
Tikchik–Nuyakuk	1,904	2,688	4,174	2,840	7,809	812	2,711	8,819	1,906	80	2,866	2,293
Koktuli River	29	0	22	426	615	556	1,156	0	2,344	103	832	250
Other	1,628	1,370	23	290	490	115	355	0	21	3	99	57
Subtotal	14,549	15,985	21,915	12,941	30,149	8,057	17,814	18,121	16,258	1,830	12,416	7,876

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Section and drainage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average 2016–2020	2021
Western												
Togiak	2,503	208	1,256	2,005	4,672	276	3,019	2,436	1,691	280	1,540	307
Other	0	0	187	0	20	10	0	17	99	0	25	396
Subtotal	2,503	208	1,443	2,005	4,692	286	3,019	2,453	1,790	280	1,566	703
Total	35,913	36,569	55,361	38,090	69,773	20,893	42,653	45,378	42,031	8,275	32,883	24,873

Source: Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 16, 2022) http://www.adfg.alaska.gov/sf/sportfishingsurvey/. Data from prior years can be found in Mills (1992, 1993) and Howe et al. (1994, 1995).