

THE SOUTHEAST ALASKA  
DEMERSAL SHELF ROCKFISH FISHERY  
WITH 2003 SEASON OUTLOOK



by

Victoria M. O'Connell  
and  
Cleo Brylinsky

Regional Information Report<sup>1</sup> No. 1J03-10

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

February 2003

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## **ABSTRACT**

The purpose of this document is to provide information on demersal shelf rockfish (DSR) and the fishery for these species. This report is designed to be used in conjunction with the 2003 Commercial Groundfish Fishing Regulations and active news releases and emergency orders as these inseason actions will supercede information provided in this document.

## **AUTHORS**

Victoria O'Connell is the Region I groundfish project leader for the Alaska Department of Fish and Game, Division of Commercial Fisheries, 304 Lake Street, Room 103, Sitka, Alaska 99835-7563.

Cleo Brylinsky is a fishery biologist II with the groundfish project for the Alaska Department of Fish and Game, Division of Commercial Fisheries, 304 Lake Street, Room 103, Sitka, Alaska 99835-7563.

## **ACKNOWLEDGEMENTS**

The authors would like to thank Mike Vaughn, Kamala Carroll, Deidra Holum, Beverly Richardson, and Sue Domenowske for port sampling and data entry support. This work is supported under NOAA Grants NA16FN1273 and NA77FM0209.

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## INTRODUCTION

Rockfishes of the genus *Sebastes* are found in temperate waters of the continental shelf off North America. At least 32 species of *Sebastes* occur in the Gulf of Alaska (GOA). In 1988, the North Pacific Fisheries Management Council (NPFMC) divided the rockfish complex into three components for management purposes in the eastern Gulf: Demersal shelf rockfish (DSR), pelagic shelf rockfish, and slope rockfish. These assemblages were based on species distribution and habitat as well as commercial catch composition data. The species composition within each assemblage has changed over time, as new information becomes available. The DSR assemblage is now comprised of the seven species of nearshore, bottom-dwelling rockfishes listed in Table 1. These fishes all occur on the continental shelf, reside on bottom, and are generally associated with rugged, rocky habitat. For purposes of this report, emphasis is placed on yelloweye rockfish *Sebastes ruberrimus*, as it is the dominant species in the DSR fishery.

The DSR fishery is managed in the Eastern Gulf of Alaska based on a total of six management areas in three subdistricts (Figure 1). The Southeast Outside Subdistrict (SEO) is comprised of East Yakutat (EYKT), Northern Southeast Outside (NSEO), Central Southeast Outside (CSEO), and Southern Southeast Outside (SSEO) management areas. The federal waters in this subdistrict are managed by ADF&G under authority of the North Pacific Fishery Management Council (NPFMC). Northern Southeast Inside (NSEI) and Southern Southeast Inside (SSEI) are subdistricts as well as management areas and are managed entirely by ADF&G.

## GENERAL BIOLOGY OF DEMERSAL SHELF ROCKFISHES

All DSR are considered highly K selective, exhibiting slow growth and extreme longevity (Adams 1980; Gunderson 1980; Archibald et al. 1981). Estimates of natural mortality are very low. We estimate the natural mortality of yelloweye rockfish to be approximately two percent. These types of fishes 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; Leaman 1991). An acceptable exploitation rate is assumed to be very low.

DSR are classified as ovoviviparous although some species of *Sebastes* are viviparous, or livebearers (Boehlert and Yoklavich 1984, Boehlert et al. 1986). Rockfishes have internal fertilization with several months separating copulation, fertilization, and parturition (release of larvae). Within this species complex parturition occurs from February through September with the majority of species extruding larvae in late winter and spring. Yelloweye rockfish extrude larvae over an extended time period, with the peak period of parturition occurring in April and May (O'Connell 1987). Although some species of *Sebastes* have been reported to spawn more than once per year in other areas (Love et al. 1990), no incidence of multiple brooding has been noted in Southeast Alaska (O'Connell 1987).

Rockfishes have a closed swimbladder, a balloon-like organ used to regulate buoyancy. Because they use a vascular system to regulate gas volume they cannot withstand quick changes in pressure and are susceptible to embolism mortality when brought to the surface from depth. Therefore most DSR, including discarded bycatch in other fisheries, are usually fatally injured when landed on fishing gear.

We collect information on size, weight, sex, stage of maturity, and age data from port samples. Summary information for Southeast Alaska samples of the species in the DSR assemblage is listed in Table 2. Rosethorn rockfish (*S. helvomaculatus*) are the smallest of the species in the assemblage with a maximum sampled size of 36 cm and yelloweye rockfish are the largest species in the assemblage with a maximum sampled length of 90 cm. Maximum age of fish sampled varied between species but ranged from 31 years in copper rockfish (*S. caurinus*) to 121 years in yelloweye rockfish. Our port sampling program concentrates on sampling yelloweye rockfish and quillback rockfish as these are the predominate species in the commercial catch.

### ***Yelloweye Rockfish***

Yelloweye rockfish, *Sebastes ruberrimus*, is the predominate species in the directed commercial catch, accounting for more than 90 percent, by weight, of the landings. They are orange in color and have bright yellow eyes. The juveniles have a distinct coloration: red with two horizontal white stripes. They are a large rockfish, attaining a maximum length of 90 cm (Figure 2). Yelloweye are a predatory fish that usually feeds close to the bottom. Food habit studies indicate that the diet of yelloweye rockfish is dominated by fish remains, which comprised 95%, by volume, of the stomachs analyzed. Herring (*Clupea harengus*), sandlance (*Ammodytes hexapterus*) and Puget Sound rockfish (*S. empheaus*) were particularly dominant. Shrimp are also an important prey item (Rosenthal et al. 1988).

Yelloweye are long-lived, with a maximum published age for yelloweye of 118 years, but one specimen from the SSEO 2000 samples was aged at 121 years (O'Connell and Funk 1987; O'Connell et al. 2002). They are slow growing and late to reach sexual maturity. Age at 50% sexual maturity (the age in which half the fish are mature) is between 20 and 25 years with a corresponding length of 47–50 cm (O'Connell and Fujioka 1991). Estimated length and age at 50% maturity for yelloweye collected in CSEO in 1988 are 45 cm and 21 years for females and 50 cm and 23 years for males. Rosenthal et al. (1982) estimated length at 50% sexual maturity for yelloweye from this area to be 52 cm for females and 57 cm for males. The commercial catch has been between 42 to 50 percent males depending on year and area sampled. Average size of fish increases with depth (Rosenthal et al. 1982). They are ovoviviparous, with parturition occurring between April and August with a peak in May and June (O'Connell 1987). Fecundity (the number of larvae a female will spawn each year) is estimated to be close to 3 million (Hart 1947).

### **Mortality Estimates**

An estimate of  $Z=0.0174 (\pm 0.0053)$  from a 1984 “lightly-exploited” stock in SSEO is used to estimate  $M=0.02$  (Table 3). There is a distinct decline in the log frequency of fish after age 95. This may be due to increased natural mortality in the older ages, perhaps senescence. The  $M=0.02$  is based on a catch curve analysis of age data grouped into two-year intervals (to avoid zero counts) between the ages of 36 and 96. This number is similar to the estimate of  $Z$  from a small sample from CSEO in 1981 and to the 0.0196 estimated for a lightly exploited stock of yelloweye on Bowie Seamount (Lynne Yamanaka, personal communication). Hoenig's geometric mean method for calculating  $Z$  yields estimates of 0.033 when using his fish parameters, and 0.038 when using his combined parameters, and a maximum age of 121 year (Hoenig 1983). Wallace (2001) set natural mortality equal to 0.04 in his stock assessment of west coast yelloweye. For the Northern California and Oregon data the model performed better when  $M$  was set constant until 50% maturity then increased linearly until age 70 (Wallace 2001).

Catch curve analysis of recent age data was run for each management area in SEO. The port sampling data from 2000–2002 were used and a line fit to the data between the majority of the ages (approximately 20–60 years). The estimate of Z is 0.03 for SSEO, 0.04 for EYKT, and 0.056 for CSEO (Table 3). Catch curves are problematic for fish with variable recruitment however these estimates would indicate that we may be exceeding our harvest policy of two percent in the CSEO area.

## **Growth Parameters**

Von Bertalanffy growth parameters and length weight parameters for yelloweye are listed in Table 4 and 5. These parameters were calculated using 2000 to 2002 port sample data. Males attain a larger maximum size than females and there appears to be a slight trend in the data for increasing growth with increasing latitude (Table 4). Estimated length and age at 50% maturity for yelloweye collected in CSEO are 42 cm and 22 years for females and 43 cm and 18 years for males (Table 5). Rosenthal et al. (1982) estimated length at 50% sexual maturity for yelloweye from this area to be 52 cm for females and 57 cm for males.

## **Age and Size Compositions in Commercial Fisheries**

Length frequency distributions are not particularly useful in identifying individual strong year classes because individual growth levels off at about age 30 (O’Connell and Funk 1987). Sagittal otoliths are collected for aging. The break and burn technique is used for distinguishing annuli (Chilton and Beamish 1983). Radiometric age validation has been conducted for yelloweye rockfish otoliths collected in Southeast Alaska (Andrews et al. 2002). Radiometry of the disequilibrium of  $^{210}\text{Pb}$  and  $^{226}\text{Ra}$  was used as the validation technique. Although there is not a tight relationship between growth-zone-derived ages and radiometric ages, Andrews et al. conclude support for age that exceeds 100 years from their observation that as aged derived from growth zones approached and exceeded 100 years, the sample ratios measured approached equilibrium. Maximum published age for yelloweye is 118 years (O’Connell and Funk 1987), but one specimen from the SSEO 2000 samples was aged at 121 years.

Age frequency data from the commercial catch differs somewhat by management area (Figures 4a-d). In EYKT, the 2001 age distribution is somewhat bimodal, the largest mode between 32 and 34 years, with a second, smaller mode at 44–45 years. Mean age of the 2001 samples is 42 years. There appears to be some recruitment in the 15 and 22 year age classes. Maximum age in EYKT was 110 years. In CSEO, the area with the longest catch history, a bimodal pattern has been present in the age distribution since 1992 and the older ages have declined in frequency over time. Maximum age for CSEO in 2001 is 110 and the average age is 36. There is a strong mode in the early thirties with the 32- and 33-year olds accounting for 18% of the sample. There is a second, smaller mode at 23–24 years. There is no sign of an incoming recruitment in these data and very few fish represented in the 60–70 year classes. In SSEO the 2001 age data has a bimodal distribution with a strong mode at 23 and a smaller mode at 44–45 years. Maximum age is 101 with very few fish older than 70, and an average age of 40 years. Year classes are more evenly distributed than in other areas, particularly between 17 and 60 years and there is some recruitment in the 18–20 year classes.

## **FISHERY**

### *Description of Fishery*

The directed fishery for DSR began in 1979 as a small, shore-based, hook and line fishery in Southeast Alaska (Bracken and O'Connell 1986; Rosenthal et al. 1982). This fishery targeted on the nearshore, bottom-dwelling component of the rockfish complex, with fishing occurring primarily inside the 110 m contour. The early directed fishery targeted the entire DSR complex. The targeted share of the total Region 1 DSR landed catch was only 31% in 1979, increasing to 59% in 1981, and 91% in 1984 (CFEC 1989). In the 1986 directed fishery yelloweye accounted for 70% of the DSR landed and 67% of the total rockfish landed while quillback accounted for 23%. The fishery has changed considerably over the past twenty years. The current fishery targets yelloweye rockfish, and fishes primarily between the 150 m and the 75 m contours. Yelloweye rockfish accounted for 92% (by weight) of the total DSR catch and 85% of the total rockfish catch while quillback rockfish accounted for 5% of the landed catch. The directed fishery is prosecuted almost exclusively by longline gear. Although snap-on longline gear was originally used in this fishery, most vessels now use conventional longline gear. Markets for this product are domestic fresh markets and fish are generally brought in whole, bled, and iced. Processors will not accept fish delivered more than three days after landed.

The fishery began in the Sitka area and through 1985 over half of the directed landings were made in the CSEO area. However by 1986 the total harvest from CSEO had dropped to less than 40% of the total, with the SSEI area accounting for 43% of the total. The following year distribution shifted again with 35% coming from SSEO, 22% from CSEO, and 22% from SSEI. Actual harvest in the CSEO also dropped and vessels moved further from port to maintain productive fishing, and voluntary logbook data also shows a decline in catch per unit effort (CPUE). This type of shift in distribution is indicative of localized depletions.

Commercial fishery catch per unit effort (CPUE), expressed as round pounds of yelloweye rockfish per hook overall logbook data, indicates CPUE in a relatively stable trend over the past five years with CPUE higher in the SSEO area (Figure 5 and 6).

Participation in the directed fishery has increased. In 2002, 58 vessels made directed fishery landings compared to 54 in 2001. There is still turnover in this fleet, evidenced by the fact that 84 vessels made directed landings in the 2001 and 2002 seasons. CSEO had the largest fleet with 39 vessels making landings in 2002, 23 vessels made landings in SSEO, and 17 vessels made landings in NSEI (Table 7a-c). Participation most noticeably increased in SSEI, with 21 vessels making landings in 2002 compared to 11 vessels landing in 2001 (Table 7d).

## **MANAGEMENT ACTIONS**

There have been significant changes in management of the directed fishery over time. The history of management action is listed in Table 5 with specific details by management area listed in Table 7a-f.

ADF&G implemented a guideline harvest limit (GHL) of 600 mt for the directed fishery CSEO area in 1985. This GHL was based on the projected catch from 1984 and was meant to limit further growth while a management plan was developed. Table 6 lists the management actions since that time. In 1986 a GHL was set for the directed fishery in each of the management areas except for EYKT. No directed fishery occurred in EYKT until 1990. In 1989 the NPFMC implemented a TAC (for all fishery removals including directed) for the SEO district of 470 mt, based on average harvest history. The ADF&G began a biomass-based harvest rate approach in 1993, setting the 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 et al. 2001).

The 2002 fishery was fast paced due in large part to increased participation. For the first time, the directed fishery was not opened in EYKT because bycatch mortality in the halibut fishery was estimated equivalent to the area TAC. CSEO had the shortest season on record, with a three-day season during the winter and a two-day season in the fall. Also for the first time, SSEI had closure in winter and fall and NSEI had a winter closure.

### *Bycatch and Discards*

DSR have been taken as bycatch in domestic longline fisheries, particularly the halibut fishery, since the turn of the century. Some bycatch was also landed by foreign longline and trawl vessels targeting on slope rockfish in the eastern Gulf from the late 1960s through the mid-1970s. DSR mortality during the halibut longline fishery continues to account for a significant portion of the total allowable catch (TAC). In 1999, the 140 mt of DSR landed in the halibut fishery accounted for 32% of the total DSR landings region-wide.

Reported bycatch does not reflect true mortality rates as most rockfish suffer embolism mortality when caught and do not generally survive when released. Estimated unreported mortality in the Southeast Outside subdistrict has ranged between 130 mt to 355 mt annually. For the past several years we have estimated unreported mortality of DSR during the halibut fishery based on International Pacific Halibut Commission (IPHC) interview data. For example the 1993 interview data indicates a total mortality of DSR of 13% of the June halibut landings (by weight) and 18% of the September halibut landings. Unreported mortality data has been more difficult to collect under the halibut IFQ fishery and appears to be less reliable than previous data.

In recent years we have used IPHC catch statistics to determine the percent of the halibut catch taken in each of the four DSR management areas in the Southeast Outside district. We group IPHC areas into ADF&G management areas (Figure 7). Based on the 2000 landing data, it is estimated that approximately 40% of the 2C (IPHC Regulatory Area) halibut quota and 12% of the 3A halibut quota are taken in SEO (IPHC web page). Total bycatch mortality of DSR in the halibut fishery is estimated using a 10% bycatch mortality for DSR in 2C and half of IPHC statistical area 190 (Fairweather Ground) and a 7% bycatch mortality in the remaining portions of 3A east of 140°. Estimated unreported mortality is the difference between the total and the reported bycatch. Based on the 2002 halibut quotas and the 2000 halibut catch distribution, the estimated total DSR mortality for the 2002 SEO halibut fishery was estimated to be 250 mt.

The IPHC has provided us with catch data from their longline survey. Bycatch is estimated based on sampling the first 20 hooks of each skate of gear. In 2000, the bycatch of DSR, expressed as the percent

of DSR weight to halibut weight (for legal sized halibut) ranged from 0% to well over 100%, with area estimate means ranging from 3% in EYKT (removing Fairweather stations) to 23% in Fairweather Ground. The overall rate ranged from 3% in EYKT and 16% in Fairweather Ground (Figure 8). The 2002 IPHC longline survey data indicates lower bycatch rates, with less than 1% in EYKT up to 8% in CSEO (Figure 8).

In February 2000 the Board of Fisheries enacted a regulation requiring all DSR landed in state waters of Southeast to be retained and reported on fish tickets. Proceeds from the sale of DSR in excess of legal sale limits are forfeited to the State of Alaska fishery fund. Current federal regulations prevent fishers from bringing in DSR above the bycatch limit of 10% of the target species (round pounds). The secretary of commerce is currently reviewing a regulation that would require fishers to retain all DSR caught, forfeiting without penalty, the amount above the directed fishing standard.

There is an inherent problem in estimating a rate of bycatch for DSR. DSR are habitat specific, and although their distribution overlaps with halibut, the distributions are not correlated. IPHC longline survey data indicates that bycatch of DSR is highly variable both interannually and within year by area. There is no linear relationship between the catch of halibut and the catch of DSR (Figure 9). Until full retention of DSR is implemented in federal waters it will be difficult to discern whether the TAC has been met or the ABC surpassed.

### **Catch History**

The history of domestic landings of DSR from SEO is shown in Table 9. The directed fishery card for DSR was introduced in 1990 for all areas east of 137° W longitude and for EYKT area in 1991. Prior to this, directed landings were made on miscellaneous finfish cards. Identification of directed DSR landings was made by assuming any landing with at least 51% DSR was directed. The CSEO area has the longest history of directed fishing pressure, with directed landings beginning in 1979 (Table 10).

The directed DSR catch in Southeast increased from 65 mt in 1979 to a peak of 1,106 mt in 1987. Directed fishery landings have often been constrained by other fishery management actions, in particular the halibut prohibited species cap (PSC) implemented by NPFMC. Once the annual PSC is met, all longline fisheries that take halibut must be closed. In 1992 the directed DSR fishery was allotted a separate halibut PSC of 10 mt and is therefore no longer affected when the PSC is met for other longline fisheries in the GOA. In 1993 the fall directed fishery was cancelled due to an unanticipated increase in DSR bycatch during the fall halibut fishery.

Directed fishery landings in Southeast totaled 208 mt in 2001 and bycatch landings totaled 182 mt, 164 mt of which were landed in the halibut fishery (Table 9). Directed catch in 2002, as of December 1 totaled 177 mt. Reported bycatch landings in 2002 totaled 183 mt, 174 mt of which were landed in the halibut fishery. These figures do not include discard at sea.

### ***Stock Assessment***

Traditional abundance estimation methods (e.g., area-swept trawl surveys, mark recapture) are not considered useful for these fishes given their distribution, life history, and physiology. ADF&G uses

direct observation to collect density estimates and is continuing research to develop and improve a stock assessment approach for these fishes. As part of that research, a manned submersible *Delta*, has been used to conduct line transects to estimate rockfish density (Buckland et al. 1993; Burnham et al. 1980). We have surveyed the Fairweather Ground in the EYKT section in 1990, 1994, 1995, 1997, and 1999; the CSEO section during 1990, 1994, 1995, and 1997; the NSEO section in 1994 and 2001; and the SSEO section in 1994 and 1999. A total of 451 line transects have been run since 1989, six of which were run in 2001 (Figure 10). Although line transect data is collected for four of the eight DSR species (yelloweye, quillback, tiger, rosethorn), and for juvenile as well as adult yelloweye, included here are density estimates for adult yelloweye rockfish only. Density estimates are limited to adult yelloweye because it is the principal species targeted and caught in the fishery, and our allowable biological catch (ABC) recommendations for the entire assemblage are keyed to adult yelloweye abundance.

Biomass of adult yelloweye rockfish is derived as the product of estimated density, the estimate of rocky habitat within the 200 m contour, and average weight of fish for each management area. Variance estimates can be calculated for the density and weight parameters but not for area. Because this is an in-situ method for stock assessment, we have made some changes in techniques each year in an attempt to improve the survey. Estimation of both line length for the transects and total area of rocky habitat are difficult and result in some uncertainty in the biomass estimates. In 2002, ADF&G revised the protocol for classifying habitat. Commercial logbook data is used directly in this protocol. The change resulted in an increase in the estimate of total exploitable biomass of yelloweye rockfish in the Southeast Outside Subdistrict, 17,510 mt for 2003. A more complete explanation of stock assessment methods for DSR is provided in ADF&G Regional Information Report IJ02-44 "Demersal Shelf Rockfish Stock Assessment and Fishery Evaluation Report for 2003" (O'Connell et al. 2002).

## **CURRENT MANAGEMENT**

### ***2003 Directed Fishery Quotas***

The directed fishery is managed with seasonal allocations: 67 percent of the directed fishery quota is allocated between January 1 and March 15 and 33 percent is allocated between November 16 and December 31. The directed fleet requested a winter fishery, as the exvessel price is highest at that time. The directed season is closed during the halibut IFQ season to prevent over-harvest of DSR.

The total TAC for 2003 for the SEO is 390 mt. Directed fishery quotas are set by management area and, for the SEO management area, are based on the remaining TAC after subtracting the estimated DSR bycatch (reported and non-reported discard) in the halibut fishery (Table 8). We determine total catch of halibut in each SEO management area from IPHC landing records and then determine the percent of the 2C and 3A catch taken in each management area. For the 2003 fishery we used the 2001 IPHC catch data as the 2002 data was not yet available. We then apply these percentages to the proposed 2003 halibut quotas to come up with the amount of halibut estimated to be taken by management area. The total DSR mortality estimated for the halibut fishery is then calculated using a 10% rate in Fairweather, CSEO, NSEO, and SSEO and a 7% rate for the remainder of EYKT. Catch curve information indicates that mortality of yelloweye may be greater than the harvest rate policy in the CSEO area (Table 3). It is

possible that the halibut fishery is catching more yelloweye than currently estimated. Because there has not been a line transect survey to assess density of yelloweye in the CSEO since 1995, directed fishery quotas will not increase in this area. The ADF&G will conduct a line transect survey in the CSEO in June 2003 to estimate current density.

This year, for the second time in two years, the directed fishery will be pre-empted by the halibut fishery in the EYKT area. IPHC catch data indicates that 12% of the 3A quota was taken in EYKT. Using the proposed 2002 halibut quota for 3A, the associated DSR mortality in EYKT is estimated to be 96 mt which is 6 mt less than the area specific ABC for this management area. The Fairweather Ground is a portion of the EYKT section and has supported an important directed fishery for DSR in past years.

Directed fishery quotas for 2003 are as follows: 70 mt CSEO, 40 mt SSEO, 25 mt SSEI, and 25 mt NSEI. No directed fishery is allowed in the NSEO management area because the biomass of yelloweye is low and estimated bycatch exceeds the area quota.

## **Regulations Summary**

This summary is intended as an informational guide only. The regulations as outlined in this document may be changed by emergency regulations or emergency orders at any time. Copies of emergency orders are available at all Southeast ADF&G area offices. All regulations pertaining to the Southeast demersal shelf rockfish fishery are listed in the 2002–2003 Groundfish Regulation Booklet. In addition, the BOF is meeting to address Southeast Groundfish issues in January of this year. Therefore it is likely that there will be additional regulations in place during 2003. The following summary was excerpted from the official codes on file with the Lieutenant Governor. There may be errors or omissions that have not been identified and changes that occurred after this publication. Please refer to the most recent copy of the Alaska Administrative Code (and its appendices) for the most current and accurate regulations.

## **General Permits Required to Directed Fish for DSR**

- State of Alaska vessel license (16.05.490)
- State of Alaska permit card (16.05.675)
- State of Alaska logbook (5 AAC 28.175)
- If fishing in federal waters:
  - Federal Groundfish Permit
- Photo identification on board the vessel while fishing and delivering fish (16.10.267 (2)).

The longline logbook form is shown in Appendix 1. Further details on federal fishing requirements may be found at the following website:

[http://www.fakr.noaa.gov/ram/applications.htm#Link\\_8](http://www.fakr.noaa.gov/ram/applications.htm#Link_8).

Vessels must be licensed to participate in the fishery. A commercial fishing vessel must display its permanent vessel license plate number in permanent symbols at least 12-inches high on both sides of the hull, cabin, or mast. Additional requirements are listed in 5 AAC 39.119. In addition, a Commercial Fishery Entry (CFEC) Permit Card is required. To fish for demersal shelf rockfish a fisherman must have a Demersal Shelf Rockfish Southeast permit card (Fishery code=Y, area code=A) which is coded to the specific gear type used. If the vessel is directed fishing on DSR in federal waters the fisher will also need a Federal Fisheries Groundfish Permit. A vessel does not need to have a federal LLP (License Limitation

Permit) as long as they remain below the maximum retainable percentages of bycatch species as published by National Marine Fisheries Service.

### **Logbooks (5 AAC 28.175 (1))**

Logbooks are required and may be obtained from ADF&G. Logbooks must be turned in with the fish ticket documenting the landing. For longline gear the logbook must include the date, the specific location of harvest by latitude and longitude within one-half mile of set, the amount of gear (number of hooks) used, the depth of each set, the estimated weight of all target species taken in the directed fishery in each specific location, and an estimated weight of the bycatch retained or discarded at sea. (Appendix 1).

### **Legal Gear (5 AAC 28.130 (d) (1))**

Demersal Shelf Rockfish may be taken by longline, dinglebar troll, hand troll gear, and mechanical jigging machines. Definition of these gear are listed in 5 AAC 39.105, page 37–39 of the 2002–2003 Groundfish Regulation Booklet. In the Southeast District, a person operating a trawl vessel shall retain, weigh, and report all demersal shelf rockfish taken. All DSR in excess of one-percent, round weight, of all target species on board the vessel must be reported but may not be sold unless all proceeds from the sale of these fishes are surrendered to the state.

### **Harvest Guidelines and Ranges (5 AAC 28.160 (c) (1))**

The directed fishery GHs for SSEI and NSEI are not to exceed 50 mt (110,000 lb). For the management areas of SEO, the directed rockfish fishing quotas will be released January 1 and calculated based on the federal TAC after estimated bycatch mortality is deducted.

### **Fishing Seasons (5 AAC 28.111)**

The directed fishery is split between two seasons: January 1 – March 14, or until 67% of the annual directed harvest limit for the management area is taken (which ever is first) and November 16 – December 31, or until 33% of the annual directed harvest for the management area is taken. Opening time is 9:00 a.m. and closing time is 4:00 p.m.

### **Trip Limits and Full Retention (5 AAC 28.171)**

In the CSEO, SSEO, SSEI, and NSEI management areas a vessel or permit holder may not sell more than 6,000 pounds (round weight) of DSR in any five-day period. All DSR in excess of this amount must be weighed and reported on an ADF&G fish ticket. All proceeds from the sale of DSR in excess of 6,000 pounds must be forfeited to the state.

In the EYKT management areas a vessel or permit holder may not sell more than 12,000 pounds (round weight) of DSR in any five-day period. All DSR in excess of this amount must be weighed and reported on an ADF&G fish ticket. All proceeds from the sale of DSR in excess of 12,000 pounds must be forfeited to the state.

Additionally, in the Southeast district, a CFEC permit holder fishing for species other than DSR must retain, weight, and report all DSR taken. All DSR bycatch in excess of 10 percent, round weight, of all target species on board the vessel must be weighed and reported as bycatch overage on an ADF&G fish ticket. All proceeds from the sale of excess DSR bycatch must be forfeited to the state.

## **FISHING AREAS**

The demersal shelf rockfish fishery is confined to the waters of the Eastern Gulf of Alaska east of 140° W longitude. There are six management areas related to this fishery (Figure 1). The EYKT, CSEO, NSEO, and SSEO comprise the Southeast Outside Subdistrict. The NSEI and SSEI are separate subdistricts and may also be referred to as “internal waters” of the Southeast Region.

### *Closed Waters*

#### **Waters Closed To All Retention**

5 AAC 28.150. Groundfish may not be taken in the waters off Cape Edgecumbe enclosed by a box defined as 56°55.5' N. lat., 56°57' N. Lat., 135°54' W. long., and 135°57' W. long. This area is commonly referred to as “the Pinnacles” or the “Edgecumbe Pinnacles” (Figure 11).

#### **Waters Closed To Directed Fishing**

5 AAC 28.150. The waters of Sitka Sound south of 57°16' N. lat. and north and east of a line from Sitka Point on Kruzof Island to the northernmost tip of Little Biorka Island to Frosty Reef (Figure 11);

In the Ketchikan vicinity: in all waters of Behm Canal, Clarence Strait, Tongass Narrows, Nichols Passage, George Inlet, Carroll Inlet, Thorne Arm, Revillagigedo Channel, and all contiguous waters enclosed by the latitude of Busy Point Light, a line from Point Alava to the Southernmost tip of Ham Island, a line from Cedar Point to Dall head, and a line from Dall Head to a point in midstream Clarence Strait at the latitude of Dall head to Amano Point (Figure 12);

In the vicinity of Craig and Klawock, in all waters enclosed by a line from the southernmost tip of St. Philip Island to the northernmost tip of San Fernando Island, to Point Cangrejo, and all water of Ulloa Channel north of the latitude of Waterfall Cannery (Figure 13);

## Bycatch Regulations

Bycatch limits for groundfish taken in the DSR fishery are set by emergency order (EO) at the beginning of the calendar year. The following is a list of what is usually allowed as bycatch in the DSR fishery. These percentages may be changed inseason if there is a conservation concern for a bycatch species (e.g. approached total allowable catch).

The provisions of 5 AAC 28.070 GROUNDFISH POSSESSION AND LANDING REQUIREMENTS. (b) are superceded by this emergency order, to read:

### 5 AAC 28.070 GROUNDFISH POSSESSION AND LANDING REQUIREMENTS.

(b) Consistent with 5 AAC 28.070 (b), bycatch limits are defined below for groundfish fisheries in the Southeast District. The limits are round weight of the bycatch as a percentage of the round weight of target species. Bycatch limits that are already set in regulation are indicated in parenthesis.

- (1) a permit holder fishing for demersal shelf rockfish (DSR) in waters of Alaska in the Southeast Outside Subdistrict
  - (A) with longline gear may retain the following:
    - i. 35% lingcod (5 AAC 28.173 (b))
    - ii. 7% shortraker and rougheye rockfish in aggregate
    - iii. 15% all other rockfish and thornyheads in aggregate
    - iv. 35% spiny dogfish (5 AAC 28.174 (1))
    - v. 20% Pacific cod
    - vi. 20% other groundfish in aggregate
  - (B) with hand troll, dinglebar and mechanical jig gear may retain the following:
    - i. 0% lingcod
    - ii. 7% shortraker and rougheye rockfish in aggregate
    - iii. 15% all other rockfish and thornyheads in aggregate
    - iv. 20% spiny dogfish
    - v. 20% Pacific cod
    - vi. 20% other groundfish in aggregate
- (2) a permit holder fishing for DSR in Southeast Inside Subdistrict (SSEI) or Northern Southeast Inside Subdistrict (NSEI)
  - (A) with longline gear may retain the following:
    - i. 35% lingcod (5AAC 28.173 (b))
    - ii. 7% shortraker and rougheye rockfish in aggregate
    - iii. 15% all other rockfish and thornyheads in aggregate
    - iv. 35% spiny dogfish (5 AAC 28.174 (1))
    - v. 20% Pacific cod
    - vi. 20% other groundfish in aggregate
  - (B) with hand troll, dinglebar and mechanical jig gear may retain the following:
    - i. 0% lingcod
    - ii. 7% shortraker and rougheye rockfish in aggregate
    - iii. 15% all other rockfish and thornyheads in aggregate
    - iv. 20% spiny dogfish
    - v. 20% Pacific cod
    - vi. 20% other groundfish in aggregate

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Table 1. Species included in the demersal shelf rockfish assemblage.

Common name	Scientific Name
canary rockfish	<i>Sebastes pinniger</i>
China rockfish	<i>S. nebulosus</i>
copper rockfish	<i>S. caurinus</i>
quillback rockfish	<i>S. maliger</i>
rosethorn rockfish	<i>S. helvomaculatus</i>
tiger rockfish	<i>S. nigrocinctus</i>
yelloweye rockfish	<i>S. ruberrimus</i>

Table 2. Length and age ranges for DSR species sampled from commercial landings in Southeast Alaska.

Species	Length range SE(cm)	Age range SE
Canary	32-69	6-68
Copper	21-55	3-31
China	26-46	26-72
Quillback	20-48	6-90
Rosethorn	19-36	8-87
Tiger	23-66	18-116
yelloweye	50-90	4-121

Table 3. Estimates of instantaneous mortality (Z) of yelloweye rockfish in Southeast Alaska.

AREA	YEAR	SOURCE	Z	n
SSEO	1984	Commercial Longline	.017*	1049
CSEO	1981	Research Jig	.020*	196
CSEO	1988	Research Longline	.042	600
EYKT	2000- 2002	Commercial Longline ages 24-62	.04	295
CSEO	2000- 2002	Commercial Longline Ages 20-60	0.056	514
SSEO	2000- 2002	Commercial Longline (ages 24-67)	0.03	602
SE		Hoenigs equation max age 121 (parameters combined taxa)	0.038	
SE		Hoenig's equation max age 121 (fish parameters)	0.033	

\*Z approximately equal to M as there was very little directed fishing pressure in these areas at that time (1981 for CSEO, 1984 for SSEO).

Table 4. Growth parameters (cm and kg) for yelloweye rockfish in Southeast Alaska from 2000-2002 port samples.

Sex	Area	Wt. Vs Length		Von Bertalanffy		
		a	b	L <sub>inf</sub>	K	t <sub>0</sub>
Female	EYKT	0.000008876	3.2113	71.0496	0.0327	-14.8832
	CSEO	0.000012	3.1346	65.8733	0.0342	-14.7556
	SSEO	0.000023	2.9689	67.4639	0.0236	-28.7107
	NSEI	0.000018	3.0248	68.5183	0.0314	-13.5622
	SSEI	0.000017	3.011	68.674	0.0196	-36.7438
Male	EYKT	0.000055	2.7441	72.0703	0.03	-18.9701
	CSEO	0.000037	2.8348	65.9722	0.05	-4.2473
	SSEO	0.000016	3.0397	63.112	0.0573	-4.4311
	NSEI	0.000008792	3.1884	63.3418	0.0367	-17.7907
	SSEI	0.000008189	3.1716	62.3299	0.0727	1.0032
Combined	Outside Areas	0.000014	3.0869	65.9619	0.0369	-13.0505

Table 5. Length and age at 50% sexual maturity for yelloweye rockfish, Southeast Alaska.

	m <sub>g</sub>	?	?	Sum(dev.)	50%
Female length	0.98142	1.0813	41.79	0.08441	41.8
Female age	0.97801	0.283363	21.814	1.2330	22.0
Male length	1.004079	0.55547	43.128	0.2227	43.1
Male age	0.9942	0.3645	18.23	0.7134	18.3

Table 6. History of DSR management action, BOF, NPFMC, and ADF&G.

YEAR	ACTION
1983	Marine reserves recommended to BOF by ADF&G – rejected
1984	Marine reserves recommended to BOF by ADF&G – rejected 600 mt harvest limit for 10 species of DSR in CSEO directed fishery NPFMC defines 10 species assemblage as DSR (yelloweye, quillback, china, copper, canary, rosethorn, tiger, silvergrey, bocaccio, redstripe) October 1 accounting year
1986	Marine reserves recommended to BOF by ADF&G – rejected ADF&G restricts gear for rockfish in the Southeast Region to hook and line only NPFMC gives ADF&G management authority for DSR to 137 <sup>0</sup> W long. (Southeast Outside SEO) Guideline harvest limit (GHL) for directed fishery reduced to 300 mt (CSEO) GHL for directed fishery set for SSEO (250), SSEI (225), NSEO (75), and NSEI (90)
1987	Sitka Sound closed to commercial fishing for DSR
1988	NPFMC implements 660 mt total allowable catch for all fisheries (TAC) for SEO
1989	NPFMC imposes TAC of 470 mt (catch history average) Industry working group discusses ITQ options with PMFC (rejected) IWG recommends 7,500 lb trip limits, mandatory logbooks, and seasonal allocations (10/1-11/31 43%, 12/1-5/15 42%, 7/1-9/30 15%). Ketchikan area closure implemented GHL for directed fishery reduced in all areas (CSEO 150, SSEO 170, SSEI 112, NSEO 50, NSEI 45)
1990	Directed permit card required for CSEO, SSEO, SSEI, NSEO, and NSEI NPFMC TAC of 470 mt
1991	NPFMC TAC of 425 mt Change in assemblage to 8 species (removed silvergrey, bocaccio, redstripe added redbanded) Craig and Klawock closures implemented
1992	East Yakutat area included in SEO (NPFMC extends ADF&G mgt authority to 140 <sup>0</sup> ) NPFMC TAC of 550 mt Directed fishery permit card required in EYKT Line transect data used to set ABC in EYKT
1993	BOF changes seasonal allocation to calendar year: 1/1-5/15 (43%), 7/1-9/30 15%, and 10/1-12/31 (42%), DSR opened for 24 hour halibut opening 6/10 (full retention) NPFMC TAC of 800, yelloweye line transect data used to set TAC NPFMC institutes a separate halibut prohibited species cap (PSC) for DSR
1994	Trip limits reduced to 6,000 in SE and 12,000 lb trip limit implemented in EYKT Reduced lower end of NSEI and SSEI GHL to 0 NPFMC TAC 960 mt line transect yelloweye plus 12% for other species
1995	NPFMC TAC 580 mt, line transect modified to include 2 <sup>nd</sup> camera, no directed fishery NSEO
1996	NPFMC TAC 945 mt, no directed fishery NSEO
1997	NPFMC TAC 945 mt, redbanded removed from assemblage definition, no directed fishery NSEO
1998	NPFMC TAC 560 mt, revised estimates of rock habitat in EYKT, 10% included for other species, Directed fishery season changed to prevent overlap with IFQ fishery 1/1-3/14 (67%), 11/16-12/31 (33%), no directed fishery NSEO
1999	NPFMC TAC 560 mt, no directed fishery NSEO
2000	NPFMC TAC 340 mt, revised estimates of rock habitat in SEO, no directed fishery NSEO
2001	NPFMC TAC 330 mt , Fall directed fishery season initially 24 hours in CSEO and SSEO due to small quota then re-opened 11/26 until quotas taken, no directed fishery NSEO
2002	NPFMC TAC 350 mt, no directed fishery in EYKT due to changes in estimated bycatch mortality in that area, no directed fishery in NSEO.
2003	NPFMC TAC 390 mt, no directed fishery in EYKT or NSEO, protocol for classifying habitat revised resulting in changes in TAC

Table 7a. Quotas, seasons, effort, and harvest for directed DSR in CSEO.

Year	Directed Annual Quota mt	Published Season	Inseason Closure Dates	Number Vessels <sup>b</sup>	Mt Harvested <sup>c</sup>
1979		1/1-12/31	No closures	16	21
1980		1/1-12/31	No closures	18	20
1981		1/1-12/31	No closures	30	75
1982		1/1-12/31	No closures	34	102
1983		1/1-12/31	No closures	35	161
1984		1/1-12/31	No closures	82	507
1985	600 mt	1/1-12/31	No closures	90	317
1986	300 mt	1/1-12/31	No closures	78	336
1987	300	1/1-12/31	Closed 8/10-9/30	97	235
1988	150	1/1-12/31	Closed 8/15-8/28 and 9/8-9/30	98	165
1989	150	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	No closures	76	143
1990	125	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 5/29-8/14 <sup>a</sup>	52	75
1991	115	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 3/21 Closed 7/13-12/31 <sup>a</sup>	28	74
1992	115	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 7/13-12/31 <sup>a</sup>	40	112
1993	115	1/1-5/15 (43%) 7/1-9/30 (15%) 10/1-12/31 (42%)	Closed 2/12 Closed 8/4 Closed 11/17-12/31	47	128
1994	115	1/1-5/15 (49%) 7/1-9/30 (21%) 10/1-12/31 (30%)	Closed 1/8 Closed 7/10 Closed 11/7-12/31	61	146
1995	100 (with SSEO)	1/1-5/15 (49%) 7/1-9/30 (21%) 10/1-12/31 (30%)	Closed 1/15-12/31	43	88
1996	185	1/1-3/15 (67%) 11/16-12/31 (33%)	Closed 1/24 Closed 12/18-12/31	72	180
1997	150	1/1-3/15 (67%) 11/16-12/31 (33%)	Closed 1/22 Closed 11/21-12/31	58	148
1998	110	1/1-3/15 (67%) 11/16-12/31 (33%)	Closed 1/8-12/31	79	120
1999	71	1/1-3/15 (67%) 11/16-12/31 (33%)	Closed 1/8 Closed 12/11-12/31	47	105
2000	71	1/1-3/15 (67%) 11/16-12/31 (33%)	Closed 1/19-12/31	22	63
2001	62	1/8-3/15 (67%) 11/16-12/31 (33%)	Closed 1/12 Closed 11/28 - 12/31	32	64
2002	70	1/8-3/15 (67%) 11/16-12/31 (33%)	Closed 1/4 Closed 11/17	39	76

<sup>a</sup> Halibut prohibited species cap met in DSR fishery so fishery was closed.

<sup>b</sup> No directed fishery cards issued until 1990 so number of directed vessels difficult to determine.

<sup>c</sup> NSEO catch and effort included in CSEO 1979-1984 (used salmon area 113).

Table 7b. Quotas, seasons, effort, and harvest for directed DSR in SSEO.

Year	Directed Annual Quota mt	Published Season	Closure Dates	Number Vessels <sup>b</sup>	Mt Harvested
1979		1/1-12/31	No closures	1	0
1980		1/1-12/31	No closures	1	0
1981		1/1-12/31	No closures	2	0
1982		1/1-12/31	No closures		0
1983		1/1-12/31	No closures	3	0
1984		1/1-12/31	No closures	13	36
1985		1/1-12/31	No closures	15	32
1986	250	1/1-12/31	No closures	38	95
1987	250	1/1-12/31	Closed 6/3-9/30	66	347
1988	170	1/1-12/31	Closed 5/13-9/30	65	244
1989	170	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 3/3-7/1	36	141
1990	150	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 5/29-8/14 <sup>a</sup>	29	89
1991	100	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 3/21-7/1 Closed 7/8-12/31 <sup>a</sup>	31	97
1992	100	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 7/28-/30	38	141
1993	100	1/1-5/15 (43%) 7/1-9/30 (15%) 10/1-12/31 (42%)	Closed 2/14 Closed 8/27 Closed 11/9	21	67
1994	75	1/1-5/15 (49%) 7/1-9/30 (21%) 10/1-12/31 (30%)	Closed 2/14 Closed 8/10	29	77
1995	100 (combined with CSEO)	1/1-5/15 (49%) 7/1-9/30 (21%) 10/1-12/31 (30%)	Closed 1/28-11/15	15	24
1996	100	1/1-3/15 (67%) 11/16-12/31 (33%)	Closed 3/8	28	66
1997	100	1/1-3/15 (67%) 11/16-12/31 (33%)		31	56
1998	75	1/1-3/15 (67%) 11/16-12/31 (33%)	Closed 1/21	19	56
1999	68	1/1-3/15 (67%) 11/16-12/31 (33%)	Closed 1/21	25	62
2000	68	1/1-3/15 (67%) 11/16-12/31 (33%)	Closed 1/29 Closed 12/14-12/31	20	63
2001	60	1/8-3/15 (67%) 11/16-12/31 (33%)	Closed 1/29	23	58
2002	60		Closed 1/25 Closed 11/24	23	60

<sup>a</sup> Halibut prohibited species cap met in DSR fishery so fishery was closed.

<sup>b</sup> No directed fishery cards issued until 1990 so number of directed vessels difficult to determine.

Table 7c. Quotas, seasons, effort, and harvest for directed DSR in NSEI.

Year	Directed Annual Quota mt	Published Season	Closure Dates	Number Vessels <sup>b</sup>	Mt Harvested
1979		1/1-12/31		2	3
1980		1/1-12/31		8	3
1981		1/1-12/31		10	14
1982		1/1-12/31		7	10
1983		1/1-12/31		12	30
1984		1/1-12/31		3	14
1985		1/1-12/31		15	32
1986	90	1/1-12/31		30	45
1987	90	1/1-12/31	Closed 7/6-9/30 <sup>a</sup>	32	48
1988	90	1/1-12/31	Closed 8/15-9/30 <sup>a</sup>	38	48
1989	45	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 4/29-7/1	17	23
1990	45	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)		39	32
1991	45	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 8/15	46	55
1992	45	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 5/15 Closed 7/28	50	50
1993	45	1/1-5/15 (43%) 7/1-9/30 (15%) 10/1-12/31 (42%)	Closed 3/29 Closed 7/20 Closed 12/17	41	48
1994	45	1/1-5/15 (49%) 7/1-9/30 (21%) 10/1-12/31 (30%)	Closed 4/7 Closed 8/21	35	29
1995	45	1/1-5/15 (49%) 7/1-9/30 (21%) 10/1-12/31 (30%)	Closed 3/14	28	22
1996	25	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closure	22	3
1997	25	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closure	29	19
1998	25	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closure	28	21
1999	25	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closure	26	14
2000	25	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closure	19	13
2001	25	1/8-3/15 (67%) 11/16-12/31 (33%)		13	21
2002	25	1/8-3/15 (67%) 11/16-12/31 (33%)	Closed 2/08	17	20

<sup>a</sup> Halibut prohibited species cap met in DSR fishery so fishery was closed.

<sup>b</sup> No directed fishery cards issued until 1990 so number of directed vessels difficult to determine.

Table 7d. Quotas, seasons, effort and harvest for directed DSR in SSEI.

Year	Directed Annual Quota mt	Published Season	Closure Dates	Number Vessels <sup>b</sup>	Mt Harvested
1979		1/1-12/31		11	21
1980		1/1-12/31		10	5
1981		1/1-12/31		21	35
1982		1/1-12/31		15	31
1983		1/1-12/31		43	78
1984		1/1-12/31		46	110
1985		1/1-12/31		78	225
1986	225	1/1-12/31		111	381
1987	225	1/1-12/31	Closed 6/3-9/30 <sup>a</sup>	111	302
1988	112	1/1-12/31	Closed 5/13-9/30 <sup>a</sup>	83	145
1989	112	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 3/26	46	62
1990	100	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	No inseason closure	35	54
1991	75	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 4/30 Closed 8/15	55	70
1992	75	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Closed 5/11 Closed 8/7	56	74
1993	50	1/1-5/15 (43%) 7/1-9/30 (15%) 10/1-12/31 (42%)	Closed 3/22	36	52
1994	50	1/1-5/15 (49%) 7/1-9/30 (21%) 10/1-12/31 (30%)	Closed 8/26	35	29
1995	25	1/1-5/15 (49%) 7/1-9/30 (21%) 10/1-12/31 (30%)	Closed 3/14	5	2
1996	25	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closure	22	7
1997	25	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closure	22	8
1998	25	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closure	23	19
1999	25	1/1-3/15 (67%) 11/16-12/31 (33%)	Closed 2/8	17	14
2000	25	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closure	18	18
2001	25	1/8-3/15 (67%) 11/16-12/31 (33%)	No fall opening	11	30
2002	25	1/8-3/15 (67%) 11/16-12/31 (33%)	Closed 2/16 Closed 12/7	21	16

<sup>a</sup> Halibut prohibited species cap met in DSR fishery so fishery was closed.

<sup>b</sup> No directed fishery cards issued until 1990 so number of directed vessels difficult to determine.

Table 7e. Quotas, seasons, effort and harvest for directed DSR in NSEO.

Year	Directed Annual Quota mt	Published Season	Closure Dates	Number Vessels <sup>a</sup>	Mt Harvested <sup>b</sup>
1979		1/1-12/31	No inseason closures		
1980		1/1-12/31	No inseason closures		
1981		1/1-12/31	No inseason closures		
1982		1/1-12/31	No inseason closures		
1983		1/1-12/31	No inseason closures		
1984		1/1-12/31	No inseason closures		
1985		1/1-12/31	No inseason closures	19	37
1986	75	1/1-12/31	No inseason closures	22	17
1987	75	1/1-12/31	No inseason closures	45	103
1988	75	1/1-12/31	No inseason closures	35	52
1989	50	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	No inseason closures	18	28
1990	50	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	No inseason closures	42	34
1991	50	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	No inseason closures	30	30
1992	50	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	No inseason closures	33	44
1993	50	1/1-5/15 (43%) 7/1-9/30 (15%) 10/1-12/31 (42%)	No inseason closures	33	41
1994	50	1/1-5/15 (49%) 7/1-9/30 (21%) 10/1-12/31 (30%)	No inseason closures	28	45
1995-2002	0			0	0

<sup>a</sup> No directed fishery cards issued until 1990 so number of directed vessels difficult to determine.

<sup>b</sup> NSEO catch and effort included in CSEO 1979-1984 (used salmon area 113)

Table 7f. Quotas, seasons, effort, and harvest for directed DSR in EYKT.

Year	Directed Annual Quota mt	Published Season	Closure Dates	Number Vessels <sup>a</sup>	Mt Harvested
1979		1/1-12/31		3	1
1980		1/1-12/31		1	3
1981		1/1-12/31		1	0
1982		1/1-12/31		1	3
1983		1/1-12/31		4	7
1984		1/1-12/31		1	1
1985		1/1-12/31		8	7
1986		1/1-12/31		0	0
1987		1/1-12/31		12	76
1988		1/1-12/31		12	38
1989		12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	No inseason closures	11	31
1990		12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	No inseason closures	5	26
1991		12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	No inseason closures	5	186
1992	50	12/1-5/15 (42%) 7/1-9/30 (15%) 10/1-11/30 (43%)	Fairweather closed 4/2 EYKT closed 10/14	9	56
1993	100	1/1-5/15 (43%) 7/1-9/30 (15%) 10/1-12/31 (42%)	Fairweather closed 3/22 EYKT closed 5/14	15	105
1994	100	1/1-5/15 (49%) 7/1-9/30 (21%) 10/1-12/31 (30%)	Closed 2/18-10/12	11	114
1995	100	1/1-5/15 (49%) 7/1-9/30 (21%) 10/1-12/31 (30%)	Closed 1/31	17	57
1996	330	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closures	15	103
1997	150	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closures	14	76
1998	100	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closures	14	65
1999	76	1/1-3/15 (67%) 11/16-12/31 (33%)	Closed 3/9	15	74
2000	76	1/1-3/15 (67%) 11/16-12/31 (33%)	No inseason closures	10	61
2001	76	1/8-3/15 (67%) 11/16-12/31 (33%)		9	50
2002	0				

<sup>a</sup> No directed fishery cards issued until 1991 so number of directed vessels difficult to determine.

Table 8. Information used to set 2003 DSR directed fishery quotas for CSEO, SSEO, Fairweather Ground, and remaining areas of EYKT.

<b>Statistic</b>	<b>CSEO</b>	<b>EYKT</b>	<b>NSEO</b>	<b>SSEO</b>
IPHC statistical areas	160, 2/3 of 170	185,190, 1/3 of 200	1/3 of 170 181	140, 150
2001 halibut catch distribution	22% 2C	12% 3A	14% 2C	10% 2C
Estimated DSR bycatch mortality (10% CSEO, SSEO, FW, 7% EYKT)	87	96	53	40
2003 DSR TAC	180	102	27	80
Directed DSR Fishery GHl	70	0	0	40

Table 9. DSR landings, mt round weight, by year. Prior to 1990 directed landings identified by having at least 51% (rd weight) DSR.

<b>Year</b>	<b>Directed</b>	<b>Bycatch</b>	<b>Total</b>
1979	65	142	207
1980	67	97	164
1981	131	88	219
1982	160	67	227
1983	291	84	375
1984	557	73	630
1985	699	101	800
1986	878	106	984
1987	1106	210	1316
1988	669	176	845
1989	409	127	536
1990	299	212	511
1991	508	339	847
1992	477	228	705
1993	441	266	707
1994	438	289	727
1995	193	158	351
1996	359	102	461
1997	307	119	426
1998	282	145	427
1999	270	161	431
2000	219	138	357
2001	208	182	390
2002 <sup>a</sup>	177	183	360

<sup>a</sup>Catch as of December 1, 2002.

Table 10. Directed DSR landings (mt round weight) by area and year. Prior to 1985 NSEO catch included in CSEO. Prior to 1990 directed fishery landings identified by having at least 51% (rd weight) DSR.

Year	EYKT	NSEO	CSEO	NSEI	SSEO	SSEI	Total
1979	1	0	30	3	1	21	65
1980	3	0	50	3	5	5	67
1981	0	0	77	14	2	35	131
1982	3	0	108	10	2	31	160
1983	7	0	164	30	5	78	291
1984	1	0	400	14	31	110	557
1985	7	37	344	32	54	225	699
1986	0	17	337	45	98	381	878
1987	76	103	233	48	344	302	1106
1988	38	52	150	48	235	145	669
1989	31	28	132	23	132	62	409
1990	26	34	71	32	82	54	299
1991	186	30	69	55	97	70	508
1992	56	44	112	50	141	74	477
1993	105	41	128	48	67	52	441
1994	114	45	146	29	77	29	438
1995	57	0	88	22	24	2	193
1996	103	0	180	3	66	7	359
1997	76	0	148	19	56	8	307
1998	65	0	120	21	56	19	282
1999	74	0	106	14	63	14	270
2000	61	0	63	13	63	18	219
2001	50	0	64	13	58	23	208
2002 <sup>a</sup>	0	0	76	20	60	21	177

<sup>a</sup>Catch as of December 1, 2002.

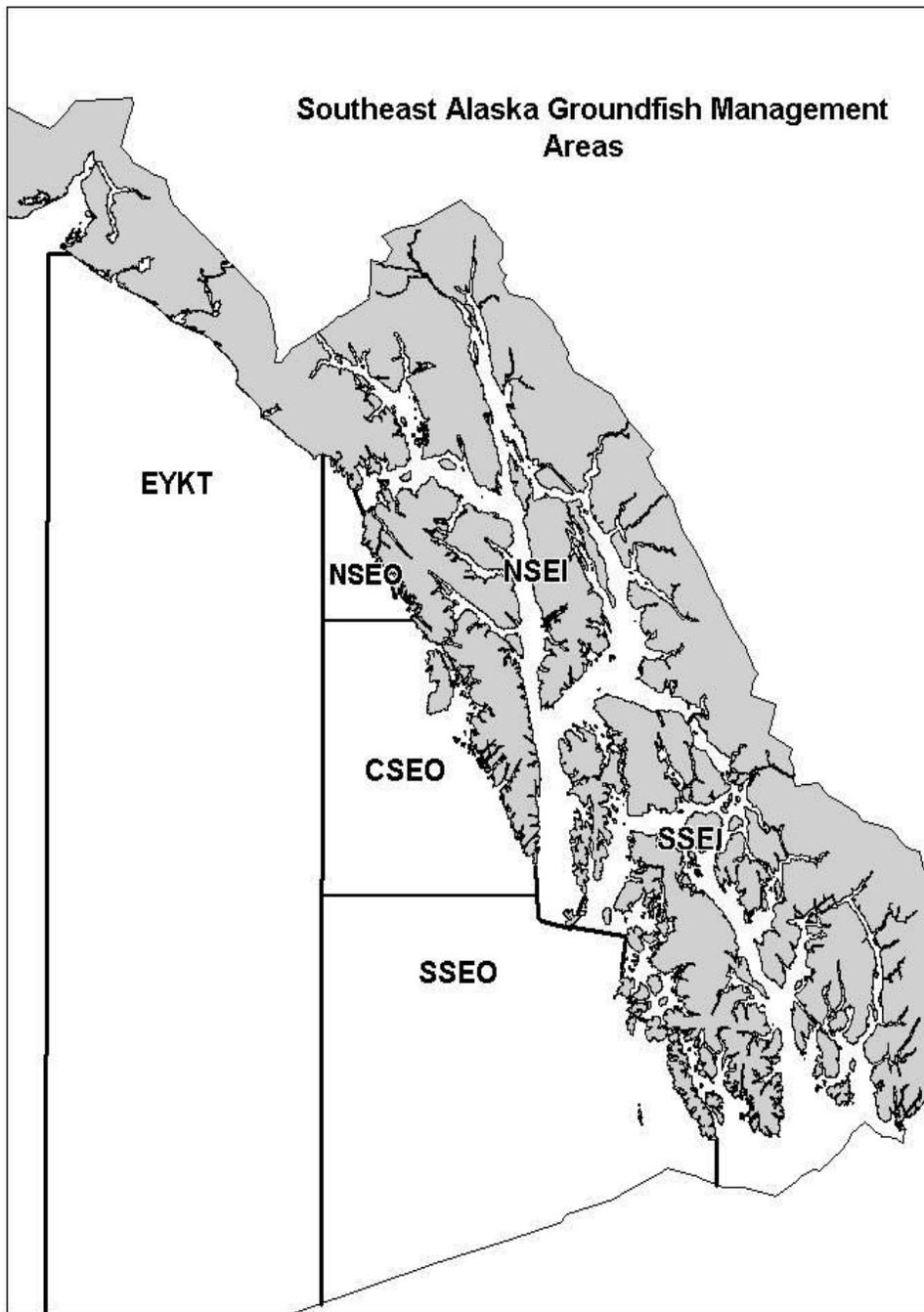


Figure 1. Demersal shelf rockfish management areas in the Southeast Region. Southeast Outside Subdistrict (SEO) is comprised of SSEO, CSEO, NSEO, and EYKT.



Figure 2. Adult yelloweye rockfish, Fairweather Ground, Southeast Alaska.

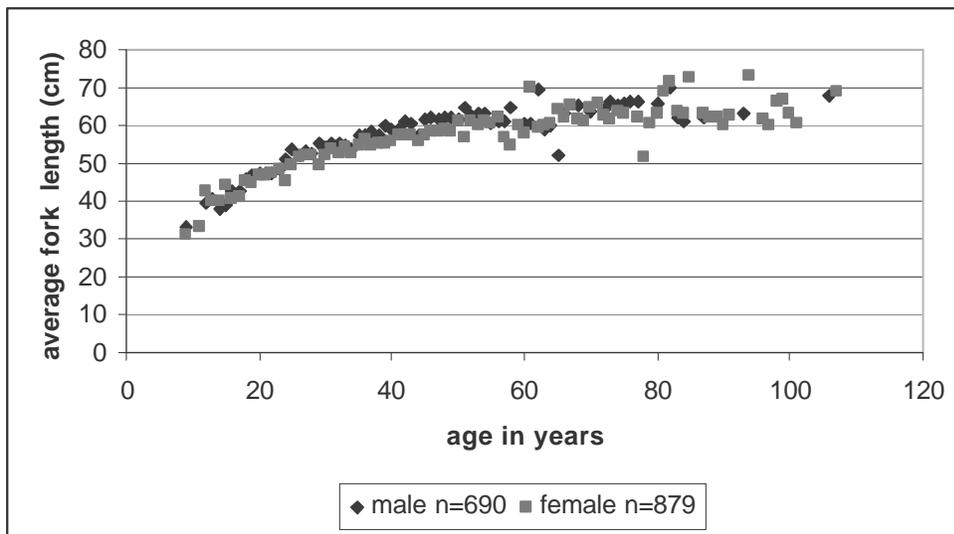


Figure 3. Average length at age data for yelloweye port samples, Southeast Alaska, 1998 and 1999, by sex.

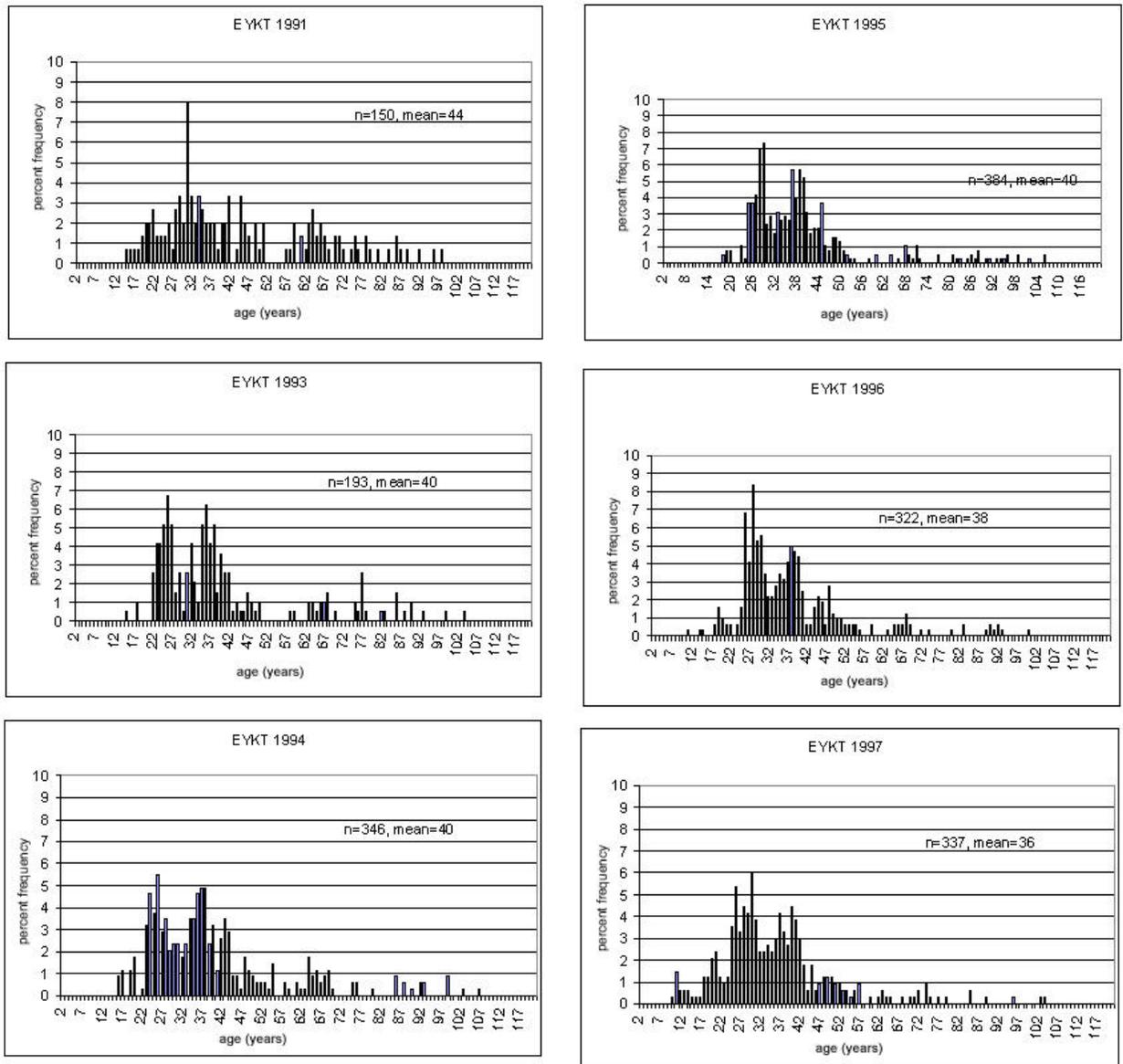


Figure 4a. Yelloweye rockfish age frequency distributions from EYKT commercial port samples.

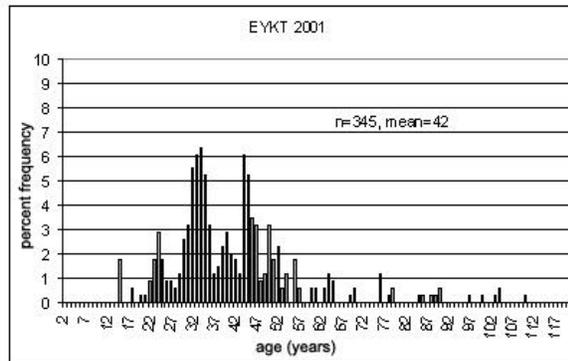
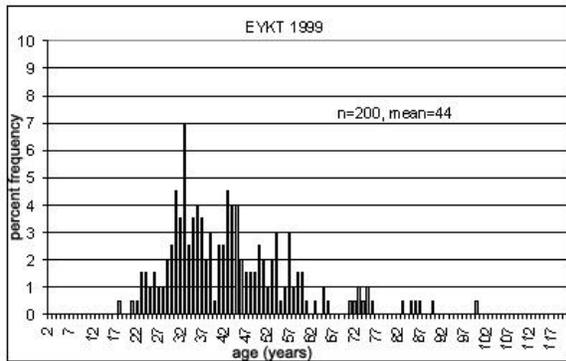
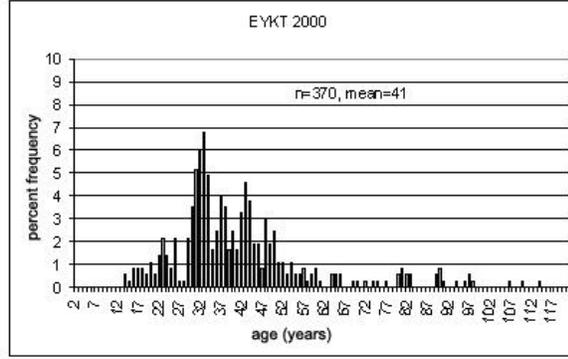
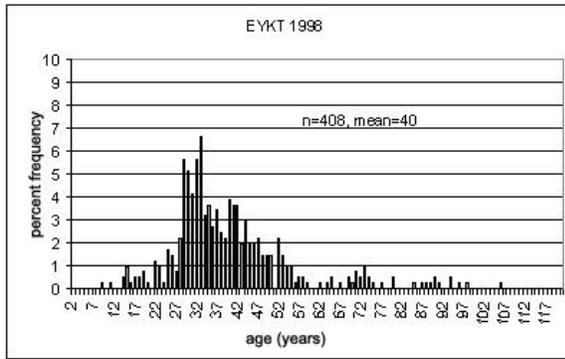


Figure 4a cont. Yelloweye rockfish age frequency distributions from EYKT commercial port samples.

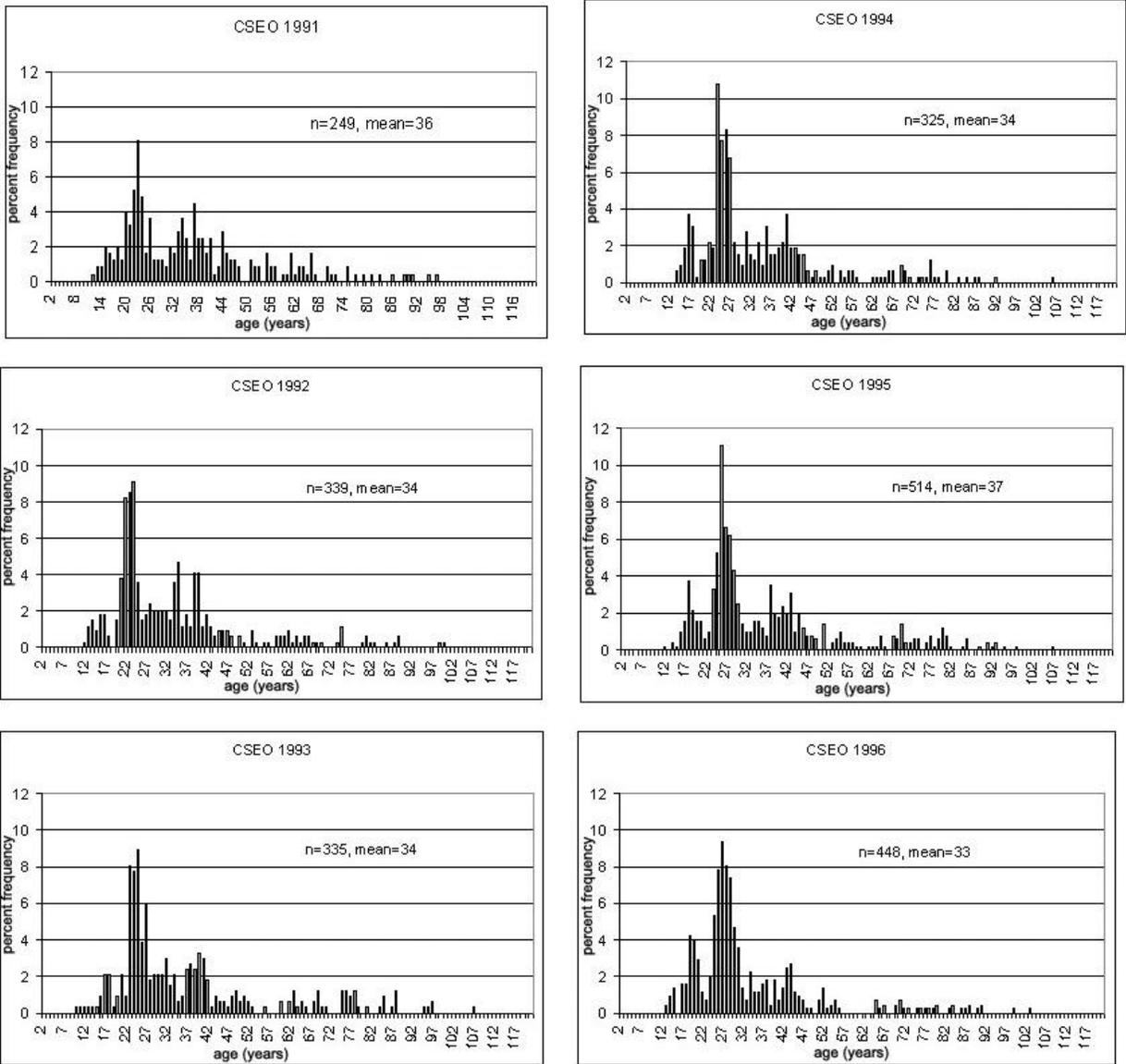


Figure 4b. Yelloweye rockfish age frequency distributions from CSEO commercial port samples.

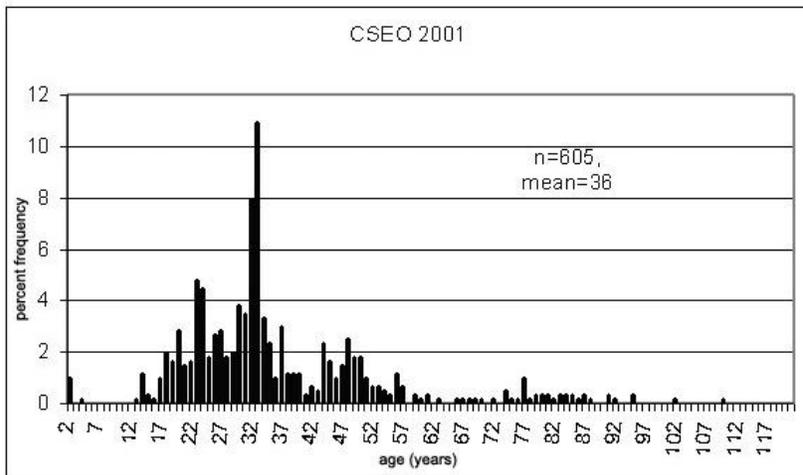
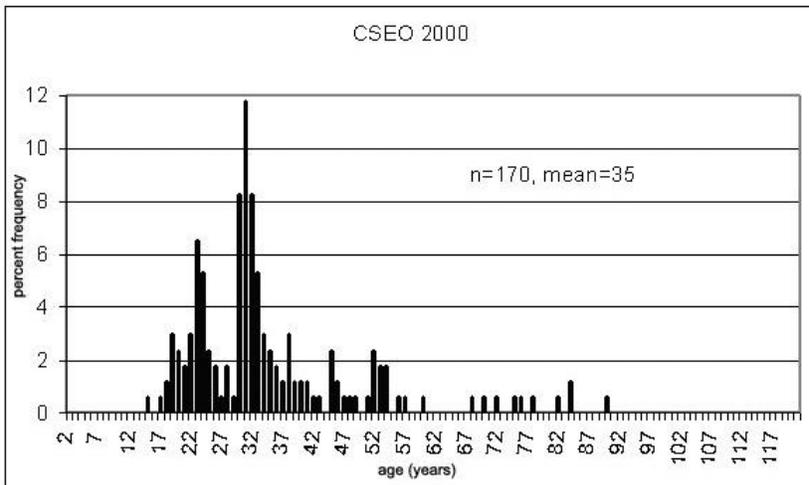
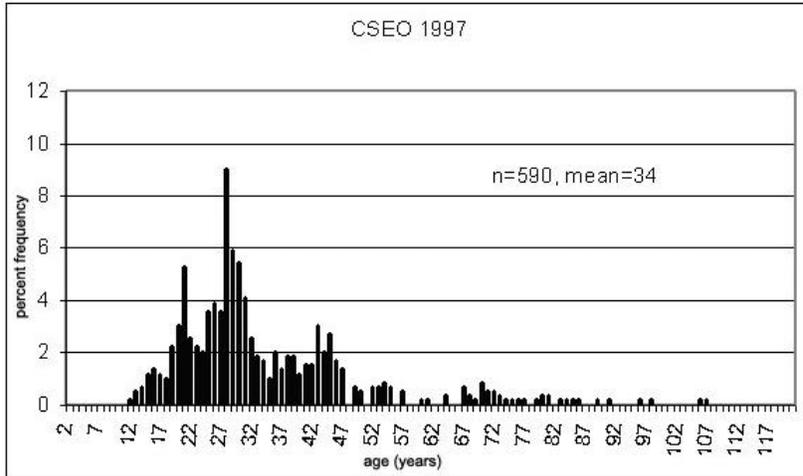


Figure 4b cont. Yelloweye rockfish age frequency distributions from CSEO commercial port samples.

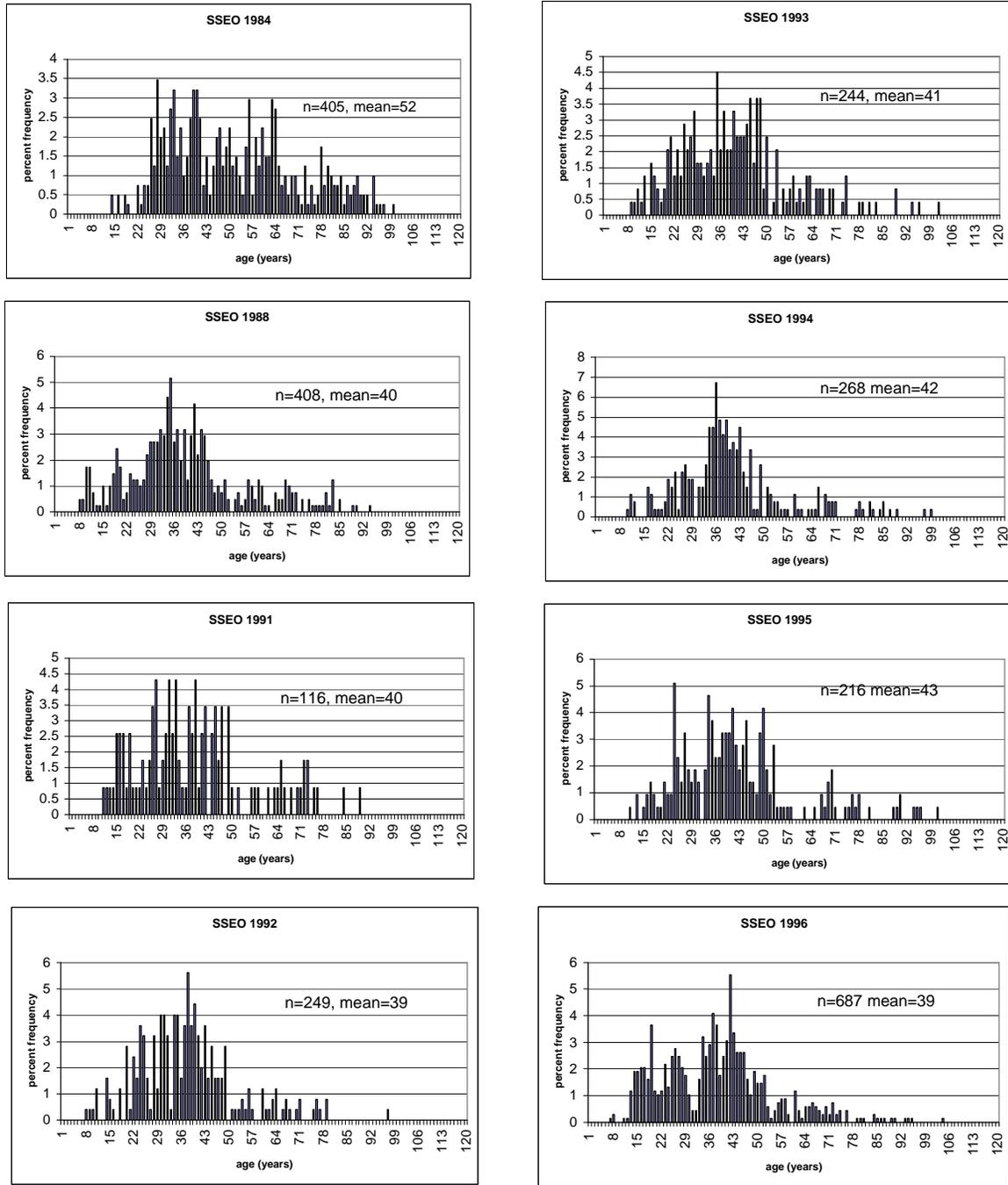


Figure 4c. Yelloweye rockfish age frequency distributions from SSEO commercial port samples.

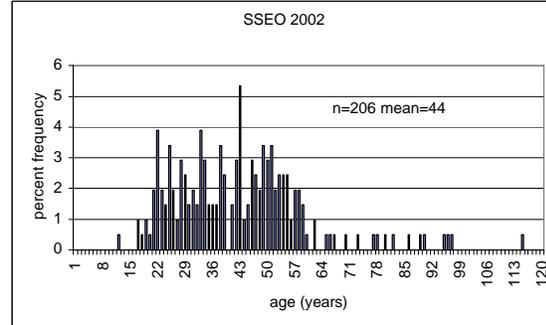
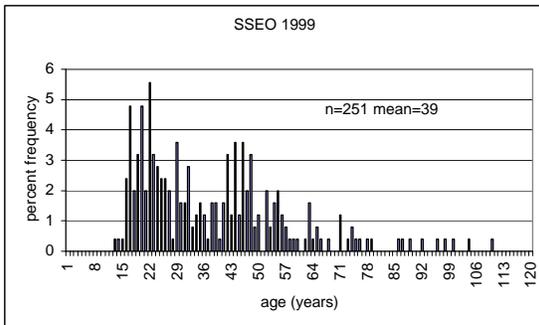
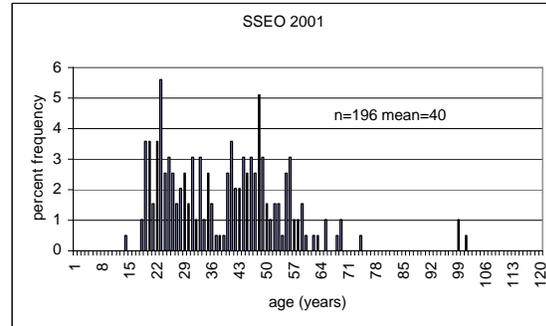
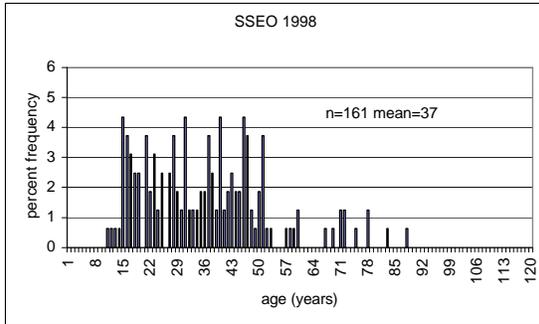
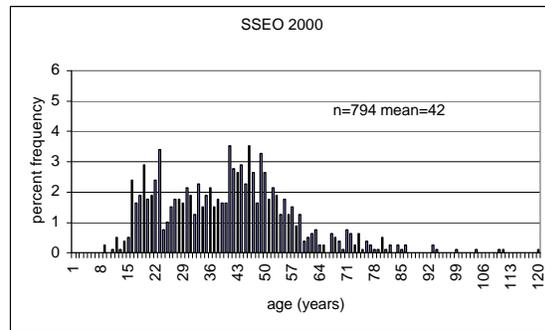
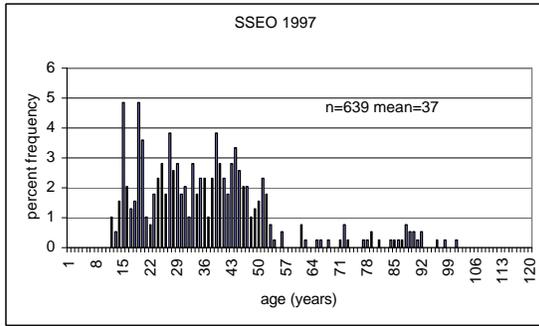


Figure 4c cont. Yelloweye rockfish age frequency distributions from SSEO commercial port samples.

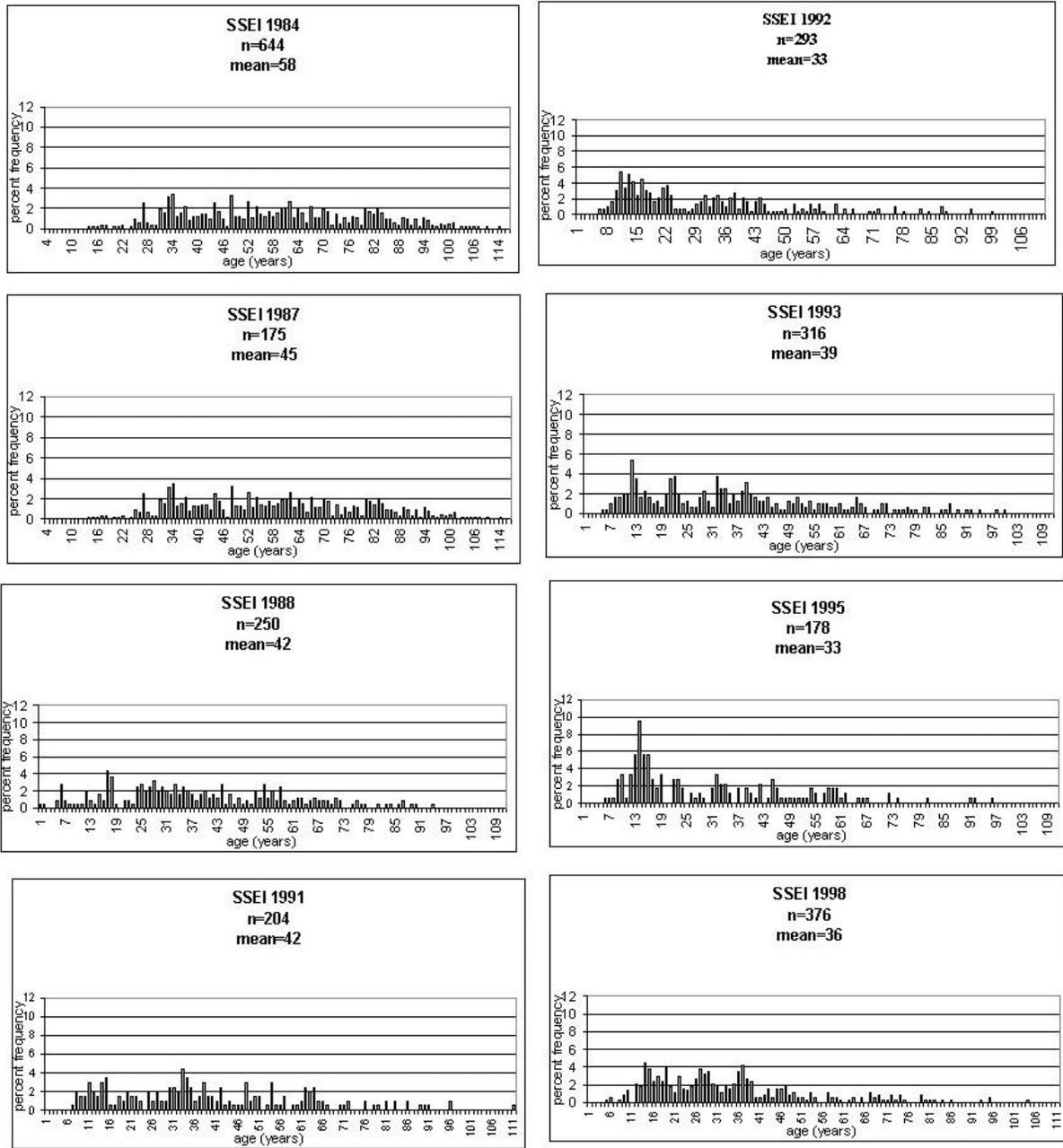


Figure 4d. Yelloweye rockfish age frequency distributions from SSEI commercial port samples.

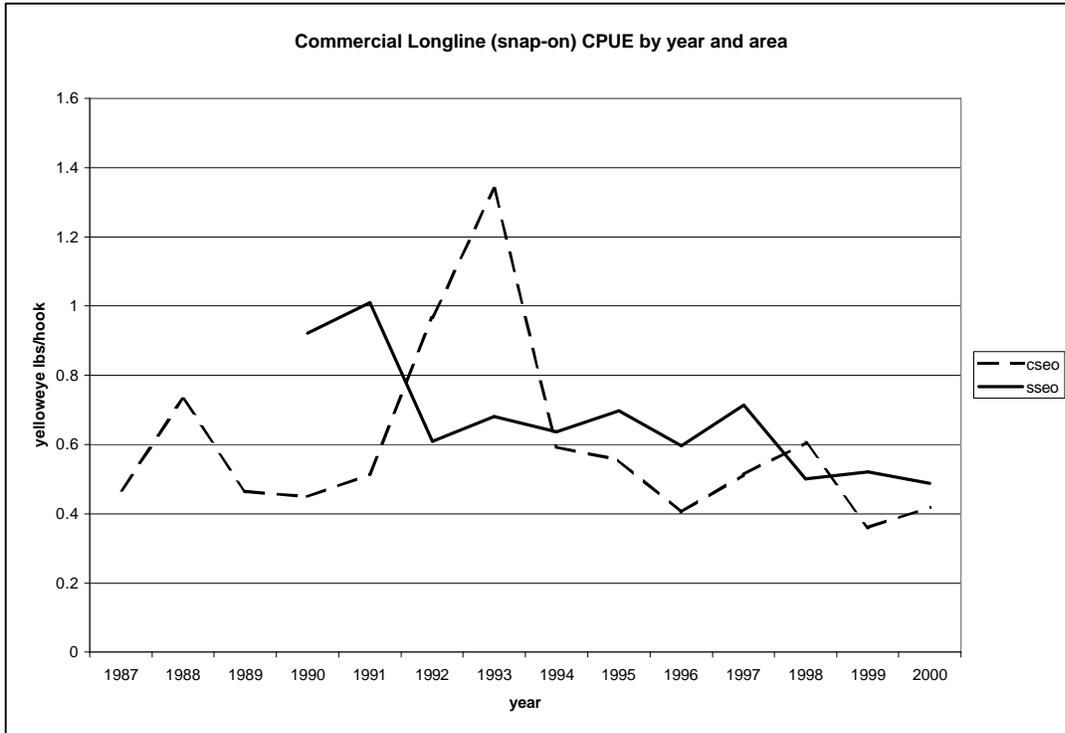


Figure 5. Commercial fishery catch per unit effort data, snap on longline gear for CSEO and SSEO, by year.

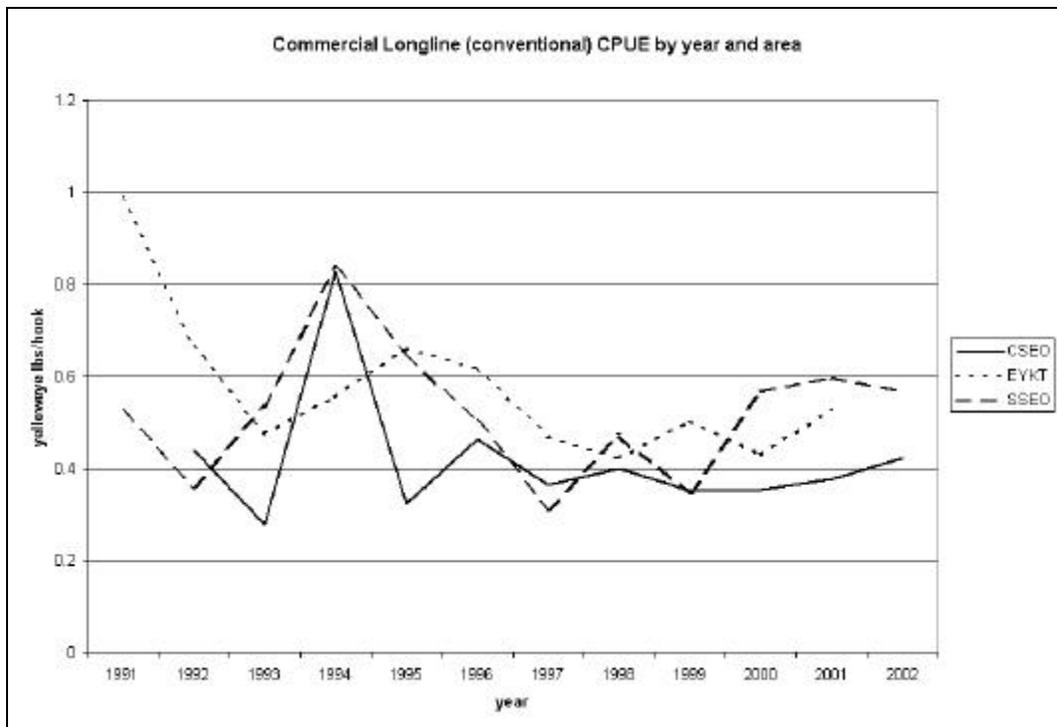


Figure 6. Commercial fishery catch per unit effort data, conventional longline gear for CSEO, SSEO, and EYKT by year.

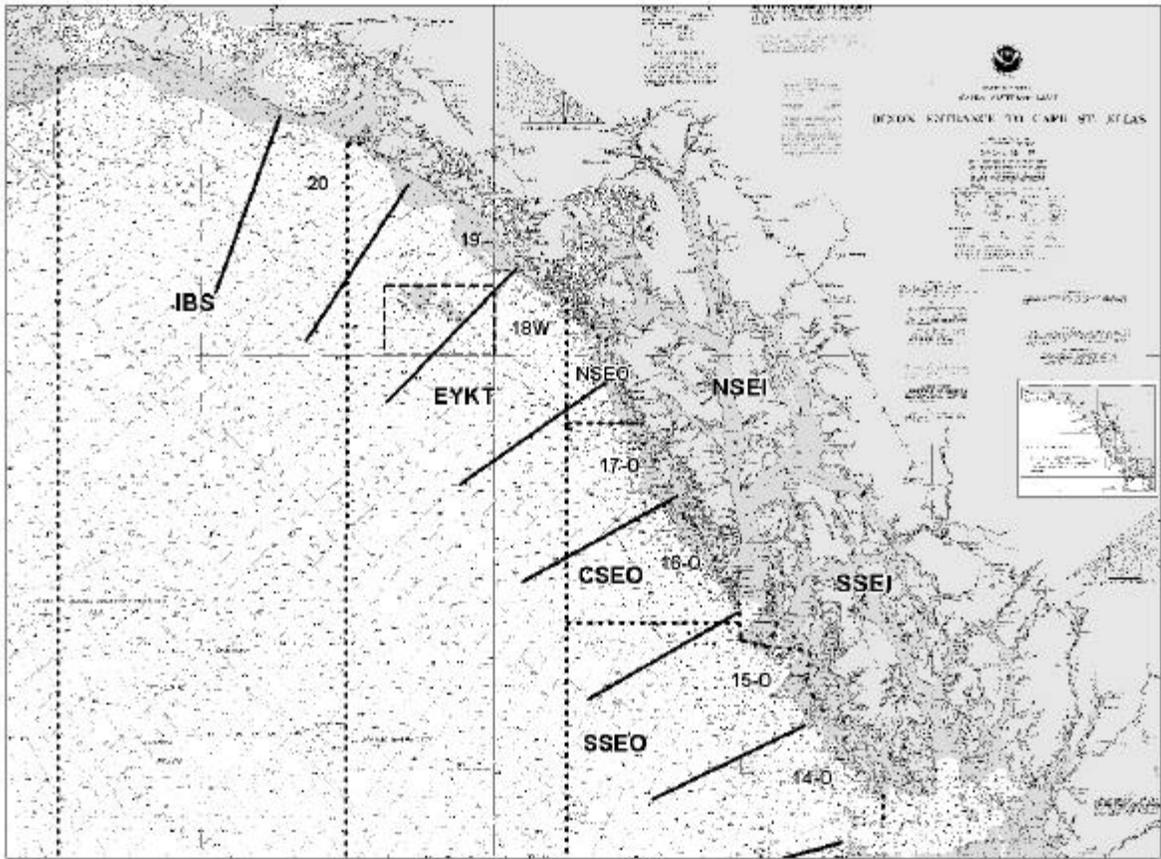


Figure 7. IPHC area (numeric) and ADF&G statistical areas.

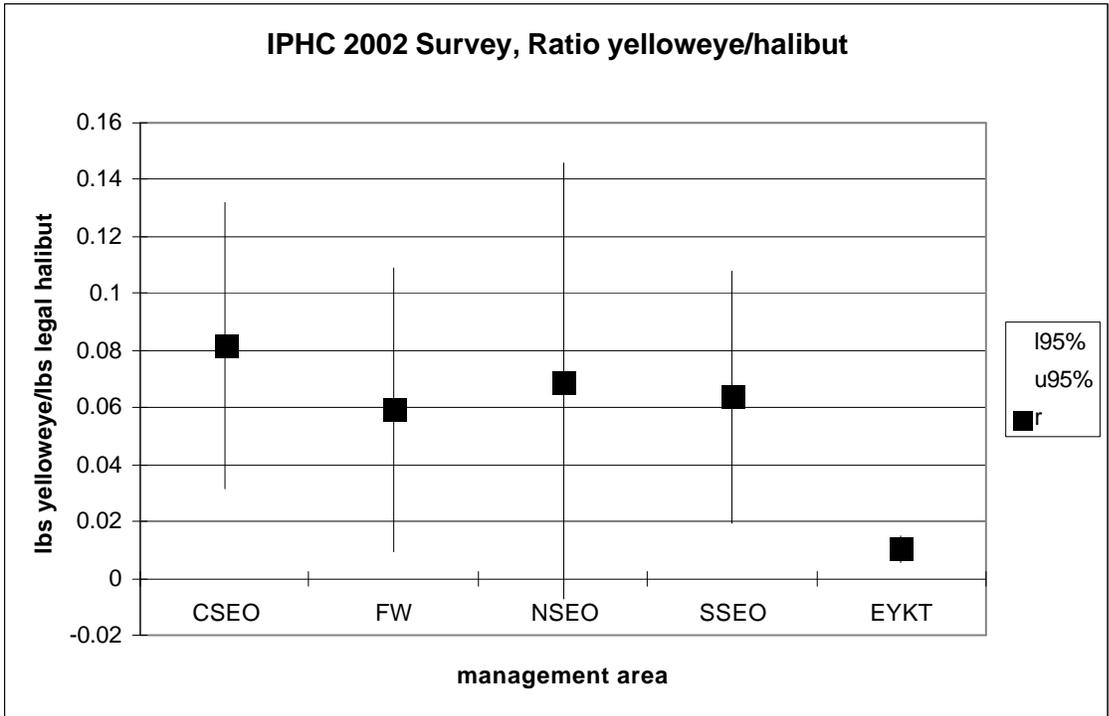
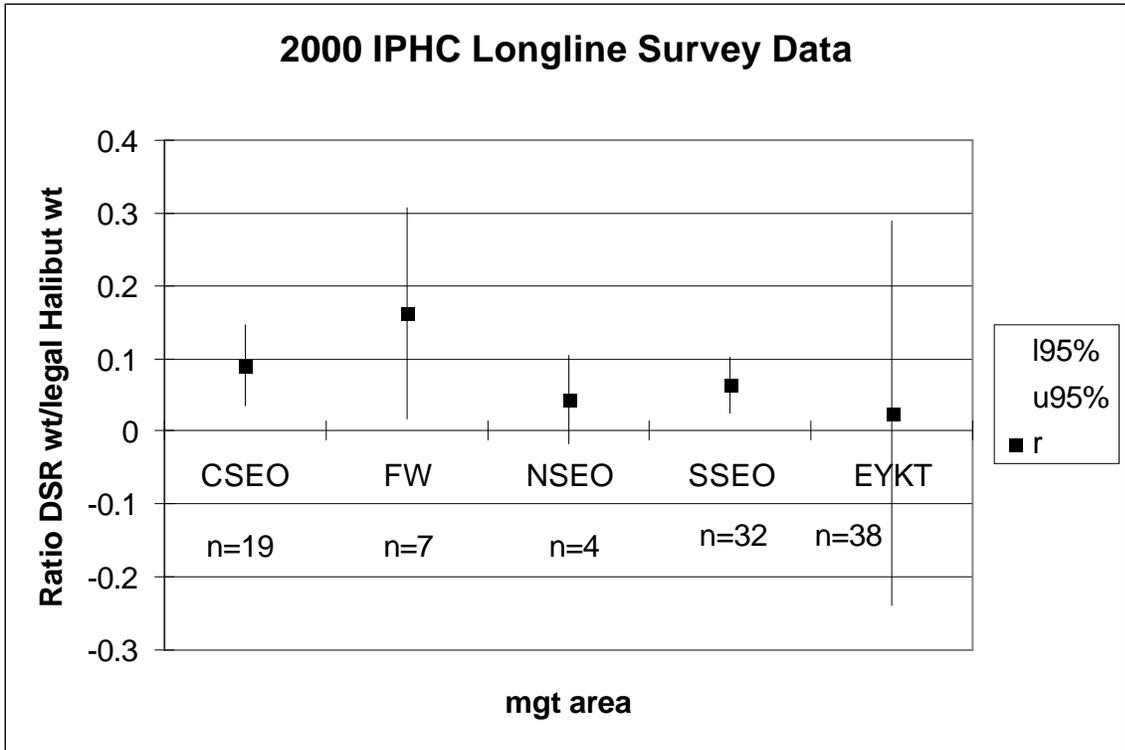


Figure 8. IPHC longline survey data: yelloweye (rd weight)/halibut (legal fish, rd weight).

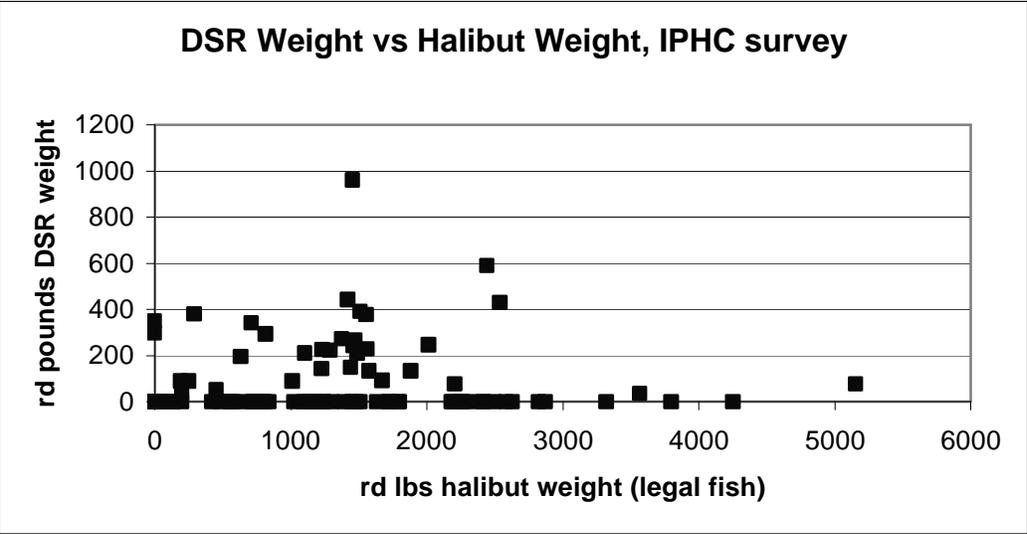


Figure 9. DSR weight versus legal sized halibut weight, IPHC longline survey 2000.

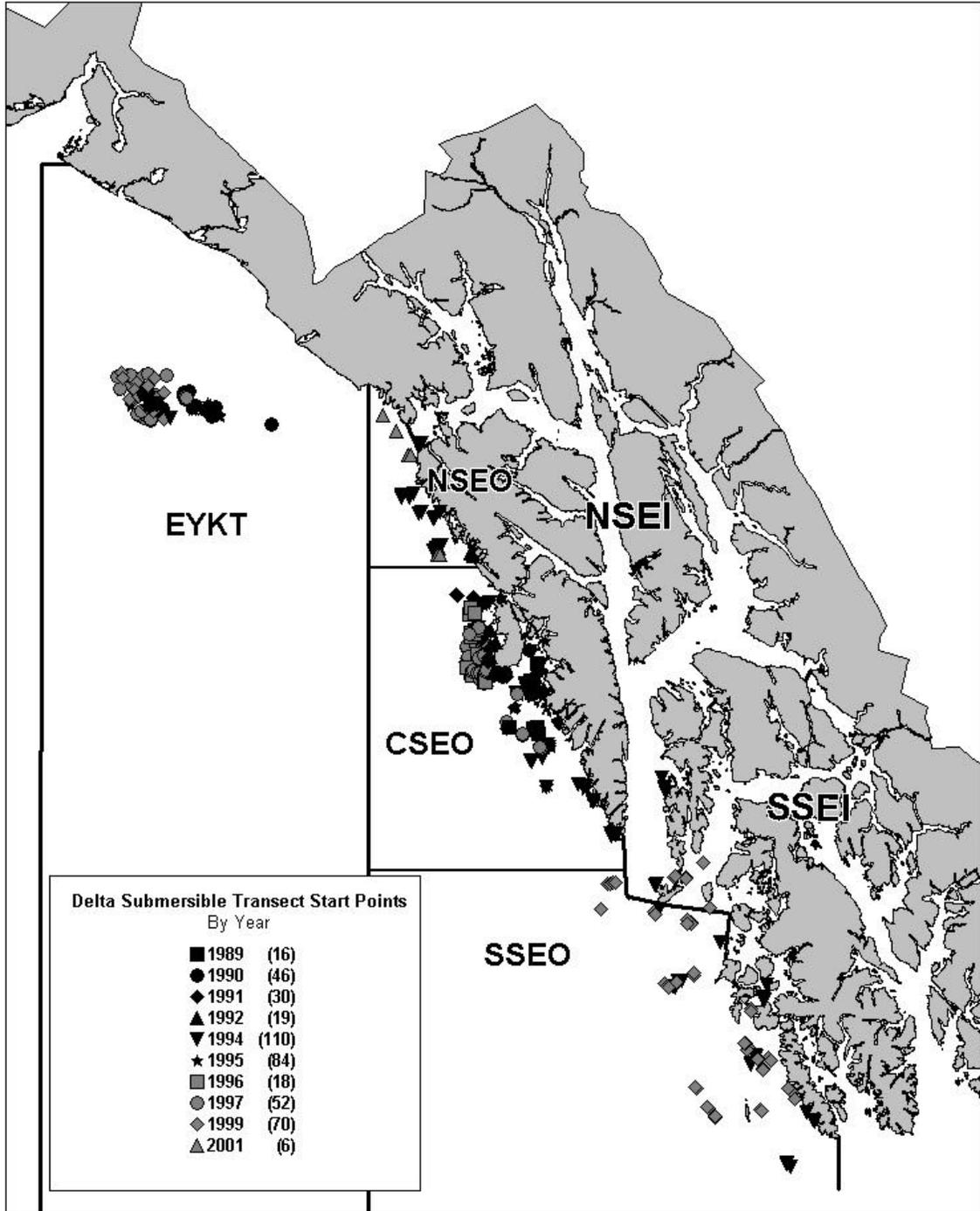


Figure 10. Starting locations of submersible dives, Southeast Alaska 1990–2001.

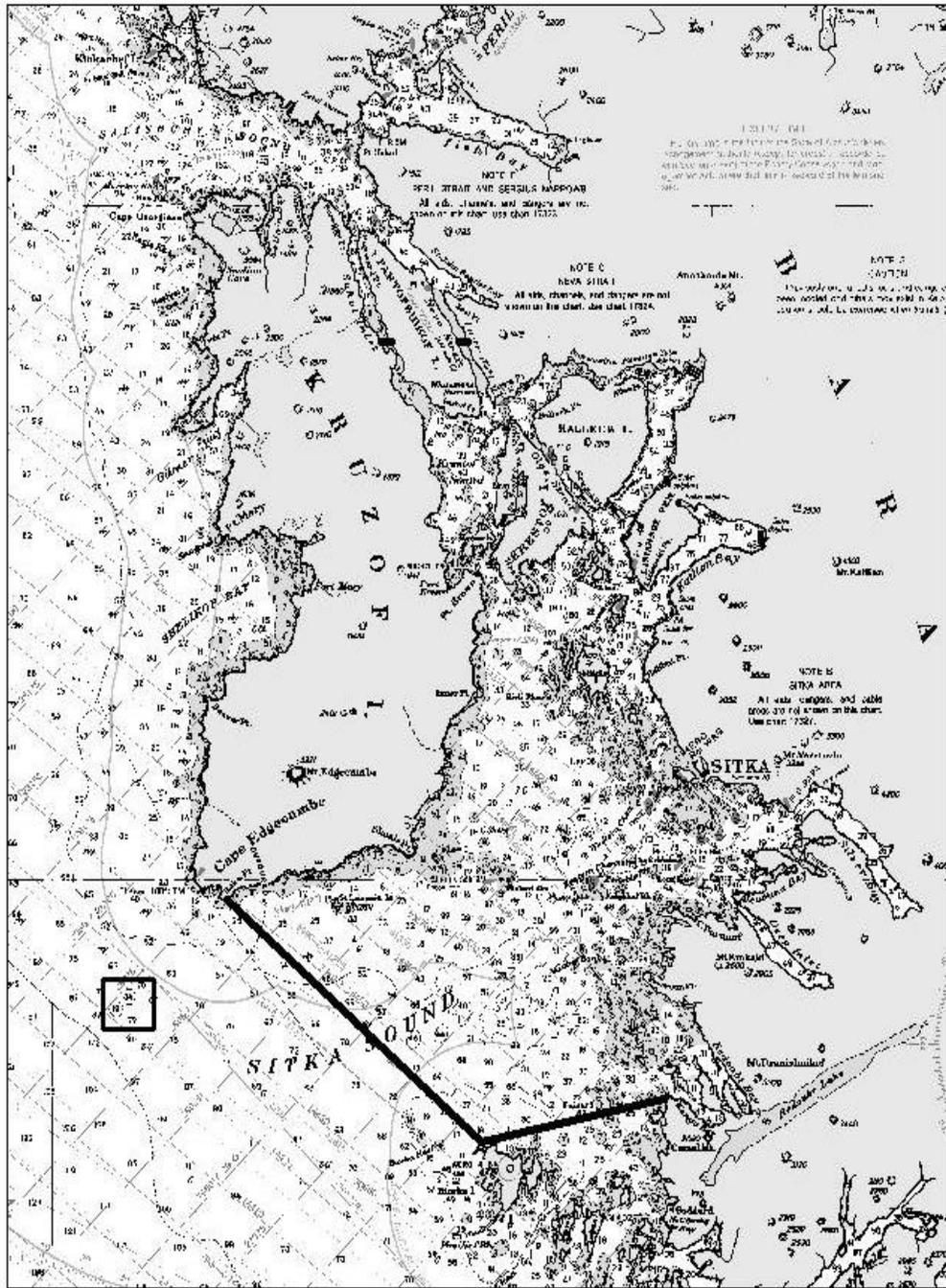


Figure 11. Location of Edgecumbe Pinnacles Marine Reserve (box) and DSR directed fishery closure area, Sitka Sound.

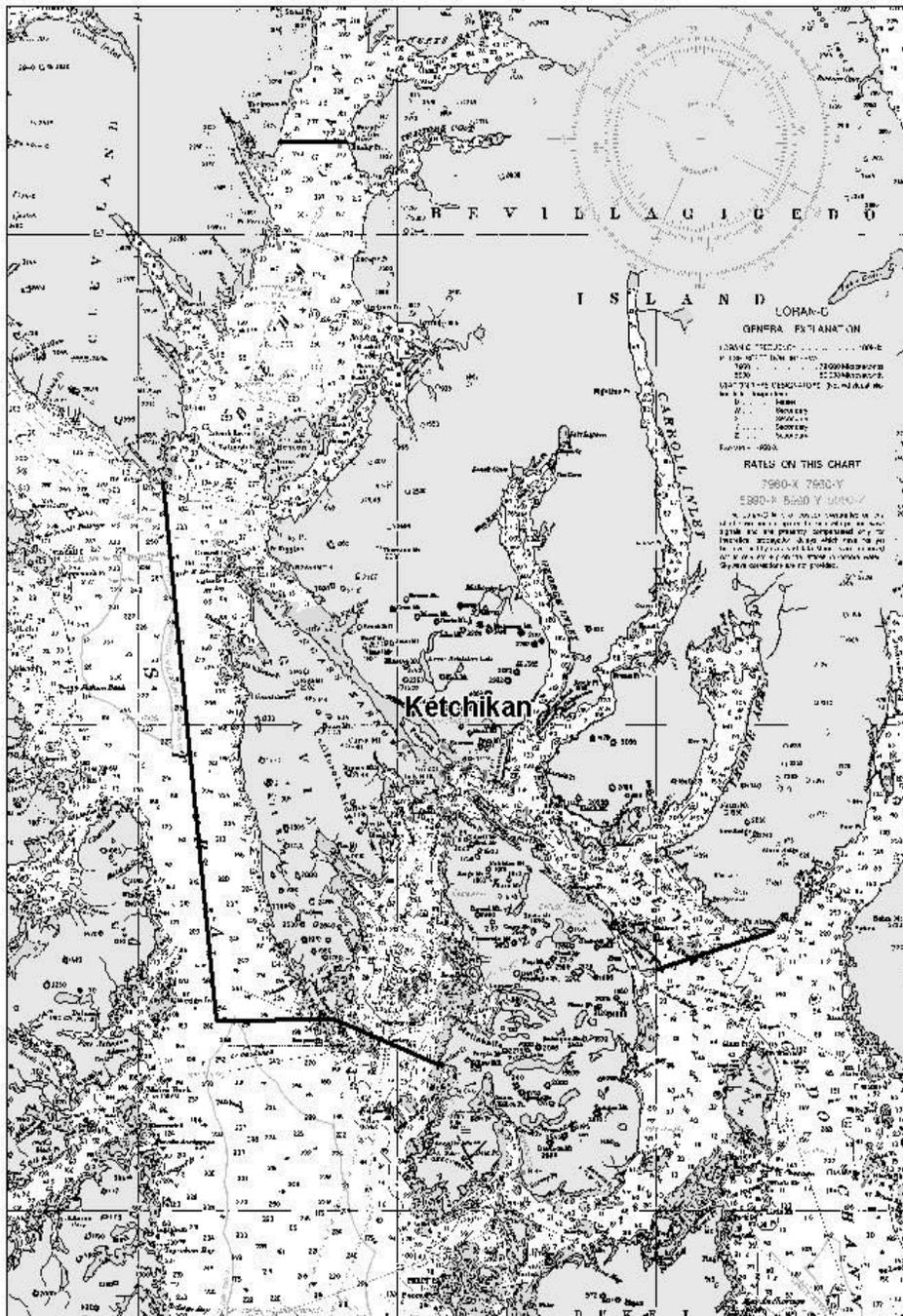


Figure 12. DSR directed fishery closure area in the vicinity of Ketchikan.

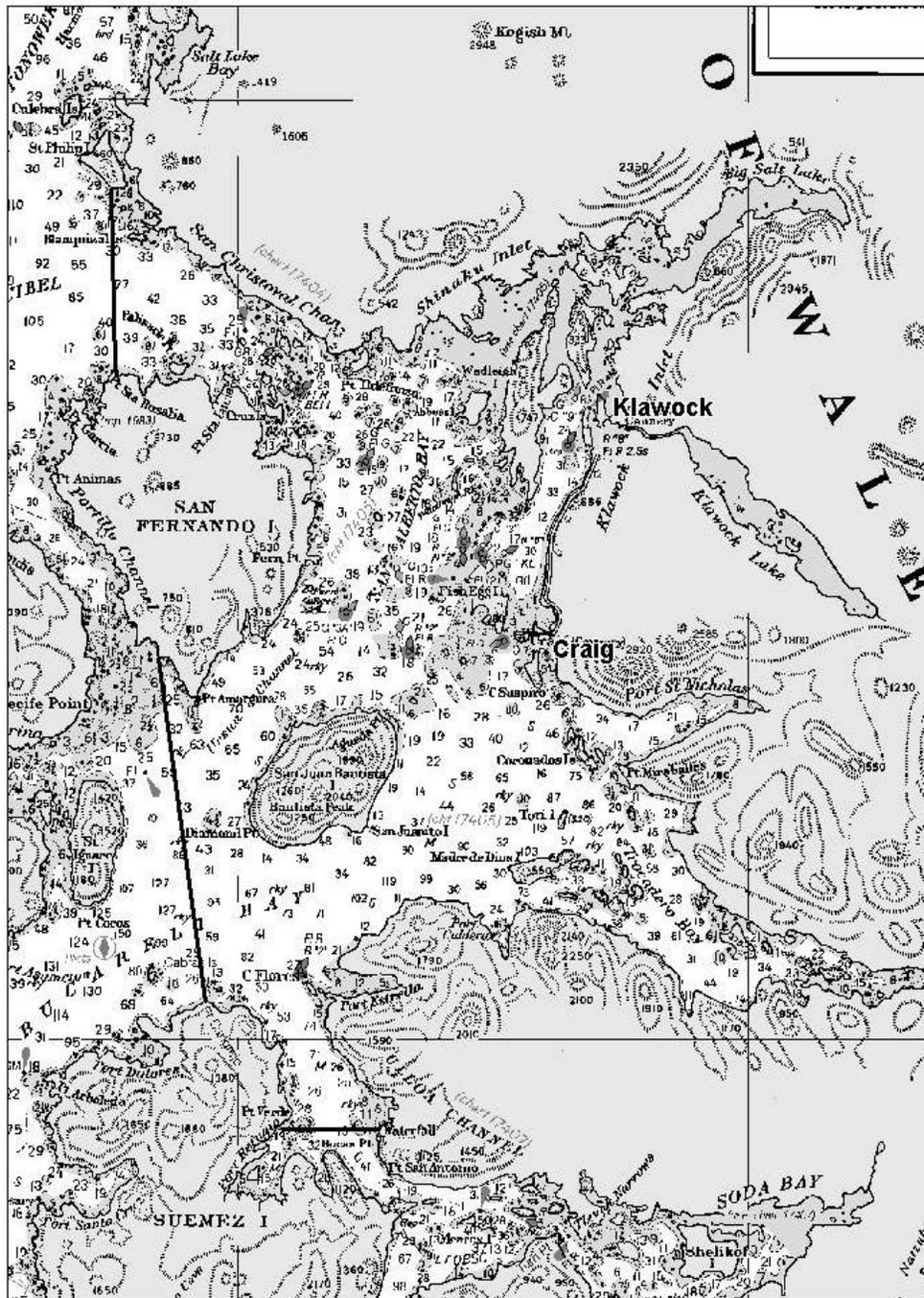


Figure 13. DSR directed fishery closure area in the vicinity of Craig.

## APPENDIX

Appendix A. Listing of ADF&G Region I commercial fisheries groundfish personnel.

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Kyle Hebert, Regional Research Supervisor Scott Kelley, Regional Management Supervisor Deidra Holum, Fishery Technician IV	Douglas Office 802 3 <sup>rd</sup> Street Douglas, AK 99824 (907) 465-4250
Tory O'Connell, Groundfish Project Leader Cleo Brylinsky, Fishery Biologist II Eric Coonradt, Fishery Biologist II Mike Vaughn, Fishery Biologist I Kamala Carroll, Fishery Technician III	Sitka 304 Lake Street, Room 103 Sitka, AK 99835 (907) 747-6688
Beverly Richardson, Research Analyst II	Petersburg 16 Sing Lee Alley Box 667 Petersburg, AK 99833 (907) 772-3801
Sue Domenowske, Fishery Technician III	Craig 333 Cold Storage Road, Suite 302 Box 668 Craig, AK 99921 (907) 826-2563
For commercial permits and vessel license applications contact:	State of Alaska <b>Commercial Fisheries Entry Commission</b> (907) 789-6150 <b>National Marine Fisheries Service</b> , Alaska Regional Office (907) 586-7229 <b>Restricted Access Management</b> program (RAM), P.O. Box 21668, Juneau, AK 99802-1668, (907)-586-7202

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Appendix B. ADF&G longline — Pot Fishery Logbook form.

ADF&G LONGLINE - POT FISHERY LOGBOOK

PERMIT HOLDER \_\_\_\_\_ TARGET SPECIES \_\_\_\_\_ CREW SIZE (includes skipper) \_\_\_\_\_  
 VESSEL NAME \_\_\_\_\_ PORT OF LANDING \_\_\_\_\_  
 ADF&G NUMBER \_\_\_\_\_ DATE LEFT PORT \_\_\_\_\_  
 SKIPPER NAME \_\_\_\_\_ DATE OF LANDING \_\_\_\_\_

SYSTEM USED  
 CONV  SNAP   
 OTHER (specify) \_\_\_\_\_

LONGLINE GEAR				POT GEAR			BAIT(S) USED	
HOOK SIZE/TYPE	SKATE LINE SIZE	HOOK SPACING	NUMBER OF HOOKS/SKATE	POT DIMENSIONS (ft)	GROUNDLINE WT. OR DIAMETER	POT SPACING (ft)		%

SET NO.	DATE SET	TIME SET	Lat X Lon Beginning	DATE HAILED	TIME HAILED	Lat X Lon End	AVERAGE DEPTH (ft) OR POTS SET	NO. SKATES OR POTS SET	LOST GEAR Y/N - (HOW MUCH?)	ATTATCH TAGS HERE FOR THIS SET	COMMENTS/TAGS

CATCH DATA  
 please indicate if catch is in NUMBERS or POUNDS (round)  
 use separate box for each species

SET NO.	DATE SET	TIME SET	Lat X Lon Beginning	DATE HAILED	TIME HAILED	Lat X Lon End	AVERAGE DEPTH (ft) OR POTS SET	NO. SKATES OR POTS SET	LOST GEAR Y/N - (HOW MUCH?)	ATTATCH TAGS HERE FOR THIS SET	COMMENTS/TAGS

CATCH DATA  
 please indicate if catch is in NUMBERS or POUNDS (round)  
 use separate box for each species

SET NO.	DATE SET	TIME SET	Lat X Lon Beginning	DATE HAILED	TIME HAILED	Lat X Lon End	AVERAGE DEPTH (ft) OR POTS SET	NO. SKATES OR POTS SET	LOST GEAR Y/N - (HOW MUCH?)	ATTATCH TAGS HERE FOR THIS SET	COMMENTS/TAGS

CATCH DATA  
 please indicate if catch is in NUMBERS or POUNDS (round)  
 use separate box for each species

SET NO.	DATE SET	TIME SET	Lat X Lon Beginning	DATE HAILED	TIME HAILED	Lat X Lon End	AVERAGE DEPTH (ft) OR POTS SET	NO. SKATES OR POTS SET	LOST GEAR Y/N - (HOW MUCH?)	ATTATCH TAGS HERE FOR THIS SET	COMMENTS/TAGS

ADDITIONAL COMMENTS / Did you shake gear and/or stabilfish due to reaching your limit? \_\_\_\_\_ How much? \_\_\_\_\_

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