Fishery Management Report No. 21-31

Sport Fisheries in the Prince William Sound Management Area, 2017–2019

by

Brittany Blain-Roth

Jay Baumer

and

Martin Schuster

October 2021

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. 21-31

SPORT FISHERIES IN THE PRINCE WILLIAM SOUND MANAGEMENT AREA, 2017–2019

by
Brittany Blain-Roth
Alaska Department of Fish and Game, Division of Sport Fish, Anchorage
Jay Baumer
Alaska Department of Fish and Game, Division of Sport Fish, Anchorage
and
Martin Schuster
Alaska Department of Fish and Game, Division of Sport Fish, Homer

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

October 2021

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

Product names used in this publication are included for completeness and do not constitute product endorsement. The Alaska Department of Fish and Game does not endorse or recommend any specific company or their products.

Brittany Blain-Roth,
Alaska Department of Fish and Game, Division of Sport Fish,
333 Raspberry Rd. Anchorage, AK, 99518-1585, USA

Jay Baumer,
Alaska Department of Fish and Game, Division of Sport Fish,
333 Raspberry Rd. Anchorage, AK, 99518-1585, USA

and

Martin Schuster
Alaska Department of Fish and Game, Division of Sport Fish,
3298 Douglas Pl. Homer, AK, 99518-1585, USA

This document should be cited as follows:
Blain-Roth, B., J. Baumer, and M. Schuster. 2021. Sport fisheries in the Prince William Sound Management Area, 2017–2019. Alaska Department of Fish and Game, Fishery Management Report No. 21-31, Anchorage.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF FIGURES

LIST OF FIGURES (Continued)

LIST OF APPENDICES

ABSTRACT

This report provides a detailed summary of the sport fisheries in the Prince William Sound Management Area for which the Alaska Board of Fisheries considered proposals through April 2020. Included are a description and historical overview of each fishery, how the fishery is managed, and sport fishery performance for the years 2017–2019.

Keywords: Prince William Sound Management Area, Alaska Board of Fisheries, sport fisheries, coho salmon, *Oncorhynchus kisutch*, sockeye salmon, *Oncorhynchus nerka*, Chinook salmon, *Oncorhynchus tshawytscha*, cutthroat trout, *Onchorhynchus clarkii*, halibut, *Hippoglossus stenolepis*, rockfish, *Sebastes* spp., lingcod, *Ophiodon elongates*, shrimp, *Pandalus* spp.

INTRODUCTION

The Alaska Department of Fish and Game (ADF&G) Prince William Sound Management Area (PWSMA) includes all waters of the Gulf of Alaska and its drainages west of the longitude of Cape Suckling (long 143°53′W) and east of the longitude of Cape Fairfield (long 148°50′W), including waters of the Copper River drainage downstream of Haley Creek (Figure 1). Western Prince William Sound and Eastern Prince William Sound marine waters are divided along longitude 147°W. Principal land managers in PWSMA include the United States Forest Service; various native corporations; the cities of Valdez, Cordova, and Whittier; the Bureau of Land Management; and the State of Alaska.

Data pertaining to effort, catch, and harvest within the sport fisheries of Prince William Sound (PWS) are collected by the ADF&G Alaska Sport Fishing Survey[1] (commonly known as the Statewide Harvest Survey or SWHS), and all data presented in this report are obtained from the SWHS except where noted. The SWHS relies on enough responses for any given site to generate reliable estimates of catch and harvest (Mills and Howe 1992). As such, estimates are generally reported by larger areas, and stream-specific catch and harvest estimates are only available for a few of the more popular streams on the Copper River Delta. Catch and harvest estimates are separated into 4 geographical areas for reporting: Western PWS, Eastern PWS, Valdez Arm, and the Cordova road system–Copper River Delta (CRD).

Angler effort is reported by geographical area as listed above and by port of landing for boat anglers. Averages for effort, catch, and harvest are given for years both prior and following the last Alaska Board of Fisheries (BOF) meeting for PWS finfish in 2017. Throughout this report, PWS refers to all geographical areas excluding CRD.

In 2014, changes were made to the coding methodology and area definitions used to summarize the SWHS data that are used in this management report. These changes made it possible to include catches from PWS fisheries that were landed in Seward (main port in Area J); these catches had been previously listed as "unknown area J" in PWSMA reports prior to November 2014 (Thalhauser 2014). Anglers using the port of Seward often travel to Prince William Sound to harvest fish and so it is appropriate that these data are used in PWSMA fisheries management and included in this report. Tables in this report indicate instances where catch from "unknown area J" was either included or not. The changes made in methodology and definitions make recreation of past data possible and inter-year comparisons more robust, and table entries in this report may differ from previous reports (e.g., Hochhalter et al. 2011).

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

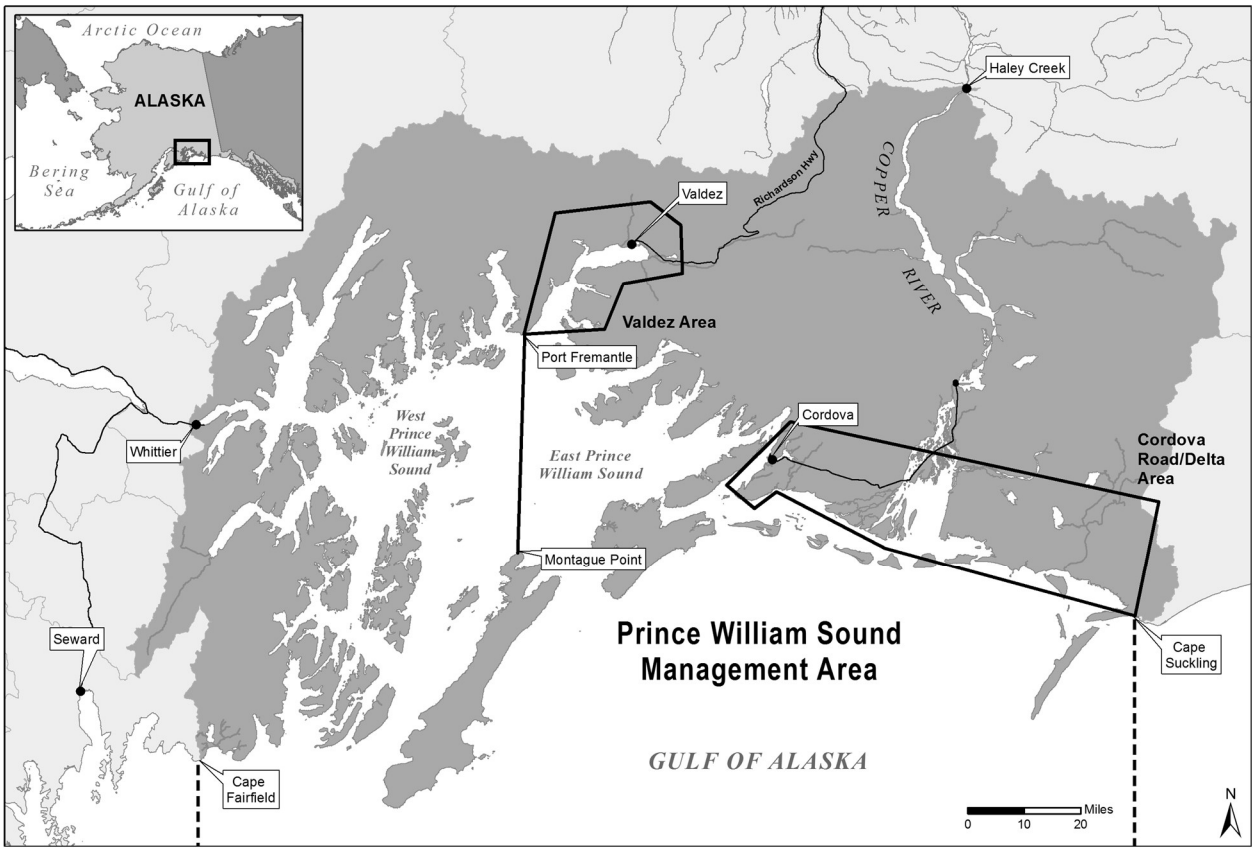

Figure 1.–Map of the Prince William Sound Management Area with defined reporting areas.

In 2020, additional changes were made to incorporate the catch and harvest of PWSMA rockfish and lingcod landed in Seward. Rockfish and lingcod catch and harvest will not match previous reports, but will be consistently estimated in future reports using the method described in the groundfish section of this report.

PWSMA offers sport anglers some of the most diverse angling opportunities available in Southcentral Alaska. Readily accessible marine waters with complex physical habitat provide anglers with opportunities to target halibut (*Hippoglossus stenolepis*), lingcod (*Ophiodon elongatus*), and rockfish (*Sebastes* spp.) in day trips from any of the 4 ports that provide access to PWSMA (Whittier, Valdez, Seward, and Cordova). Hundreds of streams and lakes throughout PWS combined with large-scale hatchery operations (e.g., Prince William Sound Aquaculture Corporation [PWSAC]) provide angling opportunities for 4 species of Pacific salmon during May through October: coho salmon (*Oncorhynchus kisutch*), sockeye salmon (*O. nerka*), pink salmon (*O. gorbuscha*), and chum salmon (*O. keta*). ADF&G provides Chinook salmon (*O. tshawytscha*) angling opportunities in the PWS salt waters through stocked fisheries. PWS supports a noncommercial, sport and subsistence shrimp (*Pandalus* spp.) fishery and provides opportunities to harvest Pacific razor clams (*Siliqua patula*), and several species of hardshell clams (e.g., Pacific littleneck [*Protothaca staminea*] and Washington butter clam [*Saxidomus giganteus*]). Salmon sharks (*Lamna ditropis*) are present in PWS throughout the summer months and are targeted by a small number of anglers annually, but these fisheries are small, and not enough data are collected from these to report. PWSMA represents the northern edge of the range of coastal cutthroat trout

(*O. clarkii clarkii*), providing anglers with unique trout fishing opportunities. Rainbow trout (*O. mykiss*) and Dolly Varden (*Salvelinus malma*) are available year-round throughout PWSMA.

Access to PWSMA is diverse and includes 3 road-accessible ports (Valdez, Whittier, and Seward); commercial aircraft and ferry services to Valdez, Cordova, Chenega Bay, and Tatitlek; and chartered float plane and boat shuttle services for remote drop-offs out of Whittier and Valdez. With the exception of some road-accessible streams in Cordova and Valdez, virtually all PWSMA sport fisheries are remote and relatively difficult to access.

Stocking of hatchery-raised fish has increased fishing opportunities available to sport anglers. These stocking activities consist of 2 types of programs. The first program aims to increase harvest for commercial fisheries and incidentally enhance the availability of fish for sport anglers. The second program conducts sport fishery enhancement without regard to commercial fisheries. However, all hatchery-released salmon are the common property of all fisheries and are thus available to any fishery regardless of the target group. To allow for greater, mostly marine angling opportunities for both boat and shore anglers, and larger harvests of fish, terminal harvest areas (THA) have been established in some areas (Figure 2) for the return of hatchery fish that are meant for harvest, not reproduction, and to relieve fishing pressure on nearby wild stocks of fish. Freshwater releases of resident rainbow trout or Arctic grayling (*Thymallus arcticus*) are exclusively harvested by sport anglers.

ADF&G's lake stocking program has historically provided stocked fisheries for rainbow trout and Arctic grayling in lakes near Valdez; however, the Arctic grayling program will be discontinued after 2020 (Appendix A1). Rainbow trout releases by ADF&G continue to occur annually at Blueberry and Thompson Lakes, and Ruth Pond, with the goal of stocking approximately 2,000 rainbow trout.[2] To provide additional opportunity for anglers, starting in 2020, approximately 900 lake trout (*Salvelinus namaycush*) fingerling were stocked into Blueberry Lake. This would become the only known road accessible lake trout population in the PWSMA. Currently, the only other lake trout population known to occur in the PWSMA is at Tokun Lake; however, it is remote and difficult to access.

ADF&G also provides a Chinook salmon stocking program that aims to increase opportunities for sport anglers in nearshore marine waters of Cordova and Whittier. In Cordova, approximately 100,000 Chinook salmon are stocked annually at Fleming Spit. Historically, Valdez was also part of the Chinook salmon stocking program, but this was put on hold in 2014 until a new release site is developed (there is none to date). Since 1999, ADF&G has taken on Chinook salmon releases in PWS except for Chenega Bay stockings, which were discontinued by PWSAC in 1999 but resumed by PWSAC in 2012. ADF&G has provided PWSAC with approximately 50,000 eyed Chinook salmon eggs to rear to smolt size for this release near Chenega Bay. Whittier releases were temporarily halted by ADF&G from 2006 through 2010 due to budgetary constraints and reduced hatchery production (Appendix A2).

[2] Alaska Department of Fish and Game, Division of Sport Fish, Region II Statewide Stocking Plan for Sport Fish, 2019 – 2023, 2019 UPDATE [cited October 2021]. Available from http://www.adfg.alaska.gov/static/fishing/pdfs/hatcheries/19region2.pdf.

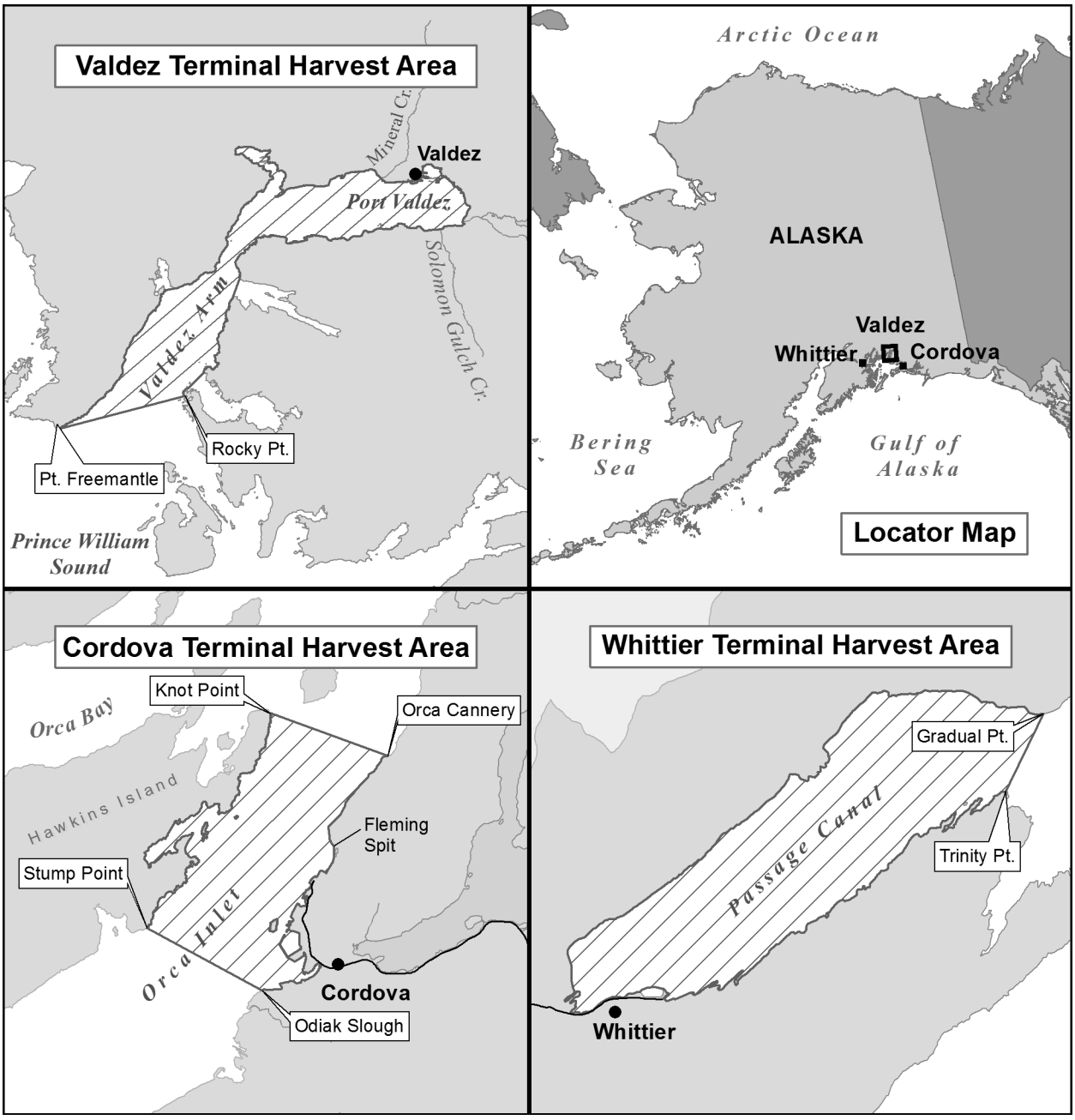

Figure 2.–Terminal harvest areas (gray hatching) in select locations of Prince William Sound.

Coho salmon are stocked by PWSAC to provide sport fishing opportunity at Evans Island near the village of Chenega Bay in Passage Canal near Whittier, and at Fleming Spit near Cordova, and the Valdez Fisheries Development Association (VFDA), another private nonprofit (PNP) hatchery, provides opportunity in Valdez Arm. (Appendix A3). These PNPs also release pink, sockeye, and chum salmon at various locations throughout PWSMA, primarily to enhance commercial fisheries, but these fish are also targeted by sport anglers. Pink salmon are released from 3 PWSAC hatcheries and 1 VFDA hatchery. Sockeye salmon are reared in 1 PWSAC hatchery and released at several sites in PWSMA. Chum salmon are reared in 2 PWSAC hatcheries and released directly from those 2 hatcheries, as well as at 2 remote locations.

SPORT FISHING EFFORT

Between 2001 and 2019, overall angler effort in PWSMA peaked in 2007 at 210,188 angler-days followed by a general decline over the next 5 years (Figure 3); in 2012, effort was the lowest observed since 2002. In 2013, effort in the PWSMA increased but then decreased through 2017, mirroring a statewide trend. However, in 2019, angler effort in PWSMA increased to 183,573 angler-days and was second only to the peak in 2007 (Figure 3). Average angler effort in PWSMA from 2017 to 2019 was 154,421 angler-days (Table 1). The contribution of PWSMA angler effort to the total statewide effort has remained steady since 2007, accounting for approximately 7–8% of statewide effort annually (calculated from Table 1) with 2019 having a slight increase to 9% of the total statewide.

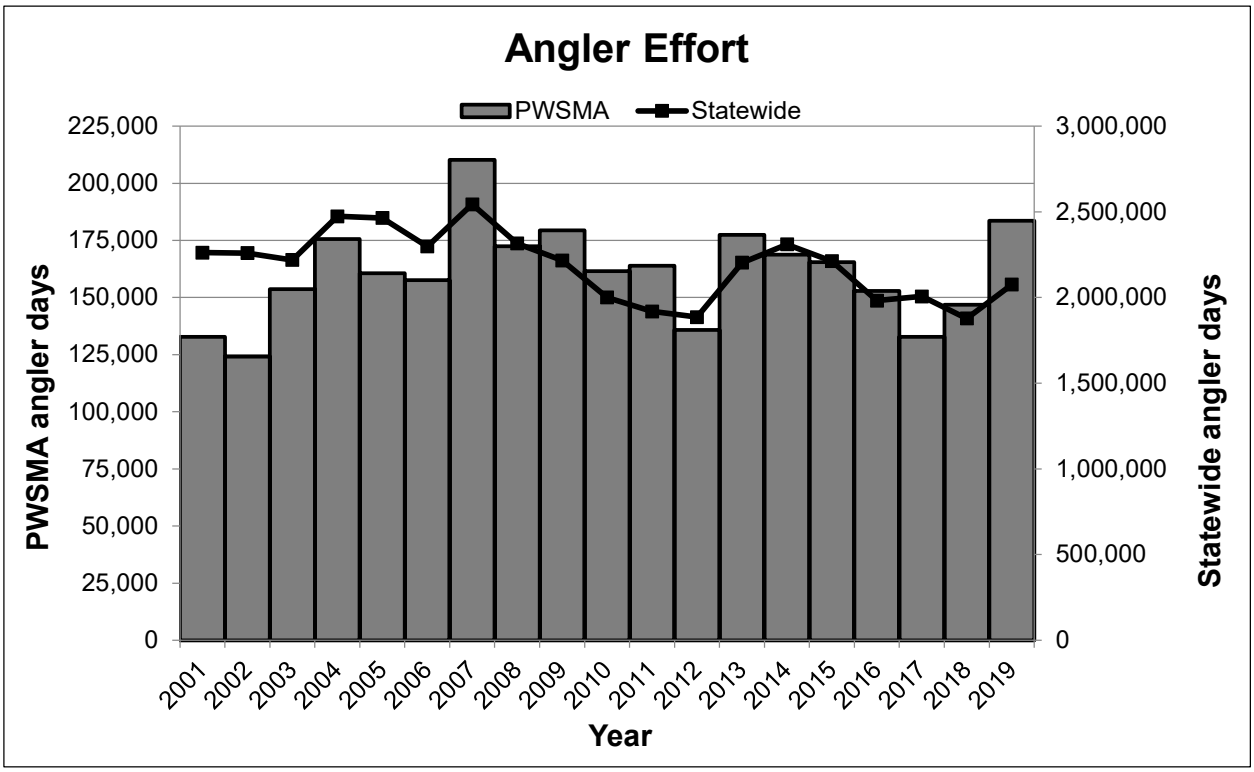

Figure 3.–Angler effort expended in PWSMA (bars) and statewide in Alaska (line), 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

The amount of angler effort in the CRD has historically averaged 11% of the annual PWS angler-days (2007–2016), varying by less than 6 percentage points, and this average percentage did not change for 2017–2019 (calculated from Table 1). Although Eastern and Western PWS had slightly more variability in percent of PWS angler effort during 2007–2016 (12 and 13 percentage points, respectively), their average percentages have remained fairly consistent (41% and 46%, respectively, during 2007–2016; and 40% and 46%, respectively, during 2017–2019), and there were only 2 years (2010 and 2012) that Eastern PWS garnered a greater number of angler-days than Western PWS since 2007.

Table 1.–Number of angler-days by geographical region expended in the Prince William Sound Management Area, 2001–2019.

	Geographic region					
Year[a]	CRD[b]	Eastern PWS[c]	Western PWS[d]	Other-unknown[e]	PWSMA total	Statewide total
2001	15,784	73,117	35,339	8,555	132,795	2,261,941
2002	10,317	61,587	46,958	5,230	124,092	2,259,091
2003	17,989	77,116	49,894	8,686	153,685	2,219,398
2004	15,005	81,075	70,467	9,017	175,564	2,473,961
2005	11,870	76,060	66,946	5,813	160,689	2,463,929
2006	12,179	77,860	61,035	6,502	157,576	2,297,961
2007	18,961	91,401	96,247	3,579	210,188	2,543,648
2008	13,042	77,593	79,526	2,287	172,448	2,315,592
2009	17,022	78,206	81,798	2,324	179,350	2,216,436
2010	21,300	73,038	65,491	1,654	161,483	2,000,152
2011	18,282	61,880	80,286	3,409	163,857	1,919,312
2012	17,205	61,228	54,538	2,881	135,852	1,885,692
2013	16,125	71,433	84,858	5,018	177,434	2,202,957
2014	20,268	56,521	88,130	3,895	168,814	2,309,851
2015	22,037	66,008	73,006	4,425	165,476	2,212,331
2016	13,830	55,516	80,829	2,665	152,840	1,982,300
2017	17,647	52,795	60,147	2,210	132,799	2,006,244
2018	15,837	63,313	63,530	4,210	146,890	1,878,009
2019	18,584	70,842	90,061	4,086	183,573	2,075,431
Average						
2007–2016	17,807	69,282	78,471	3,214	168,774	2,158,827
2017–2019	17,356	62,317	71,246	3,502	154,421	1,986,561

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

[a] To increase precision in data collection, SWHS changed from reporting area of harvest to port of landing in 2001. This had no effect on data for "PWSMA totals."

[b] Includes angler effort on the Cordova road system and Copper River Delta and for saltwater trips returning to Cordova.

[c] Includes effort of boat and shore anglers on the eastern side of PWS.

[d] Includes effort of boat and shore anglers on the western side of PWS.

[e] Includes effort of anglers in unknown and other areas of PWS.

The number of angler-days of effort in Eastern PWS in 2019 (70,842) was the highest observed since 2013 (Table 1). Likewise, angler effort in Western PWS also peaked in 2019 (90,061) after a declining trend since 2014. For both Eastern and Western PWS, despite these peaks, the recent averages for 2017–2019 (62,317 and 71,246, respectively) were smaller than the historical averages for 2007–2016 (69,282 and 78,471, respectively).

The proportion of PWSMA effort expended by boat anglers has been as low as 63% in 2001 and rose to as high as 80% in 2016. Recently, boat angler effort rose from 97,232 angler-days in 2017 to 144,593 angler-days in 2019, the highest on record since 2007 (Table 2). However, average boat angler effort over all PWSMA for 2017–2019 declined slightly from the previous 10-year average (2007–2016) from 128,585 to 119,116 angler-days (Table 2).

Table 2.–Angler-days of effort expended by boat anglers in Prince William Sound Management Area (PWSMA) by port of landing, 2001–2019.

	Port											
	Valdez		Whittier		Cordova		Seward		Other-unknown[a]		Total boat effort in PWSMA	PWSMA boat effort as a percentage of all PWSMA effort[d]
Year	Effort[b]	%[c]	Effort[b]	%[c]	Effort[b]	%[c]	Effort[b]	%[c]	Effort[b]	%[c]		
2001	43,442	52	22,373	27	6,658	8	6,231	7	5,107	6	83,811	63%
2002	40,850	46	29,301	33	6,528	7	7,961	9	3,941	4	88,581	71%
2003	54,351	52	28,761	28	6,222	6	9,616	9	4,795	5	103,745	68%
2004	60,713	46	47,229	35	7,907	6	9,967	7	7,317	5	133,133	76%
2005	53,994	43	49,940	40	4,640	4	11,388	9	4,860	4	124,822	78%
2006	56,689	48	42,343	36	4,912	4	9,760	8	5,224	4	118,928	75%
2007	66,867	42	71,967	45	7,108	4	11,632	7	2,412	2	159,986	76%
2008	55,784	41	57,648	42	7,840	6	13,310	10	1,487	1	136,069	79%
2009	53,396	39	61,733	46	8,269	6	10,756	8	1,183	1	135,337	75%
2010	51,753	44	47,998	41	4,999	4	11,701	10	569	0	117,020	72%
2011	44,252	36	46,563	38	5,429	4	23,476	19	3,189	3	122,909	75%
2012	37,420	38	33,812	35	8,095	8	15,614	16	2,387	2	97,328	72%
2013	45,733	33	61,632	45	5,435	4	20,615	15	4,045	3	137,460	77%
2014	36,856	28	66,100	51	6,513	5	16,825	13	3,585	3	129,879	77%
2015	53,236	42	48,949	38	6,944	5	14,545	11	3,855	3	127,529	77%
2016	39,562	32	54,802	45	7,848	6	17,960	15	2,159	2	122,331	80%
2017	36,757	38	40,413	42	4,538	5	14,080	14	1,444	1	97,232	73%
2018	45,944	40	45,886	40	8,292	7	12,203	11	3,198	3	115,523	79%
2019	53,327	37	68,605	47	6,291	4	13,292	9	3,078	2	144,593	79%
Average												
2007–2016	48,486	38	55,120	43	6,848	5	15,643	12	2,487	2	128,585	76%
2017–2019	45,343	38	51,635	43	6,374	5	13,192	11	2,573	2	119,116	77%

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

[a] Unknown from North Gulf Coast (Seward).

[b] Effort in angler-days.

[c] Percent of total boat angler effort in Prince William Sound.

[d] Total PWSMA angler effort given in Table 1.

Historically, Valdez was the only road-accessible port in PWSMA (Figure 1), and most boat anglers accessed PWSMA through this port. However, since the port of Whittier was linked to the state road system in 2000 by the reconstruction of the Anton Anderson Memorial Tunnel, effort by boat anglers as a percent of total effort within PWSMA has increased greatly in Whittier. In 2001, Valdez accounted for 52% of the total PWSMA boat angler effort vs. Whittier with 27%. After the completion of the tunnel, boat angler effort for Whittier increased to a high of 51% in 2014. As the share of boat angler effort increased for Whittier during this period, the share of boat angler effort from Valdez dropped to 28% in 2014, the lowest percentage on record (Table 2). This change in relative contribution reflects the increase in angler-days between 2001 and 2014 for Whittier from 22,373 to 66,100, respectively, and the decrease from 43,442 to 36,856 for Valdez. Effort for Whittier trended downward after 2014 until a turn-around and record in 2019 of 68,605 angler-days and 47% of the total PWSMA boat angler effort. Although the number of angler-days expended by Valdez boat anglers increased to 53,327 in 2019, this effort was only 37% of the total effort expended by boat anglers in PWSMA (Table 2). The port of Cordova has only a small portion of total boat angler effort (average 5% for 2007–2016, range 4–8%; Table 2).

Shore anglers in the PWSMA typically target salmon species in the terminal harvest areas near Valdez and Cordova. The port of Valdez typically sees more shore angler effort than other ports in the PWSMA and averaged 15,863 shore angler-days or 77% of total PWSMA average effort from shore during 2007–2016 (Figure 4, Table 3). In 2018, 95% of the shore angler effort was in the Valdez area (Figure 4). During 2007–2016, the average of the Cordova and Whittier shore effort combined was 2,667 angler-days or 13% of the total PWSMA shore effort. During 2010–2019, there were too few respondents to determine the shore effort for 5 of 10 years in the Cordova area, 6 of 10 years for Western PWS, and 7 of 10 years for Eastern PWS (Table 3).

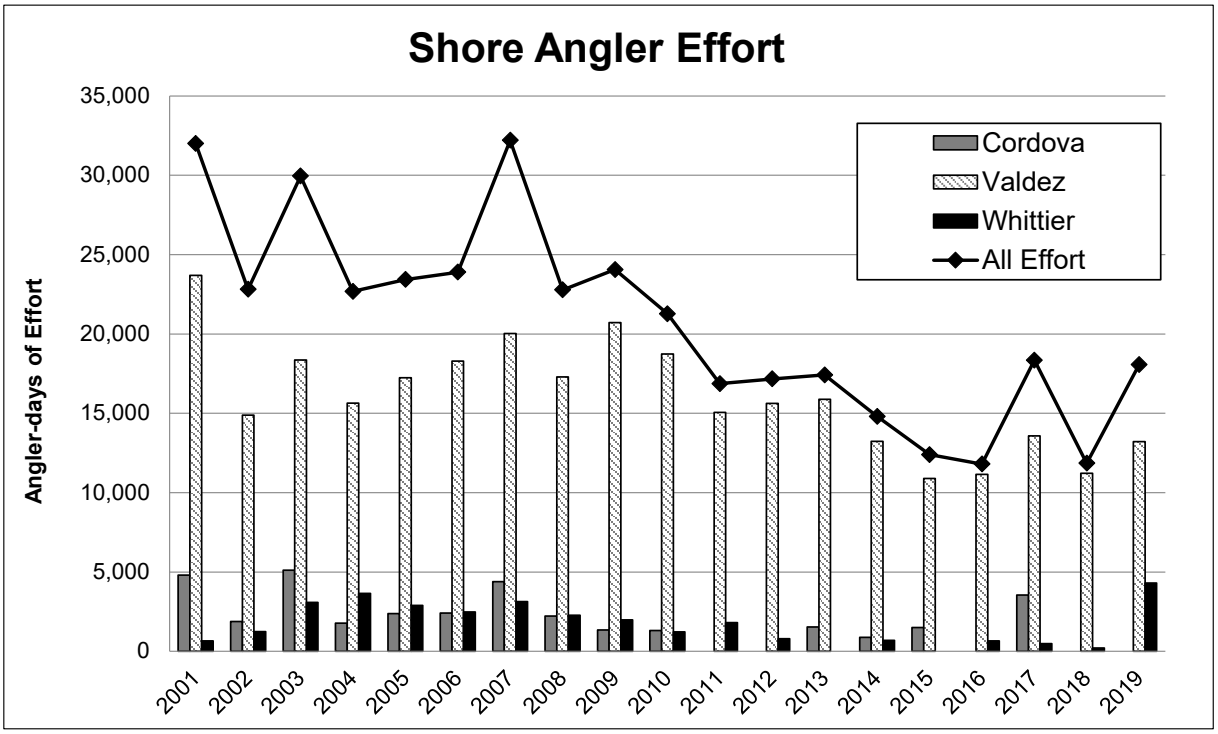

Figure 4.–Angler-days of effort by shore anglers in Prince William Sound Management Area , 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Table 3.–Angler-days of effort by shore anglers in Prince William Sound Management Area, 2001–2019.

	Port or geographic region					
Year	Cordova	Valdez	Whittier	West PWS	East PWS	Total
2001	4,802	23,690	657	1,047	1,804	32,000
2002	1,883	14,878	1,244	2,104	2,703	22,812
2003	5,118	18,356	3,077	2,565	834	29,950
2004	1,781	15,639	3,661	1,606	[a]	22,687
2005	2,378	17,240	2,887	927	[a]	23,432
2006	2,421	18,294	2,477	707	[a]	23,899
2007	4,397	20,024	3,135	3,127	1,526	32,209
2008	2,221	17,294	2,278	[a]	983	22,776
2009	1,345	20,727	1,990	[a]	[a]	24,062
2010	1,311	18,741	1,221	[a]	[a]	21,273
2011	[a]	15,060	1,806	[a]	[a]	16,866
2012	[a]	15,623	789	755	[a]	17,167
2013	1,528	15,888	[a]	[a]	[a]	17,416
2014	880	13,235	687	[a]	[a]	14,802
2015	1,507	10,887	[a]	[a]	[a]	12,394
2016	[a]	11,151	651	[a]	[a]	11,802
2017	3,553	13,584	492	699	20	18,348
2018	[a]	11,226	211	321	92	11,850
2019	[a]	13,210	4,298	569	0	18,077
Average						
2007–2016	1,884	15,863	1,570	1,941	1,255	20,558
2017–2019	–	12,673	1,667	530	37	17,033

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

[a] Data do not include sufficient respondents to make an estimate.

CHARTER LOG DATA

The greatest number of charter businesses providing anglers access to Prince William Sound Management Area (PWSMA) fishing opportunities comes from the Port of Seward, followed by the Ports of Valdez and Whittier, respectively (Table 4). Smaller ports such as Cordova, Chenega, and Port Ashton have very few businesses. All data collected in locations with fewer than 4 businesses are included into an "other" category to protect the confidentiality of respondents. As a percentage of total charter trip numbers in PWS, Seward, and Whittier have not fluctuated greatly since 2006 (making up an average of 53% and 16%, respectively), whereas the percentage of PWS trips for Valdez dropped from 36% in 2006 to 26% in 2019 and was as low as 19% in 2015 (calculated from Table 4). Overall, charter trip numbers in PWSMA have decreased since 2006 (Table 4). The majority of charter trips in the PWSMA target bottomfish (including halibut, lingcod, and rockfish) over salmon (Table 5). However, in Western PWS, trips targeting both salmon and bottomfish are common.

Table 4.–Participation of charter businesses in the Prince William Sound Management Area by location in terms of number of businesses (Bus.) and number of trips (Trips), 2006–2019.

			Western PWS						Eastern PWS						Total in PWS	
	Seward[a]		Whittier		Chenega		Port Ashton		Cordova		Valdez		Other[b]			
Year	Bus.	Trips	Bus.	Trips	Bus.	Trips	Bus.	Trips	Bus.	Trips	Bus.	Trips	Bus.	Trips	Bus.	Trips
2006	66	2,222	27	632	–	–	–	–	9	203	44	1,832	6	96	152	4,985
2007	68	2,588	31	749	4	59	–	–	7	171	46	1,693	4	71	160	5,331
2008	67	2,203	28	752	–	–	–	–	5	102	40	1,410	9	107	149	4,574
2009	54	1,981	26	614	–	–	6	18	5	54	40	1,270	8	74	139	4,011
2010	48	1,945	25	683	5	46	5	17	5	84	35	1,229	4	82	127	4,086
2011	48	2,139	20	518	4	9	4	25	4	83	31	1,026	8	101	119	3,901
2012	42	2,073	19	616	–	–	7	42	5	68	25	702	5	41	103	3,542
2013	38	2,280	13	622	–	–	4	51	–	–	28	1,032	11	114	94	4,099
2014	39	2,026	18	577	–	–	9	52	–	–	27	730	7	136	100	3,521
2015	39	2,260	18	616	–	–	6	45	–	–	22	734	8	208	93	3,863
2016	35	2,247	14	720	–	–	7	37	–	–	16	731	10	160	82	3,895
2017	34	2,147	11	641	–	–	8	38	–	–	19	783	10	170	82	3,779
2018	38	1,802	17	676	–	–	10	61	–	–	18	881	6	160	89	3,580
2019	33	1,889	11	767	–	–	8	68	–	–	20	1,024	5	200	77	3,948
Average																
2006–2016	49	2,179	22	645	1	10	4	26	4	70	32	1,126	7	108	120	4,164
2017–2019	35	1,946	13	695	ND	ND	9	56	ND	ND	19	896	7	177	83	3,769

Source: Saltwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006 to present. Accessed November 1, 2020. URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests.) Participation (number of businesses, vessels, trips, and angler-days) was determined by number of trips, not targeted species. Responses with less than 4 businesses are not reported separately, to protect confidentiality of respondents.

Note: an en dash means 3 or fewer responses. ND = data insufficient to calculate.

[a] Fished in PWS and returned to Seward.

[b] "Other" includes locations in PWSMA where there are fewer than 4 businesses. These are reported separately to protect the confidentiality of respondents.

Table 5.–Number of trips targeting particular fish (salmon, bottomfish, or both) by location for charter businesses in the Prince William Sound Management Area, 2006–2019.

	Seward trips [a]			Western PWS			Eastern PWS			Other [b]			Total		
Year	Salmon	Bottom-fish	Both	Salmon	Bottom-fish	Both	Salmon	Bottom-fish	Both	Salmon	Bottom-fish	Both	Salmon	Bottom-fish	Both
2006	127	1,133	962	70	498	64	809	1,121	105	12	45	39	1,018	2,797	1,170
2007	60	1,337	1,191	94	529	185	664	1,059	141	7	12	52	825	2,937	1,569
2008	58	1,228	917	55	611	86	547	875	90	11	9	87	671	2,723	1,180
2009	68	871	1,042	24	461	147	399	833	92	8	16	50	499	2,181	1,331
2010	32	922	991	41	491	214	419	824	70	2	18	62	494	2,255	1,337
2011	76	747	1,316	55	359	138	433	617	59	19	18	64	583	1,741	1,577
2012	12	1,171	890	38	533	87	203	524	43	0	10	31	253	2,238	1,051
2013	23	948	1,309	33	493	147	451	517	64	7	37	70	514	1,995	1,590
2014	18	872	1,136	6	544	79	219	493	18	2	104	30	245	2,013	1,263
2015	34	581	1,645	56	345	260	247	383	104	23	54	131	360	1,363	2,140
2016	25	1,417	805	11	687	59	128	598	11	4	111	45	168	2,813	920
2017	19	752	1,376	24	455	200	273	459	52	12	70	88	328	1,736	1,716
2018	39	1,005	758	28	590	119	283	578	20	18	92	50	368	2,265	947
2019	35	1,013	841	39	628	168	320	662	42	21	73	106	415	2,376	1,157
Average															
2006–2016	48	1,021	1,109	44	505	133	411	713	72	9	39	60	512	2,278	1,375
2017–2019	31	923	992	30	558	162	292	566	38	17	78	81	370	2,126	1,273

Source: Saltwater Logbook Database (Alaska Department of Fish and Game, Division of Sport Fish. 2006 to present. Accessed November 1, 2020. URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests.)

Note: Participation was determined by number of trips, not number of fish. "Bottomfish" include halibut, lingcod, and rockfish.

[a] Fished in PWS and returned to Seward.

[b] "Other" includes locations in PWSMA where there are fewer than 4 businesses. These are reported separately to protect the confidentiality of respondents.

COHO SALMON FISHERIES

AREAWIDE COHO SALMON FISHERY

Fishery Description

Prince William Sound has both wild and hatchery coho salmon runs. Wild stocks are scattered and run sizes are unknown or small. A large number of hatchery coho salmon return to Valdez, Cordova, and Whittier terminal harvest areas in most years. A majority of the PWSMA coho salmon catch and harvest occurs in these saltwater fisheries except on the CRD where wild coho salmon stocks are predominately targeted in fresh water. PWSAC stocks coho salmon at Fleming Spit in Cordova and near Whittier; the VFDA stocks coho salmon in the Valdez area. Hatcheries place smolt in pens and then release them once they have had sufficient time to imprint on that location. These stocked coho salmon create popular shore fisheries and help reduce angler effort on wild stocks. Adult coho salmon typically return to freshwater streams to spawn from August through October and are caught in salt water during this time.

Fishery Management and Objectives

Most of PWSMA is open to the taking of coho salmon year-round. In all salt and fresh waters of PWSMA, the bag limit for coho salmon is 3 per day and 3 in possession (established in 1999 for PWS and 1989 for CRD), except for terminal harvest areas (THA) encompassing the hatchery release sites in Valdez, Cordova, Chenega Bay, and Whittier (Appendix A2). Coho salmon bag limits in the THA are 6 per day and 12 in possession. Regulations restrict coho salmon harvest to 1 per day, 1 in possession in Shelter Bay on Hinchinbrook Island. Several streams or sections of streams in the Cordova area are closed to fishing for coho salmon including Eccles Creek and Eyak Lake and its tributaries (with the exception of Eyak River). Ibeck Creek is closed to all sport fishing upstream from ADF&G markers located approximately 3 miles upstream of the Copper River Highway bridge, and Hartney Creek is closed above Whiteshed Road. Clear Creek (upriver of the Carbon Mountain Bridge) was closed to salmon fishing but was reopened following an Alaska Board of Fisheries decision in 2018. In addition, all freshwater drainages to the Port of Valdez except for a portion of the Robe River and Solomon Gulch Creek are closed to fishing for salmon. In the Robe River near Valdez, the bag and possession limits are 1 coho salmon. Coho salmon removed from fresh waters crossed by the Copper River Highway must be retained and become part of the daily bag limit of the person who originally hooked the fish. A person may not remove a coho salmon from the water before releasing it. In addition, from August 15 to September 15, bait may not be used in Copper River Highway streams to catch and release coho salmon if an angler has caught their daily bag limit.

There are no stream-specific management objectives for any of the wild coho salmon that are found throughout PWS; therefore, individual stream escapement goals have not been established and there is no monitoring of inseason escapement. There is a CRD-wide coho salmon sustainable escapement goal (SEG; an indexed level of escapement known to provide sustained yield) of 32,000–67,000 coho salmon (Table 5 in Sheridan et al. 2013) that has been met or exceeded every year since 1989 (Appendix B15 in Donaldson et al. 1995; Appendix A12 in Ashe et al. 2005; Appendix A17 in Russell et al. 2017). The Division of Commercial Fisheries monitors inseason escapement of coho salmon via these aerial surveys in several streams on the CRD.

Historical Fishery Performance

Based on SWHS data, the PWSMA coho salmon fishery is among the largest sport fisheries for coho salmon in the state of Alaska. Anglers target coho salmon in both salt water and fresh water, and the fishery is supported by both wild and hatchery stocks. Hatchery coho salmon smolt are released in Whittier and Cordova as part of a sport fishery enhancement program run by PWSAC. Large-scale hatchery releases of coho salmon occur annually in Port Valdez (by VFDA) and Lake Bay (by PWSAC) that support both commercial and sport fisheries.

From 2001 to 2016, historical harvest of coho salmon in PWSMA was between 34,782 fish in 2016 and 136,434 fish in 2007 (Figure 5, Table 6). Prior to 2012, the smallest harvest was 88,095 fish. In 2012, 2 things occurred: the lowest harvest to date was observed (40,456 fish) and a strong oscillating trend with lower even years followed. Prior to 2012, except 2010, a lower even year always followed the odd year but beginning in 2012, when harvest was less than half of what was observed in 2011, the oscillation became stronger (Figure 5). Annual catches also followed a similar trend. The 10-year average catch and harvest for 2007–2016 was 123,692 and 88,783 fish, respectively, with the lowest harvest on record occurring in 2016 (34,782 fish).

The oscillating pattern observed for the PWSMA has not been observed for the CRD alone (Figure 6). Since 2012, except for a high harvest in 2015 (25,667 fish), annual harvest has ranged very little from 16,543 fish in 2018 to 18,462 fish in 2013 (Table 6). The 10-year average catch and harvest prior to 2017 for the CRD was 15,555 fish.

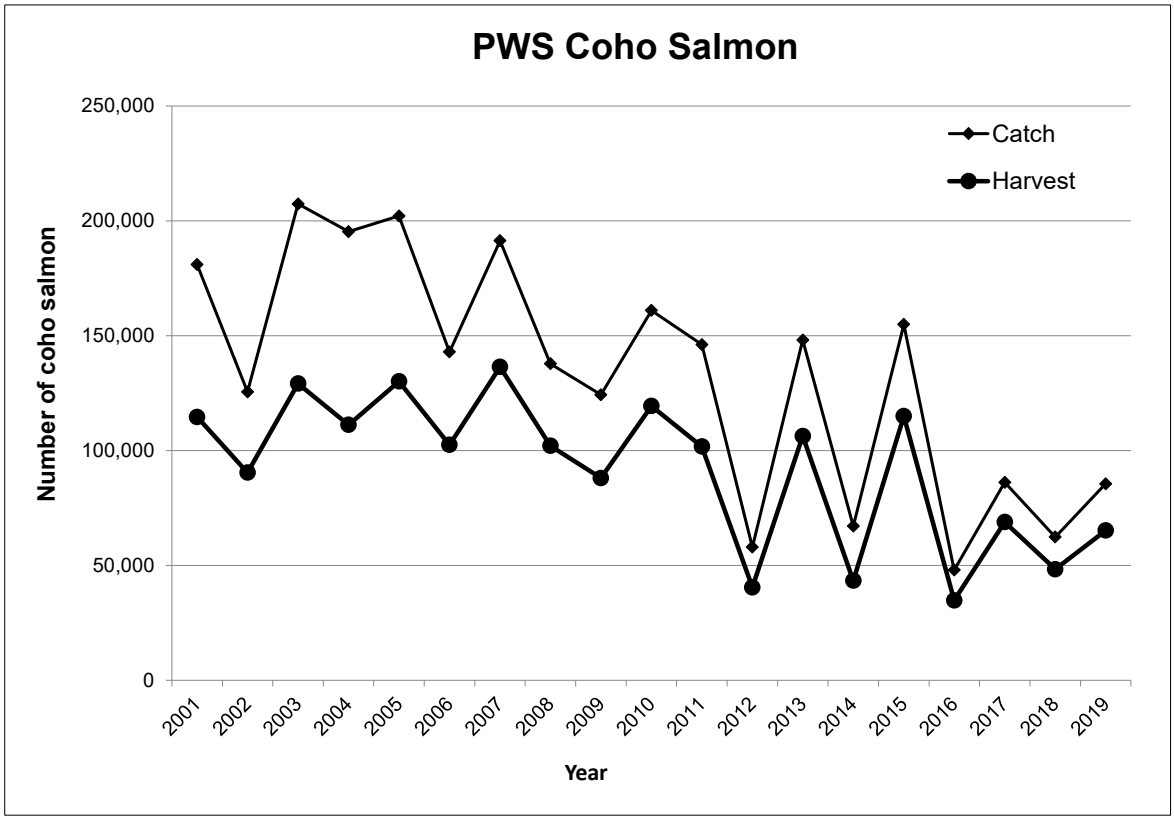

Figure 5.–Total catch and harvest of coho salmon by sport anglers by year, Prince William Sound Management Area, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Table 6.–Coho salmon catch and harvest by geographical regions, Prince William Sound Management Area, 2001–2019.

	Geographical region											
	Western PWS		Eastern PWS		Valdez		CRD		Other unknown[a]		Total[a]	
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
2001	24,738	16,767	51,223	34,377	60,836	43,786	35,504	14,517	8,679	5,198	180,980	114,645
2002	33,729	24,109	62,041	48,898	7,823	6,568	16,435	7,896	5,554	2,965	125,582	90,436
2003	35,000	22,759	24,722	16,241	90,792	70,041	47,157	16,828	9,739	3,309	207,410	129,178
2004	33,294	21,374	27,966	19,301	70,346	49,680	54,602	17,052	9,146	3,834	195,354	111,241
2005	55,286	38,485	24,256	18,111	86,018	57,944	30,112	12,043	6,509	3,569	202,181	130,152
2006	28,151	20,891	22,176	17,586	70,833	52,505	16,674	8,014	5,142	3,543	142,976	102,539
2007	50,663	35,292	41,011	30,021	77,467	59,605	19,394	9,530	2,856	1,986	191,391	136,434
2008	26,335	22,119	28,647	21,724	60,022	48,451	21,301	9,351	1,525	457	137,830	102,102
2009	23,264	18,981	20,926	16,379	48,278	35,461	28,143	14,532	3,716	2,742	124,327	88,095
2010	28,480	23,277	19,768	15,800	80,199	62,631	30,535	16,663	2,057	1,084	161,039	119,455
2011	43,056	30,180	13,821	8,699	56,773	46,451	30,068	15,087	2,443	1,357	146,161	101,774
2012	11,486	8,953	5,428	4,450	11,717	10,648	28,123	15,654	1,218	751	57,972	40,456
2013	33,048	23,906	17,946	12,938	62,960	49,375	31,409	18,462	2,789	1,685	148,152	106,366
2014	15,593	13,262	7,328	2,550	12,094	10,088	31,405	16,925	717	537	67,137	43,362
2015	39,112	33,730	23,048	17,346	41,610	36,609	49,296	25,667	1,866	1,649	154,932	115,001
2016	7,949	6,871	3,138	2,662	13,253	11,395	23,308	13,682	327	172	47,975	34,782
2017	25,450	21,825	9,947	8,472	31,085	27,114	17,813	10,447	1,868	1,058	86,163	68,916
2018	11,288	9,390	9,633	7,224	23,106	19,419	16,543	11,089	1,825	1,219	62,395	48,341
2019	22,588	17,809	12,094	10,027	26,261	22,249	22,571	13,641	2,056	1,520	85,570	65,246
Average												
2007–2016	27,899	21,657	18,106	13,257	46,437	37,071	29,298	15,555	1,951	1,242	123,692	88,783
2017–2019	19,775	16,341	10,558	8,574	26,817	22,927	18,976	11,726	1,916	1,266	78,043	60,834

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: CRD = Cordova road system–Copper River Delta.

[a] Includes unknown areas from all of Area J, including North Gulf Coast.

Fishery Performance and Escapement 2017–2019

From 2017 to 2019, there was a dramatic reduction in average coho salmon catch and harvest (78,043 and 60,834, respectively) compared to the prior 10-year average catch and harvest (123,692 and 88,783, respectively; Table 6, Figure 5). On average from 2017 to 2019, 35% of the catch and 38% of the PWSMA harvest of coho salmon came from Valdez, which were nearly the same averages for the prior 10 years (calculated from Table 6). After the lowest harvest on record in 2016 (34,782), harvest of coho salmon for the PWSMA in 2017–2019 was between 48,341 and 68,916 fish; catch also increased from 47,975 in 2016 to between 62,395 and 86,163 fish. However, the CRD did not see the same increase. From 2017–2019, CRD harvests were the lowest estimated since 2008.

COPPER RIVER DELTA (CRD) COHO SALMON FISHERY

Fishery Description

The coho salmon fishery on CRD is composed of numerous road-accessible streams west of the Copper River (west delta) and both fly-out and boat-accessible streams east of the Copper River (east delta). Most angler effort on the west delta is expended on Eyak River, Ibeck Creek, and Alaganik Slough. Smaller streams on the west delta, such as those at 18-mile and 20-mile along the Copper River Highway, receive angler effort during the coho salmon season but the low number of SWHS respondents fishing these systems precludes reliable estimates of catch and harvest of coho salmon in these areas. As such, stream-specific estimates of catch and harvest are only available for Eyak River, Ibeck Creek, and Alaganik Slough. Major streams on the east delta include the Martin and Katalla Rivers. Like the smaller systems on the west delta, catch and harvest estimates are not available for the Martin and Katalla Rivers due to the low number of SWHS respondents fishing these systems. Streams east of the delta became less accessible in 2011 when a bridge at "37-mile" of the Cooper River Highway washed out. These streams are now accessible only by airboat and plane and receive even less fishing pressure as a result.

Fishery Management and Objectives

The management objective for the CRD coho salmon fishery is to achieve the sustainable escapement goal (SEG) of 32,000–67,000 fish (Table 5 in Russell et al. 2017). Escapement for a given year is the sum of the peak aerial survey counts for index streams on the west and east sides of the CRD (Sheridan et al. 2013). There are no stream-specific escapement goals for coho salmon on the CRD.

Historical Fishery Performance

From 1996 to 2000, average catch and harvest of coho salmon on the CRD was 9,362 and 4,998 fish, respectively (Table 4 in Hochhalter et al. 2011). Average catch between 2001 and 2016 was much greater at 30,842 and 14,494 fish, respectively (calculated from Table 7). Starting in 2001 and except for 2002, catch and harvest rose to a peak catch and harvest in 2004 (54,602 and 17,052, respectively; Figure 6, Table 7). After a drop in 2005 and 2006, there was a gradual increase in catch and harvest until 2014 followed by a sudden peak in 2015 (49,296 and 25,667 fish, respectively; Figure 6, Table 7). In 2016, catch and harvest dropped to 23,308 and 13,682 fish, respectively.

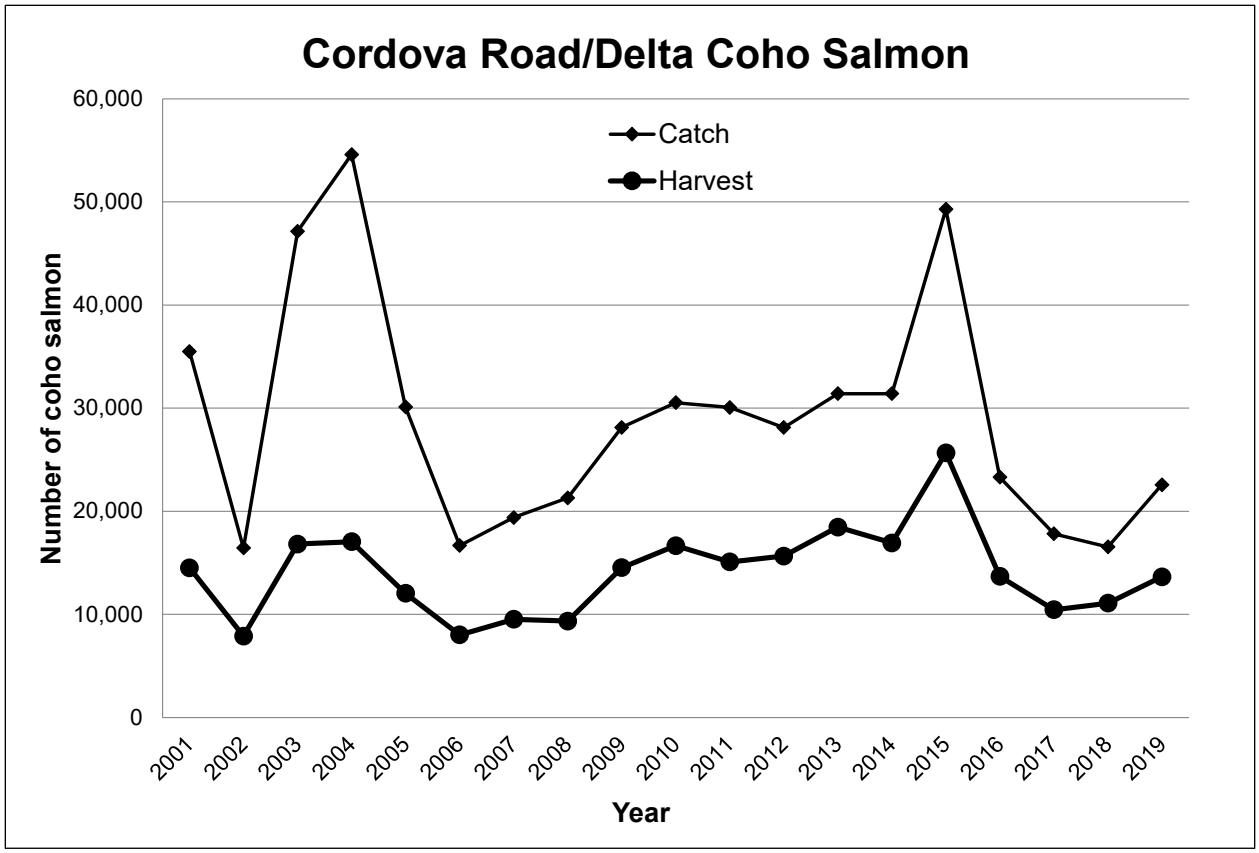

Figure 6.–Catch and harvest of coho salmon by sport anglers from streams on the Copper River Delta by year, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Catch and harvest of coho salmon in the sport fishery on the CRD is most likely dependent on an interaction between 3 variables: angler effort, stream conditions, and the size of the run. For example, low, clear stream conditions on the Eyak River and Alaganik Slough in 2004 (S. Hochhalter, Fishery Biologist, ADF&G, Anchorage, personal communication) coupled with the largest aerial survey counts of coho salmon on record for these streams (Appendix A19 in Botz et al. 2010; Appendix A20 in Sheridan et al. 2013) coincided with a record catch and harvest of coho salmon in the sport fishery (Figures 6 and 7). However, catch and harvest of coho salmon in the sport fishery can remain low despite large runs of fish when stream conditions are poor during a large portion of the season. Two independent 100-year floods during the coho salmon season of 2006 resulted in poor fishing conditions and the lowest catch and harvest of coho salmon since 2001 (Figures 6 and 7); however, the coho salmon run was the fourth largest since 1999 (Appendix A19 in Botz et al. 2010; Appendix A20 in Sheridan et al. 2013; Appendix A17 in Russell et al. 2017). Differences in stream conditions between the Eyak River, Ibeck Creek, and Alaganik Slough within a given year seem to influence the proportional contribution of these streams to the total catch and harvest of coho salmon. For example, Ibeck Creek remained low and clear during the 2003 coho salmon season (B. Marston, Sport Fish Biologist, ADF&G, Cordova, personal communication), and it contributed greatly to the total coho salmon catch and harvest in 2003 (Figure 7, Table 7). Conversely in 2004, Ibeck Creek was highly turbid for most of the coho salmon season (B. Marston, Sport Fish Biologist, ADF&G, Cordova, personal communication),

and there was very little contribution to the total coho salmon catch and harvest that year (Figure 7, Table 7).

Although catch and harvest may be impacted by the interactions described above, escapement is expected to be impacted by harvest levels. In 2015, the largest harvest was documented in the sport fishery and coincided with a slightly below average total escapement (42,165 fish), based on aerial survey indices (Appendix A17 in Russell et al. 2017), although this was well above the lower bound of the CRD SEG (32,000 fish). Conversely in 2016, coho salmon escapement in the CRD (76,400 fish) exceeded the upper bound of the escapement goal (67,000 fish; Appendix A17 in Russell et al. 2017) but only an average-sized harvest occurred in the sport fishery (13,682 fish; Table 7).

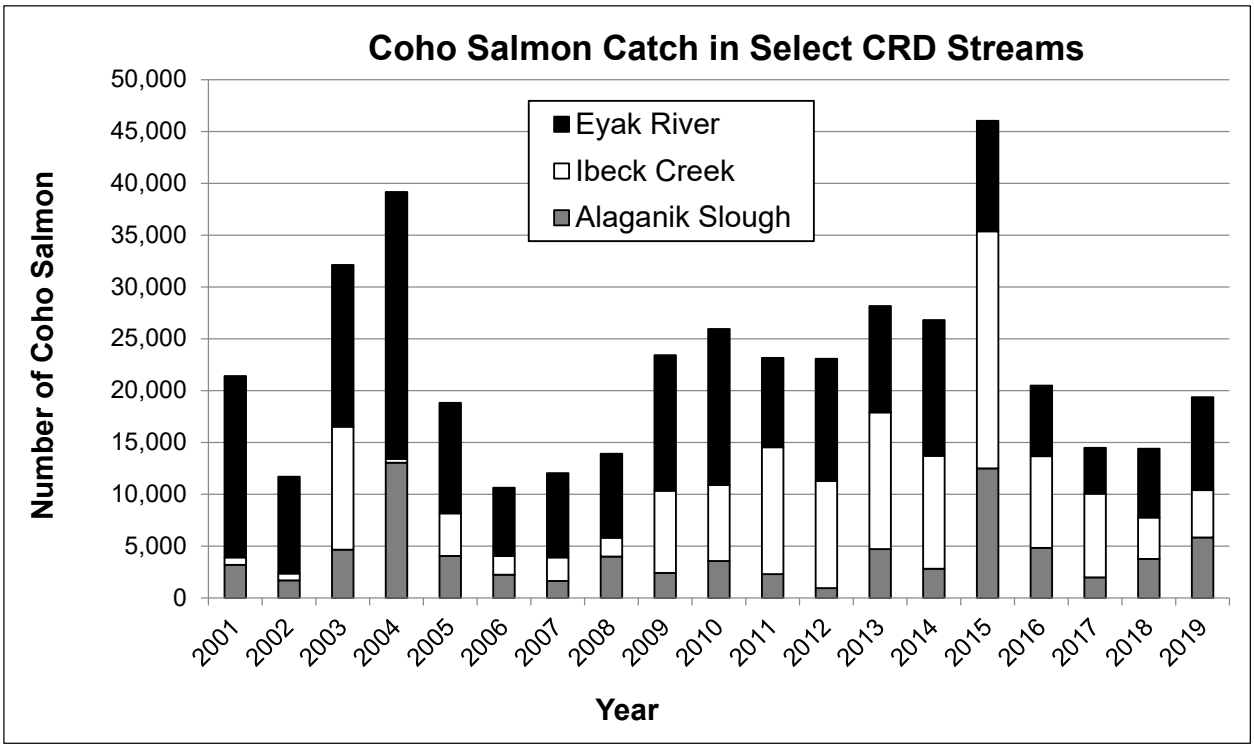

Figure 7.–Catch of coho salmon by sport anglers from select streams on the Copper River Delta, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Fishery Performance and Escapement 2017–2019

On average during 2017–2019, the CRD coho salmon fishery made up 30% of the total catch and 20% of the total harvest of coho salmon in PWSMA, which was similar to the average during 2007–2016 (28% and 22%, respectively). The recent average (2017–2019) annual catch of CRD coho salmon was 18,976 fish, which was below the previous 10-year average (2007–2016) of 29,928 fish. The recent average (2017–2019) annual harvest of CRD coho salmon was 11,726 fish and less than the previous 10-year average (2007–2016) of 15,555 fish (Table 6).

Table 7.–Catch and harvest of coho salmon at selected sites of the Cordova road system and Copper River Delta, Prince William Sound Management Area, 2001–2019.

	Cordova area sites									
	Eyak River		Alaganik Slough		Ibeck Creek		Other Cordova sites		Total	
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
2001	17,477	10,025	3,188	1,565	726	462	14,113	2,465	35,504	14,517
2002	9,345	5,547	1,681	663	662	297	4,747	1,389	16,435	7,896
2003	15,604	8,473	4,655	1,708	11,857	3,318	15,041	3,329	47,157	16,828
2004	25,746	10,235	13,032	3,843	377	135	15,447	2,839	54,602	17,052
2005	10,639	5,228	4,049	1,777	4,120	2,437	11,304	2,601	30,112	12,043
2006	6,579	3,328	2,237	1,236	1,803	913	6,055	2,537	16,674	8,014
2007	8,141	4,677	1,641	1,052	2,260	927	7,352	2,874	19,394	9,530
2008	8,103	4,714	3,994	1,738	1,811	620	7,393	2,279	21,301	9,351
2009	13,065	8,464	2,425	1,379	7,925	3,780	4,728	909	28,143	14,532
2010	15,052	8,379	3,554	2,208	7,321	4,818	4,608	1,258	30,535	16,663
2011	8,633	5,206	2,303	1,332	12,223	7,351	6,909	1,198	30,068	15,087
2012	11,775	7,010	949	623	10,345	7,430	5,054	591	28,123	15,654
2013	10,260	7,229	4,698	2,752	13,204	6,986	3,247	1,495	31,409	18,462
2014	13,093	7,857	2,815	1,728	10,890	6,274	4,607	1,066	31,405	16,925
2015	10,655	8,338	12,483	5,862	22,875	10,315	3,283	1,152	49,296	25,667
2016	6,794	5,217	4,817	2,413	8,868	5,464	2,829	588	23,308	13,682
2017	4,429	3,088	1,980	887	8,081	5,584	3,323	888	17,813	10,447
2018	6,634	4,958	3,773	2,291	3,980	2,747	2,156	1,093	16,543	11,089
2019	8,950	5,900	5,831	3,102	4,578	3,899	3,212	740	22,571	13,641
Average										
2007–2016	10,557	6,709	3,968	2,109	9,772	5,397	5,001	1,341	29,298	15,555
2017–2019	6,671	4,649	3,861	2,093	5,546	4,077	2,897	907	18,976	11,726

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

The total CRD coho salmon escapements of 43,960, 54,200, and 37,020 indexed during 2017–2019, respectively, were above the lower bound of the SEG (32,000 fish; Appendix A17 in Morella et al. 2021). Escapement indices are based on aerial surveys that were affected by observer efficiency and variability in environmental conditions, so these results likely represent a minimum escapement to CRD streams (J. Botz, Fishery Biologist, ADF&G, Cordova, personal communication).

After a substantial drop in catch and harvest in 2016 (23,308 and 13,682 fish, respectively) from the second highest catch and harvest estimated between 2001 and 2016 (49,296 and 25,667 fish in 2015, respectively), even lower catches and harvests followed during 2017–2019 (average 18,976 and 11,726, respectively; Table 6) In 2019, despite drought conditions present for much of the coho salmon fishing season and approximately 1,000 coho salmon becoming stranded and dying on a seasonal side channel of Ibeck Creek (Jeremy Botz, Fishery Biologist, Division of Commercial Fisheries, ADF&G, Cordova , personal communication), there was an observed increase in coho salmon harvest (22,571 fish) over the previous 2 years (17,813 and 16,543; Table 6).

SOCKEYE SALMON FISHERIES

FISHERY DESCRIPTION

The major sockeye salmon fisheries in PWS include freshwater fisheries for wild stocks in the Coghill River and Eshamy Creek, and a saltwater fishery for hatchery stock at Main Bay. The sockeye salmon fishery on the CRD is focused on wild stocks in the Eyak River and Alaganik Slough. Numerous small streams throughout PWS support relatively small runs of sockeye salmon and anglers target these runs as fish stage in the estuaries. The SWHS relies on a sufficient number of responses for any given site to generate reliable estimates of catch and harvest. As such, estimates are reported by geographical region, and stream-specific catch and harvest estimates are only available for a few of the more popular streams.

FISHERY MANAGEMENT AND OBJECTIVES

Current bag and possession limits for sockeye salmon were established in 1973 and are 6 per day, 12 in possession (Appendix B1). In all freshwater drainages crossed by the Copper River Highway, the bag and possession limits for salmon other than Chinook salmon are 3 fish (established in 1989). In the Eshamy Creek drainage, the limits are 3 sockeye salmon per day, 6 in possession (established in 1989). In the Robe River near Valdez, the bag and possession limit is 1 sockeye salmon (established in 1989).

The ADF&G Division of Commercial Fisheries monitors inseason escapement of sockeye salmon into Eshamy Creek and Coghill River via weirs and into index streams on the CRD via aerial surveys. The management objectives for the Eshamy Creek, Coghill River, and CRD stocks are to meet the escapement goal. For all other sockeye salmon stocks in PWSMA, there are no stock-specific management goals and no inseason monitoring of escapement.

The biological escapement goal (BEG, based on best biological information and set for maximum sustained yield) for Eshamy Creek is 13,000–28,000 sockeye salmon, the SEG for Coghill River is 20,000–60,000 sockeye salmon, and the SEG for the CRD is 55,000–130,000 sockeye salmon (Table 5 in Russell et al. 2017). The BEG for sockeye salmon in the Eshamy Creek system has been within or above the existing goal in 19 of 20 years the weir was in operation between 1991

and 2011 (Appendix C3 in Sheridan et al. 2013). Since 2013, the Eshamy Creek goal has not been used because no human-monitored weir has been operated. Commercial fisheries staff have been trying to perfect the use of a remote video monitoring system over the last 3 years with limited success, and counts are incomplete and not comparable to historical weir data (Botz et al. 2021: page 14). Sockeye salmon escapements into the Coghill system have been above the lower bound of the existing SEG every year since 1995, except 2013, 2015, and 2016 (17,231, 13,584, and 8,708 fish, respectively; Appendix B3 in Morella et al. 2021). The 2016 escapement was the second lowest documented since 1990 (Appendix B3 in Morella et al. 2021). Sockeye salmon escapement into index streams on the CRD has been within the SEG every year since 1999 with the exception of 2016 when 51,550 fish were counted, just 3,450 fish below the lower bound of the escapement goal (Appendix A13 in Botz et al. 2010; Appendix A11 in Morella et al. 2021).

HISTORICAL FISHERY PERFORMANCE

From 2001 to 2016, harvest of sockeye salmon in PWSMA was between 4,678 and 13,220 fish (Table 8, Figure 8). Peak catch and harvest (19,052 and 13,220 fish, respectively) occurred in 2007. The 10-year average catch and harvest prior to 2017 (2007–2016) was 11,007 and 8,048 fish, respectively.

FISHERY PERFORMANCE AND ESCAPEMENT 2017–2019

Total catches of sockeye salmon in PWSMA in 2017 and 2018 (7,635 and 7,797 fish, respectively) were well below the previous 10-year (2007–2016) average (11,007 fish), whereas in 2019, catch was above the 10-year average (12,904 fish; Table 8). A similar trend was also observed for harvest, and in 2019, the second highest harvest since 2007 was estimated (Figure 8; Table 8). A large percentage of the total PWSMA harvest was caught in Western PWS (Table 8) and can probably be attributed to the Main Bay fishery that occurs concurrently with the commercial fishery.

The CRD escapement goal (55,000–130,000 fish) was met from 2017 to 2019 (Appendix A11 in Morella et al. 2021). The Coghill River sockeye salmon escapement goal (20,000–60,000 fish) was also met from 2017 to 2019 (Appendix B3 in Morella et al. 2021). In 2018, the sport bag limit for sockeye salmon in the Coghill River drainage was liberalized.

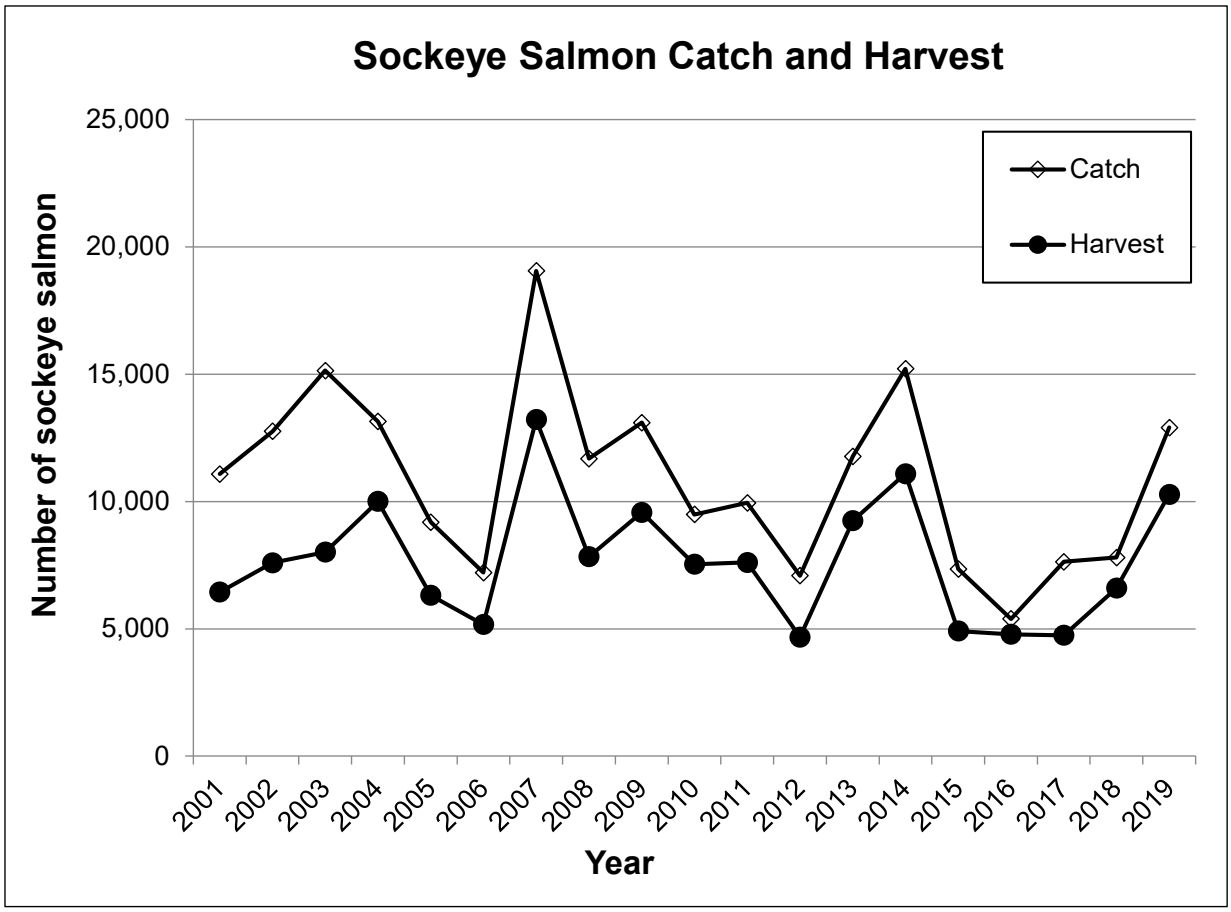

Figure 8.–Total catch and harvest of sockeye salmon by sport anglers by year, Prince William Sound Management Area, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Table 8.–Sockeye salmon catch and harvest by geographical location, Prince William Sound Management Area, 2001–2019.

	Geographical region											
	Western		Eastern		Valdez		CRD		Other unknown[a]		Total[a]	
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
2001	6,305	3,992	1,428	1,055	1,677	923	919	340	747	133	11,076	6,443
2002	7,872	5,448	1,150	837	1,398	358	1,393	731	945	220	12,758	7,594
2003	11,155	6,469	862	541	1,074	289	1,565	441	482	270	15,138	8,010
2004	9,003	7,151	780	409	1,690	1,493	1,633	919	34	34	13,140	10,006
2005	4,941	4,029	404	292	2,641	1,155	974	668	229	168	9,189	6,312
2006	4,507	3,923	387	246	1,741	651	385	158	191	191	7,211	5,169
2007	11,398	9,500	800	660	2,695	764	3,073	1,748	1,086	548	19,052	13,220
2008	5,987	4,852	1,556	995	1,795	554	2,162	1,251	183	183	11,683	7,835
2009	8,900	7,473	1,005	465	1,063	470	1,961	993	170	170	13,099	9,571
2010	4,464	3,973	781	745	1,310	900	2,354	1,342	579	579	9,488	7,539
2011	5,692	4,645	1,281	940	1,690	1,105	1,206	838	77	77	9,946	7,605
2012	4,480	3,171	394	345	173	162	1,802	764	236	236	7,085	4,678
2013	9,091	7,599	336	274	1,178	240	424	386	744	744	11,773	9,243
2014	11,390	9,791	202	184	2,973	726	428	174	218	218	15,211	11,093
2015	5,639	4,046	278	278	136	94	929	130	368	368	7,350	4,916
2016	4,149	4,015	106	61	706	462	306	246	120	0	5,387	4,784
2017	6,856	4,291	77	77	356	158	325	200	21	21	7,635	4,747
2018	5,889	5,426	76	19	1,162	645	87	22	583	486	7,797	6,598
2019	8,488	7,628	182	74	996	270	2,777	2,033	461	276	12,904	10,281
Average												
2007–2016	7,119	5,907	674	495	1,372	548	1,465	787	378	312	11,007	8,048
2017–2019	7,078	5,782	112	57	838	358	1,063	752	355	261	9,445	7,209

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: CRD = Cordova road system–Copper River Delta.

[a] Includes unknown areas from all of Area J, including North Gulf Coast.

CHINOOK SALMON FISHERIES

AREAWIDE CHINOOK SALMON FISHERY

Fishery Description

The saltwater fishery for Chinook salmon in PWSMA is small and occurs year-round. Much of the effort occurs during winter months. Chinook salmon harvested in the winter fisheries of Southcentral Alaska are most likely stocks from outside of the management area (i.e., from other Alaska management areas, British Columbia, Washington, and Oregon; Barclay et al. 2016).

Chinook salmon have been found periodically in several streams throughout PWS (Botz et al. 2010); however, with the exception of the Copper River stock, there are no known wild populations of Chinook salmon within PWSMA. Highly turbid water combined with seasonal restrictions on the use of bait (artificial lures only allowed from 15 April–14 June) prevent appreciable angler effort directed at the Copper River Chinook salmon stock downstream of Haley Creek (i.e., within PWSMA).

Fishery Management and Objectives

There are no management objectives for the Chinook salmon sport fishery in PWS. The saltwater and freshwater bag limits for Chinook salmon greater than 20 inches in length are 2 per day, 4 in possession (established in 1989; Appendix A1).

Historical Harvest

Historical harvest of Chinook salmon from 2001 through 2016 peaked in 2006 at 4,910 fish and has been as low as 1,770 fish in 2002 (Table 9, Figure 9). Annual harvests of Chinook salmon in Eastern PWS and the Valdez area have shown much more variability than in Western PWS (Table 9). The large drop in catch and harvest in the Valdez area in the years following 2011 may largely be due to the ending of the Chinook salmon stocking program in that area in 2013.

Fishery Performance and Escapement 2017–2019

Chinook salmon harvests in PWSMA during 2017 and 2018 (1,985 and 2,954 fish, respectively) were below the prior 10-year (2006–2017) average of 3,136, but harvest in 2019 (4,582 fish) was not only above average but the largest harvest since 2009 (Table 9). This increase was due to the large harvest in Western PWS.

Chinook salmon harvests in Western PWS had been declining during 2013 to 2016, but saw an increasing trend from 2017 to 2019 with 2019 having the largest harvest on record (2,969 fish). The largest estimated harvest since 2001 in Eastern PWS occurred in 2016 (2,426 fish) and was followed by a near record low in 2017 (201 fish). Larger but below average (2007–2016) harvests occurred in 2018 and 2019.

Table 9.–Chinook salmon catch and harvest by geographical region, Prince William Sound Management Area, 2001–2019.

	Geographical region											
	Western		Eastern		Valdez		CRD		Other-unknown[a]		Total[a]	
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
2001	1,283	986	2,551	907	555	378	153	129	542	235	5,084	2,635
2002	1,397	852	1,142	464	291	125	607	204	370	125	3,807	1,770
2003	963	713	3,403	769	2,903	1,648	806	530	147	98	8,222	3,758
2004	2,891	1,166	391	174	1,879	922	499	152	548	404	6,208	2,818
2005	1,522	1,025	1,941	893	2,709	1,087	530	345	323	180	7,025	3,530
2006	1,989	1,576	350	209	4,666	2,846	16	16	532	263	7,553	4,910
2007	1,773	1,311	2,697	828	2,324	974	80	80	105	89	6,979	3,282
2008	2,732	2,027	966	748	1,883	1,069	606	42	152	91	6,339	3,977
2009	1,972	1,334	2,430	1,576	4,268	1,264	265	205	74	59	9,009	4,438
2010	1,896	1,429	1,241	435	1,980	1,455	158	158	13	13	5,288	3,490
2011	1,224	959	829	466	2,818	514	83	51	17	0	4,971	1,990
2012	1,395	1,148	639	516	489	265	0	0	145	145	2,668	2,074
2013	3,672	2,328	1,127	627	851	633	42	21	0	0	5,692	3,609
2014	2,412	1,809	767	676	327	235	31	31	408	52	3,945	2,803
2015	1,795	1,288	517	427	694	365	359	147	0	0	3,365	2,227
2016	1,126	835	3,122	2,426	73	73	286	123	14	14	4,621	3,471
2017	2,374	1,211	427	201	870	433	83	83	78	57	3,832	1,985
2018	2,920	1,588	1,231	673	166	62	769	631	20	0	5,106	2,954
2019	5,313	2,969	1,308	677	1,247	601	318	281	163	54	8,349	4,582
Average												
2007–2016	2,000	1,447	1,434	873	1,571	685	191	86	93	46	5,288	3,136
2017–2019	3,536	1,923	989	517	761	365	390	332	87	37	5,762	3,174

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: CRD = Cordova road system–Copper River Delta.

[a] Includes unknown from all of Area J, including North Golf Coast.

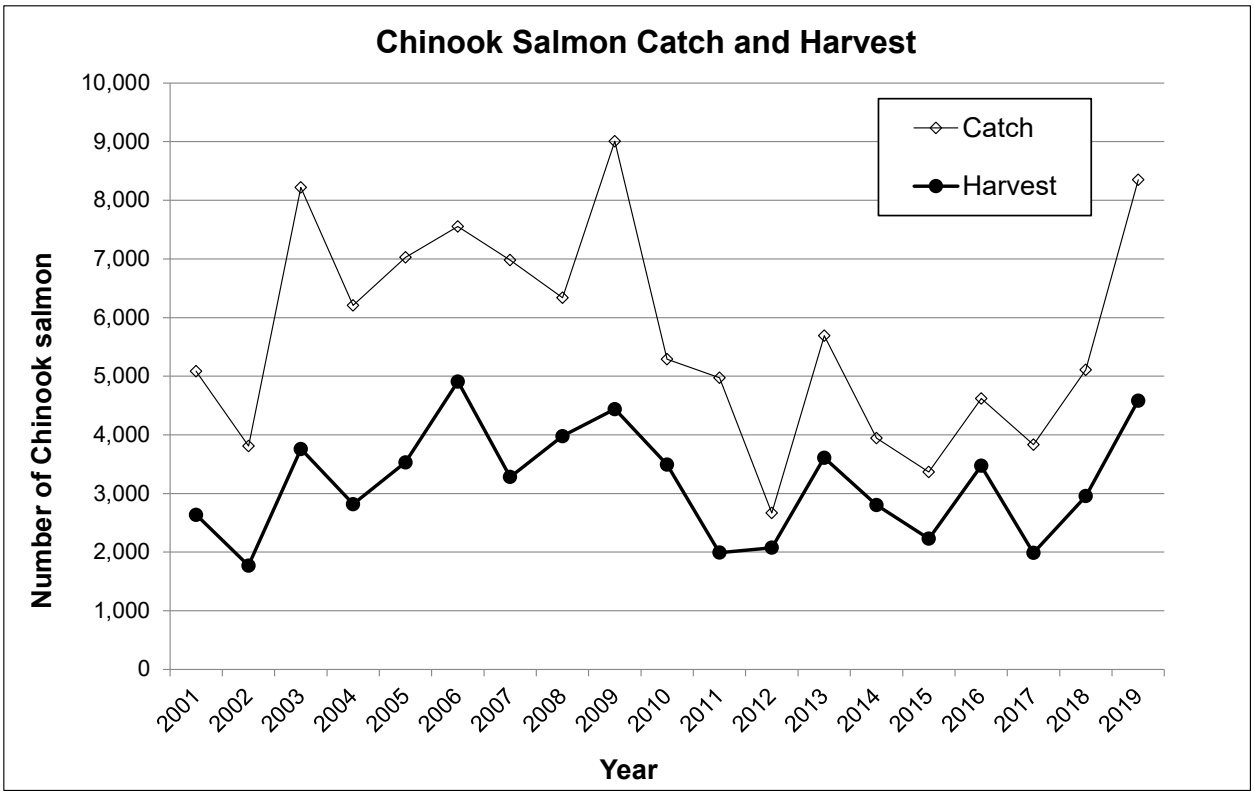

Figure 9.–Total catch and harvest of Chinook salmon by sport anglers by year, Prince William Sound Management Area, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

STOCKED CHINOOK SALMON FISHERIES

Fishery Description

Historically, there have been 3 ADF&G stocking locations for hatchery Chinook salmon in PWS. Stocking of hatchery Chinook salmon at Fleming Spit in Cordova began in 1990 and has occurred every year since. The fishery at this stocking location contributes the majority of catch and harvest in Eastern PWS. Chinook salmon have been stocked periodically in the Valdez area since 1985, with the most recent efforts conducted by ADF&G near the Old Town site. In 2013, efforts were suspended in the Valdez area due to extremely low returns. ADF&G has attempted to identify a new site that may improve returns but the site has yet to be determined. Hatchery Chinook salmon have been released at various locations around Whittier since 2000 and the fishery on this stocking contributes to the catch and harvest within Western PWS. In addition to the ADF&G stockings, the village of Chenega Bay (also part of Western PWS) has been attempting to develop a Chinook salmon fishery by releasing smolt (Appendix A2). The return from this stocking venture is not rigorously counted and so it is very difficult to determine the success of this stocking. All of these stockings provide for Chinook salmon fisheries in areas where there are limited wild Chinook salmon populations.

Fishery Management and Objectives

Originally, the ADF&G stocking objectives for each of the 3 stocked Chinook salmon fisheries in PWSMA were to produce a return of 2,000 Chinook salmon to each location and to provide 3,500 angler-days of effort at each location. Since 2010, the stocking objectives were changed to produce a return of 200 Chinook salmon to each location and provide 500 angler-days of effort. The number of Chinook salmon smolt stocked at each location each year has varied annually depending on production.[3] Since 2013, ADF&G has stocked Chinook salmon only at Fleming Spit near Cordova and Passage Canal near Whittier.

Historical Fishery Performance

The success of the PWS Chinook salmon enhancement program is measured in terms of sport fishing catch and harvest estimated by the SWHS at the 3 stocking locations: the shoreline along Orca Inlet and at Fleming Spit (Cordova Shore), in Passage Canal near Whittier (Whittier Shore), and the Valdez area. However, few statewide harvest surveys are returned to ADF&G mentioning the use of these stocking areas, therefore, no estimate of harvest is possible during some years (Figures 10 and 11). Catch and harvest has varied since the first returns were expected in 1996 from stockings near Cordova (Figure 10), in 1997 from stockings near Valdez, and in 2000 from stockings near Whittier (Figure 11). Catch and harvest of Chinook salmon by shore anglers near Cordova peaked in 1997 at 946 and 534 fish, respectively (Figure 10), followed by a decrease through 2002. In 2003, a spike in both shore catch and harvest in Cordova was estimated but since then catch and harvest estimates have been near zero or too low to estimate except in 2005 and 2010 (Figure 10). In 2013, Cordova shore catch and harvest started to show up in the SWHS again, which timed with better quality fish stocked from the William Jack Hernandez Sport Fish Hatchery (WJHSFH). Whittier shore catch and harvest has been low and variable through time (Figure 11).

A creel sampling program during the 2006 and 2007 Chinook salmon season (1 May–15 July) was aimed at identifying the proportion of hatchery Chinook salmon in the sport harvest at the Ports of Valdez and Cordova (prior to the cessation of hatchery releases in Valdez in 2013). Hatchery fish were identified by thermally marked otoliths. After 2 years of sampling, a total of 50 Chinook salmon were sampled at Valdez boat harbor and 19 at Fleming Spit in Cordova. All 50 fish sampled at Valdez were of unknown origin (i.e., none had thermal marks), whereas all 19 fish sampled at Fleming Spit in Cordova had thermal marks identifying them as ADF&G hatchery fish.

Between 2005 and 2010, ADF&G was unable to heat water at the Elmendorf and Ft. Richardson hatcheries, resulting in few Chinook salmon smolt that reached the target stocking size. In 2011, ADF&G completed construction of WJHSFH in Anchorage. This new hatchery uses well water, 95% recirculation, and heated water. This gives ADF&G the ability to rear Chinook salmon to smolt size in less than 1 year and rear to a target release size. Larger, healthier Chinook salmon smolt have been released into PWSMA since 2012. It is likely the slight increase in catch and harvest reported for Cordova shore anglers since 2013 can be attributed to higher quality smolt released at Fleming Spit and thus better returns of adults.

[3] Alaska Department of Fish and Game, Division of Sport Fish, Region II Statewide Stocking Plan for Sport Fish, 2019 – 2023, 2019 UPDATE [cited October 2021]. Available from http://www.adfg.alaska.gov/static/fishing/pdfs/hatcheries/19region2.pdf.

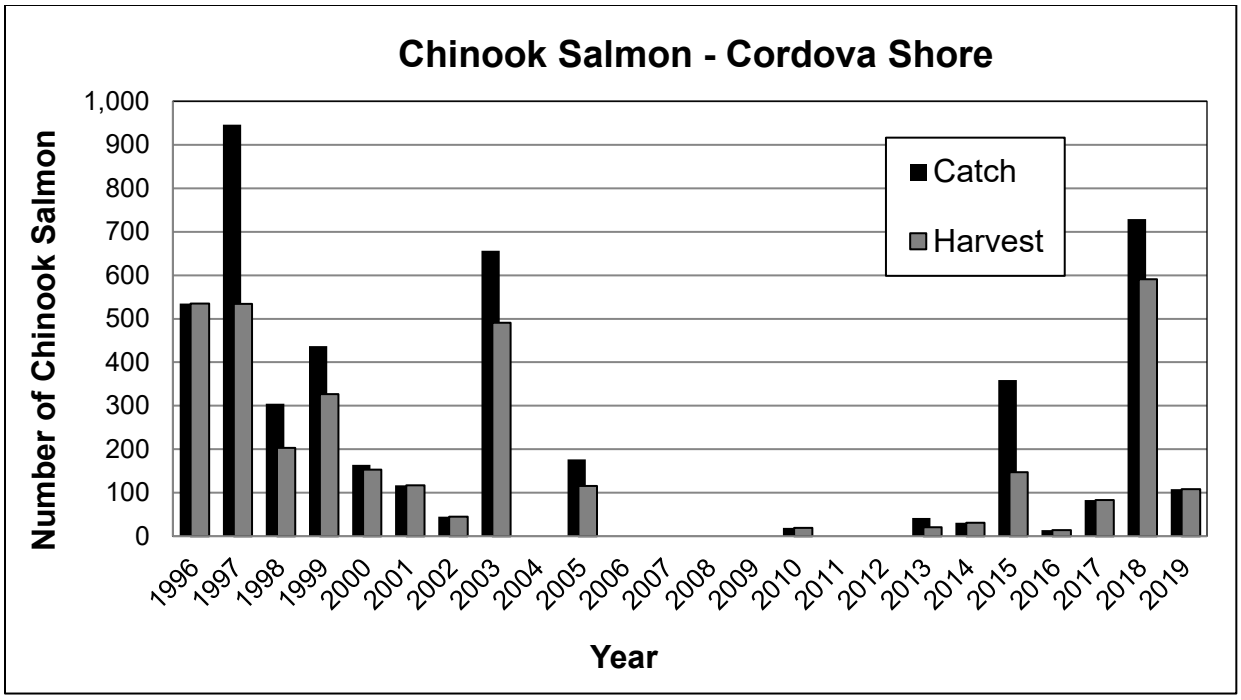

Figure 10.–Catch and harvest of Chinook salmon by shore anglers along Orca Inlet and at Fleming Spit near Cordova, 1996–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

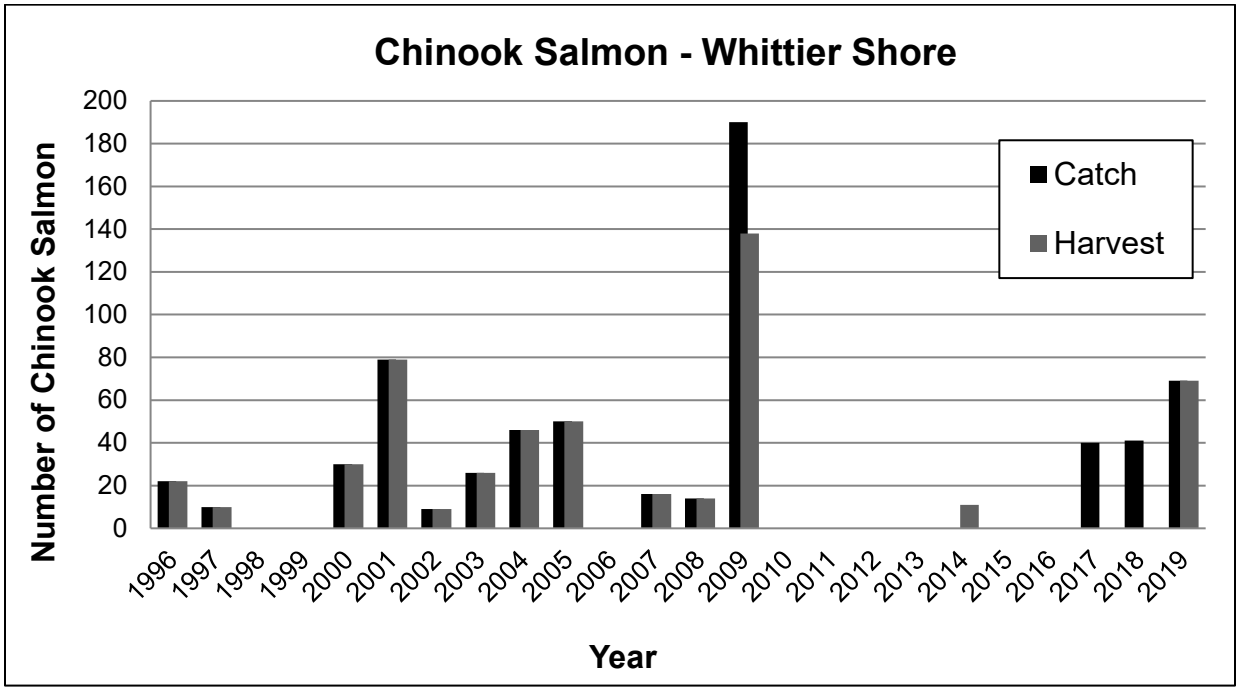

Figure 11.–Catch and harvest of Chinook salmon by shore anglers in Passage Canal near Whittier, 1996–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Fishery Performance and Escapement 2017–2019

The SWHS and angler reports both indicate that catch and harvest of Chinook salmon at Whittier and Fleming Spit near Cordova were on the rise between 2017 and 2019. Record harvest (591 fish) and near record catch (729 fish) for shore anglers near Cordova was estimated from the SWHS in 2018.

CUTTHROAT TROUT FISHERIES

FISHERY DESCRIPTION

Prince William Sound represents the northern extent of the distribution of coastal cutthroat trout (CCT). This provides not only unique fishing opportunities for anglers but also unique management challenges for fisheries biologists. From the management perspective, CCT in PWS are a sensitive species because fish populations at the edge of their distribution may be more susceptible to environmental changes and may suffer greater decline than core populations (Haak et al. 2010). Additionally, CCT populations in PWS have limited genetic heterozygosity (Currens et al. 2003) and low abundance and density levels (Hepler et al. 1996), which raises concerns for the sustainability of even low levels of harvest.

Cutthroat trout are present in numerous streams and lakes throughout PWS. Although the extent of their distribution remains unknown, there have been no directed efforts to determine the presence or absence of cutthroat trout within most of the freshwater systems in PWS. It is not feasible to generate estimates of catch and harvest of CCT from specific systems within PWSMA given the limitations of SWHS with small numbers of respondents (Clark 2009). However, occasional reporting of catch and harvest of CCT from Eyak River, Eshamy Creek and Lake, Alaganik Slough, and Green Island Creek suggests anglers either target CCT or incidentally catch CCT while targeting other species in these systems.

In 2014, the BOF adopted a proposal submitted to remove the *Copper River Delta Special Management Area for Trout* (CRDSMAT: all freshwaters south of Miles Lake and east of the Copper River excluding Clear Creek) that was previously established in 1999. The special management area regulations included year-round use of only unbaited, single-hook, artificial lures, and no retention of cutthroat trout, rainbow trout, or steelhead. Effective in 2015, the CRDSMAT no longer exists and cutthroat bag and retention limits for this area now fall under general PWS regulations for cutthroat trout (Appendix B1).

FISHERY MANAGEMENT AND OBJECTIVES

Within PWSMA, CCT are managed under presumed conservative bag limits. Current limits are 2 per day, 2 in possession, with a minimum size limit of 11 inches and a maximum size limit of 16 inches. Historically, there was no retention of trout allowed in the CRDSMAT but in 2014, the BOF passed a regulation removing the CRDSMAT and aligned the bag and possession limits for cutthroat trout already established in the PWSMA (effective in 2015).

HISTORICAL FISHERY PERFORMANCE

Between 2007 and 2016, catch of CCT in PWS is estimated to have ranged from 934 fish in 2013 to a peak of 4,228 fish in 2011 and averaged 1,885 fish (Table 10). Estimated harvest ranged from 56 fish in 2016 to 687 fish in 2011 and averaged of 381 fish (Table 10). On average (2007–2016), the CRD supported approximately 42% of the cutthroat trout catch and 48% of the harvest in

PWSMA (Table 10). The average harvest rate for 2007–2016 (calculated as average harvest per average catch) was 20% and reflects the catch-and-release nature of the cutthroat trout fisheries in PWSMA.

The abundance of CCT is unknown in any system within PWSMA. The only information gathered to date that pertains to CCT abundance in PWS was collected starting in 1989 by the Natural Resource Damage Assessment Program following the Exxon Valdez oil spill in 1989 (D. Bosch, ADF&G Fishery Biologist, personal communication). ADF&G conducted a study to determine the impacts of exposure to hydrocarbons from the Exxon Valdez oil spill on CCT growth and survival within "oiled" and "unoiled" streams. Weirs were installed in 5 streams and outmigrating CCT were enumerated. In general, the project found that the anadromous components of each of these CCT populations was composed of a few hundred individuals (Hepler et al. 1996).

FISHERY PERFORMANCE AND ABUNDANCE 2017–2019

Average annual total catch and harvest of CCT within the PWSMA from 2017 to 2019 was 548 fish and 40 fish, respectively, which was below the prior 10-year average (2007–2016) of 1,885 and 381 fish, respectively (Table 10). On average (2017–2019), the CRD supported approximately 18% of the cutthroat trout catch and 60% of the harvest in PWSMA (Table 10). The average harvest rate for 2017–2019 (calculated as average harvest per average catch) was 7% and reflects the catch-and-release nature of the cutthroat trout fishery and the likely reason why the harvest has continued to decline. Total harvest in 2019 was the lowest ever estimated (23 fish; Table 10, Figure 13).

Table 10.–Catch and harvest of coastal cutthroat trout by geographical region, Prince William Sound Management Area, 2001–2019.

	Geographical region											
	Western		Eastern		CRD		Other-unknown[a]		Total[a]		CRD % of total	
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
2001	122	46	332	115	661	52	399	212	1,514	425	44%	12%
2002	434	41	387	72	1,196	47	127	20	2,144	180	56%	26%
2003	1,578	298	722	326	1,273	225	648	213	4,221	1,062	30%	21%
2004	551	94	397	52	535	90	176	31	1,659	267	32%	34%
2005	43	33	967	383	358	46	86	33	1,454	495	25%	9%
2006	127	25	306	51	686	84	289	51	1,408	211	49%	40%
2007	720	130	47	18	418	102	35	26	1,220	276	34%	37%
2008	363	107	351	58	360	85	52	39	1,126	289	32%	29%
2009	793	115	324	300	1,127	217	272	0	2,516	632	45%	34%
2010	732	32	573	246	1,323	282	32	6	2,660	566	50%	50%
2011	2,989	192	398	86	706	355	135	54	4,228	687	17%	52%
2012	292	11	39	0	802	257	84	33	1,217	301	66%	85%
2013	119	22	424	129	337	161	54	54	934	366	36%	44%
2014	158	0	113	40	1,466	215	0	0	1,737	255	84%	84%
2015	292	0	381	264	716	113	32	0	1,421	377	50%	30%
2016	528	8	371	17	721	31	171	0	1,791	56	40%	55%
2017	0	0	404	0	272	72	19	0	695	72	39%	100%
2018	37	24	0	0	17	0	122	0	176	24	10%	0%
2019	367	8	0	0	0	0	405	15	772	23	0%	0%
Average												
2007–2016	699	62	302	116	798	182	87	21	1,885	381	42%	48%
2017–2019	135	11	135	0	96	24	182	5	548	40	18%	61%

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: CRD = Cordova road system–Copper River Delta.

[a] Includes unknown from all of Area J, including North Golf Coast.

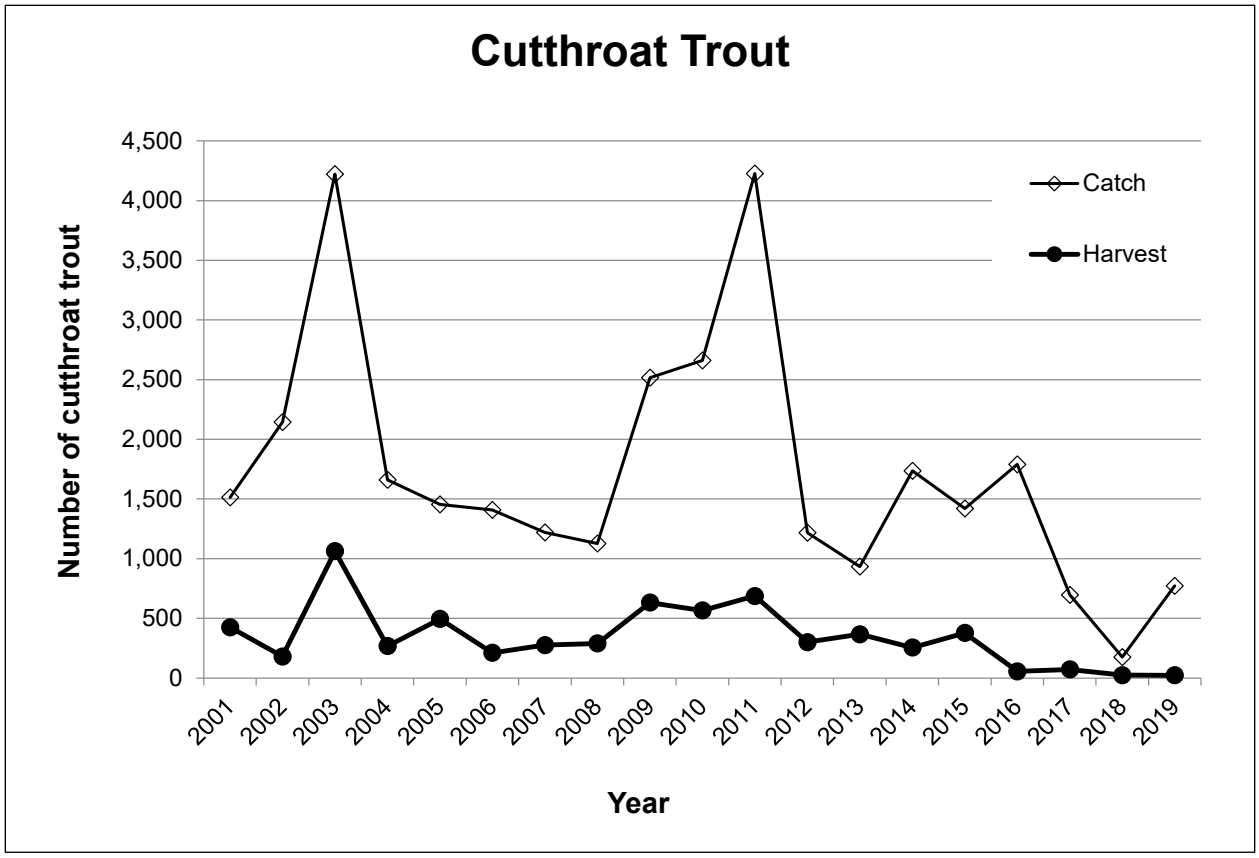

Figure 12.–Total catch and harvest of coastal cutthroat trout by sport anglers in the Prince William Sound Management Area, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

GROUNDFISH FISHERIES

FISHERY DESCRIPTION

The Prince William Sound Management Area (PWSMA) supports a large sport fishery for groundfish, predominately focused on Pacific halibut (*Hippoglossus stenolepis*), a variety of rockfish species (*Sebastes* spp.), and lingcod (*Ophiodon elongatus*). Fishing effort is highest during the months of May–September when large charter (guided) and private (unguided) fleets target Pacific halibut, rockfish, and lingcod throughout the management area. The PWSMA groundfish fishery is sampled at the ports of Seward, Whittier, and Valdez. Groundfish landed in Seward are harvested in both the North Gulf Coast Management Area (NGCMA) and PWSMA. Groundfish catch and harvest in PWS are estimated for Western PWS and for Eastern PWS, which are divided at longitude 147°W. Anglers landing fish in Seward and Whittier generally fished in Western PWS whereas anglers landing fish in Valdez generally fished in Eastern PWS (ADF&G; unpublished port sampling interview data). Rockfish and lingcod harvests landed in Seward are apportioned between the NGCMA and PWSMA using port sampling data (see below).

Apportioning SWHS Estimates for Rockfish and Lingcod Landed in Seward

PWS rockfish and lingcod harvest estimates reported here for the port of Seward use port sampling interview data to apportion fish landed in Seward between the NGC and PWS Management Areas. Historically, rockfish and lingcod harvested in PWS and landed in Seward may have been reported as harvested in the NGCMA. SWHS harvest and release estimates for rockfish and lingcod landed in Seward were apportioned between NGC and PWS Management Areas using the following equation:

$$H_{PWS} = H_{Seward} \times P \quad (1)$$

Where H_{PWS} is the number of rockfish or lingcod landed in Seward that were harvested from PWSMA, H_{Seward} is the SWHS harvest estimate for rockfish or lingcod landed in Seward, and P is the proportion (based on port sampling interview data) of rockfish or lingcod landed in Seward and harvested from PWSMA by user group (Table 11; note that charter logbook data are not used in this calculation). Release estimates were apportioned to PWSMA by user group using the same equation. Due to this change in estimation method, rockfish and lingcod harvest, catch, and release estimates in this report will differ from previous management reports.

ROCKFISH FISHERY

Fishery Description

Over 30 species of rockfish (genus *Sebastes*) inhabit the Gulf of Alaska. Sixteen species have been identified in the sport harvest from Prince William Sound Management Area (PWSMA) since 1991, but 6 species—black (*S. melanops*), dark (*S. ciliatus*), dusky (*S. variabilis*),[4] copper (*S. caurinus*), quillback (*S. maliger*), and yelloweye (*S. ruberrimus*) rockfish—typically make up the majority of the harvest. For purposes of managing the sport fishery, 2 assemblages, based on habitat preference, are defined in sport regulations (5 AAC 75.995): pelagic and nonpelagic. The pelagic assemblage includes black, dusky, dark, widow (*S. entomelas*), yellowtail (*S. flavidus*), and blue (*S. mystinus*) rockfish, and the nonpelagic assemblage includes all other species. The ADF&G Gulf of Alaska bottomfish (GOAB) port sampling program also records yelloweye rockfish separately due to high harvest levels and conservation concerns. Charter operators are also required to record pelagic, nonpelagic, and yelloweye catch and release in the charter logbook.

Key life history characteristics that differ between the 2 assemblages include longevity, age at first sexual maturity, and site fidelity, which are all greater for nonpelagic rockfish. However, both assemblages share the same physiological characteristics, including a physoclistic (closed) swim bladder that often leaves them susceptible to barotrauma and its associated injuries when brought to the surface. Because of this, rockfish are often unable to swim down after being brought to the surface.

[4] In 2008, the Alaska Board of Fisheries regulations were modified to recognize light and dark-colored morphs of dusky rockfish *S. ciliatus* as 2 species: dusky rockfish *S. variabilis* and dark rockfish *S. ciliatus* based on information presented in Orr and Blackburn (2004).

Table 11.–Proportion of Prince William Sound Management Area (PWSMA) rockfish and lingcod harvest landed in Seward from port sampling interviews and charter logbook, 2006–2019.

	Proportion PWSMA harvest landed in Seward					
	Rockfish			Lingcod		
Year	Private interview	Charter interview	Charter logbook	Private interview	Charter interview	Charter logbook
2006	12%	47%	67%	30%	65%	54%
2007	21%	56%	68%	26%	64%	62%
2008	15%	48%	68%	38%	67%	61%
2009	16%	57%	70%	44%	68%	57%
2010	17%	63%	69%	39%	77%	61%
2011	21%	52%	75%	34%	79%	66%
2012	16%	65%	78%	27%	86%	73%
2013	20%	59%	77%	49%	76%	70%
2014	18%	62%	74%	31%	92%	67%
2015	17%	52%	75%	30%	47%	70%
2016	20%	53%	75%	46%	77%	62%
2017	22%	66%	71%	10%	87%	65%
2018	19%	45%	72%	14%	67%	63%
2019	19%	47%	64%	4%	66%	56%
Average						
2006–2016	18%	56%	72%	36%	72%	64%
2017–2019	20%	53%	69%	9%	73%	61%

Source: M. Schuster, ADF&G, Division of Sport Fish, Homer, unpublished data.

The State of Alaska has management authority for sport rockfish fisheries in both state waters (within 3 nautical miles of shore) and the federal waters of the Exclusive Economic Zone (EEZ). State regulations apply in the EEZ because the NPFMC's *Gulf of Alaska Fishery Management Plan* does not address any sport groundfish fisheries. Section 306 of the Magnuson–Stevens Fisheries Conservation and Management Act, amended in 1996, allows the State of Alaska to regulate sport vessels in federal waters in the absence of a plan for the sport fishery.

Fishery Management and Objectives

There is no documented management harvest strategy for sport rockfish fisheries and no harvest targets for the fishery. Despite the lack of structured management, ADF&G and the Alaska Board of Fisheries (BOF) have attempted to take a conservative approach to management of rockfish fisheries in PWS and the rest of Alaska. Sport fishery bag limits have been reduced periodically during the last 2 decades in recognition of the failure of several Pacific rockfish fisheries in California, Oregon, Washington, and British Columbia. Their life history makes rockfish susceptible to overharvest. More restrictive bag limits have been set for the longer-lived and less productive nonpelagic species to discourage targeted harvest, while still allowing for retention of incidental catch. Seasons or size limits for rockfish have not been implemented because of concerns regarding high discard mortality attributed to barotrauma (decompression trauma).

Along with regulation changes, efforts have been made to educate anglers regarding the risks and consequences of rockfish overharvest, and to foster fishing practices that avoid bycatch and waste in the sport fishery. In 2017, ADF&G began the Statewide Rockfish Initiative (SRI) to develop both short and long-term management strategies for black and yelloweye rockfishes in the Gulf of Alaska. SRI efforts are focused on creating statewide standards for black and yelloweye rockfish

management, and developing strategies, infrastructure, and knowledge that will support long-term adaptive management (Howard et al. 2019). ADF&G has developed a web page[5] that addresses the management challenges inherent in rockfish fisheries and provides sport anglers with a list of best practices that can be employed to minimize unintentional catch of rockfish and methods to reduce release mortality.

In 2018, an outreach program was launched by the ADF&G Division of Sport Fish to educate sport anglers and guides on the proper use of deepwater release techniques. Port samplers and area offices throughout Southcentral Alaska provided deepwater release devices and best practices information to anglers and charter operators free of charge. At the end of the 2018 field season, a survey was sent to over 1,100 participants in the deepwater release program with the intent of assessing the efficacy of the outreach program. Initiation of such public outreach efforts stem from the completion of a 3-year study that examined the efficacy of deepwater release at improving the release survival of yelloweye rockfish (Hochhalter and Reed 2011), a study assessing the ability of demersal rockfish to submerge unassisted (Hochhalter 2012), and a study assessing reproductive viability following recompression events (Blain and Sutton 2016). Each of these and other studies indicate that discard mortality can be reduced dramatically and future reproduction unaffected if rockfish are quickly released using deepwater release techniques.

Historically, the sport rockfish fishery in PWS had no bag limit until 1989 when limits of 20 fish per day and in possession, only 5 of which could be "red rockfish," were implemented (Appendix B1). Effective 1991, the bag limit was lowered to 5 rockfish per day, 10 in possession from 1 May to 15 September, and 10 per day and in possession for the remainder of the year. Effective 1997, the daily bag and possession limits were 2 nonpelagic rockfish species during both seasonal periods. Effective in 1998, the BOF revised the limits such that the total bag limit was unchanged, but anglers were restricted to 1 nonpelagic rockfish per day and 2 in possession during the period 1 May–15 September, and 2 per day and in possession during the period 15 September–30 April. Anglers were required to retain the first nonpelagic rockfish caught during the summer period and the first 2 caught during the winter period, regardless of size. Effective in 2000, BOF revised the nonpelagic species limit to 2 per day and 2 in possession year-round. This modification was made to reduce waste of nonpelagic rockfish caught after the bag limit of 1 fish had been reached. Even though increasingly conservative steps have been taken to curtail harvest and manage bycatch and waste, it is unknown whether these efforts were providing for sustained yield. In 2009, seasons and nonpelagic bag limit remained unchanged, but the bag limit for pelagic rockfish was reduced to 4 per day and 8 in possession from 1 May through 15 September and 8 fish per day and 8 in possession from 16 September through 30 April. In 2018, BOF revised the bag limits for pelagic and nonpelagic rockfish to 4 per day, 8 in possession of which only 1 per day and 1 in possession could be a nonpelagic rockfish, year-round. Anglers were no longer required to retain the first nonpelagic rockfish caught (Appendix B1). In addition, BOF passed a proposal that requires deepwater release mechanisms onboard vessels statewide and using them to release rockfish at depth of capture or at least 100 feet. This regulation went into effect in January 2020.

The status of rockfish stocks in PWS is, for the most part, unknown. No surveys have been conducted in PWS to obtain a fishery-independent estimate of abundance for any species. Information on locations and quantity of rockfish habitat, and spatial or depth distribution by

[5] Rockfish Conservation Statewide Rockfish Initiative. Juneau, AK: Alaska Department of Fish and Game. (Accessed October 22, 2021). http://www.adfg.alaska.gov/index.cfm?adfg=fishingSportFishingInfo.rockfishconservation.

species are also lacking. There are, however, rudimentary indicators of the condition of the rockfish stock(s). Despite a steady growth in sport harvest (Figures 13–15), there is no obvious trend in the average length or average weight of black or yelloweye rockfish harvested in the sport fishery that might indicate a shift to older (larger) fish and a lack of recruitment (Figure 16). In addition, there is broad representation of ages in the black and yelloweye rockfish harvest, and no obvious truncation of these distributions due to excessive harvest over time (Figures 17 and 18). Therefore, if past levels of harvest have exceeded surplus production, they have not done so by a large amount. Age composition data show, however, that relatively large year-classes are at least 10 years apart, as illustrated by the 1991 and 2008 black rockfish year classes and the 1968, 1986, and 1998 yelloweye rockfish year classes, which are all strongly represented in the PWS sport harvest (Figures 17 and 18). Recruitment variability is common in rockfish and reinforces the principle that allowable levels of harvest must take natural variability into account. Managing the fishery to maintain a diversity of age classes of mature fish can serve to buffer the natural variability in production.

The potential for overfishing is the primary management concern for rockfish in PWSMA. This concern is largely based on the lack of a management strategy combined with life history characteristics that make rockfish vulnerable to overharvest, such as extreme longevity, relatively late age at maturity, high recruitment variability, and high discard mortality attributed to barotrauma.

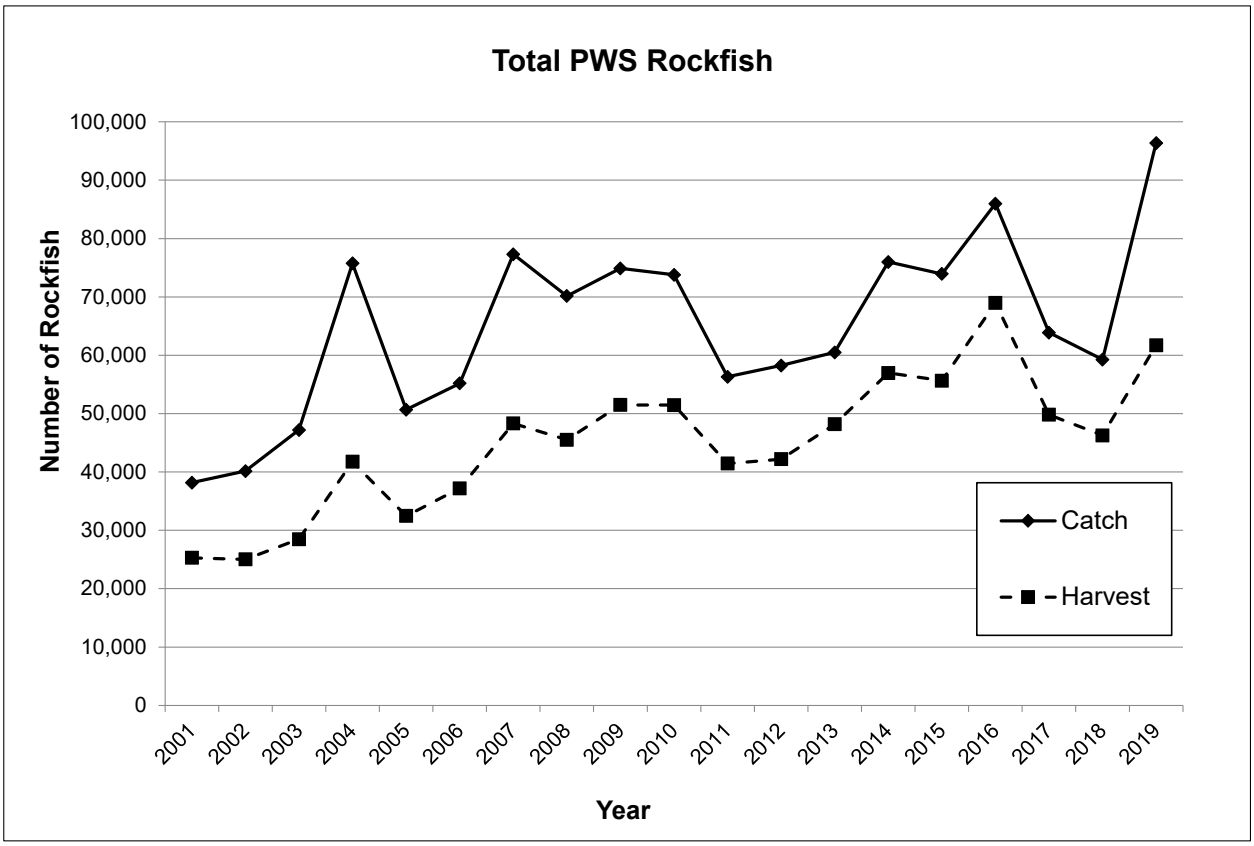

Figure 13.–Total catch and harvest of rockfish (all species) by sport anglers by year, Prince William Sound Management Area, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

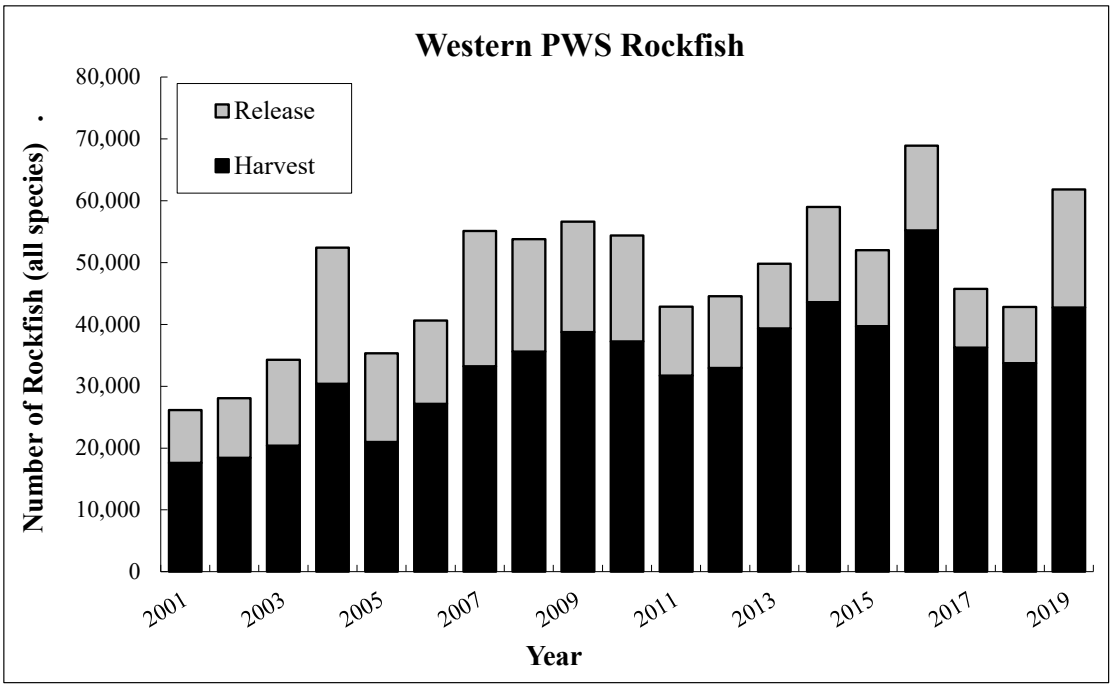

Figure 14.–Total catch, harvest, and release of rockfish in Western PWS, Prince William Sound Management Area, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: SWHS estimates are apportioned using port sampling interview data to include fish caught in PWS but landed in Seward.

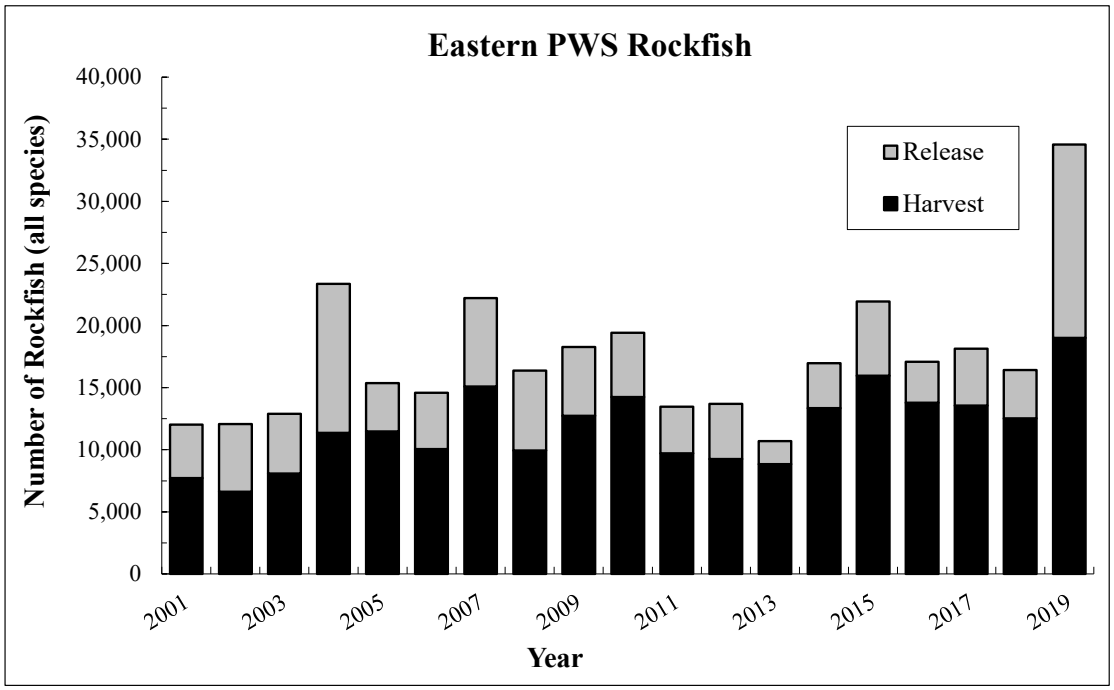

Figure 15.–Total catch, harvest, and release of rockfish in Eastern PWS, Prince William Sound Management Area, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: SWHS estimates are apportioned using port sampling interview data to include fish caught in PWS but landed in Seward.

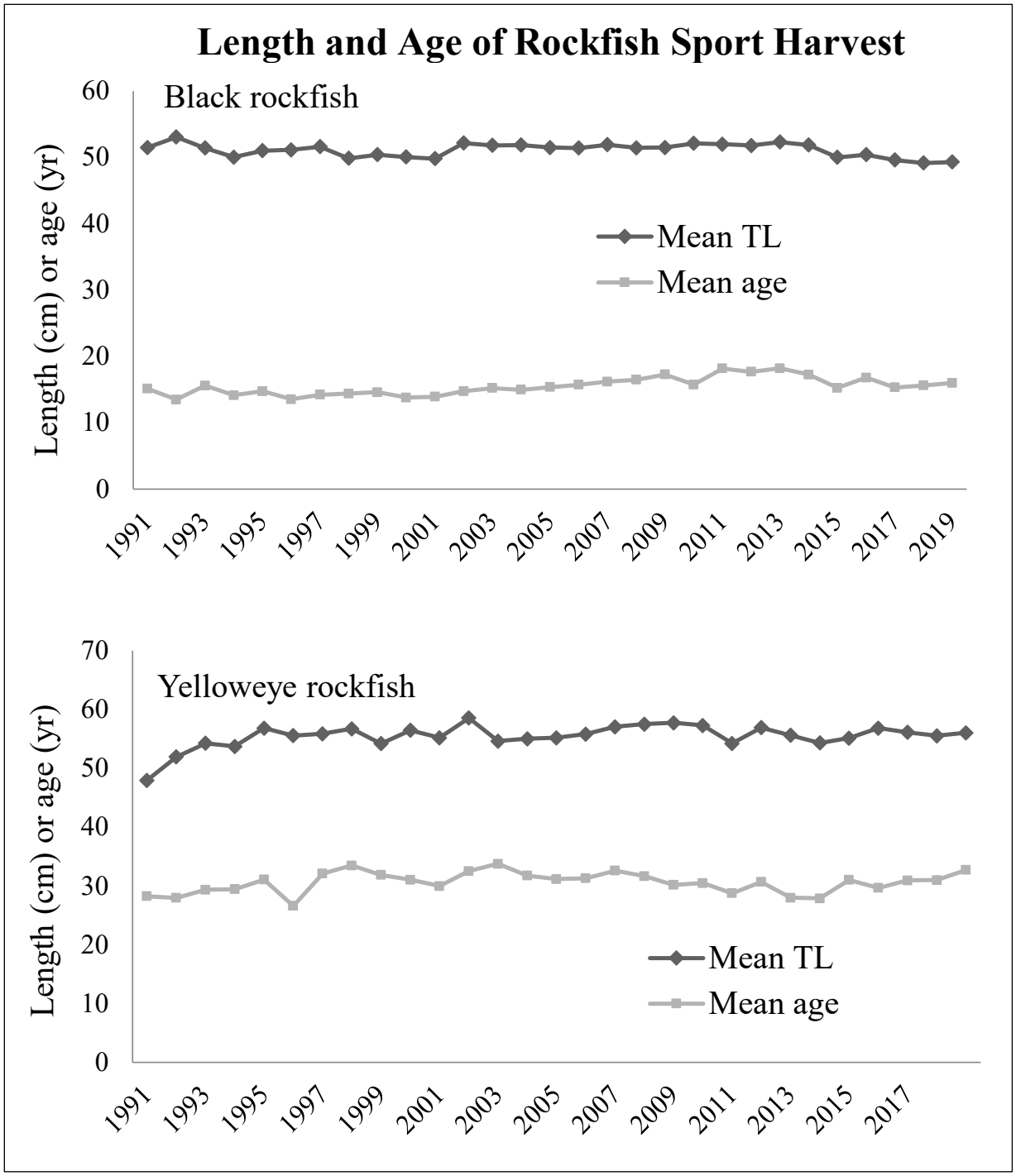

Figure 16.–Mean total length (TL) and age (years) of black and yelloweye rockfish sport harvest in Prince William Sound Management Area, 1991–2019.

Source: ADF&G port sampling program, Martin Schuster, ADF&G Fishery Biologist, Homer.

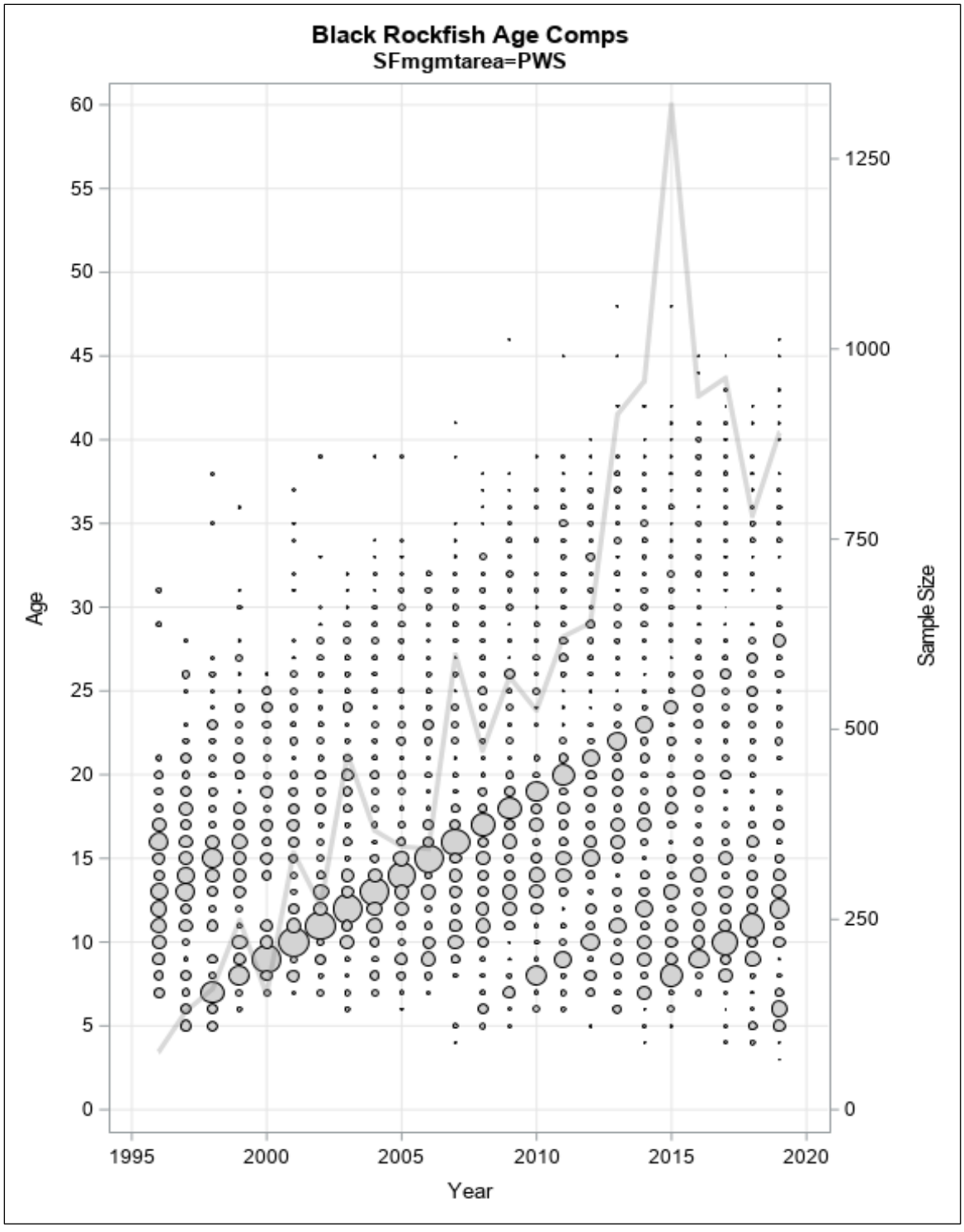

Figure 17.–Age composition of black rockfish sport harvest in Prince William Sound Management Area, 1991–2019.

Source: ADF&G port sampling program, Martin Schuster, ADF&G Fishery Biologist, Homer.
Note: Bubble area is proportional to the percent of harvest by each age group within each year.

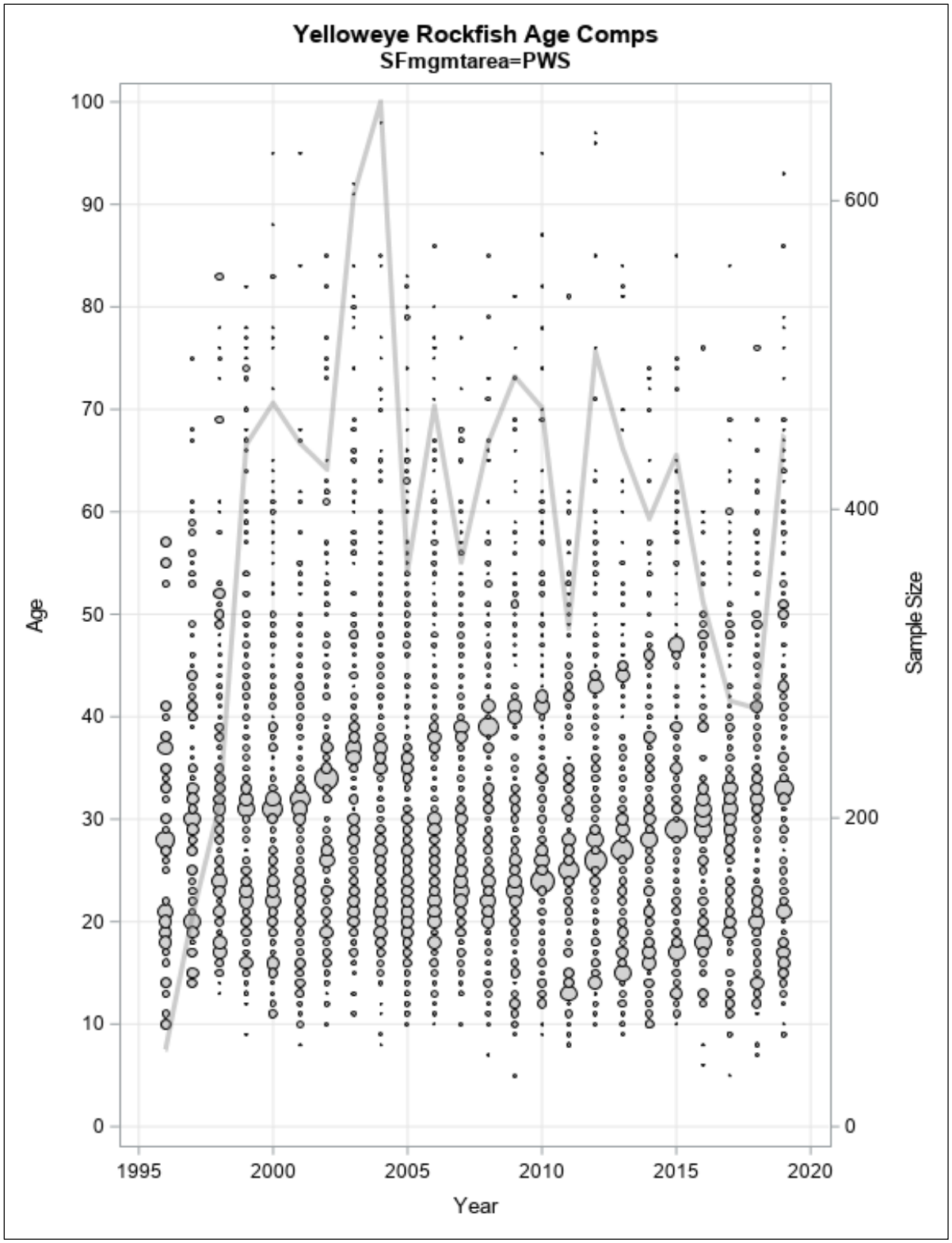

Figure 18.–Age composition of yelloweye rockfish sport harvest in Prince William Sound Management Area, 1991–2019.

Source: ADF&G port sampling program, Martin Schuster, Fishery Biologist, Homer ADF&G.

Note: Bubble area is proportional to the percent of harvest by each age group within each year.

Historical Fishery Performance

Estimates of annual rockfish harvest in Prince William Sound were below 30,000 until 2004. From 2004 to 2016 harvest was on average just below 48,000 with a high of 68,971 fish harvested in 2016 (all species combined; calculated from Table 12). The PWS rockfish harvest has made up 31–47% of the Southcentral Region sport rockfish harvest since 1996.[6]

In Western PWS, rockfish harvest was relatively stable at approximately 12,000 fish harvested annually before 2001 (calculated from Table 12). After the Whittier tunnel was opened to vehicle traffic in 2000, rockfish harvest in Western PWS a little more than doubled between 2001 and 2009 from 17,585 to a peak of 38,760 fish (from Table 12, Figure 14). After 2009, rockfish harvest in Western PWS began to gradually decline before increasing again in 2016 and reaching 55,178 fish (from Table 12, Figure 14). Angler effort also greatly increased in Western PWS after 2003 (Table 1) and has maintained high levels every year since 2004, which has likely contributed to the increase in catch and harvest of rockfish (Table 12). In Eastern PWS, rockfish harvest gradually increased from 6,272 fish in 1996 to 13,793 fish in 2016 (from Table 12). Before 2011, charter and private rockfish harvest in PWS were similar, but after 2011 charter rockfish harvest in Western PWS increased while charter harvest in Eastern PWS and private harvest in both areas did not (Table 12). Charter halibut regulations became more restrictive after 2011 and this may have caused a shift in targeted fish and contributed to the relatively higher harvest of rockfish by charter operators than private anglers in Western PWS during 2012 through 2018 than in previous years (from Table 12).

Harvest biomass (pounds round weight) was estimated for pelagic, yelloweye, and nonpelagic rockfishes from 1996 to present by computing the product of PWS-apportioned SWHS estimates of the total number of rockfish harvested (Table 12), the proportion of the port sampling harvest that is a particular assemblage (based on that year's combined port-sampling data for Seward, Whittier, and Valdez), and the average weight by species (based on that year's combined port-sampling data for Seward, Whittier, and Valdez). Prince William Sound rockfish harvest has ranged from about 88,000 lb in 1999 to over 342,000 lb in 2016 (Table 13). Pelagic species accounted for most of the increase in harvest whereas yelloweye and other nonpelagic species harvests remained relatively stable. Yelloweye, black, and quillback rockfish are the primary species in the harvest.[7] On average from 1996 to 2016, these 3 species accounted for 77% of the harvest landed at Valdez and 73% landed at Whittier. Yelloweye rockfish is the most common species in the harvest, making up an average of 38% at Valdez and 39% at Whittier. Black rockfish made up 29% of the harvest at Valdez and 17% at Whittier. Quillback rockfish made up 11% at Valdez and 16% at Whittier.

---

[6] Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

[7] A. St. Saviour, Fishery Biologist, Division of Sport Fish, ADF&G, Palmer and M. Schuster, Fishery Biologist, Division of Sport Fish, ADF&G, Homer, unpublished data and analysis.

Table 12.–Catch and harvest of rockfish (all species combined) by geographical region, Prince William Sound Management Area, 1996–2019.

	Western				Eastern				Total		Percent of catch
	Charter		Private		Charter		Private				
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	harvested
1996	9,732	8,604	7,480	4,163	3,460	2,442	6,574	3,830	27,246	19,039	70%
1997	10,527	6,172	11,428	5,710	3,610	2,345	7,263	4,675	32,828	18,902	58%
1998	9,506	5,917	10,701	6,625	3,466	1,829	8,226	4,091	31,899	18,462	58%
1999	9,006	5,128	7,066	4,112	4,315	2,270	6,565	3,983	26,952	15,493	57%
2000	11,528	7,029	12,914	6,885	4,026	2,853	7,255	4,658	35,723	21,424	60%
2001	16,495	12,173	9,651	5,412	5,159	3,676	6,861	4,037	38,167	25,298	66%
2002	17,033	11,652	11,044	6,758	4,086	2,482	7,984	4,133	40,146	25,025	62%
2003	17,614	12,335	16,675	8,062	5,402	3,413	7,495	4,666	47,186	28,477	60%
2004	26,322	16,551	26,070	13,857	9,464	4,628	13,886	6,731	75,742	41,767	55%
2005	14,552	10,581	20,762	10,421	5,463	4,571	9,898	6,895	50,675	32,468	64%
2006	19,304	13,743	21,305	13,402	5,417	3,831	9,160	6,227	55,186	37,204	67%
2007	23,040	16,613	32,060	16,613	7,600	5,758	14,611	9,339	77,311	48,323	63%
2008	23,388	17,620	30,389	17,970	6,663	4,145	9,704	5,785	70,144	45,520	65%
2009	22,849	17,658	33,777	21,102	5,714	4,323	12,551	8,405	74,891	51,488	69%
2010	29,442	21,645	24,932	15,584	8,116	6,095	11,299	8,138	73,789	51,462	70%
2011	20,225	15,822	22,618	15,905	3,484	2,437	9,982	7,277	56,310	41,441	74%
2012	27,120	21,606	17,432	11,347	4,404	3,687	9,295	5,565	58,251	42,205	72%
2013	25,438	22,276	24,353	17,058	3,332	2,991	7,375	5,850	60,497	48,175	80%
2014	30,045	25,980	28,954	17,629	5,623	4,573	11,356	8,787	75,978	56,969	75%
2015	29,273	24,870	22,733	14,828	6,403	5,142	15,540	10,813	73,949	55,653	75%
2016	42,368	37,262	26,522	17,916	5,615	4,650	11,467	9,143	85,972	68,971	80%
2017	28,105	24,518	17,642	11,737	6,890	5,521	11,245	8,035	63,882	49,811	78%
2018	23,792	21,556	19,044	12,181	6,282	5,057	10,133	7,471	59,250	46,264	78%
2019	26,516	22,789	35,278	19,930	10,115	7,665	24,460	11,348	96,369	61,731	64%
Averages											
1996–2016	20,705	15,773	19,946	11,970	5,277	3,721	9,731	6,335	55,659	37,798	67%
2017–2019	26,137	22,954	23,988	14,616	7,762	6,081	15,279	8,951	73,167	52,602	73%

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: SWHS estimates are apportioned using port sampling interview data to include fish caught in PWS but landed in Seward.

Table 13.–SWHS estimates (apportioned to assemblage using port sampling data) of sport rockfish and lingcod harvest converted to numbers of fish and pounds round weight by species in Prince William Sound Management Area, 1996–2019.

	Lingcod		Pelagic rockfish		Yelloweye rockfish		Other nonpelagic rockfish		Total rockfish[a]	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1996	2,603	66,327	8,305	40,530	5,093	39,927	5,641	12,828	19,039	93,284
1997	4,477	125,001	7,846	39,545	8,458	65,251	2,598	5,846	18,902	110,641
1998	2,636	75,898	7,003	33,592	9,470	75,555	1,989	7,538	18,462	116,685
1999	2,666	75,228	5,380	24,504	7,605	53,402	2,507	10,211	15,493	88,117
2000	3,993	121,739	5,624	22,650	10,444	83,351	5,356	61,956	21,424	167,957
2001	4,586	134,977	9,447	41,722	10,453	78,274	5,398	39,485	25,298	159,481
2002	4,541	145,984	9,147	45,393	11,512	100,919	4,366	20,469	25,025	166,780
2003	5,093	159,722	11,731	54,569	11,656	83,535	5,089	12,464	28,477	150,568
2004	6,034	193,739	17,744	86,808	17,379	127,823	6,644	20,102	41,767	234,733
2005	6,080	176,433	14,970	70,822	11,860	87,473	5,638	15,783	32,468	174,079
2006	7,956	236,460	15,509	76,422	14,344	109,501	7,351	22,939	37,204	208,862
2007	11,961	348,006	29,124	148,922	13,389	107,867	5,810	16,802	48,323	273,591
2008	10,868	300,008	22,247	103,842	13,920	116,038	9,353	25,849	45,520	245,728
2009	10,256	279,750	29,771	143,978	12,916	109,770	8,802	22,909	51,488	276,656
2010	11,428	314,548	26,989	137,733	14,381	119,318	10,092	30,798	51,462	287,849
2011	9,599	259,710	24,620	122,845	8,645	61,224	8,177	24,299	41,441	208,368
2012	9,082	248,881	23,730	115,796	10,243	83,338	8,232	28,331	42,205	227,465
2013	7,632	204,922	28,997	141,370	9,779	75,056	9,400	27,748	48,175	244,174
2014	8,245	228,904	38,330	184,179	9,688	69,754	8,951	31,921	56,969	285,854
2015	5,953	158,108	35,851	161,741	10,760	80,398	9,043	27,411	55,653	269,549
2016	6,038	177,585	49,426	221,853	11,399	92,376	8,146	27,898	68,971	342,127
2017	4,778	139,777	34,139	151,060	8,778	68,641	6,895	23,302	49,811	243,004
2018	4,807	139,968	31,452	139,384	8,010	61,175	6,802	27,926	46,264	228,484
2019	4,811	137,972	40,472	177,125	12,540	97,537	8,719	39,841	61,731	314,503
Averages										
1991-2016	7,277	197,311	34,393	162,430	10,075	75,069	9,131	29,026	53,599	266,525
2017-2019	5,208	152,444	38,339	170,765	9,396	74,064	7,281	26,375	55,015	271,205

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: SWHS estimates are apportioned using port sampling interview data to include fish caught in PWS but landed in Seward.

[a] Sum of ADF&G assemblage harvest may not equal total harvest due to rounding.

Because rockfish are often caught incidentally to other fisheries, many of them are released. The proportion of rockfish harvest that was released (1 minus the percent of catch harvested) each year in both Western and Eastern PWS averaged 33% from 1996 to 2016 (Table 12). The magnitude of the release component is important because of potential for high immediate or delayed mortality. Release mortality has been estimated in PWS fisheries and is believed to be higher for nonpelagic species than for pelagic species, primarily because pelagic species generally inhabit shallower waters making them less susceptible to decompression trauma (Blain-Roth et al. *In prep*).

Beginning in 2013, port sampling interviews also included asking anglers how they released rockfish (on the surface, with a deepwater release mechanism, or by venting; Figure 19). Education on the use of deepwater release was also implemented into the program beginning in 2013. Release data from interviews in following years shows increasing numbers of deep-water-released fish, especially by private anglers, following these implementations (Figure 19). This may reflect the efficacy of education as no regulatory changes had yet to be implemented.

Fishery Performance 2017–2019

The 2017–2019 average annual harvest of rockfish in PWSMA (52,602) was nearly 15,000 more fish than the average harvest in the historical period from 1996 to 2016 (37,798 fish; Table 12). In 2019, rockfish harvest estimates reached the second highest recorded level at 61,731 fish harvested. Rockfish harvest estimates for private anglers were especially high in 2019, increasing by almost 8,000 fish in Western PWS and 4,000 fish in Eastern PWS from the previous year (Table 12, Figures 14 and 15). Most of the increase in harvest both historically and during the recent period is made up of pelagic species, primarily black rockfish (based on ADF&G data from port sampling interviews; Meyer and Failor *In prep*). During the recent period, pelagic species accounted for about 70% of the PWS rockfish harvest (calculated from Table 13). The proportions of rockfish released in PWS during recent and historical periods were similar (averaging 27% and 33%, respectively; Table 12), except during 2019, when rockfish releases in Eastern PWS were higher than usual at about 45% (calculated from Table 12).

Due to the high discard mortality associated with surface release of rockfish (at least 78% for yelloweye rockfish; Hochhalter 2012), ADF&G has been conducting outreach to educate the public about the positive effects of using deep water release versus releasing rockfish at the surface. Port sampling data also indicates more angler awareness and use of deep-water release methods to release rockfish. For example, in Whittier, the proportion of private anglers releasing yelloweye rockfish with a deepwater release mechanism has been increasing and nearly all yelloweye rockfish were released with deepwater release techniques by 2019 (Figure 19).

Releases by Method

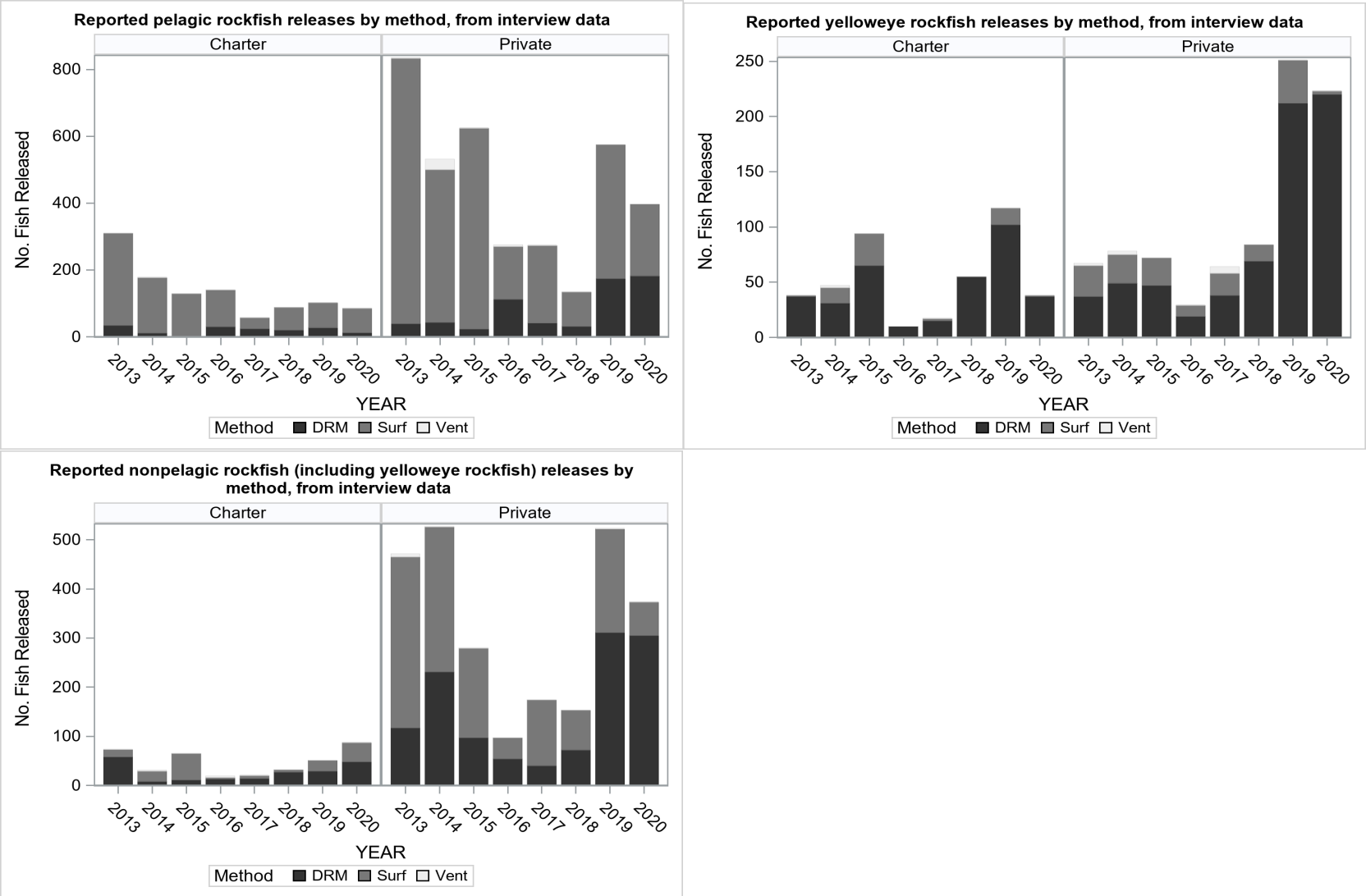

Figure 19.–Reported release method of rockfish by assemblage from port sampling interview data, Prince William Sound Management Area, 2013–2019.

LINGCOD FISHERY

Fishery Description

Lingcod are distributed from the Alaska Peninsula south to Baja California (Cass et al. 1990). In PWS, they are common along the ocean entrances from Cape Fairfield to Hinchinbrook Entrance. Lingcod are also captured around rocky reefs and underwater pinnacles that are common throughout PWS. Although adult lingcod can be found to depths of 1,200 ft, they typically inhabit nearshore rocky reefs from 30 to 300 ft in depth (Cass et al. 1990). Most lingcod are taken by anglers targeting other species or targeting lingcod in conjunction with other species. The economic value of the lingcod sport fishery in Prince William Sound is unknown.

Fishery Management and Objectives

There is no documented harvest strategy and no specific harvest objective for the PWS sport lingcod fishery. Lacking estimates of stock status, ADF&G and BOF have adopted a presumed conservative approach to the management of the sport lingcod fishery. A bag limit of 2 fish daily, 4 in possession (Appendix B1) was implemented in 1993. A minimum size limit of 35 inches total length (28 inches without head) was implemented to allow female lingcod to spawn at least once prior to harvest. Lingcod retention is only allowed from 1 July through 31 December to protect spawning fish and nest-guarding males. In 2018, BOF lowered the lingcod bag limit to 1 fish daily, 1 in possession.

The port sampling program in Southcentral Alaska has been effective at characterizing lingcod harvest in the sport fishery and provides a basis for evaluating the effects of regulatory proposals (e.g., Stock and Meyer 2005). Primary objectives for this program include estimation of age, length, sex composition, and spatial distribution of effort and harvest. However, this fishery-dependent information by itself is generally inadequate for assessing stock status and managing the fishery to respond to changes in abundance. The minimum size limit precludes harvest of fish less than 35 inches in total length, and there are no data on length composition of released fish. Fishery-dependent data can also be misleading when there are changes in fishing gear or when the proportion of effort spent targeting lingcod is changing.

Management of lingcod would benefit greatly from development of a harvest strategy with clear conservation and fishery objectives. One way to assess stock status would be through a standardized, fishery-independent index of abundance or biomass. Such an index could be used to tune age-structured assessment models or used directly in a control rule to set future allowable catches. Depending on the method used, the cost, and available funding, an index may be obtained annually or periodically. Potential data sources for this index may include International Pacific Halibut Commission longline survey data, other jig or longline surveys, mark–recapture studies, or habitat-based remote operated vehicle (ROV) surveys (e.g., Byerly et al. 2015). ADF&G, Division of Commercial Fisheries, conducted an ROV survey of portions of Prince William Sound in recent years but data are still being processed and density estimates are not yet available.

There is no obvious trend in the average length or average weight of lingcod harvested in the sport fishery that might indicate a shift to older (larger) fish and a lack of recruitment (Figure 20). In addition, there is broad representation of ages in the lingcod harvest, with little truncation of these distributions, except for some older than usual fish appearing in the harvest during years of high lingcod harvest (Figure 21).

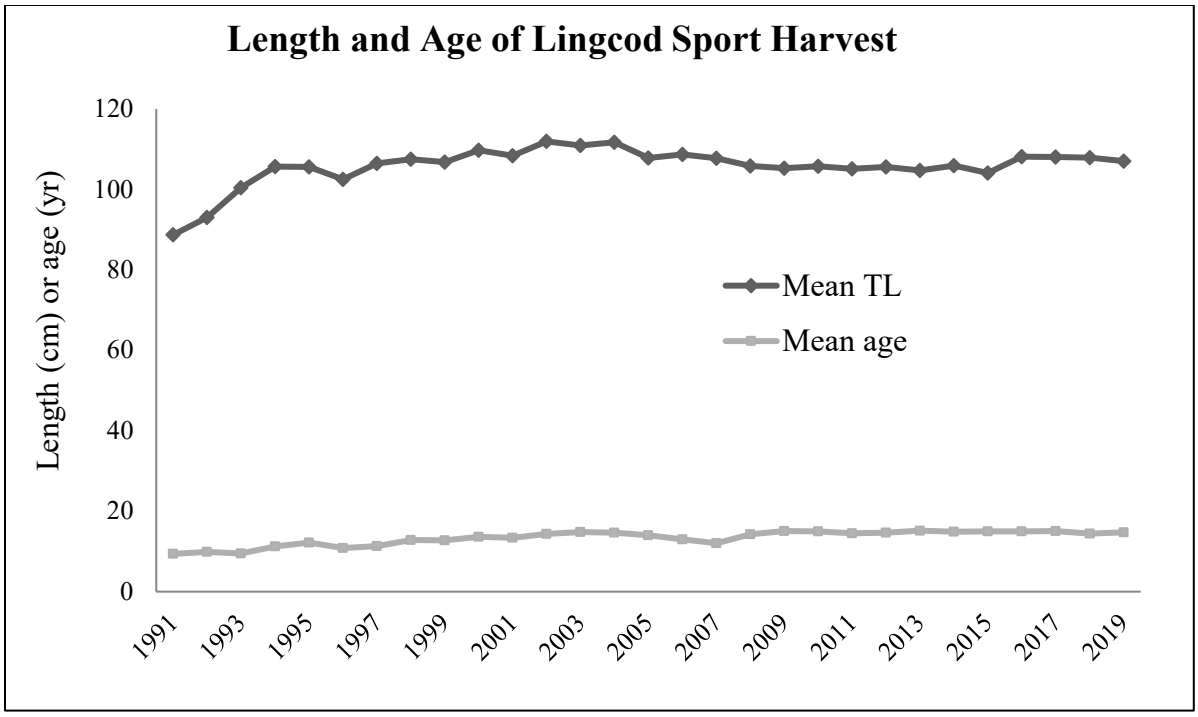

Figure 20.–Mean total length (TL) and age of lingcod in the sport harvest in Prince William Sound Management Area, 1991–2019.

Source: ADF&G port sampling program, Martin Schuster, Fishery Biologist, ADF&G, Homer.

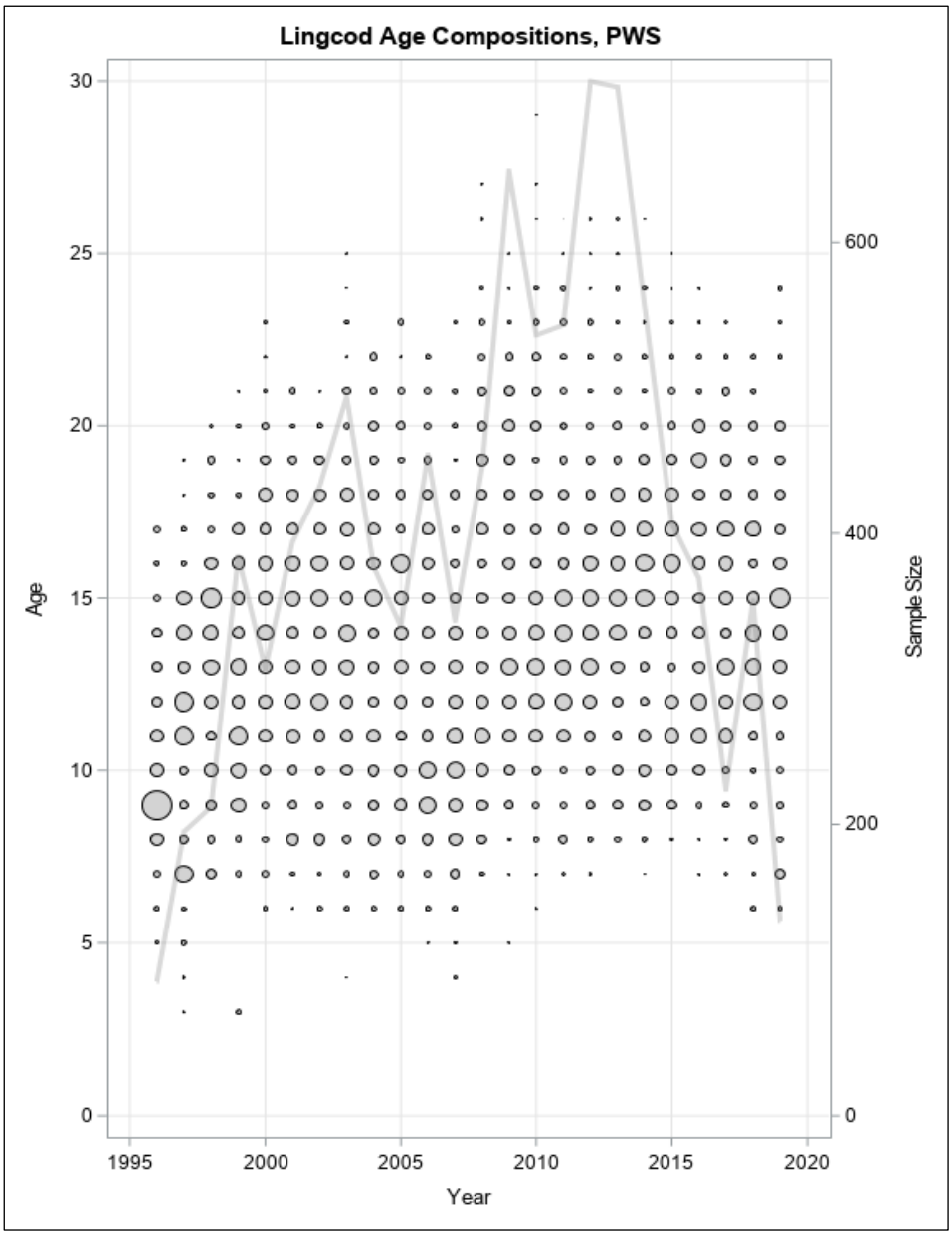

Figure 21.–Age composition of lingcod sport harvest in Prince William Sound Management Area, 1991–2019.

Source: ADF&G port sampling program, Martin Schuster, Fishery Biologist, ADF&G, Homer.

Historical Fishery Performance

Lingcod catch and harvest estimates were aggregated into Western and Eastern PWS. Western PWS includes lingcod caught anywhere in PWS but landed at sites west of longitude 147°W, including Whittier, Chenega Bay, and Seward. Eastern PWS includes lingcod caught anywhere in PWS but landed at sites east of longitude 147°W (primarily Valdez, with some landings in Cordova). Estimates of annual harvest in Prince William Sound have ranged from about 2,500 lingcod in the late 1990s to over 10,000 fish in the mid-2000s (Table 14, Figure 22). The PWS lingcod harvest has made up 26–69% of the Southcentral Region sport lingcod harvest since 1996 (http://www.adfg.alaska.gov/sf/sportfishingsurvey/ accessed October 2020).

In Western PWS, combined charter and private angler lingcod harvest increased slowly from about 1,500 fish to about 3,000 fish between 1996 and 2005 (Table 14, Figure 23). Between 2007 and 2012, annual harvest was about double what it was in prior years for both charter and private anglers, resulting in combined harvests of between 7,000 and 8,000 fish during that period (Figure 23). After a maximum combined harvest of 8,071 fish in 2010, lingcod harvests have steadily declined in Western PWS, reaching almost half peak harvest by 2015 and 2016 (Table 14, Figure 23). In Eastern PWS, lingcod harvest followed a similar trend, but lower in magnitude and peaking earlier in 2007 with a maximum combined harvest of 4,225 fish (Table 14, Figure 24). Harvest has declined since then, reaching almost half the peak (2,193 fish) by 2016 (Figure 24). Lingcod releases (1 minus the percent of catch harvest) have ranged between 41–67% of the total catch in Western PWS and between 33–72% of the total harvest in Eastern PWS during 1996–2019 (calculated from Table 14).

Harvest biomass (pounds round weight) was estimated for lingcod from 1996 to present by computing the product of PWS-apportioned SWHS estimates of the number of lingcod harvested (Table 13), and average weight of harvested lingcod (based on that year's combined port-sampling data for Seward, Whittier, and Valdez). Total PWS harvest has ranged from about 66,000 lb in 1996 to nearly 348,000 lb in 2007 (Table 13).

Fishery Performance 2017–2019

The 2017–2019 average annual harvest of lingcod in the PWSMA was 4,799, which is 2,000 fish less than the average harvest in the historical period from 1996 to 2016 (6,749 fish; Table 14). Combined private and charter angler lingcod harvest estimates were very similar during the current reporting period, ranging from 4,778 fish in 2017 to 4,811 fish in 2019 (Table 14).

The average proportion of lingcod catch that was released during the recent period was 54% and 57% in Western and Eastern PWS, respectively (calculated from Table 14). Historical averages were lower at 51% and 50% in Western and Eastern PWS, respectively. Anglers typically release fish to comply with regulations (e.g., closed waters, size limits, bag limit met), to satisfy size preferences, or for conservation. Port sampling interviews show that the proportion of sublegal lingcod (under 35 inches) released has increased in 2018 and 2019 (Figure 25). Increases in sublegal releases, as well as anecdotal reports by anglers that juvenile lingcod were present in higher numbers than usual (M. Schuster, Fishery Biologist, ADF&G, Homer, personal communication) may indicate a recent recruitment event.

Table 14.–Catch and harvest of lingcod by charter and private anglers in the sport fisheries in Prince William Sound Management Area, 1996–2019.

	Western				Eastern				Total		Percent of catch
	Charter		Private		Charter		Private				
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	harvested
1996	2,088	1,180	2,040	455	1,149	409	1,760	559	7,036	2,603	37%
1997	2,308	1,625	2,460	1,088	1,572	806	2,745	958	9,085	4,477	49%
1998	1,981	1,011	1,299	321	1,830	949	1,639	355	6,750	2,636	39%
1999	2,709	992	1,261	400	2,159	579	2,416	695	8,546	2,666	31%
2000	2,557	1,431	3,426	1,192	1,944	776	2,314	594	10,241	3,993	39%
2001	3,586	1,972	1,821	634	2,427	1,254	1,880	726	9,714	4,586	47%
2002	3,430	1,846	2,593	1,247	1,406	780	1,710	667	9,140	4,541	50%
2003	3,946	1,906	2,327	1,377	2,102	1,055	1,762	755	10,138	5,093	50%
2004	4,799	2,235	3,296	1,312	1,988	1,403	2,100	1,084	12,183	6,034	50%
2005	5,678	1,764	4,131	1,429	3,082	1,834	2,152	1,053	15,043	6,080	40%
2006	7,534	4,190	3,063	1,131	3,440	1,714	2,458	921	16,495	7,956	48%
2007	10,643	5,542	5,626	2,195	4,352	2,571	4,012	1,654	24,633	11,961	49%
2008	10,339	5,212	4,820	2,676	2,877	1,591	2,974	1,389	21,010	10,868	52%
2009	8,070	4,436	4,561	2,383	2,350	1,960	2,756	1,477	17,737	10,256	58%
2010	9,627	5,878	5,526	2,193	3,120	2,138	2,249	1,219	20,522	11,428	56%
2011	7,725	4,587	4,493	2,668	1,713	1,156	2,089	1,188	16,020	9,599	60%
2012	9,350	5,375	6,022	1,706	2,159	1,374	1,526	627	19,057	9,082	48%
2013	7,466	3,838	3,895	2,122	1,840	891	1,158	781	14,359	7,632	53%
2014	7,310	4,706	3,638	1,369	2,087	1,225	1,295	945	14,331	8,245	58%
2015	3,647	2,642	2,591	806	1,636	1,314	2,542	1,191	10,416	5,953	57%
2016	5,193	3,368	4,365	1,377	1,394	883	807	410	11,759	6,038	51%
2017	4,200	3,038	2,623	332	1,026	739	1,700	669	9,549	4,778	50%
2018	3,414	2,622	4,081	950	1,266	886	1,544	349	10,305	4,807	47%
2019	3,285	2,250	2,805	312	2,237	960	4,370	1,289	15,982	4,811	30%
Average											
1996–2016	5,714	3,130	3,488	1,432	2,220	1,270	2,112	917	13,534	6,749	49%
2017–2019	3,633	2,637	3,170	531	1,510	862	2,538	769	11,945	4,799	42%

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: SWHS estimates are apportioned using port sampling interview data in order to include fish caught in PWS but landed in Seward.

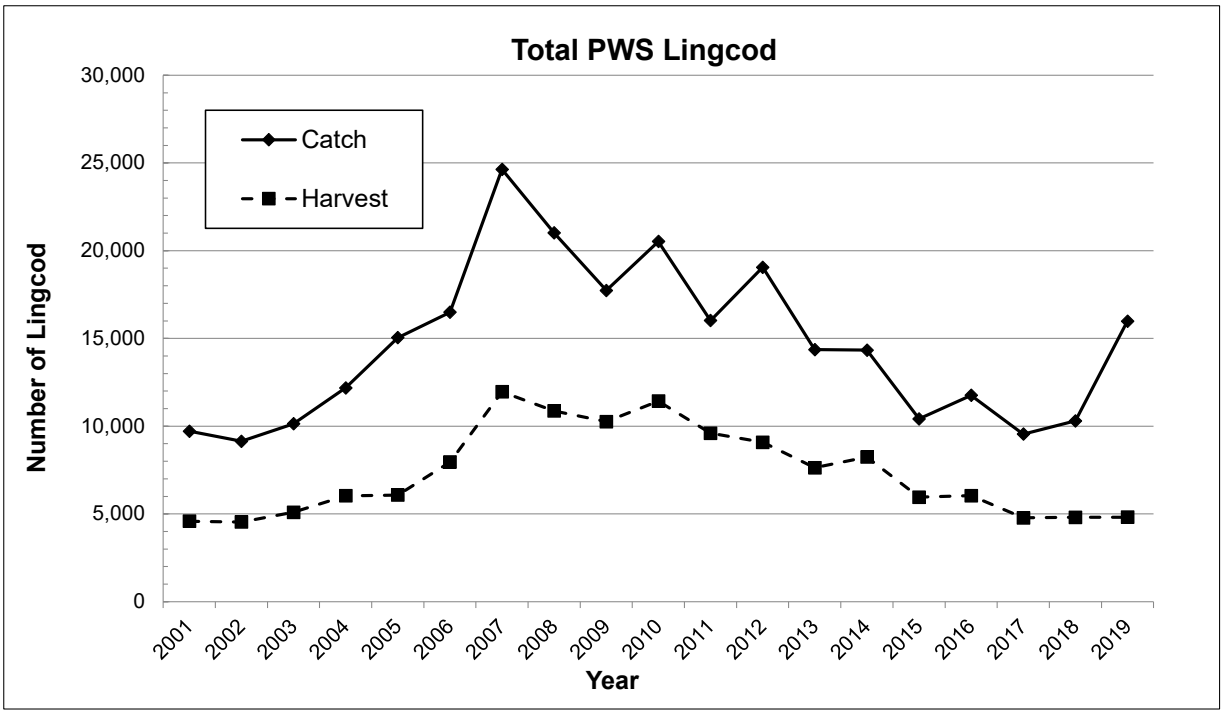

Figure 22.–Total catch and harvest of lingcod by sport anglers by year, Prince William Sound Management Area, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: SWHS estimates are apportioned using port sampling interview data to include fish caught in PWS but landed in Seward.

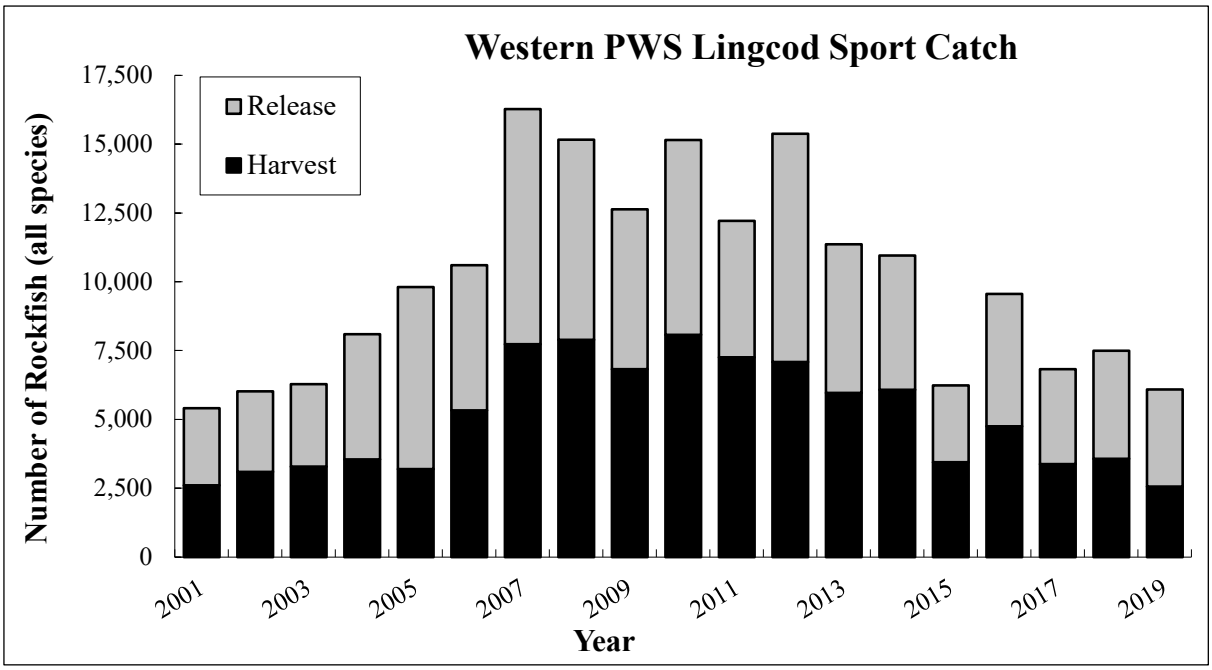

Figure 23.–Total catch, harvest, and release of lingcod in Western PWS, Prince William Sound Management Area, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: SWHS estimates are apportioned using port sampling interview data to include fish caught in PWS but landed in Seward.

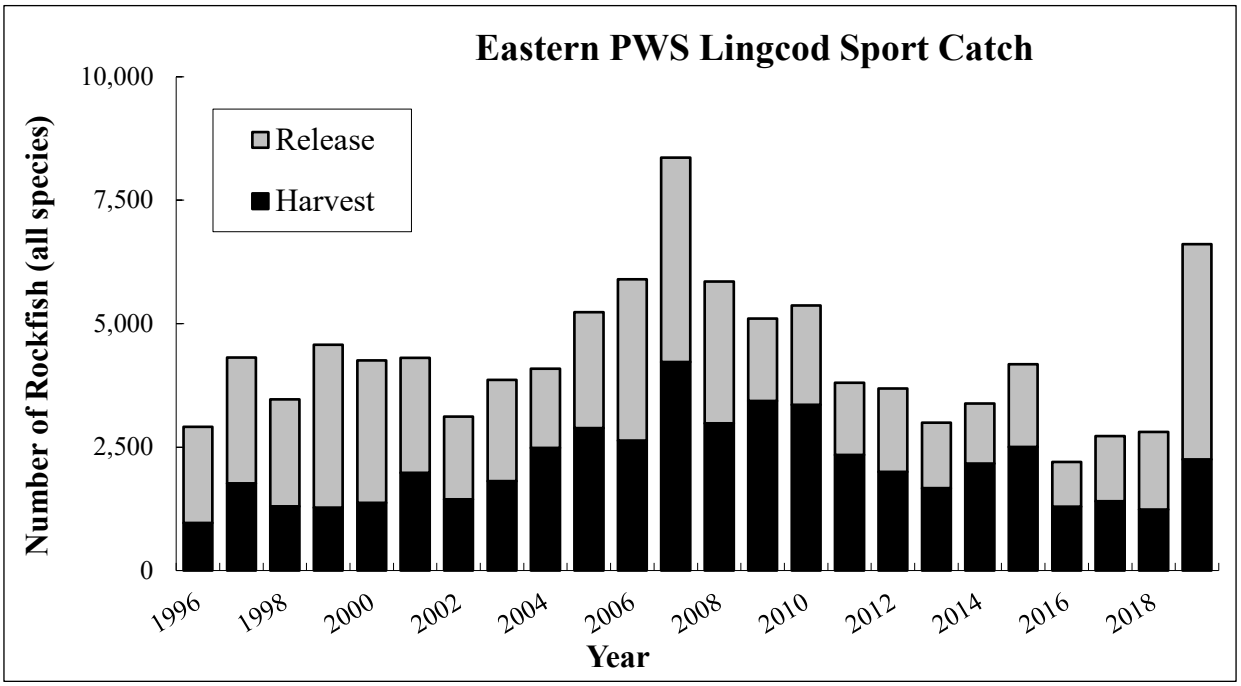

Figure 24.–Total catch, harvest, and release of lingcod in Western PWS, Prince William Sound Management Area, 2001–2019.

Source: Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (accessed October 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

Note: SWHS estimates are apportioned using port sampling interview data to include fish caught in PWS but landed in Seward.

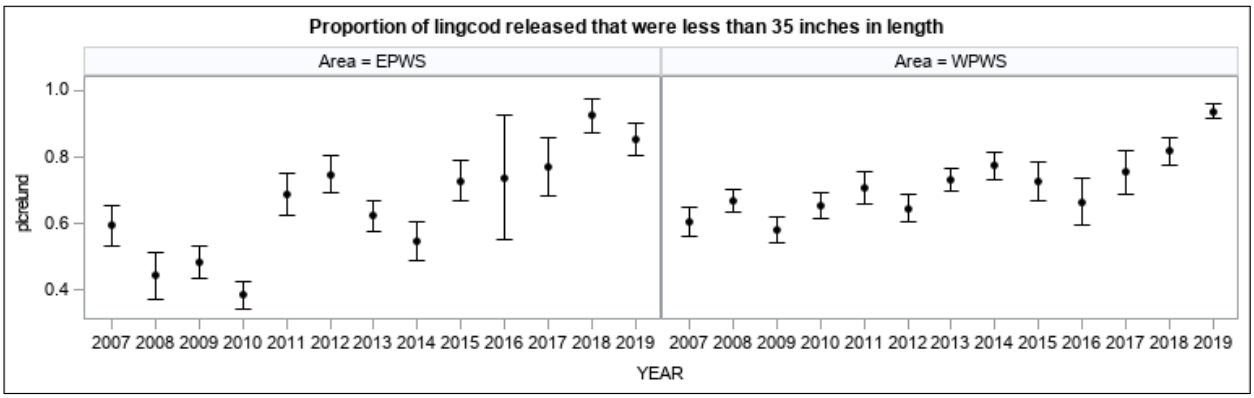

Figure 25.–Proportion of lingcod released less than 35 inches in length in the Prince William Sound Management Area, 2007–2019.

Source: ADF&G port sampling program, Martin Schuster, Fishery Biologist, ADF&G, Homer.

HALIBUT FISHERY

Fishery Description

Pacific halibut are highly sought after by sport anglers in the marine waters of the PWSMA. Most halibut are harvested from May through early September. The average weight of sport-caught halibut ranged from 20 to 30 pounds throughout the 1990s but has since dropped to around 15 pounds. The decline in average weight corresponds with a long-term decline in size-at-age of halibut throughout the Gulf of Alaska (Stewart and Monnahan 2016); since 2014, size limits for the charter sector have further impacted the average weights of halibut in PWSMA. Halibut are caught by anglers fishing from private (unguided) boats and by the charter fleet that both operate out of Seward, Whittier, and Valdez. Halibut fishing out of these ports is highly dependent upon weather. Charter vessels are typically larger than most of the private fleet, which allows them to travel farther to reach waters outside of Prince William Sound and into the Gulf of Alaska where fishing is more productive.

Fishery Management and Objectives

Pacific halibut fisheries are managed by federal and international agencies under the authority of the 1953 Halibut Convention as amended by the 1979 Protocol. The International Pacific Halibut Commission (IPHC), formed in 1923, assesses the halibut stock, conducts research, and sets legal gear, seasons, catch limits, and other regulatory measures for each of 10 regulatory areas. The PWSMA is in IPHC Regulatory Area 3A, which stretches from Cape Spencer to the southwest end of Kodiak Island. Within the United States, the IPHC and National Marine Fisheries Service (NMFS) manage halibut under the Northern Pacific Halibut Act of 1982. The Secretary of Commerce has authority to approve regulations necessary to carry out the objectives of the Convention and Halibut Act. In addition, the North Pacific Fisheries Management Council (NPFMC) has authority to develop regulations for allocation of the halibut resource within Alaska, permitted they are not in conflict with IPHC regulations.

Since the mid-1980s, ADF&G has assumed responsibility for collection of data from the sport fishery to provide harvest information to the IPHC for stock assessments, formulation of harvest strategies, and to aid in apportionment of quota among regulatory areas. ADF&G also provides this information to the NPFMC and analyzes regulatory alternatives for management of the sport charter sector. In IPHC Regulatory Area 3A, these ADF&G data sources include the Alaska Sport Fishing Survey (statewide harvest survey or SWHS), the Saltwater Guide Logbook, and a Pacific halibut and groundfish harvest monitoring program in all major ports in the region.

The IPHC first regulated the sport fishery in 1973. The open season for the halibut sport fishery is February 1–December 31 in all Alaskan waters. A bag limit of 2 fish of any size per day was established in 1975, and a possession limit of 4 fish was implemented in 1988. The bag and possession limits remain in place statewide for the unguided fishery and in western Alaska for the charter fishery. State statutes for licensed sport fishing (AS 16.05.340-430) apply to the Pacific halibut sport fishery.

The charter fisheries in the PWSMA and the rest of the state (Regulatory Areas 2C and parts of 3A not in the PWSMA) have undergone a series of regulatory changes since the early 2000s to address growth of the fishery and perceived impacts on commercial quota shareholders. Allocation conflicts were addressed by 2 major NPFMC actions. In 2011, a limited access program was established for halibut charter vessels in Areas 2C and 3A (Federal Register 75 FR 554). This

program issued permits to charter operators based on historical qualifying boat trips with endorsements for specific numbers of clients. In 2014, a Catch Sharing Plan (CSP) was implemented that allocates harvest between the commercial and charter sectors, establishes regulations to manage the charter fishery on an annual basis, and provides for temporary leases of commercial quota for use in the charter sector (Federal Registrar 78 FR 75844). Annual charter regulations are specific to Regulatory Areas. Charter regulations for Area 3A from 2014 through 2019 can be found in Appendix B1. State statues governing guide registration, logbooks, and vessel registration also apply (5 AAC 75.075–.077).

Historical Fishery Performance

Halibut catches from Area 3A have increased since the 1990s, with 2007 and 2008 having the highest harvests observed on record (402,471 and 343,394 fish, respectively; Table 15). Since 2013, a slight decrease in the number of halibut harvested has been observed for both charter and unguided anglers (Figure 26), but the average halibut weight caught by all anglers increased (Figure 27). Sport harvest yield of halibut has varied between 3.54 and 6.28 million pounds between 1996 and 2016 with a large trend downward since the peak yield in 2007 (Table 15). This downward trend was driven mostly by charter yields, which dropped by half by 2016 (from 4.00 to 2.00 million lb in 2007 and 2016, respectively), whereas the drop in yield for private anglers was less precipitous and even shows a slight increase from 2012 to 2015. There are many factors that could affect total yield of halibut interannually. The large decrease in yield of halibut by charter anglers immediately after 2007 has been attributed to the economic recession and reductions since 2013 are attributed to regulatory action taken by the IPHC and NPFMC, including decreased allocation to Area 3A, implementation of the CSP, and subsequent regulations to reduce angler effort and to limit the size of fish harvested (Appendix B1).

Fishery Performance 2017–2019

The estimated average annual sport harvest of halibut in the Area 3A from 2017 to 2019 is 246,877 fish, which is below the 2007–2016 10-year average of 317,386 fish (Table 15). However, the average weight of sport-caught halibut has increased from 13.69 lb during 2007–2016 to 14.52 lb during 2017–2019. In 2017 through 2019, halibut harvested from the PWSMA contributed approximately 17–23% of the entire harvest (by weight) yielded from of Area 3A (unpublished data, ADF&G port sampling program, Martin Schuster, ADF&G Fishery Biologist, Homer). The 2017–2019 average sport harvest yield of halibut was 3.58 million pounds, which was lower than the 10-year average yield (4.34 million pounds; Table 15). The average yield of halibut in 2017–2019 decreased for charter anglers (2.00 million lb) and was about the same for unguided anglers (1.59 million lb) as the 10-year average (1.69 million lb; Table 15).

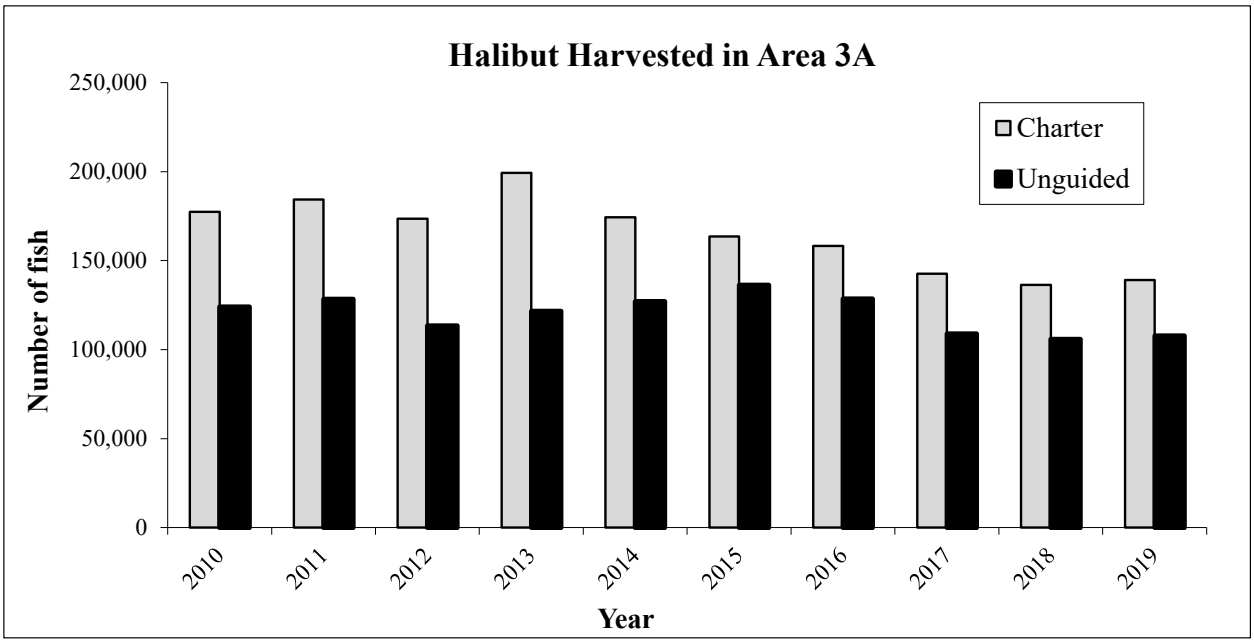

Figure 26.–Halibut sport harvest in Area 3A (including Yakutat and Glacier Bay), 2010–2019.

Sources: (1) Saltwater Logbook Database, 2nd edition. Alaska Department of Fish and Game, Division of Sport Fish. 2006 to present. (Accessed October 6, 2019). URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests; and (2) Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 11, 2019). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

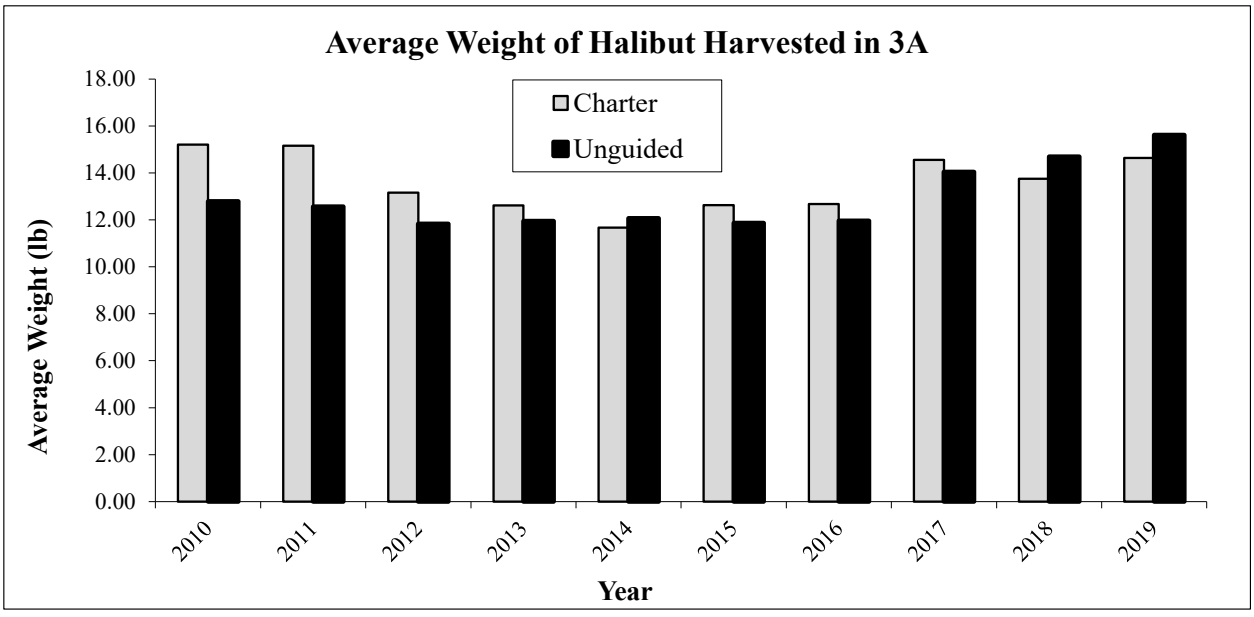

Figure 27.–Average weight of sport harvested halibut in Area 3A, 2010–2019.

Source: Assessment of Pacific Halibut and Groundfish Sport Harvest in Southcentral Alaska (Martin Schuster, Fishery Biologist, ADF&G, port sampling program, Homer), Southeast Alaska Marine Boat Sport Fisher Harvest Studies program (Mike Jaenicke, Fishery Biologist and Diana Tersteeg, Research Analyst, ADF&G, Douglas), and weighted by harvest estimates from the Charter Logbook and SWHS programs.

Note: Data from Yakutat and Glacier Bay are included in 3A.

Table 15.–Sport harvest of halibut in Area 3A, 1996–2019.

	Charter harvest			Unguided			Total sport harvest		
Year	Number[a]	Avg. wt. (lb)[b]	Yield (Mlb)[c]	Number[d]	Avg. wt. (lb)[b]	Yield (Mlb)[c]	Number	Avg. wt. (lb)	Yield (Mlb)[c]
1996	142,957	19.74	2.82	108,812	17.63	1.92	251,769	18.83	4.74
1997	152,856	22.33	3.41	119,510	17.58	2.10	272,366	20.24	5.51
1998	143,368	20.82	2.98	105,876	16.22	1.72	249,244	18.86	4.70
1999	131,726	19.23	2.53	99,498	17.03	1.69	231,224	18.29	4.23
2000	159,609	19.67	3.14	128,427	16.86	2.16	288,036	18.42	5.30
2001	163,349	19.18	3.13	90,249	17.09	1.54	253,598	18.43	4.68
2002	149,608	18.20	2.72	93,240	15.86	1.48	242,848	17.30	4.20
2003	163,629	20.67	3.38	118,004	17.34	2.05	281,633	19.27	5.43
2004	197,208	18.60	3.67	134,960	14.35	1.94	332,168	16.88	5.61
2005	206,902	17.83	3.69	127,086	15.61	1.98	333,988	16.98	5.67
2006	204,115	17.95	3.66	114,887	14.57	1.67	319,002	16.73	5.34
2007	236,133	16.95	4.00	166,338	13.71	2.28	402,471	15.61	6.28
2008	198,108	17.05	3.38	145,286	13.37	1.94	343,394	15.49	5.32
2009	167,599	16.31	2.73	150,205	13.47	2.02	317,804	14.97	4.76
2010	177,460	15.20	2.70	124,088	12.79	1.59	301,548	14.21	4.28
2011	184,293	15.16	2.79	128,464	12.57	1.61	312,757	14.09	4.41
2012	173,582	13.16	2.28	113,359	11.83	1.34	286,941	12.64	3.63
2013	199,248	12.62	2.51	121,568	11.94	1.45	320,816	12.36	3.97
2014	174,351	11.67	2.03	127,125	12.06	1.53	301,476	11.83	3.57
2015	163,632	12.63	2.07	136,225	11.86	1.62	299,857	12.28	3.68
2016	158,212	12.67	2.00	128,582	11.96	1.54	286,794	12.35	3.54
2017	142,664	14.55	2.08	108,972	14.04	1.53	251,636	14.33	3.61
2018	136,312	13.75	1.87	105,880	14.69	1.56	242,192	14.16	3.43
2019	139,082	14.64	2.04	107,722	15.62	1.68	246,804	15.06	3.72
Average									
2007–2016	183,262	14.47	2.65	134,124	12.62	1.69	317,386	13.69	4.34
2017–2019	139,353	14.32	2.00	107,525	14.78	1.59	246,877	14.52	3.58

[a] Saltwater Logbook Database, 2nd edition. Alaska Department of Fish and Game, Division of Sport Fish. 2006 to present. (Accessed October 6, 2020). URL not publicly available as some information is confidential. Contact Research and Technical Services for data requests.

[b] Assessment of Pacific Halibut and Groundfish Sport Harvest in Southcentral Alaska (Martin Schuster, Fishery Biologist, ADF&G, port sampling program, Homer), Southeast Alaska Marine Boat Sport Fisher Harvest Studies program (Mike Jaenicke, Fishery Biologist, and Diana Tersteeg, Research Analyst, ADF&G, Douglas), and weighted by harvest estimates from the Guide Logbook and SWHS programs.

[c] Measured in millions of pounds.

[d] Alaska Sport Fishing Survey database [Intranet]. 1996–present. Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish (cited October 11, 2020). Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

SHRIMP FISHERY

FISHERY DESCRIPTION

The Prince William Sound shrimp sport fishery is conducted mainly out of the ports of Whittier and Valdez. The PWS shrimp sport fishery is currently grouped with the PWS shrimp subsistence fishery as the "noncommercial shrimp fisheries." Unless an emergency order (EO) is issued modifying the regulations, participants are required to have a permit, record harvest, and use no more than 5 pots per person and vessel (regardless of the number of permit holders on a vessel) within the established fishing season (15 April–15 September). Effort and harvest by Whittier anglers is concentrated in the Passage Canal, Culross Island, and Port Wells areas, whereas Valdez anglers tend to have more effort and harvest concentrated near Port Valdez and Valdez Arm.

The noncommercial shrimp pot fishery in PWS was historically composed of sport, personal use, and subsistence fisheries. In 2016, personal use fishing regulations were repealed by the BOF to simplify regulations because they were redundant to sport fishing regulations. Beginning in 2017, the noncommercial shrimp season only consisted of sport and subsistence shrimp pot fisheries in PWS. The sport fishery harvest of shrimp has been documented since 1994 by statewide harvest surveys (SWHS) and intermittently by harvest permits since 2002 (no permits were required from 2006 to 2008; Marston and Brazil 2008).

FISHERY MANAGEMENT AND OBJECTIVES

In 1999, the BOF established a pot limit of 5 pots per vessel to maintain a modest noncommercial shrimp fishery in PWS. In 2000, the Anton Anderson Memorial Tunnel opened to vehicle traffic, providing increased access to the PWS port of Whittier. The initial 5-pot limit was retained, and the BOF delegated authority to ADF&G to modify effort, area, and season to match trends in harvestable surpluses.

An index of the abundance of spot shrimp (*Pandalus platyceros*) in PWS is monitored annually by pot survey by ADF&G Division of Commercial Fisheries (CF). The commercial pot survey began in 1989 as part of the *Exxon Valdez* oil spill (EVOS) damage assessment process, and CF initiated the annual survey using pot gear to assess spot shrimp abundance in oiled areas of PWS (Trowbridge 1992, 1994). The survey transitioned into an abundance index assessment tool starting in 1992. Between 1992 and 2009, it was determined that the shrimp stocks were not strong enough to continue to prosecute a commercial fishery, but the BOF allowed a noncommercial fishery to maintain historical harvest levels. From 2006 to 2008, the fishery was monitoring using information from the SWHS. In 2009, ADF&G determined that the PWS shrimp stocks were rebounding and some surplus above the noncommercial harvest could allow for a limited commercial fishery.

In March of 2009, BOF adopted the *PWS Noncommercial Shrimp Fishery Management Plan* (Alaska Administrative Code 5 AAC 55.055), allowing for the possibility of a commercial pot shrimp fishery if the total allowable harvest (TAH) exceeds 110,000 lb (5 AAC 31.214; Table 1 in Wessel et al. 2015). The *PWS Noncommercial Shrimp Fishery Management Plan* determined allocation, established pot limits (no more than 5 pots per person and vessel limit may be used to take shrimp), and established a shrimp fishing season (15 April–15 September). The annual TAH is determined prior to the start of the fishing season (April 15) using a surplus production model with historical harvest information as well as CPUE information from ADF&G's Division of Commercial Fisheries pot survey, which made it necessary to reinstate the noncommercial shrimp

permit prior to the start of the 2009 shrimp pot fishery season. The *PWS Noncommercial Shrimp Fishery Management Plan* allocates 60% of the TAH to noncommercial users and 40% to commercial users (Wessel et al. 2015).

In 2010, an emergency order was issued to increase the maximum pot limit from 5 to 8 per vessel; as a result, effort and harvest increased that year (Hochhalter and Hansen 2011). Since 2010, the pot limit of 5 per vessel has not been liberalized. In 2012, the BOF revisited the shrimp pot fishery management plan and repealed ADF&G's emergency order authority under 5 AAC 75.003 to increase the pot limit. However, this did not limit ADF&G's emergency order authority under AS 16.05.060 to restrict the fishery preseason as needed for conservation purposes. Since 2016, ADF&G has issued preseason emergency orders reducing the number of pots per vessel that may be used to take shrimp. In 2016, 2017, and 2018, the pot limit per person and vessel was reduced to 4 pots, and in 2019, the pot limit was further reduced to 3 pots.

There is no threshold of harvestable surplus that must be met for the noncommercial shrimp fisheries to take place. ADF&G uses estimates of harvestable surpluses to guide management decisions such as the number of pots that may be used that season. In years with potentially low or no harvestable surpluses, ADF&G has emergency order (EO) authority to close the fishery or reduce the number of pots. In years with potentially high harvestable surpluses, ADF&G does not have the authority to increase the number of pots.

PWS noncommercial shrimp permits are available online starting in mid-March to early April to those that would like to participate in the fishery and are available throughout the season. Due to the number of participants and the challenges of managing and enforcing inseason reporting once the fishery begins, ADF&G does not specifically track or actively manage these fisheries inseason. Permit holders are required to keep records of harvest during the fishing season. Postseason (by October 15) harvest reports for the full season are required to be submitted online to ADF&G. Permits that are not reported by deadlines are sent 2 reminder notifications. On average, response rate by participants reporting harvest has been around 90%. ADF&G uses harvest records to estimate noncommercial shrimp harvest after the fishing season has concluded.

HISTORICAL FISHERY PERFORMANCE

Total harvest of shrimp by noncommercial users in PWSMA increased from 9,288 lb in 2002 to 102,785 lb in 2016 (Table 16, Figure 28). Effort in the noncommercial fishery increased since 2002 from 19,387 pot-days to a peak of 78,083 pot-days in 2010 when ADF&G issued an EO increasing the pot limit to 8. Following the repeal of this authority, the average effort (2012–2016) was much less at 48,682 pot-days (Table 16). However, catch-per-unit effort increased between 2012 and 2016 from 1.76 to 2.28 (Figure 28).

FISHERY PERFORMANCE AND ABUNDANCE 2017–2019

The average harvest (108,048 lb) and number of PWS shrimp permits issued (3,821) from 2017 to 2019 were slightly higher than the prior 5-year (2012–2016) averages (85,153 lb and 3,192 permits, respectively), although average effort decreased slightly from 48,682 pot-days to 45,709 pot-days. Effort in 2019 was the lowest since 2005 (39,816 pot-days; Figure 28). The low effort in 2019 can be attributed to a preseason emergency order (EO 2-SHR-6-15-19) taken to reduce the maximum number of pots allowed to 3 per vessel. This was the first year a pot reduction down to 3 pots had ever occurred; however, with the increase in harvest observed in 2018 and the exceeded GHL, this action was necessary to stay close to the GHL in 2019.

Table 16.–Number of permits issued, response rate, permits fished, total pot-days of effort, catch-per unit effort (CPUE), guideline harvest level (GHL), and total harvest in pounds of whole shrimp in the noncommercial shrimp fishery, Prince William Sound Management Area, 2002–2019.

Year	Permits issued	Percent response	Permits recorded fishing		Effort[a]	CPUE	GHL	Harvest[b]	% of GHL[b]
			Number	%	(pot days)			(lb)	(known)
2002	717	84	385	54	19,387	0.48[b]	[c]	9,288[b]	[c]
2003	1,061	91	614	58	24,094	0.58[b]	[c]	13,965[b]	[c]
2004	1,649	90	902	55	30,694	0.84[b]	[c]	25,694[b]	[c]
2005	2,112	90	1,202	57	37,271	0.86[b]	[c]	31,950[b]	[c]
2006–2008	[d]	[d]	[d]	[d]	[d]	[d]	[d]	[d]	[d]
2009	2,733	89	1,719	63	47,631	1.18[b]	57,900[b]	56,120[b]	97[b]
2010	3,181	90	2,007	63	78,083	1.12[b]	82,200[b]	87,699[b]	107[b]
2011	3,309	88	1,972	60	56,543	1.05[b]	79,200[b]	59,182[b]	75[b]
2012	3,098	87	1,829	59	52,620	1.06[b]	76,860[b]	55,765[b]	73[b]
2013	3,101	89	1,895	61	48,976	1.76	99,450	85,988	86
2014	3,134	86	1,903	61	48,283	1.85	99,900	89,155	89
2015	3,033	87	1,847	61	48,521	1.9	100,000	92,072	92
2016	3,592	91	2,107	59	45,012	2.28	70,500	102,785	146
2017	3,441	92	2,149	62	45,606	2.03	100,000	92,365	92
2018	3,810	90	2,259	59	51,704	2.49	100,700	128,860	128
2019	4,211	88	2,321	55	39,816	2.58	102,100	102,919	101
Average									
2012–2016	3,192	88	1,916	60	48,682	1.77	89,342	85,153[b]	97[b]
2017–2019	3,821	90	2,243	59	45,709	2.37	100,933	108,048	107

[a] Effort is expanded to account for nonrespondents.

[b] Estimates using conversion factor known at the time. From 2002 to 2012, a conversion factor of 2.4 lb/gal of shrimp was used to estimate harvest in pounds. In late 2012, this conversion factor was re-evaluated and set at 3.89 lb/gal based on an ADF&G study (Maria Wessel, ADF&G Division of Commercial Fisheries, unpublished data). Footnoted (b) numbers were produced with a conversion factor of 2.4 lb/gal.

[c] No calculation was made because this was prior to the establishment of a GHL.

[d] No PWS shrimp permit was required from 2006 through 2008.

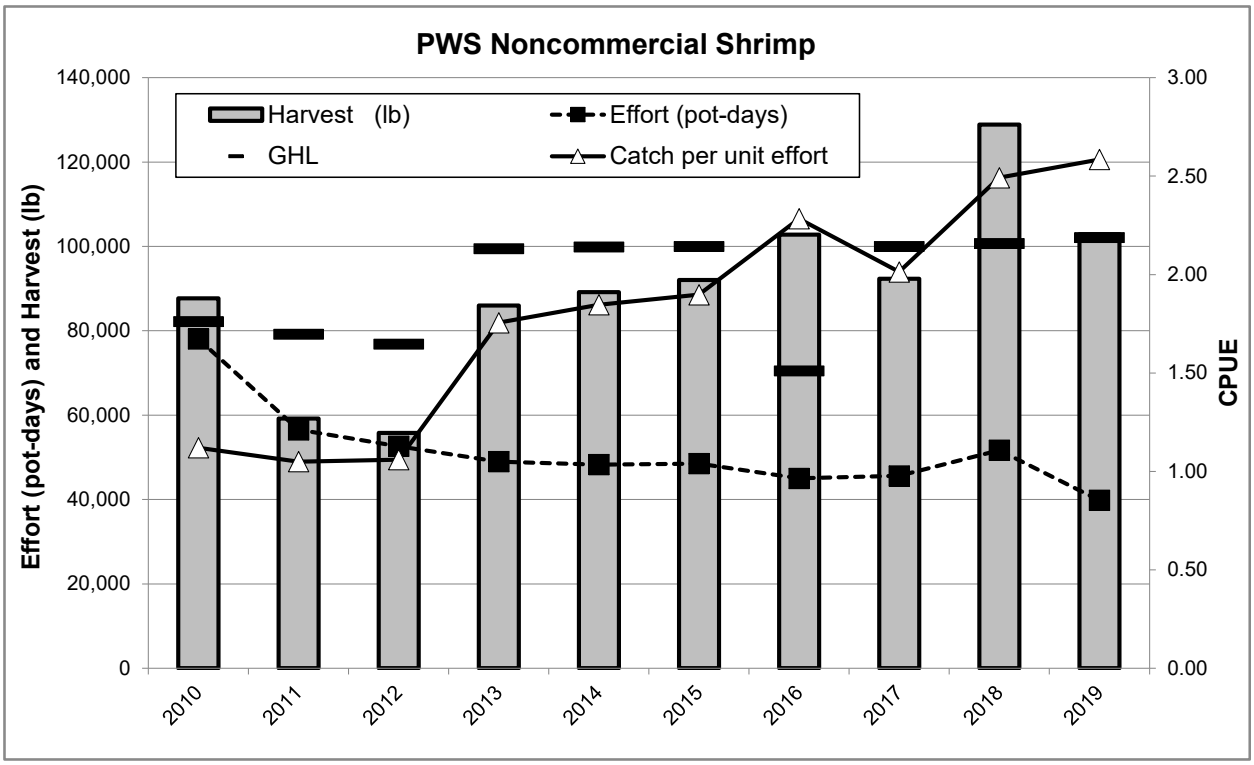

Figure 28.–Guideline harvest level (GHL), pot-days of effort, catch per unit effort (CPUE), and harvest (lb) in the noncommercial shrimp fishery, Prince William Sound Management Area, 2009–2019.

During 2017 and 2018, the pot limit was reduced by EO from 5 pots to 4 pots (Table 17). In 2017, harvest was just below the GHL; however, in 2018, the GHL was exceeded by 28%. In 2019, the pot limit was reduced to 3 pots per vessel, and the GHL was fully utilized. Even with the reduced number of pots and the reduced amount of effort, the pounds of shrimp harvested in 2019 (102,919) was the second highest on record (Table 16). In 2019, the number of permits issued also increased; however, 55% of the permits were recorded fishing, which was slightly below the 2012–2016 average (60%). The high catches and reduced effort created historically high catch per unit effort (CPUE). The high CPUE is most likely due to high abundance of shrimp or increased angler efficiency. Since 2016, the commercial shrimp pot survey has also observed high average CPUE levels at the index sites across PWS.

Additional information on the PWS shrimp fishery will be reported in Rumble et al. (*In prep*).

Table 17.–Prince William Sound sport and personal use (2010–2017) shrimp pot fishery emergency orders, 2010–2019.

Emergency order	Effective date	Explanation
		2010 Calendar Year
2-SHR-6-03-10	4/15/2010	Liberalizes the number of shrimp pots allowed to harvest shrimp in the Prince William Sound sport fishery from 5 pots per person with a maximum of 5 pots per vessel, to 8 pots per person with a maximum of 8 pots per vessel.
		2011–2015 Calendar Year
		No noncommercial fisheries EOs issued.
		2016 Calendar Year
2-SHR-6-13-16	4/15/2016	Restricts the number of shrimp pots allowed to harvest shrimp in the Prince William Sound sport fishery from 5 pots per person with a maximum of 5 pots per vessel, to 4 pots per person with a maximum of 4 pots per vessel.
2-SHR-6-14-16	4/15/2016	Restricts the number of shrimp pots allowed to harvest shrimp in the Prince William Sound personal use fisheries from 5 pots per person with a maximum of 5 pots per vessel, to 4 pots per person with a maximum of 4 pots per vessel.
		2017 Calendar Year
2-SHR-6-11-17	4/15/2017	Restricts the number of shrimp pots allowed to harvest shrimp in the Prince William Sound sport fishery from 5 pots per person with a maximum of 5 pots per vessel, to 4 pots per person with a maximum of 4 pots per vessel.
		2018 Calendar Year
2-SHR-6-05-18	4/15/2018	Restricts the number of shrimp pots allowed to harvest shrimp in the Prince William Sound sport fishery from 5 pots per person with a maximum of 5 pots per vessel, to 4 pots per person with a maximum of 4 pots per vessel.
		2019 Calendar Year
2-SHR-6-15-19	4/15/2019	Restricts the number of shrimp pots allowed to harvest shrimp in the Prince William Sound sport and subsistence fisheries from 5 pots per person with a maximum of 5 pots per vessel, to 3 pots per person with a maximum of 3 pots per vessel.

REFERENCES CITED

Ashe, D., D. Gray, B. Lewis, R. Merizon, and S. Moffitt. 2005. Prince William Sound Management Area 2003 annual finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 05-54, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/fmr05-54.pdf.

Barclay, A. W., B. J. Failor, and C. Habicht. 2016. Report to the Alaska Board of Fisheries: Progress report on genetic and coded wire tag mixed stock analysis of Chinook salmon harvested in Cook Inlet marine sport fishery, 2014–2016. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 5J16-09, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/RIR.5J.2016.09.pdf.

Blain, B. J., and T. M. Sutton. 2016. Reproductive status and blood plasma indicators of sex and gonad maturation status for yelloweye rockfish following barotrauma and recompression events. Transactions of the American Fisheries Society 145(6):1234–1240.

Blain-Roth, B. J., J. Baumer, and J. Huang. *In prep*. Post-recompression survival of rockfish in Prince William Sound. Alaska Department of Fish and Game, Fishery Data Series, Anchorage.

Botz, J., G. Hollowell, J. Bell, R. Brenner, and S. Moffitt. 2010. 2009 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 10-55, Anchorage. http://www.adfg.alaska.gov/FedAidpdfs/FMR10-55.pdf.

Botz, J., C. W. Russell, J. Morella, and S. Haught. 2021. 2020 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 21-18, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/FMR21-18.pdf.

Brylinsky, C. K., K. Carroll, M. Vaughn, J. Stahl, A. Sayer, and D. Holum. 2008. 2009 Report to the Alaska Board of Fisheries, groundfish fisheries Region 1: Southeast Alaska-Yakutat. Alaska Department of Fish and Game, Fishery Management Report No. 08-64, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/fmr08-64.pdf.

Byerly, M., M. Spahn, and K. J. Goldman. 2015. Chiswell Ridge lingcod ROV survey with ancillary population estimates of demersal shelf rockfish, 2005. Alaska Department of Fish and Game, Fishery Data Series No. 15-26, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/FDS15-26.pdf.

Cass, A. J., R. J. Beamish, and G. A. McFarlane. 1990. Lingcod (*Ophiodon elongatus*). Canadian Special Publication of Fisheries and Aquatic Sciences 109, Ottawa.

Clark, R. A. 2009. An evaluation of estimates of sport fish harvest from the Alaska statewide harvest survey, 1996–2006. Alaska Department of Fish and Game, Special Publication No. 09-12, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/SP09-12.pdf.

Currens, K. P., K. E. Griswold, and G. H. Reeves. 2003. Relations between Dolly Varden and between coastal cutthroat trout populations in Prince William Sound, *Exxon Valdez* Oil Spill Restoration Project Final Report (Restoration Project No. 98145). U. S. Department of Agriculture, U. S. Forest Service, Pacific Northwest Research Station, Corvallis, OR.

Donaldson, W., S. Morstad, D. Sharp, J. Wilcock, and S. Sharr. 1995. Prince William Sound management area 1993 annual finfish management report. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 2A95-20, Anchorage http://www.adfg.alaska.gov/FedAidPDFs/RIR.2A.1995.20.pdf.

Haak, A. L., J. E. Williams, H. M. Neville, D. C. Dauwalter, and W. T. Colyer. 2010. Conserving peripheral trout populations: the values and risks of life on the edge. Fisheries 35(11):530–549.

Hepler, K. R., P. A. Hansen, and D. R. Bernard. 1996. Impact of oil spilled from the Exxon Valdez on survival and growth of Dolly Varden and cutthroat trout in Prince William Sound, Pages 645-658 [*In*] S. D. Rice, R. B. Spies, D. A. Wolfe, and B. A. Wright, editors. Proceedings of the Exxon Valdez oil spill symposium. American Fisheries Society, Symposium 18, Bethesda, MD.

Hochhalter, S. J. 2012. Modeling submergence success of discarded yelloweye rockfish (*Sebastes ruberrimus*) and quillback rockfish (*Sebastes maliger*): toward improved estimation of total fishery removals. Fisheries Research 127–128:142–147.

REFERENCES CITED (Continued)

Hochhalter, S. J., B. J. Blain, and B. J. Failor. 2011. Recreational fisheries in the Prince William Sound Management Area, 2008–2010. Alaska Department of Fish and Game, Fishery Management Report No. 11-54, Anchorage. http://www.adfg.alaska.gov/FedAidpdfs/FMR11-54.pdf.

Hochhalter, S. J., and P. A. Hansen. 2011. Summary of the noncommercial pot shrimp fishery by permit for Prince William Sound, Alaska, 2002–2005 and 2009–2010. Alaska Department of Fish and Game, Fishery Data Series No. 11-67, Anchorage. http://www.adfg.alaska.gov/FedAidpdfs/FDS11-67.pdf.

Hochhalter, S. J., and D. J. Reed. 2011. The Effectiveness of deepwater release at improving the survival of discarded yelloweye rockfish. North American Journal of Fisheries Management 31(5):852–860.

Howard, K. G., S. Campen, F. R. Bowers, R. E. Chadwick, J. W. Erickson, J. J. Hasbrouck, T. R. McKinley, J. Nichols, N. Nichols, A. Olson, J. Rumble, T. T. Taube, and B. Williams. 2019. ADF&G Statewide Rockfish Initiative: Strategic plan 2017–2020. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 5J19-05, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/RIR.5J.2019.05.pdf.

Marston, B. H., and C. E. Brazil. 2008. Area Management Report for the recreational fisheries of Prince William Sound, 2007. Alaska Department of Fish and Game, Fishery Management Report No. 08-55, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/fmr08-55.pdf.

Meyer, S. C., and B. J. Failor. *In prep*. Characteristics of the sport harvest of rockfishes *Sebastes* in Southcentral Alaska, 1996–2015. Alaska Department of Fish and Game, Fishery Data Series, Anchorage.

Milani, K. 2008. Annual management report for the Bering Sea-Aleutian Islands Area State-Waters groundfish fisheries and groundfish harvest from parallel seasons in 2007. Alaska Department of Fish and Game, Fishery Management Report No. 08-43, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/fmr08-43.pdf.

Mills, M. J., and A. L. Howe. 1992. An evaluation of estimates of sport fish harvest from the Alaska statewide mail survey. Alaska Department of Fish and Game, Special Publication No. 92-02, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/sp92-02.pdf.

Morella, J., C. W. Russell, J. Botz, and S. Haught. 2021. 2019 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 21-19, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/FMR21-19.pdf.

Orr, J. W., and J. E. Blackburn. 2004. The dusky rockfishes (Teleostei: Scorpaeniformes) of the North Pacific Ocean: resurrection of *Sebastes variabilis* (Pallas, 1814) and a redescription of *Sebastes ciliatus* (Tilesius, 1813). Fishery Bulletin 102:328–348.

Rumble, J. M., J. Baumer, X. Zhang, B. Buzzee, E. Russ, J. Loboy, and M. Byerly. *In prep*. Prince William Sound shrimp pot fisheries, 2010–2020. Alaska Department of Fish and Game, Special Publication, Anchorage.

Russell, C. W., J. Botz, S. Haught, and S. Moffitt. 2017. 2016 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 17-37, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/FMR17-37.pdf.

Sheridan, T., J. Botz, A. Wiese, S. Moffitt, and R. Brenner. 2013. 2012 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 13-46, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/FMR13-46.pdf.

Stewart, I. J., and C. C. Monnahan. 2016. Overview of data sources for the Pacific halibut stock assessment and related analyses. Pages 99–187 [*In*] International Pacific Halibut Commission Report of Assessment and Research Activities, 2015. http://www.iphc.int/publications/rara/2015/RARA2015_11Assessmenddatasources.pdf.

Stock, C. E., and S. C. Meyer. 2005. Composition of the recreational lingcod harvest in Southcentral Alaska, 1993–2002. Alaska Department of Fish and Game, Fishery Data Series No. 05-35, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/Fds05-35.pdf.

Thalhauser, M. 2014. Recreational fisheries in the Prince William Sound Management Area, 2011–2013. Alaska Department of Fish and Game, Fishery Management Report No. 14-44, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/FMR14-44.pdf.

REFERENCES CITED (Continued)

Trowbridge, C. 1992. Prince William Sound management area 1991 shellfish annual management report. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 2A92-25, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/RIR.2A.1992.25.pdf.

Trowbridge, C. 1994. Spot shrimp *Pandalus platyceros* surveys in the Prince William Sound management area, 1989–1993. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report No. 2A94-31, Anchorage. http://www.adfg.alaska.gov/FedAidpdfs/RIR.2A.1994.31.pdf.

Wessel, M., M. Thalhauser, K. J. Goldman, X. Zhang, P. A. Hansen, J. Rumble, and C. Russ. 2015. Prince William Sound shrimp pot fisheries, 2010–2014. Alaska Department of Fish and Game, Special Publication No. 15-03, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/SP15-03.pdf.

APPENDIX A: HISTORY OF FISH STOCKING IN PRINCE WILLIAM SOUND

Appendix A1.–Number of fish stocked in lakes near Valdez in the Prince William Sound Management Area, 1966–2019.

	Ruth Pond		Thompson Lake		Blueberry Lake
Year	Rainbow trout	Arctic grayling	Rainbow trout	Arctic grayling	Rainbow trout
1966	–	–	2,000	24,259	2,000
1968	–	–	5,000	24,990	2,000
1970	–	–	5,000	25,720	3,000
1972	–	6,000	500	26,451	3,000
1974	–	–	–	10,000	3,000
1976	–	–	–	–	3,000
1978	–	–	–	10,000	–
1980	–	–	–	–	–
1981	–	–	–	11,579	1,950
1982	–	–	–	–	–
1983	–	–	–	9,500	3,000
1984	–	–	–	–	–
1985	–	–	–	10,000	2,100
1986	–	–	–	–	1,500
1987	–	–	–	10,000	–
1988	545	–	–	10,000	2,463
1989	1,002	–	–	10,000	–
1990	728	–	–	–	2,000
1991	1,052	–	–	10,000	–
1992	–	–	–	–	2,000
1993	504	–	–	10,000	–
1994	518	–	–	–	2,000
1995	1,710	–	–	–	1,038
1996	1,028	–	–	–	980
1997	1,500	–	–	–	1,000
1998	1,596	–	–	–	500
1999	1,481	–	–	–	480
2000	1,750	–	–	1,117	500
2001	1,000	1,000	–	1,045	544
2002	1,000	–	–	1,008	438
2003	1,114	–	–	–	556
2004	765	–	–	1,000	439
2005	592	–	–	–	292
2006	498	–	–	1,506	–
2007	1,495	–	–	1,000	–
2008	916	–	–	–	–
2009	933	–	–	1,000	–
2010	1,900	–	–	5,000	–
2011	–	–	–	3,000	–
2012	2,237	–	–	1,531	534
2013	1,604	–	–	1,264	500
2014	1,325	–	–	1,015	500
2015	1,027	–	–	955	500
2016	1,454	–	–	–	520

-continued-

	Ruth Pond		Thompson Lake		Blueberry Lake
Date	Rainbow trout	Arctic grayling	Rainbow trout	Arctic grayling	Rainbow trout
2017	1,041	–	314	–	532
2018	1,023	–	586	–	595
2019	985	–	566	918	546

Source: These data are summarized from the ADF&G Alaska Lake Database. Available at: http://www.adfg.alaska.gov/SF_Lakes/ (accessed January 12, 2021).

Note: An en dash means no stocking occurred for that species.

Appendix A2.–Stocking of Chinook salmon by location and hatchery in the Prince William Sound Management Area, 1985–2019.

	PWSAC[a]-Wally Noerenberg Hatchery						ADF&G				
Year	Chenega Bay	Fleming Spit	Lake Bay	Whittier and Lake Bay	Whittier and Cordova	Whittier	Fleming Spit	Whittier	Valdez Glacier Str	Valdez Harbor	Valdez old town site
1985	–	–	–	–	–	–	–	–	–	–	–
1986	–	–	57,544	–	–	–	–	–	–	–	–
1987	–	–	–	–	–	–	–	50,143	–	–	–
1988	–	–	44,787	–	–	–	–	–	–	–	–
1989	–	–	144,934	–	–	–	–	–	–	–	–
1990	–	20,282	121,657	–	–	–	–	–	–	–	–
1991	–	–	241,348	–	169,549	–	–	–	–	–	–
1992	–	102,116	274,754	102,024	–	–	–	–	–	–	–
1993	–	–	273,429	–	199,002	–	–	–	–	–	–
1994	50,318	99,334	539,195	–	–	98,302	–	–	–	–	–
1995	49,990	89,197	395,850	–	–	102,095	–	–	–	–	–
1996	49,900	–	36,515	–	–	–	–	–	–	–	–
1997	49,733	46,111	–	–	–	–	–	–	–	–	–
1998	43,411	35,627	–	–	–	–	–	–	–	–	–
1999	–	–	–	–	–	–	49,773	–	49,853	–	–
2000	–	–	–	–	–	–	45,000	–	115,582	–	–
2001	–	–	–	–	–	–	94,812	95,823	–	94,701	–
2002	–	–	–	–	–	–	109,656	109,763	–	107,861	–
2003	–	–	–	–	–	–	109,757	109,700	–	109,661	–
2004	–	–	–	–	–	–	58,000	128,611	–	–	99,464
2005	–	–	–	–	–	–	87,591	118,059	–	–	143,209
2006	–	–	–	–	–	–	113,576	–	–	–	112,221
2007	–	–	–	–	–	–	119,860	–	–	–	126,241
2008	–	–	–	–	–	–	114,627	–	–	–	126,703
2009	–	–	–	–	–	–	68,173	–	–	–	107,883
2010	–	–	–	–	–	–	111,383	–	–	–	113,801
2011	–	–	–	–	–	–	86,428	100,094	–	–	113,782
2012	49,700	–	–	–	–	–	103,515	–	–	–	102,215
2013	48,000	–	–	–	–	–	69,416	69,567	–	–	70,656

-continued-

Appendix A2.–Page 2 of 2.

	PWSAC[a]-Wally Noerenberg Hatchery						ADF&G				
Year	Chenega Bay	Fleming Spit	Lake Bay	Whittier and Lake Bay	Whittier and Cordova	Whittier	Fleming Spit	Whittier	Valdez Glacier Str	Valdez Harbor	Valdez old town site
2014	25,800	–	–	–	–	–	87,145	–	–	–	–
2015	44,200	–	–	–	–	–	111,151	101,079	–	–	–
2016	49,600	–	–	–	–	–	104,210	92,954	–	–	–
2017	32,100	–	–	–	–	–	102,633	100,355	–	–	–
2018	49,400	–	–	–	–	–	107,306	–	–	–	–
2019	49,134	–	–	–	–	–	110,874	118,535	–	–	–
Average											
2007–2016	43,460	–	–	–	–	–	97,591	90,924	–	–	–
2017–2019	43,545	–	–	–	–	–	106,938	109,445	–	–	–

Source: These data are summarized from the ADF&G Hatchery Release Report Data from the Mark, Tag, Age Lab (https://mtalab.adfg.alaska.gov/CWT/Reports-My_Taglab.aspx, accessed January 12, 2021).

Note: An en dash means no stocking occurred.

[a] Prince William Sound Aquaculture Corporation.

Appendix A3.–Stocking of coho salmon by location and hatchery in the Prince William Sound Management Area, 1985–2019.

	PWSAC[a]					ADF&G	
Year	Chenega Bay	Fleming Spit	Lake Bay	Whittier, Fleming Spit, and Lake Bay	Whittier	Fleming Spit	Whittier
1985	–	–	–	–	–	–	108,500
1986	–	–	98,778	–	–	44,470	104,696
1987	–	–	376,385	–	–	58,213	55,546
1988	–	–	871,469	–	–	–	107,428
1989	–	–	5,099,043	–	–	75,113	82,379
1990	–	–	2,460,620	–	–	54,815	88,194
1991	–	40,080	2,083,292	–	100,254	–	–
1992	–	123,658	1,563,711	–	143,829	–	–
1993	–	–	–	1,303,077	–	–	–
1994	–	–	–	1,484,936	–	–	–
1995	–	100,260	1,861,922	–	101,774	–	–
1996	–	49,845	176,913	–	48,648	–	–
1997	–	49,583	104,944	–	49,124	–	–
1998	–	102,955	205,518	–	99,242	–	–
1999	56,467	99,943	830,243	–	81,685	–	–
2000	47,395	93,000	187,775	–	47,500	–	–
2001	50,341	73,949	47,861	–	49,816	–	–
2002	48,935	100,435	241,545	–	94,919	–	–
2003	53,594	100,781	666,541	–	99,942	–	–
2004	50,000	89,893	749,598	–	99,892	–	–
2005	50,000	105,892	796,153	–	105,877	–	–
2006	50,000	36,748	866,319	–	99,830	–	–
2007	50,000	100,000	1,600,000	–	100,000	–	–
2008	50,000	100,000	1,680,000	–	100,000	–	–
2009	20,000	80,000	106,000	–	20,000	–	–
2010	50,000	100,000	3,240,000	–	100,000	–	–
2011	50,000	100,000	3,230,000	–	100,000	–	–
2012	25,000	75,000	868,000	–	50,000	–	–
2013	50,000	100,000	2,960,000	–	100,000	–	–
2014	50,000	50,000	757,000	–	50,000	–	–
2015	25,000	25,000	295,000	–	25,000	–	–
2016	50,000	100,000	3,090,000	–	100,000	–	–
2017	50,000	75,000	1,190,000	–	75,000	–	–
2018	50,000		2,091,000	–	100,000	–	–
2019	48,454	102,456	1,643,371	–	92,541	–	–
Average							
2007-2016	42,000	83,000	1,782,600	–	74,500	–	–
2018-2019	49,485	88,728	1,641,457	–	89,180	–	–

Source: These data are summarized from the ADF&G Hatchery Release Report Data from the Mark, Tag, Age Lab (https://mtalab.adfg.alaska.gov/CWT/Reports-My_Taglab.aspx, accessed January 12, 2021).

Note: An en dash means no stocking occurred.

[a] Prince William Sound Aquaculture Corporation.

APPENDIX B: REGULATION HISTORY

Appendix B1.–Regulation history for the Prince William Sound Management Area.

Regulatory extent	Effective date(s)	Regulation [a]
Areawide		
	1994	In all fresh waters, only unbaited artificial lures may be used from 15 April through 14 June.
	2009	The western sport fish regulatory boundary moved from Cape Puget to Cape Fairfield. All regulatory boundaries (commercial, sport, personal use, subsistence) now have the same western boundary.
Cutthroat trout		
	1957–1982	Part of an aggregate freshwater limit of trout, grayling, and lake trout (later "char") of 15 per day, 30 in possession with a limit of only 3 over 20 inches. No saltwater limits.
	1983	Limits for each species established. The limits for "trout" set at 3 per day, 6 in possession over 20 inches and 15 per day, 30 in possession under 20 inches.
	1985	Trout limits set at 5 per day, 10 in possession with only 1 over 20 inches.
	1991	The bag and possession limits separated from rainbow trout and set at 2 per day and in possession, except along the Cordova road system where it is 5 per day and in possession, with only 1 per day and in possession over 10 inches.
	1994	Spawning season closure from 15 April through 14 June.
	1999	*Copper River Delta Special Management Area for Trout* (Alaska Administrative Code 5 AAC 55.033) established: Only unbaited, single-hook, artificial lures allowed year-round in all fresh waters south of Miles Lake Glacier and east of the Copper River (excluding the Clear Creek drainage), and all waters draining into the Gulf of Alaska west of Cape Suckling. In addition, no retention of rainbow/steelhead trout or cutthroat trout allowed year-round.
	2002	New limits established that combined rainbow and cutthroat trout as a single bag and possession limit for all trout. For Cordova road system streams, limits are 5 trout per day and in possession, with only 1 per day and in possession over 10 inches. For all other waters, bag and possession limits are 2 fish with only 1 over 20 inches.
	2006	Rainbow/steelhead/cutthroat trout bag and possession limits 2 fish, only 1 may be 20 inches or greater per day; annual limit of 2 fish 20 inches or greater must be recorded on license. These regulations do not include the *Copper River Delta Special Management Area* specified in 5 AAC 55.033 or stocked lakes.
	2012	Rainbow/steelhead/cutthroat trout bag and possession limits 2 fish, with a minimum size of 11 inches and a maximum limit of 16 inches. These regulations do not include the *Copper River Delta Special Management Area* specified in 5 AAC 55.033 or stocked lakes.
	2014	Bag limits established for rainbow/steelhead trout and cutthroat trout in the *Copper River Delta Special Management Area for Trout* (repealed 3/29/15) as 2 per day with 1 fish over 20 inches from June 15 through April 14.
Rainbow trout		Prior to 1991, bag and possession limits were included with cutthroat trout as "trout" limits (see cutthroat trout above)
	1991	Bag and possession limits separated from cutthroat trout and set at 5 per day, 10 in possession, only 1 per day and 2 in possession over 20 inches.

-continued-

Regulatory extent	Effective date(s)	Regulation [a]
Rainbow trout (continued)		
	1999	*Copper River Delta Special Management Area for Trout* (Alaska Administrative Code 5 AAC 55.033) established (repealed 3/29/15). Only unbaited, single-hook, artificial lures allowed year-round in all fresh waters south of Miles Lake Glacier and east of the Copper River (excluding the Clear Creek drainage), and all waters draining into the Gulf of Alaska west of Cape Suckling. In addition, no retention of rainbow/steelhead trout or cutthroat trout allowed year-round.
	2002	New limits established that combine rainbow and cutthroat trout as a single bag and possession limit for all trout. For Cordova road system streams, limits are 5 trout per day and in possession, with only 1 per day and in possession over 10 inches. For all other waters, bag and possession limits are 2 fish with only 1 over 20 inches.
	2006	Rainbow/steelhead/cutthroat trout bag and possession limits 2 fish, only 1 may be 20 inches or greater per day; annual limit of 2 fish 20 inches or greater must be recorded on license. These regulations do not include the Copper River Delta Special Management Area specified in 5 AAC 55.033 or stocked lakes.
	2012	Rainbow/steelhead/cutthroat trout bag and possession limits 2 fish, with a minimum size of 11 inches and a maximum limit of 16 inches. These regulations do not include the Copper River Delta Special Management Area specified in 5 AAC 55.033 or stocked lakes.
Dolly Varden/Arctic Char		
	Early 1960s	Anglers allowed 30 Arctic char in addition to the trout/grayling limit of 15.
	Mid-1960s (before 1969)	Dolly Varden and Arctic char made part of the aggregate limit with trout and grayling.
	1983	Limits for each species established. The limits for "char" set at 3 per day, 6 in possession over 20 inches and 15 per day, 30 in possession under 20 inches.
	1991	Bag limits changed to 10 per day and in possession, with no size restrictions.
Arctic Grayling		
	1957–1982	Part of an aggregate freshwater limit of trout, grayling, and lake trout (later "Arctic char") of 15 per day, 30 in possession with a limit of only 3 over 20 inches. No saltwater limits.
	1983	Limits for each species established. The limits for Arctic grayling set at 15 per day, 30 in possession, with no size restrictions.
	1991	Bag limits changed to 10 per day and in possession, with no size restrictions.
Salmon		
	Prior to 1959	There were no salmon limits in fresh or salt waters prior to statehood.
	1960	The freshwater areas within Valdez Bay closed to salmon fishing.
	1961	A saltwater bag limit of 8 coho salmon with a possession limit of 3 bag limits.
	1965	Cordova Road system (Steamship Dock to Million Dollar Bridge) freshwater limit set at 6 salmon daily, with a possession limit of 2 bag limits. Eyak Lake, Power Creek, and Hatchery Creek closed to salmon fishing beyond markers at the east end of Power Creek Arm.

-continued-

Regulatory extent	Effective date(s)	Regulation [a]
Salmon (continued)		
	1967	A saltwater bag limit set at 8 coho, 8 chum, and 15 pink salmon; possession limit 3 daily bag limits.
	1968	Fishing from the bridge across Eyak River at Mile 3 of the Copper River Highway prohibited.
	1969	Upper limit of Cordova area salmon restriction moved from Million Dollar Bridge upstream to the Copper River below Woods Canyon.
	1970	Limit includes 8 sockeye salmon with possession limit reduced to 2 daily bag limits. The following closures established: Eccles Creek (Hartney Bay Road) closed to the taking of salmon; Hartney Creek above Hartney Bay Road closed to the taking of salmon.
	1973	Fresh and saltwater limits reduced to 6 salmon daily, 12 in possession. Eyak River 200 yards above the weir and 200 yards below the bridge closed to fishing.
	1975	Clear Creek closed to the taking of salmon. Eyak Lake and all tributaries closed to the taking of salmon.
	1979	Closure on Eyak River 200 yards above the weir and 200 yards below the bridge limited to 15 June through 1 October.
	1980	Dates of closure on Eyak River changed to 1 June through 1 October.
	1984	Eshamy Lagoon, inside ADF&G markers placed on the lagoon shore approximately one-half mile on either side of the ADF&G cabin closed to snagging until ADF&G announces the escapement goal will be met. The Robe River downstream of the Richardson Highway established as fly-fishing only from 15 May through 14 June, with a bag limit of 6 per day and 12 in possession, only 1 of which could be a sockeye salmon.
	1987	Further restrictions placed on Robe River 15 May to 22 June; only 1 salmon of each species allowed daily and in possession.
	1989	Further changes made to Robe River fly fishing area regulations. Dates extended to year-round; area defined as extending from the highway downstream to 100 yards below the confluence with the Lowe River. Bag limit of 3, only 1 may be a sockeye salmon and only 1 may be a coho salmon. Valdez Arm closed, area boundary changed to Allison Point to and including Mineral Creek. Eshamy lagoon, lake, and stream bag limits reduced to only 3 sockeye salmon per day and 6 in possession. Lake Bay (Esther Island) and all salt waters inside ADF&G markers located approximately 100 feet seaward of Esther Hatchery brood stock holding facility closed to all fishing. In Cordova and in all freshwater drainages crossed by the Copper River Highway from and including Eyak River to the Million Dollar Bridge and including Clear Creek (Mile 42) excluding the Martin River, the bag and possession limits reduced to 3 salmon other than Chinook salmon (referred to as "king salmon" in the regulations). Clear Creek remained closed to king salmon fishing. In addition, Eyak River 200 yards above the weir and 200 yards below the bridge opened to fishing year-round and as a fly-fishing-only water from 1 June through 30 September. A limit was added of 2 king salmon (4 in possession) 16 inches or more, and 6 per day, 12 in possession less than 16 inches.
	1991	Eyak fly-fishing-only area gear restrictions: only single-hook, artificial flies with gap between point and shank three-eighths inch or less and no additional weight attached to the line may be used. Solomon Gulch Creek, downstream of ADF&G marker located approximately 300 feet downstream of the Valdez Fisheries Development Association weir, opened to salmon fishing.

-continued-

Regulatory extent	Effective date(s)	Regulation [a]
Salmon (continued)		
	1994	For Cordova, in the marine waters of Orca Inlet between Odiak Inlet and the Orca Cannery on Orca Road, snagging prohibited from 1 June through 30 September, and in Fleming Spit Creek snagging allowed from 1 October through 31 May. Salmon bag limits of 3 per day and in possession in Clear Creek and all freshwater drainages crossing the Copper River Highway changed to include king salmon under 16 inches.
	1999	Daily limits for coho salmon 3 per day and 3 in possession, except in designated Terminal Harvest Areas where the saltwater limit remained at 6 per day and 12 in possession. Daily bag and possession limits for coho salmon at Shelter Bay 1 per day and 1 in possession. Clear Creek closed to salmon fishing year-round upstream of the Carbon Mountain Bridge.
	2001	Statewide, jack king salmon are defined as king salmon less than 20 inches in total length.
	2002	Coho salmon that are to be released cannot be removed from the water on streams crossed by the Copper River Highway.
	2009	Whittier Terminal Harvest Area for salmon now defined as the saltwater west of a line from Trinity Point to Gradual Point. Pink and chum salmon taken in the sport fishery may now be used as bait in sport, personal use, or subsistence fisheries. Fish used as bait part of the bag limit of the angler that originally hooked the fish.
	2014	Repealed the Copper River Delta Special Management Area for trout. The use of bait prohibited to fish for salmon once the bag limit has been reached on drainages crossing the Copper River Highway from August 15–September 15. Sport fishing in Main Bay, sport fishing from a vessel that is within 60 feet of the Prince William Sound Aquaculture hatchery barrier seine, and from a vessel that is inland of the barrier seine to the head of the bay prohibited.
	2018	The entire Clear Creek drainage at mile 42 of the Copper River Highway near Cordova now open to fishing for salmon. The bag and possession limit 3 salmon other than king salmon. This aligns with PWS Fresh Water regulations; all freshwater drainages crossed by the Copper River Highway from Eyak River to Million Dollar Bridge.
Halibut		
	1973	There were no sport fishery regulations until 1973, when the IPHC set bag/possession limit of 3 halibut and open season of March 31–October 31. Legal gear was identified as a single hook attached to handline or rod.
	1974	Bag/possession limit changed to 1 fish, not recognized by the Board of Fisheries.
	1975	Bag/possession limit set to 2 fish (adopted by State of Alaska), spear added as legal gear. Open season changed to March 1–October 31.
	1978	The captain or operator of any vessel used in charter service for sport fishing for halibut shall be held responsible for violations of these regulations by any person on board said vessel.
	1981	Legal gear expanded to include 2 hooks attached to handline or rod, and spear.
	1984	IPHC established license requirement for charter vessels.
	1985	Open season changed to March 1–December 31.
	1986	Open season changed to February1–October 31.
	1987	Open season changed to February 1–December 31. IPHC established a prohibition on filleting, mutilating, or disfiguring a halibut in a manner that would prevent determination of the number of fish caught, possessed, or landed. Also enacted prohibition on the sale, trade, or barter of sport-caught halibut.

-continued-

Regulatory extent	Effective date(s)	Regulation [a]
Halibut (continued)		
	1988	The halibut possession limit raised to 4 fish.
	1991	Any halibut brought aboard a United States vessel and not immediately returned to the sea with a minimum of injury will be included in the daily bag limit of the person catching the halibut. The operator of a charter vessel shall be liable for any violations of IPHC regulations committed by a passenger aboard said vessel.
	1998	IPHC repealed the 1984 vessel license requirement because it was redundant with the State of Alaska CFEC license requirement.
	2003	Charter guideline harvest level (GHL) became effective for Area 3A (Southcentral Alaska).
	2007	ADF&G issued an emergency order (EO) to prohibit harvest of halibut by skippers and crew in Area 3A May 1–December 31 to help keep charter fishery within its GHL.
	2008	ADF&G issued EO to prohibit harvest of halibut by skippers and crew in Area 3A May 24–September 1 IPHC adopts regulations restricting possession of halibut cut into more than 2 ventral and 2 dorsal pieces, plus two cheeks, with some skin on all pieces.
	2009	ADF&G issued EO to prohibit harvest of halibut by skippers and crew in Area 3A May 23–September 1. IPHC regulation on possession amended to allow halibut in excess of the possession limit on vessels that do not contain any sport fishing gear.
	2011	NMFS implements the charter limited access program. All charter fishing must be done under authority of a Charter Halibut Permit (CHP) with associated angler limits (endorsement).
	2014	Halibut Catch Sharing Plan (CHP) becomes effective. The CSP allocates a combined catch limit between the commercial and charter sectors according to rules published in the CSP and allows for inseason lease of IFQ to allow harvest in addition to sport bag/possession and size limits. (78FR75844). Bag and possession limit for the charter fishery set to 2/4 except that half of the fish must be 29 inches or smaller (U29). The carcasses of all fish with size limits must be retained intact on board until fish are offloaded. Charter vessels limited to 1 trip per day on which halibut are retained. CSP prohibits harvest by charter captains and crew members in 3A.
	2015	Five-fish annual limit established for charter halibut (without a recording requirement). Charter harvest not allowed on Thursdays between June 15 and August 31.
	2016	Four-fish annual limit with recording requirement for charter halibut. Charter harvest not allowed on Wednesdays all year. CHP's may only be used on 1 trip per day.
	2017	Two fish bag limit; size limit of less than 28 inches on 1 fish, 1 trip per vessel per day, Wednesdays closed all year, 3 Tuesday closures, annual limit of 4 halibut harvested on charter vessels, no harvest of halibut by crew.
	2018	Two fish bag limit, size limit of less than 28 inches on 1 fish, 1 trip per vessel per day, Wednesdays closed all year, 6 Tuesday closures, annual limit of 4 halibut harvested on charter vessels, no harvest of halibut by crew.
	2019	Two fish bag limit, size limit of less than 28 inches on 1 fish, 1 trip per vessel per day, Wednesdays closed all year, 5 Tuesday closures, annual limit of 4 halibut harvested on charter vessels, no harvest of halibut by crew.

-continued-

Regulatory extent	Effective date(s)	Regulation [a]
Rockfish		
	Prior to 1989	There was no limit on the harvest of rockfish by the sport fishery.
	1989	Bag limits set at 20 per day and in possession, with no more than 5 being "red rockfish."
	1991	Bag limits changed to 5 per day, 10 in possession 1 May through 15 September, and 10 per day and 10 in possession 16 September through 30 April, with no species restrictions. In addition, a rockfish that is removed from the water shall be retained and becomes part of the bag limit of the person originally hooking it.
	1997	Total bag limit unchanged, but a provision added that for "nonpelagic" rockfish, the limits are only 2 per day and 2 in possession all year.
	1998	Total bag and possession limits remain unchanged except that from 1 May through 15 September no more than 1 fish daily and 2 in possession may be nonpelagic species, and from 16 September through April 30 no more than 2 daily and 2 in possession may be nonpelagic species. Rockfish removed from the water become part of the bag limit of the person that hooked it.
	2000	Total bag limit unchanged, but nonpelagic limits are reinstated of 2 rockfish per day and 2 in possession, year-round. In addition, the first 2 nonpelagic rockfish removed from the water must be retained and become part of the bag limit of the person originally hooking the fish.
	2009	Seasons and nonpelagic bag limits unchanged; total bag limit reduced to 4 per day and 8 in possession from 1 May through 15 September and 8 fish per day and 8 in possession 16 September through 30 April.
	2018	Bag limits stay set at 4 fish with a possession limit of 8 fish of which only 1 can be a nonpelagic rockfish. The mandatory retention provision for nonpelagic rockfish removed. In 2020, the use of a deepwater release mechanism will become mandatory.
Lingcod		
	Prior to 1991	No bag or possession limits prior to 1991.
	1991	Bag limits set at 2 per day and 4 in possession.
	1993	A minimum length of 35 inches with head attached or 28 inches with head removed; the season closed from 1 January through 30 June, and lingcod can only be landed by hand or landing net (no gaffs).
	2004	Repealed requirement to land lingcod only by hand or with a landing net.
	2018	Bag limits set at 1 per day and 1 in possession.
Sharks		
	Prior to 1997	Prior to 1997, no season or bag limits.
	1997	Daily bag and possession limits set at 1, with an annual limit of 2. Harvest must be recorded on license or harvest card. Regulations apply to all sharks of the orders Lamniformes, Squaliformes, or Carcharhiniformes.
	2010	Daily bag and possession limit for spiny dogfish liberalized to 5 fish and annual limit removed.

-continued-

Regulatory extent	Effective date(s)	Regulation [a]
Areawide shellfish		
	Prior to 1981	A valid sport fishing license required to take shellfish. Legal gear for shrimp is pots and ring nets, for crab is pots, ring-nets, diving gear, dip nets, and hooked or hookless hand lines, and for clams is rakes, shovels, manually operated clam guns. Marking of pots: first initial, last name, and address on a keg or buoy attached to unattended subsistence (after 1990, this includes sport) fishing gear.
	1981	A side wall of all shellfish pots must contain an opening with a perimeter equal to or exceeding one-half of the tunnel eye opening perimeter. The opening must be laced, sewn, or secured together by untreated cotton twine or other natural fiber no larger than 120 thread. Dungeness crab and shrimp pots may have the pot lid tie-down straps secured to the bottom at one end by untreated cotton twine no larger than 120 thread as a substitute for the above requirement.
	1988	No person may mutilate or otherwise disfigure any crab in any manner which would prevent determination of the minimum size restriction until the crab has been processed or prepared for consumption. No more than 5 pots of any type per person and 10 pots of any type per vessel may be used. Personal use regulations were adopted as sport regulations.
	1990	Criteria for escape mechanism modified. Opening must equal or exceed 18 inches, except in shrimp pots where it must exceed 6 inches. Opening must be laced with 100% cotton twine no larger than 30 thread, knotted only at the ends, and cannot be tied or looped around the web bars. The opening must be within 6 inches of the bottom and parallel to it. Dungeness pots can substitute the above with the lid tie-down tied at one end with a single loop of 30 strand cotton twine such that when the twine degrades, the lid is no longer secure.
	1990	Thread count on cotton twine changed to 60.
	1992	Thread count on cotton twine changed to 30 thread for sewn opening and 60 thread for Dungeness crab pot lid closure.
Razor clams		
	Prior to 1959	No specific regulations prior to statehood.
	1961	Season 1 January through 30 June and 15 August through 31 December; no bag limit. No razor clams may be taken with the aid of any device other than manually operated shovel, fork, or clam gun. Sport fishing license required.
	1988	Personal use regulations (adopted as sport fish regulations requiring sport fish license after 1990): no closed season, no bag limit, no size limit except in waters east of longitude 149°W and south of a line from the southernmost tip of Point Bentinck to the southernmost tip of Point Whitshed, only razor clams 4.5 inches or longer in length of shell may be taken or possessed. In that same area a personal use permit from ADF&G required.
	1990	Personal use regulations adopted as sport fish regulations.
Shrimp		
	1957	No bag limits, no size limits, and no closed season.

-continued-

Regulatory extent	Effective date(s)	Regulation [a]
Shrimp (continued0		
	1996	All shrimp pots must have at least 2 adjacent vertical or near-vertical sides, excluding tunnels, completely composed of uncovered net webbing or rigid mesh. A pot with no definable side (including round pots) must have net webbing or rigid mesh panels covering at least 50% of its vertical or near-vertical surface area. On all pots, the net webbing or rigid mesh must be large enough to allow unaided passage of a maximum 12-inch long, seven-eighths inch diameter round wooden peg without deforming the opening, except for the selvage.
	1999	Established season from 15 April through 15 September. Reduced the number of pots allowed to 5 per person with a maximum of 5 per vessel.
	2001	A permit required to harvest shrimp.
	2006	A permit no longer required to harvest shrimp.
	2009	*Prince William Sound pot shrimp management plan* (5 AAC 55.055) requires a permit for all noncommercial users.
	2012	*Prince William Sound noncommercial shrimp fishery management plan* (5 AAC 55.055) requires that when ADF&G surveys for spot shrimp estimate a harvestable surplus of 110,000 pounds (or more), a commercial pot fishery is triggered for spot shrimp. Noncommercial users (sport, personal use, and subsistence) are allocated 60% of the surplus and are unrestricted as to where they can set pots. The permit system for the noncommercial sector back in place. Put into regulation a limit of 5 pots per person with a maximum of 5 pots per vessel that cannot be modified by emergency order.
	2017	Personal-use shrimp was removed to simplify regulations and get rid of redundant regulations.
Tanner crab		
	Prior to 1981	There were no closed seasons and no bag limits.
	1988	Personal use regulations set bag and possession limits at 20, only male crabs could be retained, minimum size limit was 5.3 inches, and no closed season.
	1990	Personal use regulations adopted as sport fish regulations.
	1999	Closed all waters of PWSMA to the taking of Tanner crab.
	2012	Opened PWSMA to taking of Tanner crab for subsistence use only (closed to sport fishing). Gear limit of 2 pots per person with no more than 2 pots per vessel with possession limit of 5 legal size (5½ inches or greater in carapace width) male Tanner crab per person per day.
	2017	If commercial fishery opens than a sport fishery will open under the same criteria.
King crab		
	1988	Personal use regulations set bag and possession limits to 6, only male crabs could be retained, no closed season, size limits 5.9 inches in width for blue king crab and 7 inches for red and brown king crabs.
	1990	Personal use regulations adopted as sport fish regulations.
	1999	All waters of PWSMA closed to the taking of king crab.
	2012	PWSMA waters west of longitude 147.20.00 are open to taking of golden king crab under subsistence use only (closed to sport fishing). Gear limit of 2 pots per person with no more than 2 pots per vessel with annual limit of 3 legal size (7-inch or greater carapace width) male king crab.

-continued-

Regulatory extent	Effective date(s)	Regulation [a]
Dungeness crab		
	1981	Subsistence regulations set bag and possession limits to 20 Dungeness crab per day, crabs must be male only, 6.5 inches or more in carapace width.
	1988	Personal use regulations set bag and possession limits to 20 per day, only male crabs, 6.5 inches or more, may be retained.
	1990	Personal use regulations adopted as sport fish regulations.
	1998	All waters of Orca Inlet (see regulation for definition) closed to sport fishing for Dungeness crab.
	1999	<u>All waters of PWSMA are close to the taking of Dungeness crab</u>.

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

[a] Underlined text indicates regulations that are currently in effect.