Fishery Management Report No. 24-26

Prince William Sound Registration Area E Groundfish Fisheries Management Report, 2021–2023

by

Martin Schuster

Alissa Cole

Joseph Loboy

Andrew Pollak

and

Chris Russ

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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 figures 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
pounds	
	pound
s	
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
%	%
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

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PRINCE WILLIAM SOUND REGISTRATION AREA E GROUNDFISH FISHERIES MANAGEMENT REPORT, 2021–2023

by

Martin Schuster, Alissa Cole, Joseph Loboy, Andrew Pollak and Chris Russ
Alaska Department of Fish and Game, Division of Commercial Fisheries, Homer

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

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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.

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Martin Schuster, Alissa Cole, Joseph Loboy, Andrew Pollak, and Chris Russ
Alaska Department of Fish and Game, Division of Commercial Fisheries,
3298 Douglas Place, Homer, Alaska 99603 USA

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ABSTRACT

The Alaska Department of Fish and Game (ADF&G) Division of Commercial Fisheries manages commercial groundfish fisheries within Prince William Sound Registration Area E (PWS). Harvests of sablefish *Anoplopoma fimbria*, pollock *Gadus chalcogrammus*, lingcod *Ophiodon elongates*, and Pacific cod *Gadus macrocephalus* are managed by season for specific guideline harvest levels. Rockfish species (genera *Sebastes* and *Sebastolobus*) are managed collectively as bycatch to other directed fisheries. From 2021 to 2023 directed pollock trawl harvest averaged 6.8 million pounds annually, state-waters and parallel season Pacific cod harvest combined averaged 1.3 million pounds annually, sablefish harvest averaged 158,000 pounds annually, lingcod harvest averaged 39,000 pounds annually, and rockfish harvest averaged 167,000 annually. Rockfish bycatch has become an issue of concern for ADF&G, and major contributors to rockfish harvest in PWS are discussed as well as recent ADF&G stock assessment efforts for black and yelloweye rockfish. From 2021 to 2023 pollock generated the highest average exvessel value of $1.1 million annually, followed by Pacific cod at $573,000 annually and sablefish at $457,000 annually. All groundfish harvest in PWS, not including federally managed Pacific halibut, had a combined minimum average value of $2.5 million annually from 2021 to 2023.

Keywords: Prince William Sound, commercial fisheries, groundfish, management, Pacific cod, *Gadus macrocephalus*, pollock, *Gadus chalcogrammus, Theragra chalcogramma*, sablefish, *Anoplopoma fimbria*, lingcod, *Ophiodon elongatus,* rockfish, *Sebastes melanops*, squid, Pacific sleeper shark *Somniosus pacificus*, salmon shark *Lamna ditropis*

INTRODUCTION

This report describes commercial groundfish fisheries managed by Alaska Department of Fish and Game (ADF&G) in the Prince William Sound Management Area (PWS), Registration Area E, and summarizes the most recent harvest information. ADF&G manages all commercial groundfish fisheries within the territorial waters of PWS, from the shoreline to 3 nautical miles (nmi) offshore. For territorial waters, the Alaska Board of Fisheries (BOF) establishes management regulations and ADF&G uses its emergency order (EO) authority to adjust fishing time and area as needed (Table 1). The National Marine Fisheries Service (NMFS) manages groundfish resources in waters of the exclusive economic zone (EEZ), located from 3 nmi to 200 nmi offshore, under fishery management plans (FMP) developed by the North Pacific Fishery Management Council (NPFMC). ADF&G manages fishing for any species in the EEZ not covered under a federal FMP, including lingcod *Ophiodon elongatus*, black rockfish *Sebastes melanops*, and dark rockfish *Sebastes ciliatus*.

The State of Alaska defines groundfish as all marine finfish except Pacific halibut *Hippoglossus stenolepis*, smelts, Pacific herring *Clupea pallasii*, and salmonids. The state-managed fisheries for rockfish *Sebastes* spp. and *Sebastolobus* spp., Pacific cod *Gadus macrocephalus*, sablefish *Anoplopoma fimbria*, Walleye pollock *Gadus chalcogrammus* and *Theragra chalcogramma*, lingcod, and miscellaneous groundfish species are discussed in this management report. Harvests of black rockfish, dark rockfish, and lingcod in adjacent federal waters are also included because the state has management authority. Miscellaneous groundfish species harvested as bycatch in other directed fisheries, including sharks, skates, and flatfish, are also included. Other non-groundfish bycatch in commercial groundfish fisheries including salmon, octopus, and squid are summarized.

Boundaries of PWS have been adjusted several times since 1996. These changes primarily affected rockfish management and are described in the rockfish section of this report. PWS currently consists of the waters of Alaska and the adjoining waters of the EEZ from 144° 00′ W long, near Cape Suckling, to the longitude of Cape Fairfield at 148° 50.25′ W long, south to the latitude of Cape Douglas at 58° 51.10′ W long, then west to 149° W long (Figure 1). The area is divided into

the Inside and Outside Districts. The Inside District is enclosed by lines from Point Whitshed to Point Bentinck, from Cape Hinchinbrook to Zaikof Point, and from Cape Cleare to Cape Puget. The Outside District is all waters seaward of the Inside District. The Outside District is divided into the Western and Eastern sections. The Western Section includes waters between Cape Fairfield and 147° 00′ W long, and the Eastern Section includes waters between 147° 00′ W long and 144° 00′ W long.

The BOF adopted regulations giving the ADF&G commissioner authority to close fishing areas to protect endangered Steller sea lions in 2001. This action complemented NMFS closures at 2 locations in the Outside District. All groundfish fishing was closed within 3 nmi of Seal Rocks, south of Hinchinbrook Entrance, and the Wooded Islands, south of Patton Bay along outer Montague Island (Figure 2). Additionally, area regulations specify a groundfish pot closure area, to protect Tanner crab *Chionecetes bairdi* populations, in waters of southeastern PWS designated by geographic coordinates and Port Gravina, except that groundfish may be taken with pots as designated within Orca Bay and in waters less than 75 fathoms deep in Hinchinbrook Entrance (Figure 2; 5 AAC 28.250 (a)).

Statewide regulations require all commercial fishing vessels to register with ADF&G prior to fishing for groundfish and restrict legal gear types for groundfish to longline hook, pelagic trawl, hand troll, seine, mechanical jigging machine, dinglebar troll, and pots; area regulations specify additional fishery-specific registration requirements and gear restrictions. Although area regulations restricted non-pelagic trawl gear in 1997, shrimp trawl vessels may retain groundfish bycatch not to exceed 10% of the gross weight of the landed shrimp, and there is a single limited entry sablefish fishery permit that may be operated on a shrimp trawl vessel (5 AAC 28.230 (f) and (g)). Area regulations also allow groundfish bycatch taken in the salmon gillnet fishery to be retained at specified levels.

Commercial groundfish harvests are monitored inseason primarily through ADF&G fish tickets (5 AAC 39.130) with additional information from dockside sampling of the commercial harvest, dockside interviews, and log sheets for some fisheries. Dockside sampling involves the collection of biological data including species, size, sex, gonad condition, and age structures. Fisher interviews are conducted dockside to collect information on fishing location and effort. Onboard observers may be deployed during commissioner's permit fisheries and by ADF&G request to gain additional fishery information including discarded catch. Reporting requirements specify that all groundfish retained, including harvest that is retained for personal use or used as bait at sea, must be reported on ADF&G fish tickets. ADF&G relies on accurate reporting of all fisheries removals to maintain the highest level of fisheries management.

ROCKFISH

BACKGROUND

There are 32 species of rockfish (genera *Sebastes* and *Sebastolobus*) in the GOA, of which 18 are commonly harvested in PWS commercial fisheries. There is no directed fishery in PWS and rockfish may only be retained as bycatch. Rockfish are long-lived with the oldest recorded rockfish, a rougheye rockfish *S. aleutianus* from Southeast Alaska, aged at 205 years (Munk 2001). Rockfish have a gas-filled swim bladder that allows buoyancy control. Rockfish may experience barotrauma, or injury caused by rapid decompression and expansion of gases in the swim bladder, during ascent to the surface when caught in deep water; the severity of the condition increases with

depth of capture. Rockfish with barotrauma often exhibit exophthalmia, or bulging eyes, and the stomach protruding from the mouth, forced out by the overinflated swim bladder. Rockfish are unable to resubmerge when released in this condition, which results in a high mortality rate after capture, and is the reason for mandatory retention requirements in PWS (Hochhalter and Reed 2011). Additionally, rockfish are slow to reach sexual maturity (7 to 27 years); these and other factors make rockfish populations vulnerable to overfishing (Love et al. 2002).

Rockfish are categorized into pelagic shelf (PSR), demersal shelf (DSR), slope species assemblages (all *Sebastes* genus), and thornyhead or "idiot" rockfish (*Sebastolobus* genus) and are defined in regulation (5 AAC 39.975) (37), (34), (38), and (39), respectively. PSR species found in PWS include black *S. melanops*, dusky *S. variabilis*, dark *S. ciliatus*, and yellowtail *S. flavidus* rockfishes. PSR are typically associated with nearshore rocky reef areas, may exhibit midwater schooling behavior, and are often harvested in other management areas in directed fisheries with mechanical jig and hand troll gear. There is no directed rockfish fishery in PWS, and PSR harvest typically occurs on longline hook gear as bycatch in Pacific cod and halibut fisheries. DSR are associated with rocky reef areas, although they tend to be bottom dwelling and often occur at greater depths than PSR species (Bechtol 2000). Yelloweye *S. ruberrimus* and quillbacks *S. maliger* rockfishes are common DSR species in PWS and are usually harvested with longline hook gear during Pacific cod and Pacific halibut fisheries. Slope rockfish species include any rockfish not specified as either PSR or DSR, and, for the purposes of this report and PWS rockfish management, thornyhead rockfish data are included with slope species. Slope rockfish are typically found near the bottom in waters deeper than 200 meters and are most often harvested with longline hook gear, targeting sablefish or Pacific halibut, or with trawl gear during the pollock and sidestripe shrimp fisheries. Common slope species in PWS include rougheye and shortraker *S. borealis* rockfish; the thornyhead rockfish species found in PWS is shortspine thornyhead *S. alascanus*.

REGULATIONS AND MANAGEMENT

The regulations and management of rockfish have changed over time through the BOF process (Rumble et al. 2021). Rockfish were not actively managed in PWS prior to 1989 when a directed rockfish fishery was established. Since 2000, all rockfish harvest has occurred as bycatch and no directed fishery remains. Currently, rockfish are managed through the *Prince William Sound Rockfish Management Plan*, which outlines allowable harvest levels (5 AAC 28.265).

For the PWS Area, the rockfish guideline harvest level (GHL) is based on historical harvest levels and set at 150,000 pounds annually for all species combined (Bechtol 1992). In addition to managing all rockfish in state waters, the State of Alaska assumes management authority over black, dark, and blue rockfish in adjacent federal waters (3-200 nautical miles offshore); harvest of those 3 species accrues to the 150,000 pound GHL. However, the harvest of black, dark, and blue rockfish in federal waters does not contribute a significant amount to the GHL annually.

Retention of all rockfish bycatch is mandatory when participating in other directed groundfish or halibut fisheries. Bycatch allowances for rockfish include 20% to sablefish, 5% to Pacific cod, 0.5% to pollock, and 10% to all other directed groundfish and halibut fisheries. Additional provisions include a trip limit of 3,000 pounds within a 5-day period. Proceeds from the sale of rockfish overages are surrendered to the State of Alaska.

Restrictions to bycatch of rockfish in groundfish and halibut fisheries have been implemented in recent years to decrease rockfish harvest. In 2022 and 2023, ADF&G issued an EO to reduce

rockfish bycatch allowances by 50% for all directed groundfish and halibut fisheries in PWS. In addition, in 2023 the department petitioned the BOF to make a finding of emergency to promulgate a new regulation delegating the department authority to close areas of high rockfish bycatch in waters of Alaska to commercial fishing with specific gear types. The rockfish GHL was achieved on September 4 and an EO was issued on October 28 closing statistical areas 466032, 476034, 476032, 476035, and 476006 to the use of longline hook gear.

HARVEST AND EFFORT

Stock Status

The Statewide Rockfish Initiative (SRI) working group is in the final stages of a stock assessment for PWS yelloweye rockfish. For the stock assessment a stock synthesis approach was used to fit an age-structured model using catch, sex, age, and length data from 1985 to 2023 (St. Saviour *In prep*[1]). The age structured model estimates that target fishing intensity has been exceeded in all years since 1998 for commercial and sport fleets combined. Further information on the SRI and the age structured model can be found in this report and in the forthcoming ADF&G PWS yelloweye assessment report (St. Saviour *In prep*).

Currently there are no fishery independent surveys for rockfish in PWS; however, remotely operated vehicle (ROV) surveys focused on lingcod, which also resulted in yelloweye rockfish abundance estimates, have been conducted in the past and are summarized in the research section of this report and in ADF&G publications. The stock status of other commonly harvested rockfish in PWS commercial fisheries such as shortraker and quillback rockfish is not known, although harvest and biological information is presented here.

Historical

Historic rockfish harvest for the Inside District ranged widely from 35,240 pounds in 2003 to 489,154 pounds in 1990 (Table 2). The peak harvest in 1990 was attributed to market conditions that encouraged targeting rockfish. In the Outside District, harvest ranged from 2,762 pounds in 1991 to 313,489 pounds in 1988. In 1988 the majority of the recorded Outside District harvest, 228,417 pounds, was taken by trawl gear (Table 3) and was composed primarily of PSR.

The relatively high harvests during early years were attributed to misreporting during periods when the directed fishery in state waters was closed but adjacent federal waters remained open. Rockfish harvest initially declined following the elimination of the federal directed rockfish fishery in 2000 but began to increase again in 2006 and continued to increase through 2016. Rockfish harvest grew from 76,265 pounds in 2006 to 161,512 pounds in 2016, mostly due to the adoption of longline hook as a legal gear type in the state-waters Pacific cod fishery, which was primarily prosecuted in the Inside District (Table 2). Higher GHLs in the directed pollock pelagic trawl fishery also contributed to higher rockfish harvest from 2006 to 2016 (Table 4). The 150,000-pound rockfish GHL was exceeded each year from 2014 to 2016.

Rockfish harvest decreased beginning in 2017 by over 100,000 pounds, averaging 67,500 pounds from 2017 to 2020 (Table 2). During this time frame Pacific cod abundance decreased resulting in less Pacific cod harvest and effort and subsequently lower levels of rockfish bycatch (Tables 5 and

[1] St. Saviour, A. *In prep*. Status of yelloweye rockfish (*Sebastes ruberrimus*) in Prince William Sound inside waters, Alaska. Alaska Department of Fish and Game, Fishery Manuscript, Anchorage. Hereafter cited in text as St. Saviour *In prep*.

6). Reduced levels of rockfish bycatch in the pollock trawl fishery also contributed to low rockfish harvest during these years, with rockfish bycatch averaging 7,605 pounds annually (Table 4).

Species composition of rockfish harvest from fish ticket data is not reported prior to 2007, when the eLandings commercial fisheries database was created. From 2007 to 2016, during a period of high rockfish harvest in PWS, harvest was composed largely of shortraker and yelloweye rockfish (Figure 3). Shortraker rockfish harvest ranged from 25,071 pounds in 2007 to 91,774 pounds in 2014 (Table 7). Rougheye rockfish harvest ranged from 10,768 pounds in 2016 to 28,774 pounds in 2008. However, shortraker and rougheye rockfish are morphologically similar and commercial fish processors may report shortraker rockfish as rougheye rockfish and vice versa. Shortraker rockfish bycatch in the pollock trawl fishery was exceptionally high in 2014 and the rockfish GHL was exceeded for the first time since 1997 (Tables 4 and 7). Yelloweye rockfish harvest ranged from 16,972 pounds in 2014 to 46,665 pounds in 2016 and quillback harvest ranged from 1,359 pounds in 2007 to 46,393 pounds in 2016 (Table 5). From 2013 to 2016 rockfish harvest was at or over the GHL, and higher yelloweye and quillback harvest was driven by bycatch in the Pacific cod fishery due to higher Pacific cod GHLs and harvest (Figure 3 and 4).

From 2017 to 2020 the harvest was composed largely of shortraker and yelloweye rockfish, but overall rockfish harvest was relatively low (Figure 3). Shortraker rockfish harvest ranged from 12,498 pounds in 2017 to 36,642 pounds in 2020. Yelloweye rockfish harvest ranged from 12,791 pounds in 2018 to 18,265 pounds in 2019, and quillback rockfish harvest ranged from 4,746 pounds in 2018 to 9,867 pounds in 2017. The lower harvest of these species during this time period was due to declining Pacific cod stocks and subsequent declines in bycatch associated with that fishery and lower shortraker rockfish bycatch in the pollock fishery.

Recent 3 years

Rockfish harvest in PWS has doubled from an average of 86,365 pounds annually from 2017 to 2020 to 167,411 pounds annually from 2021 to 2023 (Table 2). Rockfish were harvested primarily from the Inside district, averaging 133,134 pounds annually compared to 34,276 pounds annually from the Outside District. Recent rockfish harvest in both districts was driven by changing effort in the Pacific halibut fishery, which resulted in harvest at or over the GHL in each year (Figure 4). Rockfish harvest in the Pacific cod and pollock fisheries were relatively consistent from 2017 to 2020 versus 2021 to 2023.

Shortraker rockfish harvest ranged from 60,112 pounds in 2021 to 105,673 pounds in 2022, averaging 82,592 pounds annually for those years, whereas 27,077 pounds were harvested annually from 2016 to 2022 (Table 7). Yelloweye rockfish harvest nearly doubled from 2016 to 2020 versus 2021 to 2023, averaging 36,380 pounds and 21,668 pounds annually, respectively. Shortraker and yelloweye rockfish were harvested primarily as bycatch in the Pacific halibut longline hook fishery (Figure 5 and Figure 6). Quillback rockfish harvest tripled after 2020, increasing from approximately 5,000 pounds annually to 15,955 pounds annually. Quillback rockfish were harvested in both the Pacific cod and Pacific halibut longline hook fisheries (Figure 7). Rockfish harvest for these species is also presented in estimated numbers of fish, based on average weights collected from port sampling, to facilitate comparisons with Division of Sport Fish harvest estimates (Table 7).

Rockfish were sold for an average of $0.56 per pound from 2021 through 2023, down from the previous average of $0.62 per pound from 2016 to 2020 (Table 8). During the most recent 3 years, an average of 158,672 pounds were sold annually. Exvessel value of rockfish is based on the

average price of rockfish throughout the state of Alaska from Commercial Operator's Annual Reports (COAR) averaged $94,547 for 2021 through 2023 (Figure 8 and Table 9).

HARVEST SAMPLING

Dockside sampling of rockfish species harvested from PWS began in 1993; however, values are reported only after 2007 due to improved documentation of sampling methods (Tables 10–13). Rockfish sampling opportunities are variable due to rockfish being harvested exclusively as bycatch to directed fisheries delivering to multiple ports within the PWS management area. Because rockfish bycatch in the Pacific halibut fishery in PWS has increased, ADF&G staff have increased port sampling effort in that fishery. Rockfish bycatch in PWS is landed mostly in Cordova, Whittier, and Seward from January through October. From January through March rockfish bycatch is sampled primarily from the Pacific cod longline hook fishery, from April through September from the sablefish longline hook fishery, and from March through October from the Pacific halibut longline hook fishery.

Average length, weight, and age of yelloweye rockfish sampled from PWS has decreased in the last 3 years (Table 10). The average length was 55.1 centimeters from 2007 to 2015 and 46.6 centimeters from 2021 to 2023. The average weight was 3.4 kilograms from 2007 to 2015 and 2.1 kilograms from 2021 to 2023. The average age also decreased from 33 years old between 2007 and 2015 to 24 years old between 2021 and 2023, but for recent years only otoliths from PWS Inside waters have been aged.

Similar to yelloweye rockfish, average weight and length of sampled shortraker rockfish from PWS have decreased (Table 11). Average length was 65.3 centimeters from 2021 through 2023 and average weight was 4.9 kilograms. In the previous 5 years (2016 to 2021), the average length was 72.9 centimeters and average weight was 7.0 kilograms. Percent female has decreased 15% in the recent 3 years, sampling only 33.7% female shortrakers. Age data is not yet available for recent years.

Trends in sampled quillback rockfish remain relatively stable in recent years (2021 to 2023) compared to historical values (2007 to 2015; Table 12). Average length of quillback was 39.9 centimeters, average weight was 1.3 kilograms, and percent female was 46.7%. Age data for quillback rockfish is not yet available.

Average length and weight of sampled rougheye rockfish has slightly increased, but percent female has slightly decreased in recent years (2021 to 2023; Table 13). The average length was 47.6 centimeters from 2021 through 2023 but was 44.8 centimeters in the 5 years prior (2016 to 2020). Average weight was 2.0 kilograms and percent female was 44.6%. Average age data for rougheye rockfish is not yet available.

STATEWIDE ROCKFISH INITIATIVE (SRI)

In 2017, ADF&G initiated an interdivisional, statewide initiative focused on developing long-term management and assessment strategies for black and yelloweye rockfish in the Gulf of Alaska. Across the Gulf of Alaska black and yelloweye rockfish are in high demand in commercial and sport fisheries. In PWS, black rockfish are harvested in directed sport fisheries and yelloweye rockfish are harvested in both directed sport fisheries and as bycatch in commercial halibut and Pacific cod fisheries. Based on high harvest rates for both species across user groups across the

Gulf of Alaska, the SRI focuses on data synthesis, stock assessment, and outreach to facilitate conservation for these vulnerable species (Howard et al. 2019).

Currently, there are no overarching management or assessment strategies for black or yelloweye rockfish across the GOA. ADF&G's management of these species has been largely area- or region-specific and management has not been well coordinated across fishery divisions. GHLs are used for managing commercial fisheries; however, these are applied to management areas rather than populations and are primarily based on levels of historical harvest. Furthermore, in PWS the rockfish GHL is for all rockfish combined with no species-specific harvest limits. Sport fisheries are managed to constrain harvest levels (e.g., bag limits), but typically without an adequate understanding of how those harvest levels translate to exploitation rates of populations. Because rockfish are known to be particularly vulnerable to exploitation, and harvests have been increasing in recent years, proactive measures are needed and have been taken in some cases such as reduced sport bag limits for pelagic and nonpelagic rockfish in PWS, Kodiak, and Cook Inlet.

Since its inception the SRI has worked to facilitate interdivisional management between commercial and sport fisheries staff. Examples of the collaborative effort include aligning commercial and sport fisheries harvest information to create estimates of rockfish removals in pounds for both divisions combined across the Gulf of Alaska, release mortality estimates for released rockfish in sport fisheries, and stock assessment models for black and yelloweye rockfish in PWS, Southeast Alaska, and the North Gulf Coast (NGC). Stock assessment models for yelloweye rockfish in PWS and black rockfish on the NGC show that harvest has exceeded the maximum sustained yield for many years and the SRI has shared these results with commercial and sport fisheries managers in both areas. Efforts are underway to create an interdivisional harvest strategy to stabilize black and yelloweye rockfish harvest across the Gulf of Alaska.

PACIFIC COD

BACKGROUND

Pacific cod *Gadus macrocephalus*, also known as grey cod, have been fished commercially in Alaska waters since the 19th century and currently support a large and valuable commercial fishery (Table 9). Pacific cod grow quickly, up to 1.5 m in length, and reach maturity at about 0.5 m or an age of 4–5 years in the GOA and have a relatively short lifespan of less than 20 years. Adult fish are demersal, living near the ocean floor, in habitats of mud, sand, and clay. Pacific cod school together, moving seasonally from deep waters (100–250 m) on the continental shelf edge and upper slope in the winter, to shallower waters (less than 100 m) in the summer with peak spawning occurring in March.

REGULATIONS AND MANAGEMENT

In the Gulf of Alaska (GOA) Pacific cod are managed as a single stock but are apportioned as acceptable biological catches (ABCs) among federal areas of Eastern Gulf of Alaska (EGOA), Central Gulf of Alaska (CGOA), and Western Gulf of Alaska (WGOA) by the North Pacific Fisheries Management Council (NPFMC). The ABCs are further apportioned between federal/parallel and state-waters (within 3 nautical miles from shore) fisheries. The management of Pacific cod fisheries in PWS is managed though the *Prince William Sound Pacific Cod Management Plan* (5 AAC 28.267), which encompasses both parallel and state-waters fisheries and outlines allowable gear, season dates, and harvest levels. All directed Pacific cod fisheries are open access.

Parallel Fishery

A parallel fishery allows fishing in state waters that occurs concurrently with federal fisheries in adjacent federal waters (3–200 nautical miles offshore). The regulations and management of Pacific cod in the parallel season has changed over time through the BOF process (Rumble et al. 2021). During the parallel season Pacific cod harvest accrues to the federal TAC, which is calculated from either the EGOA or the CGOA ABC depending on area fished. Pacific cod harvest from the PWS Inside District and PWS Outside District Eastern Section accrue to the EGOA TAC. Pacific cod harvest from the PWS Outside District Western Section accrues to the CGOA TAC. Although the TAC comes from either the CGOA or EGOA, current parallel seasons are set annually by EO to coincide with the federal CGOA fishery for Pacific cod with respect to season dates, allowable gear types, and bycatch limits. There is an initial parallel season to coincide with the federal "A" season, and there may be a second parallel season to coincide with the federal "B" season. The initial parallel season opens January 1 each year and an EO is released by ADF&G concurrently opening state waters in PWS.

Management of the parallel fishery is based on 3 gear sectors: longline hook, pot, and jig gear. For longline hook gear, the parallel season coincides with the federal season in the CGOA for vessels less than 50 feet, but vessels greater than 50 feet may participate in the parallel season if remaining solely in state waters. For pot and jig gear (mechanical and hand troll), the parallel season coincides with the federal season in the CGOA for each gear type. There is no pot limit for pot vessels participating in the parallel season; however, longlining of pots is not currently a legal gear type. The parallel season closes by EO for each sector coinciding with the CGOA federal season. After the closure of the initial parallel season all groundfish pots must be removed from the water, except that a vessel registered for the state-waters season may store pots as specified in a designated area 10 days prior to and 10 days following a state-waters season. The federal CGOA Pacific cod "B" season for vessels using jig gear may open June 10, whereas for pot and longline hook gear the "B" season may open September 1.

Bycatch allowances during the parallel season for all gear sectors are set annually by EO and are based on a percentage of total round weight of Pacific cod by species. Rockfish and skate bycatch may not exceed 5%, lingcod and pollock may not exceed 20%, sharks may not exceed 15%, and all other species may not exceed 20%. Retention of all rockfish bycatch is mandatory and harvested rockfish in state waters during the parallel fishery are counted against the state-waters PWS rockfish GHL. In addition, retention of all pollock is mandatory when a directed fishery for them is open, up to the bycatch allowance.

While participating in parallel seasons, vessels must use federal vessel monitoring system (VMS) to help provide more precise harvest location information and support fishery enforcement efforts to protect Steller sea lions and their habitat (Figure 2). Vessels must also register with ADF&G to participate in the fishery. Registration is nonexclusive for all gear types, meaning a vessel may register with ADF&G to fish a parallel season in more than one management area within a calendar year as long as the vessel is unregistered in PWS first. This ensures that a vessel is never registered for more than one area at any given time.

State-waters Fishery

The *Prince William Sound Pacific Cod Management Plan* was implemented in 1997 and established a state-waters season that has been modified through the BOF process (Rumble et al. 2021). In a state-waters season, Pacific cod may not be taken in waters of the Outside District east

of 146°15.12′W longitude (Figure 2). The state-waters season is managed to a GHL based on the EGOA ABC set by NPFMC. Each year the GHL is calculated as 25% of the EGOA ABC and is further apportioned by gear type. Longline hook gear is allocated 85% of the GHL, and pot and jig gear are allocated a combined 15%. In years where the pot and jig GHL is achieved, the allocation will increase by 5% for the following calendar year up to a maximum of 30% and longline hook gear allocation will decrease by a corresponding 5% the following calendar year to a minimum of 70%. Providing for an incremental percentage increase is consistent with the structure of other state-waters Pacific cod fisheries.

The state-waters seasons are opened after the conclusion of the initial parallel fishery season. For longline hook gear, the state-waters season opens 7 days following the closure of the CGOA for vessels less than 50 feet in the parallel longline hook season or concurrent with the individual fishing quota (IFQ) halibut season opening date, whichever occurs later. This often takes place in early to mid-March. For pot and jig gear, the state-waters season opens 24 hours following the closure of their respective CGOA parallel season. The state-waters GHL is considered achieved in any calendar year when the total harvest is within 10% of the GHL and is then closed by EO. In the state-waters season any GHL remaining on September 1 may become available to all legal gear types. Furthermore, after October 30, gear limits and registration requirements may be liberalized by EO in the state-waters season to promote full utilization of the GHL. In addition to the seasons outlined above, the *Prince William Sound Pacific Cod Management Plan* outlines provisions for additional openings or closures.

To participate in the state-waters season vessels must register with ADF&G for the specific area and gear type. PWS is designated as an exclusive registration area during a state-waters season for pot and longline hook gear, but not jig gear. For an exclusive registration area, vessels are restricted from fishing the state-waters season in both that area and another exclusive or superexclusive registration area; however, a vessel registered for the state-waters season in an exclusive registration area would be allowed to participate in a Pacific cod season in another registration area designated nonexclusive. For jig gear, PWS is a nonexclusive registration area during the state-waters Pacific cod season, which allows jig vessels to participate in a state-waters season in both PWS and in another exclusive (or nonexclusive) registration area during the same calendar year. At any point during the state-waters season, a vessel may switch gear type within the PWS Area by unregistering with ADF&G for their original gear type and re-registering under the new gear type that they want to fish.

Bycatch allowances during the state-waters season are set annually by EO and are based on a percentage of total round weight of Pacific cod by species. Rockfish and skate bycatch may not exceed 5%, lingcod and pollock may not exceed 20%, sharks may not exceed 15%, and all other species may not exceed 20%. Retention of all rockfish bycatch is mandatory. In addition, retention of all pollock is mandatory when the fishery for pollock is open and retention is mandatory up to the 20% bycatch allowance when the fishery for pollock is closed.

In the state-waters fishery only 1 gear type may be aboard a vessel at one time, except for mechanical jigging machines and hand troll gear, which may be used at the same time. Also, no more than 60 groundfish pots and no more than 5 mechanical jigging machines are permitted in the state-waters season. Unlike the parallel season, in the state-waters season, longlining of pots is a legal gear type, effective since January of 2023. All groundfish pots must have pot tags attached that are issued by ADF&G. In the single pot fishery, tags are required to be on the buoy at the

surface and in the longline pot fishery, tags are required on the pots which are not visible when submerged.

HARVEST AND EFFORT

Stock status

Pacific cod in the GOA and surrounding areas experienced an overall increase in abundance for 2021 through 2023 after the drastic decline and a GOA federal fishery closure in 2020. This reduction in Pacific cod abundance was attributed to an ocean condition called the "warm blob," a marine heat wave that negatively affected some marine species, including Pacific cod (Barbeaux et al. 2017). These warmer water temperatures occurred between 2014 and 2016; this was an unusual event due to the magnitude of the temperature increase (Bond et al. 2015). Pacific cod for the recent 3 years (2021–2023) have not approached any overfished condition (Hulson et al. 2023).

Historical

Parallel Fishery

Prior to 1997, all Pacific cod harvest occurred in parallel seasons managed concurrently with seasons set by NMFS in the CGOA. During this period, peak parallel season harvest occurred between 1990 and 1995 with an average of 1.7 million pounds annually and a high of 2.2 million pounds in 1991, from 88 vessels in 234 landings (Table 6). From 1996 to 2000, the harvest declined to less than 1.0 million pounds in all years, except 1999, when the harvest surpassed 1.3 million pounds. Harvest began to decline in 2001 and continued to decline through 2006 with the lowest historic harvest in 2005 of 11,294 pounds. Harvest began to steadily increase again beginning in 2007 through 2015 when over 3 million pounds were harvested. Pacific cod parallel season harvest steadily declined beginning in 2016, until 2020 when the federal season did not open due to a low spawning stock biomass associated with warmer water temperatures. The high harvest during the parallel season in 2015 was a result of the "A" season remaining open until June 10.

Nearly all Pacific cod were harvested by longline hook gear prior to 1991 (Table 6). Following expansion of the pot fishery for Pacific cod in 1991, the proportion harvested by pot gear increased to a high of 83% in 1994. However, in 1998, longline hook gear returned as the dominant gear type, accounting for the majority of the parallel season harvest, and since 2001 longline hook gear has accounted for nearly 100% of the harvest.

State-waters Fishery

The PWS Pacific cod state-waters season was established in 1997. The total harvest between 1997 and 2008, when pot and jig gear were the only legal gear types, ranged from 0 to 418,994 pounds, and effort ranged from 0 to 12 vessels (Table 5). The high GHLs between 2000 and 2002 averaging 2.5 million pounds coincided with a period of steady decline in harvest that continued with low harvest levels through 2006; most of the data are confidential due to low participation. The disparity between harvest and GHL was the result of a decline in Pacific cod fishing effort and an increase in Pacific cod ABC in the federal EGOA.

In the early years of the state-waters season pot gear made up 80% or greater of the harvest, peaking at 385,817 pounds in 1998 and declining to 0 in 2001 with harvest at zero or low confidential levels during subsequent years (Table 5). Jig harvest peaked in 1999 at 79,147 pounds before declining to 0 in 2002. From 2002 through 2020, fewer than 3 vessels fishing with either pot or jig gear have participated annually, resulting in confidential harvests by those gear types, except for 2008 when 4

vessels harvested 7,557 pounds. In 2009, the GHL was achieved in 13 days, exclusively by vessels fishing with long line hook gear, marking the first time the GHL was achieved since the state-waters season began. Short seasons and a fully utilized GHL continued for the next 2 years until harvest peaked in 2011. The state-waters season GHL was relatively high between 2011 and 2017, when the allocated percentage of the EGOA ABC jumped to the maximum of 25% after the GHL was achieved for 3 consecutive years and moved through step-up provisions.

The state-waters season longline hook harvest nearly doubled from 822,747 pounds in 2010 to 1.6 million pounds in 2011, and then held relatively steady through 2014, with an average harvest of 1.4 million pounds for those 4 years (Table 5). Low harvest in the state-waters season in 2015 corresponded with high harvest for the parallel season and was primarily a result of the parallel season having remained open until June 10, encompassing the peak fishing time in the spring when Pacific cod congregate to spawn. Harvest by longline hook gear increased again in 2016 to over 1 million pounds, although less than a quarter of the 4.8 million pounds GHL was harvested; the 2016 GHL was the highest since the fishery began in 1997. Harvest dropped to low levels and is confidential due to a limited number of participants in 2017, although the GHL remained high at 4.3 million pounds. Longline hook harvest was 350,909 pounds in 2018 and 408,778 pounds in 2019, less than the half the GHLs of approximately 1 million and 0.9 million pounds, respectively. In 2020, 99% of the reduced GHL was harvested totaling 432,968 pounds. Low harvest from 2017 to 2020 coincided with a period of low productivity for Pacific cod stocks in the GOA.

Recent 3 years

Parallel Fishery

From 2021 to 2023 parallel season Pacific cod harvest ranged from 45,109 pounds in 2021 to 662,722 pounds in 2022, averaging 398,056 pounds annually (Table 6). The dominant gear type remained longline hook with zero or confidential levels of harvest from pot and jig gear, except that in 2023 jig gear harvested 9,460 pounds. The average number of vessels participating was 63 with an average of 137 landings. Average price per pound of Pacific cod was highest in 2023 at $0.54 per pound and averaged $0.49 per pound annually for the most recent 3 years, higher than the average for the prior 5 years (2016-2020) (Table 8). Exvessel value of Pacific cod based on the average price for Pacific cod throughout the state of Alaska from the Commercial Operator's Reports averaged $572,976 for this reporting period (Figure 8 and Table 9).

State-waters Fishery

From 2021 to 2023 state-waters season Pacific cod harvest ranged from 543,371 pounds in 2021 to 1,305,426 pounds in 2023, averaging 908,896 pounds annually (Table 5). The dominant gear type remained longline hook with zero or confidential levels of harvest in pot and jig, expect that in 2023 pot harvest was 261,664 pounds, exceeding the 15% allocation to jig and pot gear. This resulted in the 5% step-up provision being triggered for the pot and jig gear allocation for the 2024 state-waters season. In 2022, only 31.6% of the GHL was harvested because the state-waters season opening coincided with the peak of Pacific cod spawning. When a majority of Pacific cod are in spawning condition processors stop buying due to the degraded quality of fish and effort also declines because the fish are not as congregated. The average number of vessels participating in the fishery from 2021–2023 was 17 with an average of 40 landings. Average price per pound for Pacific cod was highest in 2023 at $0.54 per pound and averaged $0.49 per pound annually for the most recent 3 years, higher than the average for the prior 5 years (2016–2020; Table 8). Exvessel value of Pacific cod based on the average price for Pacific cod throughout the state of

Alaska from the Commercial Operator's Reports averaged $572,976 for this reporting period (Figure 8 and Table 9).

HARVEST SAMPLING

Dockside sampling of Pacific cod harvested from PWS began in 1993; however, values are reported only after 2007 due to improved documentation of sampling methods. A majority of Pacific cod sampling opportunities are concentrated within a few months because directed harvest occurs from January through March during the PWS parallel fishery and the PWS state-waters fishery. Most directed harvest of Pacific cod in PWS is landed in Seward with minimal deliveries occurring in Whittier and Homer. Samplers conducted interviews with fisheries participants for information on fishing location and effort and collected biological samples for fish length, weight, sex, and maturity stage. Age structures (otoliths) were also collected for archiving and future analysis.

The average length and weight of sampled Pacific cod from PWS has slightly increased in the last 3 years (Table 14). The average length was 63.5 centimeters from 2016 to 2020 and 66.5 centimeters from 2021 to 2023. Average weight was 3.2 kilograms from 2016 to 2020 and 3.5 kilograms from 2021 to 2023. Percent female has decreased on average across the years; from 2007 to 2015 sampled Pacific cod were 64% female and from 2021 to 2023 sampled Pacific cod were 54% female.

Otoliths were collected from 20% of the fish sampled. Pacific cod age determination can be problematic and age accuracy has been unresolved in past years (Carlile 2005). Because Pacific cod in the GOA are managed by NMFS using length, rather than an age-structured model, otolith sampling was reduced in recent years, and collected otoliths were archived.

SABLEFISH

BACKGROUND

Sablefish *Anoplopoma fimbria*, also known as black cod, are a commercially important species throughout their range, and typically harvested using longline hook or pot gear. The PWS sablefish fishery developed in the late 1970s in response to increased sablefish value and declines in shrimp and crab fisheries (Bechtol and Morrison 1997). Sablefish are a relatively long-lived species (maximum age 94; Munk 2001), and maximum age estimated from the PWS commercial fishery is 50 years old. Adult sablefish occur in deep water ranging from 150 to 1500 m and are generally found in soft substrates, although they are caught in soft, hard, and mixed substrates. Sablefish are a valuable commercial fish species and have the highest exvessel price per pound of all commercial groundfish species in PWS.

REGULATIONS AND MANAGEMENT

The regulations and management of sablefish has changed over time through the BOF process and through the Commercial Fisheries Entry Commission (CFEC; Rumble et al. 2021). Currently, sablefish are managed through the *Sablefish harvest, possession, and landing requirements for Prince William Sound Area* (5 AAC 28.272). State managed sablefish harvest in PWS is directed and occurs only in the Inside District (Figure 1).

For the PWS Area, the sablefish GHL is currently derived from longline hook and trawl surveys conducted by National Marine Fisheries Service (NMFS). ADF&G calculates the GHL by

applying the relative change between the prior and current year of the NMFS Gulf of Alaska sablefish acceptable biological catch (ABC) based on the NMFS stock assessment surveys. This helps ensure that the GHL reflects the most recent scientific data on sablefish populations and helps maintain sustainable fishing practices. The GHL is allocated among 4 limited entry permit classes, with quota allocation originally based on vessel size as specified in regulation. Limited entry permit quotas are announced annually by advisory announcement.

In 1996, the CFEC adopted the limited entry program for PWS sablefish. Despite the adoption of the limited entry fishery, gear conflicts continued, with tangled lines and vessel crowding resulting in lost gear when ground lines were parted. In response to gear conflicts and the undocumented mortality from lost gear, and to provide for conservation of the resource, the BOF adopted a shared quota approach for the PWS sablefish fishery. Quota allocations were derived such that half of the quota is allocated equally among registered participants and the balance of the GHL allocated according to the permit's vessel size class: Classes A and B (90 ft and 60 ft maximum length) vessels receive 18.5%; Class C (50 ft maximum length) vessels receive 70.3%; and Class D (35 ft maximum length) vessels receive 11.1%. After adoption of the shared quota, ADF&G petitioned the CFEC to remove the restriction on using vessels of a larger size class while maintaining the vessel size classification for the purposes of issuing the permit and allocating the resource among permit holders. Multiple permits may concurrently fish on one vessel.

Vessels participating in the fishery must register with ADF&G prior to the registration deadline of April 1 at 5:00 PM. The fishery is open by regulation from April 15 through August 31, although in 2021 the season was extended through December 31 and in 2022 it was extended through September 30 by EO to allow vessels a longer season during the first years of the COVID-19 pandemic. Vessels participating may fish with longline hook or longline pot gear or jig gear, and there is one permit that may retain sablefish with shrimp trawl gear. Groundfish pots may only be used if 2 or more pots are attached to a line connected to another groundfish pot with each end of the buoy line marked. Single pot fishing is not permitted. There is no groundfish pot limit or pot tags required. However, to aid in accurate catch accounting of sablefish from PWS state waters, a vessel may not operate gear in PWS state waters while also retaining IFQ sablefish from federal waters.

Other management measures include the following: a vessel must also keep copies of all PWS sablefish fish tickets aboard, participants are required to fill out logbooks, and there is a 6-hour prior notice of landing (PNOL) requirement. The deadline to submit log sheets to ADF&G is 7 days following a sablefish landing, which corresponds to fish ticket deadlines.

Bycatch allowances during the fishery are set annually by EO and are based on a percentage of total round weight of sablefish by species. Lingcod, rockfish, Pacific cod, and pollock bycatch may not exceed 20%, sharks may not exceed 15%, skates may not exceed 5%, and all other species may not exceed 20%. Retention of all rockfish bycatch is mandatory. In addition, retention of all Pacific cod and pollock is mandatory when a fishery for those species is open and retention is mandatory up to the 20% bycatch allowance when a fishery for those species is closed.

HARVEST AND EFFORT

Stock Status

Based on current model projections provided by National Marine Fisheries Service (NMFS), sablefish in Alaska are not approaching an overfished condition (Goethel et al. 2023.) However,

there is some concern about the lack of sablefish older than 10 years in the population, because this is the age when greater than 90% of sablefish reach maturity. NMFS conducts a sablefish longline hook survey annually in the GOA. During the most recent survey in 2023 sablefish abundance was similar to the year prior, but from 2021 to 2022 a 26% increase in abundance was observed (Goethel et al. 2023).

Historical

Annual sablefish harvest and effort between 1988 and 1995, when the fishery was open access, ranged from 188,630 pounds by 25 vessels in 1989 to almost twice the GHL when harvest was 576,725 pounds by 126 vessels in 1995 (Table 15). The 1995 peak in catch and effort was attributed to speculation about qualifying for the limited entry program. Between 1996 and 2002, following the implementation of the limited entry program, harvest and effort ranged from 208,370 pounds by 51 vessels in 1997 to 355,668 pounds by 32 vessels in 2000, with a maximum effort of 69 vessels in 1996. The shared quota fishery was implemented in 2003; following this, harvest has ranged from a high of 234,862 pounds by 38 vessels in 2004 to a low of 15,878 pounds by 21 vessels in 2015.

Most sablefish harvest historically occurred in the Inside District. However, before regulations restricted the fishery to the Inside District in 1997, harvest from the Outside District was significant in some years, accounting for nearly 20% in 1993 and 1994 (Rumble et al. 2021). Most of the Inside District fishing effort has been concentrated in a deep trench between Lone Island and the Naked Island group (Figure 1). Other harvest areas include Port Wells, Knight Island Passage, and the deeper waters of central PWS near the tanker traffic lanes.

From 1993 to 2014 the harvest ranged from 96,334 pounds in 2014 to 576,725 pounds in 1995. During this time effort ranged from 27 vessels making 72 landings in 2014 to 126 vessels making 134 landings in 1995. Historically, almost all harvest was from longline hook gear and effort from other gear types remained minimal and often was zero or confidential. However, in 2011 and 2012, over 20,000 pounds of sablefish were harvested with pot gear. This was also true for 2018 and 2020 sablefish harvest.

In 2015, PWS sablefish harvest was at the lowest level in the history of the fishery at 15,878 pounds, with effort also at historically low levels (Table 15). Since then, harvest has been steadily increasing, although still well below the GHL. After harvest more than doubled from 2015 to 2016, harvest jumped up 80% to 70,409 pounds in 2017. Harvest continued to increase from 2018 to 2020 with 95,877 pounds being harvested in 2020. However, the GHL has not been fully achieved since the shared quota fishery was implemented in 2003. Interestingly, anecdotal information from fishers indicated a higher proportion of smaller fish caught in 2019. This observation from fishers was not reflected in average weight or length of sampled sablefish from 2018 to 2019 within the port sampling program (Table 16).

Effort in the number of vessels and landings during 2016 through 2020 were similar, averaging 19 vessels with 48 landings (Table 15). However, the number of participating limited-entry permit holders has shown a steadily increasing trend since the low of 24 permits fished in 2015 up to 43 and 41 in 2018 and 2019, respectively. Since the shared quota fishery was implemented in 2003, permits have been stacked on vessels, and that trend was even more pronounced during 2017–2019, with more than twice as many permits than vessels being fished in 2019.

Exvessel value of sablefish bounced back after 2015 and 2016, which were the years with the 2 lowest values historically, $71,462 and $129,058, respectively (Figure 8 and Table 9). Exvessel value increased to over $333,000 in 2017 and nearly $307,000 in 2018, but then dropped in 2019 down to $178,456. The average sablefish price per pound was the highest on record in 2017, with an average price of $4.56 per pound, but decreased in the following two years, to $3.48 per pound in 2018 and $2.08 per pound in 2019 (Table 8).

Recent 3 years

During the most recent 3-year period, sablefish harvest ranged from 136,132 pounds in 2023 to 195,174 pounds in 2022 (Table 15). The average harvest for 2021 through 2023 was 157,076 pounds. Although longline hook had been the primary gear type historically, pot gear is responsible for almost 50% of the total harvest from 2021 to 2023. In 2023, 72,912 pounds of sablefish were harvested with pot gear, whereas only 63,221 pounds of sablefish were harvested with longline hook gear. Pot gear has become popular in recent years due to collapsible "slinky" pots becoming more common. Fishers have been drawn to using slinky pots for being easy to transport onboard the vessel, cost effective to buy, and helpful in the reduction of whale depredation. Average price per pound of sablefish in this review period is down from the historical average (1998 to 2015) of $3.57 per pound to $2.83 per pound (Table 8). Exvessel value of sablefish based on the average price of sablefish throughout the state of Alaska from Commercial Operator's Annual Reports (COAR) averaged $435,042 for 2021 through 2023 with an average of 158,672 pounds being sold from the PWS sablefish fishery (Figure 8 and Table 9).

HARVEST SAMPLING

Biological sampling of sablefish from PWS has been conducted consistently since 1995 in the ports of Cordova, Seward, and Whittier during the fishery. Since the fishery dates have shifted over time, collection has happened as early as March and as late as December. Samplers collect biological samples for fish length, weight, sex, and maturity stage. Age structures (otoliths) were also collected and were sent ADF&G Age Determination Unit (ADU) in Juneau for age determination.

The average length and weight of sampled sablefish from PWS has slightly increased in the last 3 years (Table 16). Average length was 61.7 centimeters from 2021–2023 compared to 60.1 centimeters from 2016–2020. Average weight was 2.7 kilograms from 2021–2023 compared to 2.5 kilograms from 2016–2020. Percent female has increased on average across the years; from 2007–2015 sampled sablefish were 59% female and from 2021–2023 was 64% female. The average age of sablefish has remained stable since 2007 between 6 and 7 years old.

POLLOCK

BACKGROUND

Walleye pollock *Gadus chalcogrammus* (hereafter referred to as pollock) grow to a maximum size of 1.0 meter and a maximum weight of 6.0 kilograms, although they average 30 to 50 centimeters and 0.25 to 0.90 kilograms. Pollock are semipelagic schooling fish, which become increasingly demersal with age, and are relatively fast growing and short-lived. They are caught in the PWS directed pollock fishery beginning at age 2 and may live to a maximum age of 22 years. Because many other species including Stellar sea lions feed on pollock, they play an important role in the ecosystem. At the same time, their survival rate is highly variable, which can potentially cause

large fluctuations in pollock abundance over short periods of time with associated effects on species that rely on pollock as prey.

REGULATIONS AND MANAGEMENT

Since the directed pollock pelagic trawl fishery began in 1995 there have been slight changes to the regulations and management, although they remain similar to historical regulations (Rumble et al. 2021). Currently, the directed pollock fishery is currently managed through the *Prince William Sound Pollock Pelagic Trawl Fishery Management Plan* (5 AAC 28.263). The PWS directed pollock fishery is open access.

Pollock in Alaska are managed as 5 separate stocks: Aleutian Islands, Eastern Bering Sea, Western/Central/West Yakutat Gulf of Alaska, Bogoslof, and Southeast Gulf of Alaska. For the fishery in PWS, the GHL for the pollock fishery is calculated as 2.5% of the Western/Central/West Yakutat Gulf of Alaska annual acceptable biological catch (ABC). ADF&G may reserve a percentage of the GHL for a test fishery, in which the funds will be used to aid PWS commercial fishery management, including groundfish stock assessment and inseason pollock catch sampling. The directed pollock fishery has an annual registration deadline of January 13, and the season opens at 12:00 noon on January 20. There is a regulatory closure date of March 31.

All directed pollock pelagic trawl harvest occurs in the Inside District of PWS, which is further divided into 3 sections: Bainbridge, Knight Island, and Hinchinbrook (Figure 9). No more than 60% of the pollock GHL or annual bycatch cap may be taken from a single section. Inseason management during the PWS directed pollock fishery is intensive, with close contact between the fleet and managers with attention to section harvest limits and bycatch caps. There are trip limits of 300,000 pounds for vessels fishing and 600,000 pounds for tenders. The trip limits are an important management tool to control the rate of harvest in the fishery.

Additional ADF&G management requirements include mandatory check-in and check-out procedures before fishing in or leaving a management section, as well as recording fishing information on log sheets. Log sheets are due to ADF&G 10 days after every landing. All pollock harvested in the fishery must be retained.

Bycatch is restricted in regulation to no more than 5% of the total round weight of pollock harvested, and ADF&G further manages bycatch by apportioning the percentage among the following species groups by EO: rockfish (0.5%), salmon (0.04%), shark (0.96%), squid (3.0%), and other species (0.5%). The rockfish bycatch limit of 0.5% during the directed pollock pelagic trawl fishery is specified in regulation in the *Prince William Sound Rockfish Management Plan* (5 AAC 28.265). Retention of rockfish is mandatory and accrues to the rockfish GHL of 150,000 pounds. Because rockfish bycatch levels are a percentage of the directed harvest, as pollock GHLs increase, rockfish bycatch allowances increase, and rockfish harvested in this fishery may be a significant proportion of the PWS rockfish GHL (Table 4).

HARVEST AND EFFORT

Stock Status

Pollock surveys are conducted by the National Marine Fisheries Service (NMFS) and ADF&G throughout Alaska. Based on recent surveys there was a large increase in pollock abundance in the summer NMFS bottom trawl (79.4%) and summer acoustic (71.7%) survey in 2021, but decreases in the winter acoustic (-29.2%) and ADF&G bottom trawl survey (-22.5%) from 2022 (Monnahan

et al. 2023). Although there were differing trends between survey's results showing an increase in spawning biomass of pollock. Currently, pollock are not approaching an overfished condition in the Gulf of Alaska (GOA).

Historical

Prior to the beginning of the directed pollock trawl fishery in 1995, pollock was only harvested as bycatch and averaged about 4,500 pounds annually from 1988 through 1994 (Rumle et al 2020). The start of the directed pollock fishery has increased harvest exponentially. Directed harvest of pollock from 1995–2020 averaged about 4.5 million pounds annually and ranged from 1.4 million pounds in 2008 to 9.8 million pounds in 2015 (Table 17). GHLs have ranged from 2 million in 2004 and 2005 to 13.1 million pounds in 2016. Interest and participation in the PWS directed pollock fishery has varied between 1995 and 2020 with a maximum of 22 vessels participating in 2019 to a confidential number of vessels during the 2001 season. The directed pollock season has lasted an average of 42 days with a minimum of 5 days in 1996 to a maximum of 84 days in 2003 in the 1995–2020 time period.

Harvest in the Hinchinbrook, Knight Island, and Bainbridge sections have varied considerably. In the early years of the directed fishery, 1995 through 2000, most harvest came from Bainbridge Section, and then switched to Hinchinbrook Section for most years while harvest in Knight Island remained minimal or zero (Figure 10). From 2001 through 2006 harvest occurred in all 3 sections, except in 2002 when there was no harvest in Knight Island. The majority of harvest was taken in the Hinchinbrook Section and Knight Island section from 2007 through 2017, with no to minimal harvest in the Bainbridge section. In 2018, there was a jump in harvest that occurred in the Bainbridge section and continued through 2020.

There are some notable bycatch harvests during the pollock fishery that have at times resulted in fishery closures prior to meeting the GHL. In 2014, the fishery was closed after attaining rockfish and squid bycatch limits after only 8 days of fishing (Tables 4 and 17). Rockfish bycatch was the highest seen in the fishery at 67,466 pounds, or 1.29% of the directed pollock harvest, more than twice the 0.5% rockfish bycatch cap (Table 4). Squid harvest was 171,946 pounds, or 3.29% of the directed pollock harvest. Squid harvest was high again in 2015 at 240,125 pounds. However, harvest was below the allowable bycatch level of 3.0% and did not result in a fishery closure. High squid harvest in 2015 was mirrored in the NMFS stock assessment survey and squid biomass estimates. Squid harvest again increased in 2020 up to 153,959 pounds or 3.02% of the directed pollock harvest, just over the allowable level thereby closing the fishery.

Recent 3 years

During the most recent 3-year period, directed pollock harvest ranged from 5.6 million pounds in 2021 to 7.7 million pounds in 2023, averaging 6.8 million pounds and a 97% GHL achievement (Table 17). Participation averaged 15 vessels and 23 landings with a season length of 46 days and was lowest in 2021 with 10 vessels and 20 landings. In 2021 the season lasted only 12 days before the fishery was closed due to exceeding the salmon bycatch cap of 0.04% (Table 4). The bycatch cap for salmon was met in 2022, but in 2023 bycatch caps were not met or exceeded. For this review period (2021 to 2023) rockfish bycatch averaged 0.20% of the directed pollock harvest, equating to 12,382 pounds, an increase from the previous 5 years (2016 to 2020). Total bycatch averaged 1.2% of the directed pollock harvest. Based on the Commercial Operator's Annual Reports (COAR) throughout the State of Alaska, pollock was sold at an average price of $0.17 per pound, higher than the average price seen for 2016–2020 of $0.14 per pound (Table 8). The

exvessel value of pollock averaged $1,141,224 with a low in 2021 of only $842,843 (Figure 8 and Table 9).

TEST FISHERY

There is a pollock pelagic trawl test fishery in the PWS Area that occurs annually. The purpose of the test fishery is to gather data and generate revenue to support research and management of fisheries in PWS. Each year 900,000 pounds of the annual GHL is reserved for harvest in the test fishery, which may occur the week prior to the regulatory season or when the regulatory season closes. The closure of the regulatory season varies depending on harvest and effort. In 2021, 2 landings for the test fishery occurred after the regulatory season. In 2022, there was 1 landing prior to the regulatory season and 3 landings after. In 2023, one landing occurred 2 days into the regulatory season, but fishing began prior and there was an additional landing after the regulatory season. For the recent 3 years (2021 to 2023) the test fishery harvested an average of 799,376 pounds of pollock annually. Harvest was 960,297 pounds in 2022, exceeding the amount apportioned to the test fishery. All rockfish harvested in the test fishery accrues to the 150,000 pound PWS rockfish GHL.

HARVEST SAMPLING

Dockside sampling of pollock from the PWS trawl fleet has been conducted since 1995 (Table 18). This requires ADF&G staff to travel from Homer to Seward and Kodiak to achieve sampling objectives. Since 2018 sampling operations were conducted in the port of Kodiak because there was no buyer in Seward. Samplers collected biological samples for fish length, weight, sex, and maturity stage. Age structures (otoliths) were also collected and are read at the Homer ADF&G lab for age determination.

The average length and weight of sampled pollock from PWS has slightly decreased in the last 3 years (Table 18). Average length was 44.3 centimeters from 2021–2023 compared to 45.7 centimeters from 2016–2020. Average weight was 0.7 kilograms from 2021–2023 compared to 0.8 kilograms from 2016–2020. Percent female has increased on average across the years; from 2007 to 2015 sampled pollock were 33% female and from 2021 through 2023 were 39% female. The average age for 2021 and 2022 was 5 years, similar to the historical average ages. Otoliths have not yet been read for 2023.

LINGCOD

BACKGROUND

Lingcod belongs to the Greenling (Hexagrammidae) family. They are found only on the west coast of North America from the Alaska Peninsula south to Baja California. Lingcod are common throughout Southeast Alaska, the outer Kenai Peninsula, and PWS. Lingcod are often found at nearshore rock reefs from 30 to 330 feet but can also be found at depths to 1,000 feet. Male lingcod begin to sexually mature at age 2 and 50 cm length, whereas female lingcod begin to mature around 3 to 5 years of age and 60 to 76 cm in length. Lingcod can reach sizes of 38 kilograms and 1.5 meters. Males and females grow at a similar rate until age 4, when females exhibit a faster growth rate and eventually reach a larger size than males. The maximum reported age of lingcod in the PWS Area is 36 years old (Marian Ford, Fisheries Biologist, ADF&G, October 2, 2024; personal communication). Adult male lingcod do not generally move far from where they are born and engage in nest guarding behavior, protecting eggs for 8 to 10 weeks during winter and early spring.

An unguarded nest can be destroyed within 48 hours by predators such as rockfish, sea stars, kelp greenling, and cod. Removal of a male during the nest-guarding period removes an adult contributing to the spawning population and likely results in the loss of the males' nest, affecting future recruitment.

REGULATIONS AND MANAGEMENT

The management of lingcod has changed over time in PWS through the BOF process (Rumble et al. 2021). Prior to 1997, all lingcod harvest in PWS was bycatch to other directed groundfish and halibut fisheries. In addition to managing all lingcod in state waters, the State of Alaska assumes management authority over lingcod in adjacent federal waters (3-200 nautical miles offshore). Currently, there is no lingcod management plan specified in regulation; therefore, ADF&G sets and announces harvest levels annually.

For the PWS Area, the GHL for directed and bycatch harvest is based on the 10- year average harvest from 1986 to 1995 and has been set at 7,300 pounds for the Inside District and 25,300 pounds for the Outside District and adjacent federal waters since 2008. In the directed fishery, lingcod are generally harvested with longline hook gear or jig gear (includes mechanical and hand troll). However, no regulation specifies allowable gear types for lingcod specifically, and lingcod gear type is regulated under general groundfish regulations permitting harvest by any gear type except for bottom trawls. Only one gear type may be on board the vessel at one time. Bycatch of lingcod typically occurs with longline hook gear, although it may also occur with jig and pot gear. In some cases, lingcod are also caught with trawl gear and discarded at sea. Reports of discards at sea from trawl gear may not be fully representative of actual numbers discarded.

The regulatory season is from July 1 to December 31 to protect spawning and nest-guarding lingcod during the first half of the year. To participate in the directed fishery, fishers must register with ADF&G. Vessels targeting other groundfish species or halibut may retain lingcod up to 20% directed harvest on board when the regulatory season is open. Lingcod caught prior to July 1 must be immediately released unharmed. A minimum size requirement of 35 inches overall, or 28 inches measured from the front of the dorsal fin to the tip of the tail, is intended to allow at least one spawning opportunity for a lingcod prior to being susceptible to harvest. An EO is issued closing the directed fishery if GHLs are achieved prior to the regulatory season closing. However, vessels are allowed to retain lingcod up to 20% by weight of the directed species on board after the closure of the directed lingcod season.

To facilitate biological sampling objectives, ADF&G issues an EO annually to require that all lingcod be delivered with the head attached, and with the vent and area 1.0 inch forward of the vent intact as proof of sex. In addition, for the directed fishery there is a 6-hour prior notice of landing requirement after each lingcod trip. This allows ADF&G greater opportunity to achieve necessary sample sizes and collect a more robust data set that includes information on sex.

Bycatch allowances during the directed fishery are set annually by EO and are based on a percentage of total round weight of lingcod. Pacific cod and pollock may not exceed 20%, sharks may not exceed 15%, rockfish may not exceed 10%, skates may not exceed 5%, and all other species may not exceed 20% by weight. Retention of all rockfish bycatch is mandatory. In addition, retention of all Pacific cod and pollock is mandatory up to the bycatch allowance and continues to be mandatory beyond the bycatch allowance if a directed fishery for those species is open.

HARVEST AND EFFORT

Stock Status

The stock status of lingcod is unknown in Alaska; therefore, lingcod fisheries are managed conservatively throughout the state including in PWS to prevent overharvest. Data collection and research continues to be a priority to better understand abundance and distribution of lingcod across Alaska.

Historical

All harvest from 1988 through 1996 occurred as bycatch to other directed groundfish fisheries (Rumble et al. 2021). A majority of the harvest occurred in the Outside District (including adjacent federal waters) in all years except in 1991 when 20,224 pounds were harvested in the Inside District and only 12,608 pounds were harvested in the Outside District (Table 16 in Rumble et al. 2021). Harvest averaged 44,456 pounds during this time frame, with a high in 1995 at 110,208 pounds. Effort for trips landing lingcod bycatch averaged 29 vessels and 43 landings from 1988 to 1996.

When the directed lingcod fishery began in 1997, directed harvest of lingcod was higher than bycatch for the first 10 years except in 2000, 2003, and 2006 (Table 19). On average, 16,282 pounds of lingcod were harvested in the directed fishery from 1997 through 2015. The average harvest of lingcod as bycatch was slightly lower at 14,659 pounds. In general, most harvests for both the directed fishery and bycatch occurred in the Outside District waters. In 1999, no lingcod were harvested from Inside District waters.

Total lingcod harvest from 2007 through 2015 averaged 39,062 pounds, with similar averages for both directed and bycatch harvest (Table 19). During this time frame, the lowest harvest was from the Inside District in the directed fishery where no lingcod were harvested, and the highest lingcod harvest was in 2009 with 45,742 pounds from bycatch in the Outside District. Effort for all lingcod harvest averaged 54 landings annually from an average of 31 vessels.

From 2016 through 2020, average lingcod harvest was down from the historical average (1988 to 2015) at 21,705 pounds (Table 19). The average harvest for the directed fishery was very similar to bycatch at about 10,800 pounds. Harvest was highest in 2018 at 18,800 pounds from the directed fishery and 10,754 pounds from bycatch. Effort in 2018 was also high at 36 vessels and 60 landings, although effort was highest in 2019 with 38 vessels and 64 landings. On average, there were 51 vessels with 32 landings delivering lingcod from 2016 through 2020.

Recent 3 years

Lingcod harvest in both the Inside and Outside Districts during the recent 3-year period (2021–2023) averaged 25,713 total pounds (Table 19). Harvest in the Inside District was highest in 2022 at 5,692 pounds and was highest in the Outside District, which includes federal waters, in 2023 at 24,146 pounds. In 2021, Inside District harvest was only 2,341 pounds; however, the Outside District harvest was 20,002 pounds. Most harvest in recent years has occurred as bycatch to other directed groundfish and halibut fisheries, not as directed effort in the PWS lingcod fishery. The total directed harvest in 2022 was 1,826 pounds, while the bycatch harvest was 23,341 pounds. The primary gear type used to harvest lingcod is longline hook with minimal harvest occurring from jig gear (Figure 11). During this period, lingcod were sold at an average of $1.84 per pound, with a high price in 2021 at $1.95 per pound (Table 8). Exvessel value of lingcod based on the

average price of lingcod throughout the state of Alaska from Commercial Operator's Annual Reports (COAR) averaged $70,593 for 2021 through 2023 (Figure 8 and Table 9).

HARVEST SAMPLING

There has been sporadic sampling of lingcod dating back to 1993, but sampling operations have been conducted consistently since 2003 on PWS lingcod. Port sampling of lingcod from PWS was primarily conducted in the ports of Cordova and Seward with few deliveries in the Homer port. Biological samples were collected for fish length, weight, sex, and age. Otoliths are the current age structures collected from lingcod to determine age. Prior to 2006, fin rays were the age structure used to age lingcod. An experiment comparing ages estimated from otoliths and fin ray sections was conducted between 2001 and 2005 at the Homer age lab, and analysis produced comparable results. Less labor is required to process otoliths versus fin rays, and therefore the decision was made in 2006 to switch to otoliths as the preferred age structure for all lingcod age determination in Central Region (PWS and Cook Inlet Areas) from the commercial fishery. However, ADF&G staff continue to use fin rays to assess lingcod age from the sport fishery.

The average length of sampled lingcod from PWS has slightly increased in recent years, whereas average weight was very similar and percent female has decreased (Table 20). The average length was 107.7 centimeters from 2016 to 2020 and 110.1 centimeters from 2021 through 2023. The average weight for the last 8 years is 13.2 kilograms. The average percent female from sampled fish decreased from 86% in 2016 to 2020 to 79.7% in the recent 3 years. This decrease in percent female is odd and noteworthy because female lingcod typically grow to a larger size than males and there is a minimum size requirement to retain lingcod (Jagielo 1990 and Gordon 1994). Age structures have been sent to ADF&G Age Determination Unit at the Mark, Tag, and Age Laboratory, but analysis is not yet complete for 2021 thorough 2023.

MISCELLANEOUS GROUNDFISH

BACKGROUND

Miscellaneous groundfish, including numerous species of flatfish, sharks, and skates, are landed incidentally to PWS fisheries and have been targeted only sporadically (Table 21). Octopus and squid are also landed incidental to PWS groundfish fisheries; although they are considered shellfish under state regulation, they fall under the "other" groundfish category in federal regulation. Many of these species are discarded at sea during other directed fisheries and often not reported.

REGULATIONS AND MANAGEMENT

Seasons for miscellaneous groundfish were historically set by EO to coincide with seasons set by NMFS in the adjacent federal waters of the EEZ. However, through the BOF process significant changes to regulations and management of miscellaneous groundfish have occurred (Rumble et al. 2021). Currently, miscellaneous groundfish are managed in accordance with (5 AAC 28.070).

There are no directed fisheries for miscellaneous groundfish within PWS and harvest occurs as bycatch to other directed groundfish and halibut fisheries. Bycatch limits allow retention up to 20% by weight for the directed groundfish species of halibut on board the vessel, but only 5% may be skates and only 15% may be sharks.

Although octopus is a miscellaneous shellfish species, octopus may be retained in groundfish and halibut fisheries. ADF&G manages octopus as a bycatch-only fishery under the *Registration Area E Octopus Management Plan* (5 AAC 38.217). This plan specifies a guideline harvest range (GHR) of 0 to 35,000 pounds and a bycatch limit of 20% to directed groundfish and halibut fisheries or 35% to directed shrimp fisheries.

HARVEST AND EFFORT

Skates were open to directed fishing until 1998, although harvest levels remained low. As a market for skates was developed and with the advent of the PWS state-waters Pacific cod fishery opening to longline hook gear in 2009, harvest of skates as bycatch within PWS increased (Tables 5 and 21). A Commissioners permit fishery for longnose and big skates was prosecuted from 2009 to 2010 but discontinued due to sustainability concerns (Rumble et al. 2021).

There is limited information on catch of other miscellaneous groundfish species. However, there is some information from other agencies stock assessment survey data and CPUE data from the ADF&G large-mesh trawl survey (Rumble et al. 2017). An indication of incidental catch in longline hook fisheries has also been provided by ADF&G's sablefish longline hook survey that was last conducted in 2006. Shark bycatch, particularly Pacific sleeper shark *Somniosus pacificus* in longline hook and trawl fisheries, has been reported to be significant. Similarly, there is an incidental catch of salmon sharks *Lamna ditropis* during salmon seine fisheries. In addition, squid has been a significant bycatch component in the pollock trawl fishery in some years (Table 4).

HARVEST SAMPLING

Currently there are no samples collected on miscellaneous groundfish from commercial fisheries in PWS.

GROUNDFISH RESEARCH

ROCKFISH

There have been 3 fishery independent surveys conducted that capture or count rockfish in PWS: (1) multi-species large-mesh trawl survey, (2) sablefish longline hook survey, and (3) a remotely operated vehicle (ROV) survey. The large-mesh trawl survey is an ongoing annual or biennial survey in operation since 1989. The sablefish survey was conducted annually from 1996 to 2006, and the ROV surveys were conducted in 2012 and 2016.

The multi-species large-mesh trawl survey uses a 400-mesh eastern bottom trawl net. The survey occurs mainly in the eastern and southcentral portions of PWS from Valdez Arm south to Orca Bay and west to northern Montague Island. This survey provides information on numerous commercially important species (rougheye rockfish, Pacific cod, walleye pollock, sablefish, skates and various flatfish species) some of which may be used as a relative index of abundance or biomass. In addition to catch information, biological data including sex, maturity, size, and age are collected from all rockfishes and sablefish. In the history of the survey, over 99% of the rockfish caught were slope species and rougheye rockfish made up more than 97% of the total by weight. This survey only covers a portion of rougheye rockfish habitat within PWS, so any catch information should be considered in this context. Rougheye rockfish catch per unit effort (CPUE) for the core station areas (Port Fidalgo, Orca Bay, and north Montague; Figure 12) that were surveyed each year peaked at 72.28 pounds per nautical mile in 1993 and declined to 25.88 pounds

per nautical mile in 1999. CPUE increased to 44.08 pounds per nautical mile in 2003 before decreasing again to 32.21 pounds per nautical mile in 2005. Since 2005, CPUE has been steady but declined in 2014 to 26.89 pounds per nautical mile and was 29.26 pounds per nautical mile in 2015, which was below the long-term survey average of 39.77 pounds per nautical mile (Rumble et al. 2017). Updated survey estimates are being calculated and will be reported in a future research report.

The sablefish longline hook survey covered depths deeper than 200 m, which are commonly occupied by shortraker and rougheye rockfish. Rockfish CPUE and biological data including sex, maturity, size, and age were collected for this time series. The sampling effort varied spatially throughout the years, but the northwestern portion of PWS was sampled every survey year. Therefore, data from this section has a higher potential for detecting trends in population abundance. For the northwest section, over 99% of the rockfish catch for all years combined was composed of slope species. Shortraker rockfish made up the highest percentage of the catch at 50%, rougheye rockfish made up 24%, and shortspine thornyhead rockfish accounted for 9%. CPUE was low for these species, with a high level of variation in most years (Rumble et al. 2017).

The 2012 ROV survey was part of a Central Region lingcod and DSR population assessment (Byerly et al. 2015). For this assessment, a series of index sites were chosen within the Inside and Outside Districts of PWS and the North Gulf District of the Cook Inlet Area. The size of the index sites ranges from 150 square kilometers to 400 square kilometers with 5 sites in the Central Region, 4 sites in North Gulf Coast, and 1 site in PWS. ADF&G research has surveyed 1 to 2 sites per year. After all sites are sampled once, the rotation starts again, to achieve a time series of local abundance to track changes (Rumble et al. 2017).

Index sites represent a range of harvest histories from low to high harvest and are located on rocky banks or coastlines generally separated by deeper glacial fjords. One of these sites is in southwestern PWS. It includes the passages between Bainbridge Passage and Montague Strait and extends south and west to a 150 m contour. Mechanical issues resulted in an incomplete survey, but for the restricted area that was sampled, yelloweye rockfish density was estimated at 1,697 fish per square kilometer (CV = 30%). This density estimate was not significantly different from other areas surveyed in the Cook Inlet Area.

In 2016, an ROV survey covering most of PWS was conducted. This included both inside and outside waters including federal waters. Analysis of this data is not yet available.

PACIFIC COD

There is no ADF&G-directed research on PWS Pacific cod. Although Pacific cod are captured in Central Region multi-species trawl surveys, the survey gear and design does not lend itself to accurate abundance and biomass estimates.

NMFS conducts extensive research on Pacific cod in the Gulf of Alaska including stock assessments to estimate population size and health, surveys to gather data on distribution and abundance, genetic studies to help inform differentiation among spawning populations, as well as monitoring catch and environmental variables which all help manage and sustain Pacific cod fisheries.

Stock assessment trawl surveys have been conducted by the NMFS Alaska Fisheries Science Center (AFSC) every 2 years since 2001 and every 3 years from 1984 through 2001 (Dorn et al. 2013). The survey uses a stratified random design with 49 strata that are based on depth, habitat,

and management area (Martin 1997). Biomass is estimated using mean CPUE and stratum area. Commercial bottom trawlers are used to conduct the survey using standardized trawls; typically, 800 tows are completed in a survey.

The current assessment model for GOA Pacific cod uses the following information: federal and state catch data, commercial federal and state size composition, federal bottom trawl and longline Pacific cod survey information, and conditional length-at-age data for the 2010 to 2011 fisheries.

SABLEFISH

Sablefish research in Central Region began in 1996 when ADF&G initiated an assessment program to develop a fishery-independent index of sablefish abundance using an annual longline hook survey (Bechtol and Vansant 1998; Bechtol 2001). This survey was discontinued after 2006 due to lack of funding.

A sablefish tagging study was conducted in 2011, 2013, and 2015. Sablefish tagging results have assisted with management (Figure 13). To date, 1,552 sablefish were tagged, with 1,203 tagged in 2011, 318 tagged in 2013, and 31 tagged in 2015 (Rumble et al. 2017). Of those tagged in 2011, 319 (27%) were recaptured, 56 (18%) were recaptured from the 2013 marked releases, and 5 (16%) were recaptured from 2015 releases. Recapture rate in the first year for fish tagged in 2011 was 13% and 8% for fish tagged in 2013. In the first year, 94% and 81% of recaptures came from inside PWS in 2011 and 2013, respectively. The percentage of marked fish recaptured outside PWS steadily increased in subsequent years, with the majority of recaptures occurring outside of PWS after 2 years at large. Distance traveled increased with days at large through the second year but remained similar for subsequent years (Rumble et al. 2017). Of fish that were recaptured outside PWS, more moved south to Southeast Alaska and beyond than moved west (Figure 12).

POLLOCK

There is no directed ADF&G research on PWS pollock but pollock are caught in Central Region multi-species trawl surveys, which are designed to target and assess Tanner crab. Survey estimates for pollock from these surveys are highly variable and not an accurate tool for assessing pollock; therefore, the survey is unable to provide abundance and biomass estimates for the pollock population in PWS, but CPUE estimates can be examined for trends and may provide an index.

Pollock CPUE estimates from the ADF&G large-mesh trawl survey are available for 1994 to 2015. Estimated CPUE increased for the first 3 years pollock were accounted for in the survey to a peak of 150.19 pounds per nautical mile in 1997 for the time series. Pollock CPUE then dropped dramatically in 1999 to 28.82 pounds per nautical mile and remained below average through 2003. CPUE estimates were above average in 4 out of the next 5 surveys from 2005 to 2013 with a high of 94.41 pounds per nautical mile in 2009. CPUE declined after 2009, dropping to very low levels of approximately 19.70 pounds per nautical mile in 2014 and 2015 (Rumble et al. 2017). More recent estimates will be published in a future research report.

NMFS conducts stock assessments of pollock every year with a variety of sources of data included to estimate abundance. For 2017 to 2019 assessments, information included in the assessment model included: federal fishery total catch and catch at age, Shelikof Strait acoustic survey biomass and age composition, NMFS bottom trawl survey biomass and length composition, ADF&G crab/groundfish trawl survey biomass and age composition, and summer acoustic survey biomass and length composition (Dorn et al. 2019, Dorn et al. 2018, Dorn et al. 2017). In this time period

there have been contrasting trends in the survey's abundance indices that have caused uncertainty and poor model fits. Besides the model estimates, other factors have been used to make harvest recommendations including population dynamics considerations (age composition) and environmental and ecosystem considerations. These abundance estimates and recommended ABC's are used to derive annual GHL's. Between 2017 and 2020, pollock ABCs for the GOA have decreased steadily (excluding Southeast Outside) from 203,769 metric tons in 2017 to 108,494 metric tons in 2020, a decrease of ~50%.

LINGCOD

An ROV survey was conducted in 2012 to estimate lingcod and demersal shelf rockfish (DSR) density and local abundance in the southwestern portion of PWS (see Rockfish section above). Mechanical issues resulted in an incomplete survey, but for the restricted area that was sampled, lingcod density was estimated at 2,889 fish per square kilometer. This density estimate was not significantly different from that in other areas sampled in the Cook Inlet Area, although the PWS estimate had lower precision. Based on stereo video measurements, 57% of lingcod observed were estimated to be of legal size. In 2016, an ROV survey covering most of PWS was conducted in both inside and outside waters, including federal waters. Analyses require comprehensive video review and data are not yet available.

Very few lingcod are captured in the large-mesh trawl survey or in the sablefish longline hook survey (likely because these surveys are conducted deeper than lingcod typically occur), and as such, those data are of little use for assessment purposes.

Size at maturity was estimated for lingcod collected throughout Central Region. Length at 50% maturity was estimated at 85.65 centimeters (33.72 inches), which is smaller than the 35-inch size restriction in regulation. There were 198 lingcod in the analysis with 106 fish collected from chartered vessels for the maturity study. There were 2 collecting trips: 1 in the North Gulf Coast District of the Cook Inlet Area and the other in PWS. The remaining 82 fish were collected from ADF&G surveys (trawl and jig) and from commercial sampling. Samples were collected between 1998 and 2005; 51% of the samples came from PWS. There is a latitudinal trend of increasing size at maturity from southern Canada to Southcentral Alaska.

SKATES

Skates are captured in multispecies trawl surveys and attempts have been made to estimate biomass to set GHLs in PWS. However, selectivity for big and longnose skates in the ADF&G bottom trawl survey differs from selectivity in longline hook fisheries for those species. There have been attempts to sample more habitats such as shallow waters to improve selectivity, but they have not been successful. Also, there are seasonal differences as the trawl survey occurs in the summer and fisheries harvesting a large portion of skates in PWS occur in the early spring,

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TABLES

Table 1.–Groundfish emergency orders issued for Prince William Sound Registration Area E, 2021–2023.

Fishery	Emergency order	Effective date	Explanation
			2021 calendar year
Global bycatch	2-GF-E-01-21	Jan-21	Closes and reopens directed groundfish and halibut fisheries. Establishes bycatch limits for groundfish interim-use permit holders during a directed fishery. Establishes bycatch allowance for directed salmon and herring fisheries where groundfish may be incidentally caught by drift or set gillnet.
Pollock	2-GF-E-02-21	Jan-21	Sets bycatch limits for pollock pelagic trawl fishery. Closes and immediately reopens the fishing season for walleye pollock.
Pacific cod	2-GF-E-03-21	Jan-21	Opens parallel Pacific cod season concurrent with federal Central Gulf of Alaska Area.
Pacific cod	2-GF-E-04-21	Jan-21	Closes parallel Pacific cod season to vessel fishing with pot gear 12:00 noon January 22 and opens state-waters season to vessels fishing with pot gear effective 12:00 noon January 23.
Pollock	2-GF-E-05-21	Jan-21	Closes the directed pollock pelagic trawl season
Pacific cod	2-GF-E-06-21	Feb-21	Closes parallel Pacific cod season to vessels fishing with longline gear at 12:00 noon February 5. Opens state-waters Pacific cod season to vessels fishing with longline gear at 12:00 noon March 6.
Pollock	2-GF-E-07-21	Feb-21	Closes pollock pelagic trawl season due to annual salmon bycatch limit being reached, effective 5 pm February 15.
Pacific cod	2-GF-E-08-21	Mar-21	Closes state-waters Pacific cod season to vessels fishing with longline gear at 2:00pm March 20.
Lingcod	2-GF-E-09-21	Jul-21	Requires all lingcod taken in the PWS Area to be landed with the head on and evidence of gender retained.
Sablefish	2-GF-E-10-21	Sep-21	Extends the closure of the sablefish season from 11:59 pm, August 31, to 11:59, December 31.
Pacific cod	2-GF-E-11-21	Sep-21	Opens parallel season to vessels fishing pot gear and vessels fishing longline gear that are less than 50 feet in length effective 12 noon September 1.
			2022 calendar year
Global bycatch	2-GF-E-01-22	Jan-22	Closes and reopens directed groundfish and halibut fisheries. Establishes bycatch limits for groundfish interim-use permit holders during a directed fishery. Establishes bycatch allowance for directed salmon and herring fisheries where groundfish may be incidentally caught by drift or set gillnet.
Pollock	2-GF-E-02-22	Jan-22	Sets bycatch limits for pollock pelagic trawl fishery. Closes and immediately reopens the fishing season for walleye pollock.
Pacific cod	2-GF-E-03-22	Jan-22	Opens parallel Pacific cod season concurrent with federal Central Gulf of Alaska Area.
Pollock	2-GF-E-04-22	Jan-22	Closes the directed pollock pelagic trawl season, Hinchinbrook section.
Pollock	2-GF-E-05-22	Feb-22	Closes the directed pollock pelagic trawl season.

-continued-

Table 1.–Page 2 of 2.

Fishery	Emergency order	Effective date	Explanation
Pacific cod	2-GF-E-06-22	Feb-22	Closes parallel Pacific cod season to vessel fishing with pot gear 12:00 noon February 16 and opens state-waters season to vessels fishing with pot gear effective 12:00 noon February 17.
Pacific cod	2-GF-E-07-22	Mar-22	Closes parallel Pacific cod season to vessels fishing with longline gear at 12:00 noon March 15. Opens state-waters Pacific cod season to vessels fishing with longline gear at 12:00 noon March 22.
Lingcod	2-GF-E-08-22	Jul-22	Requires all lingcod taken in the PWS Area to be landed with the head on and evidence of gender retained.
Sablefish	2-GF-E-09-22	Sep-22	Extends the closure of the sablefish season from 11:59 pm August 31 to 11:59 September 30.
Pacific cod	2-GF-E-10-22	Sep-22	Closes state-waters Pacific cod season to vessels fishing pot and longline gear and opens parallel Pacific cod season to vessels fishing pot and longline gear at noon September 1.
Global bycatch	2-GF-E-11-22	Sep-22	Closes and reopens directed groundfish and halibut fisheries with a reduction in rockfish bycatch allowances. Establishes bycatch limits for groundfish interim-use permit holders during a directed fishery.
			2023 calendar year
Global bycatch	2-GF-E-01-23	Jan-23	Closes and reopens directed groundfish and halibut fisheries. Establishes bycatch limits for groundfish interim-use permit holders during a directed fishery. Establishes bycatch allowance for directed salmon and herring fisheries where groundfish may be incidentally caught by drift or set gillnet
Pollock	2-GF-E-02-23	Jan-23	Sets bycatch limits for pollock pelagic trawl fishery. Closes and immediately reopens the fishing season for walleye pollock.
Pacific cod	2-GF-E-03-23	Jan-23	Opens parallel Pacific cod season concurrent with federal Central Gulf of Alaska Area.
Pollock	2-GF-E-04-23	Jan-23	Closes the directed pollock pelagic trawl season, Hinchinbrook section.
Pacific cod	2-GF-E-05-23	Feb-23	Closes parallel Pacific cod season to vessels fishing pot gear and opens state-waters Pacific cod season to vessels fishing pot gear at noon February 27.
Pacific cod	2-GF-E-06-23	Feb-23	Closes parallel Pacific cod season to vessels fishing with longline gear at 12:00 noon February 28. Opens state-waters Pacific cod season to vessels fishing with longline gear at 12:00 noon March 10.
Pacific cod	2-GF-E-07-23	Mar-23	Closes state-waters Pacific cod season to vessels fishing longline gear at noon March 23.
Pollock	2-GF-E-08-23	Mar-23	Closes the directed pollock pelagic trawl season.
Pacific cod	2-GF-E-09-23	Apr-23	Closes state-waters Pacific cod season to vessels fishing pot and jig gear at 11:59 pm April 3.
Pacific cod	2-GF-E-10-23	Apr-23	Closes parallel Pacific cod season to vessels fishing jig gear at noon April 28
Global bycatch	2-GF-E-11-23	Jun-23	Closes and reopens directed groundfish and halibut fisheries with a reduction in rockfish bycatch allowances. Establishes bycatch limits for groundfish interim-use permit holders during a directed fishery.
Lingcod	2-GF-E-12-23	Jul-23	Requires all lingcod taken in the PWS Area to be landed with the head on and evidence of gender retained.
Rockfish bycatch	2-GF-E-13-23	Oct-23	Closes directed groundfish and halibut fisheries to vessels using longline gear in statistical areas: 466032, 476034, 476032, 476035, 476006 due to exceeding the rockfish GHL.

Table 2.–Prince William Sound Area commercial rockfish harvest and effort from the Inside and Outside districts including black and dark rockfish from federal waters, 1988–2023.

	Inside district			Outside district			Total
Year	Vessels	Landings	Harvest (pounds)	Vessels	Landings	Harvest (pounds)	harvest (pounds)
1988	64	170	113,253	18	25	313,489	426,742
1989	35	95	93,307	7	8	25,125	118,431
1990	93	391	489,154	10	11	17,314	506,468
1991	88	239	153,889	6	6	2,762	156,650
1992	106	275	178,621	16	24	12,882	191,503
1993	67	183	81,095	20	33	27,478	108,573
1994	65	160	97,710	31	51	104,670	202,380
1995	122	211	153,107	35	60	156,839	309,946
1996	86	208	108,372	31	50	76,315	184,686
1997	90	234	136,593	26	36	29,245	165,838
1998	80	198	100,120	13	23	8,914	109,034
1999	81	214	60,539	21	31	11,447	71,987
2000	97	260	111,171	18	31	10,749	121,919
2001	94	205	60,597	17	37	13,485	74,082
2002	81	161	67,242	13	26	7,369	74,612
2003	72	168	35,240	30	58	12,751	47,990
2004	61	149	40,582	23	47	12,219	52,801
2005	72	166	47,528	17	47	13,322	60,850
2006	91	167	61,095	22	51	15,176	76,271
2007	58	161	66,133	25	57	15,282	81,415
2008	60	159	92,108	20	49	14,692	106,800
2009	70	200	96,538	37	68	21,657	118,196
2010	71	212	89,962	32	55	14,939	104,901
2011	66	188	96,511	32	53	22,244	118,755
2012	73	191	90,721	36	60	23,155	113,877
2013	75	230	134,575	28	50	14,586	149,161
2014	71	172	143,885	32	46	13,573	157,458
2015	63	235	126,623	25	51	25,505	152,128
2016	71	218	133,032	29	52	28,418	161,451
2017	50	160	46,503	29	50	13,211	59,714
2018	72	170	48,799	30	42	7,653	56,452
2019	74	173	54,385	46	78	17,591	71,976
2020	79	190	70,295	32	55	11,939	82,234
2021	84	208	106,429	48	107	35,707	142,136
2022	94	271	167,467	45	94	29,376	196,843
2023	86	202	125,507	57	120	37,746	163,254
Average							
1988–2015	77	200	111,653	23	41	37,042	148,695
2016–2020	69	182	70,603	33	55	15,763	86,365
2021–2023	88	227	133,134	50	107	34,276	167,411

Note: Values may differ from Rumble et al. 2021 due to reporting updates in Ocean AK fish ticket database. Individual vessels may land fish from two districts in one trip.

Table 3.–Prince William Sound Area commercial rockfish harvest by gear type, including black and dark rockfish from federal waters, 1988–2023.

			Harvest (pounds)				
Year	Vessels	Landings	Jig	Trawl/other	Longline	Pots	Total
1988	80	195	54,097	228,417	144,228	0	426,742
1989	39	103	[a]	[a]	104,328	0	104,328
1990	96	402	30,088	20,238	455,789	[a]	506,115
1991	89	247	15,624	11,162	129,864	0	156,650
1992	114	299	9,946	28,510	152,945	[a]	191,401
1993	80	209	13,905	12,610	81,978	[a]	108,493
1994	92	211	94,588	[a]	104,799	[a]	199,387
1995	148	284	168,777	267	127,616	[a]	296,660
1996	99	257	57,103	3,507	124,077	0	184,687
1997	106	266	34,047	1,294	130,141	[a]	165,482
1998	88	220	2,903	1,079	104,889	[a]	108,871
1999	92	244	1,130	1,951	68,906	0	71,987
2000	100	284	2,401	2,061	117,210	247	121,919
2001	101	233	1,165	4,495	68,400	[a]	74,060
2002	87	190	0	30,553	44,059	0	74,612
2003	89	243	256	4,752	42,982	0	47,990
2004	71	197	283	3,735	48,783	0	52,801
2005	80	206	[a]	8,863	51,547	0	60,410
2006	72	226	1,008	12,391	62,866	[a]	76,265
2007	72	209	[a]	10,970	69,419	0	80,389
2008	70	202	[a]	21,656	85,113	0	106,769
2009	88	256	[a]	22,359	95,663	[a]	118,022
2010	87	262	[a]	6,500	98,117	[a]	104,617
2011	81	232	0	8,113	110,497	[a]	118,610
2012	94	245	881	18,054	94,587	[a]	113,522
2013	84	269	[a]	29,680	119,561	[a]	149,241
2014	90	211	0	69,039	88,419	0	157,458
2015	79	280	0	23,293	128,835	0	152,128
2016	86	262	966	25,110	135,436	[a]	161,512
2017	66	202	433	4,413	54,859	[a]	59,705
2018	91	203	129	4,402	51,920	0	56,452
2019	100	230	[a]	9,715	61,307	[a]	71,022
2020	94	238	[a]	20,558	61,509	[a]	82,067
2021	105	291	[a]	8,918	132,411	799	142,128
2022	106	341	45	19,839	176,349	[a]	196,233
2023	110	296	308	14,690	146,132	2,123	163,254
Average							
1988–2015	88	239	–	–	109,129	18	147,486
2016–2020	87	227	–	12,840	73,006	–	86,152
2021–2023	107	309	–	14,482	151,631	–	167,205

Note: En dashes indicate averages for 2016–2020 could not be computed because data were not available for all years.

Note: Total harvest does not include confidential data.

[a] Confidential data due to limited number of participants.

Table 4.–Prince William Sound Area directed pollock fishery bycatch by species or species group, in pounds and as a percentage of the directed pollock harvest, 2000–2023.

	Harvest												
	Pollock	Rockfish		Salmon		Shark		Squid		Other		Total bycatch	
Year	Pounds	Pounds	Percent	Pounds	Percent	Pounds	Percent	Pounds	Percent	Pounds	Percent	Pounds	Percent
2000	2,256,504	1,368	0.06%	535	0.02%	2,024	0.09%	5,487	0.24%	974	0.04%	10,388	0.46%
2001	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
2002	2,364,143	28,993	1.23%	1,262	0.05%	52,480	2.22%	179,933	7.61%	3,431	0.15%	266,099	11.26%
2003	2,421,772	3,824	0.16%	189	0.01%	7,254	0.30%	20,417	0.84%	8,319	0.34%	40,003	1.65%
2004	1,928,458	2,086	0.11%	151	0.01%	3,148	0.16%	10,890	0.56%	3,848	0.20%	20,123	1.04%
2005	1,677,157	8,289	0.49%	775	0.05%	11,483	0.68%	6,044	0.36%	9,841	0.59%	36,432	2.17%
2006	3,486,499	11,303	0.32%	635	0.02%	3,461	0.10%	31,813	0.91%	17,846	0.51%	65,058	1.87%
2007	2,339,978	10,262	0.44%	836	0.04%	2,650	0.11%	11,155	0.48%	2,233	0.10%	27,136	1.16%
2008	1,395,933	20,790	1.49%	48	0.00%	1,550	0.11%	30,619	2.19%	1,066	0.08%	54,073	3.87%
2009	3,249,441	21,093	0.65%	142	0.00%	19,101	0.59%	15,747	0.48%	14,115	0.43%	70,199	2.16%
2010	3,662,919	3,594	0.10%	223	0.01%	3,133	0.09%	17,052	0.47%	21,854	0.60%	45,856	1.25%
2011	3,377,325	5,290	0.16%	50	0.00%	411	0.01%	15,006	0.44%	2,410	0.07%	23,167	0.69%
2012	5,785,295	16,904	0.29%	1,431	0.02%	1,810	0.03%	8,123	0.14%	12,682	0.22%	40,950	0.71%
2013	5,779,241	27,824	0.48%	61	0.00%	3,230	0.06%	86,116	1.49%	3,401	0.06%	120,632	2.09%
2014	5,220,121	67,446	1.29%	260	0.00%	526	0.01%	171,946	3.29%	24,322	0.47%	264,500	5.07%
2015	9,818,616	20,785	0.21%	442	0.00%	889	0.01%	240,125	2.45%	7,337	0.07%	269,578	2.75%
2016	8,573,163	21,992	0.26%	1,067	0.01%	2,720	0.03%	41,993	0.49%	12,286	0.14%	80,058	0.93%
2017	4,143,533	2,552	0.06%	177	0.00%	117	0.00%	259	0.01%	2,857	0.07%	5,962	0.14%
2018	6,802,350	3,437	0.05%	1,172	0.02%	477	0.01%	1,732	0.03%	20,421	0.30%	27,239	0.40%
2019	6,539,859	6,995	0.11%	258	0.00%	679	0.01%	31,744	0.49%	5,358	0.08%	45,034	0.69%
2020	5,090,676	17,436	0.34%	2,240	0.04%	10,357	0.20%	153,959	3.02%	2,562	0.05%	186,554	3.66%
2021	4,710,088	8,198	0.17%	2,268	0.05%	2,959	0.06%	39,027	0.83%	2,422	0.05%	54,874	1.17%
2022	6,174,300	14,736	0.24%	2,464	0.04%	4,489	0.07%	58,970	0.96%	3,311	0.05%	83,970	1.36%
2023	7,167,286	14,211	0.20%	2,473	0.03%	1,405	0.02%	53,980	0.75%	4,565	0.06%	76,634	1.07%
Average													
1995–2015	3,868,061	12,510	0.37%	477	0.01%	6,937	0.26%	44,845	1.15%	7,968	0.23%	72,737	2.03%
2016–2020	6,229,916	10,482	0.16%	983	0.02%	2,870	0.05%	45,937	0.81%	8,697	0.13%	68,969	1.17%
2021–2023	6,017,225	12,382	0.20%	2,402	0.04%	2,951	0.05%	50,659	0.85%	3,433	0.06%	71,826	1.20%

[a] Confidential data due to limited number of participants.

Table 5.–Prince William Sound Area state-waters Pacific Cod season annual effort, guideline harvest level (GHL), and harvest by gear type, 1997–2023.

					Harvest (pounds)			
Year	Vessels	Landings	GHL (pounds)	% of GHL	Longline	Pot	Jig/hand troll	Total[a]
1997	9	36	881,849	22.7%	Closed	192,142	8,378	200,520
1998	9	33	859,803	48.7%	Closed	385,817	33,177	418,994
1999	7	27	931,453	42.3%	Closed	314,987	79,147	394,134
2000	12	36	2,948,683	9.9%	Closed	268,765	22,377	291,142
2001	3	3	2,617,989	0.0%	Closed	0	228	228
2002	0	0	1,904,243	0.0%	Closed	0	0	0
2003	[b]	[b]	705,479	[b]	Closed	[b]	0	[b]
2004	[b]	[b]	970,034	[b]	Closed	[b]	0	[b]
2005	[b]	[b]	896,620	[b]	Closed	[b]	0	[b]
2006	[b]	[b]	910,730	3.1%	Closed	[b]	[b]	2,353
2007	3	20	910,730	38.0%	Closed	[b]	[b]	345,684
2008	4	6	586,430	1.3%	Closed	0	7,557	7,557
2009	18	34	487,663	143.9%	701,759	0	0	701,759
2010	24	45	784,735	[b]	822,747	[b]	0	[b]
2011	25	63	1,435,209	111.1%	1,594,590	0	0	1,594,590
2012	38	70	1,448,437	[b]	1,395,483	0	[a]	[b]
2013	25	77	1,781,335	71.6%	1,275,245	0	0	1,275,245
2014	30	61	1,463,318	94.6%	1,384,749	0	0	1,384,749
2015	9	15	1,558,668	14.7%	[b]	0	[b]	228,454
2016	27	75	4,841,902	21.9%	1,059,916	0	[b]	1,059,915
2017	[b]	[b]	4,338,146	[b]	[b]	0	0	[b]
2018	16	36	992,080	35.4%	350,909	0	0	350,909
2019	15	40	936,965	43.6%	408,778	0	0	408,778
2020	7	23	437,425	99.0%	[b]	0	b	432,968
2021	17	39	1,094,044	80.2%	877,891	[b]	0	877,891
2022	14	30	1,717,952	31.6%	543,371	0	0	543,371
2023	19	50	1,289,704	101.2%	1,043,761	261,664	0	1,305,426
Average								
1997-2015	14	35	1,267,548	43.0%	1,195,762	89,362	10,058	488,958
2016-2020	16	44	2,309,304	50.0%	606,534	0	3,526	563,142
2021-2023	17	40	1,367,233	71.0%	821,674	130,832	0	908,896

[a] Total does not include confidential data.

[b] Confidential data due to limited number of participants.

Table 6.–Prince William Sound Area parallel Pacific cod season annual effort and harvest by gear type, 1988–2023.

			Harvest (pounds)[a]				
Year	Vessels	Landings	Longline	Pot	Jig/hand troll	Other[b]	Total[c]
1988	39	87	330,718	0	0	0	330,718
1989	23	45	71,845	[d]	[d]	[d]	71,845
1990	84	307	1,203,118	[d]	[d]	[d]	1,203,118
1991	88	234	1,248,218	961,912	[d]	17,074	2,227,204
1992	140	524	1,359,176	594,741	[d]	[d]	1,953,917
1993	57	205	810,831	466,202	[d]	[d]	1,277,033
1994	46	197	316,550	1,584,722	[d]	0	1,901,272
1995	75	205	359,765	1,204,450	6,982	24,539	1,595,736
1996	50	135	214,021	420,183	1,663	218,170	854,037
1997	60	172	334,086	582,324	4,333	1,506	922,249
1998	50	150	534,553	138,243	0	5,879	678,675
1999	54	196	687,169	641,523	[d]	1,909	1,330,601
2000	58	175	403,230	332,310	0	[d]	735,540
2001	23	63	143,641	[d]	[d]	[d]	143,641
2002	22	51	17,700	0	0	[d]	17,700
2003	26	45	14,051	[d]	[d]	234	14,285
2004	17	45	13,247	[d]	0	[d]	13,247
2005	24	38	11,073	[d]	0	221	11,294
2006	30	59	18,407	[d]	0	587	18,988
2007	31	82	64,807	[d]	[d]	[d]	64,807
2008	35	78	66,563	0	0	0	66,563
2009	41	93	169,297	0	0	[d]	166,190
2010	40	93	88,700	0	0	326	89,026
2011	39	93	359,402	[d]	0	345	359,747
2012	32	82	420,544	[d]	0	1,963	422,507
2013	32	92	806,281	[d]	[d]	182	806,463
2014	33	82	791,448	[d]	0	415	791,863
2015	44	188	3,045,972	0	0	782	3,046,754
2016	49	145	1,138,283	0	82,109	5,766	1,224,099
2017	36	121	845,947	0	[d]	197	846,144
2018	45	90	238,296	480	[d]	1,323	240,099
2019	42	65	73,749	[d]	0	1,530	75,279
2020				Closed			
2021	58	114	44,647	0	[d]	462	45,109
2022	72	174	662,222	[d]	0	501	662,723
2023	58	123	476,537	0	9,460	340	486,337
Average							
1988–2015	46	136	496,586	–	–	–	754,108
2016–2019	43	105	574,069	–	–	2,204	596,405
2021–2023	63	137	394,469	–	–	434	398,056

Note: No GHL between 1988–1996; en dashes mean averages could not be computed because data were not available for all years.

[a] Harvest includes Pacific cod bycatch to other groundfish fisheries.

[b] "Other" includes trawl and gillnet gear.

[c] Total does not include confidential data.

[d] Confidential data due to limited number of participants.

Table 7.–Prince William Sound Area commercial rockfish harvest in pounds and estimated number of fish based on mean weight, 2007–2023.

	Yelloweye harvest		Shortraker harvest		Quillback harvest		Rougheye harvest	
Year	Pounds	# of fish	Pounds	# of fish	Pounds	# of fish	Pounds	# of fish
2007	22,432	3,189	25,071	2,014	1,359	428	25,528	3,301
2008	21,813	2,587	36,652	2,763	1,646	519	32,739	6,112
2009	28,815	3,701	42,847	3,443	2,798	882	28,774	5,805
2010	22,794	3,059	45,648	3,562	1,840	580	17,458	3,310
2011	36,629	4,319	26,373	1,971	9,630	3,019	23,892	4,260
2012	27,343	4,073	46,750	3,281	10,052	3,064	13,499	2,565
2013	37,402	5,563	56,883	4,028	12,142	3,681	24,841	4,969
2014	16,972	2,468	91,774	6,039	13,869	4,011	16,124	3,785
2015	37,783	5,549	48,249	2,649	21,228	6,685	24,798	6,574
2016	46,665	8,047	41,433	2,965	46,393	13,956	10,768	2,901
2017	15,919	2,120	12,498	743	9,867	3,035	11,669	2,943
2018	12,791	1,613	20,037	1,230	4,746	1,437	9,229	2,705
2019	18,265	2,776	24,773	1,731	7,878	2,481	10,564	2,878
2020	14,699	2,100	36,642	2,401	5,346	1,700	15,367	3,518
2021	33,323	6,822	60,112	5,565	16,019	5,458	14,794	3,647
2022	37,903	8,133	105,673	10,708	14,092	4,640	11,673	2,877
2023	38,812	8,457	81,991	7,112	17,754	6,950	8,586	1,655
Average								
2007–2015	27,998	3,834	46,694	3,306	8,285	2,541	23,073	4,520
2016–2020	21,668	3,331	27,077	1,814	14,846	4,522	11,519	2,989
2021–2023	36,680	7,804	82,592	7,795	15,955	5,682	11,684	2,726

Note: If sample size was less than 50, mean weight was used from 2007–2015 or 2016–2023 to estimate number of fish harvested.

Table 8.–Statewide groundfish harvest average price per pound, 1988–2023.

	Average price per pound					
Year	Lingcod	Pacific cod	Pollock	Rockfish[a]	Sablefish	Skate
1988	$0.54	$0.12	$0.07	$0.50	$1.51	$1.06
1989	$0.41	$0.20	$0.07	$0.43	$1.48	$1.02
1990	$0.53	$0.16	$0.07	$0.40	$1.22	$0.98
1991	$0.53	$0.21	$0.08	$0.46	$1.65	$0.90
1992	$0.41	$0.21	$0.12	$0.41	$1.90	$1.04
1993	$0.55	$0.17	$0.07	$0.42	$1.65	$0.95
1994	$0.56	$0.15	$0.08	$0.43	$2.34	$1.18
1995	$0.76	$0.19	$0.09	$0.56	$3.18	$1.11
1996	$0.65	$0.16	$0.08	$0.51	$3.27	$0.89
1997	$0.68	$0.18	$0.10	$0.56	$3.74	$0.85
1998	$0.72	$0.17	$0.07	$0.50	$2.50	$0.70
1999	$0.84	$0.27	$0.10	$0.54	$3.04	$0.91
2000	$0.87	$0.32	$0.12	$0.60	$3.55	$1.14
2001	$0.69	$0.26	$0.11	$0.55	$3.13	$0.95
2002	$0.74	$0.24	$0.11	$0.60	$3.24	$0.91
2003	$0.83	$0.28	$0.10	$0.54	$3.59	$0.78
2004	$0.85	$0.25	$0.10	$0.54	$3.09	$0.84
2005	$0.93	$0.27	$0.12	$0.48	$3.30	$0.84
2006	$1.08	$0.39	$0.13	$0.49	$3.77	$0.78
2007	$0.87	$0.48	$0.13	$0.48	$3.91	$0.81
2008	$0.92	$0.55	$0.20	$0.50	$4.57	$0.95
2009	$0.93	$0.27	$0.18	$0.49	$4.81	$0.83
2010	$0.99	$0.26	$0.16	$0.51	$5.78	$1.17
2011	$1.52	$0.31	$0.17	$0.57	$7.76	$1.47
2012	$1.55	$0.34	$0.17	$0.63	$6.20	$1.46
2013	$1.17	$0.28	$0.15	$0.60	$4.42	$1.42
2014	$1.27	$0.29	$0.15	$0.63	$5.50	$1.28
2015	$1.35	$0.28	$0.14	$0.59	$5.89	$1.19
2016	$1.51	$0.28	$0.13	$0.59	$6.50	$1.40
2017	$1.88	$0.32	$0.12	$0.65	$7.36	$1.36
2018	$1.63	$0.41	$0.15	$0.68	$5.38	$1.27
2019	$1.79	$0.43	$0.16	$0.63	$4.00	$1.28
2020	$1.58	$0.38	$0.14	$0.56	$2.56	$1.13
2021	$1.95	$0.37	$0.15	$0.55	$2.88	$1.34
2022	$1.79	$0.47	$0.19	$0.56	$3.25	$1.50
2023	$1.78	$0.44	$0.16	$0.58	$2.35	$0.46
Average						
1998–2015	$0.85	$0.26	$0.12	$0.52	$3.57	$1.01
2016–2020	$1.68	$0.36	$0.14	$0.62	$5.16	$1.29
2021–2023	$1.84	$0.43	$0.17	$0.56	$2.83	$1.10

Source: Statewide Commercial Operator's Annual Reports (COAR) available from: https://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.coar

[a] Rockfish includes yelloweye, black, shortraker, rougheye, and quillback rockfish.

Table 9.–Prince William Sound Area state-managed groundfish harvest, in whole pounds, and exvessel values, 2000–2023.

	Lingcod		Pacific cod		Pollock		Rockfish		Sablefish		Skate	
Year	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
2000	23,855	$20,754	1,027,105	$331,779	2,631,273	$304,368	121,919	$73,372	356,513	$1,266,839	323	$1,149
2001	26,812	$18,504	170,673	$44,732	3,509,669	$379,015	74,082	$40,724	323,908	$1,013,143	243	$760
2002	20,170	$14,866	17,831	$4,362	2,541,214	$283,256	74,612	$44,767	328,618	$1,065,407	691	$2,240
2003	24,235	$20,197	317,530	$90,173	2,476,588	$252,171	47,990	$26,144	223,846	$804,058	882	$3,170
2004	30,292	$25,727	332,976	$82,548	2,329,685	$240,688	52,801	$28,383	234,996	$726,720	283	$875
2005	24,244	$22,627	132,816	$36,123	1,995,145	$248,811	60,850	$29,470	227,079	$749,951	84,013	$277,461
2006	28,084	$30,223	47,046	$18,326	3,487,089	$440,612	76,271	$37,441	195,562	$736,414	89	$335
2007	36,646	$31,708	426,100	$202,577	2,599,139	$335,105	81,415	$39,250	199,415	$778,870	2,537	$9,910
2008	45,156	$41,553	74,120	$41,025	1,395,938	$280,315	106,239	$53,469	207,286	$946,275	13,741	$62,728
2009	89,286	$83,107	871,267	$235,431	3,550,867	$652,898	118,196	$58,044	219,984	$1,058,121	333,777	$1,605,465
2010	60,225	$59,469	914,252	$235,947	3,979,711	$619,662	104,901	$53,957	213,202	$1,232,354	228,837	$1,322,727
2011	60,725	$92,278	1,955,057	$614,772	3,730,616	$621,084	118,755	$67,723	223,659	$1,735,414	216,426	$1,679,288
2012	60,265	$93,502	1,819,433	$623,918	5,786,061	$1,001,611	113,877	$71,596	204,604	$1,269,430	154,781	$960,313
2013	41,545	$48,588	2,082,981	$586,627	6,271,391	$961,437	149,161	$90,172	155,879	$689,462	244,770	$1,082,631
2014	128,165	$163,175	2,120,427	$618,071	5,221,217	$776,083	157,039	$98,794	97,029	$533,690	124,518	$684,886
2015	53,588	$72,201	3,331,471	$926,499	9,822,290	$1,418,843	152,547	$90,037	17,079	$100,537	284,026	$1,671,940
2016	29,362	$44,455	2,286,277	$640,917	9,366,407	$1,181,371	161,451	$94,986	40,802	$265,022	103,886	$674,779
2017	17,168	$32,327	841,972	$271,249	4,147,254	$513,903	59,149	$38,488	73,259	$539,516	41,316	$304,267
2018	36,704	$59,676	600,812	$244,496	7,730,658	$1,125,785	56,717	$38,667	88,367	$475,396	36,592	$196,858
2019	32,817	$58,790	487,872	$212,140	7,476,384	$1,177,852	72,276	$45,432	94,836	$378,931	35,735	$142,786
2020	72,246	$114,482	461,338	$175,547	6,020,091	$864,126	82,191	$45,647	96,860	$248,146	27,836	$71,312
2021	34,723	$67,539	981,559	$364,919	5,608,595	$842,843	142,179	$78,102	141,712	$408,736	56,382	$162,619
2022	35,865	$64,212	1,206,400	$565,635	7,136,334	$1,347,035	196,843	$110,853	196,945	$640,639	49,020	$159,457
2023	44,975	$80,030	1,791,762	$788,375	7,711,213	$1,233,794	163,254	$94,687	137,359	$322,772	51,315	$120,583
Average												
1988–2015	43,287	$39,957	1,107,187	$271,215	3,081,953	$394,177	148,675	$75,273	255,929	$834,201	67,370	$360,844
2016–2020	37,659	$61,946	935,654	$308,870	6,948,159	$972,607	86,357	$52,644	78,825	$381,402	49,073	$278,000
2021–2023	38,521	$70,593	1,326,574	$572,976	6,818,714	$1,141,224	167,425	$94,547	158,672	$457,382	52,239	$147,553

Note: Exvessel value is based on average price per pound annually according to the Statewide Commercial Operator's Annual Reports (COAR).

Table 10.–Average length, weight, and age; sex ratio (percent female); and number sampled (*n*) of commercially harvested yelloweye rockfish sampled from the Prince William Sound Area, 2007–2023.

Year	Average length (cm)	*n*	Average weight (kg)	*n*	Average age (years)	*n*	Percent female	*n*
2007	55.6	135	3.2	135	34	517	45.9%	62
2008	57.7	139	3.8	139	35	461	48.9%	67
2009	57.5	53	3.5	52	32	573	52.8%	28
2010	56.8	4	3.7	4	33	496	75.0%	3
2011	57.1	121	3.8	121	34	470	66.1%	80
2012	53.0	170	3.0	170	31	876	65.7%	111
2013[a]	52.4	592	3.0	592	33	957	55.9%	329
2014	52.5	536	3.1	536	32	912	61.1%	327
2015[a]	53.2	598	3.1	598	30	598	53.8%	322
2016[a]	50.6	397	2.6	397	26	308	53.7%	208
2017[a]	55.4	447	3.4	445	35	428	63.6%	283
2018[a]	57.0	362	3.6	333	36	38	53.7%	181
2019	52.6	571	3.0	565	29	591	52.5%	296
2020	53.8	280	3.2	280	38	849	61.1%	171
2021[a]	47.5	423	2.2	422	28[b]	116	54.7%	229
2022[a]	46.2	409	2.1	409	25[b]	187	49.5%	197
2023[a]	46.2	804	2.1	804	20[b]	274	54.0%	421
Average								
2007–2015	55.1	261	3.4	261	33	651	58.4%	148
2016–2020	53.9	411	3.2	404	33	443	56.9%	228
2021–2023	46.6	545	2.1	545	24	404	52.7%	282

[a] Ages are preliminary.

[b] 2021–2023 yelloweye rockfish ages do not include Prince William Sound Outside waters.

Table 11.–Average length, weight, and age; sex ratio (percent female); and number sampled (*n*) of commercially harvested shortraker rockfish sampled from the Prince William Sound Area, 2007–2023.

Year	Average length (cm)	*n*	Average weight (kg)	*n*	Average age (years)	*n*	Percent female	*n*
2007	68.9	112	5.6	112	63	101	21.4%	24
2008	70.2	59	6.0	59	63	45	42.4%	25
2009	68.1	146	5.6	133	54	149	36.1%	48
2010	69.4	107	5.8	107	56	102	26.2%	28
2011	69.8	249	6.1	247	53	269	44.1%	109
2012	71.5	234	6.5	234	51	224	34.6%	81
2013	69.8	286	6.4	286	52	33	45.8%	130
2014	72.3	487	6.9	487	48	114	41.7%	192
2015	76.8	197	8.3	197	56	10	60.2%	118
2016	70.8	216	6.3	216	[a]	[a]	38.6%	83
2017	75.0	139	7.6	139	49	2	59.7%	83
2018	74.0	167	7.4	166	62	11	58.1%	97
2019	71.3	161	6.5	161	[a]	[a]	44.1%	71
2020	73.4	71	6.9	71	[a]	[a]	39.4%	28
2021	65.9	91	4.9	91	[a]	[a]	34.1%	31
2022	63.7	86	4.5	86	[a]	[a]	29.4%	25
2023	66.4	89	5.2	89	[a]	[a]	37.5%	33
Average								
2007–2015	70.7	209	6.4	207	55	116	39.2%	84
2016–2020	72.9	151	7.0	151	–	–	48.0%	72
2021–2023	65.3	89	4.9	89	–	–	33.7%	30

[a] Age structures submitted to Age Determination Unit for 2016 and 2019–2023 have not yet been analyzed.

Table 12.–Average length, weight, and age; sex ratio (percent female); and number sampled (*n*) of commercially harvested quillback rockfish sampled from the Prince William Sound Area, 2007–2023.

Year	Average length (cm)	*n*	Average weight (kg)	*n*	Average age (years)	*n*	Percent female	*n*
2007	40.5	24	1.3	24	[a]	[a]	37.5%	9
2008	41.6	17	1.4	17	[a]	[a]	52.9%	9
2009	41.4	45	1.4	45	[a]	[a]	56.8%	25
2010	41.5	35	1.4	35	[a]	[a]	77.1%	27
2011	41.0	79	1.4	79	[a]	[a]	63.3%	50
2012	41.4	191	1.5	191	[a]	[a]	47.1%	90
2013	40.5	619	1.5	619	[a]	[a]	36.0%	221
2014	40.8	546	1.6	546	[a]	[a]	42.9%	234
2015	40.8	477	1.4	477	[a]	[a]	44.0%	209
2016	41.5	324	1.5	324	[a]	[a]	43.5%	140
2017	41.6	158	1.5	158	[a]	[a]	57.0%	90
2018	41.9	143	1.5	143	[a]	[a]	50.3%	72
2019	41.1	411	1.4	411	[a]	[a]	39.9%	163
2020	41.0	222	1.4	222	[a]	[a]	48.2%	107
2021	40.3	90	1.3	90	[a]	[a]	38.9%	35
2022	40.1	328	1.4	327	[a]	[a]	57.4%	186
2023	39.4	144	1.2	144	[a]	[a]	43.7%	62
Average								
2007–2015	41.1	226	1.4	226	ND	ND	50.9%	97
2016–2020	41.4	252	1.5	252	ND	ND	47.8%	114
2021–2023	39.9	187	1.3	187	ND	ND	46.7%	94

[a] Analysis of age data at the ADF&G lab in Homer is not yet complete for 2007–2023.

Table 13.–Average length, weight, and age; sex ratio (percent female); and number sampled (*n*) of commercially harvested rougheye rockfish sampled from the Prince William Sound Area, 2007–2023.

Year	Average length (cm)	*n*	Average weight (kg)	*n*	Average age (years)	*n*	Percent female	*n*
2007	57.6	59	3.5	59	42	61	47.5%	28
2008	54.3	32	2.9	32	40	30	65.5%	19
2009	50.3	165	2.2	163	26	297	57.1%	93
2010	51.6	71	2.4	71	33	91	57.7%	41
2011	52.1	148	2.5	148	26	375	64.8%	92
2012	51.5	201	2.4	201	35	272	59.2%	119
2013	49.8	150	2.3	150	31	152	46.3%	69
2014	44.8	237	1.9	237	24	237	53.8%	126
2015	44.0	368	1.7	368	27	81	53.3%	196
2016	44.9	148	1.7	148	30	34	54.5%	79
2017	45.3	226	1.8	226	23	117	46.9%	105
2018	42.7	391	1.5	382	50	12	48.1%	188
2019	44.1	165	1.7	165	57	2	51.2%	84
2020	46.9	64	2.0	64	9	32	40.6%	26
2021	44.0	42	1.6	42	[a]	[a]	45.2%	19
2022	48.4	31	2.1	31	[a]	[a]	38.7%	12
2023	50.4	76	2.4	76	[a]	[a]	50.0%	38
Average								
2007–2015	50.7	159	2.4	159	32	177	56.1%	87
2016–2020	44.8	199	1.7	197	34	39	48.3%	96
2021–2023	47.6	50	2.0	50	–	–	44.6%	23

[a] Age structures submitted to Age Determination Unit for 2021-2023 have not yet been analyzed.

Table 14.–Average length, average weight, sex ratio (percent female), and number sampled (*n*) of Pacific cod from commercial fisheries in the Prince William Sound Area, 2007–2023.

Year	Average length (cm)	*n*	Average weight (kg)	*n*	Percent female	*n*
2007	67.5	419	3.8	205	78	88
2008	70.3	79	4.4	79	65	79
2009	67.5	281	3.8	132	62	131
2010	65.8	750	3.9	374	62	375
2011	65.3	600	3.4	300	62	300
2012	63.5	500	3.3	250	65	250
2013	65.6	1,673	3.6	825	59	845
2014	65.4	1,799	3.8	860	57	900
2015	63.6	2,054	3.4	1054	63	1053
2016	60.5	2,000	2.7	998	56	965
2017	62.8	1,351	3.1	675	55	672
2018	66.0	1,349	3.8	700	61	648
2019	63.2	1,107	3.1	581	58	579
2020	64.6	1169	3.4	644	62	644
2021	64.8	1850	3.2	926	56	924
2022	66.5	1600	3.6	825	56	824
2023	68.2	2950	3.8	1525	51	1522
Average						
2007–2015	66.1	906	3.7	453	64	447
2016–2020	63.4	1,395	3.2	720	58	702
2021–2023	66.5	2,133	3.5	1,092	54	1,090

Table 15.–Prince William Sound Area commercial sablefish harvest and effort by gear type and guideline harvest level (GHL), 1988–2023.

				Harvest (pounds)				
Year	Vessels	Landings	GHL	Jig	Trawl/other	Longline	Pots	Total[a]
1988	54	145	192,063	0	0	247,374	0	247,374
1989	25	95	192,063	[b]	1,359	187,271	0	188,630
1990	71	251	192,063	8,790	11,339	196,529	[b]	216,659
1991	78	157	192,063	0	2,940	347,698	0	350,638
1992	63	126	192,063	0	0	464,546	[b]	464,546
1993	60	92	242,000	[b]	0	391,540	0	391,540
1994	66	102	242,000	0	[b]	340,306	0	340,306
1995	126	134	242,000	0	[b]	576,725	0	576,725
1996	69	77	242,000	0	[b]	290,607	[b]	290,607
1997	51	81	242,000	0	1,043	207,327	0	208,370
1998	59	60	242,000	0	0	244,695	0	244,695
1999	42	45	242,000	0	2,840	211,058	0	213,897
2000	32	32	242,000	0	[b]	355,668	0	355,668
2001	47	49	242,000	0	0	323,908	0	323,908
2002	49	51	242,000	0	0	328,602	0	328,602
2003	39	67	242,000	0	0	223,757	0	223,757
2004	38	67	242,000	0	0	234,862	0	234,862
2005	34	70	242,000	0	0	227,077	0	227,077
2006	25	54	242,000	0	1,136	193,020	[b]	194,156
2007	28	61	242,000	0	[b]	198,818	0	198,818
2008	30	69	242,000	0	[b]	206,053	0	206,053
2009	31	104	242,000	0	[b]	216,198	0	216,198
2010	30	112	242,000	0	[b]	208,221	0	208,221
2011	28	92	242,000	0	[b]	195,177	24,860	220,037
2012	26	87	242,000	0	[b]	179,127	23,670	202,796
2013	29	92	242,000	0	[b]	147,371	7,561	154,931
2014	27	72	242,000	[b]	[b]	94,904	1,430	96,334
2015	21	40	122,000	0	[b]	15,878	0	15,878
2016	20	41	110,823	0	[b]	38,462	0	38,462
2017	19	49	117,000	0	[b]	70,409	b	70,409
2018	20	58	133,000	0	[b]	66,550	20,007	86,557
2019	16	46	134,000	0	[b]	55,664	b	93,832
2020	18	47	167,000	0	0	68,737	27,140	95,877
2021	18	53	208,000	0	0	83,360	56,564	139,923
2022	20	60	264,000	0	0	99,732	95,442	195,174
2023	18	40	269,000	0	0	63,221	72,912	136,132
Average								
1988–2015	46	89	228,797	–	–	251,940	–	255,046
2016–2020	19	48	132,365	0	–	59,965	–	77,028
2021–2023	19	51	247,000	0	0	82,104	74,972	157,076

Note: En dashes indicate the average could not be computed because data were not available for all years.

[a] Total does not include confidential data when harvest from only 1 gear type is confidential.

[b] Confidential data due to limited number of participants.

Table 16.–Average length, weight, and age; sex ratio (percent female); and number sampled (*n*) of commercially harvested sablefish sampled from the Prince William Sound Area, 2007–2023.

Year	Average length (cm)	*n*	Average weight (kg)	*n*	Average age (years)	*n*	Percent female	*n*
2007	61.9	666	2.8	666	7	645	61%	666
2008	64.1	597	3.0	597	7	591	61%	618
2009	61.4	722	2.6	722	7	720	61%	722
2010	60.1	777	2.4	777	7	777	56%	777
2011	60.3	629	2.4	629	6	626	62%	629
2012	60.7	688	2.5	688	7	686	59%	688
2013	60.0	667	2.6	664	6	665	60%	662
2014	65.5	758	3.5	758	7	758	59%	758
2015	63.6	170	3.3	170	6	168	56%	170
2016	56.8	686	2.2	686	5	684	57%	675
2017	59.6	698	2.6	698	5	690	63%	697
2018	61.0	839	2.5	839	6	834	71%	839
2019	61.2	601	2.5	601	6	592	69%	592
2020	61.8	700	2.7	700	6	700	68%	697
2021	61.6	819	2.7	819	6	819	68%	815
2022	63.2	592	2.9	591	7	592	68%	591
2023	60.3	250	2.4	250	6	250	57%	248
Average								
2007–2015	62.0	630	2.8	630	7	626	59%	632
2016–2020	60.1	705	2.5	705	6	700	66%	700
2021–2023	61.7	554	2.7	553	6	554	64%	551

Table 17.–Prince William Sound Area directed pollock harvest and effort by gear type, guideline harvest level (GHL), and season length, 1995–2023.

	Effort			Harvest (pounds)				
Year	Vessels	Landings	Season (days)	Directed	Test fishery	Total[a]	GHL (million pounds)	Percent of GHL
1995	9	35	26	6,325,575	215,025	6,540,600	2.1-4.4	144%
1996	11	24	5	3,265,740	420,571	3,686,311	3.1	105%
1997	10	31	8	4,319,707	539,123	4,858,830	3.9	111%
1998	11	29	7	4,013,725	631,751	4,645,476	3.9	103%
1999	6	38	36	4,673,074	490,761	5,163,835	4.6	102%
2000	4	20	70	2,256,504	366,724	2,623,228	3.1	73%
2001	[b]	[b]	64	[b]	381,502	381,502	3.1	100%
2002	3	22	70	2,364,143	177,003	2,541,146	3.8	62%
2003	3	17	84	2,421,772	53,595	2,475,367	3.8	64%
2004	3	9	68	1,928,458	400,403	2,328,861	2.0	96%
2005	6	8	48	1,677,157	317,183	1,994,340	2.0	84%
2006	8	15	58	3,486,499	ND	3,486,499	3.6	97%
2007	5	11	69	2,339,978	259,155	2,599,133	3.6	65%
2008	5	7	56	1,395,933	ND	1,395,933	3.6	39%
2009	7	12	60	3,243,959	300,806	3,544,765	3.6	90%
2010	11	14	42	3,662,919	311,853	3,974,772	3.6	102%
2011	7	12	17	3,377,325	339,683	3,717,008	3.6	94%
2012	9	21	24	5,785,295	ND	5,785,295	6.1	95%
2013	14	22	14	5,779,241	488,666	6,267,907	5.8	100%
2014	19	22	8	5,220,121	ND	5,220,121	8.6	61%
2015	17	35	16	9,818,616	ND	9,818,616	9.3	106%
2016	9	30	71	8,573,163	779,979	9,353,142	13.1	65%
2017	8	15	71	4,143,533	ND	4,143,533	9.4	44%
2018	16	24	42	6,802,350	926,066	7,728,416	7.1	96%
2019	22	25	24	6,539,859	935,114	7,474,973	6.6	99%
2020	14	23	41	5,090,676	928,792	6,019,468	5.1	100%
2021	10	20	12	4,710,088	898,250	5,608,338	4.9	96%
2022	17	23	27	6,174,300	960,297	7,134,597	6.4	96%
2023	19	27	68	7,167,286	539,582	7,706,868	7.3	98%
Average								
1995–2015	8	20	40	3,867,787	355,863	3,661,546	4.2	90%
2016–2020	14	23	43	6,229,916	892,488	6,943,906	8.3	81%
2021–2023	15	23	46	6,017,225	799,376	6,816,601	6.2	97%

Note: No data for years when test fishery did not occur.

[a] Total does not include confidential data.

[b] Confidential data due to a limited number of participants.

Table 18.–Prince William Sound Area walleye pollock average length, weight, and age, sex ratio (percent female), and number sampled (*n*), harvested from the commercial directed pelagic trawl fishery, 2007–2023.

Year	Average length (cm)	*n*	Average weight (kg)	*n*	Average age (years)	*n*	Percent female	*n*
2007	52.7	1,956	1.2	730	7	730	49%	730
2008	50.8	1,074	1.3	350	6	349	12%	349
2009	44.8	1,032	0.9	677	5	692	25%	682
2010	47.4	2,214	1.0	964	5	1,199	39%	1,067
2011	49.4	1,600	1.1	800	5	949	30%	800
2012	50.0	1,600	1.1	800	5	798	36%	800
2013	50.6	1,785	1.3	900	5	1,096	35%	899
2014	52.0	1,400	1.3	700	6	695	37%	697
2015	51.8	1,800	1.2	900	6	894	30%	900
2016	45.9	400	0.7	200	6	226	30%	199
2017	42.4	1,400	0.6	699	[a]	[a]	23%	699
2018	45.2	1,200	0.8	598	[a]	[a]	46%	599
2019	47.2	2,070	0.8	1,050	[a]	[a]	37%	1,050
2020	47.9	1,000	0.8	500	[a]	[a]	37%	500
2021	43.0	200	0.5	100	5	794	39%	100
2022	43.3	1,400	0.7	700	5	693	32%	700
2023	46.5	1,200	0.9	700	[a]	[a]	46%	699
Average								
2007–2015	49.9	1607	1.2	758	6	822	33%	769
2016–2020	45.7	1214	0.8	609	–	226	35%	609
2021–2023	44.3	933	0.7	500	–	744	39%	500

Note: En dashes indicate that the average could not be computed because some data were not available.

[a] Analysis of age data at the ADF&G lab in Homer is not yet complete.

Table 19.–Prince William Sound Area commercial lingcod effort and harvest, directed and bycatch fisheries combined, from Inside District, Outside District, and adjacent federal waters, 1997–2023.

			Directed harvest (pounds)			Bycatch harvest (pounds)			Total harvest (pounds)		
Year	Vessels	Landings	Inside	Outside[a]	Total	Inside	Outside[a]	Total	Inside	Outside[a]	Total
1997	42	73	21,260	1,714	22,974	1,630	13,593	15,223	22,890	15,307	38,197
1998	18	27	2,422	4,342	6,764	977	3,355	4,332	3,399	7,697	11,096
1999	16	18	0	4,904	4,904	1,483	2,957	4,440	1,483	7,861	9,344
2000	18	41	610	9,937	10,547	4,503	8,805	13,308	5,113	18,742	23,855
2001	32	49	2,200	16,711	18,911	2,159	5,742	7,901	4,359	22,453	26,812
2002	20	27	131	15,670	15,801	876	3,493	4,369	1,007	19,163	20,170
2003	32	51	1,217	5,382	6,600	4,376	13,259	17,635	5,593	18,642	24,235
2004	30	47	4,924	17,223	22,146	1,100	7,045	8,145	6,024	24,268	30,292
2005	30	46	5,055	11,357	16,412	1,137	6,694	7,831	6,193	18,051	24,244
2006	22	46	5,041	9,795	14,836	870	12,377	13,248	5,911	22,173	28,084
2007	34	57	6,480	5,798	12,278	386	18,031	18,417	6,866	23,829	30,695
2008	33	52	7,500	21,929	29,429	551	10,620	11,171	8,051	32,550	40,601
2009	42	89	2,147	18,238	20,385	6,345	45,742	52,087	8,492	63,980	72,472
2010	34	75	4,643	13,031	17,674	2,027	35,225	37,252	6,670	48,256	54,925
2011	29	49	5,956	19,998	25,954	1,997	17,860	19,856	7,952	37,858	45,810
2012	45	69	4,056	22,025	26,081	58	14,346	14,404	4,114	36,371	40,485
2013	26	35	0	17,405	17,405	1,527	11,399	12,926	1,527	28,804	30,331
2014	20	25	4,008	6,945	10,952	192	4,727	4,919	4,199	11,672	15,871
2015	18	35	1,568	7,740	9,308	1,400	9,656	11,056	2,968	17,396	20,364
2016	27	40	0	5,132	5,132	404	8,558	8,961	404	13,690	14,093
2017	22	28	0	6,021	6,021	460	6,140	6,600	460	12,162	12,622
2018	36	60	3,114	15,686	18,800	3,574	7,181	10,754	6,688	22,867	29,554
2019	38	64	5,596	2,583	8,179	1,792	16,437	18,229	7,388	19,020	26,408
2020	35	63	1,858	14,271	16,130	1,193	8,524	9,717	3,052	22,795	25,847
2021	33	78	35	8,949	8,985	2,306	11,052	13,358	2,341	20,002	22,343
2022	44	92	200	1,626	1,826	5,492	17,849	23,341	5,692	19,475	25,167
2023	43	82	2,915	10,719	13,634	2,568	13,427	15,995	5,483	24,146	29,629
Average											
1988-2015	29	46	–	–	–	2,952	21,285	24,237	5,781	29,504	35,285
2016-2020	32	51	2,114	8,739	10,852	1,485	9,368	10,853	3,598	18,107	21,705
2021-2023	40	84	1,050	7,098	8,148	3,455	14,110	17,565	4,505	21,208	25,713

[a] Outside District includes harvest from adjacent federal waters.

Table 20.–Average length, weight, and age; sex ratio (percent female); and number sampled (*n*) of commercially harvested lingcod sampled from the Prince William Sound Area, 2007–2023.

Year	Average length (cm)	*n*	Average weight (kg)	*n*	Average age (years)	*n*	Percent female	*n*
2007	106.0	313	13.3	108	15	241	80%	201
2008	103.0	388	11.0	373	14	383	87%	388
2009	104.7	483	11.1	464	14	524	89%	483
2010	105.1	133	11.9	133	15	133	80%	133
2011	108.3	485	12.3	420	16	482	89%	481
2012	108.9	314	13.4	314	17	314	95%	314
2013	110.1	281	12.9	281	16	281	98%	280
2014	110.9	96	13.9	96	15	96	95%	96
2015	110.7	277	14.1	277	17	271	89%	276
2016	109.2	186	13.7	186	17	182	93%	182
2017	109.0	127	13.4	127	16	123	98%	127
2018	109.4	324	13.5	278	16	300	84%	314
2019	105.8	278	13.6	278	16	264	97%	261
2020	105.2	449	12.5	449	17	439	58%	436
2021	110.3	176	12.8	176	[a]	[a]	94%	176
2022	111.0	14	14.2	14	[a]	[a]	83%	6
2023	108.9	60	12.2	60	[a]	[a]	62%	55
Average								
2007-2015	107.5	308	12.7	274	15	303	89%	295
2016-2020	107.7	273	13.4	264	16	262	86%	264
2021-2023	110.1	83	13.1	83	ND	ND	79%	79

[a] Age structures submitted to Age Determination Unit for 2021–2023 have not yet been analyzed.

Table 21.–Prince William Sound Area annual reported catch (pounds) of miscellaneous groundfish species, including discards at sea, 1988–2023.

Year	Flatfish[a]	Salmon	Sharks	Skates	Other	Octopus	Squid	Totals
1988	15,457	0	[b]	11,770	[b]	0	0	27,227
1989	[b]	0	0	[b]	0	0	[b]	2,781
1990	72,973	0	0	0	[b]	0	[b]	72,973
1991	5,742	0	0	11,022	2,124	[b]	510	19,398
1992	8,942	0	1,338	19,192	17,035	1,230	[b]	47,737
1993	664	0	[b]	1,565	2,781	5,625	917	11,552
1994	1,216	0	2,465	4,435	19,203	5,798	2,523	35,640
1995	10,421	79	1,368	9,668	5,534	3,814	3,134	34,018
1996	76,346	0	32,052	26,700	3,636	[b]	1,873	140,607
1997	320	72	4,840	37,256	1,326	3,547	19,191	66,552
1998	4,182	371	8,692	44,790	6	2,928	23,782	84,751
1999	462	2,148	14,233	868	1,240	0	6,897	25,848
2000	7,637	545	2,044	999	129	0	6,227	17,581
2001	1,235	[b]	7,149	4,158	457	0	31,388	44,387
2002	4,214	1,274	188,256	6,783	776	[b]	180,250	381,553
2003	3,893	189	47,939	8,938	5,718	[b]	21,612	88,289
2004	4,527	156	42,869	7,748	1,850	[b]	11,947	69,097
2005	5,624	775	76,558	87,044	5,456	[b]	7,117	182,574
2006	6,826	635	159,462	10,845	11,254	[b]	32,770	221,792
2007	2,274	872	11,169	2,537	535	0	11,805	29,192
2008	[b]	[b]	19,613	13,741	911	0	30,619	64,884
2009	10,551	142	31,572	333,777	4,662	0	16,022	396,726
2010	12,360	229	47,464	228,837	11,507	[b]	17,210	317,606
2011	1,723	73	25,659	216,426	1,347	0	16,841	262,069
2012	6,739	1,431	28,291	154,781	6,328	0	8,123	205,693
2013	1,197	61	76,231	244,770	[b]	0	88,155	410,414
2014	13,435	260	15,322	131,781	11,303	[b]	171,946	344,046
2015	3,799	442	17,255	276,763	5,272	[b]	240,125	543,656
2016	9,620	1,271	10,473	103,886	1,511	[b]	57,906	184,666
2017	893	177	833	41,987	1,635	[b]	275	45,800
2018	7,177	1,171	4,724	36,163	[b]	341	[b]	49,576
2019	4,118	305	66,262	35,493	12,902	0	35,006	154,087
2020	1,356	[b]	41,013	27,836	2,759	0	156,912	229,875
2021	2,280	2,282	23,366	56,382	1,245	[b]	39,848	125,403
2022	2,807	2,505	29,213	49,020	1,332	[b]	70,186	155,063
2023	1,324	2,632	4,668	51,315	3,343	155	54,882	118,319
Average								
1988-2015	–	–	–	–	–	–	–	148,166
2016-2020	3,012	–	23,181	21,925	–	–	47,194	68,090
2021-2023	2,137	2,473	19,082	52,239	1,973	–	54,972	132,928

[a] Flatfish does not include halibut.

[b] Confidential due to limited number of participants.

FIGURES

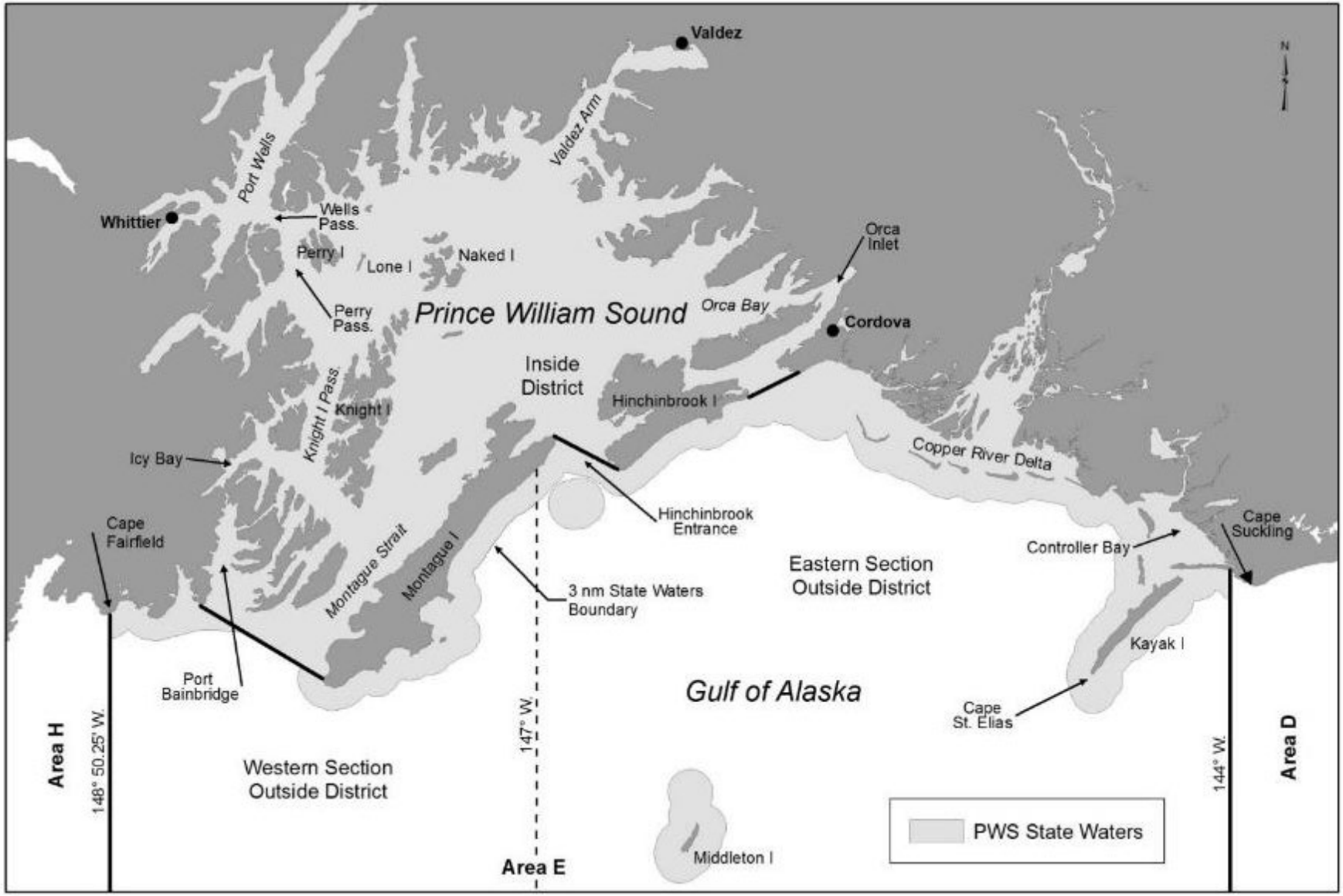

Figure 1.–Prince William Sound Area groundfish fishing districts and other landmarks.

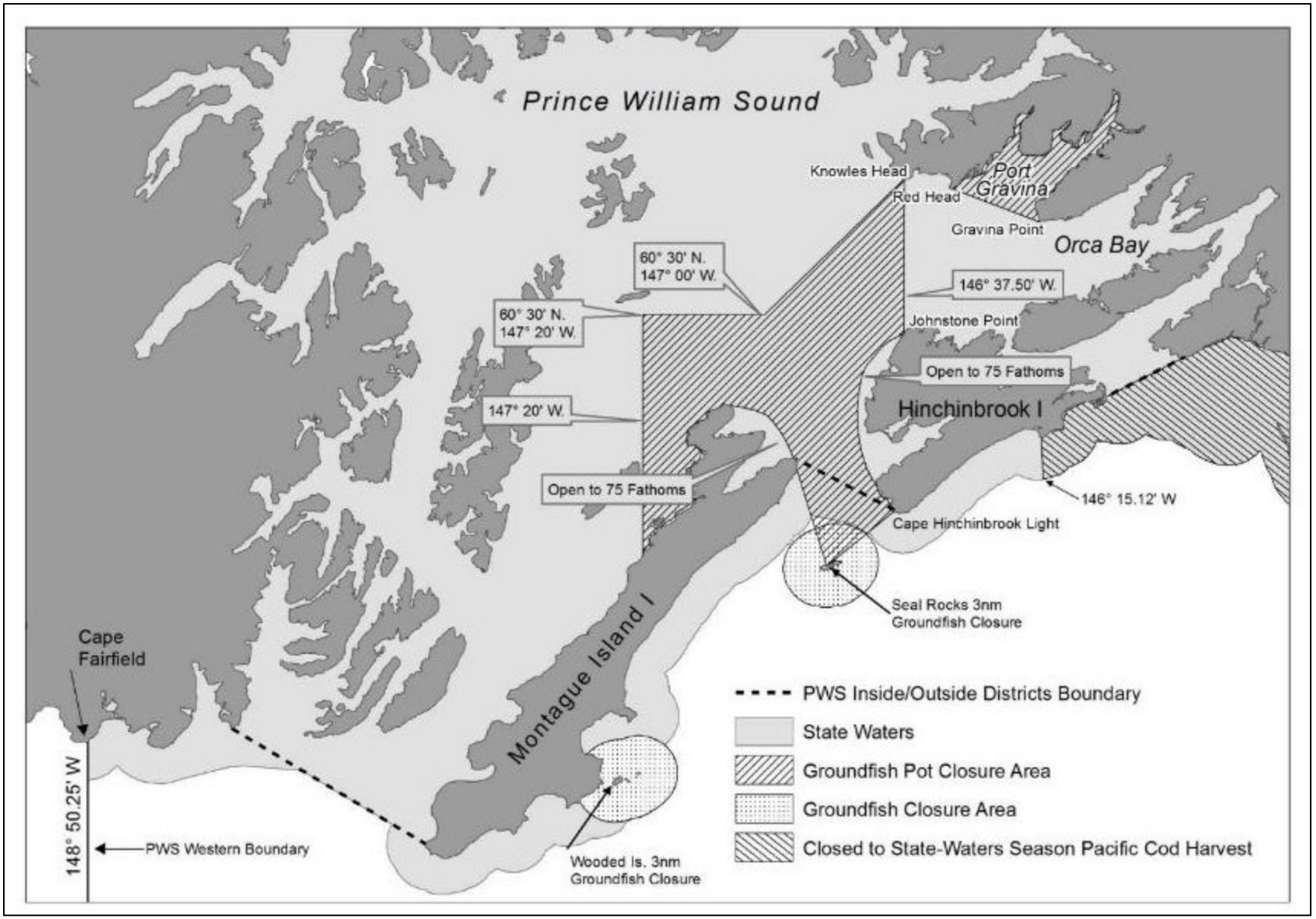

Figure 2.–Prince William Sound Area with groundfish fishing closure areas.

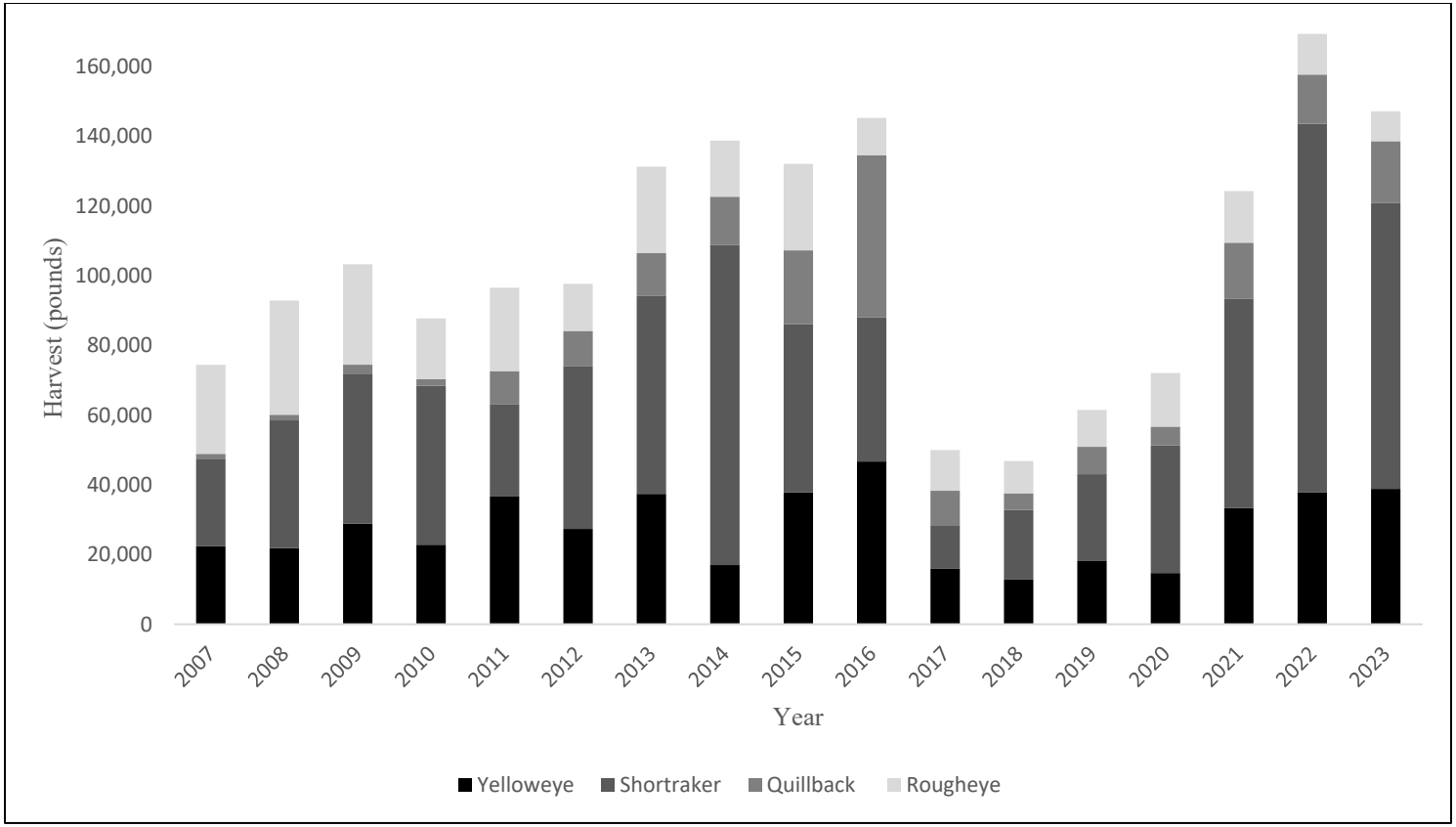

Figure 3.–Prince William Sound Area rockfish harvest by species, 2007–2023.

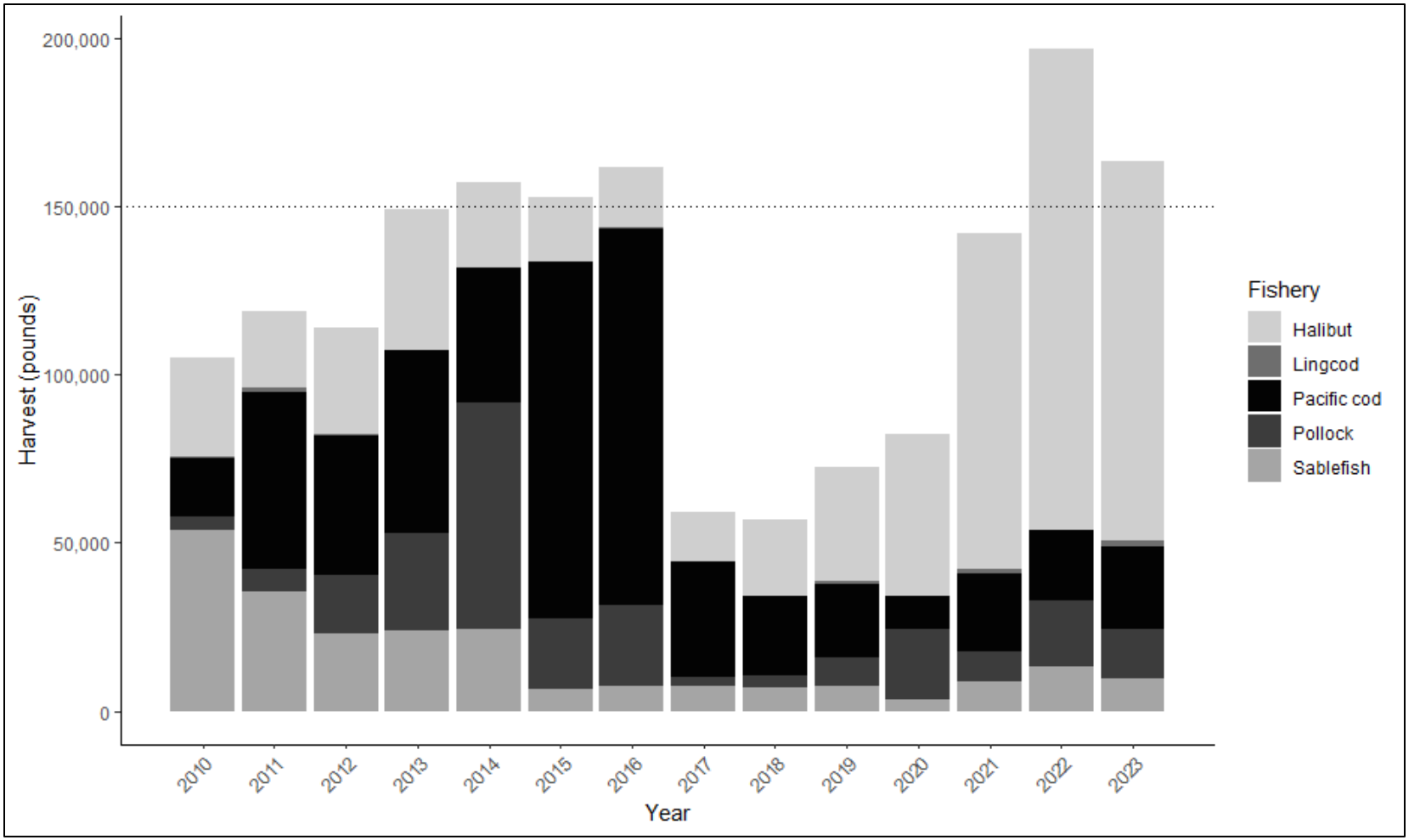

Figure 4.–Prince William Sound Area rockfish harvest by fishery, 2010–2023.

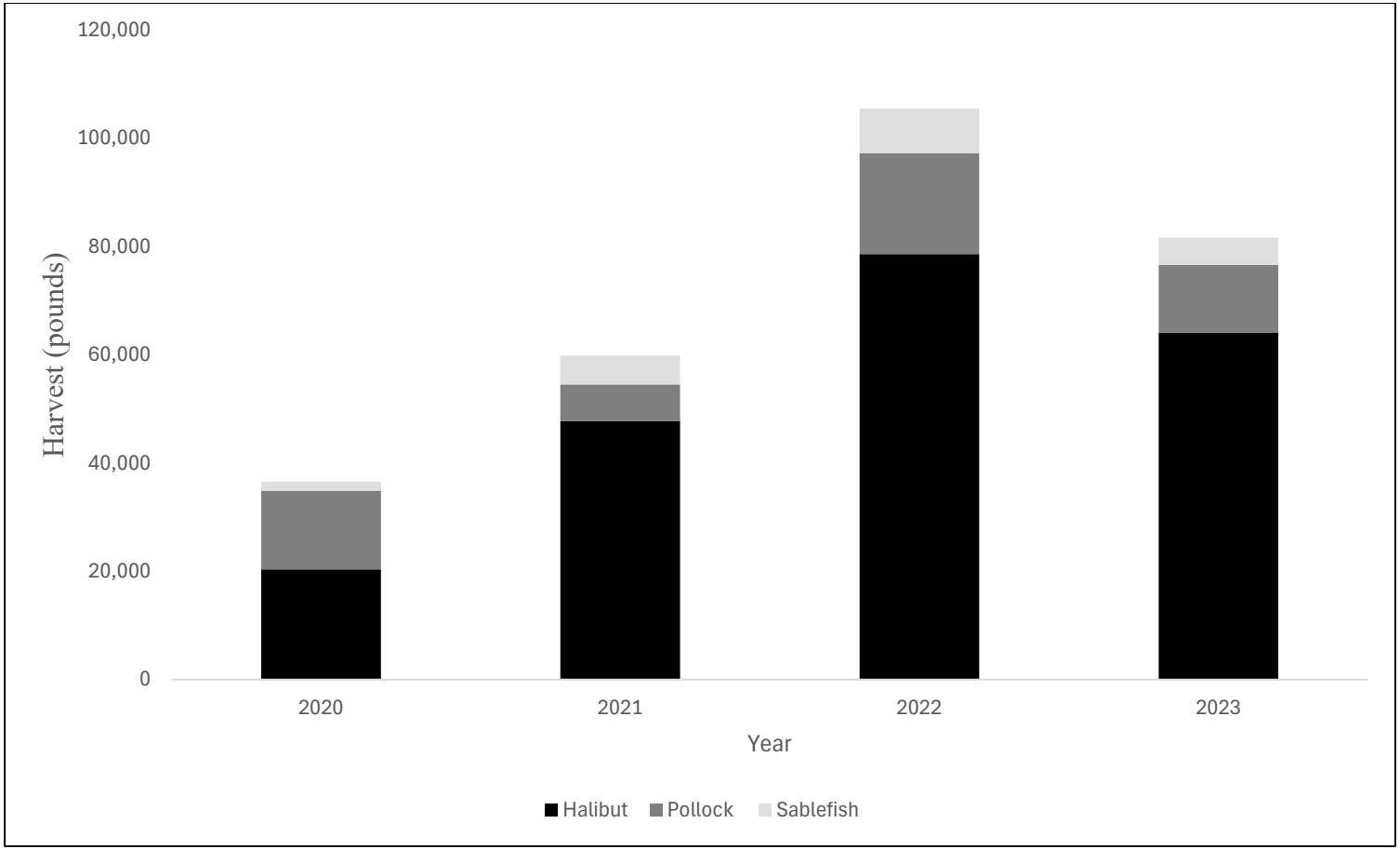

Figure 5.–Prince William Sound Area shortraker rockfish harvest by fishery, 2020–2023.

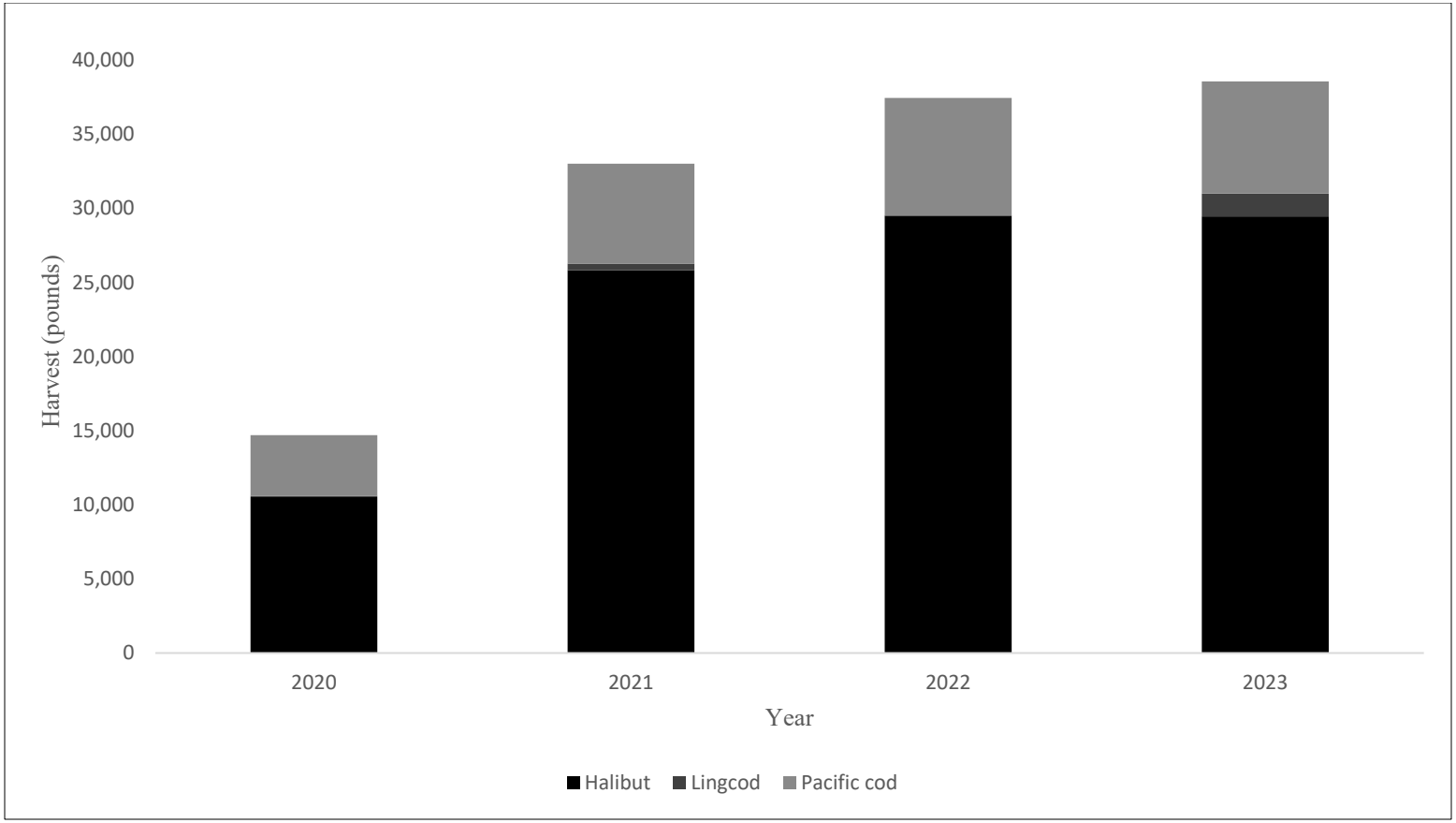

Figure 6.–Prince William Sound Area yelloweye rockfish harvest by fishery, 2020–2023.

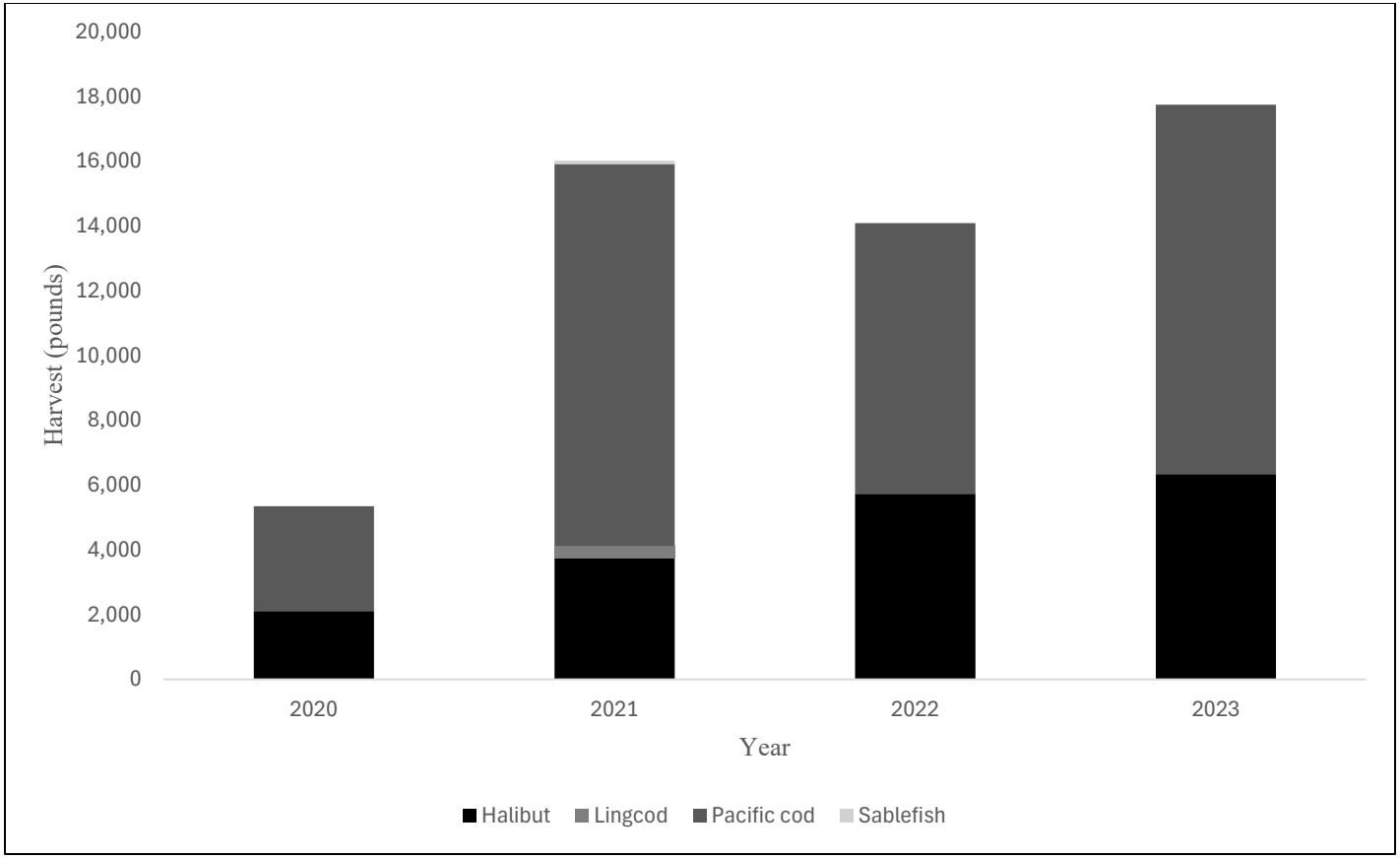

Figure 7.–Prince William Sound Area quillback rockfish harvest by fishery, 2020–2023.

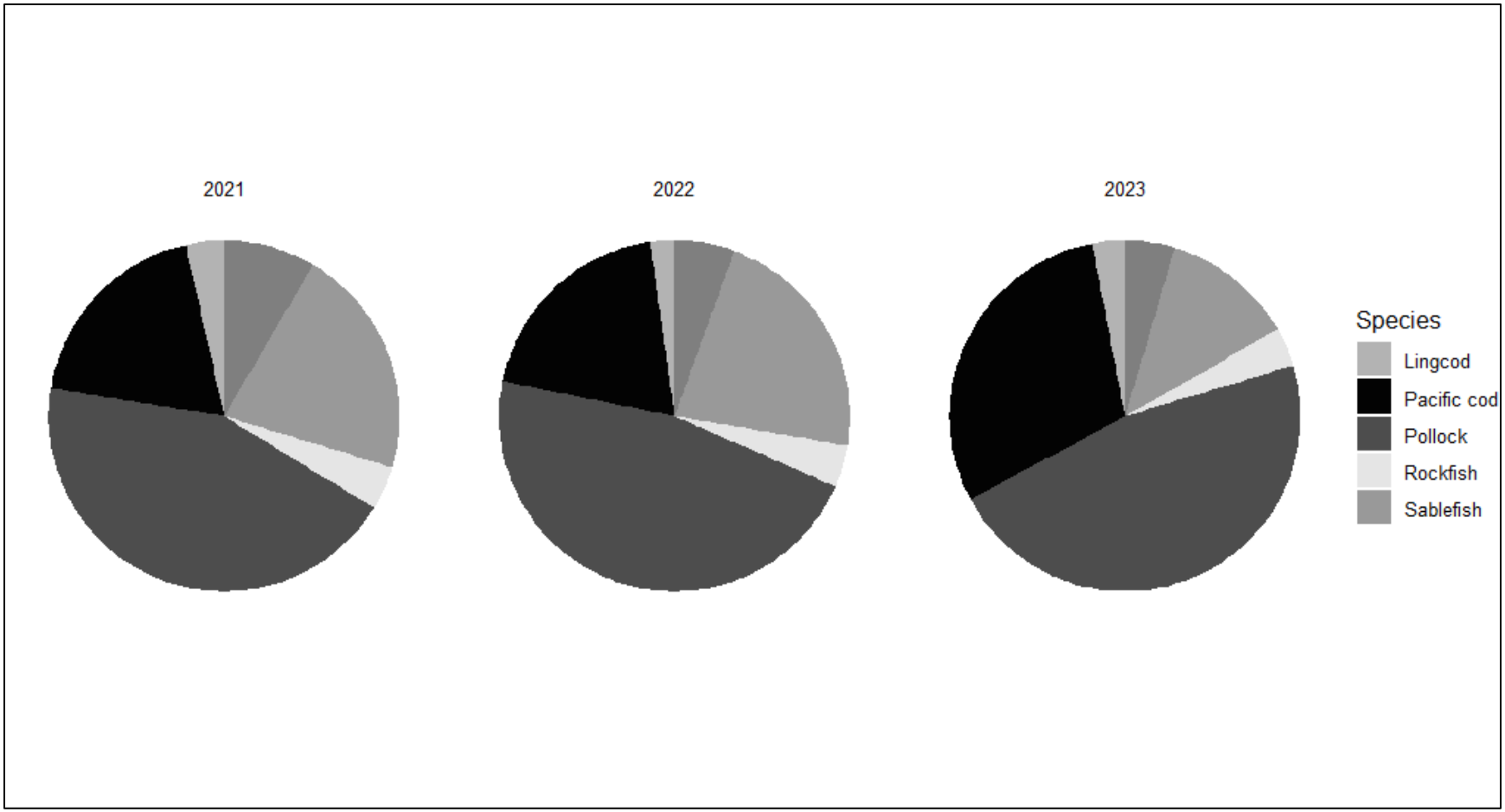

Figure 8.–Prince William Sound Area state managed groundfish, percent of fishery contribution to total exvessel value, 2021–2023.

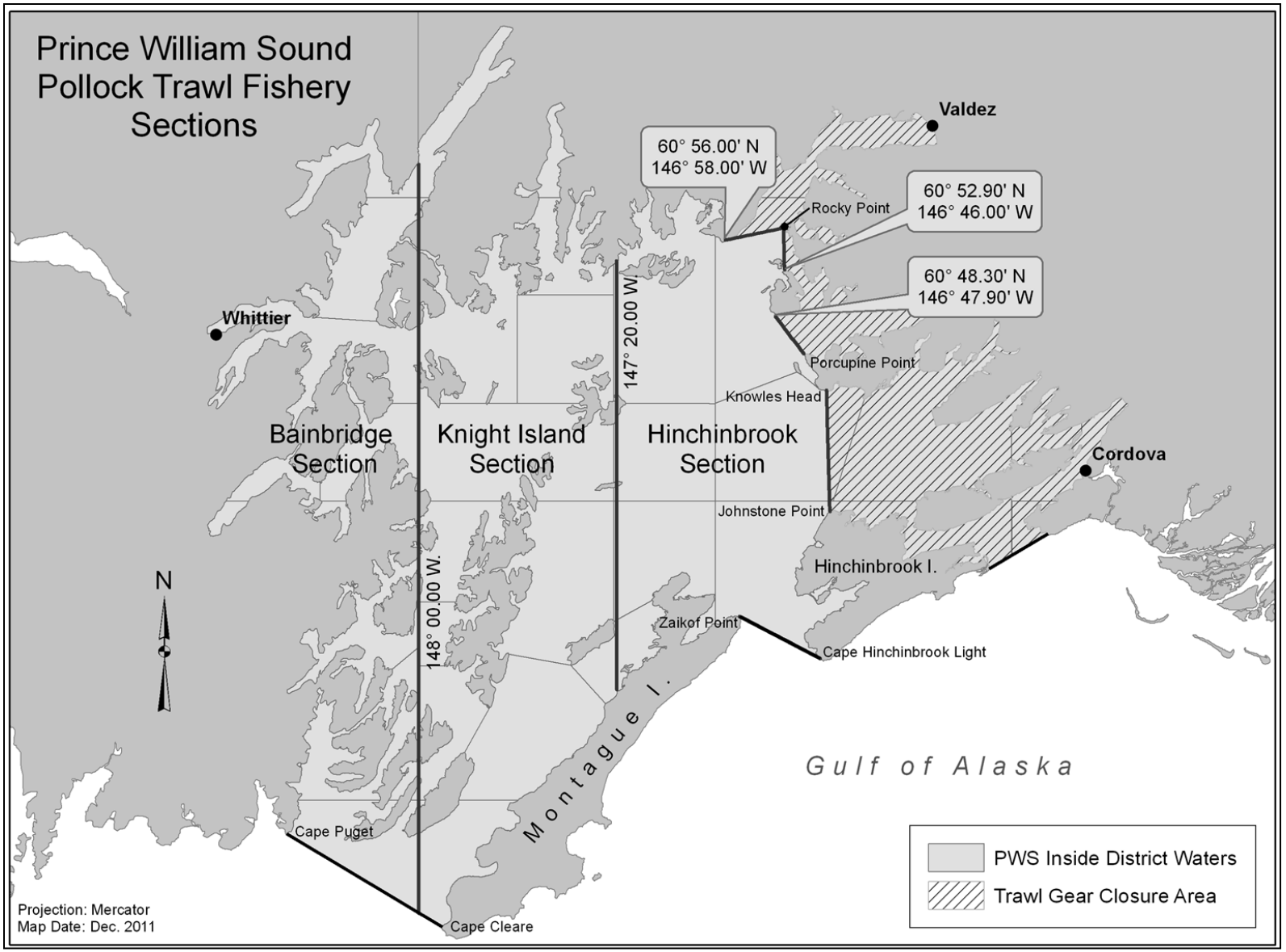

Figure 9.–Prince William Sound Area Inside District pollock management sections for the directed commercial trawl fishery.

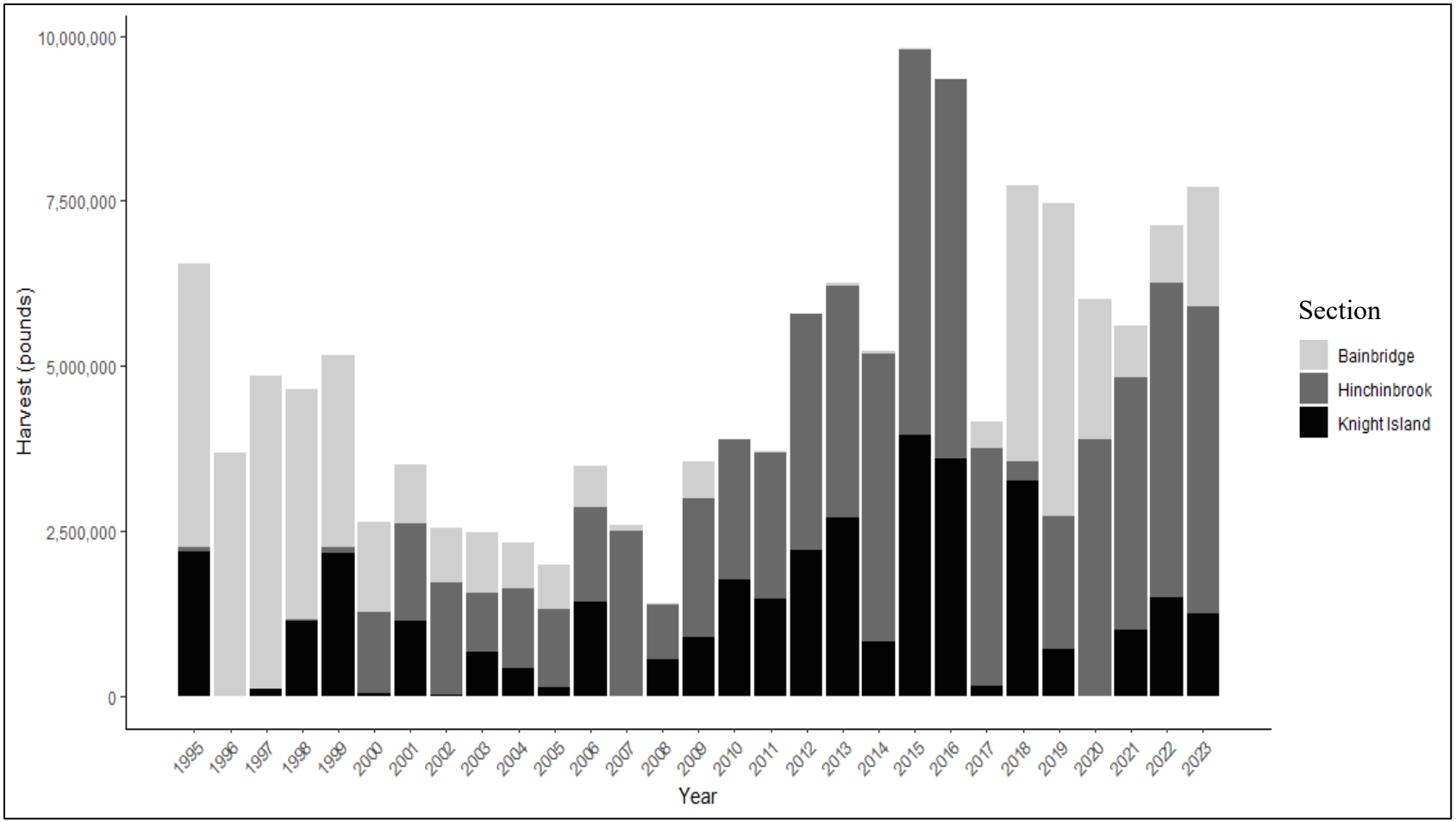

Figure 10.–Prince William Sound Area directed pollock harvest by section, 1995–2023.

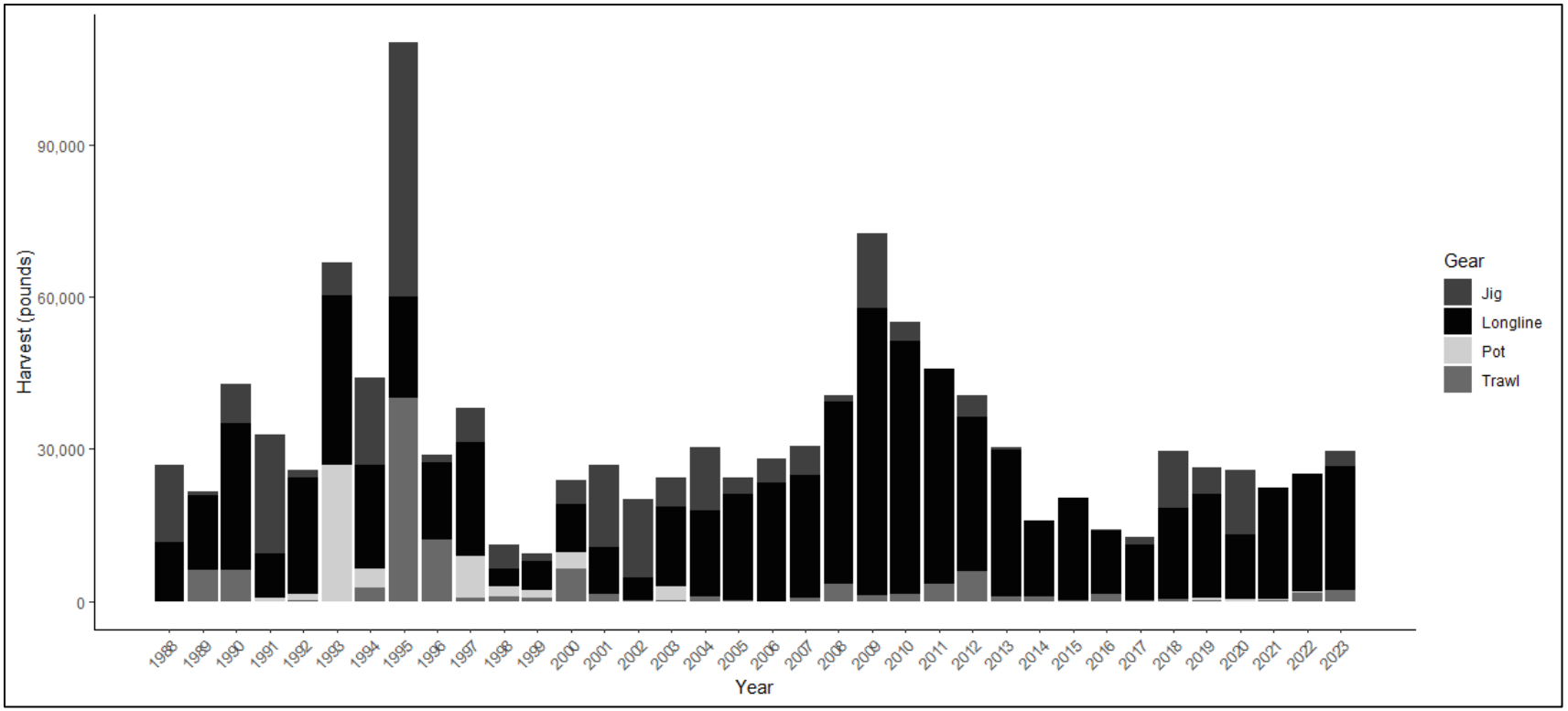

Figure 11.–Prince William Sound Area lingcod harvest by gear type, 1988–2023.

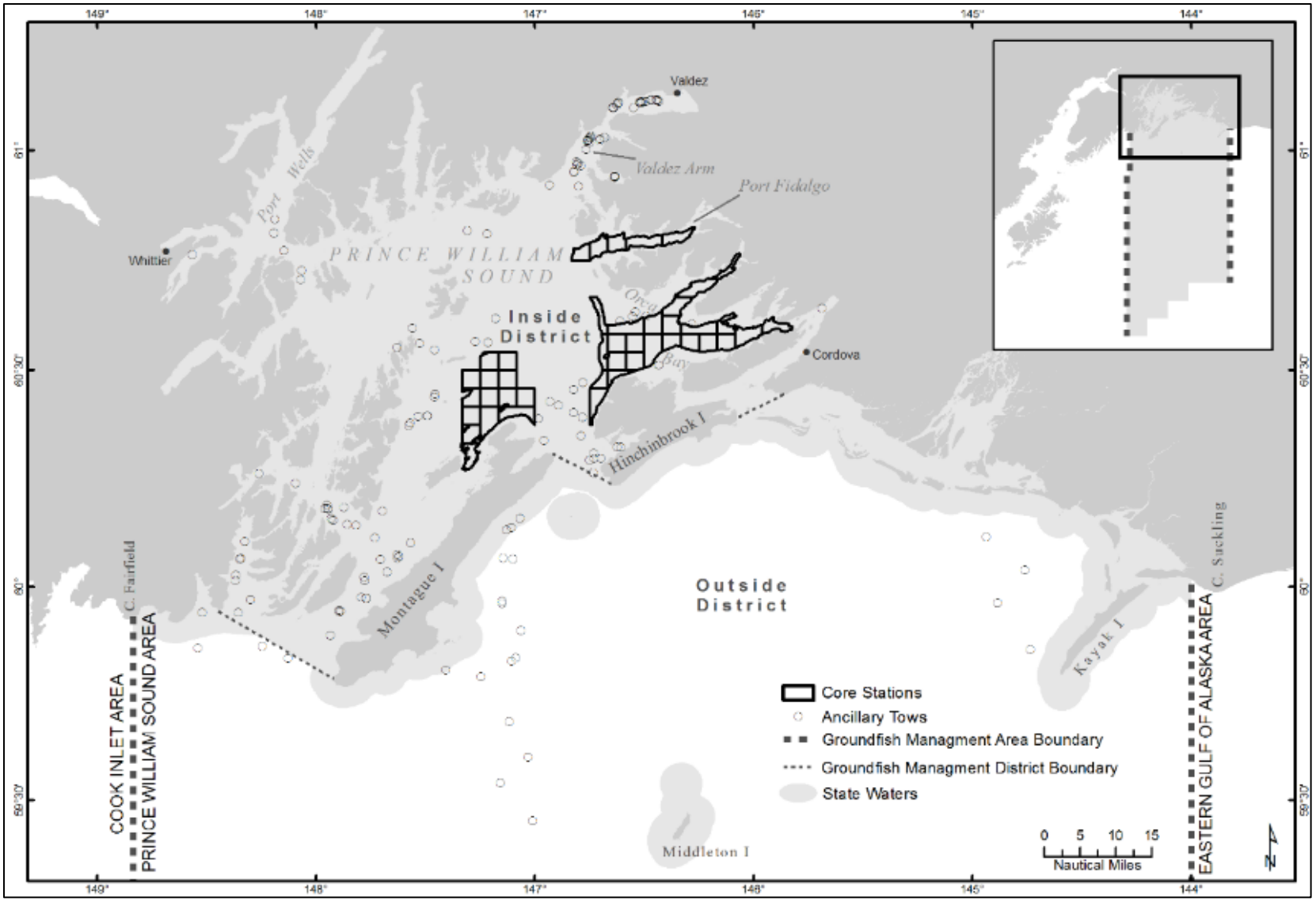

Figure 12.–Prince William Sound large mesh trawl survey core stations.

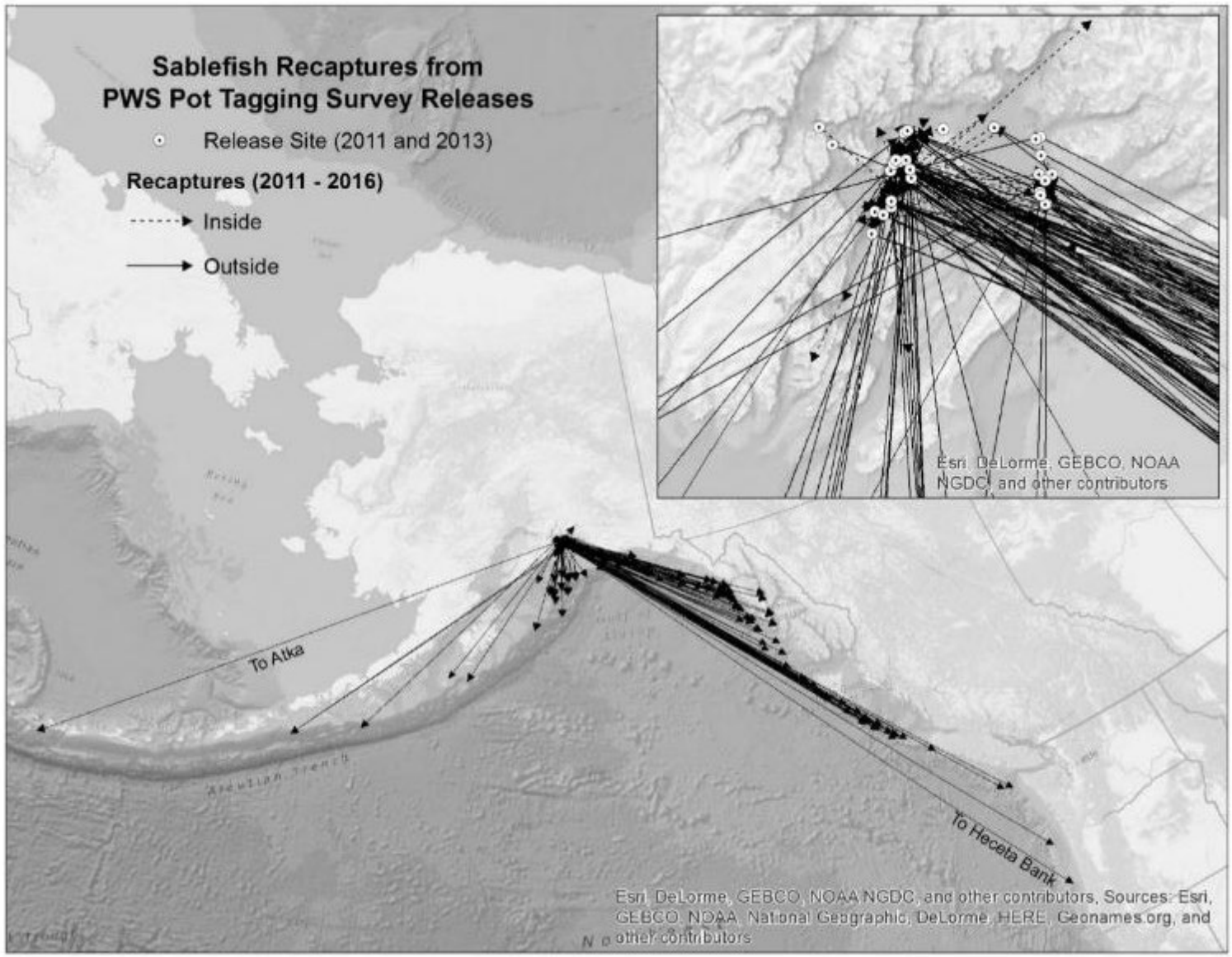

Figure 13.–Prince William Sound Area sablefish tagging project recapture sites, 2011–2016.