Report to the Board of Fisheries

GROUNDFISH FISHERIES

Region I: Southeast Alaska-Yakutat

Alaska Department of Fish and Game
Commercial Fisheries Division
Juneau, Alaska

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REPORT TO THE BOARD OF FISHERIES,

REGION I GROUNDFISH FISHERIES

By

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ABSTRACT

This report includes summaries of catch and effort information and management actions for the period 1996-1998 and an outlook to the 1999 season for the groundfish fisheries managed by the Alaska Department of Fish and Game (ADF&G) in Region I, the Eastern Gulf of Alaska. Harvest of groundfish in this jurisdiction totaled 8,099,451 pounds in 1996, 8,426,239 pounds in 1997, and 8,334,723 pounds in 1998 (Table 1). The estimated exvessel value of $12.7 million in 1996 increased to $15.2 million in 1997 before declining to $10.2 million in 1998. The decline in value of groundfish landings in 1998 is due primarily to a decline in the price of sablefish and demersal shelf rockfish.

All species are managed on a calendar year basis, except flatfish, for which the season is October 1 through September 30. Inseason management action was required in the sablefish, demersal shelf rockfish (DSR), lingcod, flatfish, pelagic shelf rockfish, and Pacific cod fisheries in all years during the reporting period.

The total lingcod harvests declined from 755,771 round pounds to 560,427 round pounds in 1998. The decrease was due primarily to a 37% decline in the directed dinglebar fishery catches between 1996 and 1998. Landings from the East Yakutat (EYKT) management area continued to dominate the Southeast District harvest comprising 49%, 52%, and 39% of the total dinglebar catch in 1996, 1997, and 1998 respectively. Declines in the EYKT directed fishery were due to management action. Landings from the Southern Southeast Outside (SSEO) area have increased significantly since 1995, and in 1998 accounted for 24% of the total directed fishery harvest. Directed harvests in Central Southeast Outside (CSEO) and Northern Southeast Outside (NSEO) are well below the GHL and CPUE continues to decline in these areas.

The total landings of Demersal Shelf Rockfish (DSR) have declined region-wide between 1996 and 1998. The Total Allowable Catch (TAC) declined beginning in 1998. The directed fishery in the CSEO area continued to close within the first month of the winter and fall season. The pace of the fishery in other areas varied. In EYKT, inclement weather often prevented the quota from being taken by the close of the season. Market conditions in ports in SSEO continue to be unstable, influencing the pace in which the quota was reached each year and season. Occasionally the quota in the inside areas closed before the end of the season due to concentrated effort by a few boats. No directed fishing was allowed in NSEO waters. Major regulation changes made during the 1997 Board of Fisheries meeting included allocating the directed fishing quota between the winter and fall fishing periods, setting the Southern Southeast Inside (SSEI) and Northern Southeast Inside (NSEI) directed fishing quotas at 50 mt each, making dinglebar troll gear legal for DSR, and allowing the DSR directed fishery to take 35% lingcod as bycatch.

The total landings of pelagic shelf rockfish taken in internal waters have averaged 11,000 pounds per year for the past five years, with approximately 37% taken by mechanical jig gear in the directed fishery. A small black rockfish directed fishery developed rapidly in Southeast in 1992 and peaked in 1997 before declining to low levels due to low effort in 1998.

The NSEI sablefish fishery was changed to a shared quota system in 1994. The harvest objective was 4.8 million round pounds from 1996-1998. The individual share increased from 38,888 round pounds in 1996 to 41,700 pounds in 1998. This increase in the individual share was due to the exclusion of additional interim permits from the fishery. The Southern Southeast Inside (SSEI) sablefish fishery was open for 48 hours in 1996, during which 502,459 round pounds of the guideline harvest limit of 790,000

round pounds were taken. The shared quota system was implemented in the SSEI sablefish fishery in June of 1997. A total of 725,070 round pounds of the 790,000 round pounds harvest objective were taken that year. In 1998, the harvest objective was lowered 20% due to a significant decline in the catch per unit effort (CPUE) in the research survey conducted three weeks prior to the opening of the fishery. A new regulation in 1997 closed the 0-3 mile coast of the Southeast Outside subdistrict to retention of sablefish.

Pacific cod landings have remained steady in the last three years, increasing 20% from 1996 to 1997 before declining 16% in 1998. As in the past, the majority of the harvest (88%) is taken in the NSEI management area.

Inseason management action was necessary in the flatfish trawl fishery in 1998. On April 1, 1998, the waters of Zimovia Strait and portions of Anita Bay were closed to the directed fishing after approximately 20,000 pounds of flatfish were landed from this area. Effort and participation remains low in this fishery.

In 1998 the Board of Fisheries (BOF) closed a 3.2 square mile area surrounding the Cape Edgecumbe pinnacles to all groundfish fishing. The North Pacific Fishery Management Council acted in 1999 to close this area to all halibut and groundfish fishing. This is the first no-take groundfish marine reserve in Alaska.

INTRODUCTION

The Eastern Gulf of Alaska 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 140° W. longitude and all waters of Yakutat Bay and waters three miles seaward of a line from Pt. Manby to Ocean Cape (Figure 1).

The Alaska Department of Fish and Game has management jurisdiction over all groundfish resources within state waters in the Eastern Gulf of Alaska area, and these are managed as part of Region I. 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, a provision in the Gulf of Alaska Groundfish Fisheries Management Plan (FMP) authorizes the state to execute inseason management of DSR in both state and federal waters in the SEO Subdistrict (outer coastal waters east of 140° W. longitude). Lingcod is under state jurisdiction in both state and federal waters east of 147° W. longitude because lingcod is not defined as a groundfish under the FMP. In 1999, the North Pacific Fisheries Management Council (FPFMC) removed black and blue rockfish from the FMP. The State of Alaska now has sole management and assessment responsibilities for these species.

Six groundfish management areas have been established in the Southeast Alaska and Yakutat area (Figure 1). Four of the areas, EYKT section, NSEO section, CSEO section, and Southern Southeast Outside section (SSEO), are along the outer coast and make up the SEO subdistrict. The remaining two areas, Northern Southeast Inside (NSEI) subdistrict and Southern Southeast Inside (SSEI) subdistrict, are in internal waters.

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 (NPFMC) under the terms of a cooperative agreement with NMFS. Under this agreement, ADF&G staff has the responsibility of collecting, editing, and entering all fish tickets from the domestic harvest of groundfish in Alaska waters. The state is also involved in the management of groundfish in the EEZ through the groundfish project leader's participation on the Gulf of Alaska Groundfish Plan Team.

This report provides detailed harvest, effort, and management information for the state-managed groundfish fisheries in the Eastern Gulf of Alaska for the period 1996 through 1998. The primary state-managed fisheries within the region include sablefish, rockfish, lingcod, Pacific cod, black and blue rockfish, and starry flounder. 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 on sablefish and DSR almost exclusively use longline gear and directed lingcod fisheries use primarily dinglebar troll gear. Flatfish are harvested with trawl gear.

A 3.2 square nm area surrounding the Cape Edgecumbe pinnacles was closed to removals of all groundfish by the Board of Fisheries (BOF) in 1998 and to all halibut and groundfish by the NPFMC in 1999. This represents the first no-take groundfish marine reserve in Alaska.

Harvest totaled 8,099,451 pounds in 1996, 8,426,239 pounds in 1997, and 8,334,723 pounds in 1998 (Table 1). The estimated exvessel value of $12.7 million in 1996 increased to $15.2 million in 1997 before declining to $10.2 million in 1998 (Table 1). The decline in value of groundfish landings in 1998 is due primarily to a decline in the price of sablefish and demersal shelf rockfish.

LINGCOD

Lingcod are the largest member of the greenling family, attaining a maximum length of five 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 may occasionally move large distances. Females attain a greater size and age than males. Lingcod live to a maximum age of at least 20 years and have an unusual reproductive strategy. Males move into nearshore rocky areas in the fall and set up territories. Females move into this area just prior to spawning and leave the area post-spawning. The females lay large egg masses and the males, after fertilizing the eggs, guard the egg mass from predation until hatching, generally 7 to 11 weeks.

Lingcod have traditionally been an important bycatch species in the rockfish longline fishery and in the salmon troll fishery, as well as bycatch in the halibut fishery and taken in subsistence and recreational fisheries. The directed commercial fishery for lingcod developed in 1987 off the outer coast of Kruzof Island in CSEO and has increased in importance and presence since that time.

Fisheries and History

Prior to 1987, lingcod taken in the Southeast District were landed incidentally in fisheries targeting other species (Gordon 1994). Lingcod have traditionally been landed as a bycatch in the longline fishery for demersal shelf rockfish. In some areas and seasons, bycatch rates of lingcod taken in the DSR fishery have exceeded 50%. Lingcod have also been taken as bycatch in the salmon troll and halibut longline fishery.

The directed commercial lingcod fishery has developed steadily since its inception in 1987 when a small fleet using dinglebar gear harvested 159,000 pounds of lingcod from the northern CSEO and NSEO areas. In 1991, the directed fishery catch of 492,742 pounds accounted for almost half of the total catch (Table 2). 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 the EYKT subdistrict, primarily the Fairweather Ground (Table 3). The peak directed fishery harvest occurred in 1995, with 653,228 pounds taken. The total harvest of lingcod was highest in 1991, with 960,378 pounds landed by all gears (Table 4).

Regulation Development

The BOF first addressed Southeast Alaska lingcod management at their 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 limit of 300,000 to 500,000 pounds was established for the Southeast District (east of 137^{o} W. longitude) based on catch histories in the CSEO fishery. In addition, a winter closure inside the surfline 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 fishers, longliners, and trollers, and developed a lingcod management plan to present to the BOF. The board adopted an interim management strategy for Southeast lingcod in 1994. Using a habitat-based approach, GHL ranges were set between 0.25 mt/nm^2 and 0.50 mt/nm^2 of rocky habitat for each management area. Seasonal and area allocations were also set for the directed and 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 defined as hook and line only.

In 1997, the BOF 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.

Stock Assessment and Management

The department does not have a reliable method of estimating lingcod abundance and must rely on fishery performance data to estimate population trends and to determine whether harvest levels are sustainable. The directed commercial fishery data are indicative of stock declines and serial depletion. Catch per unit effort data (CPUE), in terms of fish/hook hour, shows that CPUE has declined between 21% to 62% in areas where there has been development of a directed fishery. There appears to be some serial depletion in the CSEO and NSEO areas and the commercial fleet has moved into the EYKT and SSEO areas. For these reasons, we believe that the current GHLs, based on the habitat area approach described above, do not appear to be sufficiently conservative to provide for sustained yield.

The department has initiated research to estimate abundance, but this work is still in the development stage. For example, research surveys to obtain catch per unit effort independent of the fishery have occurred seasonally since 1993. Because the movement of local stocks of lingcod in Southeast Alaska is not well understood, a tagging study was launched in the spring of 1996. To date, over 3,700 lingcod have been tagged and 77 tags have been recovered. An exploitation rate will also be estimated based on the tag recovery program and fishing removal experiments begun in 1999.

In addition to the tagging research, the department is a participant in a cooperative project with the California Sea Grant Program to use ultrasonic telemetry techniques to investigate the utility of marine reserves for protection of lingcod stocks. Lingcod caught in the Cape Edgecumbe pinnacle marine reserve area, will be implanted with sonic tags. Movements of tagged lingcod will be monitored by receivers placed on the ocean floor.

1996, 1997, and 1998 Season Summary

In the Southeast District, the total lingcod harvests declined from 755,771 round pounds in 1996 to 612,950 round pounds in 1997 and 560,427 round pounds in 1998 (Table 1). The decrease was due primarily to a 21% decline in the directed dinglebar fishery catches from 1996 to 1997 and a 16% decline from 1997 to 1998 (Table 2). Management action has been taken in the directed commercial fishery since 1991, including the imposition of quotas and seasonal allocations. The longline and troll catches have remained fairly stable (Table 2). The slight decline in longline harvest is a reflection of reduced quotas for the DSR fishery.

The directed fishery GHL has recently only been met in the EYKT area. The reduction in harvest in the CSEO and NSEO area is reflective of declining CPUE in those areas. Landings from the EYKT management area continued to dominate the Southeast District harvest in all three years comprising 49%, 52% and 39% of the total dinglebar catch in 1996, 1997, and 1998 respectively (Table 3). Landings from the SSEO area have increased significantly since 1995, and accounted for 24% of the directed fishery catch in 1998 (Table 3). Conservation closures occurred in some areas of CSEO, NSEO, and SSEO.

The EYKT area is the only area where GHLs are limiting to the fishery. The reduction in harvest in the EYKT area is due to in-season closures. Recently, sport harvest has increased dramatically, primarily due to an increase in charter vessels, and accounted for 327,000 round pounds, 34% of total removals, in 1998.

1999 Outlook

The 1999 lingcod total harvest (January through September) in Southeast Alaska continued to show a declining trend since 1996 (Table 2). Catch summaries by gear showed this decline prevailed across all gear types (Table 2). The directed fishery landed 59% of the total harvest, a slight decrease from the 66% taken in 1998 (Table 4).

A delayed opening of state waters until May 16 was also implemented in 1999 by emergency order. Inseason management actions included small area closures in high fishing effort areas to prevent localized depletion.

Research surveys to collect biological samples, to tag, and to measure catch and effort in the Southeast Outside subdistrict continued with additional emphasis on tagging.

The department will propose significant reductions in GHLs for lingcod at the January 2000 BOF meeting. The department is recommending rescinding the habitat approach for setting GHLs for this species. The proposal would modify the department's management strategy for lingcod to include all fisheries (commercial, sport, subsistence, and personal use) under a guideline harvest level for each management area. An extension of the winter closed period through May 31 is also being proposed.

ROCKFISHES

More than 30 species of rockfishes from two genera (*Sebastolobus* and *Sebastes*) are landed in Region I groundfish fisheries. Thornyhead rockfish (*Sebastolobus spp*) inhabit the continental slope in waters as deep as 6,000 feet. These fishes are landed primarily as bycatch in the sablefish longline fishery. The *Sebastes* rockfishes are divided into three assemblages for management purposes because a group of species co-inhabiting an area are generally caught together. The assemblages are based on habitat preference and behavior:

- The DSR 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 five nearshore schooling species including black rockfish (*S. melanops*) and dusky rockfish (*S. ciliatus*).
- 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. Rougheye rockfish (*S. aleutianus*), shortraker rockfish (*S. borealis*), and Pacific Ocean perch (*S. alutus*) are predominant commercial species in this group.

DEMERSAL SHELF ROCKFISHES

The assemblage definition for DSR has changed three times since its inception as a result of new information. The current DSR assemblage comprises seven species including yelloweye rockfish, quillback rockfish, tiger rockfish, china rockfish, canary rockfish, copper rockfish, and rosethorn rockfish.

Yelloweye rockfish, the dominant species in the DSR assemblage, occur in nearshore waters to 200 fm (although commonly to 100 fm) from northern Baja California to the Aleutian Islands. These fish are habitat specific, occurring on rocky reefs, ridges, and pinnacles. They attain a maximum length of 36 inches and maximum reported age of 118 years (O'Connell and Funk 1986). They are slow growing, late maturing, and ovoviviparous or viviparous (Adams 1980, Gunderson 1980, Archibald et al. 1981, Boehlert and Yoklavich 1984, Boehlert et al. 1986).

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 using skiffs and automatic jigging machines. By 1982 longline gear had replaced jigging machines and with the change in gear type the dominant species caught became yelloweye and quillback rockfish. Harvest increased six fold in five years with total catch exceeding one-million pounds in 1986. Prior to 1984 well over half of the total Southeast Alaska rockfish landings were reported from the CSEO area. Management action was limited to the CSEO area and as effort and harvest continued to increase much of the effort shifted into the SSEI management area followed by a shift in the late 1980s to the SSEO area. A directed DSR fishery developed in the EYKT subdistrict in 1991, primarily targeting yelloweye on the Fairweather Ground. The majority of the DSR harvested in Southeast Alaska continues to be in the EYKT, CSEO, and SSEO management areas, with little effort and harvest in the inside waters (Figure 2). The State has not opened the directed fishery in the NSEO section since 1994 when the stock assessment survey in that area indicated a low abundance of fish. Table 5 lists harvest, value, and effort for the DSR fishery from 1987 through September 1999.

Prior to the implementation of management for this fishery, there was a general trend toward high effort close to port followed by a period of fishing further and further from port. This is significant for several reasons. DSR are habitat specific, and tend to be resident, preferring rocky reefs, ridges, and pinnacles and consequently are susceptible to localized depletion. The market for DSR is primarily a high quality, round fish, fresh market. This means that fish may not be delivered to the plant more than four days after capture, limiting the feasible travel distance to fishing grounds. The increase in travel distance was almost certainly due to localized pressure causing declines in abundance. Imposition of regulations and inseason management action combined seems to have provided some stabilization.

Regulation Development

The DSR fishery has been intensively managed since 1989. Prior to 1989 the fishery occurred primarily in the CSEO area where a 1.3 million pound harvest cap was placed in 1984. Limited management measures were in place for this area only, beginning in 1987 a draft management plan was written and quotas 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), exploring management options for this fishery. The workshop was funded through PSMFC. Several recommendations for management actions came from this working group and were implemented at the 1989 BOF meeting.

In the 1980s the fishery was managed with an October 1 start date. In 1989 regulations were passed to retain 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 pounds per five-day period. Legal gear for DSR was defined as hook and line only. Annual guideline harvest limits 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 to be maintained by fishers directed fishing for DSR. A DSR directed fishery CFEC permit card for Southeast Alaska was introduced in 1990. Fishers making directed landings from EYKT did not use this card until 1991 when EYKT was included in the SEO subdistrict.

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 mortality cap in non-halibut fisheries) was met. In 1991 the NPFMC set aside a separate allocation of halibut mortality for the DSR fishery that prevents the directed DSR fishery from being impacted by excessive halibut bycatch in other Gulf of Alaska fisheries.

Bycatch and wastage of DSR in other fisheries is a concern because these species often die when brought to the surface, making release ineffective. Consequently, a regulation was passed that allowed for unlimited retention of all DSR landed incidental during the halibut fisheries. This was to minimize wastage of bycatch that occurred during the historic 24-hour halibut fisheries. Additionally, fishers may no longer target DSR while fishing for bait, and no more than 10% by weight of bait catch may be DSR.

In 1991 the NPFMC extended the SEO District, and the State's management authority for DSR from 137^{o} W. longitude to 140^{o} W. longitude. Further regulation changes were made at the 1993 meeting, largely drafted by the Sitka Rockfish Working Group to reflect changes in the nature of the fishery. Reapportionment of DSR by season was made to allow for more product to be taken in the winter season when the price was best. New, lower guideline harvest limits were adopted for DSR and a directed fishery harvest limit for DSR in the East Yakutat District was implemented. Trip limits were set at 12,000 pounds for East Yakutat and reduced from 7,500 to 6,000 pounds in the other management areas.

Allowable biological catch levels (ABC) and total allowable catch levels (TAC) are now set annually for the SEO subdistrict as part of the NPFMC Fishery Evaluation and Stock Assessment process. These levels do not specify directed fishing levels. With the implementation of IFQ management for halibut, several major changes have occurred in management of rockfish. First, because the season for halibut is now open for eight months, the regulation that had allowed for unlimited retention of DSR during halibut fishing could easily result in exceeding the TAC for DSR, particularly when the price for DSR is high and there is an incentive to increase bycatch of these species. Therefore the directed season for DSR is limited to the non-IFQ months (January 1 - March 15 and November 16 - December 31) and bycatch during the halibut fishery is limited to 10%, by weight, of all halibut on board. Second, seasonal apportionment of DSR is now based on these two open periods with most of the production occurring in winter. Third, bycatch needs for other fisheries are estimated first (including an estimate of unreported mortality) and taken off the TAC prior to setting directed fishing levels in the SEO District.

In 1997, the Board of Fisheries changed the DSR directed fishery season by regulation to reflect the way the fishery had been managed since the implementation of the halibut IFQ fishery. Sixty-seven percent of the annual TAC was allocated to the winter season and 33 percent to the fall season. In addition, the board set the 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 50 mt in each area.

Stock Assessment and Management

The State is conducting a multi-year stock assessment survey for DSR in the SEO district. Biomass is estimated as the product of density/km^2 collected during line transect surveys, the area of rocky habitat within the 100 fm contour, and the average weight by management area (O'Connell and Carlile 1993, O'Connell et al. 1999). The NPFMC system requires that ABC and overfishing levels be set based on a six-tier system. DSR falls under the fourth tier, where a reliable point estimate of B (biomass), $F_{30\%}$ (fishing mortality rate, F, equal to 30% of the biomass per recruit), and $F_{40\%}$ (F equal to 40% of the biomass per recruit) are available. Allowable biological catch for the SEO Subdistrict is set by multiplying the lower 90% confidence interval of biomass for yelloweye rockfish by the natural mortality rate (0.02) and adjusting for the 10% of other species landed in the assemblage. This is more conservative than using the $F_{40\%}$ rate of 0.023. The overfishing level is set using a rate of $F_{30\%}$ (0.037). There is no stock assessment information available for NSEI and SSEI and these harvest levels are set at low levels based on historic CPUE and catch data.

Habitat mapping and line transect surveys continued in 1997 through 1999. In 1997, line transect surveys using a manned submersible were conducted in EYKT and CSEO management areas. Side scan sonar equipment was used to map habitat on the Fairweather Grounds in EYKT in 1998. In 1999, line transect surveys were performed in the SSEO and EYKT management areas.

1996, 1997, and 1998 Season Synopsis

The total DSR harvest in the Southeast District declined from 1,008,417 round pounds in 1996 to 913,492 round pounds in 1997 and increased to 940,783 pounds in 1998 (Table 1). The decline between 1996 and 1997 was due in part to the reduction of the directed fishing quota in EYKT and CSEO as a result of an increase in the estimated unreported mortality from 1996 (343,980 pounds) to 1997 (500,000 pounds). Although the TAC was reduced 43% from 1997 (2.1 million pounds) to 1998 (1.2 million pounds), the bycatch harvest increased 22% between 1997 (262,146 pounds) and 1998 (319,362 pounds) (Table 5). The exvessel value in the directed fishery increased 5% from 1996 ($787,585) to 1997 ($828,122) before declining 4% in 1998 ($751,919). Prior to 1995 many fishers landed their DSR bycatch from halibut on their directed fishery card which greatly increased the number of permits with DSR landings. Beginning in 1995, DSR bycatch landed in the halibut fishery was limited to 10% and had to be landed on a halibut permit card (Table 5). The number of directed fishing permits increased to 125 in 1996 and decreased to 88 in 1998 (Table 5).

Management actions included area quotas, seasonal allocations, and inseason small area closures to distribute effort. The directed fishery in the CSEO area continued to close within the first month of the winter and fall season. The concentrated effort and short season in CSEO is due primarily to the close proximity of good fishing grounds to Sitka, a primary port of landing. The pace of the fishery in other areas varied. In EYKT, inclement weather often prevented the quota from being taken by the close of the season. Market conditions in SSEO continue to be unstable, influencing the pace in which the quota was reached each year and season. Occasionally the quota in the inside areas closed before the end of the season due to concentrated effort by a few boats. No directed fishing was allowed in NSEO waters. In

1996, the EYKT and CSEO directed fishery allocation was 441,000 pounds for each management area and 220,500 pounds was allocated for the SSEO management area. The NSEI and SSEI were both allocated 55,125 pounds. In 1997, allocations for the directed fishery were reduced to 330,000 pounds for each EYKT and CSEO. The directed fishery quota remained at 220,500 pounds in SSEO and at 55,125 pounds each for the NSEI and SSEI areas. The allocations for the 1998 directed fishery were further reduced to 198,450 pounds for EYKT, 242,550 pounds for CSEO, and 154,350 pounds for SSEO due to the reduction of the TAC and an increase in the estimated unreported mortality. The NSEI and SSEI quotas remained at 55,125 pounds.

1999 Season Outlook

As of September 30, 1999, 70 directed fishery permit holders landed 435,973 pounds (round wt.) with an exvessel value of $474,041 (Table 5). An additional 332,175 pounds, valued at $285,974, were landed as bycatch in other fisheries (Table 5). It is estimated that 714,420 pounds were taken as unreported mortality.

The TAC for DSR in the SEO subdistrict remained at 1.2 million pounds (round weight) in 1999 because no additional line transect surveys were performed in 1998. The total directed allocations by management area were 220,500 pounds (round weight) in EYKT, 242,550 pounds in CSEO, 165,375 pounds in SSEO, and 55,125 pounds each for the NSEI and SSEI areas. The winter season for the CSEO closed January 8, 1999. The SSEO area was closed to directed fishing on January 21, 1999. The SSEI closed February 8 and EYKT closed March 8, 1999. Early closures were expected with the lower quotas for the outside waters. However, the SSEI area closed before the end of the winter season for the first time. The fall fishery opened November 16 with 70,000 pounds remaining in EYKT, 99,000 pounds in CSEO, 31,000 pounds in SSEO and NSEI, and 33,000 pounds in SSEI.

PELAGIC SHELF AND SLOPE ROCKFISHES

The PSR group includes black rockfish, dusky rockfish, widow rockfish, yellowtail rockfish, and blue rockfish. The total landings of pelagic shelf rockfish taken in internal waters have averaged 11,000 pounds per year for the past five years, with approximately 37% taken by mechanical jig gear in the directed fishery. A small black rockfish directed fishery developed rapidly in Southeast in 1992 and peaked in 1997 before declining to low levels due to low effort in 1998.

Pelagic shelf rockfish are primarily taken as bycatch in longline and troll fisheries in the NSEI and SSEI areas. (Table 6). In 1999, the North Pacific Fisheries Management Council (FPFMC) removed black and blue rockfish from the Federal Fisheries Management Plan (FMP). The State of Alaska now has sole management and assessment responsibilities for these species. Schools of adult black rockfish are often aggregated over rugged, rocky bottoms or in large feeding aggregations at the sea surface. Both these behaviors make them highly susceptible to a directed fishery. Because the Gulf of Alaska is the northern

most boundary of the distribution of blue rockfish, this species is rarely caught in the groundfish commercial fisheries in the Southeast district.

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 underwater cameras. A revised study will be conducted in 2000. In addition, historical catch data will be 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).

Slope rockfish include all deepwater species of rockfish not included in the DSR and PSR assemblages. Slope rockfishes 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 7). In addition to the bycatch landings, there are a few longline fishers who target slope rockfish in the NSEI area. There was a significant increase in the landings of slope rockfish beginning in 1995. The number of pounds landed increased 105% from 1994 and to 1995 (Table 7). There has been a steady but significant increase in the following years. In 1998, 905,127 pounds were landed, a 52% increase from the 426,904 pounds landed in 1995 (Table 7). The increase in landings can be attributed to two factors: a good market for slope rockfish, primarily thornyheads, shortraker, and rougheye rockfishes, and the change in management strategy for NSEI sablefish fishery. The longer season and slower pace of the fishery for sablefish encourages the retention of bycatch.

SABLEFISH

Sablefish (*Anoplopoma fimbria*) occur only in the North Pacific Ocean, the Bering Sea, and adjacent waters from Hokkaido, Japan to Baja, California with the greatest abundance in the Gulf of Alaska. Adult sablefish inhabit the deeper water areas of the continental shelf, the slope, and the 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 the NSEI fishery, the average age from survey samples of this long-lived species is estimated at 15 years, with a range of 1-88 years of age.

Sablefish is one of the most valuable fin fish currently sold in Southeast and Gulf of Alaska waters. The exvessel value of sablefish continued to increase in 1996 and 1997, peaking at $2.43/pound (round) in 1997 before declining to $1.57/pound (round) in 1998 (Table 1).

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: the NSEI area, where fishing occurs mostly in Chatham Strait, and the SSEI area, including Clarence Strait and adjacent waters of Dixon Entrance.

Prior to the 1940s, sablefish were primarily landed as incidental catch in the halibut fishery. Halibut longline gear was modified in the late 1940s to specifically target sablefish. Pot gear was first introduced in 1970 in the SSEI and Dixon Entrance, accounting for 33% of the harvest in the early 1970s. By 1979, pot gear was responsible for less than 5% of the catch. Harvest levels fluctuated widely until the 1970s due to price and more opportunities in other fisheries.

Season limitations were first imposed in 1945 for the NSEI fishery, and in 1982 for the SSEI fishery (Braken 1983). Seasons were shortened as effort escalated in the 1970s and 1980s. Guideline harvest ranges (GHRs) were established for both areas in 1980 based on historical catches. Fleet effort and efficiency continued to increase dramatically and the season was reduced to five days in the NSEI area by 1984 (Table 9). In 1985, a limited entry program was implemented for the fishing fleets in the NSEI and SSEI areas. However, the overall operating efficiency of the NSEI longline fleet increased seven fold after the limited entry program was in place. For example, the average number of hooks set per vessel per day increased from 4,791 in 1984 to 28,514 in 1993. In order to stay within harvest objectives, the department continued to reduce the number of fishing days in both areas. In the NSEI fishery, the number of fishing days went from 76 in 1980 to one in 1987. A one-day opening continued until 1993. In that year, the fleet harvested 3,640,000 dressed pounds, 2,140,000 pounds over the upper bounds of the 1,500,000 pounds GHL in 24 hours. In an effort to improve management, the Board of Fisheries adopted a shared quota system for the NSEI fishery beginning in 1994 as recommended by a working group of industry representatives and state fisheries managers. The number of days fished in the SSEI fishery declined from 200 days in 1980 to two days in 1996 (Table 10). In 1997, at industry's request, the Board of Fisheries adopted a shared quota system for the SSEI management area. In addition to minimizing the risk of overharvest and loss of gear, the shared quota system allowed the five pot permits to re-enter the fishery after being excluded due to the short seasons in recent years.

Regulations

Current management regulations, including guideline harvest ranges, management plans, fishing seasons, and gear specifications, are defined separately for the NSEI and SSEI management areas. The shared quota system directs the department to divide the annual harvest objective equally among the permanent CFEC permits and interim use permits eligible for each fishery. The GHR for NSEI is 1.59 to 4.8 million pounds (round). The GHR for the SSEI area is 400,000 to 790,000 pounds (round). There is no sablefish fishery in the state-managed 0-3 mile zone in outside coastal waters of Southeast Alaska because this zone is mostly too shallow to harbor adult sablefish, which are generally found at depths exceeding 200 fm. There are no size limits placed on the sablefish fisheries.

Current Fishing Seasons and Periods

Under the shared quota system, the NSEI management area is open between September 1 and November 15 by regulation each year. In SSEI management area, the longline gear season is open between June 1 and July 15, and to avoid gear conflicts, the pot fishery season is from September 1 to November 15 each year.

Gear Restrictions

Only longline gear can be used to catch sablefish in the NSEI fishery. Both longline and pot gear are legal in the SSEI fishery and pots may be longlined.

Stock Assessment and Management

In 1988, the department began annual longline research surveys in the NSEI and SSEI management areas to assess the relative abundance of sablefish over time. Previous research indicates substantial movement of sablefish into and out of both Chatham and Clarence areas, but neither the extent nor consequence of movement on the abundance of sablefish in those areas is known. Therefore, department surveys are conducted a few weeks prior to the fishery to determine relative abundance of sablefish near the time of the fishery. Fixed sampling stations were randomly assigned within statistical subareas 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. A general linear multivariate model (GLMM) has been used to detect significant CPUE trends over time. Biological data collected during the surveys include length, weight, sex, stage of maturity and otoliths (aging structures) from a subset of fish collected. This data is used to describe the age and size structure of the populations and detect recruitment events. The annual harvest objective for both fisheries was set after the department completed the survey in each management area.

In 1997, the department changed the survey design (Cartwright, in review). Prior to this year, the survey gear was retrieved one hour after it was deployed. The department had concerns that a one-hour soak in certain depths and tidal/current conditions might not adequately represent relative abundance. Therefore, the department changed to a three-hour soak time in 1997. At the same time, the department standardized survey methods with the National Marine Fisheries Service (NMFS) survey (three-hr soaks, squid bait, and 70" hook spacing). The department estimated a conversion factor from one-hour to three-hour soaks using a side-by-side study conducted in 1995. The results of this study indicated that the one-hour soak catch rates were approximately 43% of the three-hour soak catch rates.

In 1997 and 1998, a mark-recapture study was conducted to estimate absolute abundance in the NSEI management area (single event-Petersen method). The department tagged and released over 5,000

sablefish in the NSEI survey each year and a small proportion of the tags were recaptured in the fishery. Preliminary results suggested "hook shyness" may be present which may result in overestimates of abundance. The department will continue mark-recapture methods. However, we will investigate alternative capture methods for initial capture and tagging to reduce the chance of hook shyness and thereby promote more accurate estimates of abundance. Tags may also be useful to estimate an annual exploitation rate and to describe movement patterns of sablefish between the internal waters of Alaska, the Gulf of Alaska, and British Columbia. Application of an age-structured model (ASA) using fishery and survey data is also being explored to estimate abundance of sablefish.

In the past, the department set the harvest objectives for the sablefish fisheries after the survey was completed, a few weeks prior to the opening of the fishery. Because tagging and age structure data cannot be analyzed until after the fishery has been prosecuted, the department will set the overall quota for a given year prior to the survey, using the survey and fishery data from the previous years.

The fishery CPUE (pounds/hook) is calculated from mandatory logbooks collected after each individual fishing trip. Landed weight is obtained from fish tickets. Logbooks provide detailed effort data as well as information on location of fishing, numbers of fish caught, location of recaptured tags, and amount of gear lost by set.

1996, 1997, and 1998 Season Summary

The total sablefish landings from the two State-managed fisheries were 5.2 , 5.5, and 8.3 million pounds (round) in 1996, 1997, and 1998 respectively (Table 1). The exvessel value of the sablefish fisheries increased from $2.08/pound in 1996 to $2.40/pound in 1997 and declined to $1.55/pound in 1998 (Table 1).

NSEI

The NSEI sablefish fishery continued to stay within the 4.8 million round pound harvest objective in 1996-1998 under the shared quota system (Table 9; Figure 3). The Commercial Fisheries Entry Commission (CFEC) issued 121, 122, and 116 permanent and interim permits for the fishery in 1996, 1997, and 1998 respectively (Table 8). The individual vessel share increased slightly from 38,888 round pounds in 1996 to 41,700 round pounds from in 1998. This increase was a result of the same overall quota for the fishery divided by fewer eligible permit holders during these three years.

The harvest objective is determined by using the fishery and survey performance data (CPUE), the survey biological data, and tag return information. The survey CPUE (round pounds/hook) declined between 1996 and 1997 and slightly increased between 1997 and 1998 (Figure 4). The catch rates (round pounds/hook) in the NSEI fishery continued to decline at a faster rate than the survey CPUE (Figure 4).

SSEI

The number of round pounds landed for all gears in the SSEI sablefish fishery was 502,459, 725,070, and 571,067 for 1996, 1997, and 1998 respectively (Table 9). The shared quota system began in 1997, making the 1996 fishery the last "derby style" fishery. The number of permits fished increased between 1996 and 1997 due to the re-entry of pot permit holders into the fishery (Table 9). The decline in the number of SSEI permits in 1998 was due to the elimination of three interim permits.

Results of the departmental survey in SSEI showed that catch rates declined from 0.11 to 0.07 round pounds/hook from 1996 to 1997 (converted from three-hour soak to one-hour soak; Figure 4). A continued decline in catch rates to 0.06 round pounds/hook in 1998 led the department to institute a 20% reduction in quota that year.

1999 Season Outlook

NSEI

Given the divergent survey and fishery CPUE (Figure 4), the department took a precautionary approach and assumed that the fishery CPUE data was indicative of a five-year decline that was not reflected in the survey CPUE. Therefore, the harvest objective was lowered from 4.8 to 3.12 million round pounds in 1999, a 35% reduction. Of 112 possible permits, only 81 permits had registered and landed fish as of September 30, 1999 (Table 8). The round pounds per hook continued to decline compared to previous years (Table 8). Results of this preliminary fishery data continue to be a concern and may warrant further reduction in the harvest objective next year.

Stock assessment models will continue to be developed in an attempt to estimate absolute sablefish biomass in the Chatham Strait (NSEI) area. The department plans to tag and release 5,000 tags in Chatham Strait in July using pot gear to minimize the "hook shyness" problems that compromised the mark-recapture analysis in the past. Additional years of survey and fishery catch rates and biological information should strengthen results generated by the age structured analysis.

SSEI

In 1999, the survey CPUE (0.50 round pounds/hook) in the SSEI longline fishery increased compared to 0.077 round pounds/hook in 1997 and 0.06 round pounds/hook 1998 (Table 1, Figure 4). The longline component of the SSEI fishery was completed July 15, 1999. The catch rate results showed a 75% increase between 1999 (0.50 round pounds/hook) and the two previous years (0.37 round pounds/hook for 1997 and 1998; Figure 4). The pot fishery in SSEI opened September 1 and closed November 15, 1999.

PACIFIC COD

In 1991, the BOF implemented a regulation setting a guideline harvest range for Pacific cod at 750,000 to 1,250,000 pounds round weight. The reported landings of Pacific cod from NSEI and SSEI have varied widely over the past ten years with a low of 309,919 pounds reported in 1990 to a high of 962,434 pounds in 1993 (Table 10). The increase in catch in the early 1990s was due to the development of a food market for Pacific cod.

Pacific cod landings have remained steady in the last three years, increasing 20% from 1996 to 1997 before declining 16% in 1998. As in the past, the majority of the harvest (88%) is taken in the NSEI management area. Pacific cod catches through September 30 in 1999 indicate that the harvest will be similar to 1998 (Table 10). A large portion of the Pacific cod taken in Southeast Alaska is used for bait in other fisheries. The implementation of additional bait regulations, including the regulation requiring that a fish ticket be submitted to the department detailing bait catches, have largely been unsuccessful in increasing the reporting of bait taken for personal use.

FLATFISH

The trawl fishery for flatfish is limited to four areas: the Stikine Flats, lower Duncan Canal, Port Camden, and Zimovia Strait/Anita Bay. Harvest guidelines are low in all areas due to limited habitat and low stock conditions , in fact, the Stikine Flats area is closed due to particularly poor stock condition. The season begins October 1 and runs into April for some areas. Permits require that the operator keep a detailed logbook. Areas open, gear restrictions, and reporting requirements are outlined in the individual permits. Permits are issued for 30 days and are renewable only upon return of completed logbook pages. The department may also require on-board observer coverage. In 1993 the BOF implemented a 20,000 pound weekly trip limit that is intended to prevent overharvest of these small quotas. In 1997, the board rejected a proposal to increase the weekly trip limit to 35,000 pounds.

There were no directed fishing landings of flatfish in the 1995/1996 and 1996/1997 seasons and only one landing in each of the 1997/1998 and 1998/1999 seasons (Table 11). The department closed the Zimovia Strait/Anita Bay area to directed trawl fishing in April 1998 when the GHL was reached.

OTHER SPECIES

Landings of other groundfish species continue to be low. Spiny dogfish and skates continue to dominate the harvest of miscellaneous species. The harvest of spiny dogfish declined from 11,000 pounds to 7,888 pounds between 1995 to 1996 and only one landing was made in 1997 and one in 1998. In May of 1998, the Board of Fisheries closed the directed fishery for sharks state-wide. Skate harvests increased from 23,286 in 1996 to 35,346 in 1997 and declined to 274 pounds in 1998. There is a periodic interest in developing a hagfish fishery but to date no markets have been developed. With the exception of hagfish, these species tend to be taken as bycatch in other fisheries and have not yet been targeted as a directed fishery.

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Table 1. Round weight (pounds) and exvessel value for state managed commercial groundfish fisheries, Region I, 1993-1998.[a]

Species Group	Area Managed	1993 Round Wt.	1993 Value	1994 Round Wt.	1994 Value	1995 Round Wt.	1995 Value	1996 Round Wt.	1996 Value	1997 Round Wt.	1997 Value	1998 Round Wt.	1998 Value
Lingcod	Region I	950,562	$390,836	786,766	$346,177	829,629	$481,185	755,771	$377,886	612,950	$330,993	560,427	$308,235
Flatfish[b]	NSEI/SSEI	23,259	$4,652	11,375	$2,389	22,016	$4,403	1,185	$273	5,614	$1,067	14,631	$2,634
Demersal Shelf Rockfish	Region I	1,563,811	$834,344	1,619,214	$858,680	747,872	$781,092	1,008,417	$923,641	913,492	$973,727	940,783	$931,361
Pelagic Rockfish	NSEI/SSEI	18,092	$5,605	16,920	$4,907	9,237	$2,771	8,365	$3,011	15,105	$3,927	6,740	$2,022
Slope Rockfish	NSEI/SSEI	175,694	$66,764	331,568	$192,309	426,904	$273,219	510,210	$321,432	622,581	$397,774	905,127	$534,025
Pacific Cod	NSEI/SSEI	962,434	$394,598	402,475	$148,916	339,312	$115,366	639,343	$326,065	778,033	$326,774	647,940	$233,258
Sablefish	NSEI/SSEI	6,619,985	$6,437,864	5,580,340	$10,210,439	5,221,110	$9,045,576	5,176,160	$10,807,647	5,478,464	$13,153,151	5,259,075	$8,165,376
Total		10,313,837	$8,136,378	8,748,658	$11,763,591	7,596,080	$10,703,612	8,099,451	$12,761,352	8,426,239	$15,188,026	8,334,723	$10,176,938

[a] Region I is defined as all waters in the Southeast District. Data are from the groundfish fish-ticket database. Values are preliminary and do not reflect additional adjustments to processor prices made after the fishing season.
[b] The flatfish fishery data is compiled from October 1-September 30 and is listed under the year. For example, data from October 1, 1992 to September 30 1993 is presented as 1993 data.

Table 2. The Southeast District commercial lingcod harvest (round pounds) by gear type, 1990-September 1999.

Year	Jig-type Gear	Troll	Longline	Total
1990	314,595	110,992	346,866	772,453
1991	492,742	93,472	458,734	1,044,948
1992	452,047	66,864	452,092	971,003
1993	486,639	71,324	441,435	999,398
1994	416,333	94,628	370,431	881,392
1995	653,441	88,924	176,188	918,553
1996	524,454	53,518	231,317	809,289
1997	411,960	42,508	197,051	651,519
1998	372,024	39,365	188,403	599,792
1999 (through 9/30)	273,603		187,924	

.

Table 3. The Southeast District commercial lingcod harvests (round weight in pounds x 1,000) by groundfish management area and gear type, 1994-1998.[a]

Management Area	Longline					Jig-type Gear				
	1994	1995	1996	1997	1998	1994	1995	1996	1997	1998
EYKT	124.1	39.5	39.6	65.9	75.2	87.5	312.7	255.1	218.2	144.8
NSEO	55.5	26.3	22.4	15.3	15.2	107.7	97.1	51.6	31.4	39.5
CSEO	123.7	93.8	146.7	88.1	69.1	201.7	199.3	85.4	93.5	88.2
NSEI	9.5	7.0	5.7	8.2	8.0	15.4	12.3	11.4	25.2	3.0
SSEO	45.8	8.1	15.7	15.9	16.7	3.3	31.8	95.9	44.7	87.9
SSEI	11.7	1.5	1.2	3.7	4.3	0.6	0.2	25.0	2.9	8.6
Total	370.3	176.2	231.3	197.1	188.5	416.2	653.4	524.4	415.9	372.0

[a] Incidental landings on salmon troll gear are not reported in this table because troll management areas do not coincide with groundfish management areas.

Table 4. The Southeast District commercial lingcod harvest, effort, and value, 1987- September 1999.[a]

Year	Directed Harvest Round Wt. (lb)	Directed Value	Directed Permits	Total Harvest Round Wt. (lb)	Total Value	Total Permits
1987	163,938	$70,493	35	464,169	$194,951	435
1988	258,368	$118,849	59	595,542	$250,128	562
1989	196,030	$94,094	40	535,598	$208,865	602
1990	314,595	$157,298	46	678,517	$278,192	635
1991	492,742	$231,589	57	960,378	$393,755	646
1992	452,047	$194,380	61	907,957	$317,785	680
1993	486,639	$248,730	64	930,562	$392,551	577
1994	415,454	$216,110	72	786,766	$345,951	603
1995	653,228	$405,392	83	829,629	$481,185	474
1996	524,136	$262,068	101	755,771	$379,283	462
1997[b]	411,960	$234,817	60	612,950	$331,606	442
1998	369,391	$210,553	45	560,427	$308,262	417
1999 (through 9/30)	273,045	$191,132	38	460,563	$299,386	440

[a] Salmon troll bycatch data is not included.
[b] Directed catches of lingcod were landed on an “M” gear card until 1997 when a directed lingcod permit, “I” gear card, was issued.

Table 5. The Southeast District demersal shelf rockfish harvest, effort, and value 1987- September 1999.[a]

Year	Directed Harvest Round Wt. (lb)	Directed Value	Directed Permits	Total Harvest Round Wt. (lb)	Total Value	Total Permits
1987[b]	3,300,563	$1,650,282		2,745,762	$1,427,763	646
1988[b]	1,555,607	$777,804		1,935,895	$1,065,043	819
1989[b]	997,388	$498694		1,400,966	$768,302	833
1990[b]	690,253	$403,752	144	1,122,095	$600,190	789
1991[c]	1,147,267	$734,251	136	1,484,328	$777,496	862
1992[c]	1,087,554	$626,336	149	1,591,020	$768,960	919
1993[c]	976,368	$657,066	122	1,563,811	$834,344	834
1994[c]	982,745	$680,863	133	1,619,214	$858,680	847
1995[c]	398,401	$442,783	66	747,872	$781,092	811
1996[d]	782,776	$787,585	125	1,008,417	$923,641	736
1997[d]	651,346	$828,122	105	913,492	$973,727	718
1998[d]	621,421	$751,919	88	940,783	$931,361	709
1999[d] (through 9/30)	435,973	$474,041	70	768,148	$760,015	745

[a] Directed fishery permit 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.

[b] Demersal Shelf Rockfish assemblage includes: Bocaccio, Canary, China, Copper, Quillback, Redstripe, Rosethorn, Silvergray, Tiger, Yelloweye, and Unspecified DSR.

[c] Demersal Shelf Rockfish assemblage includes: Canary, China, Copper, Quillback, Redbanded, Rosethorn, Tiger, Yelloweye, and Unspecified DSR.

[d] Demersal Shelf Rockfish assemblage includes: Canary, China, Copper, Quillback, Rosethorn, Tiger, Yelloweye, and Unspecified DSR

Table 6. The pelagic shelf rockfish harvest, effort, and value landed in the SSEI and NSEI subdistricts, 1987- September 1999.

Year	Directed Harvest Round Wt. (lb) (Jig-type gear)	Directed Value	Directed Permits	Total Harvest Round Wt. (lb)	Total Value	Total Permits
1987	551	$298	1	7,206	$3,243	36
1988	11,144	$3,009	7	17,989	$5,397	44
1989	1,106	$387	5	9,532	$2,764	57
1990	1,021	$276	6	5,220	$1,357	67
1991	30	$7	1	9,906	$3,170	58
1992	9,870	$2,764	10	26,315	$7,105	83
1993	4,868	$1,363	7	18,092	$5,605	57
1994	3,846	$1,115	7	16,920	$4,907	53
1995	2,124	$786	6	9,237	$2,771	46
1996	4,359	$1,221	13	8,365	$3,011	57
1997	8,528	$2,132	6	15,105	$3,927	61
1998	1,838	$588	3	6,740	$2,022	58
1999 (through 9/30)[a]	Confidential	Confidential	1	3,630	$1,197	43

[a] In 1999, black and blue rockfish were removed from the pelagic shelf rockfish group in the federal Fisheries Management Plan (FMP). The State of Alaska assumed management of these species in the Gulf of Alaska.

Table 7. Other rockfish (slope and thornyheads) harvest, value, and effort landed in the NSEI and SSEI subdistricts, 1987- September 1999.[a]

Year	Directed Harvest Round Pounds	Directed Value	Directed Permits	Total Harvest Round Pounds	Total Value	Total Permits
1985	13,937	na	20	24,318	na	61
1986	30,669	$13,187.67	22	56,321	$21,965.19	50
1987	16,901	$7,436.44	42	52,181	$25,568.69	127
1988	15,108	$6,798.60	43	77,685	$35,735.10	146
1989	18,459	$7,014.42	42	102,053	$37,759.61	189
1990	11,347	$3,744.51	28	91,045	$39,149.35	192
1991	40,801	$16,728.41	30	147,386	$66,323.70	232
1992	35,914	$11,851.62	46	153,449	$56,776.13	249
1993	52,359	$19,372.83	58	175,694	$66,763.72	243
1994	73,198	$46,114.74	48	331,568	$192,309.44	247
1995	150,625	$88,868.75	91	426,904	$273,218.56	369
1996	271,250	$160,037.50	136	510,210	$321,432.30	452
1997	369,785	$218,173.15	156	622,581	$379,774.41	504
1998	531,426	$292,284.30	161	905,127	$534,024.93	597
1999 (through 9/30)	234,041	$128,722	135	450,717	$265,923	524

[a] 1987-1990 slope complex includes: POP, darkblotched, sharpchin, thornyhead ,greenstripe, northern, rougheye, shortraker, redbanded and unspecified slope.
1991-1995 slope complex includes POP, darkblotched, sharpchin, thornyhead, greenstripe, northern, rougheye, shortraker, silvergray, redstripe, bocaccio and unspecified slope.
1996-1998 slope complex includes: POP, darkblotched sharpchin, thornyhead, greenstripe, northern, rougheye, shortraker, silvergray, redstripe, bocaccio and unspecified slope.

Table 8. The sablefish harvest, value and catch per unit effort in the NSEI Subdistrict, 1980-September 1999.[a]

	NSEI				
Year	Pounds landed (round weight)	Exvessel Value	No. of Permits	No. of Days	CPUE (round lb/hook)
1980	1,373,205	$363,350	50	76	0.44
1981	1,060,140	$340,623	42	40	0.78
1982	1,240,429	$554,844	38	15	0.52
1983	1,851,540	$653,223	61	12	0.55
1984	1,782,290	$718,620	67	5	1.11
1985	2,951,056	$2,005,394	105	3	0.97
1986	3,874,269	$2,866,959	138	2	1.43
1987	3,861,546	$3,514,006	158	1	1.40
1988	4,206,509	$4,543,029	149	1	1.33
1989	3,767,518	$2,900,988	151	1	1.16
1990	3,281,393	$3,543,904	121	1	1.25
1991	3,955,189	$6,882,028	127	1	1.25
1992	4,267,781	$4,907,948	115	1	1.38
1993	5,795,974	$5,622,094	120	1	1.62
1994	4,713,552	$9,144,290	121	30	1.00
1995	4,542,348	$7,721,991	121	30	0.90
1996	4,673,701	$9,908,246	121	61	0.79
1997	4,753,394	$11,550,747	122	76	0.68
1998	4,688,008	$7,360,172	116	76	0.53
1999[b]	1,797,470	$3,882,535	81	30	0.57

[a] Harvest and value NSEI 1980-1984 are based on hand-tallied data. Harvest and value after 1984 based on fish ticket records.
[b] The 1999 data summary is compiled as of 9/30/99. The NSEI longline fishery closes November 15.

Table 9. The sablefish harvest, value and catch per unit effort in the SSEI subdistrict, 1980-September 1999. [a]

	Longline Fishery					Pot Fishery		
Year	Pounds landed (Round lb)	Ex-vessel Value	No. of Permits	No. of Days	CPUE (round lb/hk)	Pounds landed (Round lb)	Ex-vessel Value	No. of Permits	No. of Days
1981	120,635	$38,760		154					
1982	460,303	$205,894		215					
1983	112,021	$39,521		278					
1984	376,554	$151,827	18	48					
1985	511,617	$322,319	43	7	0.84				
1986	554,121	$260,436.87	22	7	0.84	Confidential	Confidential	2	7
1987	435,501	$291,785.67	22	5	0.68	Confidential	Confidential	1	5
1988	712,787	$719,914.87	26	5	0.59	Confidential	Confidential	1	5
1989	952,231	$714,173.25	31	5	0.52	Confidential	Confidential	1	5
1990	758,663	$553,823.99	29	3	0.59			0	3
1991	679,623	$625,253.16	30	2.4	0.52	Confidential	Confidential	1	2.4
1992	936,811	$936,811.00	29	2.4	0.62	Confidential	Confidential	1	2.4
1993	824,011	$815,770.89	27	2.4	0.52			0	2.4
1994	866,788	$1,066,149.24	30	2.4	0.48			0	2.4
1995	678,762	$1,323,585.90	28	2.4	0.52			0	2.4
1996	502,459	$899,401.61	28	2	0.41			0	2
1997	608,789	$1,345,423.69	29	45	0.46	116,281	$256,981.01	5	76
1998	489,221	$689,801.61	27	45	0.44	81,846	$113,765.94	4	76
1999[b]	565,190	$1,006,038.20	25	45	0.49	96,234	$193,430.34	4	76

[a] Harvest and value SSEI 1980-1985 are based on hand-tallied data. After 1985, harvest and value are based on fish ticket records. Prior to 1985, pot and longline gears are not separated and both gears fished in this area.

[b] The 1999 data summary is compiled as of 9/30/99. The SSEI longline fishery closed July 15 and the SSEI pot fishery closes November 15.

Table 10. Pacific cod harvest, value, and effort, NSEI and SSEI subdistricts, 1987-September 1998.

Year	Directed Harvest Round Pounds	Directed Value	Directed Permits	Total Harvest Round Pounds	Total Value	Total Permits
1985	132,915		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 (through 9/30)	543,134	$195,134	107	627,432	$213,327	307

Table 11. Flatfish harvest, value, and effort, NSEI and SSEI, 1987-88 through 1998-99.

Year Oct. 1 –Sept. 31	Directed Trawl Harvest Round Pounds	Directed Value	Directed Permits	Total Harvest Round Pounds	Total Value	Total Permits
1987-1988	861,349	$215,337	7	863,679	$215,920	15
1988-1989	532,918	$138,559	4	533,333	$138,667	11
1989-1990	278,671	$66,881	2	283,006	$67,921	6
1990-1991	340,633	$78,346	7	341,061	$78,444	11
1991-1992	58,854	$8,240	5	59,118	$8,277	6
1992-1993	Confidential	Confidential	2	23,259	$4,652	8
1993-1994	Confidential	Confidential	1	11,375	$2,389	3
1994-1995	Confidential	Confidential	2	22,016	$4,403	14
1995-1996	0	0	0	1,185	$273	10
1996-1997	0	0	0	5,614	$1,067	14
1997-1998	Confidential	Confidential	1	14,631	$2,634	17
1998-1999	Confidential	Confidential	1	12,968	$2,464	12

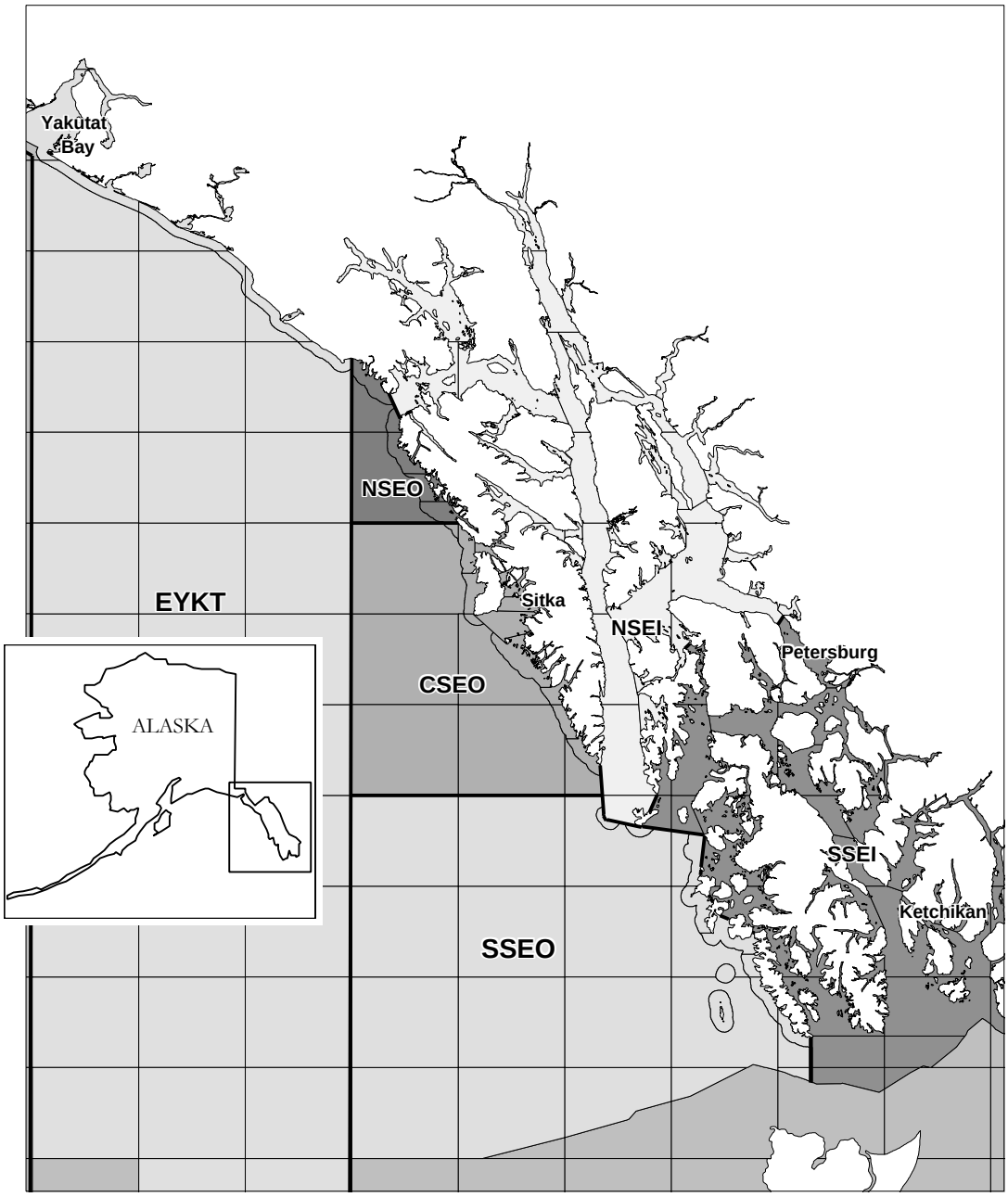


Figure 1. Southeast region groundfish management areas.

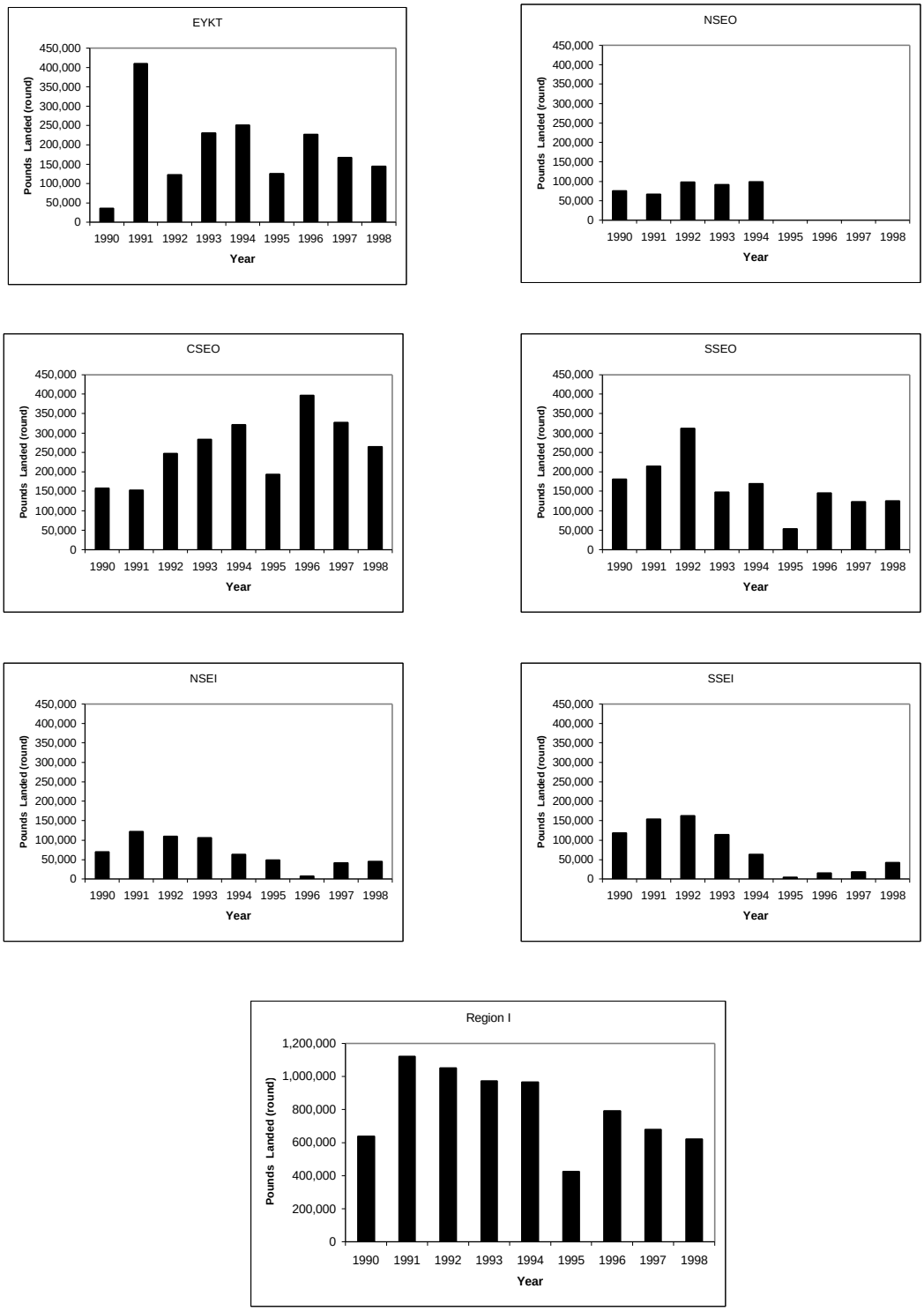
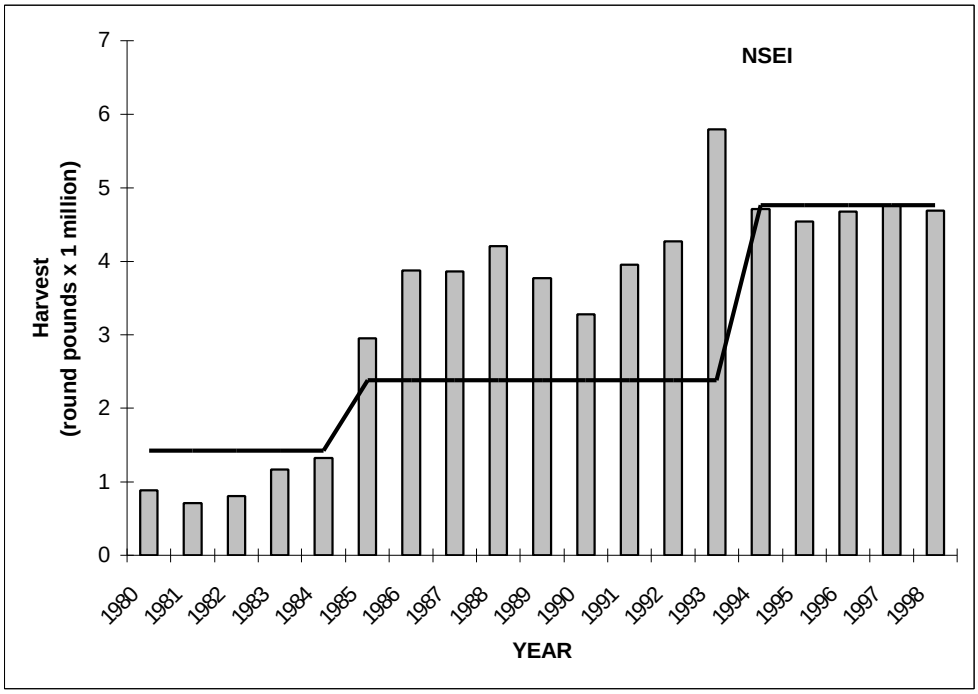


Figure 2. Directed DSR landings, round pounds, by management area by year, 1990-1998. Note that the scale is different in the Region I harvest graph.



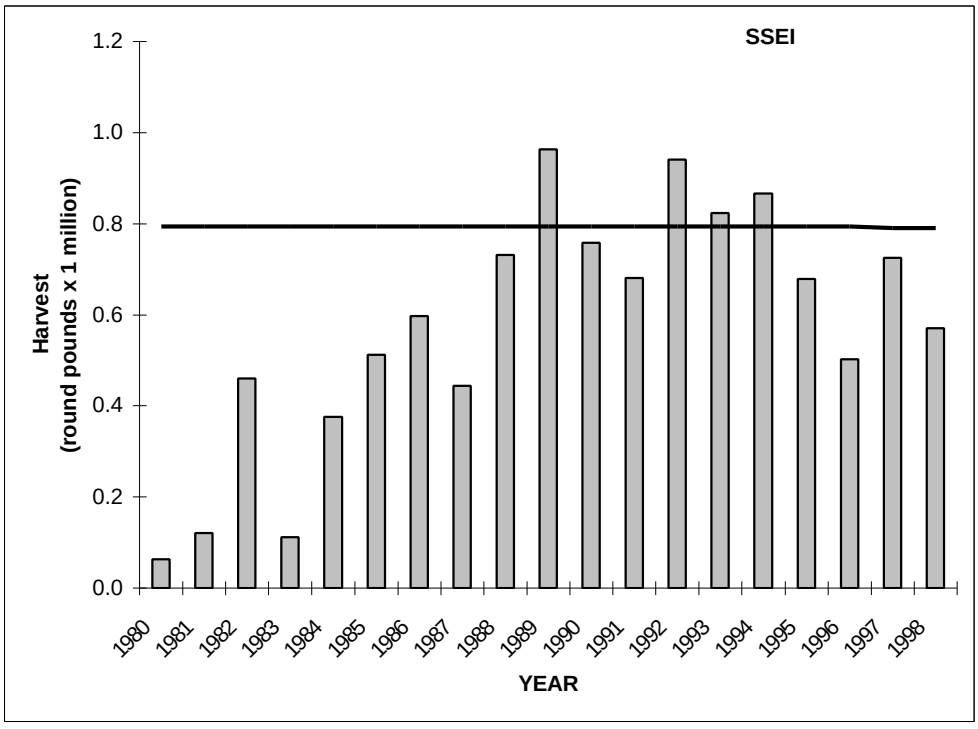
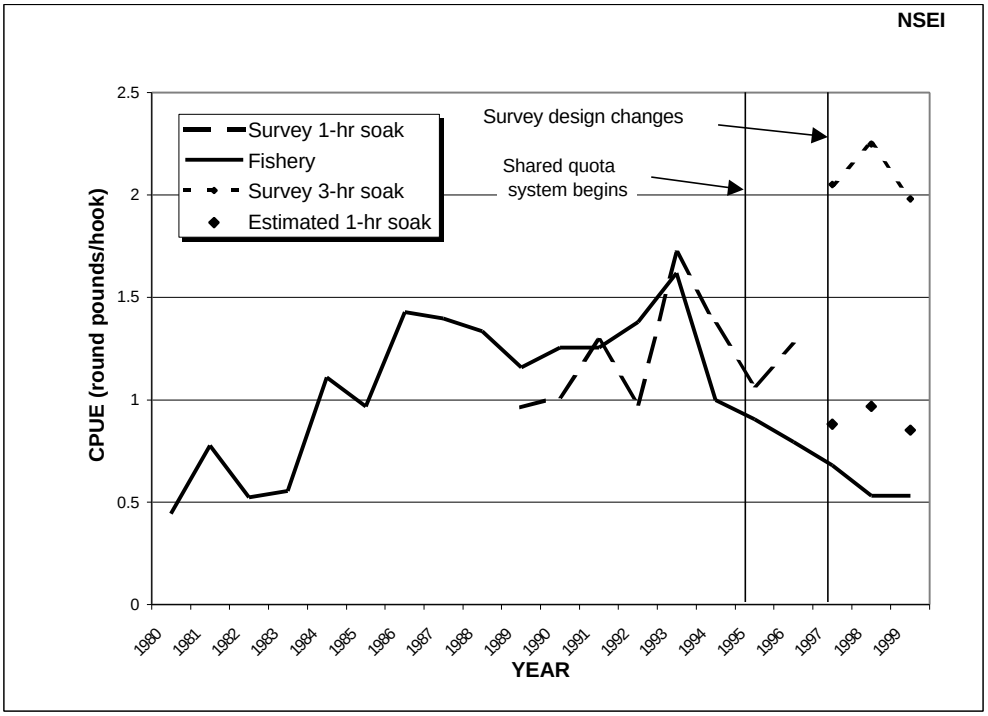


Figure 3. The total number of pounds (round) harvested in the Southeast Alaska sablefish fisheries, NSEI (top) and SSEI (bottom) from 1980 to present. The bold line denotes the upper GHR. Note: the vertical scale is different for the two fisheries.



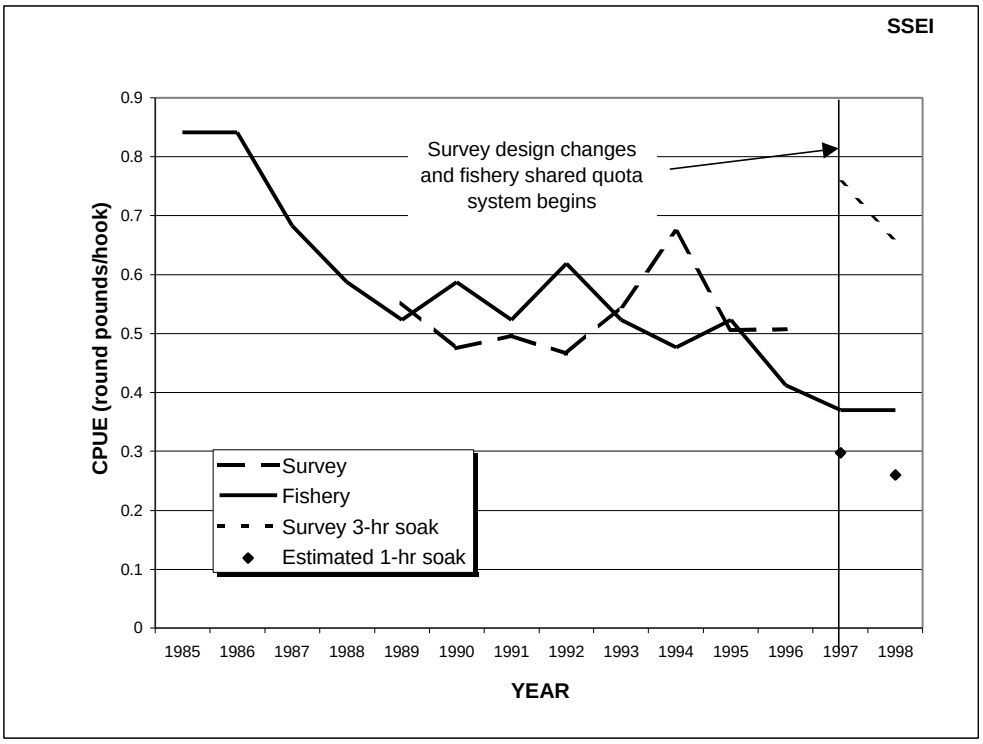


Figure 4. Survey and fishery CPUE (rd lb/hook) for NSEI (top) and SSEI (bottom). Note: the one-hour soak CPUE for the 1997 and the 1998 survey were estimated using a conversion factor of 0.43 derived from paired sets in the 1995 NSEI survey.