

Fishery Management Report 11-70

2012 Report to the Alaska Board of Fisheries, Groundfish Fisheries: Southeast Alaska and Yakutat

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Divisions of Sport Fish and Commercial Fisheries



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

FISHERY MANAGEMENT REPORT 11-70

**2012 REPORT TO THE ALASKA BOARD OF FISHERIES, GROUND FISH
FISHERIES: SOUTHEAST ALASKA AND YAKUTAT**

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ABSTRACT

This report includes summaries of reported catch and effort information and management actions for the period 2008–2011 for the groundfish fisheries managed by the Alaska Department of Fish and Game (ADF&G) in the Eastern Gulf of Alaska (EGOA). State-managed groundfish were demersal shelf rockfish (DSR) *Sebastes spp.*, black rockfish (*Sebastes melanops*), and lingcod (*Ophiodon elongates*) in state and federal waters and all groundfish harvest in internal state waters. In 2011 there were directed fisheries for sablefish (*Anaploploma fimbria*), DSR, black rockfish, lingcod, and Pacific cod (*Gadus macrocephalus*). Reported harvest of groundfish in Southeast Alaska totaled 4,015,875 round pounds in 2008, 3,543,071 round pounds in 2009, 3,612,197 round pounds in 2010, and 2,626,206 round pounds in 2011. The estimated ex-vessel value ranged from \$8.1 million in 2008 to \$8.5 million in 2011. Values in 2011 are through October 2011. In 2010, sablefish accounted for 84% of the ex-vessel value of groundfish in Southeast Alaska. In addition to groundfish landed in groundfish and halibut fisheries in 2010, 39,300 round pounds of groundfish (primarily lingcod and black rockfish) were landed in salmon fisheries and 130,816 round pounds of groundfish (primarily sablefish) were landed in testfish fisheries conducted by ADF&G and the International Pacific Halibut Commission (IPHC).

Key words: Sablefish, rockfish, lingcod, Pacific cod, flatfish, longline, dinglebar, Southeast Alaska, commercial fishing, Board of Fisheries, groundfish

INTRODUCTION

The Eastern Gulf of Alaska (EGOA) regulatory area for groundfish management encompasses all waters surrounding the Alexander Archipelago from Dixon Entrance (54°30' N latitude) northwestward along the outer coast to 144° W longitude (Figure 1).

Seven state groundfish management areas have been established in Southeast Alaska (Figure 1). These areas encompass the Southeast District (SE). The Icy Bay Subdistrict (IBS), 144° W longitude to 140° W longitude including Yakutat Bay three miles seaward of a line from Ocean Cape, was added to the Southeast Region in 1999. Four of the 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 and make up the Southeast Outside (SEO) District. The remaining two areas, Northern Southeast Inside (NSEI) Subdistrict and Southern Southeast Inside (SSEI) Subdistrict, are in internal waters. For the purposes of lingcod management and black rockfish 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) 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 are under state jurisdiction in both state and federal waters. In 2009, dark rockfish were removed from the FMP and management responsibility was transferred to the State of Alaska. Lingcod are under state jurisdiction in both state and federal waters because they are not defined as a groundfish under the FMP.

In addition to having direct management responsibility for certain groundfish species, the Region I Groundfish Project provides harvest information and other resource data from the adjacent Exclusive Economic Zone (EEZ) to the National Marine Fisheries Service (NMFS) and North

Pacific Fishery Management Council (Council) under the terms of a cooperative agreement with NMFS. Under this agreement, department staff have the responsibility of collecting, editing, and verifying all fish tickets from the harvest of groundfish and halibut in Alaska waters. Since May 2006 fish tickets are being entered by processors via e-Landings, a web-based data entry system, and subsequently validated by department staff. The state is also involved in the management of groundfish in the EEZ through the groundfish project leader's participation on the Council Gulf of Alaska Groundfish Plan Team.

This document details information on reported harvest, effort, and management for the state-managed groundfish fisheries in Southeast Alaska for the period 2008 through October 2011. The department does not require at-sea observer coverage in EGOA groundfish fisheries, thus data on at-sea discards is not available. Catch and effort data included in this document include the DSR, black rockfish, and lingcod harvest for the Eastern Gulf of Alaska and all groundfish species harvested in NSEI and SSEI. The primary state-managed fisheries within the region include sablefish, demersal shelf rockfish, black rockfish, lingcod, and Pacific cod. 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 use primarily 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 3.2 square nm area surrounding the Cape Edgecumbe pinnacles was closed to all removals of groundfish by the Alaska Board of Fisheries (BOF) in 1998 and to all halibut and groundfish by the the Council in 1999. This represents the first no-take groundfish marine reserve in Alaska.

Harvest of state-managed groundfish reported in commercial groundfish and halibut fisheries in Southeast Alaska totaled 4,015,875 round pounds in 2008, 3,543,071 round pounds in 2009, 3,612,197 round pounds in 2010, and 2,626,206 round pounds in 2011 (Table 1). The estimated ex-vessel value has risen from \$8.1 million in 2008 to \$8.5 million in 2011. Values in 2011 are through October 2011. In 2010, in addition to groundfish landed in groundfish and halibut fisheries, 39,300 round pounds of groundfish (primarily lingcod and black rockfish) were landed in salmon fisheries and 130,816 round pounds of groundfish (primarily sablefish) were landed in testfish fisheries conducted by the department and the International Pacific Halibut Commission (IPHC) (Tables 2 and 3).

LINGCOD

Lingcod are the largest member of the greenling family, attaining a maximum length of 5 feet. This cold-water species occurs from the intertidal to depths of 270 fm from northern Baja, California to the Bering Sea. Adults tend to be resident although they exhibit some seasonal movement related to spawning and individual fish occasionally move great distances (Jagiello 1990a). Females attain a greater size and age than males. Lingcod reach maturity between 3 and 5 years, and in the literature, maximum age estimates are 14–20 years; however the maximum age estimated for Southeast Alaska is 36 years¹. Greenlings have an unusual reproductive strategy. Male lingcod move into nearshore rocky areas in the fall and set up territories. Females move into this area just prior to spawning in the winter. The females lay large egg masses and the males, after fertilizing

¹ Unpublished data, Kristen Munk, ADF&G Age Determination Unit, Juneau, Alaska.

the eggs, guard the egg mass from predation until hatching, generally from seven to 11 weeks. During the nest-guarding period, males are particularly susceptible to harvest.

FISHERIES DEVELOPMENT AND HISTORY

Prior to 1987, lingcod taken in the Southeast District were landed incidentally in fisheries targeting other species (Gordon 1994). Lingcod comprise a large amount of the bycatch in the longline fishery for DSR. In some areas and seasons, bycatch rates of lingcod taken in the DSR fishery have exceeded 50%, by weight, of the DSR catch. Lingcod have also been 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 fleet using dinglebar gear harvested 163,305 lb of lingcod from the NSEO and the northern portion of CSEO (Table 4). In 1991, the directed fishery catch of 490,873 round pounds accounted for almost 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. Peak directed fishery harvest occurred in 1995, with 665,860 round pounds taken (Table 4) and total harvest of lingcod was greatest in 1991, with 966,842 round pounds landed by all commercial gears (Table 4). Since 1990 the directed fishery accounted for well over half of the ex-vessel value of commercial lingcod landings in all years except 2001 (Table 4).

Current fisheries for lingcod include allocations for directed fishing (dinglebar gear), sport fishing, and bycatch in the longline, jig and salmon troll fisheries (Table 5), with the largest commercial guideline harvest level (GHL) allocated to the EYKT fisheries (Table 6).

REGULATION DEVELOPMENT

The board first addressed Southeast Alaska lingcod management at its 1989 meeting when they implemented a size limit of 27" for lingcod in an attempt to prevent harvest of sexually immature females. In 1991 a guideline harvest range (GHR) of 300,000 to 500,000 round pounds was established for the Southeast District (east of 137° W longitude) based on catch histories in the CSEO fishery. In addition, a winter closure inside the surf line was implemented from January 1 through May 31 in an attempt to protect nest-guarding males.

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. The board adopted an interim management strategy for Southeast Alaska lingcod in 1994. Using a habitat-based approach, GHRs were set based on an assumption of 0.25–.50 mt lingcod biomass per square nm of rocky habitat for each management area. Seasonal and area allocations were also set for the directed and salmon troll fisheries in CSEO and NSEO. The seasonal closure in waters of Alaska was changed to December 1 through April 30 and the closure line was extended out to three miles offshore. A mandatory logbook program was established and legal gear types were defined as hook and line only.

In 1997, the board imposed additional gear restrictions, changed bycatch levels, and created year-round closures in two small areas. Longline gear was prohibited in the directed fishery and the percent bycatch in the DSR longline fishery was increased from 20% to 35%. The Sitka Sound area was closed to the retention of lingcod except in the halibut longline fishery and the pinnacle area off of Cape Edgecumbe was permanently closed to the taking of lingcod by all

users. Beginning in 1997, the winter closure of the waters of Alaska was extended until May 16 by emergency order to further protect nest-guarding males.

In 2000, the board took action regarding lingcod fishery management including GHR reductions, inclusion of the sport harvest in the total GHL, and allocation of lingcod between fishing sectors and areas (Table 5). The board also defined an additional subdistrict (IBS), and two sectors in the Southeast District. The western boundary of the Eastern Gulf of Alaska (Southeast District) was extended from 140° W longitude to 144° W longitude. The IBS comprises all waters between 140° W longitude and 144° W longitude including Yakutat Bay three miles seaward of a line from Ocean Cape at 59°30' W latitude. The new sectors redefine 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).

Other lingcod regulations adopted by the board in 2000 include:

1. In the directed lingcod fishery, the vessel owner or the owner's agent must register the vessel with the department before directed fishing for lingcod.
 2. Trip limits may be imposed in the directed lingcod fishery by emergency order to promote an orderly fishery and for stock conservation.
 3. Lingcod may be taken in a directed lingcod fishery only from May 16 through November 30.
 4. Lingcod may be taken in a directed lingcod fishery only by mechanical jigging machines, dinglebar troll gear, and hand troll gear.
 5. Lingcod may only be taken as bycatch with hook and line gear (no pots, trawls or other net gears).
 6. Commercial salmon trollers may only retain lingcod from May 16 through November 30.
1. In 2003, the board took the following action regarding lingcod:
 1. Allowed the department to set groundfish bycatch in troll fisheries by emergency order (therefore ensuring that commercial salmon trollers have an opportunity to harvest their lingcod allocation).
 2. Allowed for the development of a directed fishery in IBS by combining the commercial catch allocation from the longline and troll fisheries into one allocation of 66.66% combined for the longline bycatch, salmon troll bycatch, and directed commercial fisheries (33.33% is allocated to the sport sector).
 3. Established IBS as a super-exclusive registration area for directed lingcod fishing.
 4. Provided for a small allocation of lingcod to the black rockfish jig fishery.
1. In 2006 the board took the following action regarding lingcod:
 1. Prohibited lingcod from being taken by spear or while using diving gear between December 1 and May 15.
 2. The upper end of the GHR for EYKT was increased from 200,000 to 225,000 round pounds with the increase allocated to the directed fishery. The regulation stipulates that in years when the GHL is 200,000 round pounds or less, the GHL will be allocated as described in 5AAC 28.165(a)(2)(A).

3. The bycatch allowance of lingcod in the halibut fishery was increased from 5% to 10% in IBS.

- 1.

2. In 2009 the board directed the department to set the bycatch allowance of lingcod in the halibut fishery by emergency order. With this new regulation, the department has the ability to set the appropriate bycatch percentage to achieve the harvest allocation of lingcod in each management area.

STOCK ASSESSMENT AND MANAGEMENT

The department is not currently able to reliably 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. Analysis of catch per unit effort data (CPUE), in terms of fish per hook hour for 1988–1998, showed a decline in CPUE ranging from 21% to 62% in areas where a directed fishery and increased recreational catch had developed. Consequently, the GHR for lingcod was reduced in all areas in 1999. Commercial logbook data for the period 1994–2011 shows an increasing trend in CPUE for the CSEO management area through 2007, and a declining trend between 2008 and 2011 (Figure 3). In NSEO and SSEOC there have been few participants in the directed fishery and CPUEs are shown only for years with three or more vessels so as to not reveal proprietary information. CPUE in NSEO is fairly stable and relatively low, while CPUE in SSEOC is highly variable. In EYKT, CPUE is variable between 1994 and 2000; during this time total lingcod harvest fluctuated dramatically and in the years following high harvests, commercial CPUE dropped. Since 2000, when the GHR was reduced in EYKT, CPUE has remained stable and is high relative to other management areas, likely due to higher abundances of lingcod in this area. In IBS, the directed fishery was opened in 2003, however data for that season are confidential due to the limited number of participants. CPUE in IBS was stable between 2004 and 2009 and increased in 2010 and 2011. Recent increases in CPUE may indicate an increase in lingcod stocks or a result of changing fishery dynamics, as vessel participation has decreased but the remaining participants are more experienced fishermen.

The department initiated a tag and release study for lingcod in 1996 with the goal of obtaining a better understanding of the movement patterns of local lingcod stocks. To date, over 9,175 lingcod have been tagged and 460 tags have been recovered. Net movements of lingcod recaptured in this tagging study are similar to results of other lingcod tagging studies in the literature: the majority of recaptured lingcod (55%) were recovered less than 10 km from the location of release, 25 % were recaptured between 10 and 25 km, 10 % between 25 km and 50 km, and 10 % were recaptured greater than 50 km from release location. Tagging of lingcod continues on a limited and volunteer basis.

2008–2011 SEASON SUMMARY

In the Southeast District the total reported commercial harvest of lingcod has increased from the last reporting period (2005–2008), but between 2008 and 2011 has been stable between 400,412 round pounds and 432,015 round pounds (Table 7). These increases have occurred primarily in the directed fishery and longline fishery bycatch (Table 7). Although the directed DSR fisheries have been restricted to SSEO and EYKT in recent years and reduction in halibut quotas in area 2C and 3A have reduced longline effort, the department also increased the halibut longline bycatch allowance for lingcod, which may have contributed to stable or increasing in lingcod

bycatch in these fisheries. Lingcod prices have been high during this reporting period, particularly in 2011, and increased market value may have led to more harvest in the directed fishery. Vessel participation in the directed lingcod fishery may have also increased in conjunction with the 2009 repeal of the federal requirement for Vessel Monitoring Systems (VMS) in the dinglebar fishery.

ROCKFISHES AND THORNYHEADS

More than 30 species of rockfishes from two genera (*Sebastolobus* and *Sebastes*) are landed in Region I groundfish fisheries. Shortspine thornyhead rockfish (*Sebastolobus alascanus*) inhabit the continental slope in waters as deep as 6,000 feet. The *Sebastes* rockfishes are divided into three assemblages for management purposes because cohabitating species groups are generally caught together. The assemblages are based on habitat preference and behavior. The demersal shelf rockfish assemblage is comprised of seven species of nearshore, bottom-dwelling species and includes yelloweye rockfish (*S. ruberrimus*). The pelagic shelf rockfish (PSR) assemblage is comprised of six nearshore schooling species including black rockfish (*S. melanops*), dusky rockfish (*S. variabilis*), dark rockfish (*S. ciliatus*), blue rockfish (*S. mystinus*), yellowtail rockfish (*S. flavidus*) and widow rockfish (*S. entomelas*). Formerly there were five species in this assemblage but in recent years “light” dusky rockfish were determined to be a separate species from dark rock fish and were given a new scientific name. In 2009, dark rockfish were removed from the FMP and management was deferred to the State of Alaska. The slope rockfish assemblage is found along the edge of the continental shelf and on the continental slope in depths as great as 400 fm. This group contains all remaining species of rockfish. Roughey rockfish (*S. aleutianus*), shortraker rockfish (*S. borealis*), and redbanded rockfish (*S. babcocki*) are the predominant commercial species in this group. For the purposes of this report, catch of shortspine thornyhead is included in the slope rockfish assemblage.

DEMERSAL SHELF ROCKFISHES

The assemblage definition for DSR has changed three times since its inception. The current DSR assemblage comprises seven species including yelloweye rockfish, quillback rockfish (*S. maliger*), tiger rockfish (*S. nigrocinctus*), china rockfish (*S. nebulosus*), canary rockfish (*S. pinniger*), copper rockfish (*S. caurinus*), and rosethorn rockfish (*S. helvomaculatus*).

All DSR are considered highly K-selective (i.e. species life history characteristics include slow growth, late maturity, and longevity) (Adams 1980, Gunderson 1980, Archibald et al. 1981). Estimates of natural mortality are low (i.e. 2%) Fishes with these life history characteristics are very susceptible to over-exploitation and are slow to recover once driven below the level of sustainable yield (Leaman and Beamish 1984; Francis 1985). An acceptable exploitation rate is assumed to be low; the department manages the fishery at an exploitation rate (F) equal to natural mortality (2%).

Yelloweye rockfish, the dominant species in the DSR assemblage (in terms of catch and biomass), occur in nearshore waters to 200 fm (although typically found at 100 fm) from northern Baja California to the Aleutian Islands. Yelloweye rockfish attain a maximum length of 36 inches and maximum reported age of 121 years (Brylinsky et al. 2007). These fish are most often associated with rock habitat, i.e. rocky reefs, ridges, and pinnacles. Yelloweye tend to be resident and tag return information indicates that adult fish stay in the same area over years

(O'Connell 1991). 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 Alaska 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. By 1982, longline gear had replaced jigging machines. The use of longline gear in the fishery changed the dynamic and target species of the fishery, and the catch became predominately yelloweye and quillback rockfish. Harvest increased six-fold in five years with total catch exceeding one million round pounds in 1986. Prior to 1984 well over half of the total Southeast Alaska rockfish landings were reported from CSEO. As 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.

Directed fishery catch has decreased from 2.7 million round pounds worth \$1.4 million in 1987 to a low of 3,078 round pounds worth \$4,349 in 2006 (Table 8). In 2007, harvest was again low (5,426 round pounds), but since 2007, directed harvest has increased (Table 8). Low values in 2006 and 2007 were because the directed fishery was closed in these years in SEO. In 2011 directed harvest was 93,428 round pounds worth \$146,563 (Table 8). Directed fleet size has ranged between 149 permits (1992) and four permits (2007). In 2011, 14 permits harvested fish. Total reported landings of DSR for all groundfish and halibut fisheries have ranged between 3.3 million round pounds worth \$1.65 million in 1987 to 308,110 round pounds worth \$297,141 in 2011 (Table 8). The majority of the DSR harvested in Southeast Alaska has been in EYKT, CSEO, and SSEO, with little recent effort and harvest in the inside waters (Figure 4).

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 however this area was open to directed fishing in 2004–2005, and 2008–2009. The CSEO fishery has not been opened since 2004. The directed fishery in SSEO opened in 2004, and in 2008–2011 after three closed years. Closures in CSEO and SSEO occurred due to stock conservation concerns.

REGULATION DEVELOPMENT

The DSR fishery has been highly regulated since 1989 (O'Connell and Brylinsky 2001). Prior to 1989, the fishery occurred primarily in CSEO where a 1.3 million pounds harvest cap was placed in 1984. In 1987 a draft management plan was written, and GHs were set for five management areas. A portion of Sitka Sound was closed by emergency order to directed commercial fishing after public testimony underscored the concern regarding localized stock depletion.

The department, concerned about the rapid increase in catch and effort, co-sponsored an industry workshop with the Commercial Fisheries Entry Commission (CFEC) and the Pacific States Marine Fisheries Commission (PSMFC), to explore management options for this fishery. Several recommendations for management actions came from this working group and were implemented at the 1989 board meeting.

In the 1980s the fishery was opened on October 1. In 1989, regulations were implemented to enhance the small boat, fresh-product nature of the fishery. These regulations included providing for a three-period, split season to facilitate marketing of fresh product over an extended portion of the year, and imposing a trip limit of 7,500 round pounds per five-day period. Legal gear for DSR was defined as hook and line only. The GHLs were reduced substantially in all areas, and closures to directed commercial fishing were implemented for areas surrounding the ports of Sitka, Craig, and Ketchikan. In addition, logbooks were required by fishers directed fishing for DSR. A DSR directed fishery CFEC interim use permit card for Southeast Alaska was introduced in 1990. Harvesters making directed landings from EYKT did not use this card until 1991 when EYKT was included in the SEO district.

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.

Bycatch of DSR in other fisheries is a concern because these species are highly susceptible to injury from barotrauma due to the pressure change between catch depth and surface waters. Due to the high post-release mortality of this species, a regulation was adopted to require full retention of all DSR landed incidentally in the commercial halibut fishery in 2000 for state waters and in 2004 for federal waters. This was to minimize wastage of bycatch that occurred during the derby-style halibut fisheries. Additionally, fishermen were no longer permitted to target DSR for bait use, and no more than 10% by weight of bait catch could be DSR.

In 1989 the Council implemented a total allowable catch (TAC)² (for all fishery removals including directed) for the SEO district (waters east of 137° W longitude) of 470 mt, based on average fishery harvest history. In 1991, the Council extended the SEO district (and state management authority) westward to 140° W longitude to include the waters of EYKT Section. Additional DSR regulation changes were adopted at the 1993 Alaska Board of Fisheries meeting largely based on input from the Sitka Rockfish Working Group. DSR were reapportioned by season to allow more fish to be harvested in the winter season when the price was best. To allow the state to manage DSR harvest within the federal TAC, lower GHLs were adopted for DSR in SEO and a directed fishery harvest limit for DSR in EYKT was implemented. Trip limits were set at 12,000 round pounds for EYKT and reduced from 7,500 to 6,000 round pounds in the other management areas.

The department began a biomass-based harvest rate approach in 1993, and thus was able to set a TAC based on a 2% harvest rate applied to the lower 90% confidence limit of the area specific biomass estimates (O'Connell and Carlile 1993, O'Connell and Brylinsky 2001). In 1997, the board modified DSR directed fishery management to reflect the way the fishery had been managed since the implementation of the halibut individual fishing quota (IFQ) fishery. Sixty-seven percent of the TAC was allocated to the winter season and 33% to the fall season. In addition, the board limited lingcod bycatch to 35% in the longline fisheries, set opening and closing time to daylight hours, added dinglebar troll gear as legal gear for targeting DSR, clarified trip limits, and changed the directed fishery quota for SSEI and NSEI to 110,000 round pounds in each area. Regulations also set the directed fishery quota for the SEO by allocating the

² The federal TAC is set in metric tons (mt); the department sets fishery quotas (GHR, TAC, AHO) in round pounds (round lb).

remainder of the acceptable biological catch (ABC) after accounting for an estimate of DSR mortality in the halibut fishery.

In 2000, the board adopted regulations requiring full retention of DSR in all state waters of Southeast Alaska. A CFEC permit holder must retain, weigh, and report all DSR taken. All DSR in excess of the allowable bycatch limits shall be reported as bycatch overage on a fish ticket. DSR in excess of legal bycatch limits may be retained for personal use or donated. If the fish are sold, proceeds from the sale of fish must be forfeited to the State of Alaska. The Council adopted an amendment requiring full retention of DSR in federal waters; this was implemented as a final rule in 2005. Fish caught in excess of allowable bycatch limits are subject to the same regulations as the state regulations listed above; however, no excess DSR caught in federal waters can enter commerce. In 2003, the board adopted regulations requiring permit holders to register prior to participating in the directed DSR fishery.

In 2006 the board adopted a regulation that allocates the DSR TAC between the commercial sector and the sport sector, 84% and 16% respectively. Regulations were also adopted that restricted the SEO DSR fishery to the winter season only and prevented the directed DSR fishery from overlapping with the IFQ halibut season.

In 2009, the board adopted a proposal to deduct the subsistence catch from the DSR ABC prior to the allocation of the TAC between the commercial sector (84%) and the sport sector (16%). The board adopted a proposal to clarify that the remainder of NSEI and SSEI annual DSR allocations not taken during the winter fishery would be available for harvest in the fall season. The winter fishery remained limited to not more than 67% of the annual DSR allocation. The board adopted proposals providing the department flexibility in setting DSR bycatch allowances and clarified that DSR full retention regulations only applied to groundfish and halibut fisheries.

STOCK ASSESSMENT AND MANAGEMENT

The department conducts a multi-year stock assessment survey for DSR in the Southeast District. Biomass is estimated by management area as the product of yelloweye rockfish density determined from line transect surveys, the area of rocky habitat within the 100 fm contour, and the yelloweye rockfish average weight (O'Connell and Carlile 1993, Brylinsky et al. 2007). Yelloweye rockfish density for the stock assessment is based on the most recent estimate by management area. Yelloweye rockfish densities for each area are multiplied by the current year's average commercial fishery weight of yelloweye rockfish specific to that management area. During the last submersible survey in 2009, density surveys were conducted in EYKT. The SSEO area was last surveyed in 2005, CSEO was last surveyed in 2007 and NSEO was surveyed in 2001. The most recent density estimates by area range from 1,068 to 3,557 yelloweye rockfish per km².

Allowable biological catch for the SEO is set by multiplying the lower bound of the 90% confidence interval of total biomass for yelloweye rockfish by the natural mortality rate (0.02) and increasing the biomass estimate by 2–4.0% (depending on the current year's weight ratio of other species landed in the DSR assemblage). This method is more conservative than using $F_{40\%}$ (0.26) to determine the ABC. The overfishing level is set using a rate of $F_{30\%}$ (0.32). There is no stock assessment information available for NSEI and SSEI and the GHL has historically been set annually at 55,125 round pounds for each area, or approximately at the midpoint of the GHR (110,000 round pounds).

Overall, the trend for yelloweye rockfish biomass estimates for Southeast District has been decreasing despite a conservative harvest strategy. However, since 2004, increased accounting of total DSR removals as well as the allocation of the resource between sport and commercial sectors in 2006 has improved the management of this fishery. The stock is not considered overfished, but due to the life history characteristics of this long-lived species and infrequent stock assessment surveys, observable increases in yelloweye rockfish biomass may not be detected quickly.

2008–2011 SEASON SUMMARY

The total DSR harvest in the Southeast District decreased from 516,397 round pounds in 2008 to 308,110 round pounds in 2011 (through October) (Table 8). Directed fishery allocations totaled 302,085 round pounds in 2008, 282,682 round pounds in 2009, 177,062 round pounds in 2010, and 165,375 round pounds in 2011 (Table 9). The ex-vessel value in the directed fishery decreased slightly from \$174,957 in 2008 to \$146,563 in 2011 (Table 8). During this reporting period, the maximum price per pound for yelloweye has varied from a low of \$1.72 per round pounds in 2009 to a high of \$2.75 per pounds in 2008. The number of active directed fishing permits was 18 in 2008, 22 in 2009, 16 in 2010, and 14 in 2011 (Table 8).

Recent management actions include updating area quotas based on DSR stock assessment and projection of DSR catch in the halibut fishery and in-season tracking of fisheries. The directed fishery was opened in EYKT and SSEO in 2008 and 2009. A total of 93,727 pounds of DSR were harvested in 2008, and 166,824 pounds in 2009 in SEO directed fisheries. In 2010 and 2011 only SSEO was opened. A total of 65,080 pounds was harvested in 2010 and 47,848 pounds in 2011.

2012 SEASON OUTLOOK

The most recent version of the DSR stock assessment was presented to the Council's Gulf of Alaska Groundfish Plan Team in November 2011 recommending a TAC of 286 metric tons for 2012 (Green et al. 2011). This is a reduction of 3% from the TAC established in 2010. The TAC is apportioned 84% to commercial fisheries and 16% to sport fish fisheries, after subsistence catch is deducted from the ABC. This results in a commercial TAC of 240 mt, and a sport TAC of 46 mt. At the time of publication for this document it was not determined whether to open a directed DSR fishery for 2012. This decision rests in part on the anticipated bycatch of DSR in the halibut fishery, thus the decision to open a directed fishery will be made in January 2012 after halibut quotas for 2012 have been set.

PELAGIC SHELF, SLOPE ROCKFISHES, AND SHORTSPINE THORNYHEADS

FISHERY DEVELOPMENT AND HISTORY

Pelagic shelf rockfish (PSR) are primarily taken as bycatch in longline and troll fisheries in NSEI and SSEI (Table 10). Pelagic shelf rockfish include black rockfish (*S. melanops*), blue rockfish (*S. mystinus*), dusky rockfish (*S. variabilis*), dark rockfish (*S. ciliates*), widow rockfish (*S. entomelas*), and yellowtail rockfish (*S. flavidus*). A directed PSR fishery using mechanical jigging machines developed rapidly in Southeast Alaska in 1992 and peaked in 1997 before declining. Total PSR catch in NSEI and SSEI ranges from a high of 26,315 round pounds in 1992 to 601 round pounds in 2011 (Table 10). In the past ten years, the directed black rockfish

harvest in SEO has ranged from 88,467 round pounds (nine vessels) in 2003 to 440 pounds in 2011 (three vessels) 2011 (Table 11). In 1999, the Council removed black and blue rockfish from the FMP, and in 2009, dark rockfish were removed as well. The state now has sole management and assessment responsibilities for black, blue, and dark rockfish in state and federal waters.

Slope rockfish include all deepwater species of rockfish not included in the DSR and PSR assemblages. Shortspine thornyhead catches are included with this group although they are not rockfish in the *Sebastes* genus. Slope rockfishes and thornyheads are taken as bycatch in longline fisheries for sablefish, halibut, and DSR with the majority of the catch associated with the SSEI and NSEI sablefish fisheries (Table 12). In addition to the bycatch landings, a few longline fishermen targeted slope rockfish prior to 2003 (Table 1). In 2011, shortspine thornyhead accounted for 45% of the landed catch, followed by shortraker rockfish (28%), rougheye rockfish (18%), and redbanded rockfish (7%).

REGULATIONS

Full retention regulations adopted at the 2000 board meeting require that all rockfish caught in internal waters be weighed and accounted for on fish tickets. Proceeds of sales in excess of legal landing limits are forfeited to the State of Alaska.

In 2003 the board prohibited directed fishing for thornyhead, shortraker, rougheye, and redbanded rockfish thereby classifying all rockfish, other than DSR and black rockfish, into bycatch-only status. Current regulations allow for a directed fishery for black rockfish in some areas of SEO. This fishery is managed using area GHs, vessel registrations, gear restrictions and small area closures. All other non-DSR rockfish are managed under the terms of a commissioner's permit. Harvest of rockfishes is limited to hook and line gear and longline gear is not a legal gear in the directed black rockfish fishery.

In 2009 the board adopted a proposal which repealed the prohibition on the sale of black rockfish taken as bycatch in the waters that are closed to directed black rockfish fishing.

STOCK ASSESSMENT AND MANAGEMENT

The directed fishery for black rockfish focuses on fishing in nearshore, shallow water rock "reef" habitat, an area traditionally very difficult to assess. In 1999, the department conducted a pilot study to evaluate the feasibility of a combination depletion experiment/mark-recapture survey for assessing nearshore black rockfish stocks. The pilot study focused on developing appropriate field methods, including the use of underwater cameras. Based on experiences in 1999, a revised study was conducted in 2000. The department concentrated effort in two areas with high black rockfish abundance. A total of 2,483 black rockfish were tagged and released during the 2000 field season. Additionally, 20 tagged fish were recaptured; 17 of these fish had been released in 1999, and three fish had been released in 2000. During 2002, the department conducted additional black rockfish stock assessment surveys. Three separate trips were made, two trips for the purpose of locating and sampling unfished stocks of black rockfish, and one trip to locate schools of fish in water deeper than is customarily fished with mechanical jigging machines. In addition, historical catch data was integrated with logbook and fish ticket data into a GIS application to estimate the number of removals in specific locations within the study area (Tydingco and Brylinsky 1999).

There is no department stock assessment survey for slope rockfishes and thornyheads in the Southeast District, although they are caught as a bycatch species on the annual sablefish longline surveys. Length, weight, and sex data are collected for rockfish, length data only are collected for thornyheads.

2008–2011 SEASON SUMMARY

The PSR reported catch for NSEI and SSEI has remained low in the past several years, with <1,500 round pounds harvested between 2008 and 2011 (Table 10). Black rockfish catches from the SEO declined sharply in 2005 from previous years and have remained low (Table 11). Increasing fuel prices and low market value for black rockfish may be contributing to the decline in interest in this fishery.

The total catch of slope rockfishes and thornyheads in NSEI and SSEI has been less than 300,000 round pounds for the years 2008–2011 with 2008 having the highest catch in those years at 261,963 round pounds (Table 12). The board closed the directed fishery for slope rockfish in 2003.

2012 SEASON OUTLOOK

With the continued decline in participation in the directed black rockfish fishery it is difficult to predict industry interest in harvesting this species in 2012.

SABLEFISH

Sablefish occur in the northeastern Pacific Ocean from Baja California to the Aleutian Islands and into the Bering Sea. The center of abundance is in the Gulf of Alaska. Adult sablefish inhabit the deep-water areas of the continental shelf, slope, and deep-water coastal fjords. Most adults live in depths of 200 to 500 fm although they have been found in less than 100 fm and greater than 1,000 fm (Allen and Smith 1988). In NSEI the average age from survey samples of this long-lived species is estimated at 15 years; maximum reported age is 94 years of age (Kris Munk, pers. comm). Sablefish is the most valuable groundfish in Southeast Alaska. In 2008 the total sablefish ex-vessel value was \$6,727,573, and as of October 2011, high sablefish prices have resulted in the highest sablefish ex-vessel value since 2000 (\$7,445,970)

FISHERY DEVELOPMENT AND HISTORY

Sablefish have been harvested in the internal waters of Southeast Alaska since the early 1900s. The fishery is split into two areas: NSEI, where fishing occurs primarily in Chatham Strait, and SSEI, where fishing occurs primarily in Clarence Strait and the adjacent waters of Dixon Entrance.

Prior to the 1940s, sablefish were primarily landed as bycatch in the halibut fishery. 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 area.

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. Fleet effort and efficiency continued to increase dramatically such that the season in the NSEI area was reduced to five days by 1984 (Table 13). 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 1 day in 1987. One-day openings continued in the NSEI area through 1993. In 1993, the NSEI fleet harvested 3,640,000 dressed pounds, which was 2,140,000 dressed pounds over the upper bound of the GHR (1,500,000 dressed pounds). In an effort to improve management, the board adopted an equal quota share (EQS) system for the NSEI area in 1994. This system was recommended by a working group of industry representatives and state fisheries managers. In SSEI, the number of fishing days declined from 200 days in 1980 to 2 days in 1996 (Table 14). In 1997, at the request of industry, the board adopted a similar EQS system for SSEI fishery. In addition to minimizing the risk of overharvest and loss of gear, the EQS system allowed the five limited-entry pot permits to re-enter the fishery. These pot permits had been functionally excluded due to the short season in previous years.

REGULATIONS

Management regulations, including annual harvest objectives (AHOs), fishing seasons, and gear specifications, are defined separately for the NSEI and SSEI sablefish fisheries and there is no sablefish fishery 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 NSEI the AHO is determined by applying a harvest rate to a forecast of sablefish biomass, where current year sablefish abundance is estimated with mark-recapture methods. In SSEI, the AHO is determined by analyzing the fishery and survey CPUE, historic fishery landings, and biological information about the population (age, weight, length, and maturity data). 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 taken for use as bait.

The SSEI longline fishery is open annually between June 1 and August 15 and the pot gear fishery from September 1 to November 15. The SSEI directed fishing seasons are split to avoid possible gear conflicts. 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. Off-season fishing in the winter occurred in 2004 and 2005 to collect CPUE data and biological information, however winter fishing has not occurred since 2005 because the AHO must be released prior to off-season fishing, and typically the NSEI stock assessment is not completed until June or July before the start of the directed commercial fishery. However, in 2010, under the same regulation, the department implemented a program to allow NSEI permit holders to retain their PQS during the survey in an effort to decrease department testfish removals. This program also results in a smaller testfish decrement to the ABC, and thus an increased AHO for all permit holders.

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. Previous research indicated some movement of sablefish into and out of NSEI and substantial movement into and out of SSEI. The extent of movement is unknown; therefore, department surveys are conducted a few weeks prior to the start of each fishery to examine relative abundance and sablefish population composition near the time of these fisheries. Fixed sampling stations were randomly assigned within statistical areas in both Chatham and Clarence Strait, where the majority of fleet fishing effort is focused. Once established, the same stations are fished in a similar manner each year to estimate change in relative abundance over time. Biological data collected during the surveys 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.

In 1997, the department changed survey methodology (Cartwright 2000). Prior to this year, the survey gear was retrieved one hour after it was deployed. There were concerns that a one hour soak in certain depths and tidal/current conditions is not sufficient time for fishing gear to reach the bottom and be available to fish. Therefore, a three to 11 hour soak time for longline survey gear was implemented beginning in 1997. At the same time, department survey methods were standardized with the National Marine Fisheries Service (NMFS) sablefish longline survey (three-hour minimum soaks, squid bait, and 78" hook spacing). In 2000, the department purchased survey gear to ensure standardization between survey vessels.

In 1997 and 1998, a mark-recapture study was conducted to estimate absolute abundance in NSEI (single event-Petersen method). Using longline gear, the department tagged and released over 5,000 sablefish during the NSEI survey each year. A small proportion of the tagged fish were recaptured in the fishery. Preliminary results suggested "hook shyness" might have decreased the number of potential fishery recaptures, which would result in overestimates of abundance. In 2000, the department began using pot gear for capture and tagging, to reduce the chance of hook shyness and thereby promote more accurate estimates of abundance (Richardson 2001). Improved tag-recapture results indicate that this bias has decreased with the use of pot gear for the initial capture of fish. Data recovered from tagged sablefish recaptured in the survey and the commercial fishery are used to estimate an annual exploitation rate. Release and recapture location data from recaptured fish are useful for understanding movement patterns of sablefish between the internal waters of Alaska, Gulf of Alaska, Bering Sea, Aleutian Islands, and British Columbia. Application of an age-structured model (ASA) using fishery, survey, and mark-recapture data is also being explored to estimate abundance of sablefish. A similar model is used by NMFS for the Bering Sea, Aleutian Islands and Gulf of Alaska sablefish assessment. Prior to 1997, the department set the AHOs for the sablefish fisheries after the surveys were completed, just prior to the opening of the fisheries. Because the NSEI tagging and the age structure data cannot be analyzed until after the NSEI fishery has been prosecuted, the department now sets the overall AHO for a given year prior to the survey, using the survey and fishery data from the previous years.

In February 2002, the department convened a multi-agency panel to conduct an independent review of the NSEI sablefish stock assessment program. A report detailing past stock assessments and management programs was prepared and provided to the review committee in advance of the panel meeting (Carlile et al. 2002). The panel met with department staff to discuss

the stock assessment report to gain further insight into the details of the fishery and assessment and then convened privately to draft recommendations for consideration (Leaman et al. 2002). Based, in part, on this review and on additional assessment data available in 2002, the department took a new approach for setting the AHO for NSEI sablefish in 2003. The AHO was set based on a harvest rate applied to an estimate of biomass. The biomass estimate was calculated using a Peterson estimator (Seber 1982), which was applied to mark-recapture data, and weight-at-age data. The department continues to estimate the abundance of sablefish in the NSEI area using mark-recapture methods. Currently, the department calculates the AHO for NSEI by estimating sablefish abundance in the current year, forecasting abundance for the upcoming year, converting forecasted abundance to biomass using weight-at-age data, and applying a $F_{50\%}$ harvest rate. The forecast for 2011 was 16,284,116 round pounds of sablefish. An $F_{50\%}$ (0.070) harvest rate was applied to the forecasted biomass to yield a preliminary ABC of 1,046,873 round pounds for the 2011 NSEI sablefish fishery. This ABC was decremented 167,275 lb to account for testfish harvest, estimated mortality in the halibut fishery, discard mortality in the directed fishery, and mortality in subsistence, personal use and sport fish fisheries. The resulting value was rounded to the nearest thousand pounds to yield the final quota (AHO) of 880,000 round pounds for the 2011 NSEI commercial sablefish fishery.

Unlike NSEI, the department does not currently estimate the absolute abundance of SSEI sablefish. There appears to be substantial movement of sablefish in and out of the SSEI area, which violates the assumption of a closed population, consequently, Peterson 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.

2008–2011 NSEI AND SSEI SEASON SUMMARY

The total reported sablefish landings from both state-managed fisheries was 2.1 million round pounds in 2008, 1.7 million round pounds in 2009 and 1.6 million round pounds in 2010 (Table 1). As of October 2011, 1.4 million pounds have been harvested in 2011. The average ex-vessel price per round pound reported on fish tickets continues to increase; the average price in 2008 was \$3.15 per round pounds compared with \$5.31 per round pounds in 2011.

NSEI

The NSEI sablefish fishery AHO has decreased during this reporting period from 1.51 million round pounds in 2008 to 880,000 round pounds in 2011 (Table 13) and total permit holders in the fishery continue to decrease as well: CFEC issued 96 permits in 2008 and 81 permits in 2011 (Table 13). The EQS has decreased from 15,710 round pounds in 2008 to 10,602 round pounds in 2011 (Table 13). Sablefish biomass estimates for NSEI based on the mark-recapture study continue to decrease (Figure 5). Commercial catch rates (standardized for hook spacing) have decreased during this reporting period from 0.90 round pounds per hook in 2008, to 0.78 in 2009 and 0.73 in 2010 (Figure 6). Survey data show a decrease in CPUE during this same period, from 1.79 round pounds per hook in 2008, to 1.77 round pounds per hook in 2009 to 1.72 round pounds per hook in 2010 (Figure 7). Data from 2011 fishery and survey are not yet available. Survey CPUE has historically been higher than fishery CPUE. Unlike the fishery, all catch is accounted for on surveys, including small fish that are below market value fish, fish that are predated, lost, etc., thus resulting in a higher CPUE. Other influencing factors may be that the

skippers of the contracted vessels typically have extensive fishery experience, and the inclusion of dual target halibut trips are not influencing the results of the CPUE for the surveys as they do in the fishery.

SSEI

SSEI sablefish fishery AHO has decreased during this reporting period from 696,000 round pounds in 2008, to 583,280 round pounds in 2011 (Table 14). The EQS was 24,860 round pounds in 2008 and decreased to 23,300 round pounds in 2011 (Table 14). Permit holders continue to decrease in this fishery as well; there were 32 permit holders in 2008, and 25 permit holders in 2011 (Table 14). Commercial longline CPUE, standardized for hook spacing, dropped from 0.79 round pounds per hook in 2008 to 0.63 round pounds per hook in 2011 during this reporting period (Figure 8). Survey CPUEs have decreased steadily during the reporting period from 0.96 round pounds per hook in 2008, to 0.63 round pounds per hook in 2010 (Figure 9). Although the sablefish round pounds per hook continued to decrease in the 2010 survey, the number of fish per hook increased, indicating higher numbers of small fish were caught in the survey. Length frequency data from fish caught in the 2010 survey also indicate a pulse of smaller sablefish.

2012 SEASON OUTLOOK

NSEI

The tagging survey, which serves as the first stage of the annual mark-recapture study, was canceled in 2011 due to mechanical issues with the survey vessel. As a result, the department will not be able to forecast sablefish biomass for 2012 using 2011 data. The department did continue the annual longline survey in 2011, collecting CPUE data and sablefish biological information (age, weight, length, sex and maturity). The department also collected sablefish biological data through port sampling of commercial fishery landings.

The 2012 NSEI quota decision will be made based on the evaluation of NSEI fishery and survey CPUE, previous NSEI biomass estimates, age, length, and maturity data, and recruitment.

SSEI

The 2012 AHO will be set in March 2012 after analyses of fishery and survey CPUE and biological data are completed.

PACIFIC COD

Pacific cod are found from the northern Yellow Sea in China through the Bering Sea as far north as the Chukchi Sea, and south along the Gulf of Alaska and the coast of North America to Monica Bay, California (Love 1991; Westrheim 1996). Pacific cod inhabit the waters of the continental shelf and the upper continental slope waters (Bakkala et al. 1984; Westrheim 1996).

FISHERY DEVELOPMENT AND HISTORY

Catch history of the directed Pacific cod fishery in the inside waters of Southeast Alaska, is fragmented due to limited landing records for the fishery. Under regulation, Pacific cod sold for bait in the crab fisheries must be reported on fish tickets under a catcher-seller permit. 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. In addition, directed Pacific cod harvest is landed on a CFEC miscellaneous finfish interim use permit card (M card) and bycatch of Pacific cod harvested in other fisheries may also be landed on the M card, so it is difficult to differentiate bycatch of Pacific cod from the landings in the directed fishery.

Longline gear is the primary gear used in the directed Pacific cod fishery in Southeast Alaska, although pots and other hook and line gear such as jig and dinglebar are also legal. The directed fishery for Pacific cod has remained open year round in state waters since the adoption of the GHR in 1994. The 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 between 750,000 and 1,250,000 round pounds to accommodate traditional harvest patterns and allow potential expansion of the fishery if additional harvest was deemed sustainable.

Reported landings of Pacific cod from NSEI and SSEI have varied widely over the past twenty years (Table 15). The increase in catch in the 1990s was due to the development of a food market for Pacific cod. The GHR for Pacific cod in the SSEI and NSEI Subdistricts combined is 750,000–1,250,000 round pounds. Total annual reported landings of Pacific cod from NSEI and SSEI have ranged from 142,405 round pounds (1985) to 962,434 round pounds (1993) with most of this harvest landed on miscellaneous finfish interim use permits (Table 15). Between 17 and 179 miscellaneous finfish interim use permits have landed Pacific cod in any year between 1985 and 2011 (Table 15).

REGULATIONS

In 1994, the board implemented a regulation setting a GHR for Pacific cod at 750,000 to 1,250,000 round pounds. In 2000 the board limited lawful gear for the harvest of Pacific cod to longline, dinglebar troll gear, hand troll gear, mechanical jigging machines and pots.

STOCK ASSESSMENT AND MANAGEMENT

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

In recent history, the directed Pacific cod catch has been concentrated within a few specific areas in NSEI. To distribute directed fishery harvest throughout the management area and reduce fishing pressure on these potential spawning aggregations, the department has implemented in-season closures in these areas when harvests have reached target levels.

2008–2011 SEASON SUMMARY

Total Pacific cod landings have increased during this reporting period. In 2010 Pacific cod harvest was the one of the highest harvests recorded (927,681 round pounds) (Table 15). Increased harvests in the past several years are likely due to increased market value for Pacific cod. As in the past, the majority of the harvest (93%) was taken in NSEI. In 2008 and again in 2010, the area around Frederick Sound was closed to directed fishing in order to distribute Pacific cod harvest. In 2009 and 2011, Icy Strait was closed to directed fishing. Inseason

closures were implemented because large portions of the annual GHL had been taken in these areas.

2012 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. The high market value for Southeast Alaska Pacific cod in the fall of 2011 suggests that this fishery should continue to be important in the region.

FLATFISH

Starry flounder (*Platichthys stellatus*) are the primary species targeted in the beam trawl fishery for flatfish in Southeast Alaska. Starry flounder occur in soft-bottom, shallow water estuaries generally shallower than 55 fm, from the Beaufort Sea to Southern California and from the East Siberian Sea south to the Sea of Okhotsk and to the Sea of Japan off Korea (Mecklenburg et al. 2002).

FISHERY DEVELOPMENT AND HISTORY

There is relatively limited estuarine habitat in Southeast Alaska where trawl fisheries are likely to target flounder. A trawl fishery for flatfish was already established in the inside waters of Southeast Alaska by 1960 when landings of flatfish were first documented. Between 1960 and 1965 approximately 40,000 round pounds 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 one million round pounds by 1973 with the harvest dropping substantially by 1980. The harvest in these early years came primarily from Port Camden, Level Island, and the Stikine Flats. These fish were primarily delivered south, 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 pounds in the late 80s, consisting primarily of starry flounder and some rock sole (*Lepidopsetta spp*). All the flatfish harvested in 1996 and 1997 were processed in Southeast Alaska, a significant change from previous years. Harvests remained high from 1987–1991 and then decreased to less than 10,000 round pounds by 1995 and since that time have remained at 20,000 round pounds or less per season (Table 16). The GHRs are low in all areas due to limited flatfish habitat, lack of flatfish stock status information, and concerns for potentially high bycatch of crab, shrimp, and halibut (Bracken et al. 1991).

Trip limits of 20,000 round pounds were implemented by the board in 1993. These trip limits made it uneconomical for large trawl vessels traveling south from the Western Gulf to make a season culminating trip to Southeast Alaska, a common occurrence historically. Since that time the fishery has remained a small local fishery with very few participants. Recent harvest has been used locally in Wrangell and it is believed that not all landings are reported.

REGULATIONS

The trawl fishery for flatfish is limited to four areas: the 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 concentrations of flatfish; hence, fishing is productive over only a portion of the year. Fishing seasons are October 1 through April 15 for the Anita Bay area and October 1 through November 15 and February 15 through April 15 in the

Port Camden and Level Island Fisheries. In 1993 the board implemented a 20,000 round pounds weekly trip limit that is intended 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 pounds. Legal gear for directed flatfish fishing in Southeast Alaska was limited to beam trawl gear beginning in 2001.

Department-issued 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 on-board observer coverage.

STOCK ASSESSMENT AND MANAGEMENT

There are no department stock assessment surveys for flatfish in the Southeast District. Previously, on-board observers collected information on CPUE and biological characteristics of the stock. Data collected in 1988 indicated that the mature flatfish stock in the Stikine Flats area was in very poor condition and the fishery was in danger of recruitment overfishing (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 GHF had been met. There has been no directed fishing since 1998 in any area.

The department currently has little information about the current condition of the flatfish resource in Southeast Alaska as there have been no fishery independent surveys or any commercial fishery in recent years.

2008–2011 SEASON SUMMARY

There was no participation in the directed flatfish fishery at any time during this reporting period.

2012 SEASON OUTLOOK

The department will issue permits if requested with an emphasis on collecting biological data on flatfish as well as bycatch information.

OTHER SPECIES

Landings of other groundfish species in NSEI and SSEI continue to be low. The majority of other species are discarded at sea and not reported on fish tickets. Primary discards include Pacific sleeper sharks (*Somniosus pacificus*), spiny dogfish, spotted ratfish (*Hydrolagus colliei*), skates (Family *Rajidae*), arrowtooth flounder (*Atheresthes stomias*), hagfish (*Eptatretus spp.*), and grenadiers (Family *Macrouridae*). There have been no, or very low skate harvests in internal waters of Southeast since 2003, however average skate landings in internal waters increased during this reporting period to 13,376 round pounds, mostly due to a large harvest in 2008 of 23,500 round pounds. Increased harvest during this reporting period was a result of increased market value for skates.

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TABLES AND FIGURES

Table 1.—Reported catch (round pounds) and ex-vessel value for state-managed groundfish taken in commercial groundfish and halibut fisheries, Southeast District from 1996 through October 2011. Slope rockfish include all deepwater species of rockfish not included in the DSR and PSR assemblages. 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.

Year	Species/Area managed								Total
	Lingcod Southeast	Flatfish NSEI/SSEI	DSR Southeast	PSR NSEI/SSEI	Black RF SEO	Slope NSEI/SSEI	Pacific cod NSEI/SSEI	Sablefish NSEI/SSEI	
1996	755,771	1,185	1,008,417	8,365	67,166	510,210	639,343	5,176,160	8,099,451
	\$377,886	\$273	\$923,641	\$3,011	\$19,560	\$321,432	\$326,065	\$10,807,647	\$12,759,955
1997	612,950	5,614	913,492	15,105	127,445	622,581	778,033	5,478,464	8,426,239
	\$330,993	\$1,067	\$973,727	\$3,927	\$40,945	\$397,774	\$326,774	\$13,153,151	\$15,187,413
1998	581,364	14,631	953,538	6,740	60,434	905,127	647,940	5,266,064	8,375,404
	\$308,881	\$2,634	\$919,950	\$2,022	\$20,001	\$534,025	\$233,258	\$8,316,809	\$10,317,579
1999	515,291	12,968	969,777	49,833	42,957	654,469	823,342	3,704,697	6,773,334
	\$319,632	\$2,464	\$1,019,155	\$16,770	\$14,587	\$412,315	\$279,936	\$7,838,126	\$9,902,985
2000	481,034	4,418	786,706	44,375	36,782	733,227	593,104	3,672,579	6,352,225
	\$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	17,288	487,407	356,790	2,793,295	4,870,232
	\$166,371	\$0	\$971,431	\$5,879	\$3,716	\$264,544	\$121,309	\$5,813,074	\$7,346,324
2002	351,421	2371	1,076,598	96,883	84,754	349,328	251,751	2,659,719	4,872,825
	\$208,136	\$237	\$1,027,351	\$33,781	\$27,024	\$191,941	\$100,700	\$6,102,368	\$7,691,538
2003	393,371	1124	800,892	96,690	91,676	306,946	386,548	2,658,579	4,735,826
	\$258,264	\$112	\$935,865	\$42,838	\$41,104	\$161,873	\$150,754	\$6,316,033	\$7,906,843
2004	360,682	802	874,526	50,981	45,458	222,781	451,446	2,878,801	4,885,477
	\$232,010	\$0	\$1,076,852	\$19,001	\$16,938	\$149,319	\$186,483	\$5,563,286	\$7,243,889
2005	324,323	1779	608,510	4,773	9,715	264,866	469,215	2,665,850	4,349,031
	\$223,473	\$0	\$599,880	\$2,661	\$4,365	\$159,856	\$208,396	\$6,378,833	\$7,577,464
2006	348,053	confidential	566,784	1,123	8,816	290,743	363,659	2,658,618	4,237,796
	\$282,165	\$0	\$458,240	\$801	\$4,317	\$183,797	\$165,453	\$6,501,059	\$7,595,832
2007	346,010	confidential	542,894	1,289	3,054	265,029	581,314	2,121,646	3,861,236
	\$277,168	\$0	\$409,647	\$491	\$1,076	\$144,598	\$269,965	\$5,269,200	\$6,372,145
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	\$470	\$147,049	\$400,676	\$6,727,573	\$8,132,070
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	\$869	\$122,669	\$307,766	\$5,317,529	\$6,543,417
2010	391,169	confidential	461,676	792	1,860	216,110	927,681	1,612,909	3,612,197
	\$336,898	\$0	\$361,815	\$214	\$600	\$131,306	\$403,123	\$6,455,388	\$7,689,344
2011	409,081	confidential	308,110	601	1,296	130,055	375,836	1,401,227	2,626,206
	\$529,726	\$0	\$297,141	\$176	\$490	\$79,813	\$192,998	\$7,445,970	\$8,546,314

Table 2.—Groundfish bycatch (round pounds) reported in the Southeast Alaska commercial salmon troll fisheries, 1990 through October 2011. 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.

Year	Demersal shelf rockfish	Pelagic rockfish	Slope rockfish	Pacific cod	Lingcod	Total round pounds	Total value	Total permits
1990	2,284	1,059	222	0	110,992	114,557	\$26,869	520
1991	1,524	4,834	223	4	92,914	99,499	\$28,520	496
1992	1,099	5,368	553	28	60,525	67,573	\$16,226	432
1993	3,425	4,636	1,133	0	70,181	79,375	\$17,362	394
1994	2,641	3,356	1,283	0	61,986	69,266	\$18,625	318
1995	2,006	14,836	2,754	33	88,754	108,383	\$40,675	422
1996	1,162	9,205	1,232	0	50,833	62,432	\$20,239	280
1997	1,864	13,573	1,208	17	42,508	59,170	\$19,394	314
1998	2,314	15,445	1,926	274	39,365	59,324	\$18,868	310
1999	971	13,297	1,053	523	30,239	46,083	\$15,643	277
2000	1,481	13,846	2,294	164	45,201	62,986	\$23,622	319
2001	1,484	13,012	3,148	0	27,592	45,236	\$21,071	226
2002	2,285	20,406	3,557	66	57,273	83,587	\$25,623	242
2003	3,711	19,834	3,402	14	33,350	60,311	\$21,952	230
2004	3,742	19,695	2,801	20	34,622	61,891	\$26,343	231
2005	2,643	20,937	1,873	32	25,400	50,884	\$21,175	210
2006	2,032	18,087	1,729	0	34,937	56,785	\$25,060	237
2007	2,211	18,689	1,830	0	41,231	63,961	\$26,570	250
2008	1,699	22,458	2,063	9	31,860	58,089	\$24,847	246
2009	1,749	12,782	1,811	0	29,707	46,049	\$17,746	210
2010	3,058	13,652	3,289	54	19,247	39,300	\$15,076	187
2011	2,490	9,044	2,197	42	22,541	36,314	\$23,644	176

*Delivery code for lingcod was not documented in the troll fishery prior to 2001. Estimated round weights were calculated from the landed weights using the standard western cut delivery conversion rate. Lingcod data prior to 2001 should be considered an estimate of round harvest amounts.

Table 3.–Testfish landings (round pounds) and ex-vessel values for Alaska Department of Fish and Game and International Pacific Halibut Commission surveys, by group and year for state-managed species, 1999 through October 2011. 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.

Year	PSR	DSR	Lingcod	Pacific cod	Sablefish	Slope rockfish	Total
1999	26	5,813	0	1,028	93,044	6,205	106,115
	\$9	\$6,009	\$0	\$285	\$167,226	\$2,757	\$176,286
2000	0	18,379	1,622	413	128,421	4,967	152,181
	\$0	\$19,035	\$1,343	\$83	\$287,345	\$2,424	\$308,887
2001	826	16,944	1,038	514	145,966	6,692	171,980
	\$202	\$17,422	\$448	\$90	\$285,952	\$1,981	\$306,096
2002	2,104	6,438	0	214	137,654	5,528	151,939
	\$561	\$8,314	\$0	\$21	\$284,358	\$2,618	\$295,873
2003	62	18,076	1,739	2,125	151,755	9,958	183,715
	\$23	\$23,917	\$1,127	\$84	\$321,984	\$3,854	\$350,988
2004	4	6,956	0	1,232	139,976	4,900	153,068
	\$1	\$6,680	\$0	\$20	\$264,182	\$1,744	\$272,628
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	4,846	158,948
	\$1	\$7,460	\$0	\$78	\$388,036	\$1,570	\$397,145
2007 ^a	96	10,846	0	614	148,305	6,583	166,444
	\$22	\$9,302	\$0	\$92	\$384,080	\$2,359	\$395,855
2008 ^a	67	8,203	1,360	903	153,122	5,106	168,761
	\$14	\$11,722	\$0	\$233	\$475,956	\$1,839	\$489,763
2009 ^a	80	13,017	5,520	735	142,057	7,373	168,782
	\$36	\$17,039	\$0	\$123	\$459,388	\$2,234	\$478,819
2010 ^a	109	19,877	0	1,793	93,735	6,591	130,816
	\$22	\$32,696	\$0	\$257	\$366,915	\$2,253	\$389,042
2011 ^a	11	4,936	421	1,603	88,652	7,941	103,564
	\$2	\$6,780	\$0	\$522	\$442,412	\$5,879	\$455,594

^a Includes IPHC surveys landed outside of Alaska 2007–2011

Table 4.—Southeast District reported harvest (round pounds), effort, and ex-vessel value for lingcod taken in the directed commercial fishery and as bycatch in the groundfish and halibut fisheries, 1987 through October 2011.

Year	Directed harvest	Directed value	Directed permits	Total harvest in groundfish and halibut fisheries	Value in groundfish and halibut fisheries	Groundfish and halibut 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	confidential	\$178,544	33	394,913	\$258,264	377
2004	confidential	\$124,800	28	359,510	\$232,010	329
2005	177,525	\$146,860	27	323,629	\$223,473	298
2006	confidential	\$228,815	30	345,813	\$282,165	305
2007	confidential	\$228,767	32	341,650	\$277,168	334
2008	confidential	\$276,152	39	405,813	\$370,212	309
2009	confidential	\$235,888	53	435,953	\$332,015	315
2010	239,349	\$255,114	44	391,169	\$336,898	330
2011	confidential	\$451,097	45	409,081	\$529,726	284

Table 5.–Lingcod guideline harvest ranges (GHR; round pounds) and allocations between sectors.

	Icy Bay	East Yakutat*	NSEO	CSEO	SSEOC	SSEIW	NSEI
GHL	0–100,000	0–200,000	0–40,000	0–240,000	0–167,000	0–52,000	0–32,000
Sector	Percent allocation						
Sport Fishery	33.3%	2%	22%	30%	44%	92%	50%
Directed Fishery		43%	43%	36%	30%	0%	0%
Longline Bycatch	66.6%	47%	27%	23%	17%	4%	30%
Salmon Troll Bycatch		8%	8%	7%	2%	4%	20%
Hand troll & Jig Bycatch	0%	0%	0%	4%	7%	0%	0%

Note: GHL is currently 225,000 round pounds; when the GHL exceeds 200,000 round pounds then the quota is allocated as follows: 4,000 round pounds to sport, 94,000 to longline, 16,000 to troll, and the remainder to directed fisheries.

Table 6.–Commercial lingcod guideline harvest limit (GHL) by fishery and management area in round pounds for 2011.

Management area	2011 Annual Harvest Objective (round pounds)				
	Directed	Salmon troll	Longline	Hand troll and Jig	Total
IBS		combined		0	66,660
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					600,540

Table 7.—Southeast District lingcod reported harvest (round lb) for commercial groundfish, halibut, and salmon troll fisheries, 2003–Oct. 2011.

Year	Fishery	CSEO	EYKT	IBS	NSEI	NSEO	SSEIW	SSEOC	Grand total*
2003	directed	75,652	101,419	confidential	– ^b	14,493	– ^b	48,762	240,326
	salmon	12,637	6,595 ^a	1,427 ^a	1,615	4,047	2,030	3,106	33,350
	longline	45,230	41,578	10,822	9,687	13,319	2,747	25,760	149,143
Total		133,519	149,592	12,249	11,302	31,859	4,777	77,628	422,819
2004	directed	23,351	100,670	28,846	– ^b	2,587	– ^b	confidential	155,454
	salmon	8,377	6,140 ^a	6,552 ^a	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	201,793	47,855	10,402	19,096	2,616	28,046	385,194
2005	directed	54,034	80,085	40,748	– ^b	2,659	– ^b	0	177,526
	salmon	8,812	2,230 ^a	3,436 ^a	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	147,634	68,896	11,415	17,592	3,036	15,090	349,031
2006	directed	46,916	108,650	63,432	– ^b	confidential	– ^b	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	– ^b	confidential	– ^b	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	– ^b	5,313	– ^b	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	confidential	436,982
2009	directed	85,189	118,822	61,178	– ^b	10,694	– ^b	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	– ^b	16,209	– ^a	14,189	239,349
	salmon	4,421	6,471	11	2,190	2,416	1,152	2,586	19,247
	longline	20,943	57,636	19,487	8,522	11,432	4,447	29,354	151,820
Total		80,701	166,555	70,664	10,712	30,057	5,599	46,129	410,417
2011	directed	85,894	121,604	67,562	– ^b	15,896	– ^b	confidential	290,956
	salmon	3,964	9,345	0	688	3,558	942	4,044	22,541
	longline	16,874	62,571	16,521	2,480	5,424	911	12,916	117,697
Total		106,732	193,520	84,083	3,168	24,878	1,853	16,960	431,194

Note: Totals and grand totals do not include confidential directed fishery harvest from IBS in 2003, NSEO in 2006 and 2007, and SSEOC in 2004, 2007–2009, and 2011.

^a Due to differences in groundfish and salmon reporting areas and the convergence of the IBS and EYKT groundfish management areas at Ocean Cape, it is unfeasible to accurately assign the troll lingcod harvest in salmon statistical areas 181-60 and 189-30 to a groundfish management area. The IBS and EYKT troll catch reported in this table for 2003-2005 displays only the lingcod harvest reported from salmon statistical areas that can be accurately assigned to one of these groundfish areas. Lingcod harvest in salmon statistical areas 181-60 and 189-30 is not included in the individual IBS or EYKT groundfish management area totals for these years however it is included in the grand total for each of these years. The amount of lingcod reported from 181-60 and 189-30 for this period is as follows: 2003 (1,893), 2004 (4,811 lb), and 2005 (3,069 lb).

^b No allocation for the directed fishery was made.

Table 8.—The Southeast District Demersal Shelf Rockfish (DSR) reported harvest (round pounds), effort and value for DSR taken in the directed commercial fishery and as bycatch in groundfish and halibut fisheries, 1987 through October 2011.

Year	Directed harvest	Directed value	Directed permits	Total harvest round pounds	Total ex-vessel value	Total permits
1987 ^a	2,745,762	\$1,427,763	^d	3,300,563	\$1,650,282	646
1988 ^a	1,555,607	\$777,804	^d	1,935,895	\$1,065,043	819
1989 ^a	997,388	\$498,694	^d	1,400,966	\$768,302	833
1990 ^a	690,253	\$403,752	144	1,122,095	\$600,190	789
1991 ^b	1,147,267	\$734,251	136	1,484,328	\$777,496	862
1992 ^b	1,087,554	\$626,336	149	1,591,020	\$768,960	919
1993 ^b	976,368	\$657,066	122	1,563,811	\$834,344	834
1994 ^b	982,745	\$680,863	133	1,619,214	\$858,680	847
1995 ^b	398,401	\$442,783	66	747,872	\$781,092	811
1996 ^c	782,776	\$787,585	125	1,008,417	\$923,641	736
1997 ^c	651,346	\$828,122	105	913,492	\$973,727	718
1998 ^c	622,289	\$749,599	88	953,538	\$919,950	733
1999 ^c	593,638	\$727,855	83	969,777	\$1,019,155	851
2000 ^c	473,385	\$706,842	59	786,706	\$959,146	774
2001 ^c	457,980	\$673,231	55	860,958	\$971,431	774
2002 ^c	413,792	\$666,206	63	1,076,598	\$1,027,351	768
2003 ^c	336,572	\$494,761	60	800,892	\$935,865	819
2004 ^c	437,079	\$660,047	45	874,526	\$1,076,852	740
2005 ^c	108,141	\$184,611	17	608,510	\$599,880	721
2006 ^c	3,078	\$4,349	4	566,784	\$458,240	735
2007 ^c	5,426	\$6,529	4	542,894	\$409,647	734
2008 ^c	106,169	\$174,957	18	516,397	\$485,140	689
2009 ^c	181,225	\$217,977	22	544,066	\$462,275	635
2010 ^c	110,518	\$139,510	16	461,676	\$361,815	629
2011 ^c	93,428	\$146,563	14	308,110	\$297,141	545

Note: Directed fishery permit (Y) was implemented in 1990 in all areas, but EYKT (1992) used M cards with >40% DSR for target prior to Y permits; dinglebar gear card was implemented in 1997.

^a DSR assemblage includes: bocaccio, canary, china, copper, quillback, redstripe, rosethorn, silvergray, tiger, yelloweye, and unspecified DSR.

^b DSR assemblage includes: canary, china, copper, quillback, redbanded, rosethorn, tiger, yelloweye, and unspecified DSR.

^c DSR assemblage includes: canary, china, copper, quillback, rosethorn, tiger, yelloweye, and unspecified DSR.

^d The number of directed fishery permits could not be determined prior to the directed fishery permit card in 1990.

Table 9.—Directed fishery allocation (round pounds) and catch (round pounds) for demersal shelf rockfish (DSR) by management area and year, 2008 through October 2011.

Management area	2011		2010		2009		2008	
	Allocation	Catch	Allocation	Catch	Allocation	Catch	Allocation	Catch
EYKT	0	0	0	0	106,502	99,177	123,480	48,904
NSEO	0	0	0	0	0	0	0	0
CSEO	0	0	0	0	0	0	0	0
SSEO	55,125	47,848	66,812	65,080	65,930	67,647	68,355	44,368
NSEI	55,125	4,807	55,125	7,294	55,125	7,395	55,125	12,422
SSEI	55,125	40,773	55,125	38,144	55,125	7,006	55,125	475
Total	165,375	93,428	177,062	110,518	282,682	181,225	302,085	106,169

Table 10.—The pelagic shelf rockfish (PSR) reported harvest (round pounds), effort and ex-vessel value landed from NSEI and SSEI for commercial groundfish and halibut fisheries, 1987 through October 2011.

Year	Total PSR harvest	Total ex-vessel 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	\$214	33
2011	601	\$176	18

Table 11.—Directed black rockfish commercial fishery harvest (round pounds) and ex-vessel value and total commercial harvest (round pounds; includes bycatch in Groundfish and salmon fisheries) for the Southeast Outside District, 1999 through October 2011.

Year	Directed harvest	Directed ex-vessel value	Directed permits	Total comm. harvest	Total ex-vessel value	Total permits
1999	35,653	\$12,381	10	42,957	\$14,587	105
2000	31,258	\$12,140	8	36,782	\$13,898	84
2001	10,439	\$2,228	5	17,288	\$3,716	69
2002	81,771	\$26,073	8	84,754	\$27,024	67
2003	88,467	\$40,057	9	91,676	\$41,104	72
2004	45,458	\$16,938	7	45,458	\$16,938	58
2005	5,478	\$3,097	7	9,715	\$4,365	44
2006	7,009	\$3,785	5	8,816	\$4,317	38
2007	confidential	confidential	2	3,054	\$1,076	43
2008	confidential	confidential	1	1,871	\$470	40
2009	1,113	\$592	3	2,066	\$869	38
2010	confidential	confidential	2	1,860	\$600	49
2011	440	\$52	3	1,296	\$490	41

Table 12.—Slope rockfish and shortspine thornyhead reported harvest (round pounds), ex-vessel value, and effort in NSEI and SSEI directed and bycatch in commercial groundfish and halibut fisheries, 1985 through October 2011. Slope rockfish include all deepwater species of rockfish not included in the DSR and PSR assemblages.

Year	Directed harvest	Directed value	Miscellaneous finfish permits	Total harvest	Total value	Total permits
1985	13,937	NA	20	24,318	NA	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 ^a	—	—	—	222,781	\$149,319	450
2005 ^a	—	—	—	264,866	\$159,856	458
2006 ^a	—	—	—	290,743	\$183,797	498
2007 ^a	—	—	—	265,029	\$144,598	505
2008 ^a	—	—	—	261,963	\$147,049	505
2009 ^a	—	—	—	212,781	\$122,669	432
2010 ^a	—	—	—	216,110	\$131,306	428
2011 ^a	—	—	—	130,055	\$79,813	338

Note: 1987–1990 the slope complex included: Pacific ocean perch (POP), darkblotched, sharpchin, thornyhead, greenstripe, northern, roughey, shortraker, redbanded and unspecified slope rockfish.

1991–2011 the slope complex includes: POP, darkblotched, sharpchin, thornyhead, greenstripe, northern, roughey, shortraker, silvergray, redstripe, bocaccio and unspecified slope rockfish.

The directed fishery for slope and thornyhead rockfish was closed by the Board of Fisheries in 2003, effective July 26, 2003.

^a No directed fishery occurred.

Table 13.—Annual harvest objective, equal quota share, reported harvest in round pounds, and ex-vessel value, and effort for the directed commercial NSEI sablefish fishery, 1985 through October 2011. No. of Days for 2011 only reflects the fishing season through October 2011.

Year	Annual harvest objective	Equal quota share	Harvest	Ex-vessel value	No. of permits	No. of Days
1985	2,380,952	—	2,951,056	\$2,005,394	105	3
1986	2,380,952	—	3,874,269	\$2,866,959	138	2
1987	2,380,952	—	3,861,546	\$3,514,006	158	1
1988	2,380,952	—	4,206,509	\$4,543,029	149	1
1989	2,380,952	—	3,767,518	\$2,900,988	151	1
1990	2,380,952	—	3,281,393	\$3,543,904	121	1
1991	2,380,952	—	3,955,189	\$6,882,028	127	1
1992	2,380,952	—	4,267,781	\$4,907,948	115	1
1993	2,380,952	—	5,795,974	\$5,622,094	120	1
1994	4,761,905	38,889	4,713,552	\$9,144,290	121	30
1995	4,761,905	38,889	4,542,348	\$7,721,991	121	30
1996	4,761,905	38,889	4,673,701	\$9,908,246	121	61
1997	4,800,000	39,300	4,753,394	\$11,550,747	122	76
1998	4,800,000	41,700	4,688,008	\$7,360,172	116	76
1999	3,120,000	28,000	3,043,273	\$6,634,335	112	76
2000	3,120,000	28,600	3,082,159	\$7,394,890	111	76
2001	2,184,000	19,600	2,142,617	\$4,563,774	111	76
2002	2,005,000	18,400	2,009,380	\$4,814,718	109	76
2003	2,005,000	18,565	2,001,643	\$4,809,492	108	93
2004	2,245,000	20,787	2,229,956	\$4,532,611	108	93
2005	2,053,000	19,400	2,026,131	\$5,027,393	106	93
2006	2,053,000	19,550	2,033,786	\$5,066,320	105	93
2007	1,488,000	14,500	1,501,478	\$3,754,847	103	93
2008	1,508,000	15,710	1,513,040	\$4,873,176	96	93
2009	1,071,000	12,170	1,071,554	\$3,550,253	88	93
2010	1,063,000	12,218	1,054,276	\$4,399,622	87	93
2011	880,000	10,602	860,296	\$4,803,045	81	78

Note: Equal quota share was implemented in 1994.

Table 14.—The annual harvest objective, equal quota share, and reported harvest (in round pounds), along with ex-vessel value and effort for the directed commercial SSEI sablefish fishery, 1985 through October 2011. Number of permits in 1985 represents permits fished; limited entry was implemented in 1986.

Year	Annual harvest objective	Equal quota share	Longline and Pot Fishery combined		Longline Fishery		Pot Fishery	
			Harvest	Ex-vessel value	No. of permits	No. of days	No. of permits	No. of days
1985	790,000	—	511,617	\$322,319	43	7	0	7
1986	790,000	—	597,503	\$283,496	22	7	2	7
1987	790,000	—	435,501	\$291,785	22	5	0	5
1988	790,000	—	731,584	\$738,070	26	5	1	5
1989	790,000	—	963,088	\$721,653	31	5	1	5
1990	790,000	—	758,663	\$553,823	30	3	0	3
1991	790,000	—	680,688	\$626,362	30	2.4	1	2.4
1992	790,000	—	941,182	\$941,505	30	2.4	1	2.4
1993	790,000	—	824,011	\$815,770	30	2.4	0	2.4
1994	790,000	—	866,788	\$1,066,149	30	2.4	0	2.4
1995	790,000	—	678,762	\$1,323,585	30	2	0	2
1996	790,000	—	502,459	\$899,401	30	2	0	2
1997	790,000	23,200	725,067	\$1,602,404	30	45	5	76
1998	632,000	20,400	578,056	\$813,421	29	45	4	76
1999	720,000	24,000	661,424	\$1,199,468	26	45	4	76
2000	696,000	24,000	590,815	\$1,176,816	25	76	4	76
2001	696,000	24,000	650,678	\$1,249,300	25	76	4	76
2002	696,000	24,000	650,339	\$1,287,650	25	76	4	76
2003	696,000	24,860	656,936	\$1,506,541	24	76	4	76
2004	696,000	24,860	648,845	\$1,030,675	24	76	4	76
2005	696,000	24,860	639,719	\$1,351,440	24	76	4	76
2006	696,000	21,750	624,832	\$1,434,739	28	76	4	76
2007	696,000	21,750	620,168	\$1,514,353	28	76	4	76
2008	696,000	21,750	618,033	\$1,854,397	28	76	4	76
2009	634,000	22,650	595,748	\$1,767,276	25	76	3	76
2010	634,000	23,400	558,633	\$2,055,766	24	76	3	76
2011	583,280	23,300	540,931	\$2,642,925	22	76	3	76

Note: Equal quota share was implemented in 1997.

Table 15.—Pacific cod reported harvest (round pounds), ex-vessel value, and effort, from NSEI and SSEI directed commercial fishery and bycatch in the groundfish and halibut fisheries, 1985 through October 2011.

Year	Directed harvest	Directed value	Directed permits	Total harvest	Total 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	335,462	\$185,723	17	375,836	\$192,998	167

Table 16.—Flatfish reported harvest (round pounds), ex-vessel 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, 1987–2011.

Season	Trawl harvest	Directed value	Directed permits	Total harvest	Total 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

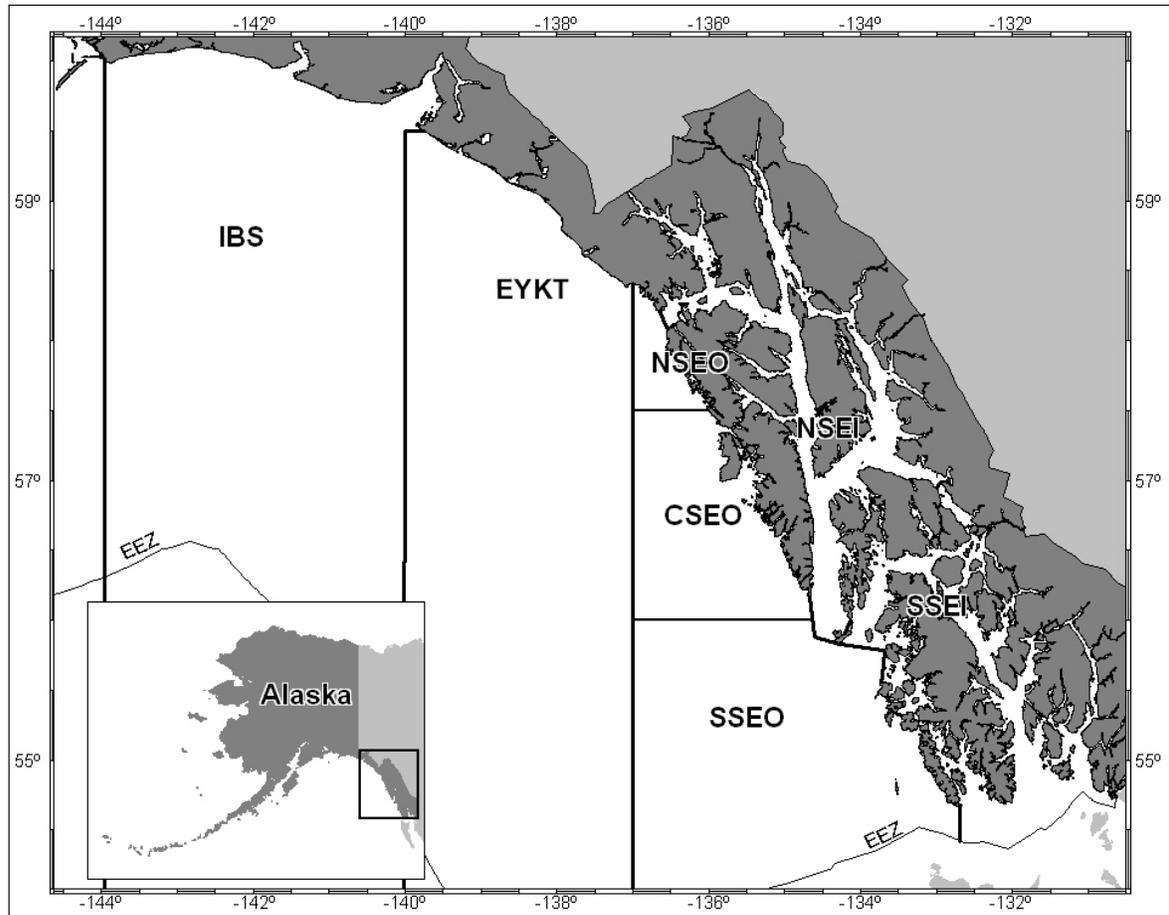


Figure 1.—Southeast District groundfish management area boundaries in Southeast Alaska waters: Icy Bay Subdistrict (IBS), East Yakutat (EYKT) Section, Northern Southeast Outside (NSEO) Section, Central Southeast Outside (CSEO) Section, Southern Southeast Outside (SSEO) Section, Northern Southeast Inside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

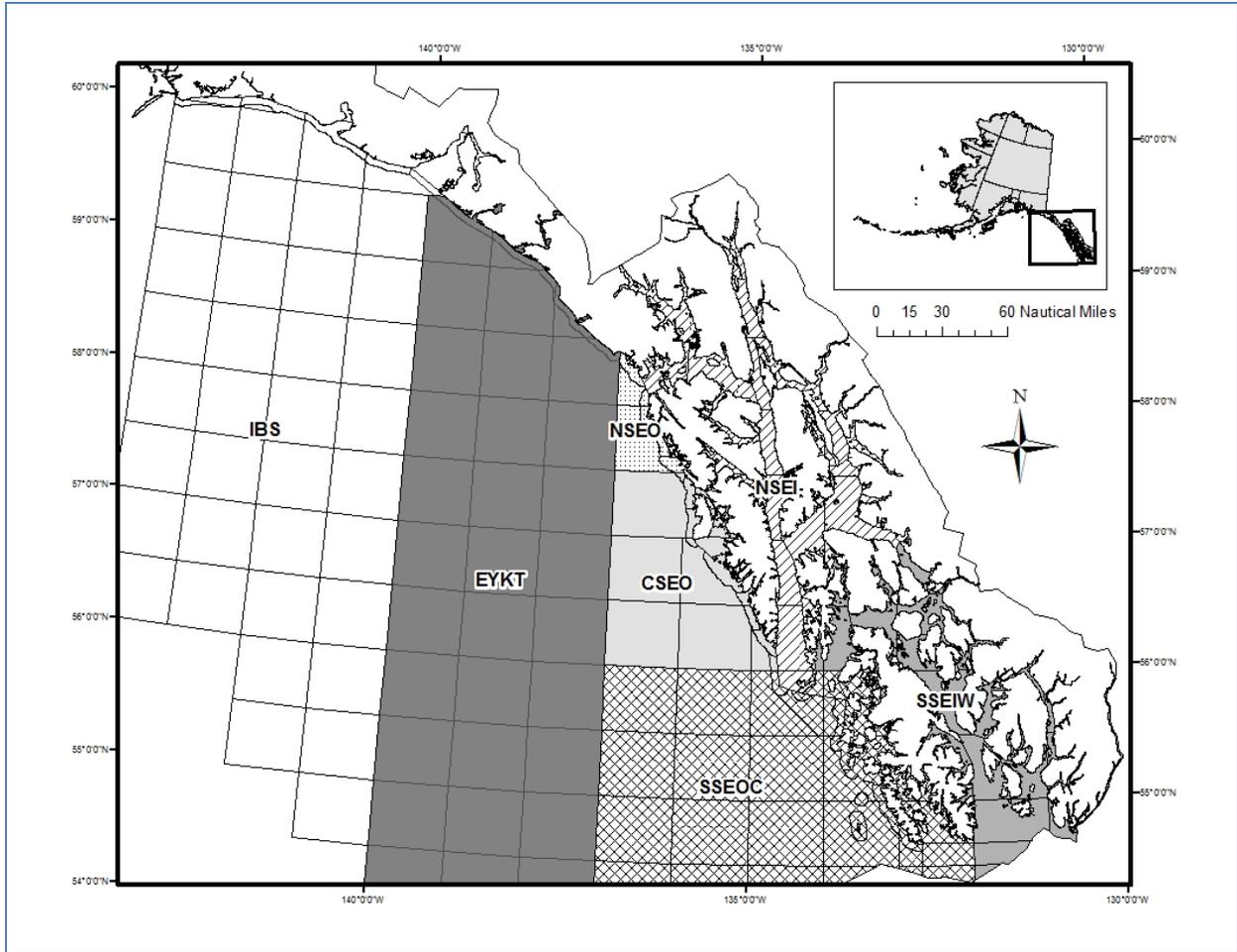


Figure 2.— Lingcod management area boundaries in Southeast Alaska waters: Icy Bay Subdistrict (IBS), East Yakutat (EYKT) Section, Northern Southeast Outside (NSEO) Section, Central Southeast Outside (CSEO) Section, Southern Southeast Outer Coast (SSEOC) Sector, Northern Southeast Inside (NSEI) Subdistrict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

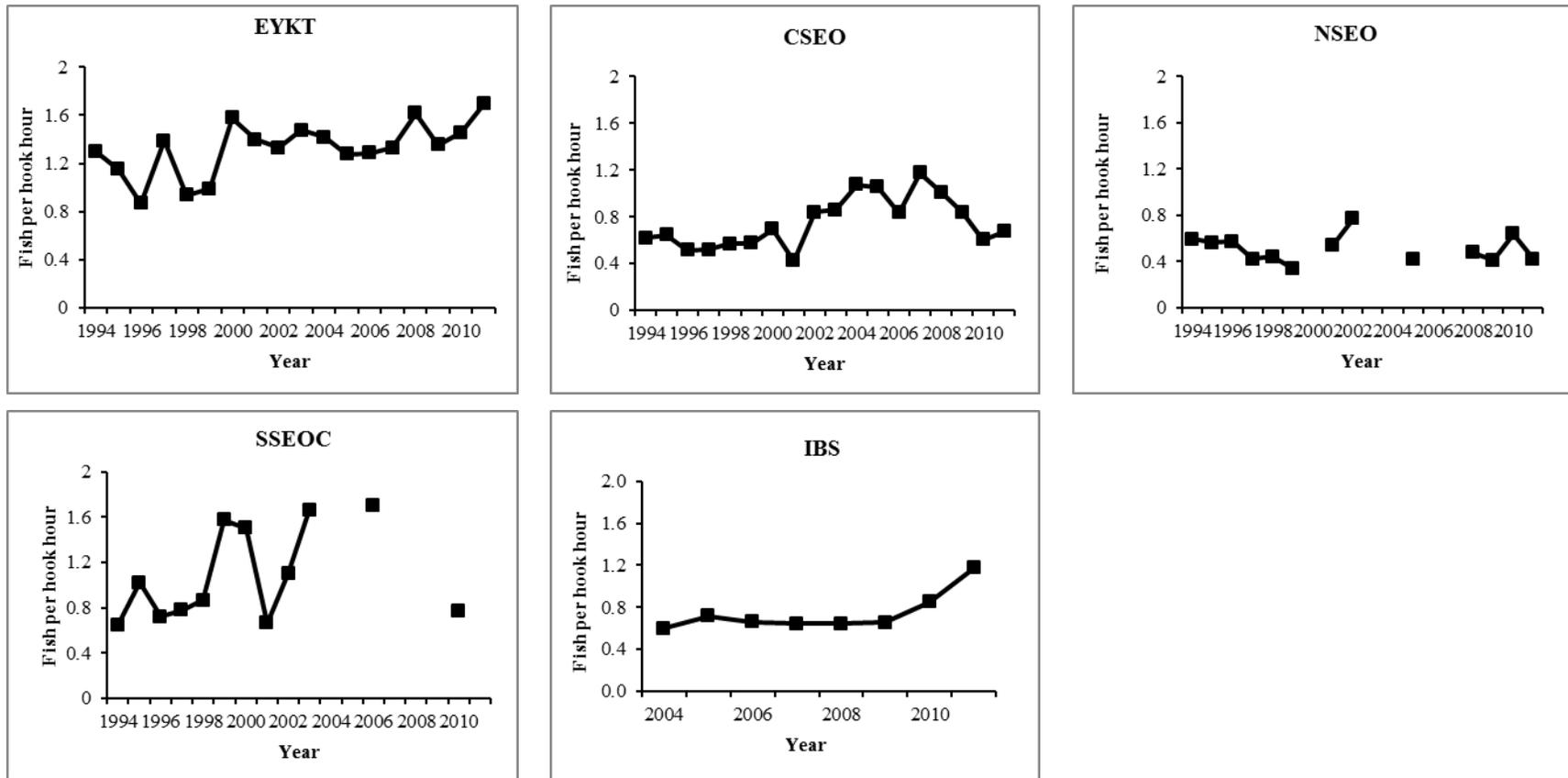


Figure 3.—Lingcod directed commercial fishery catch per unit effort (retained lingcod/hook hour) by each management area: Icy Bay Subdistrict (IBS), East Yakutat (EYKT) Section, Northern Southeast Outside (NSEO) Section, Central Southeast Outside (CSEO) Section, and Southern Southeast Outer Coast (SSEOC) Sector.

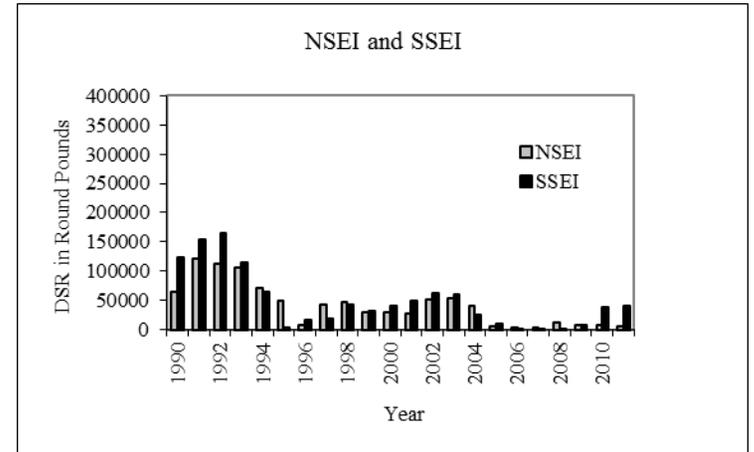
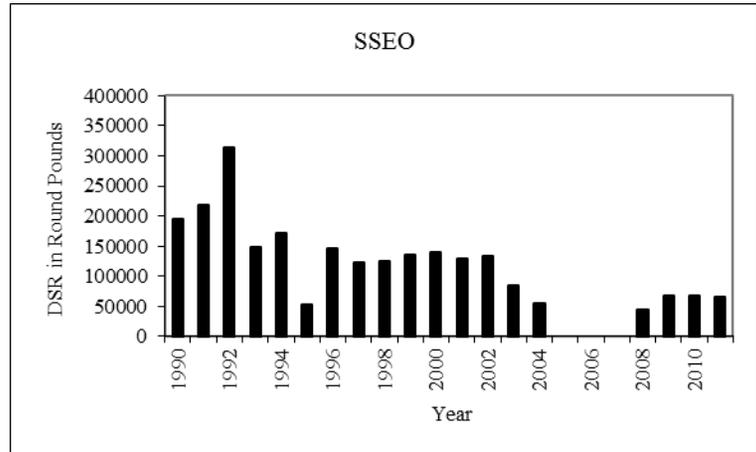
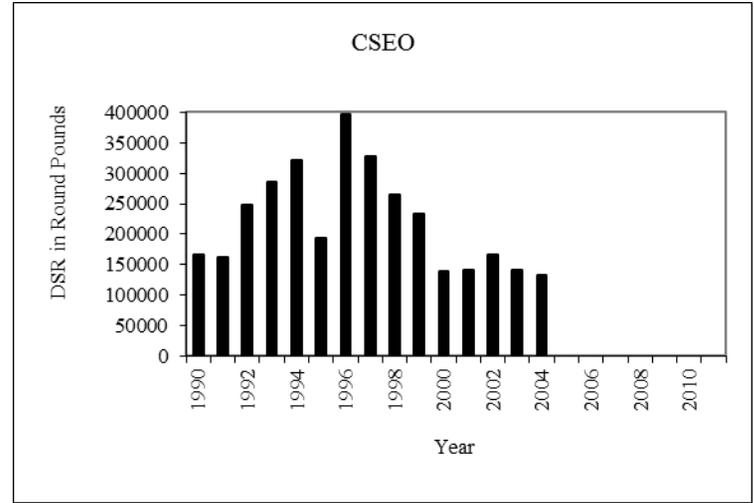
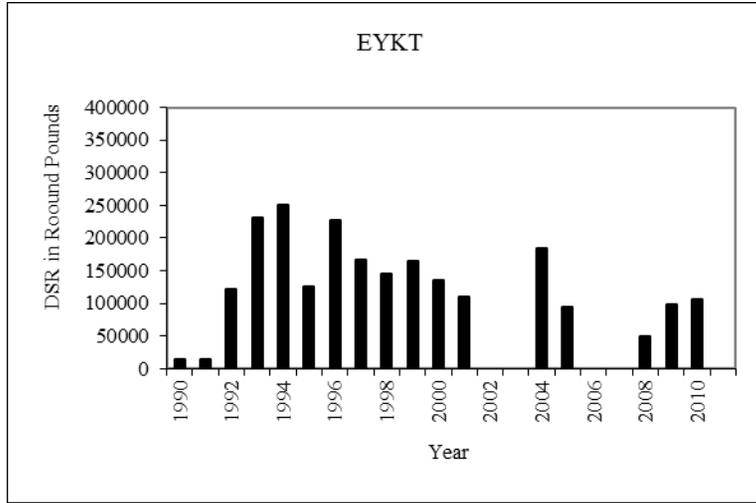


Figure 4.—Directed demersal shelf rockfish (DSR) landings (round pounds) by selected management area: East Yakutat (EYKT) Section, Central Southeast Outside (CSEO) Section, Southern Southeast Outside (SSEO) Section, and Northern and Southern Southeast Inside (NSEI and SSEI) Subdistrict, 1990–October 2011.

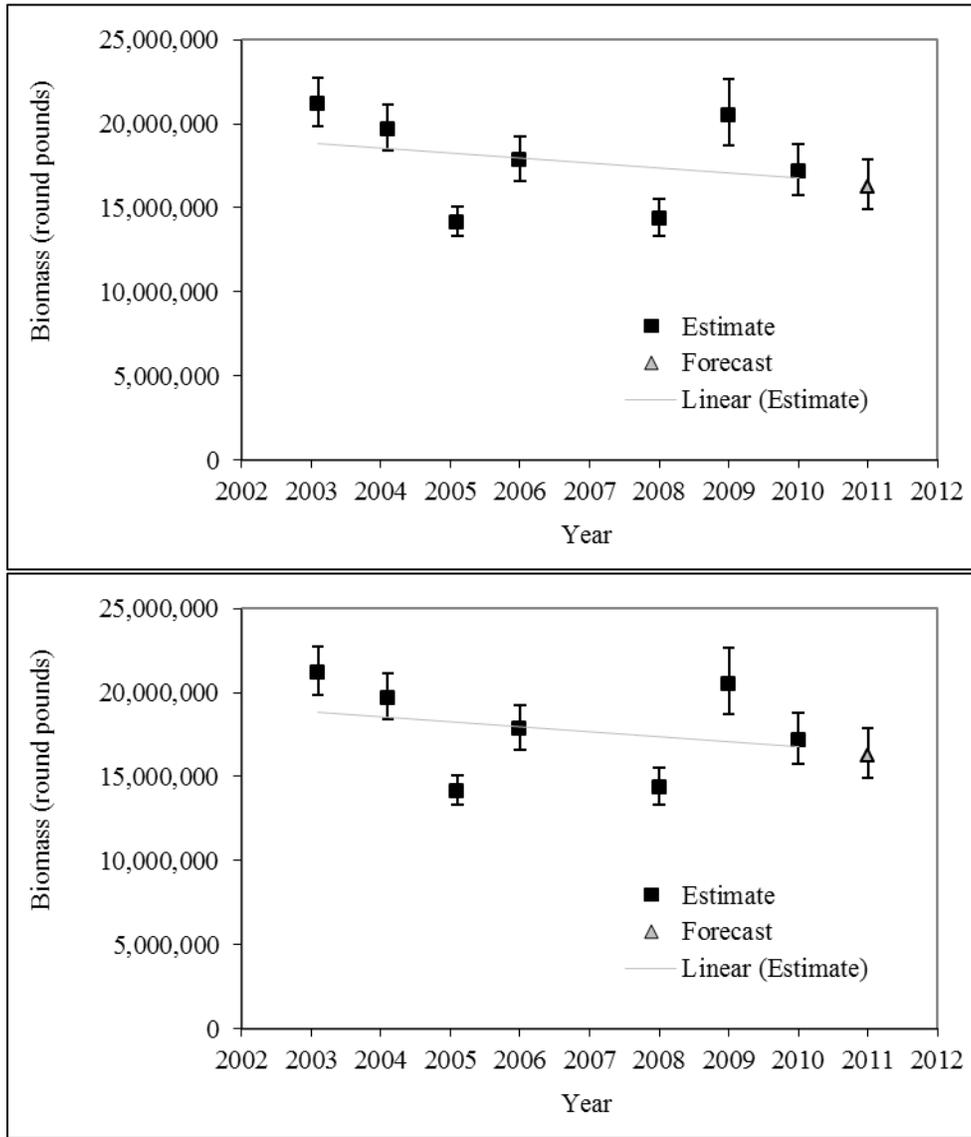


Figure 5.–Petersen estimates of exploitable biomass in Northern Southeast Inside (NSEI) Subdistrict based on mark-recapture study from 2002–2010 with 2011 forecast and 90% confidence intervals.

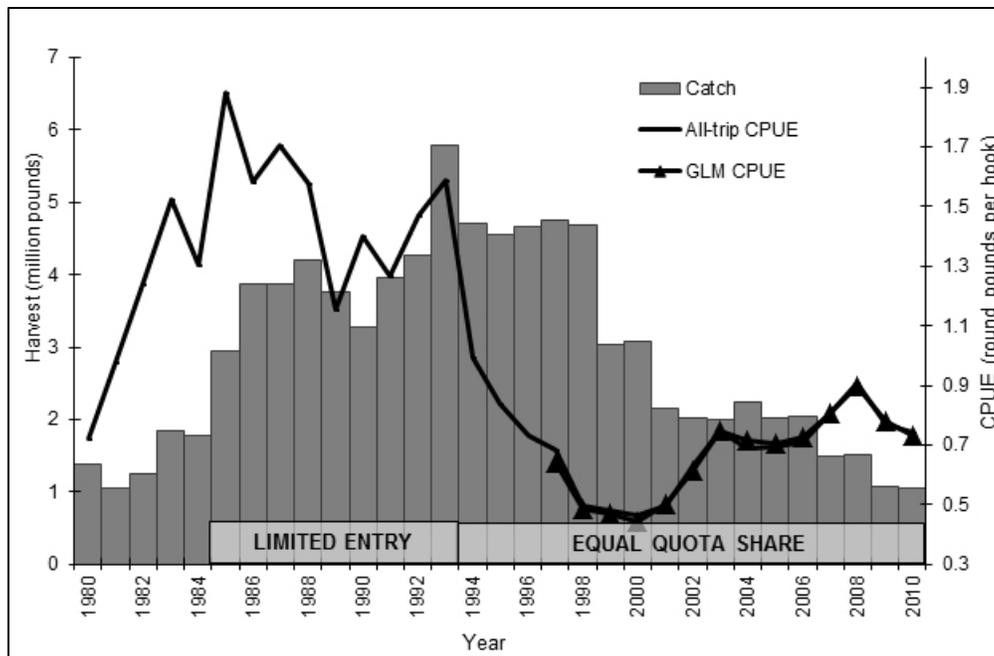


Figure 6.—Northern Southeast Inside (NSEI) Subdistrict commercial directed sablefish fishery catch per unit of effort (CPUE) in round pound per hook, and harvest in millions of pounds from 1980 to 2010. CPUE results from a General Linear Model (GLM) are also displayed. Limited entry began in 1985, and equal quota shares began in 1994.

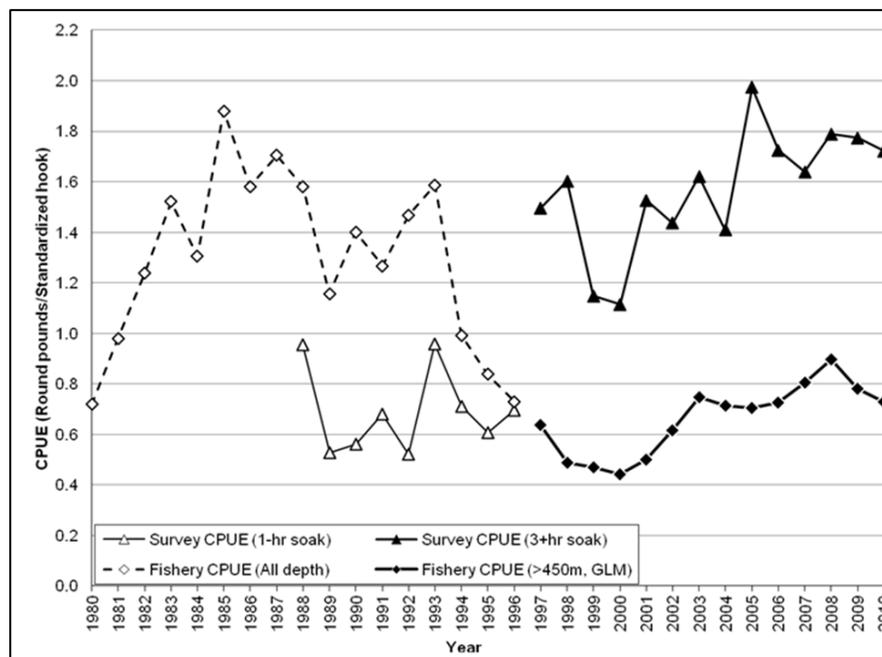


Figure 7.—Northern Southeast Inside (NSEI) commercial sablefish fishery and department longline survey Catch Per Unit Effort (CPUE), 1980–2010. Longline survey set soak time during the 1988–1996 surveys was 1 hour long, as opposed to 3–11 hours long during 1997–2010.

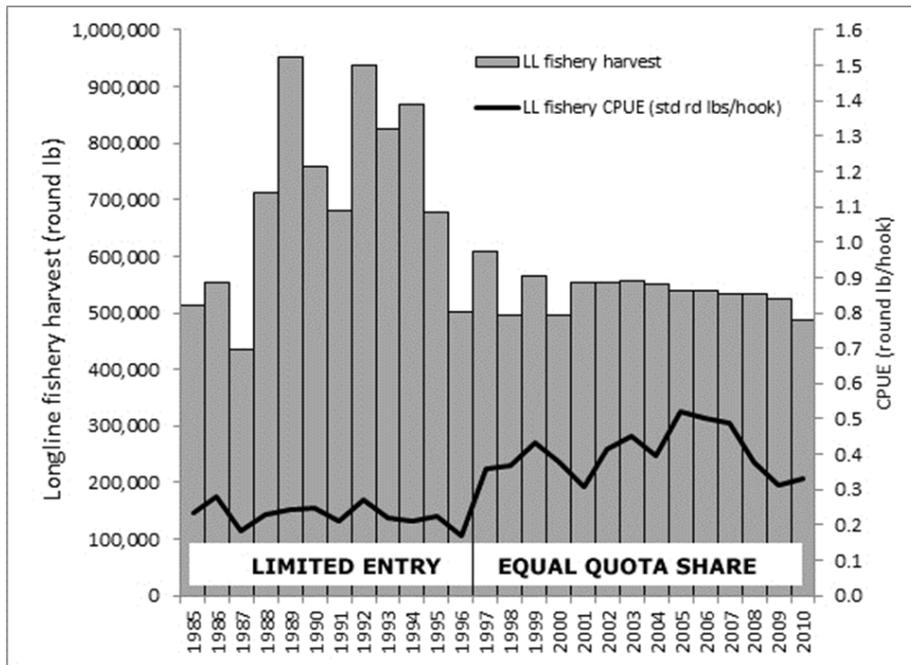


Figure 8.– Southern Southeast Inside (SSEI) Subdistrict sablefish commercial longline fishery harvest in round pounds, and fishery Catch Per Unit Effort (CPUE) (round pounds per hook), 1985–2010. Limited entry began in 1985, and equal quota share began in 1997.

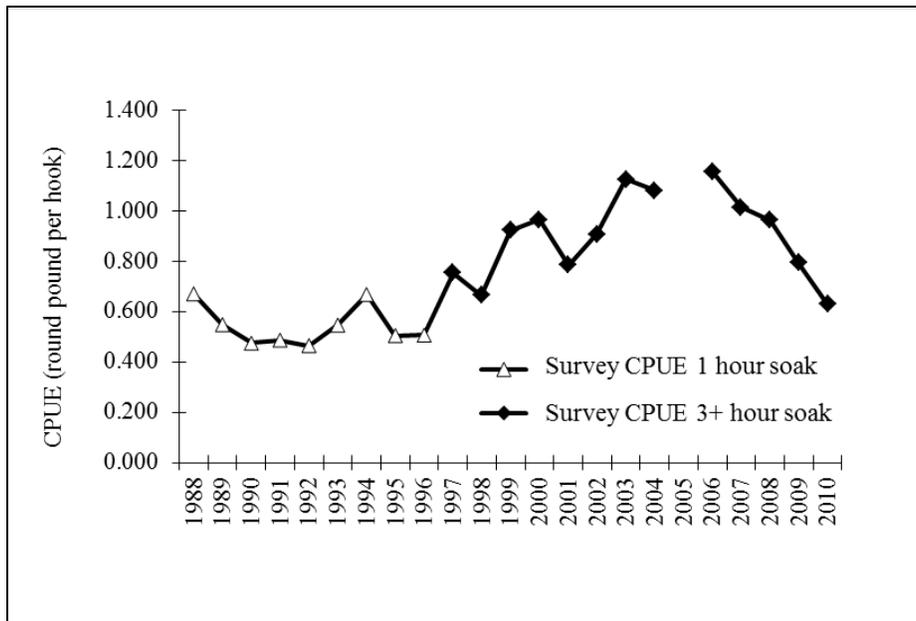


Figure 9.–Southern Southeast Inside (SSEI) Subdistrict sablefish longline survey Catch Per Unit Effort (CPUE) (round pounds per hook), 1988–2010. Longline survey set soak time during the 1988–1996 surveys was 1 hour long, as opposed to 3–11 hours long during 1997–2010. No survey was conducted in 2005.