Fishery Management Report No. 21-02

Management Report for the Southeast and Yakutat Commercial Groundfish Fisheries, 2017–2020

by

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

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Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

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

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ABSTRACT

This report summarizes reported catch and effort information and management actions for Southeast and Yakutat groundfish fisheries managed by the Alaska Department of Fish and Game in the Eastern Gulf of Alaska Area, with updated information from 2017 through October 2020. The department manages groundfish caught in directed and bycatch fisheries, and all references to harvest, landings, or removals are specific to commercial fisheries, unless otherwise noted. The state manages several directed fisheries in Alaska waters: sablefish (*Anoplopoma fimbria*), demersal shelf rockfish (DSR; *Sebastes* spp.), black rockfish (*Sebastes melanops*), lingcod (*Ophiodon elongatus*), and Pacific cod (*Gadus macrocephalus*). The state is also responsible for management of lingcod, DSR, and black, blue (*S. mystinus*), deacon (*S. diaconus*), and dark (*S. ciliatus*) rockfish in federal waters. The average annual catch of groundfish for this reporting period in Southeast Alaska was 2.5 million round lb with an annual estimated exvessel value of $5.6 million. Catch includes fish discarded at sea for species with high mortality after capture, all *Sebastes* and *Sebastolobus* rockfishes (demersal shelf, pelagic shelf, slope, and black rockfishes), and Pacific cod. All other groundfish catch numbers reflect landings only. The 2020 catch includes landings through October. Sablefish accounted for 76% of the exvessel value of groundfish during this reporting period. In addition to landings in groundfish and halibut fisheries, an annual average of 48,325 round lb of groundfish, primarily lingcod and black rockfish, were landed in salmon troll fisheries and 88,248 round lb of groundfish, primarily sablefish, were landed in surveys (test fish fisheries) conducted by the department and the International Pacific Halibut Commission during this reporting period.

Key words: sablefish, rockfish, lingcod, Pacific cod, flatfish, longline, dinglebar, jig, Southeast Alaska, Yakutat, commercial fishing, Board of Fisheries, groundfish, Annual Management Report

INTRODUCTION

The Eastern Gulf of Alaska (EGOA) regulatory area for groundfish management encompasses all waters from Dixon Entrance (54°30′N latitude) northwestward along the outer coast to 144° W longitude. Seven state groundfish management areas have been established in Southeast Alaska and occur within the Southeast District (Figure 1). The Icy Bay Subdistrict (IBS) was added to the Southeast District in 1999 and includes the waters between 140° and 144°W longitude and waters of Yakutat Bay north of a line at 59°30′N latitude, extending seaward from Ocean Cape to 140°W longitude. Four of the management areas—East Yakutat (EYKT) Section, Northern Southeast Outside (NSEO) Section, Central Southeast Outside (CSEO) Section, and Southern Southeast Outside (SSEO) Section—are along the outer coast of Southeast Alaska and make up the Southeast Outside (SEO) Subdistrict. The remaining two areas, Northern Southeast Inside (NSEI) Subdistrict and Southern Southeast Inside (SSEI) Subdistrict, are in internal waters. For lingcod (*Ophiodon elongatus*) and black rockfish (*Sebastes melanops*) management, the southern areas are redefined as two sectors, Southern Southeast Internal Waters (SSEIW) and Southern Southeast Outer Coast (SSEOC; Figure 2).

The Alaska Department of Fish and Game (ADF&G or department) has management jurisdiction over all groundfish resources within state waters in the EGOA area. State waters include all internal waters of Southeast Alaska and Yakutat Bay, and waters within three miles of shore along the outer coast. In addition, an amendment to the Gulf of Alaska Federal Groundfish Fisheries Management Plan (FMP) defers management of demersal shelf rockfish (DSR) in both state and federal waters in the SEO district (outer coastal waters east of 140°W longitude) to the state. Black and blue rockfish were removed from the FMP in 1998 and dark rockfish in 2009, transferring management responsibility for these species to the department. Lingcod are under state jurisdiction in both state and federal waters.

In addition to direct management responsibility for certain groundfish species, the Southeast Alaska and Yakutat (Region I) Groundfish Project provides harvest information and other resource

data from the adjacent Exclusive Economic Zone (EEZ) to the National Marine Fisheries Service (NOAA Fisheries) and North Pacific Fishery Management Council (Council) under the terms of a cooperative agreement with NOAA Fisheries. Under this agreement, department staff have the responsibility of collecting, editing, and verifying all fish tickets from the harvest of groundfish and Pacific halibut (*Hippoglossus stenolepis*) landed in Alaska waters. Since May 2006, fish tickets are entered by processors via eLandings, a web-based reporting system, and are subsequently validated by department staff. The state is also involved in the management of groundfish in the EEZ through the groundfish project's participation on the Council's Gulf of Alaska Groundfish Plan Team.

This document provides information on reported harvest, effort, and management for the state-managed groundfish fisheries in Southeast Alaska and includes updates from 2017 through October 2020. The department does not require at-sea observer coverage in EGOA groundfish fisheries, and as a result, only limited data on at-sea discards are recorded. Catch and effort data contained in this document include DSR, black rockfish, and lingcod harvest for state and federal waters in the EGOA and all groundfish species harvested in state waters of NSEI and SSEI. The primary state-managed fisheries within the region include sablefish (*Anoplopoma fimbria*), demersal shelf rockfish (*Sebastes* spp.), black rockfish, lingcod, and Pacific cod (*Gadus macrocephalus*). By regulation, sablefish can be fished only with longline and pot gear, and state-managed rockfish and lingcod fisheries are restricted to hook-and-line gear in the Southeast District. Fisheries targeting sablefish or demersal shelf rockfish almost exclusively use longline gear and directed lingcod fisheries primarily use dinglebar troll gear. Flatfish (*Platichthys, Lepidopsetta* and *Pleuronectes* spp.) can be harvested with beam trawl gear in limited areas of NSEI and SSEI. Other trawl gear is prohibited unless authorized in a commissioner's permit.

A no-take groundfish marine reserve (Edgecumbe Pinnacles Marine Reserve) is located in a 3.2 nmi^2 area surrounding the Cape Edgecumbe pinnacles off the southwest coast of Kruzof Island (Figure 3). This area was closed to all removals of groundfish in 1998 by the Alaska Board of Fisheries (board) and to halibut and groundfish in 1999 by the Council. This represents the first no-take groundfish marine reserve in Alaska.

An average of 2.5 million round lb of state-managed groundfish were caught[1] annually in groundfish and halibut fisheries from 2017 to October 2020; the average annual exvessel value of these fish was $5.6 million dollars (Table 1). Groundfish are also landed in commercial salmon troll fisheries (primarily lingcod and black rockfish; Table 2) and in surveys conducted by the department and the International Pacific Halibut Commission (IPHC; Table 3). Through October 2020, 38,735 round lb of groundfish were caught in salmon troll fisheries and 141,495 round lb in test fish fisheries. An additional 45,194 round lb of Chatham fishery permit holder personal quota share sablefish were landed in the 2020 NSEI sablefish longline survey.

LINGCOD

Lingcod are the largest member of the greenling family, attaining lengths up to 60 inches (Mecklenburg et al. 2002). This coldwater species occurs inshore to depths of 260 fathoms, ranging from northern Baja California to the Gulf of Alaska (Mecklenburg et al. 2002). Adult

[1] Catch includes fish discarded at sea for species with high mortality after capture, all *Sebastes* spp. and *Sebastolobus* spp. rockfishes (demersal shelf, pelagic shelf, slope, and black rockfishes), and Pacific cod. All other groundfish catch numbers reflect landings only. The 2020 catch only includes landings through October.

lingcod have complex movement patterns that include daily movements within a home range (Tolimieri et al. 2009; Beaudreau and Essington 2011), frequent excursions outside of this home range (Starr et al. 2004), and long-distance migrations (Jagielo 1990; Starr et al. 2004; Stahl et al. 2014b), with some of these movements related to feeding and spawning. Lingcod are sexually dimorphic (Hart 1973; Cass et al. 1990; Love 1996) with females having a larger average size and greater range of length than males (Stahl et al. 2014b). Lingcod reach maturity between 3 and 5 years (Richards et al. 1990; Silberberg et al. 2001) with the maximum age estimated for Southeast Alaska at 36 years.[2] Lingcod have an unusual reproductive strategy where males move into nearshore rocky areas in the fall to set up territories and females move into the area just prior to spawning in the winter. The females lay large egg masses and the males, after fertilizing the eggs, guard the egg mass from predation until hatching (Cass et al. 1990). During the nest-guarding period, males are particularly susceptible to harvest.

FISHERIES DEVELOPMENT AND HISTORY

Prior to 1987, lingcod landed in the Southeast District were captured incidentally in fisheries targeting other species (Gordon 1994). Lingcod make up a large amount of the bycatch in the directed DSR longline fishery. In some areas and seasons, historical bycatch rates of lingcod taken in the DSR fishery exceeded 50%, by weight, of the DSR catch. Lingcod are also taken as bycatch in the salmon troll and halibut longline fisheries.

The directed lingcod fishery has developed steadily since its inception in 1987 when a small fishing fleet used dinglebar gear to harvest 163,305 round lb of lingcod from the NSEO and the northern portion of CSEO management areas. By 1991, the directed fishery catch of 490,873 round lb was over half of the total catch (Table 4). The directed fishery occurred primarily out of Sitka with major fishing grounds off the outer coasts of Baranof, Chichagof, and Kruzof Islands. In 1995, there was a major expansion of the directed fishery to EYKT, primarily the Fairweather Grounds; during that year, peak directed fishery harvest occurred with 665,860 round lb harvested. The largest total harvest of lingcod in commercial groundfish and halibut fisheries occurred in 1991 with 966,842 round lb landed (Table 4). Since 1990, the directed fishery accounted for over half of the exvessel value of commercial lingcod landings, except in 2001 (Table 4). The majority of the directed fishery is prosecuted using dinglebar troll gear. Commercial guideline harvest levels (GHLs) are set annually by management area and fishery (Table 5).

REGULATION DEVELOPMENT

In 1994, a mandatory logbook program was established for the directed lingcod fishery, and hook-and-line was designated as legal gear for lingcod fishing. In 1997, the board prohibited the use of longline gear in the directed fishery. In 2000, legal gear for the directed fishery was limited to mechanical jigging machines, dinglebar troll, and hand troll gear. Lingcod bycatch in other fisheries was restricted to hook-and-line (no pots, trawls, or other net gears).

Regulations, including size limits and seasonal and area closures, have been developed for lingcod to preserve their stock structure. In 1989, the board implemented a minimum size limit for lingcod in an attempt to prevent harvest of sexually immature females. Harvested lingcod were required to measure at least 27 in from tip of snout to tip of tail or 20.5 in from the insertion of the dorsal fin to the tip of the tail. In 1991, a seasonal closure from January 1 to May 31 was implemented inside

[2] Southeast Alaska lingcod maximum age estimate was taken from Mark, Tag and Age Laboratory's Age Determination Unit. Alaska Department of Fish and Game, Juneau. [accessed February 11, 2021] https://mtalab.adfg.alaska.gov/ADU/analysis.aspx#maxage.

the surf line to protect nest-guarding males. In 1994, the seasonal closure changed to December 1–April 30 and the closure line extended out to 3 mi offshore of the outer coast. Beginning in 1997, the seasonal closure extended until May 16 by emergency order to further protect nest-guarding males. Area closures were also implemented that year for lingcod in Sitka Sound (except as bycatch in the halibut longline fishery) and in the Cape Edgecumbe Pinnacles Marine Reserve. In 2000, the board set the commercial directed and salmon troll bycatch lingcod season to May 16–November 30. In 2006, a regulation was adopted that prohibits lingcod from being taken by spear or while using diving gear from December 1 to May 15.

Lingcod have been managed using guideline harvest ranges (GHR) and fishery allocations since the early 1990s. In 1991, a GHR of 300,000–500,000 round lb was established for the Southeast District (east of 137°W longitude) based on historical catch data in the CSEO fishery. In 1994, the department met with industry representatives, including directed commercial fishermen, longliners, and trollers, and developed a lingcod management plan to present to the board. Using a habitat-based approach, GHRs were set on an assumption of 0.25 to 0.50 metric tons (mt) of lingcod biomass per square nmi of rocky habitat for each management area. Seasonal and area allocations were also set for the directed and salmon troll commercial fisheries in CSEO and NSEO.

In 2000, the board took significant action regarding lingcod fishery management including GHR reductions, inclusion of the sport fishery harvest in the total GHL, and allocation of lingcod between fishing sectors and areas (Table 5). The board also defined IBS as an additional subdistrict, and two sectors in the Southeast District for lingcod management. The western boundary of the Eastern Gulf of Alaska (Southeast District) was extended from 140°W longitude to 144°W longitude. The IBS area comprises all waters between 140°W longitude and 144°W longitude, including Yakutat Bay 3 mi seaward of a line from Ocean Cape at 59°30′W latitude. The new sectors redefined the Southern Southeast area as follows: SSEOC includes all waters of the SSEO and all waters of the SSEI that are south of 56°N latitude, and west of Prince of Wales Island, or, if south of 54°43′N latitude, that are west of 132°W longitude; SSEIW Sector includes all waters of the SSEI Subdistrict not included in the SSEOC Sector (Figure 2). Additional regulations adopted by the board that year included a registration requirement for the directed fishery, emergency order authority for the department to set trip limits when necessary to promote orderly fisheries, as well as the aforementioned updates to fishing gear and seasons.

A new superexclusive directed lingcod fishery was established by the board in 2003 with the commercial longline and troll allocations combined into a single allocation to be shared by the three commercial user groups until the annual GHL was taken. This commercial all-gear allocation was then allocated by the board to each user group in 2012. In 2006, the upper end of the GHR for EYKT was increased from 200,000 to 225,000 round lb with the increase allocated to the directed fishery. The regulation stipulates that in years when the GHL is 200,000 round lb or less, the GHL will be assigned to gear groups based on user allocations established in 2000.

The department has managed lingcod bycatch through regulations set by the board and through emergency orders. In 1994, the board limited lingcod bycatch in the halibut fishery to 5%. In 1997, the lingcod bycatch allowance in the DSR longline fishery was increased from 20% to 35%. The board later implemented regulations to allow the department to set groundfish bycatch limits by emergency order in the salmon troll fishery (2003) and in the halibut fishery (2009) in order to achieve the lingcod harvest allocations in each area.

STOCK ASSESSMENT AND MANAGEMENT

The department does not have a stock assessment for lingcod and is not currently able to estimate lingcod biomass or abundance in Southeast Alaska. Lacking abundance estimates and given the complex life history and behavior of lingcod, impacts to lingcod populations from fishing are difficult to assess. Lingcod GHLs were reduced in all areas in 1999 due to continued declines in commercial catch per unit effort (CPUE, fish per hook-hour) with subsequent GHRs being reduced by the board in 2000. After these reductions in the GHRs, CPUE began to increase in CSEO until around 2007; since then, CPUE decreased but has been more consistent in recent years (Figure 4). Participation in the NSEO and SSEOC directed fisheries is generally low; these data are confidential if there were less than three participants. In NSEO, CPUE has been stable although there have been some recent fluctuations (Figure 4). Participation in the SSEOC fishery has fluctuated over the last decade but has increased since 2016 with the directed fishery GHL met in 2019 and 2020. This has resulted in erratic CPUE trends due to no or confidential harvest in this area for 8 of the last 18 years (Figure 4). In EYKT, CPUE was variable between 1994–2000 while harvest fluctuated dramatically, with CPUE dropping in years following high harvests (Figure 4). After the GHR was reduced in 2000, the CPUE increased slightly from 2000 to 2011 but has remained low from 2012–2020. The CPUE in EYKT is higher relative to other management areas, probably because fishing is concentrated in a smaller area where there are typically higher abundances of lingcod (i.e., the Fairweather Grounds). In IBS, the directed fishery was opened in 2003; however, data for that season are confidential. The CPUE in IBS varied from 2004–2014 but declined from 2015–2019 to the lowest levels seen in the fishery (Figure 4). Recent declines in IBS CPUE may be related to atypical ocean conditions or variability in fishery participants.

The department initiated a tagging study for lingcod in 1996 with the goal of better understanding the movement patterns of local lingcod stocks. Approximately 10,000 lingcod were tagged, and 487 tags have been recovered since 2011 (Stahl et al. 2014b). Movement patterns of lingcod recaptured in this tagging study were similar to results of other studies with the majority of recaptured lingcod recovered close to their release location (55% within 2.7 nmi) and a small proportion recovered at great distances (8% >27 nmi; Stahl et al. 2014b).

2017–2020 SEASONS SUMMARY

Directed lingcod harvest increased throughout the 2017–2020 reporting period, ranging from 237,793–302,298 round lb (Table 6). The number of permits participating in the directed fishery ranged from 40–48, and the directed fishery generated an average of 66% of the total lingcod harvest in commercial groundfish, halibut, and salmon troll fisheries. Lingcod bycatch in the salmon troll fisheries fluctuated each year, likely caused by closures or reductions of salmon fishing in certain areas. Longline bycatch harvest declined throughout this period, likely driven by changes in dock prices and in bycatch allowances in longline fisheries. Directed fishery deliveries received as much as $2.71 per lb for fresh headed and gutted product during 2020.

2021 SEASON OUTLOOK

Lingcod harvest for directed and bycatch fisheries are expected to be similar or slightly increase in 2021. Dock price generally influences the level of interest in the directed fishery, but participation is also tied to the status and future outlook for the salmon troll fishery. If lingcod prices remain high, it is likely that additional salmon troll vessels will become more active in the

fishery. The amount of lingcod bycatch taken by the longline fleet can vary and is related to the size of the halibut fishery quota and whether a directed DSR fishery is prosecuted in SEO.

ROCKFISHES AND THORNYHEADS

More than 30 species of rockfishes are landed in Southeast and Yakutat groundfish fisheries from the genera of *Sebastes* and *Sebastolobus*. *Sebastes* rockfishes are divided into three assemblages for management purposes because species within an assemblage have similar habitat preferences and behavior. The DSR assemblage is composed of seven nearshore, bottom-dwelling species and includes yelloweye (*S. ruberrimus*), quillback (*S. maliger*), tiger (*S. nigrocinctus*), China (*S. nebulosus*), canary (*S. pinniger*), copper (*S. caurinus*), and rosethorn (*S. helvomaculatus*) rockfish. The pelagic shelf rockfish (PSR) assemblage is composed of six nearshore schooling species, including black (*S. melanops*), dark (*S. ciliates*), blue (*S. mystinus*), dusky (*S. variabilis*), yellowtail (*S. flavidus*), and widow (*S. entomelas*) rockfish. Prior to 2004, the dusky and dark rockfishes were considered one species and known as *S. ciliatus* (Orr and Blackburn 2004). The slope rockfish assemblage is found along the edge of the continental shelf and on the continental slope in deep water. This group is defined by regulation as any species of the genus *Sebastes* not specified in the DSR or PSR assemblage. The predominant commercial species in this assemblage are rougheye (*S. aleutianus*), blackspotted (*S. melanostictus*), shortraker (*S. borealis*), and redbanded rockfish (*S. babcocki*). Some rockfish landed as rougheye rockfish are likely blackspotted due to the morphological similarities between these species (Orr and Hawkins 2008); however, on fish tickets most are defined as rougheye at this time. The *Sebastolobus* species commonly captured in Southeast, the shortspine thornyhead rockfish (*Sebastolobus alascanus*), is found in similar habitats and depths as the *Sebastes* slope rockfish assemblage; consequently, data on shortspine thornyhead rockfish will be summarized in this report with the slope rockfish assemblage.

DEMERSAL SHELF ROCKFISHES

All DSR exhibit the life history characteristics (e.g., slow growth, late maturity, and longevity) of K-strategist species producing higher quality over a larger quantity of offspring (Adams 1980; Gunderson 1980; Archibald et al. 1981). Fishes with these life history characteristics are highly susceptible to overexploitation and are slow to recover once driven below the level of sustainable yield (Leaman and Beamish 1984; Francis 1985). An acceptable exploitation rate for such species is assumed to be low (Dorn 2000). The department manages the DSR fishery at an exploitation rate (F) equal to natural mortality (2%).

Yelloweye rockfish, the dominant species in the DSR assemblage (in terms of numbers and biomass of catch), occur from northern Baja California to the Aleutian Islands in nearshore waters to 300 fathoms (Mecklenburg et al. 2002). Yelloweye rockfish have been recorded up to 38 inches in length (Kellii Wood, ADF&G Division of Commercial Fisheries Biologist, Southeast Alaska Groundfish Project, unpublished data, 2020) and to a maximum reported age of at least 120 years (Munk 2001). These fish are generally associated with rock habitat (e.g., rocky reefs, ridges, and pinnacles) and exhibit high site fidelity (O'Connell 1991; Hannah and Rankin 2011). Due to these life history traits, yelloweye rockfish populations are susceptible to overharvest and localized depletion.

FISHERY DEVELOPMENT AND HISTORY

DSR have been the target of a directed shore-based longline fishery in Southeast since the late 1970s. The fishery began in the Sitka Sound area as a small family-run, fresh-fish business,

catching primarily black rockfish from skiffs using automatic jigging machines, and by 1982, longline gear had replaced jigging machines. The use of longline gear in the fishery changed the dynamics and target species of the fishery, where the catch became predominately yelloweye and quillback rockfish. Harvest increased six-fold in five years with total catch exceeding 1 million round pounds in 1986. Prior to 1984, well over half of the total Southeast rockfish landings were reported from CSEO. Because effort and harvest continued to increase, much of the effort shifted into SSEI followed by a shift in the late 1980s to SSEO. A directed DSR fishery developed in EYKT in 1991, primarily targeting yelloweye rockfish on the Fairweather Grounds.

The directed DSR fishery has declined since 1987 when 2.7 million round lb was harvested for an exvessel value of $1.4 million. The lowest directed harvests occurred in 2006 and 2007 when all of SEO was closed to directed fishing, and only a few permits directed fishing for DSR in inside waters during this time (Table 7). The greatest number of directed permits fishing for DSR occurred in 1992 with 149 permits. Total reported harvest of DSR for all groundfish and halibut fisheries was highest in 1987 with 3,300,563 round lb harvested and lowest in 2020 when 268,694 round lb were harvested, because the directed commercial DSR fishery was closed regionwide. The majority of the DSR harvest has occurred in EYKT, CSEO, and SSEO, while DSR harvest in internal waters has occurred on a smaller scale (Figure 5).

Area closures have occurred in some years due to stock conservation concerns. The department has not opened the directed fishery in NSEO since 1994 when the stock assessment survey in that area indicated a low abundance of fish. The EYKT fishery was not opened in 2002 and 2003 because of high levels of estimated DSR mortality in the halibut fishery. This area was also closed to fishing in 2006, 2007, 2010, and 2011. The EYKT area was open to directed fishing from 2012 to 2017, followed by closures from 2018 to 2020. The CSEO area was open to directed fishing in 2012 and 2013. However, the area was closed prior to 2004, and again from 2014 to 2017. The CSEO area was opened to directed fishing in 2018 but was then closed in 2019 and 2020 due to a decrease in estimated abundance in the 2018 stock assessment survey. The directed fishery in SSEO was closed from 2005 to 2007 and again from 2014 to 2018. The department survey showed an increase in the estimated biomass in SSEO in 2018, and the area was opened to directed fishing in 2019. Fishing has been open to directed DSR fishing in the internal waters of both NSEI and SSEI since 2003; however, due to an overall decline in estimated yelloweye rockfish biomass from the most recent stock assessment surveys and signs of age truncation in biological data, the DSR directed fishery was closed in both outside and inside waters in 2020.

REGULATION DEVELOPMENT

The state has regulated the harvest of DSR in Southeast since the 1980s. Up until 1989, the fishery occurred primarily in CSEO, where a 1.3 million round lb harvest cap was placed in 1984. In 1987, GHLs for the directed DSR fishery were first set by management area under a draft management plan and directed commercial fishing for DSR was closed in a portion of Sitka Sound after public testimony emphasized a concern regarding localized stock depletion. In 1989, legal gear for DSR was defined as hook-and-line only.

Regulations were implemented with the development of the directed DSR fishery to improve the market for landings by the small-boat commercial fleet. In the 1980s, the fishery opened October 1; however, in 1989, the directed fishery was split into three periods (one for SEO and two for inside waters) to facilitate marketing of fresh product over an extended portion of the year. In addition, a trip limit of 7,500 round lb per 5-day period was implemented to preserve DSR as a fresh product.

In 1993, the DSR harvest allocation by season was reapportioned to allow more fish to be landed in the winter season when the price was highest.

The directed fishery season was curtailed in the summer of 1990 and again in the summer and fall of 1991 when the prohibited species cap for halibut (halibut bycatch mortality cap in non-halibut fisheries) was met. In 1991, the Council set aside a separate allocation of halibut bycatch mortality for the DSR fishery that prevented the directed DSR fishery from being impacted by halibut bycatch mortality in other Gulf of Alaska fisheries.

In 1989, prior to the development of a stock assessment for DSR in SEO, the Council implemented a total allowable catch (TAC)[3] of 1,036,000 round lb for all fishery removals of DSR in the SEO district based on the historical fishery harvest in the area. In 1991, the Council extended the waters of SEO from 137°W longitude to 140°W longitude to include the EYKT section, also extending state management authority to this area. To allow the state to manage DSR harvest within the federal TAC, the department lowered GHLs for DSR in all management areas in SEO and implemented a directed fishery harvest limit for DSR in EYKT. Trip limits were set at 12,000 round lb for EYKT and reduced from 7,500 to 6,000 round lb in the other management areas. In addition, closures to directed commercial fishing were implemented for areas surrounding the ports of Sitka, Craig, and Ketchikan. In 2018, the board reduced the trip limit from 12,000 round lb to 8,000 round lb in EYKT for more effective management of the fishery.

The DSR fishery in SEO has been managed since 1993 using a TAC based on a harvest rate applied to a biomass estimate (O'Connell and Carlile 1993, O'Connell and Brylinsky 2001). The directed DSR fishery has been managed with separate seasons following the implementation of the halibut individual fishing quota (IFQ) fishery. In 1997, regulations were adopted to reflect this management with 67% of the TAC allocated to the winter fishery season and 33% to the fall fishery season. In 2006, the board allocated the DSR TAC between commercial and sport sectors with 84% to commercial and 16% to sport, and in 2009, the board adopted a proposal to deduct the subsistence catch from the DSR TAC prior to the allocation between the commercial and sport sectors. In 2006, regulations were adopted that restricted the SEO DSR fishery to the winter season, preventing the directed fishery from overlapping with the IFQ halibut season.

In 1997, an annual GHL for directed DSR fisheries in the internal waters of SSEI and NSEI was established and set at a level not to exceed 110,000 round lb in each area. Generally, the annual GHL is set at 55,125 lb, half of the allowable limit, with 37,485 lb for the winter fishery in each area and 17,640 lb reserved for the fall fishery with an adjustment for any underage or overage of the winter fishery.

Regulations have been developed to reduce the at-sea discard of DSR due to their high post-release mortality caused from exposure to pressure changes experienced between catch depth and surface waters. Full retention was required of all DSR captured in state waters of Southeast in 2000, and in 2009, was restricted to groundfish and halibut fisheries only. In state waters, a CFEC permit holder must retain, weigh, and report all DSR taken, and any excess of the allowable bycatch limits must be reported as bycatch overage on a fish ticket. Proceeds from the sale of excess DSR are forfeited to the State of Alaska. DSR in excess of legal bycatch limits may be retained for personal use or donated. In addition, there are restrictions on the use of yelloweye rockfish for bait where only the head, tail, fins, and viscera from delivered and processed yelloweye rockfish may be used.

[3] The federal TAC is set in metric tons (mt); the department sets fishery quotas (GHR, TAC, AHO) in round pounds.

Full retention of DSR has been required in groundfish and halibut fisheries in federal waters since 2005. DSR bycatch overage taken in federal waters cannot enter commerce.

The department monitors the directed DSR fishery through logbooks, fish tickets, and fishery registration. In 1989, the department began requiring logbooks for directed fishing of DSR, and in 1990, Southeast fishermen needed a DSR directed fishery CFEC interim use permit card (Y card). However, this permit card was not used in EYKT until 1991 when the SEO district was extended to include this area. Since 2003, fishermen have been required to register prior to participating in the directed DSR fishery.

STOCK ASSESSMENT AND MANAGEMENT

The department conducts a multi-year stock assessment survey for DSR in SEO. Biomass is estimated by management area as the product of yelloweye rockfish density, the area of rocky habitat within the 100-fathom contour, and the yelloweye rockfish average weight (O'Connell and Carlile 1993, Brylinsky et al. 2007). Yelloweye rockfish density for the annual stock assessment is based on the most recent estimate by management area. These densities are multiplied by the average weight of yelloweye rockfish from the commercial directed DSR and halibut longline fisheries for the current year and management area.

Yelloweye rockfish density is estimated using distance sampling methods along line transects (Buckland et al. 1993, Burnham et al. 1980, Thomas et al. 2010). From 1994 to 2009, a manned submersible was used to survey yelloweye rockfish; however, due to high costs and lack of submersible availability, the department began conducting line transects with a remote operated vehicle (ROV) in 2012. Side-by-side analysis of data obtained from ROV and submersible surveys indicates that the ROV is an appropriate survey tool to assess yelloweye rockfish stocks and provides estimates that are comparable to those produced with the submersible (O'Connell and Carlile 1994). All four of the SEO management areas have been surveyed with the ROV: CSEO in 2012, 2016, and 2018; SSEO in 2013, 2018, and 2020; EYKT in 2015, 2017, and 2019; and NSEO in 2016 and 2018. The most recent estimates of yelloweye rockfish density (i.e., ye/km^2) by management area are as follows: 898 ye/km^2 in CSEO, 1,624 ye/km^2 in SSEO (from the 2018 stock assessment survey), 1,562 ye/km^2 in EYKT, and 553 ye/km^2 in NSEO.

The allowable biological catch (ABC) for the DSR assemblage in SEO is set by multiplying the lower bound of the 90% confidence interval of yelloweye rockfish biomass for the region by the natural mortality rate (M = 0.02) and average estimated harvest from commercial, sport, and subsistence fisheries of other species in the DSR assemblage, which is added to the yelloweye rockfish ABC. In this assessment, natural mortality is equal to fishing mortality (F), or $F = M$. This method is more conservative than using $F_{40\%}$ (0.026) to determine the ABC. The overfishing level is set using a rate of $F_{35\%}$ (0.032). There is no stock assessment information available for NSEI and SSEI management areas where the GHL has historically been set annually at 55,125 round lb for each area or approximately at the midpoint of the GHR (110,000 round lb).

Overall, yelloweye rockfish biomass has been decreasing in SEO despite a conservative harvest strategy. Management for this species has improved with increased accounting of total DSR removals since 2004 and allocation of the resource between sport and commercial sectors since 2006. Additionally, in 2017, the department began an interdivisional, statewide rockfish initiative to develop long-term management strategies for yelloweye rockfish. The stock is not considered overfished, but due to the life history characteristics of this long-lived species and infrequent stock assessment surveys, fluctuations in yelloweye rockfish biomass may not be detected quickly. Due

to this and a general decline in estimated biomass, the directed commercial, personal use, and sport fisheries were closed to DSR fishing in 2020.

2017–2020 SEASON

SUMMARY

During this period, quotas were set annually by management area based on the DSR stock assessment and projection of DSR catch in the halibut fishery. Beginning in 2016, the directed fishery was opened in one management area in SEO at a time, alternating with areas that were surveyed in the previous year, and the management area was only opened if the quota was large enough to prosecute an orderly fishery. This allowed for one management area in SEO to have a two-to-three-year recovery period and be surveyed prior to opening a directed fishery.

During the 2017–2020 reporting period, directed fishing was open in internal waters (NSEI and SSEI), EYKT in 2017 only, CSEO in 2018 only, and SSEO in 2019 only. Due to a continuous decline in estimated the biomass, the directed commercial DSR fishery was closed in all management areas in 2020. During this period, the DSR harvest in the Southeast District was highest in the directed fishery in 2018 with 175,049 round lb and in all groundfish and halibut fisheries in 2019 with 412,055 round lb (Table 7). The largest directed fishery allocation and value occurred in 2018 with 231,606 round lb allocated (Table 8) and an exvessel value of $340,282 (Table 7). From 2017 to 2019, the average price per lb for directed yelloweye rockfish varied from a high of $2.18 per lb in 2017 to a low of $2.03 per round lb in 2018. The number of active directed fishing permits ranged from 10 to 17 permits from 2017 to 2019 (Table 7). Due to the regionwide closure of the directed commercial fishery in 2020, the fishery allocation, exvessel value, and number of active directed fishing permits are zero.

2021 SEASON OUTLOOK

The most recent version of the DSR stock assessment presented to the Council's *Gulf of Alaska Groundfish Plan Team* in November 2020 recommended an ABC of 566,588 lb, and a TAC of 551,156 lb for 2021 (Wood et al. 2020). This is an 8% increase from the TAC established in 2020. The TAC was determined by deducting the estimated subsistence catch (15,432 lb) from the ABC. The TAC is apportioned 84% to commercial fisheries and 16% to sport fish fisheries, which results in a commercial TAC of 462,971 lb and a sport TAC of 88,185 lb (Wood et al. 2020). At the time of publication of this document, it was not determined whether the directed DSR fisheries would open in 2021. Directed fisheries are opened if, after accounting for mortality in other fisheries, there is sufficient DSR resource available to conduct an orderly fishery and there are no area-specific conservation concerns. This decision will be announced in January; however, given concerns for the health of the yelloweye rockfish stocks, directed DSR fisheries are unlikely to open in 2021.

PELAGIC SHELF, SLOPE ROCKFISHES, AND SHORTSPINE THORNYHEADS

FISHERY DEVELOPMENT AND HISTORY

Black rockfish compose the largest proportion of the landings for the PSR assemblage both in inside and outside waters in Southeast Alaska. Black rockfish are taken primarily as bycatch in longline and salmon troll fisheries; however, there is a directed black rockfish fishery that occurs

in the SEO. In inside waters, PSR harvest peaked in 1992 and has since generally been declining (Table 9). Harvest levels have been relatively low in recent years and have varied from a high of 26,315 round lb in 1992 to 186 round lb in 2012 (Table 9). Since 2007, effort has been low in the directed black rockfish fishery in SEO; harvest peaked in 2003 with 88,465 round lb and has been as low as 440 round lb in 2011 (Table 10). Harvest in the directed fishery has been made up of 23–64% of the total harvest of black rockfish in SEO during the years 2017–2020.

In 1998, the Council removed black and blue rockfish from the FMP, and in 2009, dark rockfish were removed as well. The state has sole management responsibilities for black, blue, and dark rockfish in state and federal waters.

Slope rockfishes and shortspine thornyheads are captured incidentally in longline fisheries for sablefish, halibut, and DSR with the majority of the catch associated with the SSEI and NSEI sablefish fisheries (Table 11). In addition, slope rockfish were targeted by a few fishermen prior to 2003 (Table 11). For inside waters in 2020, shortspine thornyhead accounted for 54% of the landed slope rockfish bycatch, followed by shortraker rockfish (23%), redbanded rockfish (12%), and rougheye (blackspotted/rougheye) rockfish (10%).

REGULATIONS

Full retention regulations adopted at the 2000 board meeting require that all rockfish (*Sebastes* spp.) caught in internal waters (NSEI and SSEI) be weighed and reported on fish tickets. In 2003, full retention regulations were adopted that require CFEC permit holders fishing for groundfish or halibut in the EGOA to retain, weigh, and report all black rockfish caught. The board also adopted five area closures for the direct taking of black rockfish in the EGOA. These five area closures prevent the complete removal of older fish, because research indicates the importance of older year classes of black rockfish in maintaining genetic diversity and stock condition. In addition to these changes, the board prohibited directed fishing for slope and thornyhead rockfish (*Sebastolobus* spp.). These rockfish may only be captured as bycatch or in directed fisheries under the terms of a commissioner's permit.

Directed fishing for black rockfish is open year-round and the fishery is prosecuted only in outside waters of the Southeast District. Directed fishing is prohibited in NSEI and SSEIW along with five areas along the outer coast. Gear is limited to mechanical jigging machines and dinglebar and hand troll gear. In 2009, the board adopted a proposal which repealed the prohibition on the sale of black rockfish taken as bycatch in waters that are closed to directed black rockfish fishing.

In 2020, federal regulations were adopted that require the operator of a federally permitted catcher vessel using hook-and-line, pot, or jig gear in the exclusive economic zone (EEZ) of the Gulf of Alaska to retain and land all rockfish caught while fishing for groundfish or halibut.

STOCK ASSESSMENT AND MANAGEMENT

The directed black rockfish fishery is managed using area GHLs, vessel registrations, gear restrictions, and small area closures. This fishery focuses on fishing in nearshore, shallow water rock "reef" habitat, an area traditionally very difficult to assess. There have been no stock assessment surveys to assess black rockfish since 2002. Surveys were conducted to tag black rockfish from 1999 to 2002 with 4,659 black rockfish tagged and released with 58 tags recovered (Tydingco and Brylinsky 1999). No surveys are performed to assess slope and thornyhead rockfish stocks; however, these species are captured incidentally on annual sablefish longline surveys. In

2017, the department began an interdivisional, statewide rockfish initiative to develop long-term management strategies for black rockfish.

2017–2020 Season Summary

The PSR harvest has been variable in both outside and inside waters during this reporting period (2017–2020). During this time period, NSEI and SSEI harvest levels fluctuated from 200 round lb to 3,109 round lb (Table 9). Black rockfish harvest in SEO has ranged from 4,239 to 13,624 round lb in the directed fishery and 15,755–22,481 round lb in all groundfish, halibut, and salmon troll fisheries between 2017 and 2020 (Table 10). The number of permits fished in the directed black rockfish fishery ranged from 3 to 10 (Table 10) between 2017 and 2020.

The total catch of slope rockfishes and thornyheads in NSEI and SSEI has remained low during this reporting period with under 150,000 round lb harvested. The highest harvest during this time was in 2017 with 140,678 round lb (Table 11).

2021 Season Outlook

Slope rockfish, thornyhead, and PSR bycatch landings in 2021 are expected to be similar to recent annual landings. Effort is expected to be similar in the directed black rockfish fishery in 2021. Fishing effort may relate to a number of economic factors, including the market value for black rockfish, fuel prices, and dynamics in other fisheries.

SABLEFISH

Sablefish occur in the northeastern Pacific Ocean from Baja California to the Aleutian Islands and into the Bering Sea (Mecklenburg et al. 2002). Adult sablefish inhabit the deep-water continental shelf, slope, and coastal fjords. Most adults live in depths of 200–500 fathoms but have been captured in depths as great as 1,000 fathoms (Allen and Smith 1988). Sablefish are long-lived and have been aged to at least 94 years in Alaska waters (Munk 2001); however, few fish greater than 20 years of age are captured in Southeast Alaska commercial fisheries (Mueter 2010). Sablefish are the most valuable groundfish in Southeast Alaska with an average annual exvessel value of $4,258,297 in the current reporting period.

Fishery Development and History

State managed fisheries currently occur in NSEI (Chatham Strait) and SSEI (Clarence Strait and adjacent waters of Dixon Entrance). Sablefish have been harvested in the internal waters of Southeast Alaska since the early 1900s. Prior to the 1940s, sablefish were primarily landed as bycatch in the halibut fishery (Bracken 1983). Halibut longline gear was modified in the late 1940s to target sablefish. Until the 1970s, harvest levels fluctuated widely due to low price and better opportunities in other fisheries. Pot gear was first introduced in 1970 in the Clarence Strait and Dixon Entrance areas, and the pot fishery accounted for 33% of the total harvest in the early 1970s. In 1981, the NSEI fishery was restricted to longline gear only, but pot gear was still allowed in the SSEI Subdistrict.

Sablefish have been historically managed with limitations on fishing seasons and harvest levels. Season limitations were first imposed in 1945 for the NSEI management area and in 1982 for the SSEI management area (Bracken 1983). Fishing seasons continued to be shortened in both areas as effort escalated in the 1970s and 1980s. GHRs based on historic catches were established for both areas in 1980. In 1985, a limited entry program was implemented for both the NSEI and SSEI

sablefish fisheries. However, the number of vessels and overall operating efficiency of the longline fleet increased significantly after the limited entry program was implemented. In order to stay within GHRs, the department continued to reduce the number of fishing days in both areas. In the NSEI area, the number of fishing days fell from 76 days in 1980 to one day in 1987 (Table 12). One-day openings continued in the NSEI area through 1993. In 1993, the NSEI fleet harvested 3,640,000 dressed lb, which was 2,140,000 dressed lb over the upper bound of the GHR (1,500,000 dressed lb). In an effort to improve management, the board adopted an equal quota share (EQS) system for the NSEI area in 1994. In SSEI, the number of fishing days declined from 200 days in 1980 to 2 days in 1995 and 1996 (Table 13). In 1997, at the request of industry, the board adopted a similar EQS system for the SSEI fishery and established separate seasons for the longline and pot fisheries to reduce gear conflicts and enable pot fishers to utilize their gear more effectively.

REGULATIONS

Management regulations, including annual harvest objectives (AHOs), fishing seasons, and gear specifications, are defined separately for the NSEI and SSEI sablefish fisheries. No sablefish fishery occurs in the state-managed 0–3 mile zone in outside coastal waters of Southeast Alaska. The EQS system requires the department to divide the AHO equally among the CFEC permits eligible for each fishery. In 2003, the board adopted regulations allowing fishermen to apply a 5% overage or a 5% underage from the previous year to the current year's EQS in an effort to reduce discard mortality and to acknowledge the difficulties in landing exact amounts of fish. Sablefish may no longer be harvested for use as bait.

The NSEI longline fishery is open annually between August 15 and November 15. In 2003, new regulations allowed for an off-season fishery in the NSEI area in an effort to collect biological data on sablefish residing in NSEI during winter and spring months. The department chartered longline vessels to conduct a survey in January and February of 2004 and 2005 as part of a research project to observe CPUE rates and collect biological data during the winter. However, winter fishing has not occurred since 2005 because the AHO must be announced prior to off-season fishing, and typically the NSEI stock assessment is not completed until June or July. In 2010, under the same regulation, the department implemented a program to allow NSEI permit holders to retain their personal quota share (PQS) during the department longline survey conducted in the summer prior to the start of the commercial fishery season in an effort to decrease department test fish removals. This program reduces the test fish decrement to the ABC, and thus increases the AHO for all permit holders.

Starting in 2000, the SSEI sablefish commercial fishery season was open from June 1 to August 15 for longline gear only and from September 1 to November 15 for pot gear only. At the 2018 board meeting, the longline and pot fishery seasons were combined from June 1 to November 15. In 2017, the CFEC approved a petition from industry to allow SSEI sablefish C61C permits to be changed to be longline/pot permits due to whale depredation issues and concerns in the longline fishery. Since 2017, C61C permits have the flexibility to fish both gear types, while C91C permits remain as pot permits only. At the 2018 board meeting, new regulations were adopted to require at least two circular escape rings with a minimum inside diameter of 4 inches installed on opposing vertical or sloping walls of pot gear and to allow a CFEC permit holder or interim use permit holder for sablefish to possess live sablefish for delivery as a live product.

STOCK ASSESSMENT AND MANAGEMENT

In 1988, the department began annual longline research surveys in both NSEI and SSEI to assess the relative abundance of sablefish over time using fixed survey stations. Research at the time indicated some movement of sablefish into and out of NSEI and substantial movement into and out of SSEI. Consequently, the department has conducted surveys a few weeks prior to the start of each fishery to examine relative abundance and sablefish population composition near the time of these fisheries. During the annual longline surveys, biological data are collected on sablefish and include length, weight, sex, stage of maturity, and otoliths (aging structures). These data are used to describe the age and size structure of the populations and detect recruitment events.

The longline surveys were designed as random stratified surveys; fixed stations were placed in sablefish habitat (based on depth) in Clarence and Chatham Straits where the majority of the commercial SSEI and NSEI fishery harvest occurred. For the SSEI survey, stations were added in Dixon Entrance in 1996 to reflect changes in the fishery distribution. In 2013, the SSEI longline survey was redesigned to improve the spatial coverage of the survey relative to the fishery; the fishery had further shifted into Dixon Entrance and few survey stations were located in this area. Survey stations were re-allocated in proportion to sablefish habitat by strata. Statistical areas were included in the survey design if a minimum average of 3% (or greater) commercial harvest occurred in the area from 2003 to 2012 (Stahl et al. 2014a).

Since 2000, the longline survey hook spacing, gear soak time, and bait type and size have been standardized to the specifications used in the federal longline survey to allow for comparisons of stocks in federal and state waters. The hook spacing was 1.6 to 1.8 m from 1997 to 1999; in 2000 spacing was standardized to 2 m. Prior to 1997, survey gear was retrieved one hour after deployment. A 3- to 11-hour soak time was implemented in 1997 to match the minimum 3-hour soak time on the federal longline survey and to address concerns that the 1-hour soak time was not sufficient for gear to reach the bottom and be available for fish at certain depths and tidal/current conditions (Cartwright 2000). In addition, herring was replaced with squid as bait in 1997 partially due to the concern that herring disintegrates with longer soak times (Cartwright 2000).

Since 1997, mark–recapture activities have occurred to estimate absolute abundance of sablefish in NSEI. From 1997 to 1999, sablefish were marked during the annual NSEI longline survey; however, tag–recovery data indicated tagged fish released using longline gear were avoiding subsequent capture with longline gear (Carlile et al. 2002). In 2000, to avoid this potential bias and more accurately assess abundance, the department began using longlined pots to capture and mark sablefish. Marking surveys also provide release and recapture locations for tagged sablefish. These data allowed for estimation of migration rates and analysis of movement patterns between internal waters and the Gulf of Alaska, Bering Sea, Aleutian Islands, and British Columbia. After one year of occupancy, the probability of sablefish in Chatham Strait moving to any other area is 10–14%, and 30% for Clarence Strait (after one year of occupancy; Hanselman et al. 2014).

Prior to 1997, the department set the AHOs for the sablefish fisheries after the longline surveys were completed and just before to the opening of the fisheries. Since then, the department has set the AHO in NSEI for a given year using the survey and fishery data from previous years, because mark–recapture and fishery age structure data cannot be analyzed until after the NSEI fishery has been prosecuted. From 2003 to 2019, AHOs were set in NSEI by applying a harvest rate to an estimate of biomass that is calculated from mark–recapture and weight-at-age data using Chapman's modification of the Peterson estimator (Chapman 1951; Dressel 2009; Seber 1982).

Beginning in 2020, a new statistical catch-at-age model replaced past methodology that partitioned a mark–recapture abundance estimate to numbers-at-age using fishery age compositions. This reduced the department's reliance on an annual mark–recapture project by integrating multiple indices of abundance and biological data including catch, mark–recapture abundance estimates, longline survey and fishery catch-per-unit-effort, and longline survey length and age compositions to estimate recruitment, abundance, and spawning stock biomass of NSEI sablefish since 1975. As in previous years, maximum ABC is defined by F_{50}, the fishing mortality rate that reduces spawning biomass to 50% of equilibrium unfished levels. A new management procedure was also implemented that constrained the recommended ABC to a 15% annual maximum change to increase fishing stability and maximize catch. With these advancements, the recommended 2020 ABC was 1,216,743 round lb (F_{ABC} = 0.0537), a 15% increase from the 2019 ABC. The increase in ABC was attributed to the large 2014-year class, which is estimated to be 45% mature in 2020 and made up 38% of the forecasted female spawning stock biomass. The ABC was decremented 108,740 round lb to account for the longline survey removals, estimated mortality in the halibut fishery, and mortality in subsistence, personal use, and sport fish fisheries, resulting in an AHO of 1,108,003 round lb for the 2020 NSEI commercial sablefish fishery and an equal quota share of 14,773 round lb for the 75 permit holders.

Unlike NSEI, the department does not currently estimate the absolute abundance of the SSEI sablefish stock. There appears to be substantial movement of sablefish in and out of the SSEI area, violating the assumption of a closed population; consequently, mark–recapture estimates of abundance or exploitation rates are not possible for this fishery. Instead, the SSEI sablefish population is managed based on relative abundance trends from survey and fishery CPUE data, as well as with survey and fishery biological data that are used to describe the age and size structure of the population and detect recruitment events.

2017–2020 NSEI AND SSEI SEASONS SUMMARY

For this reporting period, there was an increase in the AHO for NSEI from 2017 to 2020 (Table 12), and an increase in SSEI from 2017 to 2019 with a slight decrease in 2020 due to declines in both the longline survey and fishery CPUE indices and concerns over suppressed spawning biomass (Table 13). From 2017 to October 2020, 5,329,660 round lb of sablefish were harvested (Table 1). The highest harvest in this reporting period occurred in 2019 with 1,497,035 round lb and the lowest in 2017 with 1,228,605 round lb harvested. The average exvessel price was $1.88 per round lb in the NSEI fishery and $1.21 in the SSEI fishery in 2020, a substantial decrease from the 2019 average price of $3.12 for NSEI and $2.45 in SSEI.

NSEI

The 2020 NSEI AHO was 1,108,003 round lb, a 19% increase from 2019. The 2020 AHO was the highest NSEI fishery quota since 2008 (Table 12), a result of an increase in the exploitable biomass (Figure 6) and recent strong recruitment trends in NSEI and surrounding areas. The fishery and survey CPUE values have fluctuated annually, and the fishery and survey CPUEs for 2020 have not yet been analyzed. The annual AHO and EQS values were higher in this reporting period than the previous reporting period, and total permit holders in the 2020 fishery is at a new low of 75 permits (Table 12).

SSEI

The SSEI AHO in 2020 decreased by 3% from 2019 to 572,639 round lb, resulting in an EQS of 26,029 round lb, which was the second highest EQS in the SSEI sablefish fishery. The number of permit holders declined during this reporting period from 23 to 22 permits. The largest EQS occurred in 2019 when the AHO was set at 590,349 round lb and each EQS was 26,834 round lb. Overall, the annual AHO and EQS values were higher compared to the previous reporting period (Table 13). Both the longline survey and longline fishery CPUEs increased slightly from 2017 to 2018 but declined from 2018 to 2019 (Figure 7). The fishery and survey CPUE for 2020 have not yet been analyzed.

Survey CPUEs in NSEI and SSEI have historically been higher than fishery CPUEs. Unlike the fishery, longline surveys account for sablefish discards and fish lost at the roller, resulting in higher CPUE estimates. In addition, commercial CPUE estimates may be lower, because some fishermen may target both halibut and sablefish in the same trip.

2021 Season Outlook

NSEI

The tagging survey, which serves as the first stage of the annual mark–recapture study, was conducted in 2020 using a department survey vessel. The department also conducted the annual longline survey in 2020, collecting CPUE data and sablefish biological information (age, weight, length, sex, and maturity). The department collected sablefish biological data through port sampling of commercial fishery landings. The 2021 NSEI quota decision will be made based on the evaluation of NSEI fishery and survey CPUE, previous NSEI biomass estimates, and the current year's age, length, sex, and maturity data. The department will not conduct a tagging survey in 2021 due to budget constraints.

SSEI

The 2021 AHO will be set in the spring after analyses of fishery and survey CPUE and biological data are completed. The department will continue to closely monitor sablefish recruitment trends, age, length, weight, and maturity data, as well as survey and fishery performance in SSEI.

PACIFIC COD

Pacific cod are found from the Yellow Sea in China through the Bering Sea as far north as the Chukchi Sea, and south to Santa Monica Bay, California (Love 1996; Westrheim 1996; Mecklenburg et al. 2002). Pacific cod inhabit the waters of the continental shelf and upper continental slope (Bakkala et al. 1984; Westrheim 1996).

Fishery Development and History

The catch history of the directed Pacific cod fishery in internal waters of Southeast Alaska is incomplete due to some limitations with landing records for this fishery. Under regulation, Pacific cod harvested for bait in other fisheries must be reported on the fish ticket for the directed fishery and cannot be sold or transported outside the Eastern Gulf of Alaska Area. However, the amount of Pacific cod retained for bait use in other fisheries is unknown and compliance with this reporting requirement is assumed to be low due to the small number of vessels that report the use of Pacific cod for bait. Since 1997, fishing trips targeting Pacific cod have required logbooks with the target species recorded, which has allowed for more accurate tracking. Prior to this time, it was difficult

to differentiate Pacific cod harvested on a directed fishery trip from those landed as incidental catch because all Pacific cod landings could be reported on the same CFEC miscellaneous finfish interim use permit card (M card).

A GHR was implemented in 1994 to establish state management authority of Pacific cod in internal waters. In the absence of state regulations, management of Pacific cod in state waters would be subsumed to the federal government. The GHR was set at 750,000–1,250,000 round lb to accommodate traditional harvest patterns and allow potential expansion of the fishery if additional harvest was deemed sustainable. The directed fishery for Pacific cod has remained open year-round in state waters since the adoption of the GHR in 1994; however, area closures have been implemented during this time due to concerns of possible localized depletion.

Reported landings of Pacific cod from NSEI and SSEI have varied widely over the past 20 years (Table 14). The increase in catch in the 1990s was due to the development of a food market for Pacific cod. Total annual reported landings of Pacific cod from NSEI and SSEI have ranged from 132,915 round lb (1985) to 889,676 round lb (1993) with most of this harvest landed on miscellaneous finfish interim use permits (Table 14). On average, 87% of the Pacific cod harvested have come from the directed fishery with a range of 9 to 179 miscellaneous finfish interim use permits landing Pacific cod in the directed fishery from 1985 to 2020 (Table 14).

REGULATIONS

In 2000, the board limited gear for the harvest of Pacific cod to longline, dinglebar troll, hand troll, mechanical jigs, and pot gear. Longline gear is the primary gear used in the directed Pacific cod fishery in Southeast Alaska. In 2012, the board defined the open fishing period for the Pacific cod fishery as January 1–December 31 preventing opening and closing the fishery by emergency order.

STOCK ASSESSMENT AND MANAGEMENT

There are no department stock assessment surveys for Pacific cod in internal state waters in Southeast Alaska. Pacific cod are sampled at the dock from landings made during the NSEI directed fishery. Biological data are collected for length, sex, maturity, and otoliths. Aging of Pacific cod is problematic and estimated ages are not yet used for assessing stock condition.

The Pacific cod GHR is managed on the calendar year cycle and applies to directed fishery harvest as well as Pacific cod taken incidentally in the commercial halibut, sablefish, and demersal shelf rockfish fisheries. Management actions (e.g., inseason closures) are structured to coincide with the seasonality of the fishery using a time frame of July 1 to June 30 rather than the calendar year because spawning aggregations are targeted primarily from October to April. Closures are implemented in some areas when harvests have reached target levels to distribute directed fishery harvest throughout the management area and reduce fishing pressure on potential spawning aggregations. Seasonal closures remain in effect through June 30.

2017–2020 SEASONS SUMMARY

Total Pacific cod landings have fluctuated during this reporting period but are similar to harvest levels in previous years. The highest harvest in the directed fishery during this period occurred in 2020 with 281,501 round lb (through October) and the lowest was in 2019 with 191,400 round lb (Table 14). Harvests levels have fluctuated with the market value for Pacific cod; the price per pound can be quite variable even within a given year depending on when and what product is sold. As in the past, the majority of the harvest (94%) during this reporting period was taken in NSEI.

During the 2017/18, 2018/19, and 2019/20 fishing seasons, directed fishing for Pacific cod began in the fall and proceeded through winter and spring. Closures were only implemented in the winter of 2018 in the northern NSEI area including portions of Cross Sound, Icy Strait, Port Frederick, Lynn Canal, Berners Bay, Stephens Passage/Gastineau Channel, and northern Chatham Strait. The inseason closure was implemented because of a decline in Southeast Alaska harvest, suggesting that the area was experiencing a period of reduced biomass, and the area closure distributed effort and harvest throughout the remaining open areas.

2021 Season Outlook

Pacific cod continues to be an important food and bait fish in the EGOA, and the fishery provides an opportunity for entry-level participants. If the market value of Pacific cod remains high, this fishery may continue to be important in Southeast Alaska.

FLATFISH

Starry flounder (*Platichthys stellatus*) are the primary species targeted in a beam trawl fishery for flatfish in Southeast Alaska. Starry flounder occur in soft-bottom, shallow water estuaries, generally shallower than 55 fathoms, in the North Pacific (Mecklenburg et al. 2002).

Fishery Development and History

There is relatively limited estuarine habitat in Southeast Alaska where trawl fisheries are likely to target flatfish. A trawl fishery for flatfish was already established in the internal waters of Southeast Alaska by 1960 when landings of flatfish were first documented. Between 1960 and 1965 approximately 40,000 round lb of flatfish were harvested annually from Port Camden and delivered to the Yukon Fur Farm on Kupreanof Island for use as mink food. Department reporting records show a substantial increase in annual harvest from low levels in the early 1960s to approximately 1 million round lb by 1973, with the harvest dropping substantially by 1980. The harvest in these early years came primarily from Port Camden, Level Island, and Stikine Flats. These fish were primarily delivered out of state, often in chill-vans, which kept the product live. The fishery again escalated from minimal reported landings in the early 1980s to landings just over 800,000 round lb in the late 1980s, consisting primarily of starry flounder and some rock sole (*Lepidopsetta* spp.). Harvests remained high from 1987 to 1991 and then decreased to less than 10,000 round lb by 1995, and since that time have remained at 20,000 round lb or less per season (Table 15). All the flatfish harvested in 1996 and 1997 were processed in Southeast Alaska, a significant change from previous years. Current GHRs are based on the limited amount of flatfish habitat available, lack of flatfish stock status information, and concerns for potentially high bycatch of crab, shrimp, and halibut (Bracken et al. 1991).

Regulations

The trawl fishery for flatfish is limited to 4 areas: Stikine Flats, Level Island, Port Camden, and Anita Bay; although, Stikine Flats has been closed to directed fishing since 1989. The beam trawl fishery targets pre-spawning aggregations of flatfish; hence, fishing is limited seasonally. Fishing seasons are October 1–April 15 for Anita Bay fisheries and October 1–November 15 and February 15–April 15 for Port Camden and Level Island fisheries. In 1993 the board implemented a 20,000 round lb weekly trip limit to prevent overharvest of the small GHRs in this fishery. In 1997, the board failed to adopt a proposal to increase the weekly trip limit to 35,000 round lb. Legal gear for directed flatfish fishing in Southeast Alaska was limited to beam trawl gear

beginning in 2001. Department-issued commissioner's permits are required to participate in the directed beam trawl flatfish fishery. The conditions of this permit require the operator to keep a detailed logbook. Open areas, gear restrictions, and reporting requirements are outlined in the individual permits. Permits are issued for 30 days and are renewable at the department's discretion. The department may also require onboard observer coverage.

STOCK ASSESSMENT AND MANAGEMENT

The department has little information about the current condition of the flatfish resource in Southeast Alaska as there are no department stock assessment surveys. In the past, onboard observers have collected information on CPUE and biological characteristics of the stock. Data collected in 1988 on Stikine Flats indicated that the proportion of mature fish in the area was insufficient to support a directed fishery (Bracken et al. 1991). Consequently, this area was closed to directed fishing in 1989 and has remained closed. The most recent management action for the flatfish fishery occurred in April 1998 when the department closed the Anita Bay area to directed trawl fishing when the area GHL had been met.

2017–2020 SEASONS SUMMARY

There was no participation in the directed flatfish fishery at any time during this reporting period and no requests for commissioner's permits. For inside waters during this entire reporting period, 1,278 round lb of flatfish were discarded at sea, retained for personal use, or retained for bait.

2021 SEASON OUTLOOK

The department will evaluate requests for commissioner's permits based on flatfish harvest and associated bycatch concerns and will structure permit terms to allow for collection of biological data on flatfish as well as associated bycatch information.

OTHER SPECIES

Landings of other groundfish species in NSEI and SSEI continue to be low. The majority of other species not noted above are discarded at sea and not reported on fish tickets. Primary discards include Pacific sleeper sharks (*Somniosus pacificus*), spiny dogfish (*Squalus suckleyi*)[4], spotted ratfish (*Hydrolagus colliei*), skates (Family Rajidae), arrowtooth flounder (*Atheresthes stomias*), hagfish (*Eptatretus* spp.), and grenadiers (Family Macrouridae). Skate landings in internal waters of NSEI and SSEI during this reporting period (2017–2020) totaled 94,596 round lb. Landings fluctuated annually with a low harvest in 2020 (through October) of 20,888 round lb and a high in 2019 of 28,187 round lb. Skates harvest fluctuates with current market value. Fewer than three permit holders were targeting hagfish during this reporting period, consequently this information is confidential.

[4] Since 2010, spiny dogfish have been identified as *Squalus suckleyi* and separated from the Atlantic species of dogfish *S. acanthias* based on morphology and genetics; however, in regulation they are still identified as *S. acanthias*.

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TABLES AND FIGURES

Table 1.–Reported catch (round pounds) and exvessel value for state-managed groundfish taken in commercial groundfish and halibut fisheries, Southeast District from 1996 to October 2020. DSR include the demersal shelf rockfish assemblage, PSR includes all pelagic shelf rockfish, and slope rockfish include all rockfish (*Sebastes* and *Sebastolobus* spp.) not included in the DSR and PSR assemblages.

	Species/Area managed								
	Lingcod	Flatfish	DSR[a]	PSR[a]	Black Rockfish[a]	Slope[a]	Pacific cod[a]	Sablefish	
Year	Southeast	NSEI/SSEI	Southeast	NSEI/SSEI	SEO	NSEI/SSEI	NSEI/SSEI	NSEI/SSEI	Total
1996	755,771	1,185	1,008,417	8,365	67,166	510,210	639,343	5,176,160	8,166,617
	$377,886	$273	$923,641	$3,011	$19,560	$321,432	$326,065	$10,807,647	$12,779,515
1997	612,950	5,614	913,492	15,105	127,445	622,581	778,033	5,478,464	8,553,684
	$330,993	$1,067	$973,727	$3,927	$40,945	$397,774	$326,774	$13,153,151	$15,228,358
1998	581,364	14,631	953,538	6,740	60,434	905,127	647,940	5,266,064	8,435,838
	$308,881	$2,634	$919,950	$2,022	$20,001	$534,025	$233,258	$8,316,809	$10,337,580
1999	515,291	12,968	969,777	49,833	42,950	654,469	823,342	3,704,697	6,773,327
	$319,632	$2,464	$1,019,155	$16,770	$14,642	$412,315	$279,936	$7,838,126	$9,903,040
2000	481,034	4,418	786,706	44,375	36,781	733,227	593,104	3,672,579	6,352,224
	$327,726	$499	$959,146	$16,110	$13,898	$445,289	$231,311	$8,570,766	$10,564,745
2001	330,569	1,392	860,958	22,533	16,461	487,407	356,790	2,793,295	4,869,405
	$166,371	$0	$971,431	$5,879	$4,199	$264,544	$121,309	$5,813,074	$7,346,807
2002	351,421	2371	1,076,598	96,883	78,635	349,328	251,751	2,659,719	4,866,706
	$208,136	$237	$1,027,351	$33,781	$24,900	$191,941	$100,700	$6,102,368	$7,689,414
2003	393,371	1124	800,892	96,690	91,666	306,946	386,548	2,658,579	4,735,816
	$258,264	$112	$935,865	$42,838	$41,097	$161,873	$150,754	$6,316,033	$7,906,836
2004	360,682	802	874,526	50,981	46,308	222,781	451,446	2,878,801	4,886,327
	$232,010	$0	$1,076,852	$19,001	$17,278	$149,319	$186,483	$5,563,286	$7,244,229
2005	324,323	1779	608,510	4,773	9,258	264,866	469,215	2,665,850	4,348,574
	$223,473	$0	$599,880	$2,661	$5,162	$159,856	$208,396	$6,378,833	$7,578,261
2006	348,053	confidential	566,784	1,123	9,049	290,743	363,659	2,658,618	4,238,029
	$282,165	$0	$458,240	$801	$4,453	$183,797	$165,453	$6,501,059	$7,595,968
2007	346,010	confidential	542,894	1,289	2,813	265,029	581,314	2,121,646	3,860,995
	$277,168	$0	$409,647	$491	$1,135	$144,598	$269,965	$5,269,200	$6,372,204
2008	405,813	447	516,397	1,939	1,871	261,963	696,372	2,131,073	4,015,875
	$370,212	$244	$485,140	$706	$463	$147,049	$400,676	$6,727,573	$8,132,063
2009	435,953	confidential	544,066	972	2,066	212,781	679,931	1,667,302	3,543,071
	$332,015	$0	$462,275	$294	$831	$122,669	$307,766	$5,317,529	$6,543,379

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Table 1.–Page 2 of 2.

	Species/Area managed								
Year	Lingcod Southeast	Flatfish NSEI/SSEI	DSR[a] Southeast	PSR[a] NSEI/SSEI	Black Rockfish[a] SEO	Slope[a] NSEI/SSEI	Pacific cod[a] NSEI/SSEI	Sablefish NSEI/SSEI	Total
2010	402,200	0	467,124	792	2,212	216,110	928,403	1,612,908	3,629,749
	$355,958	$0	$474,766	$208	$712	$131,991	$403,123	$6,464,903	$7,831,661
2011	431,655	862	321,495	868	1,574	134,876	602,152	1,423,710	2,917,192
	$573,060	$0	$405,325	$245	$579	$82,348	$340,196	$7,586,700	$8,988,453
2012	401,578	0	440,134	186	11,206	150,678	456,078	1,491,361	2,951,221
	$565,673	$0	$691,972	$72	$6,976	$98,224	$267,822	$5,396,702	$7,027,441
2013	415,771	0	539,560	5,346	8,360	149,384	792,783	1,477,098	3,388,302
	$384,733	$0	$755,225	$2,436	$3,664	$92,391	$471,186	$4,186,359	$5,895,994
2014	324,156	confidential	314,560	2,852	846	149,311	774,040	1,267,017	2,832,782
	$357,224	confidential	$480,901	$1,166	$465	$89,491	$426,761	$4,824,386	$6,180,394
2015	358,096	0	325,442	5,879	11,917	150,115	963,077	1,293,195	3,107,721
	$390,690	$0	$397,088	$3,316	$11,935	$93,149	$533,731	$5,085,240	$6,515,149
2016	362,776	0	331,922	1,023	9,585	140,678	639,771	1,121,794	2,607,549
	$449,689	$0	$373,256	$456	$11,623	$90,955	$354,627	$5,022,700	$6,303,306
2017	380,057	562	355,041	469	14,070	140,678	282,500	1,228,605	2,401,982
	$555,505	$0	$544,532	$292	$17,727	$90,955	$140,337	$6,025,082	$7,374,430
2018	381,197	0	409,326	3,109	8,402	120,803	263,799	1,430,862	2,617,498
	$457,677	$0	$686,483	$1,280	$2,270	$73,532	$156,300	$4,597,532	$5,975,074
2019	404,867	confidential	412,055	1,188	8,271	134,887	245,690	1,497,035	2,703,993
	$548,507	confidential	$662,188	$527	$4,411	$91,385	$143,638	$4,309,153	$5,759,809
2020	377,424	confidential	268,694	200	14,771	112,596	311,369	1,230,911	2,315,965
	$494,425	confidential	$282,129	$144	$10,159	$70,935	$236,640	$2,101,420	$3,195,853

Note: Total exvessel values for 1996–2016 were calculated from fish ticket data and 2017–2019 were calculated from CFEC gross earnings data. The values for 2020 are preliminary numbers calculated from fish ticket data. Data excludes test fishery harvest.

[a] For species with high mortality after capture, fish discarded at-sea were included in the catch estimates for 2010–2020. All other catch numbers reflect landings only.

Table 2.–Groundfish bycatch (round pounds) landed in the Southeast Alaska commercial salmon troll fisheries from 1990 to October 2020. DSR include the demersal shelf rockfish assemblage, PSR includes all pelagic shelf rockfish, and slope rockfish include rockfish (*Sebastes* and *Sebastolobus* spp.) not included in the DSR and PSR assemblages.

Year	DSR	PSR	Slope rockfish	Pacific cod	Lingcod[a]	Total bycatch	Total value[b]	Total permits
1990	2,284	1,059	222	0	110,992	114,557	$26,869	519
1991	1,524	4,834	223	Confidential	92,914	99,495	$28,520	493
1992	1,099	5,368	553	28	60,525	67,573	$16,226	430
1993	3,425	4,636	1,133	0	70,181	79,375	$17,362	391
1994	2,641	3,356	1,283	0	61,986	69,266	$18,625	317
1995	2,006	14,836	2,755	33	88,754	108,384	$40,675	422
1996	1,162	9,205	1,232	0	50,833	62,432	$20,239	280
1997	1,864	13,573	1,261	Confidential	42,508	59,206	$19,394	314
1998	2,314	15,445	1,929	274	39,365	59,327	$18,868	309
1999	971	13,297	1,078	523	30,239	46,108	$15,643	276
2000	1,481	13,846	2,294	164	45,201	62,986	$23,622	319
2001	1,484	13,011	6,296	0	27,592	48,383	$21,071	226
2002	2,285	20,406	3,534	66	57,274	83,564	$25,623	242
2003	3,714	19,801	3,358	Confidential	33,349	60,222	$21,952	230
2004	3,753	19,791	2,926	20	34,622	61,112	$26,343	230
2005	2,659	20,914	1,889	Confidential	25,400	50,862	$21,175	210
2006	2,033	18,092	1,711	0	34,937	56,773	$25,060	237
2007	2,211	18,673	1,777	0	41,231	63,893	$26,570	250
2008	1,699	22,516	2,012	Confidential	31,862	58,088	$24,847	246
2009	1,749	12,804	1,807	0	29,709	46,069	$18,770	210
2010	3,058	13,610	3,274	Confidential	19,246	39,188	$15,275	185
2011	2,616	10,048	2,743	42	22,541	37,991	$24,690	182
2012	3,184	28,977	4,499	Confidential	34,692	71,353	$55,831	244
2013	1,856	12,366	3,208	Confidential	18,815	36,245	$20,975	202
2014	1,756	15,304	2,395	77	14,004	33,536	$23,364	210
2015	3,591	15,788	2,820	95	23,920	46,215	$39,076	208
2016	6,951	30,804	5,652	32	32,730	76,168	$66,107	244
2017	4,124	17,137	3,678	Confidential	20,047	44,985	$50,358	226
2018	4,886	25,259	4,784	369	38,007	73,304	$80,771	233
2019	3,620	16,863	2,158	109	13,526	36,277	$35,551	205
2020	3,478	13,105	1,703	197	20,252	38,735	$38,074	191

[a] Delivery code for lingcod was not documented in the troll fishery prior to 2001; consequently, round weights prior to this time should be considered estimates. These weights were calculated by converting landed weights with the standard western cut delivery conversion rate.

[b] Total exvessel values for 1990–2016 were calculated from fish ticket data and 2017–2020 were calculated from CFEC gross earnings data.

Table 3.–Test fish landings (round pounds) and exvessel values for Alaska Department of Fish and Game and International Pacific Halibut Commission surveys, by group and year for state-managed species from 1999 to October 2020. DSR include the demersal shelf rockfish assemblage, PSR includes all pelagic shelf rockfish, and slope rockfish include all rockfish (*Sebastes* and *Sebastolobus* spp.) not included in the DSR and PSR assemblages. Data excludes discard at sea.

Year	PSR	DSR	Lingcod	Pacific cod	Sablefish	Slope rockfish	Total
1999	26	5,813	0	1,028	93,044	6,205	106,116
	$9	$6,009	$0	$285	$167,226	$2,757	$176,286
2000	0	18,379	1,622	413	128,421	4,967	153,802
	$0	$19,035	$1,343	$83	$287,345	$2,424	$310,230
2001	826	16,944	1,038	514	145,966	6,692	171,980
	$202	$17,422	$448	$90	$285,952	$1,981	$306,095
2002	2,104	6,438	0	214	137,654	5,528	151,938
	$561	$8,314	$0	$21	$284,358	$2,618	$295,872
2003	62	18,076	1,739	2,125	151,755	9,958	183,715
	$23	$23,917	$1,127	$84	$321,984	$3,854	$350,989
2004	4	6,956	0	1,232	139,976	4,900	153,068
	$1	$6,680	$0	$20	$264,182	$1,744	$272,627
2005	18	12,613	0	709	128,042	4,018	145,400
	$5	$9,970	$0	$177	$317,005	$1,474	$328,631
2006	3	6,757	0	487	146,855	8,332	162,434
	$1	$7,460	$0	$78	$388,036	$2,819	$398,394
2007	142	10,846	0	851	148,305	10,963	171,107
	$33	$9,303	$0	$158	$384,080	$3,764	$397,336
2008	106	5,502	1,360	3,309	154,907	11,417	176,602
	$24	$6,410	$0	$1,318	$475,956	$3,517	$487,225
2009	93	8,226	1,320	1,626	142,617	14,059	167,941
	$24	$8,403	$0	$354	$459,388	$5,536	$473,705
2010	158	19,877	0	4,047	93,735	14,739	132,556
	$61	$32,697	$0	$984	$366,915	$6,117	$406,774
2011	96	15,352	421	5,632	91,064	17,431	129,997
	$21	$24,342	$0	$1,442	$442,412	$5,255	$473,470
2012	60	12,695	0	3,957	122,664	16,066	155,442
	$22	$21,153	$0	$1,149	$440,490	$11,405	$474,219
2013	52	11,104	0	2,565	84,168	15,618	113,507
	$17	$12,969	$0	$648	$209,251	$6,485	$229,370
2014	53	14,174	0	2,531	95,529	14,060	126,346
	$24	$18,431	$0	$736	$399,774	$8,458	$427,424
2015	108	12,204	0	3,413	82,366	13,144	111,235
	$48	$13,980	$0	$1,173	$339,919	$6,331	$361,450
2016	82	11,434	0	2,462	72,104	12,065	98,147
	$31	$16,027	$0	$823	$314,690	$4,755	$336,326
2017	77	10,178	0	576	49,745	7,270	67,847
	$42	$17,312	$0	$187	$219,776	$3,247	$240,565
2018	90	16,494	0	862	39,964	10,283	67,694
	$40	$24,872	$0	$276	$89,432	$4,655	$119,276
2019	1,604	23,760	0	945	31,904	17,742	75,954
	$3,228	$30,558	$0	$325	$52,863	$7,545	$94,519
2020	42	17,139	0	974	107,164	16,177	141,495
	$14	$14,403	$0	$140	$122,691	$5,990	$143,238

Note: The 2007–2019 landings include fish captured in state waters during the IPHC surveys but landed outside of Alaska. Exvessel values for 1999–2020 were calculated from fish ticket data.

Table 4.–Southeast District reported harvest (round pounds), effort, and exvessel value for lingcod taken in the directed commercial fishery and as bycatch in the groundfish and halibut fisheries from 1987 to October 2020.

Year	Directed harvest	Directed value[b]	Directed permits	Total harvest	Total exvessel value[b]	Total permits landing lingcod
1987	163,305	$70,493	35	463,932	$194,951	435
1988	249,295	$118,849	59	589,930	$250,128	562
1989	180,516	$94,094	40	543,725	$208,865	602
1990	312,820	$157,298	46	688,723	$278,192	635
1991	490,873	$231,589	57	966,842	$393,755	646
1992	457,801	$194,380	61	929,640	$317,785	680
1993	496,771	$248,730	64	964,671	$392,551	577
1994	419,291	$216,110	72	796,774	$345,951	603
1995	665,860	$405,392	83	856,641	$481,185	474
1996	525,510	$262,068	101	772,488	$379,283	462
1997	421,262	$234,817	60	642,385	$331,606	442
1998	370,739	$213,784	52	564,222	$308,881	429
1999	276,707	$191,051	39	495,652	$319,632	478
2000	306,658	$229,968	35	481,115	$327,726	427
2001	137,290	$79,781	25	328,918	$166,371	421
2002	178,892	$125,763	28	351,387	$208,136	397
2003[a]	240,326	$178,544	33	394,913	$258,264	377
2004[a]	155,454	$124,800	28	359,510	$232,010	329
2005	177,525	$146,860	27	323,629	$223,473	298
2006[a]	235,644	$228,815	30	345,813	$282,165	305
2007[a]	233,440	$228,767	32	341,650	$277,168	334
2008[a]	268,919	$276,152	39	405,813	$370,212	309
2009[a]	275,883	$235,888	53	435,953	$332,015	315
2010	239,349	$272,972	44	402,200	$355,958	335
2011[a]	290,956	$465,339	45	431,655	$573,060	292
2012	248,068	$394,775	50	401,578	$565,673	300
2013	254,665	$261,200	44	415,771	$384,733	309
2014	208,715	$251,526	30	324,156	$357,224	254
2015	228,408	$268,972	28	358,096	$390,690	244
2016[a]	223,816	$329,541	38	362,776	$449,689	285
2017	237,793	$395,548	40	383,057	$555,505	278
2018	248,513	$314,985	48	381,197	$457,677	298
2019	284,914	$421,373	46	404,867	$548,507	293
2020	302,298	$423,217	43	377,424	$494,425	214

[a] Total directed harvest does not include confidential directed fishery harvest.

[b] Directed values and total exvessel values for 1987–2016 were calculated from fish ticket data and 2017–2019 were calculated from CFEC gross earnings data. The values for 2020 are preliminary numbers calculated from fish ticket data.

Table 5.–Commercial lingcod guideline harvest level (GHL; round pounds) by fishery and management area for 2020.

	2020 Annual GHL (round lb)				
Management area	Directed	Salmon troll	Longline	Groundfish jig	Total
IBS	46,000	8,000	12,670	0	66,670
EYKT	111,000	16,000	94,000	0	221,000
NSEO	17,200	3,200	10,800	0	31,200
CSEO	86,400	16,800	55,200	9,600	168,000
SSEOC	50,100	3,340	28,390	11,690	93,520
NSEI	0	6,400	9,600	0	16,000
SSEIW	0	2,080	2,080	0	4,160
Total					600,550

Table 6.–Southeast District lingcod reported harvest (round pounds) by management area for commercial directed and salmon troll and longline bycatch fisheries from 2003 to October 2020.

Year	Fishery	CSEO	EYKT	IBS	NSEI	NSEO	SSEIW	SSEOC	Grand total
2003	directed	75,652	101,419	confidential	no allocation	14,493	no allocation	48,762	240,326
	salmon	12,637	8,202	1,712	1,615	4,047	2,030	3,106	33,349
	longline	45,230	41,578	10,822	9,687	13,319	2,747	25,760	149,143
Total		133,519	151,199	12,534	11,302	31,859	4,777	77,628	422,818
2004	directed	23,351	100,670	28,846	no allocation	2,587	no allocation	confidential	155,454
	salmon	8,377	10,119	7,384	420	4,118	673	3,531	34,622
	longline	38,847	94,983	12,457	9,982	12,391	1,943	24,515	195,118
Total		70,575	205,772	48,687	10,402	19,096	2,616	28,046	385,194
2005	directed	54,034	80,085	40,748	no allocation	2,659	no allocation	0	177,526
	salmon	8,812	4,480	4,255	1,195	3,894	381	2,383	25,400
	longline	19,453	65,319	24,712	10,220	11,039	2,655	12,707	146,105
Total		82,299	149,884	69,715	11,415	17,592	3,036	15,090	349,031
2006	directed	46,916	108,650	63,432	no allocation	confidential	no allocation	16,646	235,644
	salmon	13,391	8,552	46	3,776	4,711	584	3,877	34,937
	longline	19,606	33,954	16,243	9,615	11,846	3,161	15,134	109,559
Total		79,913	151,156	79,721	13,391	16,557	3,745	35,657	380,140
2007	directed	69,805	100,614	63,021	no allocation	confidential	no allocation	confidential	233,440
	salmon	16,575	14,242	287	2,063	3,753	928	3,383	41,231
	longline	18,540	35,306	11,333	11,825	12,117	2,884	15,236	107,241
Total		104,920	150,162	74,641	13,888	15,870	3,812	18,619	381,912
2008	directed	84,571	140,867	38,168	no allocation	5,313	no allocation	confidential	268,919
	salmon	9,441	11,290	2,942	1,982	3,695	833	1,677	31,860
	longline	16,444	50,837	25,949	12,047	7,774	2,288	20,864	136,203
Total		110,456	202,994	67,059	14,029	16,782	3,121	22,541	436,982
2009	directed	85,189	118,822	61,178	no allocation	10,694	no allocation	confidential	275,883
	salmon	5,770	11,435	0	1,515	5,530	780	4,677	29,707
	longline	14,238	76,837	20,571	9,056	8,283	2,117	18,538	149,640
Total		105,197	207,094	81,749	10,571	24,507	2,897	23,215	455,230
2010	directed	55,337	102,448	51,166	no allocation	16,209	no allocation	14,189	239,349
	salmon	4,421	6,471	11	2,190	2,416	1,152	2,586	19,247
	longline	21,013	62,532	19,487	8,522	11,432	4,447	29,684	157,117
Total		80,771	171,451	70,664	10,712	30,057	5,599	46,459	415,713

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Year	Fishery	CSEO	EYKT	IBS	NSEI	NSEO	SSEIW	SSEOC	Grand total
2011	directed	85,894	121,929	67,562	no allocation	15,571	no allocation	confidential	290,956
	salmon	3,964	9,345	0	688	3,558	942	4,044	22,541
	longline	16,946	63,129	18,068	2,890	5,424	2,647	13,103	122,207
Total		106,804	194,403	85,630	3,578	24,553	3,589	17,147	435,704
2012	directed	81,273	85,856	58,482	no allocation	19,679	no allocation	2,778	248,068
	salmon	10,489	13,169	0	1,516	5,029	1,051	3,439	34,693
	longline	39,145	81,899	7,153	2,767	11,168	1,008	10,138	153,278
Total		130,907	180,924	65,635	4,283	35,876	2,059	16,355	436,039
2013	directed	74,770	103,494	54,606	no allocation	16,982	no allocation	4,813	254,665
	salmon	4,277	5,373	544	1,053	3,402	1,153	3,013	18,815
	longline	33,360	69,537	14,564	7,601	8,186	1,517	25,878	160,643
Total		112,407	178,404	69,714	8,654	28,570	2,670	33,704	434,123
2014	directed	43,957	114,912	43,153	no allocation	6,693	no allocation	0	208,715
	salmon	3,715	3,957	1,083	790	2,124	1,349	986	14,004
	longline	13,871	47,770	11,577	10,343	12,248	5,552	14,081	115,442
Total		61,543	166,639	55,813	11,133	21,065	6,901	15,067	338,161
2015	directed	57,552	106,118	43,034	no allocation	13,599	no allocation	8,105	228,408
	salmon	3,692	12,229	1,422	1,375	861	607	3,735	23,921
	longline	16,996	67,690	13,108	9,714	10,707	4,456	6,867	129,538
Total		78,240	186,037	57,564	11,089	25,167	5,063	18,707	381,867
2016	directed	67,787	112,247	41,033	no allocation	2,749	no allocation	confidential	223,816
	salmon	10,593	11,135	154	2,038	2,833	923	5,054	32,730
	longline	17,631	69,921	11,864	7,463	9,835	3,279	13,085	133,078
Total		96,011	193,303	53,051	9,501	15,417	4,202	18,139	389,624
2017	directed	85,543	104,524	9,261	no allocation	15,863	no allocation	22,602	237,793
	salmon	3,281	7,663	544	1,526	3,286	300	3,447	20,047
	longline	30,103	67,037	11,570	7,748	9,755	3,676	15,099	144,988
Total		118,927	179,224	21,375	9,274	28,904	3,976	41,148	402,828
2018	directed	86,796	92,251	21,606	no allocation	16,693	no allocation	31,167	248,513
	salmon	5,997	24,165	124	828	3,805	151	2,937	38,007
	longline	33,565	38,499	12,545	8,771	9,296	3,432	25,820	131,928
Total		126,358	154,915	34,275	9,599	29,794	3,583	59,924	418,448

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Year	Fishery	CSEO	EYKT	IBS	NSEI	NSEO	SSEIW	SSEOC	Grand total
2019	directed	79,753	110,784	22,754	no allocation	18,133	no allocation	53,490	284,914
	salmon	5,046	2,228	0	1,529	1,756	201	2,766	13,526
	longline	15,449	42,437	16,236	5,453	11,297	3,229	25,707	119,808
Total		100,248	155,449	38,990	6,982	31,186	3,430	81,963	418,248
2020	directed	85,860	99,681	44,439	no allocation	18,752	no allocation	53,566	302,298
	salmon	7,427	5,975	confidential	1,754	2,510	158	2,342	20,166
	longline	14,510	23,927	9,690	5,370	9,141	1,407	10,171	74,216
Total		107,797	129,583	54,129	7,124	30,403	1,565	66,079	396,680

Note: Totals and grand totals do not include confidential directed fishery harvest.

Table 7.–Reported harvest (round pounds), effort, and value for demersal shelf rockfish (DSR) taken in the directed commercial fishery and as bycatch in groundfish and halibut fisheries from 1987 to October 2020.

Year	Directed harvest	Directed value[f]	Directed permits	Total harvest	Total exvessel value[f]	Total permits
1987[a,b]	2,745,762	$1,427,763	–	3,300,563	$1,650,282	646
1988[a,b]	1,555,607	$777,804	–	1,935,895	$1,065,043	819
1989[a,b]	997,388	$498,694	–	1,400,966	$768,302	833
1990[a]	690,253	$403,752	144	1,122,095	$600,190	789
1991[c]	1,147,267	$734,251	136	1,484,328	$777,496	862
1992[c]	1,087,554	$626,336	149	1,591,020	$768,960	919
1993[c]	976,368	$657,066	122	1,563,811	$834,344	834
1994[c]	982,745	$680,863	133	1,619,214	$858,680	847
1995[c]	398,401	$442,783	66	747,872	$781,092	811
1996[c]	782,776	$787,585	125	1,008,417	$923,641	736
1997[d]	651,346	$828,122	105	913,492	$973,727	718
1998[d]	622,289	$749,599	88	953,538	$919,950	733
1999[d]	593,638	$727,855	83	969,777	$1,019,155	851
2000[d]	473,385	$706,842	59	786,706	$959,146	774
2001[d]	457,980	$673,231	55	860,958	$971,431	774
2002[d]	413,792	$666,206	63	1,076,598	$1,027,351	768
2003[d]	336,572	$494,761	60	800,892	$935,865	819
2004[d]	437,079	$660,047	45	874,526	$1,076,852	740
2005[d]	108,088	$184,611	17	639,522	$599,880	748
2006[d]	3,078	$4,349	4	601,409	$458,240	770
2007[d]	5,426	$6,529	4	574,748	$409,647	765
2008[d]	106,169	$174,957	18	553,066	$485,140	735
2009[d]	181,023	$217,977	22	580,655	$462,275	672
2010[d]	110,719	$141,988	17	517,595	$368,876	680
2011[d]	96,088	$154,042	15	360,113	$311,649	618
2012[d]	240,922	$446,064	25	460,543	$616,029	570
2013[d]	318,612	$514,795	22	565,943	$682,664	571
2014[d]	132,088	$257,157	12	331,576	$417,727	554
2015[d]	103,132	$217,223	10	325,442	$397,088	560
2016[d]	99,590	$186,972	15	331,922	$373,256	556
2017[d]	83,387	$161,364	10	355,041	$544,532	564
2018[d]	175,049	$340,282	15	409,326	$686,483	589
2019[d]	145,551	$275,602	17	412,055	$662,188	585
2020[d,e]	0	$0	0	268,694	$282,129	443

[a] DSR assemblage includes bocaccio, canary, China, copper, quillback, redstripe, rosethorn, silvergray, tiger, yelloweye, and unspecified DSR.

[b] The directed fishery permit, Y, was implemented in 1990 for all areas except EYKT, which was implemented in 1991. Prior to Y cards, trips with M card were considered DSR target if >40% harvest was DSR. The number of directed fishery permits could not be determined prior to the directed fishery permit card in 1990.

[c] DSR assemblage includes canary, China, copper, quillback, redbanded, rosethorn, tiger, yelloweye, and unspecified DSR.

[d] DSR assemblage includes canary, China, copper, quillback, rosethorn, tiger, yelloweye, and unspecified DSR.

[e] The directed commercial DSR fishery was closed in all management areas in 2020.

[f] Directed values and total exvessel values for 1987–2016 were calculated from fish ticket data and 2017–2019 were calculated from CFEC gross earnings data. The values for 2020 are preliminary numbers calculated from fish ticket data.

Table 8.–Directed fishery allocation (round pounds) and catch (round pounds) for demersal shelf rockfish (DSR) by management area and year, 2017–2020. The directed commercial DSR fishery was closed in all management areas in 2020.

Management area	2020		2019		2018		2017	
	Allocation	Catch	Allocation	Catch	Allocation	Catch	Allocation	Catch
EYKT	0	0	0	0	0	0	59,228	71,005
NSEO	0	0	0	0	0	0	0	0
CSEO	0	0	0	0	121,356	112,665	0	0
SSEO	0	0	111,865	100,226	0	0	0	0
NSEI	0	0	55,000	5,298	55,125	17,076	55,125	confidential
SSEI	0	0	55,000	40,027	55,125	45,308	55,125	12,382
Total	0	0	221,865	145,551	231,606	175,049	169,478	83,387

Note: Total does not include confidential directed fishery harvest.

Table 9.–The pelagic shelf rockfish (PSR) reported harvest (round pounds), effort, and exvessel value landed from NSEI and SSEI for commercial groundfish and halibut fisheries from 1987 to October 2020.

Year	Total PSR harvest	Total exvessel value	Total permits
1987	7,206	$3,243	36
1988	17,989	$5,397	44
1989	9,532	$2,764	57
1990	5,220	$1,357	67
1991	9,906	$3,170	58
1992	26,315	$7,105	83
1993	18,092	$5,605	57
1994	16,920	$4,907	53
1995	9,237	$2,771	46
1996	8,365	$3,011	57
1997	15,105	$3,927	61
1998	6,740	$2,022	58
1999	7,619	$2,396	66
2000	7,602	$2,212	70
2001	6,077	$1,619	56
2002	14,236	$7,290	44
2003	5,049	$1,743	42
2004	4,677	$1,593	38
2005	4,773	$2,661	33
2006	1,123	$801	29
2007	1,289	$491	30
2008	1,939	$706	29
2009	972	$294	31
2010	792	$208	27
2011	868	$245	14
2012	186	$72	12
2013	5,346	$2,436	25
2014	2,852	$1,166	17
2015	5,879	$3,316	34
2016	1,023	$456	22
2017	469	$292	15
2018	3,109	$1,280	27
2019	1,188	$527	27
2020	200	$144	14

Note: Total exvessel values for 1987–2016 were calculated from fish ticket data and 2017–2019 were calculated from CFEC gross earnings data. The values for 2020 are preliminary numbers calculated from fish ticket data.

Table 10.–Black rockfish landings (round pounds) and exvessel value in directed and all commercial fisheries, including bycatch in groundfish, halibut, and salmon troll fisheries, for the Southeast Outside District from 1999 to October 2020.

Year	Directed harvest	Directed value	Directed permits	Total harvest	Total exvessel value	Total permits
1999	36,212	$12,558	17	44,157	$14,938	177
2000	31,277	$12,555	14	38,738	$14,308	163
2001	10,450	$2,915	6	25,801	$6,037	145
2002	75,663	$23,946	8	93,035	$28,057	164
2003	88,465	$40,057	9	104,012	$44,170	154
2004	38,558	$16,997	9	61,877	$22,709	159
2005	6,513	$4,398	7	23,707	$9,905	139
2006	7,647	$4,017	7	21,812	$8,646	143
2007	1,447	$665	4	17,107	$5,836	133
2008	confidential	confidential	1	18,838	$4,853	147
2009	1,113	$554	3	9,224	$2,730	114
2010	confidential	confidential	2	8,187	$2,307	124
2011	440	$49	3	6,732	$2,680	127
2012	9,303	$6,036	6	38,297	$21,804	161
2013	3,422	$1,403	3	13,204	$6,324	131
2014	confidential	confidential	1	9,031	$4,573	127
2015	10,478	$11,144	5	19,678	$16,609	140
2016	8,238	$10,866	10	23,652	$19,179	152
2017	11,434	$15,910	7	22,481	$22,900	149
2018	4,239	$5,333	10	18,494	$7,165	166
2019	4,840	$6,089	6	15,755	$7,452	162
2020	13,624	$15,395	3	21,412	$14,319	122

Note: Directed values and total exvessel values for 1999–2014 were calculated from fish ticket data and 2015–2019 were calculated from CFEC gross earnings data. The values for 2020 are preliminary numbers calculated from fish ticket data.

Table 11.–Slope rockfish and shortspine thornyhead reported harvest (round pounds), exvessel value, and effort in NSEI and SSEI directed commercial and groundfish and halibut commercial fisheries from 1985 to October 2020. Slope rockfish assemblage includes all deep-water species of rockfish not in the DSR and PSR assemblages.

Year	Directed harvest	Directed value	Miscellaneous finfish permits	Total harvest	Total exvessel value	Total permits
1985	13,937	–	20	24,318	–	61
1986	30,669	$13,188	22	56,321	$21,965	50
1987	16,901	$7,436	42	52,181	$25,569	127
1988	15,108	$6,799	43	77,685	$35,735	146
1989	18,459	$7,014	42	102,053	$37,760	189
1990	11,347	$3,745	28	91,045	$39,149	192
1991	40,801	$16,728	30	147,386	$66,324	232
1992	35,914	$11,852	46	153,449	$56,776	249
1993	52,359	$19,373	58	175,694	$66,764	243
1994	73,198	$46,115	48	331,568	$192,309	247
1995	150,625	$88,868	91	426,904	$273,219	369
1996	271,250	$160,038	136	510,210	$321,432	452
1997	369,785	$218,173	156	622,581	$379,774	504
1998	531,426	$292,284	161	905,127	$534,025	597
1999	365,389	$219,233	170	654,469	$412,315	628
2000	494,703	$285,803	159	733,227	$445,289	575
2001	268,479	$140,273	128	487,407	$264,544	545
2002	150,023	$66,256	81	349,328	$191,941	479
2003	91,108	$36,972	41	306,946	$161,873	454
2004	–	–	–	222,781	$149,319	450
2005	–	–	–	264,866	$159,856	458
2006	–	–	–	290,743	$183,797	498
2007	–	–	–	265,029	$144,598	505
2008	–	–	–	261,963	$147,049	505
2009	–	–	–	212,781	$122,669	432
2010	–	–	–	216,129	$131,991	429
2011	–	–	–	134,876	$82,348	354
2012	–	–	–	150,678	$98,224	344
2013	–	–	–	149,384	$92,391	328
2014	–	–	–	149,311	$89,491	361
2015	–	–	–	150,115	$93,149	352
2016	–	–	–	140,809	$88,717	327
2017	–	–	–	140,678	$90,955	361
2018	–	–	–	120,803	$73,532	335
2019	–	–	–	134,887	$91,385	366
2020	–	–	–	112,596	$70,935	265

Note: The slope rockfish complex from 1987 to 1990 included Pacific ocean perch (POP), darkblotched, sharpchin, thornyhead, greenstripe, northern, rougheye, shortraker, redbanded, and unspecified slope rockfish; and from 1991 to present includes POP, darkblotched, sharpchin, thornyhead, greenstripe, northern, rougheye, shortraker, silvergray, redstripe, bocaccio, and unspecified slope rockfish. The board closed the directed fishery for slope and thornyhead rockfish in 2003 (effective July 26, 2003). Directed values and total exvessel values for 1985 to 2016 were calculated from fish ticket data and 2017–2019 were calculated from CFEC gross earnings data. The values for 2020 are preliminary numbers calculated from fish ticket data.

Table 12.–NSEI sablefish fishery annual harvest objective (AHO), equal quota share (EQS), harvest (round pounds), exvessel value, and effort from 1985 to October 2020. Limited entry was implemented in 1985 and equal quota share in 1994. Data excludes test fishery harvest and discards at sea.

Year	AHO	EQS	Harvest	Exvessel value	Number permits	Number of days	Season dates
1985	2,380,952	–	2,951,056	$2,005,394	105	3	10/04–10/06
1986	2,380,952	–	3,874,269	$2,866,959	138	2	9/09–9/11
1987	2,380,952	–	3,861,546	$3,514,006	158	1	9/15–9/16
1988	2,380,952	–	4,206,509	$4,543,029	149	1	9/19–9/20
1989	2,380,952	–	3,767,518	$2,900,988	151	1	9/22–9/23
1990	2,380,952	–	3,281,393	$3,543,904	121	1	9/12–9/13
1991	2,380,952	–	3,955,189	$6,882,028	127	1	9/16–9/17
1992	2,380,952	–	4,267,781	$4,907,948	115	1	9/17–9/18
1993	2,380,952	–	5,795,974	$5,622,094	120	1	9/25–9/26
1994	4,761,905	38,889	4,713,552	$9,144,290	121	30	9/22–10/22
1995	4,761,905	38,889	4,542,348	$7,721,991	121	30	9/13–10/13
1996	4,761,905	38,889	4,673,701	$9,908,246	121	61	9/08–11/08
1997	4,800,000	39,300	4,753,394	$11,550,747	122	76	9/01–11/15
1998	4,800,000	41,700	4,688,008	$7,360,172	116	76	9/01–11/15
1999	3,120,000	28,000	3,043,273	$6,634,335	112	76	9/01–11/15
2000	3,120,000	28,600	3,082,159	$7,394,890	111	76	9/01–11/15
2001	2,184,000	19,600	2,142,617	$4,563,774	111	76	9/01–11/15
2002	2,005,000	18,400	2,009,380	$4,814,718	109	76	9/01–11/15
2003	2,005,000	18,565	2,001,643	$4,809,492	108	93	8/15–11/15
2004	2,245,000	20,787	2,229,956	$4,532,611	108	93	8/15–11/15
2005	2,053,000	19,400	2,026,131	$5,027,393	106	93	8/15–11/15
2006	2,053,000	19,550	2,033,786	$5,066,320	105	93	8/15–11/15
2007	1,488,000	14,500	1,501,478	$3,754,847	103	93	8/15–11/15
2008	1,508,000	15,710	1,513,040	$4,873,176	96	93	8/15–11/15
2009	1,071,000	12,170	1,071,554	$3,550,253	88	93	8/15–11/15
2010	1,063,000	12,218	1,054,275	$4,409,137	87	93	8/15–11/15
2011	880,000	10,602	882,779	$4,943,775	83	93	8/15–11/15
2012	975,000	12,342	969,535	$3,633,668	79	93	8/15–11/15
2013	1,002,162	12,848	971,499	$2,871,660	78	93	8/15–11/15
2014	745,774	9,561	772,258	$3,138,615	78	93	8/15–11/15
2015	786,748	10,087	780,615	$3,341,162	78	93	8/15–11/15
2016	650,754	8,343	646,328	$3,220,588	78	93	8/15–11/15
2017	720,250	9,234	714,400	$3,633,326	78	93	8/15–11/15
2018	855,416	10,967	855,598	$3,069,520	78	93	8/15–11/15
2019	920,094	11,796	909,869	$2,831,419	78	93	8/15–11/15
2020[a]	1,108,003	14,773	913,460	$1,717,305	75	93	8/15–11/15

Note: Offseason trips occurred in 2003 (January–April) and 2004 (February–May) to obtain biological data during the winter through spring spawning periods. Exvessel values for 1985 to 2016 were calculated from fish ticket data and 2017–2019 were calculated from CFEC gross earnings data. The values for 2020 are preliminary numbers calculated from fish ticket data.

[a] Harvest and exvessel value updated through October 29, 2020.

Table 13.–The annual harvest objective (AHO), equal quota share (EQS), and reported harvest (in round pounds), along with exvessel value and effort for the directed commercial SSEI sablefish fishery from 1985 to October 2020. Limited entry was implemented in 1985 and equal quota share in 1997. Data excludes test fishery harvest and discards at sea.

			Longline and pot fisheries combined		Longline Fishery			Pot Fishery		
Year	AHO	EQS	Harvest	Exvessel value	No. of permits	No. days	Season Dates	No. of permits	No. days	Season Dates
1985	790,000	–	511,617	$322,319	43	7	6/15–6/22	0	7	6/15–06/22
1986	790,000	–	597,503	$283,496	22	7	6/15–6/22	2	7	6/15–06/22
1987	790,000	–	435,501	$291,785	22	5	6/18–6/23	0	5	6/18–06/23
1988	790,000	–	731,584	$738,070	26	5	6/05–6/10	1	5	6/05–06/10
1989	790,000	–	963,088	$721,653	31	5	6/22–6/27	1	5	6/22–06/27
1990	790,000	–	758,663	$553,823	30	3	6/15–6/18	0	3	6/15–06/18
1991	790,000	–	680,688	$626,362	30	2.4	6/21–6/23	1	2.4	6/21–06/23
1992	790,000	–	941,182	$941,505	30	2.4	6/21–6/23	1	2.4	6/21–06/23
1993	790,000	–	824,011	$815,770	30	2.4	6/21–6/23	0	2.4	6/21–06/23
1994	790,000	–	866,788	$1,066,149	30	2.4	6/15–6/17	0	2.4	6/15–06/17
1995	790,000	–	678,762	$1,323,585	30	2	6/08–6/10	0	2	6/08–06/10
1996	790,000	–	502,459	$899,401	30	2	6/08–6/10	0	2	6/08–06/10
1997	790,000	23,200	725,067	$1,602,404	30	45	6/15–7/30	5	76	9/01–11/15
1998	632,000	20,400	578,056	$813,421	29	45	6/01–7/15	4	76	9/01–11/15
1999	720,000	24,000	661,424	$1,199,468	26	45	6/01–7/15	4	76	9/01–11/15
2000	696,000	24,000	590,815	$1,176,816	25	76	6/01–8/15	4	76	9/01–11/15
2001	696,000	24,000	650,678	$1,249,300	25	76	6/01–8/15	4	76	9/01–11/15
2002	696,000	24,000	650,339	$1,287,650	25	76	6/01–8/15	4	76	9/01–11/15
2003	696,000	24,860	656,936	$1,506,541	24	76	6/01–8/15	4	76	9/01–11/15
2004	696,000	24,860	648,845	$1,030,675	24	76	6/01–8/15	4	76	9/01–11/15
2005	696,000	24,860	639,719	$1,351,440	24	76	6/01–8/15	4	76	9/01–11/15
2006	696,000	21,750	624,832	$1,434,739	28	76	6/01–8/15	4	76	9/01–11/15
2007	696,000	21,750	620,168	$1,514,353	28	76	6/01–8/15	4	76	9/01–11/15
2008	696,000	21,750	618,033	$1,854,397	28	76	6/01–8/15	4	76	9/01–11/15
2009	634,000	22,650	595,748	$1,767,276	25	76	6/01–8/15	3	76	9/01–11/15
2010	634,000	23,400	558,633	$2,055,766	24	76	6/01–8/15	3	76	9/01–11/15
2011	583,280	23,300	540,931	$2,642,925	22	76	6/01–8/15	3	76	9/01–11/15
2012	583,280	25,360	521,825	$1,763,034	20	76	6/01–8/15	3	76	9/01–11/15
2013	583,280	25,360	505,599	$1,314,699	19	76	6/01–8/15	3	76	9/01–11/15
2014	536,618	23,331	494,760	$1,685,771	19	76	6/01–8/15	3	76	9/01–11/15
2015	536,618	23,331	512,580	$1,744,078	19	76	6/01–8/15	3	76	9/01–11/15
2016	482,956	20,998	475,466	$1,802,112	20	76	6/01–8/15	3	76	9/01–11/15
2017	516,763	22,468	514,205	$2,391,756	20	76	6/01–8/15	3	76	9/01–11/15
2018	578,774	25,164	575,264	$1,528,012	20	168	6/01–11/15	3	152	6/17–11/15
2019	590,349	26,834	587,166	$1,477,734	19	168	6/01–11/15	3	168	6/01–11/15
2020[a]	572,639	26,029	317,451	$384,115	19	168	6/01–11/15	3	168	6/01–11/15

Note: Exvessel values for 1985–2016 were calculated from fish ticket data and 2017–2019 were calculated from CFEC gross earnings data. The values for 2020 are preliminary numbers calculated from fish ticket data.

[a] Harvest and exvessel value updated through October 29, 2020.

Table 14.–Pacific cod reported harvest (round pounds), exvessel value, and effort, from NSEI and SSEI directed commercial fishery and bycatch in the groundfish and halibut fisheries from 1985 to October 2020.

Year	Directed harvest	Directed value	Directed permits	Total harvest	Total exvessel value	Total permits
1985	132,915	$31,001	42	142,405	$35,601	61
1986	318,312	$79,578	99	338,145	$84,536	123
1987	724,781	$231,930	179	781,487	$250,076	259
1988	474,359	$166,026	156	522,964	$177,808	278
1989	311,255	$124,502	102	380,070	$140,626	318
1990	218,120	$80,704	74	309,919	$102,273	338
1991	504,036	$191,534	88	589,376	$212,175	322
1992	780,265	$335,514	141	886,243	$354,497	377
1993	889,676	$382,561	133	962,434	$394,598	319
1994	346,663	$138,665	77	402,475	$148,916	220
1995	285,363	$105,584	92	339,312	$115,366	237
1996	592,090	$313,808	129	639,343	$326,065	281
1997	722,814	$310,810	138	778,413	$326,933	298
1998	585,573	$216,662	106	647,940	$233,258	301
1999	724,089	$260,672	132	823,342	$279,936	356
2000	529,267	$219,583	107	593,104	$231,311	304
2001	312,714	$109,450	78	356,790	$121,309	237
2002	211,109	$90,777	48	251,751	$100,700	193
2003	328,253	$134,584	50	386,548	$150,754	211
2004	408,995	$176,708	41	451,446	$186,483	166
2005	424,054	$204,303	26	469,215	$208,396	172
2006	307,138	$159,263	21	363,659	$165,453	191
2007	509,463	$264,422	33	581,314	$269,965	215
2008	646,807	$391,618	40	696,372	$400,676	209
2009	643,875	$301,538	30	679,931	$307,766	160
2010	869,828	$392,347	25	927,681	$403,123	187
2011	412,634	$246,725	23	602,152	$340,196	181
2012	396,616	$253,897	24	456,078	$267,822	198
2013	737,708	$463,339	18	792,783	$471,186	174
2014	699,502	$413,711	20	774,040	$426,761	198
2015	882,521	$511,676	14	963,077	$533,731	212
2016	567,500	$334,675	16	639,771	$354,627	210
2017	226,787	$134,373	9	282,500	$140,337	176
2018	204,649	$146,110	11	263,799	$156,300	192
2019	191,400	$130,237	11	245,690	$143,638	220
2020	281,501	$222,386	9	311,369	$236,640	147

Note: Directed values and total exvessel values for 1985–2016 were calculated from fish ticket data and 2017–2019 were calculated from CFEC gross earnings data. The values for 2020 are preliminary numbers calculated from fish ticket data.

Table 15.–Flatfish reported harvest (round pounds), exvessel value, and effort, from the directed commercial fishery and bycatch in groundfish fisheries in NSEI and SSEI. Fishing seasons are defined in regulation from October 1–April 15, thus seasons are split across years. Data are shown from 1987 to October 2020.

Season	Trawl harvest	Directed value	Directed permits	Total harvest	Total exvessel value	Total permits
1987–1988	861,348	$194,919	7	863,638	$214,417	13
1988–1989	confidential	confidential	3	confidential	confidential	10
1989–1990	confidential	confidential	2	313,670	$76,443	5
1990–1991	340,633	$67,893	7	341,324	$68,010	11
1991–1992	56,904	$6,801	4	57,255	$8,016	9
1992–1993	confidential	confidential	2	23,200	$4,657	7
1993–1994	confidential	confidential	1	11,376	$2,371	4
1994–1995	confidential	confidential	2	19,805	$3,975	10
1995–1996	0	0	0	1,278	$302	7
1996–1997	0	0	0	4,158	$1,096	11
1997–1998	confidential	confidential	1	13,214	$2,127	12
1998–1999	confidential	confidential	1	17,557	$3,101	23
1999–2000	0	0	0	1,156	$203	7
2000–2001	0	0	0	4,857	$381	14
2001–2002	0	0	0	1,391	$20	7
2002–2003	0	0	0	947	$41	4
2003–2004	0	0	0	992	$24	5
2004–2005	0	0	0	660	$10	7
2005–2006	0	0	0	1,265	$22	3
2006–2007	0	0	0	353	$0	3
2007–2008	0	0	0	confidential	confidential	2
2008–2009	0	0	0	180	$0	4
2009–2010	0	0	0	0	$0	0
2010–2011	0	0	0	862	$0	3
2011–2012	0	0	0	0	$0	0
2012–2013	0	0	0	0	$0	0
2013–2014	confidential	confidential	1	confidential	confidential	1
2014–2015	0	0	0	0	$0	0
2015–2016	0	0	0	0	$0	0
2016–2017	0	0	0	562	$0	3
2017–2018	0	0	0	0	$0	0
2018–2019	0	0	0	confidential	confidential	2
2019–2020	0	0	0	confidential	confidential	1

Note: Directed values and total exvessel values for 1987–2016 were calculated from fish ticket data and 2017–2019 were calculated from CFEC gross earnings data. The values for 2020 are preliminary numbers calculated from fish ticket data.

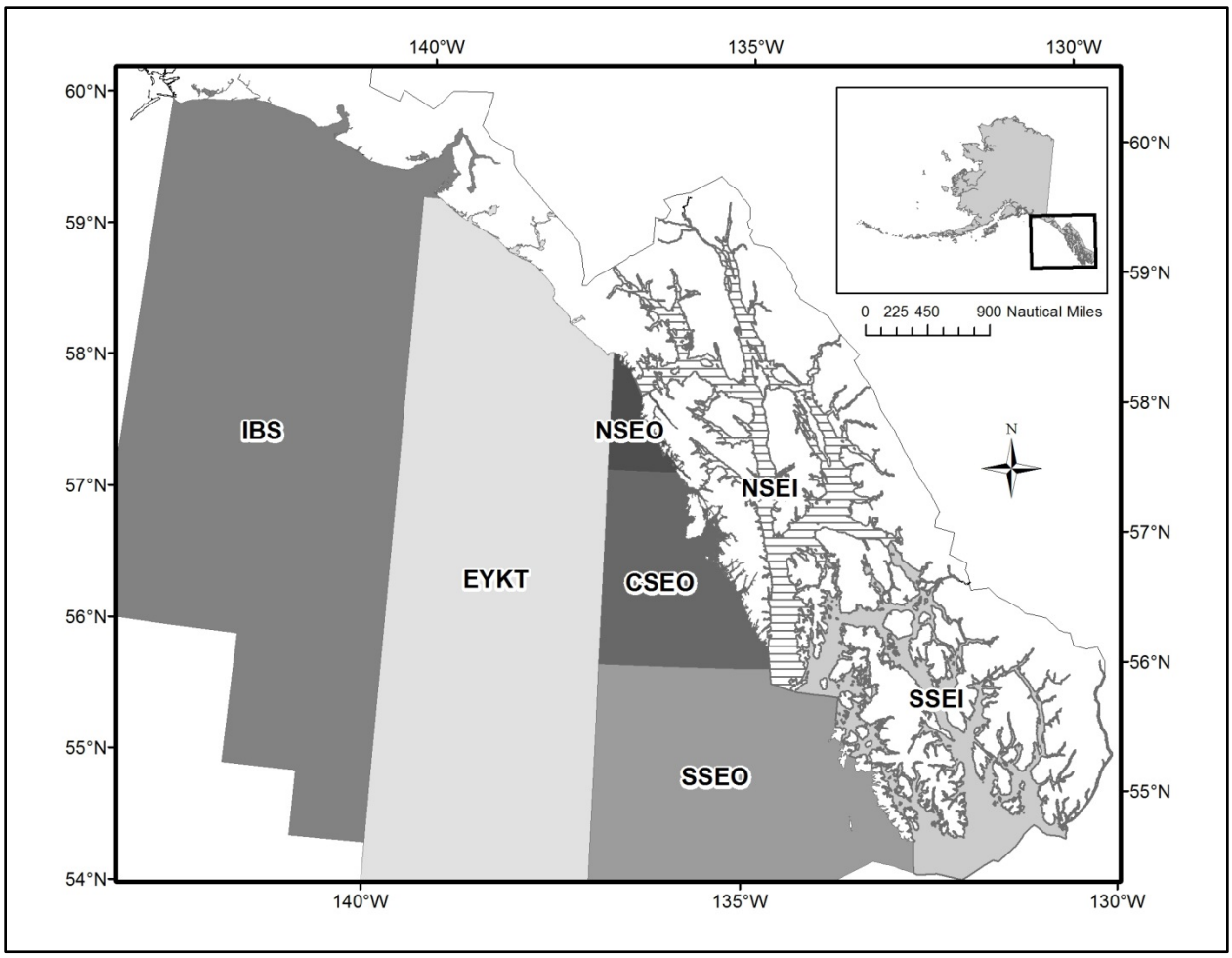

Figure 1.–Southeast District groundfish management area boundaries in Southeast Alaska waters excluding lingcod and black rockfish: Icy Bay Subdistrict (IBS), East Yakutat (EYKT) Section, Northern Southeast Outside (NSEO) Section, Central Southeast Outside (CSEO) Section, Southern Southeast Outside (SSEO) Section, Northern Southeast Inside (NSEI) Subdistrict, and Southern Southeast Inside (SSEI) Subdistrict.

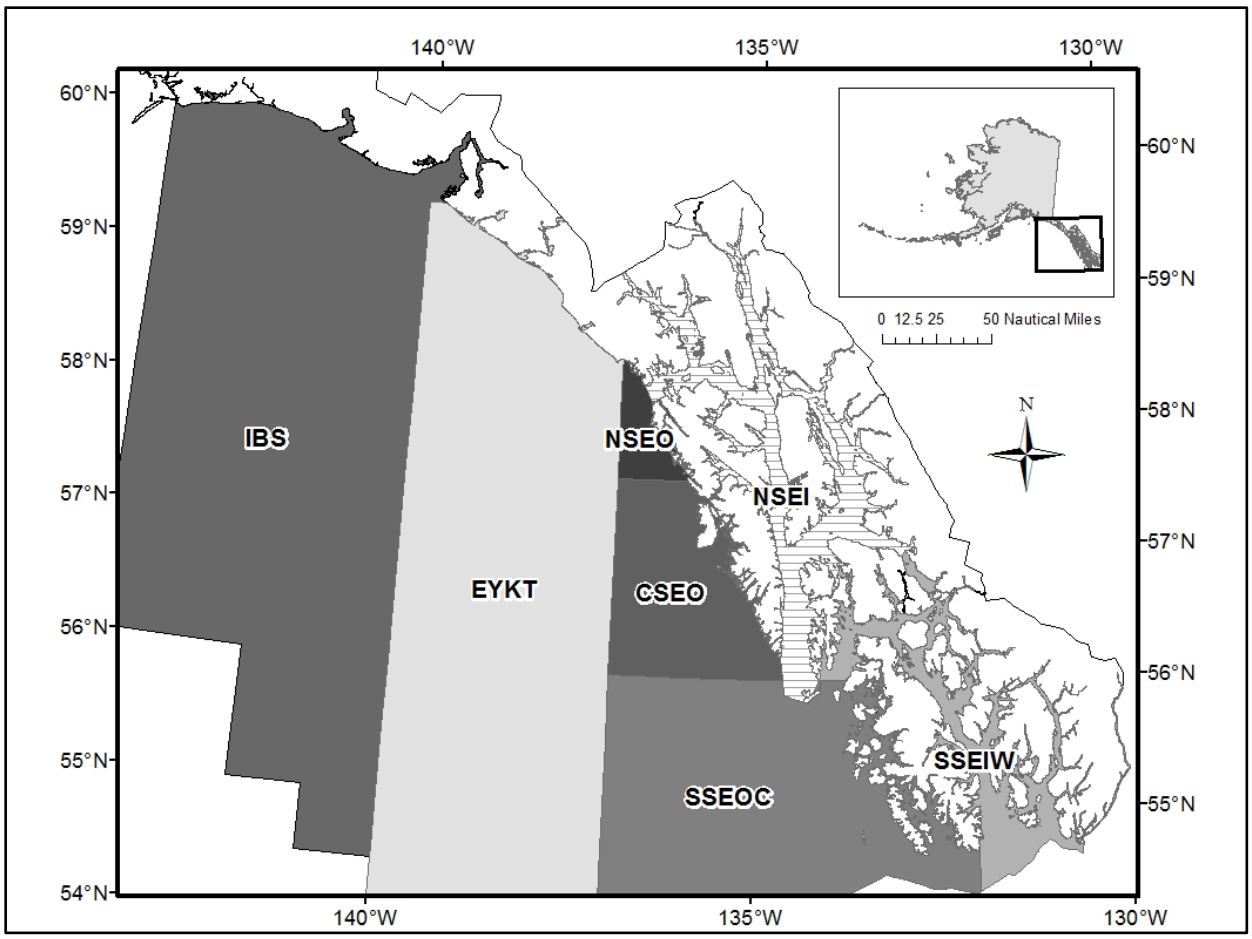

Figure 2.–Lingcod and black rockfish management area boundaries in Southeast Alaska waters: Icy Bay Subdistrict (IBS), East Yakutat (EYKT) Section, Northern Southeast Outside (NSEO) Section, Central Southeast Outside (CSEO) Section, Southern Southeast Outer Coast (SSEOC) Sector, Northern Southeast Inside (NSEI) Subdistrict, and Southern Southeast Internal Waters (SSEIW) Sector.

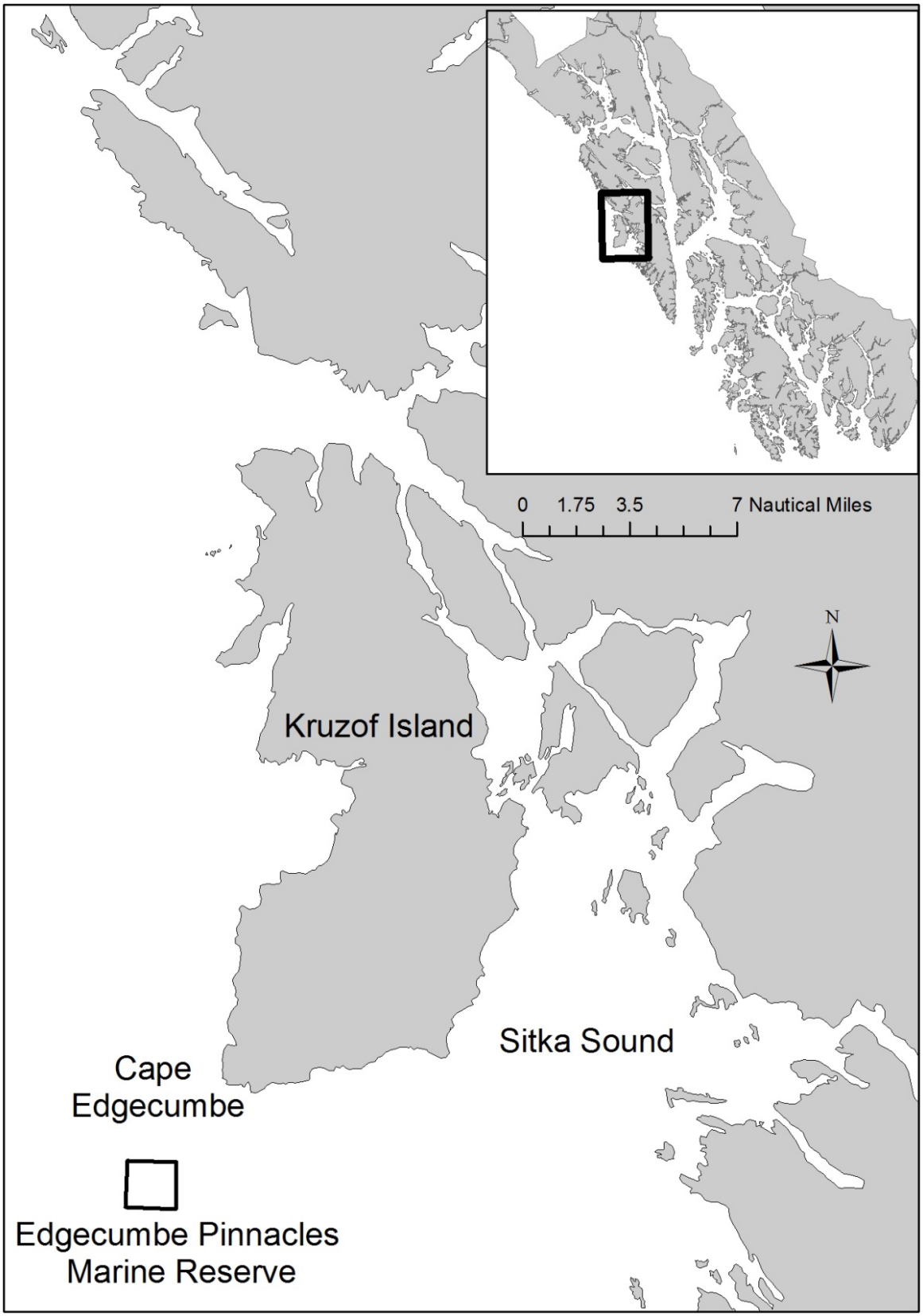

Figure 3.–Edgecumbe Pinnacles Marine Reserve no-take groundfish area.

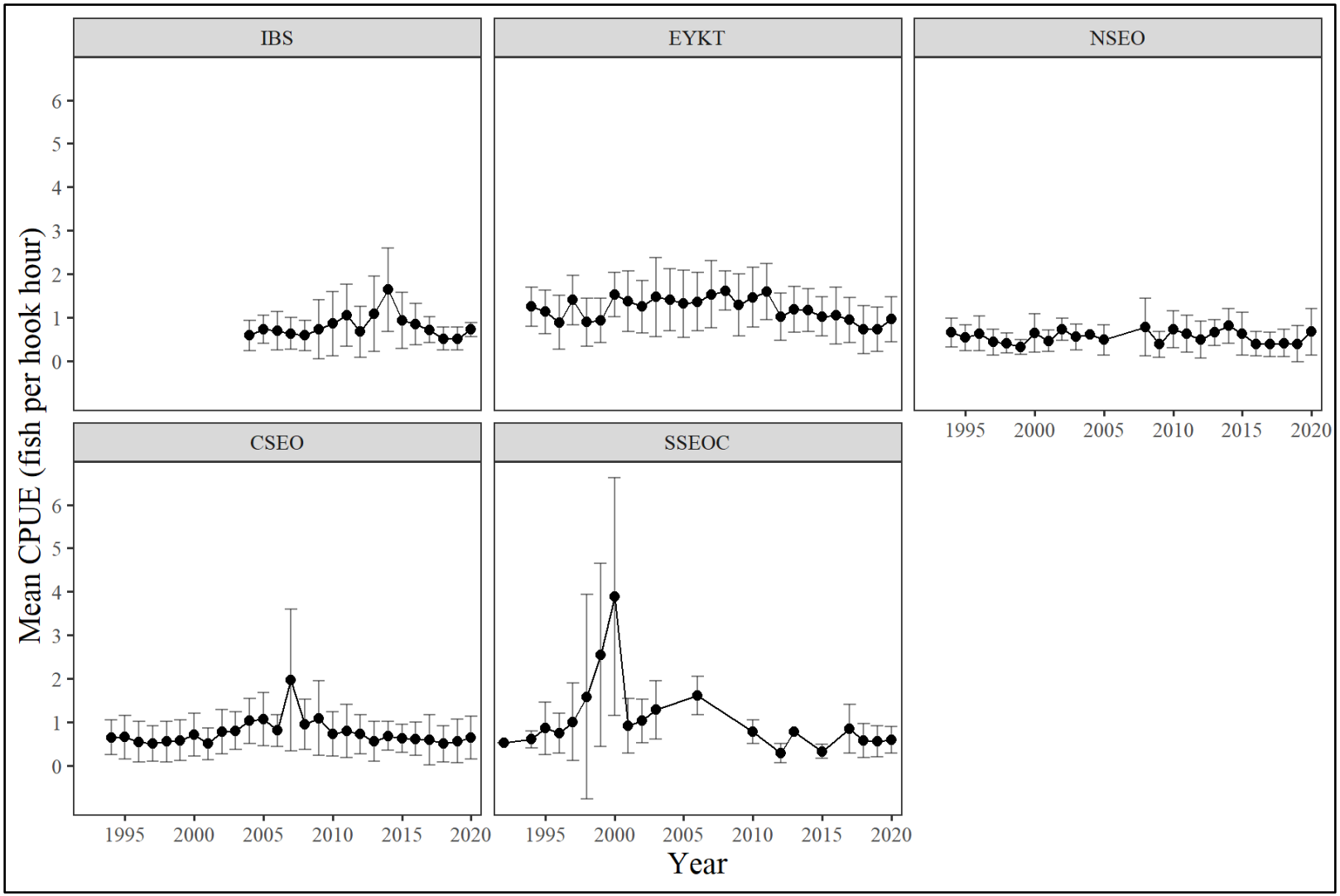

Figure 4.–Lingcod directed commercial fishery catch per unit effort (retained lingcod per hook-hour) with error bars (+/- 1 standard deviation) by management area: Icy Bay Subdistrict (IBS), East Yakutat (EYKT) Section, Northern Southeast Outside (NSEO) Section, Central Southeast Outside (CSEO) Section, and Southern Southeast Outer Coast (SSEOC) Sector from 1994 to October 2020. Confidential harvest information has been excluded if fewer than 3 permit holders participated in the fishery.

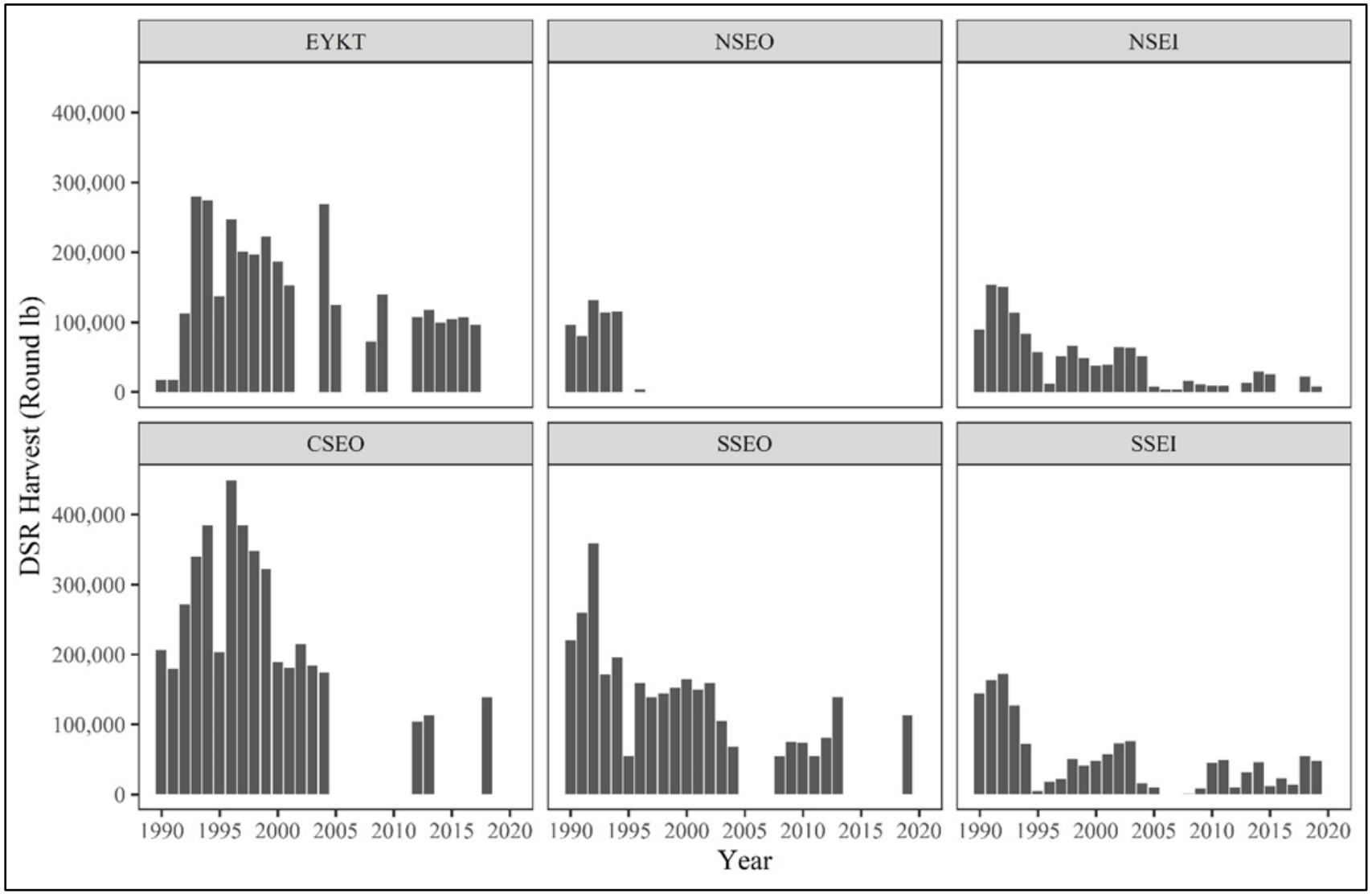

Figure 5.–Directed demersal shelf rockfish (DSR) landings (round pounds) by management area: East Yakutat (EYKT) Section, Central Southeast Outside (CSEO) Section, Northern Southeast Outside (NSEO) Section, Southern Southeast Outside (SSEO) Section, Northern Southeast Inside (NSEI) Subdistrict, and Southern Southeast Inside (SSEI) Subdistrict, 1990–2020. The directed commercial DSR fishery was closed in all management areas in 2020. Confidential harvest information has been excluded if fewer than 3 permit holders participated in the fishery.

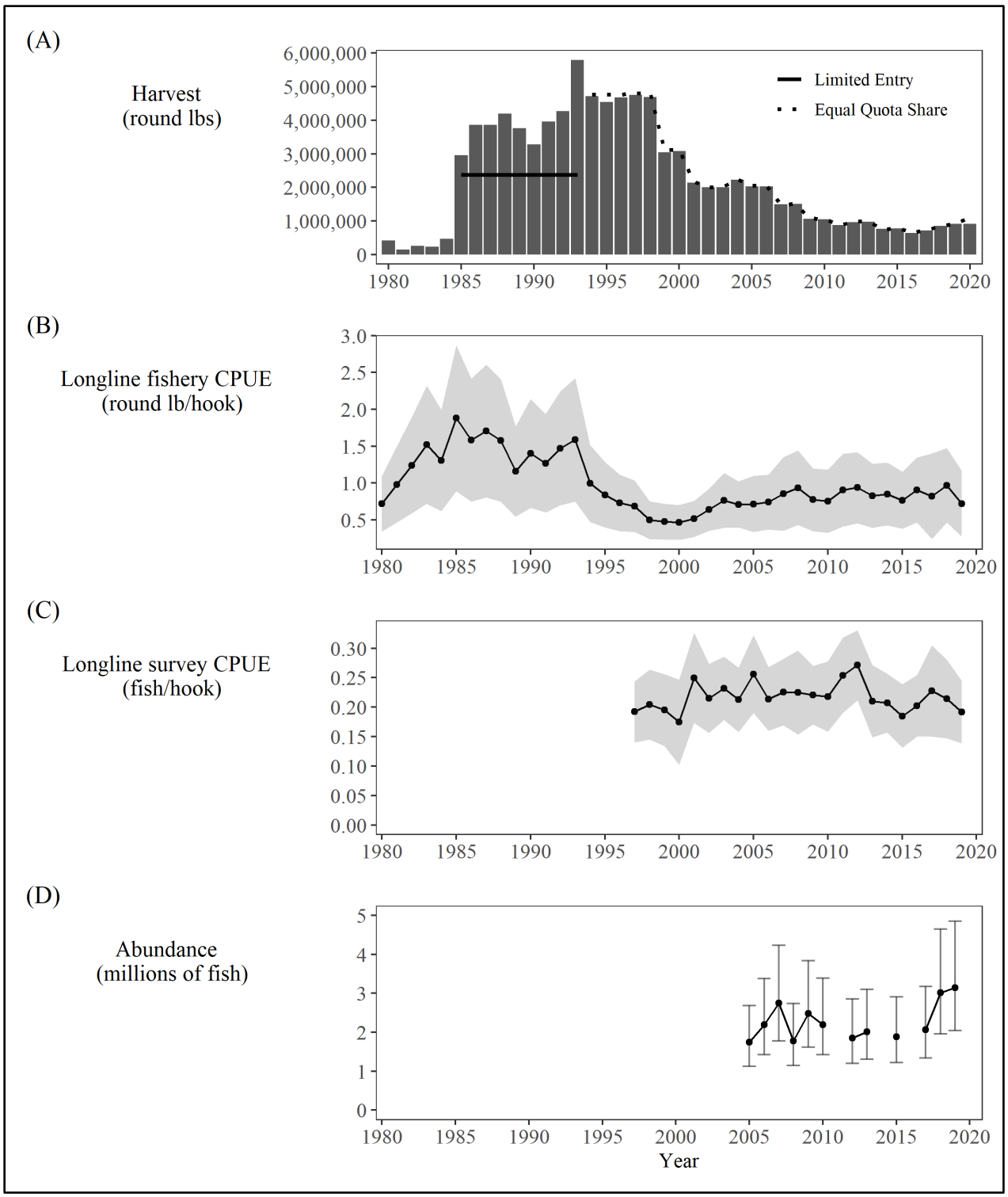

Figure 6.–Northern Southeast Inside (NSEI) Subdistrict (A) sablefish commercial fishery harvest (round pounds) from 1980 to October 2020 with the annual harvest objective line shown in solid for limited entry and dashed for equal quota share; (B) catch per unit effort (CPUE) from 1980–2019 logbook data are shown for the sablefish longline fishery in round pounds per hook; (C) sablefish longline survey CPUE in numbers of fish per hook, 1997–2019; and (D) mark–recapture abundance estimates in millions of fish. Error distribution (+/- 1 standard deviation) for CPUE values are shown as shaded grey polygons.

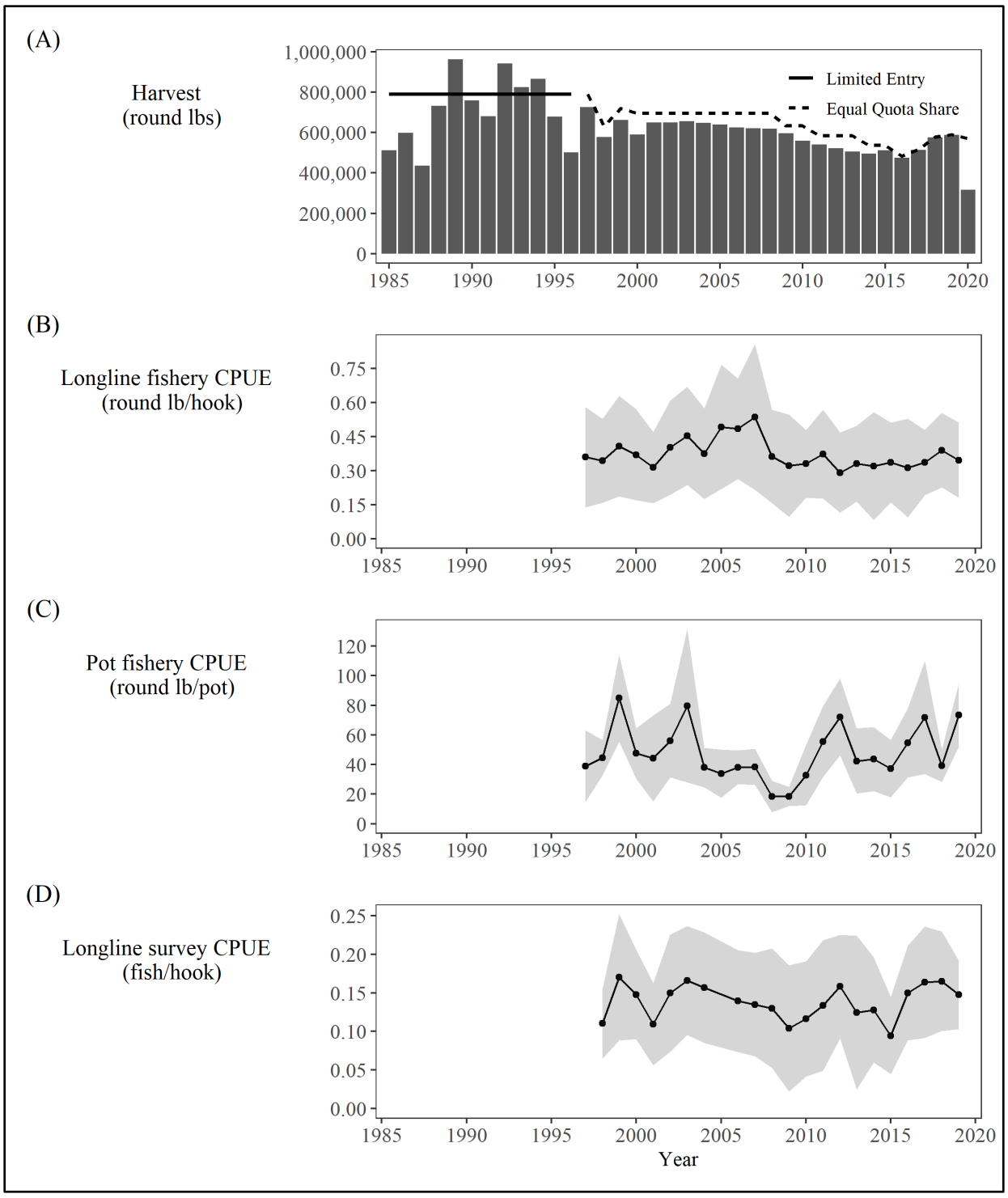

Figure 7.–Southern Southeast Inside (SSEI) Subdistrict (A) sablefish commercial fishery harvest (round pounds) from 1985 to October 2020 with the annual harvest objective line shown in solid for limited entry and dashed for equal quota share; (B) catch per unit effort (CPUE) from 1997 to 2019 logbook data are shown for the sablefish longline fishery in round pounds per hook; (C) pot fishery in round pounds per pot; and (D) sablefish longline survey CPUE in numbers of fish per hook shown from 1998 to 2019 when survey gear, bait, and soak type were standardized. Error distribution (+/- 1 standard deviation) for CPUE values are shown as shaded grey polygons.