REVIEW OF THE 1993 GROUNDFISH FISHERIES IN THE CENTRAL REGION

by

William R. Bechtol

Regional Information Report[1] No. 2A94-19

Alaska Department of Fish and Game
Commercial Fisheries Management and Development Division
Central Region
333 Raspberry Road
Anchorage, Alaska 99518

May 1994

---

[1] The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Commercial Fisheries Management and Development Division.

AUTHOR

William R. Bechtol is the Central Region Groundfish Biologist for the Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, 3298 Douglas St., Homer, AK 99603.

ACKNOWLEDGEMENTS

Several people helped in the compilation of data used to monitor harvests of the Central Region groundfish fisheries. Trish McNeill and Elaine Challup assisted with editing of groundfish harvests records. Better harvest documentation in recent years, particularly for rockfish landings, has reflected opportunistic port sampling which was subsequently used to modify poorly documented landings. I would like to thank Trish McNeill, Scott Meyer, Greg Demers, Tom Sigurdsson, and Henry Yuen for their help with sampling at various times. Henry Yuen was also instrumental in developing computer programs to summarize port sampling data. James Brady and Stephen Fried reviewed this manuscript.

TABLE OF CONTENTS

Page

LIST OF TABLES v

LIST OF FIGURES vi

LIST OF APPENDICES vi

ABSTRACT vii

INTRODUCTION 1

METHODS 1

Fish Ticket Reporting System 1

Reporting Areas 2

Conversion and Summary of Fish Products 2

Discard Estimation 3

RESULTS 3

Management Actions in 1993 3

Central Region Summary 4

Central Region Product Value 6

Harvest by Reporting Area 6

North Gulf Harvest 6
Prince William Sound Harvest 7
Prince William Sound Sablefish. 7
Other Prince William Sound Groundfish. 7
Cook Inlet Harvest 8

Reported Discards 8

Deliveries to Central Region Ports 8

TABLE OF CONTENTS (Continued)

Page

DISCUSSION 9

Management Strategies 9

Groundfish Regulations 9

Discards 10

Market Considerations 10

LITERATURE CITED 13

LIST OF TABLES

Table		Page
1.	Monthly groundfish harvest and effort from Cook Inlet, Prince William Sound, and the North Gulf during 1987-1993	15
2.	Central Region harvest and effort from Cook Inlet, Prince William Sound, and the North Gulf during 1987 to 1993	16
3.	Central Region groundfish harvests (a) by gear type and month during 1993 and (b) by gear type and year during 1987-1993	17
4.	Landings and exvessel value of Central Region groundfish harvests during 1987 to 1993	18
5.	Annual effort, harvest, and exvessel value of the commercial sablefish fishery in Prince William Sound during 1984 to 1993	19
6.	Estimated at sea discards of groundfish from Central Region waters during 1991 to 1993	20
7.	Deliveries of groundfish caught in both state and federal waters to Central Region ports during 1987 to 1993	21

LIST OF FIGURES

Figure		Page
1.	Groundfish harvest reporting areas of the Central Region	22
2.	Groundfish harvest from the North Gulf, Prince William Sound and Cook Inlet during 1987 to 1993	23
3.	Harvest of groundfish species groups from the North Gulf during 1987 to 1993	24
4.	Harvest of groundfish species groups from Prince William Sound during 1987 to 1993	25
5.	Harvest of groundfish species groups from Cook Inlet during 1987 to 1993	26

LIST OF APPENDICES

		Page
A.	Delivery condition codes used to specify the dressed weight condition of groundfish products as reported on groundfish fish tickets	27
B.	Primary openings and closures of groundfish fisheries in state waters of the Central Region during 1993	28
C.	Alaska Board of Fisheries action on groundfish proposals during 1993 meeting cycle	29

ABSTRACT

The Central Region includes all state waters west of Cape Suckling and north of Cape Douglas; and includes Prince William Sound, Cook Inlet, and what is referred to as the North Gulf. During the 1993 fishing season, 225 vessels delivered 6.9 million lb (3,145 tonnes) of groundfish in 908 landings from Central Region waters. This was the second largest harvest on record and generated an exvessel value of $1.9 million. Pacific cod comprised 90%, sablefish 7%, and rockfish 2% of the harvested biomass. Species caught primarily as bycatch included flounders, lingcod, and "other" groundfish. Longline gear yielded 54%, pot gear 45%, and other gears < 1% of the 1993 harvest. Although groundfish markets remained favorable, a 26% decline in groundfish harvests from 1992 to 1993 was attributed to (1) a general decrease in groundfish quotas for the Gulf of Alaska; (2) earlier attainment of halibut bycatch mortality caps for longline gear; and (3) more conservative management of some nearshore fishery resources. State management of groundfish stocks in the Central Region generally conformed to Federal inseason actions taken in adjacent offshore waters. Increased fishing effort in recent years has generated concern with the status of some nearshore resources, particularly rockfish and lingcod. Management strategies adopted by the Alaska Board of Fisheries, and implemented for the first time in 1993, included rockfish trip limits, lingcod size and season restrictions, and statewide elimination of sunken gillnets for groundfish. More active and intensive management of nearshore groundfish resources will be necessary as fishing effort continues to increase and people search for more diversified fishing opportunities. Improved stock assessment programs are urgently needed to ensure that nearshore groundfish resources are harvested at sustainable levels.

KEY WORDS: Groundfish, harvest, Central Region, North Gulf, Prince William Sound, Cook Inlet, Pacific cod, rockfish, lingcod

INTRODUCTION

The terms groundfish and bottomfish refer to all marine finfish excluding halibut, herring, salmonids, and osmerids. The Alaska Department of Fish and Game (ADF&G) and the National Marine Fisheries Service (NMFS) coordinate management responsibilities for groundfish harvests in coastal waters off Alaska. ADF&G has management jurisdiction for groundfish stocks in territorial waters extending from 0 to 3 miles from shore. NMFS has jurisdiction in federally managed waters of the Exclusive Economic Zone (EEZ; previously referred to as the Fishery Conservation Zone) extending from 3 to 200 miles from shore. Fishery management plans for the EEZ are developed by the North Pacific Fisheries Management Council, and inseason management actions are implemented by NMFS. Management regulations for state waters are established by the Alaska Board of Fisheries, and inseason adjustments are made through Emergency Orders issued by ADF&G. State inseason management actions generally conform with federal actions implemented in the adjacent EEZ. Unless specific management actions have been established in regulations by the Alaska Board of Fisheries, ADF&G management authority is limited to time and area closures for resource conservation. In recent years, growing fishing pressure combined with uncertainties over resource impacts from the Exxon Valdez oil spill, have increased conservation concerns for some groundfish resources (McBride et al. 1993; Bechtol 1992 and 1993; Vincent-Lang and Bechtol 1992). This report presents data on commercial groundfish landings 1) from Central Region territorial waters, including waters between Cape Suckling (144° W. longitude) and Cape Douglas (58°52' N. latitude); 2) from federal waters inside Cook Inlet; and 3) to Central Region processors.

METHODS

Fish Ticket Reporting System

Processors, buyers, and fishers were responsible for recording each groundfish landing on an ADF&G fish ticket and submitting that fish ticket to ADF&G. As part of a cooperative agreement between NMFS and ADF&G, harvest data for all groundfish landings at Central Region processors were entered into the statewide groundfish database. An ADF&G representative reviewed fish ticket data for incomplete or inaccurate information, and then entered the data into an electronic database (ADF&G 1989). Groundfish data were electronically transferred to the NMFS Management Division office in Juneau, Alaska, for compilation of statewide harvest data. NMFS used this database to verify harvests and to provide information for inseason management decisions. Data were later transferred to the ADF&G Computer Services office in Juneau for inclusion in historical databases. Data reported herein resulted

from harvests of sablefish, miscellaneous groundfish, and other species by longline, pot, jig, and other gears in state waters of Prince William Sound, Cook Inlet, and the North Gulf, and in federal waters of the Gulf of Alaska.

Reporting Areas

Groundfish harvests from the Central Region were further summarized according to three geographic areas (Figure 1):

(1) Cook Inlet, defined as all waters (including federal waters) of Cook Inlet enclosed by a line from Point Adam (59°15'20" N, 151°58'30" W) to Cape Elizabeth (59°09'30" N, 151°53' W) to Cape Douglas (58°52' N);

2) Prince William Sound, defined as all waters of Prince William Sound enclosed by lines from Point Whitshed (60°27' N, 145°53' W) to Point Bentinck (60°24' N, 146°04' W), from Cape Hinchinbrook (60°14' N, 146°39' W) to Zaikof Point (60°19' N, 146°55' W), and from Cape Cleare (59°46'25" N, 147°54'30" W) to Cape Puget (59°56'35" N, 148°26'30" W); and

3) North Gulf, defined as all state waters between Cape Suckling (143°53' W.) and Cape Douglas, excluding Prince William Sound and Cook Inlet.

Conversion and Summary of Fish Products

Harvests reported by commercial fishers and processors on ADF&G fish tickets were usually expressed as dressed weight. Dressed weights and product values were converted to round weight equivalents using Product Recovery Ratios (PRR's) specific to species and delivery condition codes (Appendix A; ADF&G 1989). Groundfish harvest data, expressed in pounds (lb) or tonnes (1 tonne = 1,000 kg or 2,205 lb) of round weight, were summarized by individual species or species groups: rockfish *Sebastes* and *Sebastolobus* spp., sablefish *Anoplopoma fimbria*, Pacific cod *Gadus macrocephalus*, flatfish Pleuronectiformes, lingcod *Ophidon elongatus*, and "other species". Although walleye pollock *Theragra chalcogramma* comprised a major component of the groundfish harvest from federal waters, this species comprised $<0.1\%$ (6,883 lb; 3 tonne) of the catch from Central Region state waters and was included in the "other species" category. Octopus *Octopus* spp. landed and reported as groundfish bycatch comprised 20,309 lb of the 1993 groundfish harvest and was also included in the "other species" category.

For consistency with other data in this report, exvessel values were presented as round-weight equivalents. Product value was not always available for each landing report. To estimate exvessel value, the price-per-pound for individual species was averaged across all Central Region landings for which product values were reported. This average price was applied to all Central Region landings and summed within fish groups.

Discard Estimation

In all fisheries, some fish, shellfish, or other organisms are discarded (Dewees and Ueber 1990). Discards consist of a species, size, or sex which have a relatively low market value, are damaged during capture, or are listed as prohibited species and cannot be legally retained. Discards can be further categorized as discards at sea, reported as condition code 98, or landed discards, reported as condition code 99 (Appendix A). Discards at sea were estimated by the vessel operator, recorded in the operator's logbook, and reported as at-sea discards on the ADF&G fish ticket. The accuracy and consistency of discard reporting was highly variable between processors and vessel operators. The extent of discard under-reporting could not be determined through the ADF&G fish ticket reporting system (ADF&G 1989). However, to estimate discards at sea throughout the Central Region, I summarized all reported at-sea discards by management area for each year from 1991 to 1993 and calculated the average discard per landing. This average was then applied to all landings, stratified by area and year. Due to inconsistent and limited reporting by processors and vessel operators, at sea discards were not estimated for years prior to 1991.

RESULTS

Management Actions in 1993

With the exception of trawl and directed sablefish fisheries, all groundfish fisheries in state waters of the Central Region and in the adjacent federal waters opened for directed fishing on 1 January 1993 (Appendix B). Groundfish trawl fisheries were delayed until 20 January, then were opened with bycatch-only restrictions for rockfish until 1 July. An emergency order, effective from 29 December 1992 to 27 April 1993, allowed commercial crab vessels to fish groundfish pots during the 14 day period prior to the commercial Tanner crab *Chionoecetes bairdi* season in the Cook Inlet Management Area. Because Pacific cod is important as bait in the commercial Tanner crab fishery, this action allowed the fleet to diversify and maximize potential economic gain during the relatively short commercial seasons for cod and crab.

An ADF&G emergency order, effective from 20 January 1993 through 31 December 1993, established commercial groundfish seasons in state waters of Cook Inlet and the Central Gulf of Alaska, including the North Gulf, as coinciding with seasons in the adjacent federal waters. This emergency order (1) allowed consistent management for fisheries which harvested the same groundfish stocks in adjacent state and federal waters; (2) facilitated enforcement of regulations; (3) reduced the number of individual regulatory actions issued for adjacent state and federal waters; and (4) provided stock conservation measures in cases where ADF&G lacks sufficient data to actively manage nearshore groundfish populations. A similar emergency order has been implemented since 1991 (Bechtol 1993, 1994). Lingcod and rockfish were excluded from this emergency order because explicit management strategies existed for these fishes. In an effort to keep the public informed, news releases detailing the status of the various groundfish fisheries were periodically distributed to Central Region groundfish processors.

Several Central Region groundfish fisheries were restricted or closed to protect depressed species and to stay within bycatch allocations. The Kamishak Bay and inner Kachemak Bay areas of Cook Inlet were closed to groundfish pot gear for all of 1993 to protect depressed or rebuilding crab stocks. The North Montague and Orca Bay areas of Prince William Sound were also closed to groundfish pots during 1993 to protect depressed crab stocks. The commercial lingcod fishery was closed from 15 February through 30 June to protect depressed lingcod populations during the critical spawning and nest-guarding phase (Vincent-Lang and Bechtol 1992). Because the National Marine Fisheries Service does not manage lingcod, this closure was also in effect in the adjacent federal waters of the EEZ. Lingcod fishing has remained closed in Resurrection Bay since February 1993 to protect depressed stocks. A shift of the Pacific cod fishery to bycatch-only on 24 March reduced much of the Central Region groundfish effort. Sablefish was opened to longline gear in Cook Inlet and the North Gulf from 15-30 May; and opened to all gears in Prince William Sound from 17-20 May and again from 10-11 June. To provide a fair start in the Prince William Sound sablefish and halibut fisheries, all groundfish fishing was closed from 15-17 May and 7-10 June. Since halibut bycatch mortality caps were exceeded, directed longline groundfish fishing in the Gulf of Alaska and Prince William Sound was closed from 30 May to the end of the year. Directed trawl groundfish fisheries were also closed when halibut bycatch mortality caps were exceeded. These trawl closures occurred from 24-29 March, 16 April to 28 June, 3 August to 4 October, and, for deepwater flatfish, from 4 October to 31 December.

Central Region Summary

During the 1993 season, 225 vessels made 922 landings and harvested 6.9 million lb of groundfish from Central Region waters (Table 1). Most of the 1993 harvest occurred in directed fisheries for Pacific cod (6.2 million lb, 90% of the 1993 total), sablefish (486,361 lb, 7% of the total), and rockfish (165,037 lb, 2% of the total). Lingcod (15,322 lb), flatfish (766 lb), and other species (32,518 lb) were landed primarily as bycatch. Despite being the second largest

catch on record, the 1993 harvest represented a 26% decline from the record 1992 harvest (Table 2; Bechtol 1993). However, since almost twice as many landings occurred in 1992, catch rates were probably greater in 1993. The North Gulf accounted for 47% of the 1993 harvest, Prince William Sound produced 32%, and Cook Inlet produced 21%. The portion of the Central Region catch produced by the North Gulf has increased since 1991, while the Prince William Sound portion has declined (Table 2; Figure 2). Monthly harvests from Central Region peaked at 4.1 million lb in March (Table 3). Due to closures of directed fishing for (1) Pacific cod in March, (2) all groundfish with longline gear in May, and (3) sablefish in May, 97% of the 1993 groundfish harvest had been achieved by mid-June. Most groundfish deliveries from late-June through the end of the year resulted from directed jig fisheries for rockfish and from groundfish bycatch in halibut longline and shrimp trawl fisheries. When directed groundfish fishing was closed, vessels were prohibited from retaining incidentally caught groundfish in an amount exceeding 20% of their non-groundfish, onboard products (Alaska Administrative Code 5 AAC 05.120).

Harvests of both lingcod and rockfish were substantially less than those recorded in previous years. The 1993 lingcod harvest was only 50% of the 1992 and 18% of the 1991 harvests. This reduction probably resulted from the 15 February to 30 June closure of the lingcod fishery and the 35 in (889 mm) minimum-size-for-retention restriction. The season closure reduced harvests during the critical nest-guarding period, which also coincided with the timing of the primary groundfish fisheries in 1993. The minimum size was set to allow most lingcod to reach sexual maturity prior to being harvested (Vincent-Lang and Bechtol 1992). Similar season and size restrictions were also implemented for recreational lingcod fisheries (Meyer 1993). The 1993 rockfish harvest was only 31% of the 1992 harvest. This reduction resulted from trip limits, implemented in April 1993, which prohibited vessels from delivering, within five consecutive days, an aggregate of all rockfish species exceeding (1) 4,000 lbs from the North Gulf (excluding the area from Cape Suckling to 147°W long.), (2) 3,000 lb from Prince William Sound, or (3) 1,000 lb from Cook Inlet (Bechtol 1993). Trip limits were intended to decrease harvest rates and to reduce the potential for localized, depletions of these long-lived, slow-growing, late-maturing species (Bechtol 1992; Leaman and Beamish 1984; Leaman 1991).

Harvests of other species have increased since 1991. This resulted from greater retention and delivery of non-target species such as pollock, shark, and octopus (Table 2). Octopus accounted for only 2,716 lb of landings in 1992, but comprised 20,306 lb of landings in 1993. Additional octopus harvests occurred in groundfish fisheries, but were reported as shellfish landings. Increased octopus landings in groundfish fisheries are also notable because directed commercial efforts to harvest octopus in the Central Region have largely been unsuccessful (Kimker 1994; Trowbridge 1994). Despite a generally high price paid for octopus by Central Region processors, most reported commercial landings of octopus in recent years are the result of incidental catches in groundfish fisheries.

While a single vessel can obtain licenses and permits to fish several gear types, either over the course of a year or at the same time, over 90% of the vessels fish a single gear type. During the 1993 season, 189 longline vessels made 584 landings and harvested 3.7 million lb of

groundfish (54% of the total groundfish harvest from state waters of the Central Region; Table 3). Thirty-three pot vessels made 251 landings and harvested 3.1 million lb of groundfish (45% of the region total). Fifteen jig (both mechanical jig and hand troll) vessels made 35 landings and harvested 55,925 lb of groundfish (<1% of the region total). Other gear types landed 46,706 lb of groundfish (<1% of the region total). The portion of the total harvest landed by longline vessels was the lowest on record and reflected an increasing use of groundfish pots for Pacific cod over the last three years. Harvests by longline, pot, and other gears peaked in March, while jig harvests peaked in August.

Central Region Product Value

Product value was calculated using round weight equivalents. The 6.9 million lb of groundfish harvested from state waters of the Central Region in 1993 generated an estimated exvessel value of $1.9 million (Table 4). This was seven times greater than the 1989 value, but marked a 29% decline from the 1992 value. Pacific cod, with an average delivery value of $0.22/lb, generated the greatest exvessel value, nearly $1.4 million, for a species or species group. Sablefish, which had the highest average delivery value of $.95/lb ($1.51/lb dressed as headed-and gutted), generated an exvessel value of $462,043. Rockfish, with an average delivery value of $0.36/lb, generated an exvessel value of $58,912. Finally, lingcod generated $5,826, flatfish generated $115, and other species generated $17,235 in exvessel values. In recent years, sablefish and rockfish prices have generally increased, Pacific cod prices have declined, and no definite trends have emerged for other prices. The high price paid for other species in 1993 primarily reflected the average landed value of $1.00/lb for the 20,306 lb of octopus harvested as bycatch in groundfish fisheries.

Harvest by Reporting Area

North Gulf Harvest

During 1993, 121 vessels made 345 landings and harvested 3.3 million lb of groundfish from state waters of the North Gulf (Table 1, Figure 3). Pacific cod comprised 92% (3.0 million lb), sablefish 5% (172,238 lb), and rockfish 2% (77,050 lb) of the North Gulf harvest. The remainder of the harvest was comprised of lingcod (15,087 lb), other species (1,908 lb), and flatfish (31 lb). The 1993 harvest from the North Gulf was the second largest on record but represented a 37% decline from the 1992 harvest (Table 2). Monthly harvests from the North Gulf in 1993 peaked at 2.3 million lb in March (Table 1). The record sablefish harvest from the North Gulf was probably due to greater fishing effort being directed to nearshore waters.

A 78% decline in rockfish harvests from 1992 levels was probably attributable to five-day landing limits of 4,000 lb. The lingcod harvest from the North Gulf was only 23% of the 1992 level due to the 15 February to 30 June closure and the minimum retention size of 35 in (889 mm).

Prince William Sound Harvest

Prince William Sound Sablefish. A Prince William Sound Sablefish Fishery Permit is required prior to commercially harvesting sablefish in Prince William Sound. Eighty-two people obtained permits for the 1993 sablefish season. Approximately 30% of all vessel operators obtaining Sablefish Fishery Permits each year do not participate in the fishery. ADF&G encouraged people validly licensed to participate in the sablefish fisheryi to also obtain a miscellaneous finfish interim use card. This allowed sablefish permit holders to also retain miscellaneous groundfish in excess of the state's 20% incidental catch limits. It was hoped that this would reduce waste resource and increase potential income.

The Prince William Sound sablefish fishery is managed for a harvest guideline range of 97,020 to 385,875 lb (44 to 175 tonnes). This fishery has historically been opened in conjunction with the sablefish fishery in adjacent federal waters, and been closed by emergency order when the midpoint of the guideline harvest range has been reached. In recent years, high catch rates, relatively high participation, and delayed catch reporting have made it increasingly difficult to manage the Prince William Sound fishery to ensure that the harvest remained within the guideline range (Bechtol 1993 and 1994). Therefore, in 1993, an initial fishing period of 72 hr was set to control harvests. Preliminary processor reports following this period, from 17-20 May, indicated the harvest had only slightly exceeded the midpoint of the guideline harvest range. Because the Prince William Sound sablefish resource appeared healthy, the sablefish fishery was reopened for 24 hours during the 10-11 June halibut fishery. During the 96 hr of fishing allowed for sablefish in 1993, 55 vessels made 87 deliveries and harvested 313,976 lb. This was the fourth largest sablefish harvest on record and had an exvessel value of $298,277, the third greatest ever recorded (Table 5).

Removal of sablefish from longlines by killer whales *Orcinus orca* during gear retrieval has been a contentious issue in Prince William Sound and other areas in past years (Dalheim 1988; Matkin 1988). In 1993, however, Prince William Sound permit holders reported that sablefish loss to killer whales was relatively low. It is possible that the short duration of the fishery prevented killer whales from "orienting" to this foraging opportunity.

Other Prince William Sound Groundfish. Over 1.4 million lb of groundfish were harvested from state waters of Prince William Sound during 1993 by 87 vessels making 322 landings (Table 1). Monthly harvest levels peaked at 661,691 lb in March, reflecting the large fishing effort directed at Pacific cod, which comprised 71% (1,022,546 lb) of the 1993 harvest. Species

caught primarily as bycatch in the Pacific cod and sablefish fisheries included rockfish (81,475 lb), other species (12,042 lb), flatfish (644), and lingcod (245). The 1993 Pacific cod harvest was the fourth largest on record, but the smallest since 1990, and was probably due to shorter seasons during recent years (Table 2; Figure 4). Also, development and expansion of the pot fishery for Pacific cod since 1991, combined with continued concerns about depressed crab resources in Prince William Sound, led ADF&G to exclude pot gear from areas with known crab habitat (Bechtol 1994). The 1993 harvest of other species was the second highest on record and was primarily due to the retention of 4,500 lb of octopus from the Pacific cod fishery and 5,627 lb of walleye pollock from the shrimp trawl fishery. Rockfish and lingcod harvests were both the smallest recorded since 1987, and probably resulted from more restrictive regulations for these species in 1993. These new regulations will help ensure that both these resources are harvested at sustainable levels.

Cook Inlet Harvest

During 1993, 2.2 million lb of groundfish were harvested from Cook Inlet state and federal waters by 53 vessels making 255 landings (Tables 1). Despite a three-year decline in the number of landings, the 1993 harvest was the largest on record (Table 2; Figure 5). Pacific cod comprised over 99% of the Cook Inlet groundfish harvest. Other species (18,568 lb) and rockfish (6,512 lb) accounted for most of the remaining harvest. The largest portion of the other species harvest was octopus (14,932 lb) taken as bycatch in the Pacific cod fishery. Monthly harvests from Cook Inlet peaked at 1.2 million lb in March.

Reported Discards

In 1993, an estimated 384,693 lb of groundfish were discarded at sea, a 53% decline from 1992 levels (Table 6). The estimated average discard rate of 417 lb/landing for 1993 represented a slight decline from the 1992 average. As in previous years, most reported discards were other species (320,463 lb), primarily shark and skate. Some flatfish (40,458 lb) and Pacific cod (21,629 lb) were also discarded, but, unlike previous seasons, no rockfish discards were reported.

Deliveries to Central Region Ports

Although total groundfish landings from both state and federal waters reported for 1993 have declined about 13% from 1992 levels, increased groundfish landings were observed at Homer,

Valdez, Whittier, and Kenai area ports (Table 7). It is likely that these increases reflect processor diversification resulting from declines in more traditional fisheries such as salmon and shellfish. However, while groundfish landings at these ports has increased, landings at Seward have decreased.

DISCUSSION

Management Strategies

Participation in most Central Region groundfish fisheries has been extremely variable, and appears to be driven by a combination of short-term market fluctuations and declines in other fisheries (e.g., salmon, crab; Bechtol 1993 and 1994). As groundfish fisheries have evolved and expanded, management actions have been taken to protect groundfish resources from overexploitation. For example, regulatory management plans have been developed for Central Region rockfish (Bechtol 1992 and 1993), and guideline harvest levels have been set for Central Region rockfish and Prince William Sound sablefish. As a better understanding of the resource is gained, or when fishing patterns and effort levels changes, management plans, harvest guidelines, and other regulations often have to be modified. For example, increasing sablefish catch rates made it necessary to more closely control and monitor landings so that the total harvest could be held within established guidelines. To accomplish this in 1993, ADF&G set weekly fishing periods, implemented preseason processor registration, and required processors to report deliveries immediately following each weekly fishing period. Although high catch rates in 1993 limited the fishery to a single weekly period (Table 5), this strategy, using ADF&G inseason management authority for time and area closures, did maintain the sablefish harvest within established guidelines. A similar strategy will be applied in 1994. In contrast to rockfish and Prince William Sound sablefish, data on other Central Region groundfish stocks remains limited. To provide some resource protection in the absence of stock production data or established management strategies, ADF&G management actions for many groundfish fisheries in the Central Region will continue to coincide with NMFS actions in adjacent federal waters of the Central Gulf of Alaska.

Groundfish Regulations

Fisheries regulations establish a formal framework within which resource managers, enforcement agents, and the fishing industry work to provide for long-term, sustainable yield for a variety of user groups. As resource use intensifies, resource managers must address both short- and

long-term conservation concerns. If demand for a resource exceeds the potential resource production, the resource must be allocated among user groups. For resources managed by the State of Alaska, the Alaska Board of Fisheries adopts regulations to govern resource conservation and utilization. Although some under-reporting may have occurred, drastic declines in reported harvests of both lingcod and rockfish probably resulted from the more restrictive regulations implemented in 1993 (Table 2). ADF&G is primarily concerned with the establishment of regulations addressing resource conservation concerns (Bechtol 1992; Vincent-Lang and Bechtol 1992). Regulatory changes which modify resource allocations are addressed by the Alaska Board of Fisheries after input from user groups, advisory committees and the public have been obtained. During the 1993-1994 meeting cycle, the Alaska Board of Fisheries considered regulation changes for finfish, including groundfish, in the Southeast, Yakutat, and Prince William Sound areas (Appendix C).

Discards

Bycatch and discards complicate the conservation and economic goals of fishery managers and the fishing industry (Dewees and Ueber 1990). Discarding species such as sablefish and skate at sea results in relatively low mortality, if these species are not retained in the fishing gear for a long time and are released quickly with little handling. However, soft-bodied species, such as sole and flounders, and species susceptible to embolism, such as rockfish, often suffer high mortality when retained by fishing gear and released. Accurate reporting of at-sea discards has continued to be a problem in managing groundfish fisheries. In some cases, a viable market has developed for a species which was previously unreported as a discard. A rapid increase in the retention of such species often results in management efforts to limit the catch, if only temporarily, to historically reported levels. Continued rapid expansion of fisheries for previously unutilized species may result in the implementation of a management plan for high impact emerging fisheries (Alaska Administrative Code 5 AAC 39.210). In reality, removals of these species may be similar to past years when reporting was not accurately done. A similar situation may occur when markets develop for species previously retained for personal use (often referred to as "home-pack"), such as rockfish. Therefore, to successfully manage groundfish resources for long-term, sustainable yield, it is important that all catch, including that retained for personal use as bait or food, and all discards be accurately reported.

Market Considerations

Fisheries for groundfish are expected to continue to develop in Central Region, although specific market emphases may vary. A major consideration in retaining existing and developing new markets will continue to be product quality. In some instances, fish processors may refuse to

purchase all or a portion of a delivery if quality is judged to be poor. Fish which cannot be sold must be reported as landed discarded (condition code 99; Appendix A). The amount of groundfish harvested from Central Region waters and reported as landed discarded increased from 10,840 lb in 1992 to 66,423 lb in 1993 (unreported ADF&G fish ticket data). Although some of this increase may result from more accurate reporting by processors not equipped to process certain species, most landed discards were Pacific cod which were improperly handled aboard catcher vessels and delivered in poor condition. Often, entire loads were discarded due to inadequate refrigeration or icing of the catch while at sea. Thus, most of the increase in landed discards probably resulted from more competitive market conditions and a greater concern about product quality.

In an effort to maximize financial returns, several fishing cooperatives have been formed to develop small, specialized "niche" markets for selected species. These cooperatives have been able to obtain a relatively high exvessel value for their catch by delivering a high quality product at a relatively constant supply rate. Similar fishing cooperatives are a major component of the shore-based fishing industry in Japan (personal observation). To ensure that constant supplies of selected nearshore groundfish are available in Central Region, an allocation strategy may need to be developed. Establishment of such allocations could be based on historical harvests or on stock dynamics data that would justify managing some inshore bottomfish resources independently of offshore resources in federal waters. It may also be necessary for the public to propose or develop plans which limit access into some nearshore fisheries to maintain economic viability. Future implementation of an Individual Fishing Quota (IFQ) program in federal waters, as well as a general groundfish license restriction (Holmes 1992; NPFMC 1994), would confine new entrants unable to purchase an IFQ to open-access groundfish fisheries in state waters.

To provide better access to target species, reduce the potential for overharvest, and avoid resource waste through unnecessary discards, groundfish managers need to understand temporal and areal changes in groundfish species composition and the impact different fisheries and gears have on these resources. Groundfish managers and the industry are already working to reduce interactions with prohibited species by modifying fishing gear, methods, and areas. For example, groundfish pots equipped with halibut exclusion devices and biodegradable panels have proven effective in harvesting Pacific cod, reducing halibut bycatch, and reducing ghost fishing problems caused by lost pots (Kimker 1990 and 1992; Kruse and Kimker 1993). However, groundfish pot gear which reduces crab bycatch to acceptable levels has not been developed, so groundfish pot fishing continues to be closed in Central Region areas containing important crab habitat (Bechtol 1994).

Groundfish fisheries will continue to change as issues such as bycatch, marine mammals, gear efficiency, and catch allocation are addressed. Cooperative efforts are needed among the industry, management agencies, and the public to develop gear and conduct fisheries that minimize bycatch, are cost-effective, and yield high quality products. As management agencies develop a better understanding of stock production and dynamics, users will play an increasingly important role in resolving related social and economic issues. In some cases, maximum

financial yield from a particular resource might result from maximizing resource removal over a shore time frame (Walters and Collie 1989). However, given the mobility of modern vessels, it is unlikely that such a strategy would provide much economic benefit to local, shore-based fleets intending to provide long-term economic yield from the resource. Ultimately, public input through the Alaska Board of Fisheries process will be used to guide development of acceptable strategies for the use and harvest of Central Region groundfish resources.

LITERATURE CITED

ADF&G (Alaska Department of Fish and Game). 1989. Fish ticket system users guide. Version 7.0. Alaska Department of Fish and Game Computer Services, Juneau.

Bechtol, W.R. 1992. Review of the 1987-1992 Central Region rockfish fisheries: Report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Regional Informational Report 2A92-22, Anchorage.

Bechtol, W.R. 1993. Review of the 1992 groundfish fisheries in the Central Region. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Informational Report 2A93-20, Anchorage.

Bechtol, W.R. 1994. Review of the 1993 groundfish fisheries in Prince William Sound: Report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report No. 2A94-08, Anchorage.

Dalheim, M.E. 1988. Killer whaler (*Orcinus orca*) depredation on longline catches of sablefish (*Anoplopoma fimbria*) in Alaskan waters. National Marine Fisheries Service (unpublished report), Seattle.

Dewees, C.M., and E. Ueber, editors. 1990. Effects of different fishery management schemes on bycatch, joint catch, and discards. California Sea Grant Report No. T-CSGCP-019. University of California, La Jolla.

Holmes, K. 1992. IFQs off the port bow. North Pacific Fisheries Management Council (unpublished report), Anchorage.

Kimker, A. 1990. Biodegradable twine: report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 2H90-05, Anchorage.

Kimker A. 1992. Tanner crab survival in closed pots. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 2A92-21, Anchorage.

Kimker, A. 1994. Commercial Dungeness crab, shrimp, and miscellaneous shellfish fisheries of the Cook Inlet Management Area: 1994 report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report No. 2A94-09, Anchorage.

LITERATURE CITED (Continued)

Kruse, G.H., and A. Kimker 1993. Degradable escape mechanisms for pot gear: a summary report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report No. 5J93-01, Juneau.

Leaman, B.M., and R.J. Beamish. 1984. Ecological and management implications of longevity in some northeast Pacific groundfishes. International North Pacific Fishery Commission Bulletin 42: 85-96.

Leaman, B.M. 1991. Reproductive styles and life history variables relative to exploitation and management of *Sebastes* stocks. Environmental Biology of Fishes 30: 253-271.

Matkin, C.O. 1988. Status of Prince William Sound killer whales and the sablefish fishery in late 1987. North Gulf Oceanic Society (unpublished report), Homer.

McBride, D., A. Hoffman, and W.R. Bechtol. 1993. Rockfish: Caught between a reef and a hard place. Alaska's Wildlife 25(1): 46-47.

Meyer, S.C. 1993. Assessment of the recreational harvest and fishery for lingcod in Southcentral Alaska. Alaska Department of Fish and Game, Division of Sport Fish, Fishery Data Series No. 93-33, Anchorage.

NPFMC (North Pacific Fisheries Management Council). 1994. The IFQ Program. North Pacific Fisheries Management Council, Restricted Access Management Division (unpublished report), Juneau.

Trowbridge, C. 1994. Prince William Sound 1994 shellfish report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report No. 2A94-010, Anchorage.

Vincent-Lang, D., and W.R. Bechtol. 1992. Current stock status and recommendations for the future management of the lingcod stocks of the Central Gulf of Alaska: Report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Anchorage.

Walters, C.J., and J.S. Collie. 1989. An experimental strategy for groundfish management in the face of large uncertainty about stock size and production. Pages 13 to 25 *in* R.J. Beamish and G.A. McFarlane, editors. Effects of ocean variability on recruitment and an evaluation of parameters used in stock assessment models. Canadian Special Publications in Fisheries and Aquatic Sciences 108.

Table 1. Monthly groundfish harvest and effort from the Cook Inlet, North Gulf, and Prince William Sound management areas during 1993.

Month	Vessels	Landings	Round Weight (lb) Rockfish	Sablefish	Pacific Cod	Flatfish	Other	Lingcod	Total
North Gulf									
January	<4	6	483	585	18,848				19,916
February	31	49	2,778	277	548,177		996		552,228
March	80	203	21,744	1,061	2,257,494		905		2,281,204
April	8	9	6,695	105	74,187				80,987
May	18	26	5,139	120,025	114,478			6,560	246,202
June	22	23	4,768	50,185	1,638	25			56,616
July	<4	5	12,250		122			475	12,847
August	<4	6	10,024		551			2,802	13,377
September	9	10	8,741		4,920	6		1,354	15,021
October	<4	4	810		342			1,604	2,756
November									0
December	4	4	3,618				7	2,292	5,917
Total	121	345	77,050	172,238	3,020,757	31	1,908	15,087	3,287,071
Prince William Sound									
January	<4	<4			57,214				57,214
February	18	50	2,047	81	283,208		1,694		287,030
March	28	96	9,889	61	648,935		2,806		661,691
April	4	15	10,861		1,657	108	6,542		19,168
May	47	75	35,053	256,149	3,693	233	1,000		296,128
June	36	55	12,063	57,680	17,542	122			87,407
July	<4	8	4,188		82	131		28	4,429
August	<4	7	3,285		164	50		32	3,531
September	10	10	1,756	5	9,424				11,185
October	<4	<4	2,333		627			185	3,145
November									0
December									0
Total	87	322	81,475	313,976	1,022,546	644	12,042	245	1,430,928
Cook Inlet									
January	14	42			172,686		4,035		176,721
February	17	80			799,950		8,960		808,910
March	24	108	305	105	1,213,325		5,140		1,218,875
April									0
May									0
June	<4	<4	2,903		649				3,552
July	<4	<4				91			91
August									0
September	15	15	973	42	9,154				10,169
October	<4	<4	833				193		1,026
November	<4	<4	1,498				240		1,738
December									0
Total	53	255	6,512	147	2,195,764	91	18,568	0	2,221,082
Central Region Total									
Total	225	922	165,037	486,361	6,239,067	766	32,518	15,332	6,939,081

Table 2. Central Region harvest and effort from Cook Inlet, Prince William Sound, and the North Gulf during 1987 to 1993.

Year	Vessels	Landings	Round Weight (lb) Rockfish	Sablefish	Pacific Cod	Flatfish	Other	Lingcod	Total
North Gulf									
1987	116	310	169,109	37,338	785,661	887	4,834	25,557	1,023,386
1988	76	200	183,810	108,735	308,551	2,368	2,495	25,176	631,135
1989	25	56	47,606	3,797	35,028	0	316	7,026	93,773
1990	59	80	46,709	12,487	62,038	13	468	5,467	127,182
1991	113	261	219,151	127,283	968,455	175	1,238	65,256	1,381,558
1992	203	766	350,519	162,959	4,685,596	1,056	3,428	28,337	5,231,895
1993	121	345	77,050	172,238	3,020,757	31	1,908	15,087	3,287,071
Prince William Sound									
1987	103	237	97,923	190,024	444,094	27,113	8,141	594	767,889
1988	82	282	111,903	222,206	325,860	15,457	13,655	1,338	690,419
1989	41	146	93,047	190,633	67,825	11	4,487	1,280	357,283
1990	115	564	489,169	213,974	1,153,538	72,973	9,725	8,117	1,947,496
1991	146	454	153,869	331,314	2,218,911	4,385	1,104	19,357	2,728,940
1992	171	685	177,933	438,301	1,854,422	1,169	7,500	2,357	2,481,682
1993	87	322	81,475	313,976	1,022,546	644	12,042	245	1,430,928
Cook Inlet									
1987	166	704	12,708	0	881,551	135,238	56,874	103	1,086,474
1988	53	159	3,684	67,607	214,903	50	275	127	286,646
1989	4	5	30	0	7,726	0	234	0	7,990
1990	63	151	1,132	1,899	365,851	0	1,938	414	371,234
1991	86	414	302	132	2,011,379	0	1,612	0	2,013,425
1992	63	345	521	105	1,665,531	0	6,488	0	1,672,645
1993	53	255	6,512	147	2,195,764	91	18,568	0	2,221,082
Central Region Total									
1987	325	1,251	279,740	227,362	2,111,306	163,238	69,849	26,254	2,877,749
1988	175	641	299,397	398,548	849,314	17,875	16,425	26,641	1,608,200
1989	60	207	140,683	194,430	110,579	11	5,037	8,306	459,046
1990	213	795	537,010	228,360	1,581,427	72,986	12,131	13,998	2,445,912
1991	273	1,129	373,322	458,729	5,198,745	4,560	3,954	84,613	6,123,923
1992	351	1,796	528,973	601,365	8,205,549	2,225	17,416	30,694	9,386,222
1993	225	922	165,037	486,361	6,239,067	766	32,518	15,332	6,939,081

Table 3. Central Region groundfish harvests by gear type and month (A) during 1993 and by gear type and year (B) during 1987-1993.

A. Monthly harvests during 1993.

Month	Round Weight (lb)				
	Longline	Pot	Jig	Other	Total
January	64,424	189,427	0	0	253,851
February	590,937	1,051,810	0	5,421	1,648,168
March	2,398,272	1,742,593	0	20,905	4,161,770
April	91,097	0	909	8,149	100,155
May	431,000	104,973	2,565	3,792	542,330
June	144,622	0	970	1,983	147,575
July	0	0	13,365	4,002	17,367
August	0	0	14,454	2,454	16,908
September	27,295	0	9,080	0	36,375
October	0	0	6,927	0	6,927
November	0	0	5,967	0	5,967
December	0	0	1,688	0	1,688
Total	3,747,647	3,088,803	55,925	46,706	6,939,081

	Number of Vessels and Landings				
	Longline	Pot	Jig	Other	Total
Vessels[a]	189	33	15	5	225
Landings	584	251	35	38	908

[a] Some vessels fished more than one gear type during a given year.

B. Annual harvests during 1987-1993.

Year	Percentage of Total Weight Landed				Effort		
	Longline	Pots	Jig	Other	Vessels	Landings[a]	Total Lbs
1987	87.2%	0.6%	3.1%	10.0%	324	1,250	2,877,749
1988	90.8%	1.3%	6.2%	1.7%	171	634	1,608,200
1989	94.5%	0.2%	4.2%	1.1%	60	208	459,046
1990	89.1%	3.0%	2.8%	5.1%	211	798	2,445,912
1991	57.3%	36.6%	5.5%	0.6%	273	1,127	6,123,923
1992	64.1%	33.9%	1.4%	0.6%	351	1,782	9,346,652
1993	54.0%	44.5%	0.8%	0.7%	225	922	6,939,081

Table 4. Landings and exvessel value of Central Region groundfish harvests during 1987 to 1993.

Year	Rockfish	Sablefish	Pacific cod	Flounders	Other	Lingcod	Total
1987 Harvest							
Round Weight (lb)	279,740	227,362	2,111,306	163,238	69,849	26,254	2,877,749
Price ($/lb)	$0.31	$0.64	$0.24	$0.28	$0.25	$0.45	
Value	$86,719	$145,512	$506,713	$45,707	$17,462	$11,814	$813,928
1988 Harvest							
Round Weight (lb)	299,397	398,548	849,314	17,875	16,425	26,641	1,608,200
Price ($/lb)	$0.33	$0.99	$0.24	$0.35	$0.28	$0.34	
Value	$98,801	$394,563	$203,835	$6,256	$4,599	$9,058	$717,112
1989 Harvest							
Round Weight (lb)	140,683	194,430	110,579	11	5,037	8,306	459,046
Price ($/lb)	$0.41	$0.89	$0.21	$0.10	$0.16	$0.36	
Value	$57,680	$173,043	$23,222	$1	$806	$2,990	$257,742
1990 Harvest							
Round Weight (lb)	537,010	228,360	1,581,427	72,986	12,131	13,998	2,445,912
Price ($/lb)	$0.38	$0.69	$0.24	$0.22	$0.12	$0.36	
Value	$204,064	$157,568	$379,542	$16,057	$1,456	$5,039	$763,727
1991 Harvest							
Round Weight (lb)	373,322	458,729	5,198,745	4,560	3,954	84,613	6,123,923
Price ($/lb)	$0.28	$0.91	$0.28	$0.23	$0.46	$0.37	
Value	$104,530	$417,443	$1,455,649	$1,049	$1,819	$31,307	$2,011,797
1992 Harvest							
Round Weight (lb)	528,973	601,365	8,205,549	2,225	17,416	30,694	9,386,222
Price ($/lb)	$0.32	$0.93	$0.24	$0.19	$0.35	$0.29	
Value	$169,271	$559,269	$1,969,332	$423	$6,096	$8,901	$2,713,292
1993 Harvest							
Round Weight (lb)	165,037	486,361	6,239,067	766	32,518	15,332	6,939,081
Price ($/lb)	$0.36	$0.95	$0.22	$0.22	$0.53	$0.38	
Value	$58,912	$462,043	$1,372,595	$166	$17,235	$5,826	$1,916,776

Table 5. Annual effort, harvest, and exvessel value of the commercial sablefish fishery in Prince William Sound during 1984-1993.

Year	Vessels	Landings	Harvest Pounds	Harvest Tonnes	Price $/lb	Exvessel Value	Pounds/ Vessel	Pounds/ Landing	Fishing Season Opened	Fishing Season Closed
1984	20	37	109,920	50	0.46	$50,673	5,496	2,971	1/01	12/31
1985	29	108	383,290	174	0.60	$229,974	13,217	3,549	1/01	11/20
1986	32	36	189,850	86	0.63	$119,606	5,933	5,274	4/01	6/21
1987	71	120	205,350	93	0.64	$131,424	2,892	1,711	4/01	6/25
1988	53	147	222,206	101	0.99	$219,984	4,193	1,512	4/01	7/21
1989	26	98	190,633	86	0.89	$169,663	7,332	1,945	6/12	12/31
1990	70	257	213,974	97	0.69	$147,642	3,057	833	4/01	8/07
1991	72	147	331,314	150	0.91	$301,496	4,602	2,254	5/15	6/22
1992	54	119	438,301	199	0.93	$406,620	8,117	3,683	5/15	6/01
1993	55	87	313,976	141	0.95	$298,277	5,709	3,609	5/17	6/12[a]

[a]Total fishing time during the 1993 season was 96 hours.

Table 6. Estimated at sea discards of groundfish from Central Region waters during 1991 to 1993.

Year	Round Weight (lb) Rockfish	Sablefish	Pacific cod	Flatfish	Other	Lingcod	Total	Landings	lb/ Landing
					North Gulf				
1991	725	0	5,800	1,740	16,820	0	25,085	261	96.1
1992	1,737	167	16,672	64,593	251,935	12,401	347,506	766	453.3
1993	0	29	19,413	38,199	168,859	1,864	228,364	345	662.9
					Prince William Sound				
1991	3,099	57	28,375	15,606	141,557	10,056	198,750	454	437.8
1992	12,985	152	3,197	88,076	314,887	0	419,296	685	612.1
1993	0	219	0	729	138,866	0	139,813	322	434.2
					Cook Inlet				
1991	21	0	0	72	57,857	0	57,950	414	140.0
1992	9,660	55	2,760	1,904	31,409	41	45,830	345	132.8
1993	0	12	2,236	1,530	12,738	0	16,516	255	64.8
					TOTAL				
1991	3,844	57	34,175	17,419	216,234	10,056	281,785	1,129	249.6
1992	24,381	374	22,629	154,573	598,231	12,442	812,631	1,796	452.5
1993	0	259	21,649	40,458	320,463	1,864	384,693	922	417.2

Table 7. Deliveries of groundfish caught in both state and federal waters to Central Region ports during 1987 to 1993.

	Round Weight (lb)								
Year	Cordova	Homer	Kenai Area[a]	Seldovia	Seward	Valdez	Whittier	Other	Total
1987	614,263	1,234,555	188,600	708,659	3,161,151	71,406	107,203	4,347	6,090,184
1988	3,052,981	1,408,467	54,242	188,788	10,299,309	237,085	299,155	80,468	15,620,495
1989	1,758,587	873,231	0	0	11,183,346	33,384	249,037	0	14,097,585
1990	3,314,701	1,500,134	69,273	4,599	15,952,828	109,127	1,222,879	0	22,173,541
1991	3,287,735	2,996,474	14,663	2,148,119	19,181,029	604,971	432,686	11,180	28,676,857
1992	4,882,887	5,179,792	41,784	0	17,638,517	1,318,717	230,461	852,659	30,144,817
1993	4,619,356	6,515,650	48,259	0	12,337,422	2,328,994	306,002	72,722	26,228,405

[a] Includes all Cook Inlet ports north of Homer.

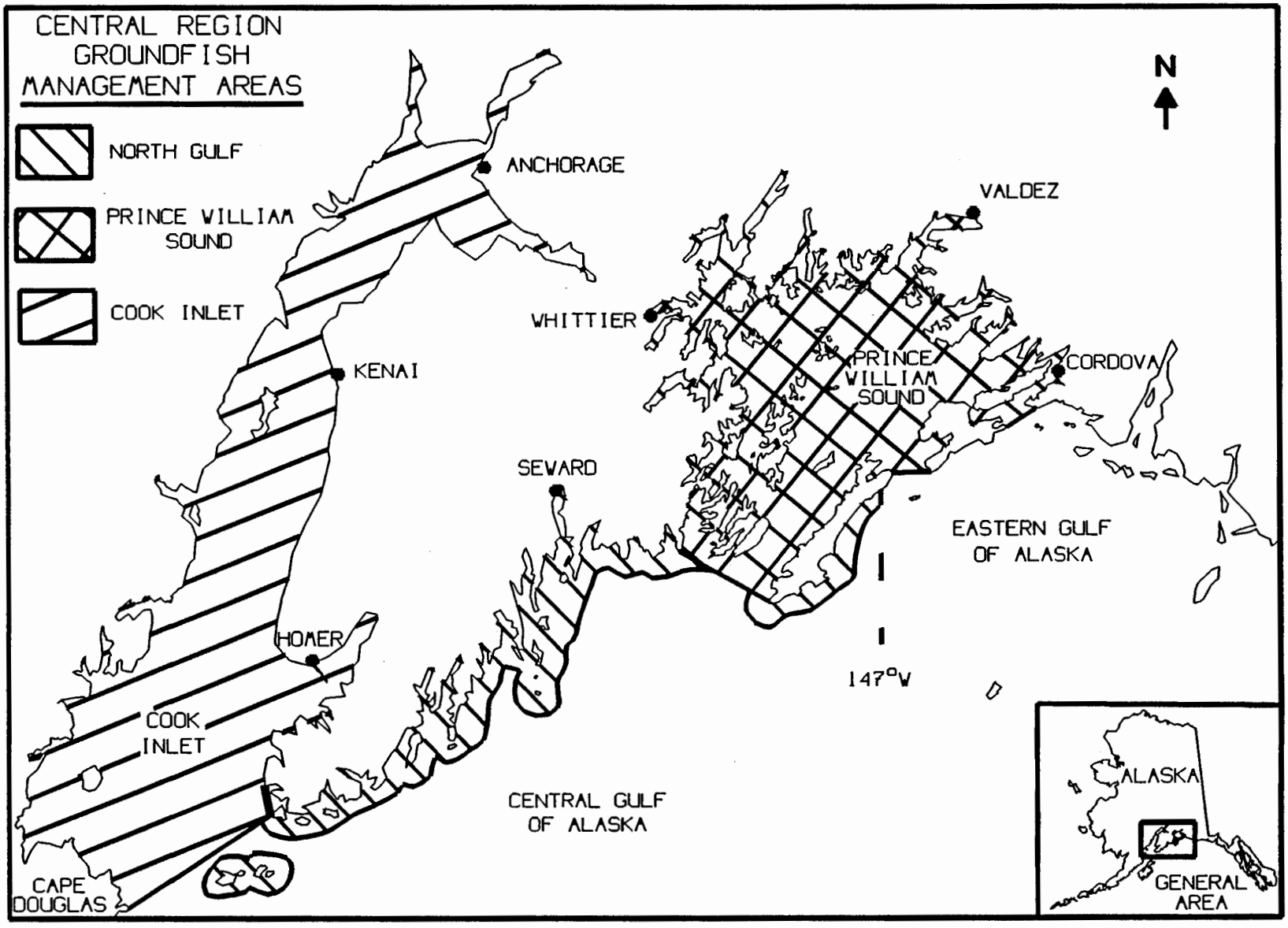

Figure 1. Groundfish harvest reporting areas of the Central Region.

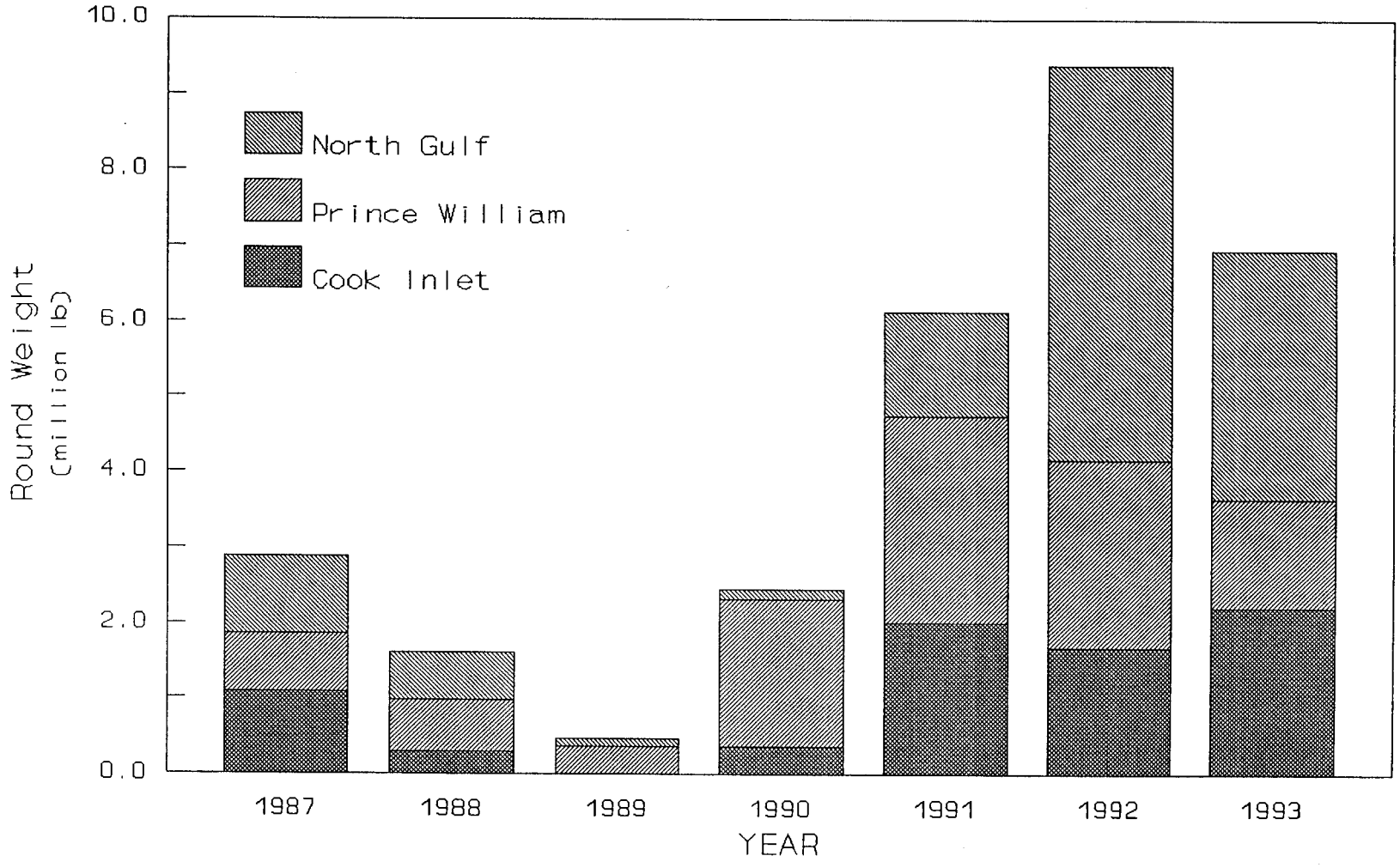

Figure 2. Groundfish harvest from the North Gulf, Prince William Sound and Cook Inlet during 1987 to 1993.

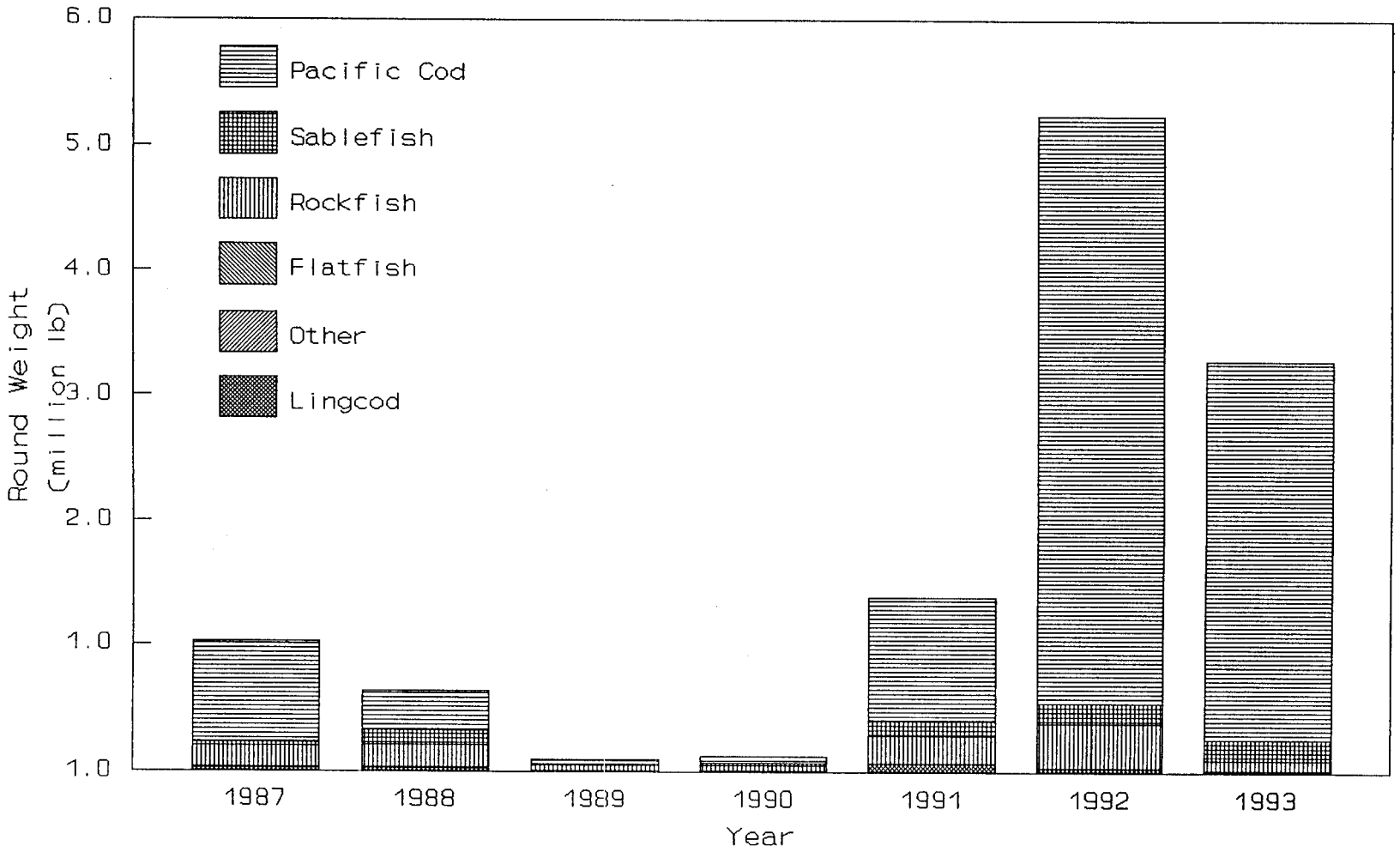

Figure 3. Harvest of groundfish species groups from the North Gulf during 1987 to 1993.

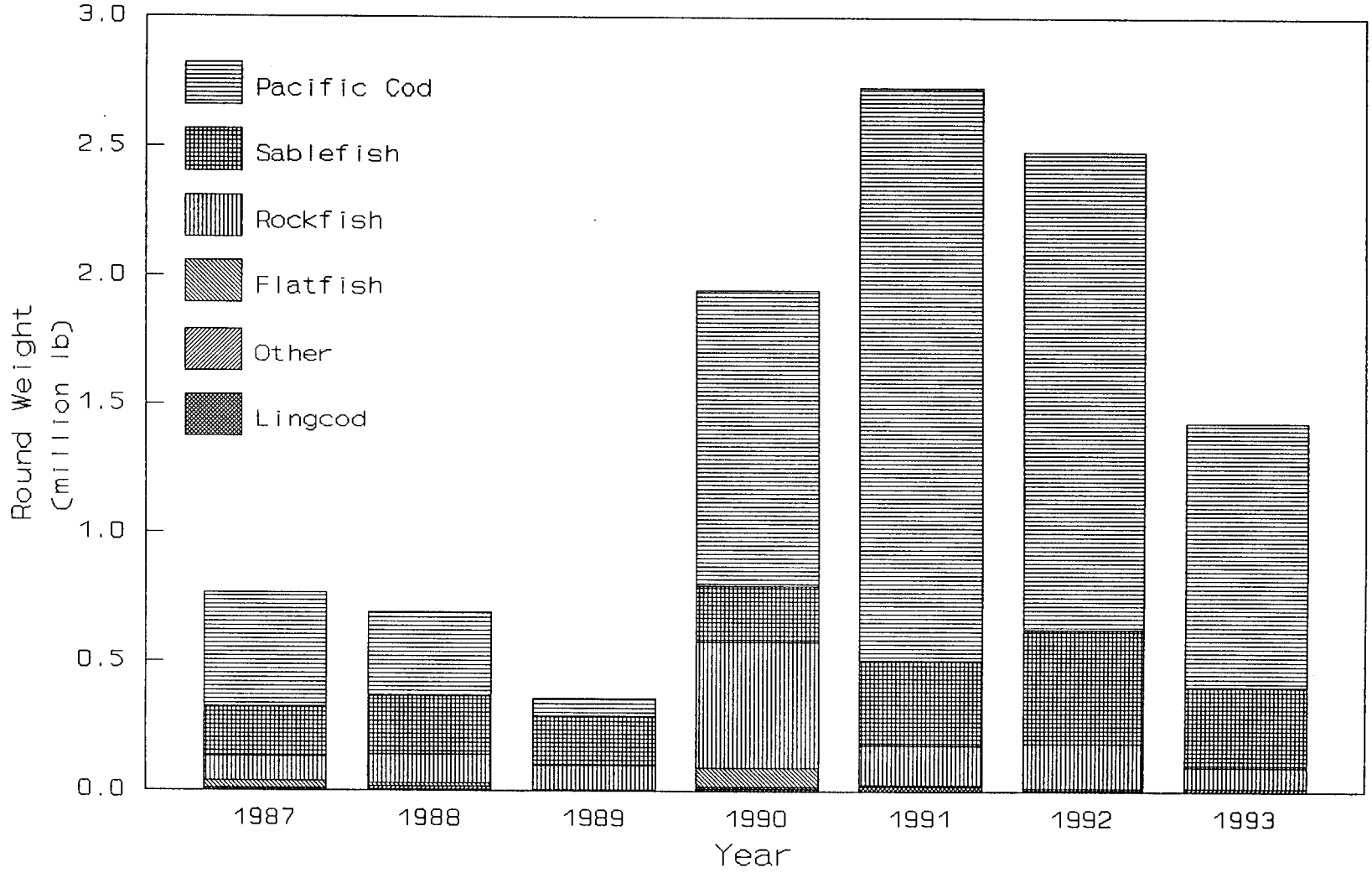

Figure 4. Harvest of groundfish groups from Prince William Sound during 1987 to 1993.

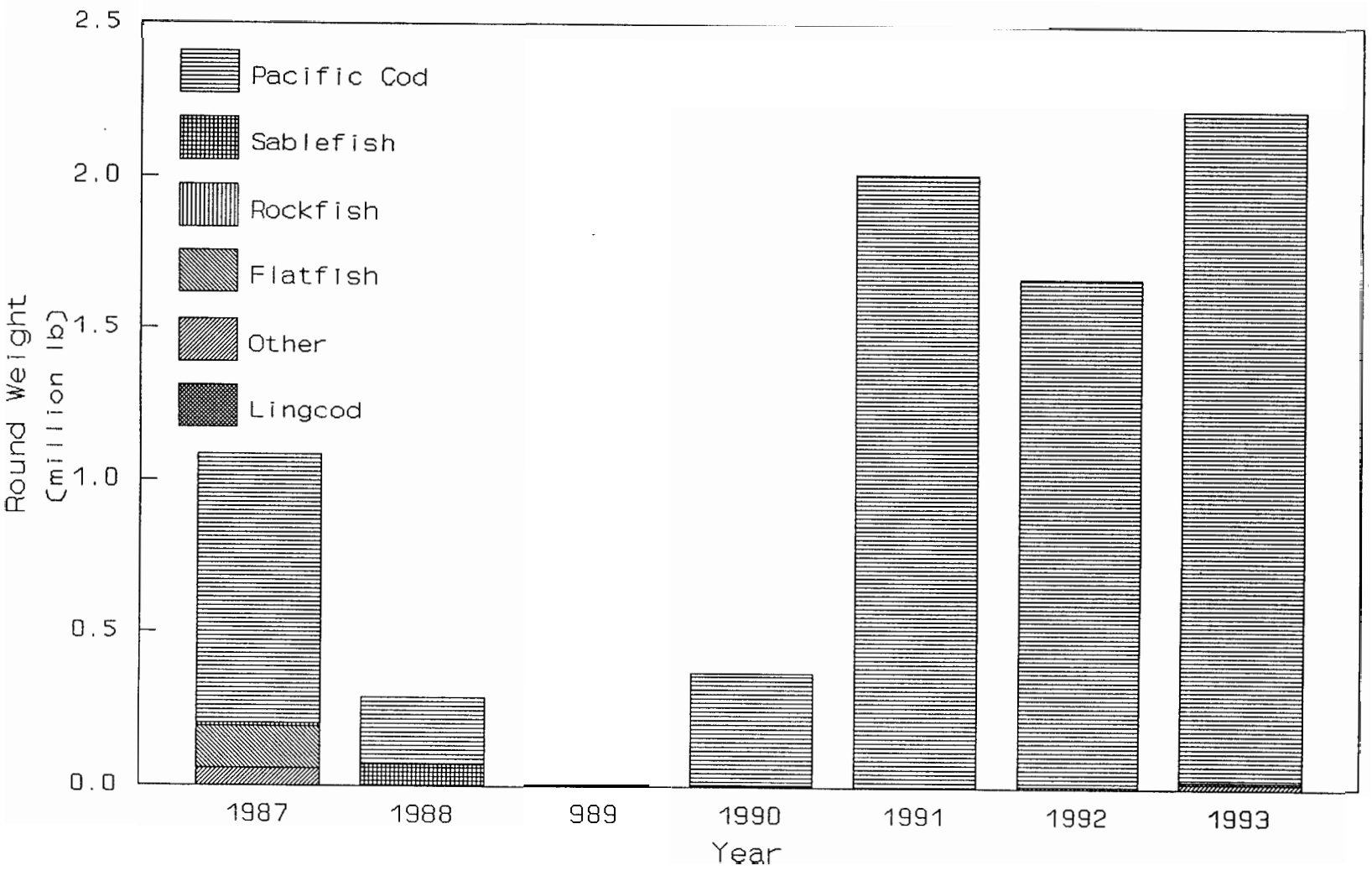

Figure 5. Harvest of groundfish groups from Cook Inlet during 1987 to 1993.

Appendix A. Delivery condition codes used to specify the dressed weight condition of a groundfish product as reported on groundfish fish tickets.

Condition Code	Fish Product[1]
01	WHOLE FISH/FOOD FISH
02	WHOLE FISH/BAIT
03	BLED ONLY
04	GUTTED ONLY
06	HEADED AND GUTTED, WITH ROE
07	HEADED AND GUTTED, WESTERN CUT
08	HEADED AND GUTTED, EASTERN CUT
10	HEADED AND GUTTED, TAIL REMOVED
11	KIRIMI
12	SALTED AND SPLIT
13	WINGS
14	ROE
15	PECTORAL GIRDLE
16	HEADS
17	CHEEKS
18	CHINS
19	BELLY (MEAT)
20	FILLETS WITH SKIN AND RIBS
21	FILLETS WITH SKIN, NO RIBS
22	FILLETS WITH RIBS, NO SKIN
23	FILLETS, SKINLESS AND BONELESS
30	SURIMI
31	MINCED
32	FISH MEAL
33	FISH OIL
34	MILT
35	STOMACHS (INTERNAL ORGANS)
36	OCTOPUS/SQUID MANTLES
37	BUTTERFLY, NO BACKBONE
39	BONES
96	DECOMPOSED FISH
97	OTHER - SPECIFY
98	DISCARDED AT SEA
99	LANDED DISCARDED

[1] In cases where multiple products are derived from the same fish, the primary product is shown with the appropriate code and secondary products are listed with the appropriate codes preceded by the letter "A".

Appendix B. Primary openings and closures of groundfish fisheries in state waters of the Central Region during 1993.

Date	Waters[a]	Fishery	Gear	Action[b]
1/01[c]	CI	EMERGENCY REGULATION TO VOID 14-DAY WAITING PERIOD FOR POTS		
1/01[c]	KAMISHAK & KACHEMAK BAYS	ALL	POT	CLOSED
1/01[c]	N MONTAGUE & ORCA BAY	ALL	POT	CLOSED
1/01[c]	CI - 14-DAY WAITING PERIOD	ALL	POT	VOIDED
1/01[c]	PWS	SABLEFISH	ALL	CLOSED
1/20[c]	CI, NG	SEASONS COINCIDE W/NMFS INSEASON ADJUSTMENTS		
1/20	CI, NG	SABLEFISH	ALL	BYCATCH
2/15[c]	CI, PWS, NG	LINGCOD	ALL	CLOSED
2/24	CI, NG	POLLOCK	ALL	BYCATCH
3/01[c]	KACHEMAK BAY	ALL	POT	AMENDED
3/24	CI, NG	PACIFIC COD	ALL	BYCATCH
3/24[c]	PWS	PACIFIC COD SEASON COINCIDES WITH NMFS SEASONS		
3/24	CI, NG	ALL	TRAWL	BYCATCH
3/29	CI, NG	ALL	TRAWL	OPENED
4/16	CI, NG	ALL	TRAWL	BYCATCH
4/20[c]	PWS	ALL	TRAWL	BYCATCH
5/15	CI, NG	SABLEFISH	HOOK-AND-LINE	OPENED
5/15[c]	PWS	SABLEFISH, ALL	ALL	CLOSED
5/17[c]	PWS	SABLEFISH, ALL	ALL	OPENED
5/20[c]	PWS	SABLEFISH, ALL	ALL	CLOSED
5/30	CI, NG	SABLEFISH	HOOK-AND-LINE	BYCATCH
5/30[c]	PWS	ALL	ALL, EXC. TRAWL	OPENED
6/28	CI, NG	ALL	TRAWL	OPENED
7/07[c]	PWS	ALL	ALL	CLOSED
6/10	CI, PWS, NG	HALIBUT-24 hr[d]	HOOK-AND-LINE	OPENED
6/10[c]	PWS	SABLEFISH-24 hr	ALL	OPENED
6/11	CI, PWS, NG	ALL	HOOK-AND-LINE	BYCATCH
7/01[c]	CI, PWS, NG	LINGCOD	ALL	OPENED
7/01[c]	RESURRECTION BAY	LINGCOD	ALL	OPENED
8/03	CI, NG	ALL	TRAWL	BYCATCH
8/08	CI, PWS, NG	HALIBUT-24 hr[d]	HOOK-AND-LINE	OPENED
8/19[c]	PWS	TRAWL & LONGLINE SEASONS COINCIDE W/NMFS ADJUSTMENTS		
10/04	CI, PWS, NG	ALL	TRAWL	OPENED
10/04	CI, PWS, NG	DEEPWATER FLATFISH & ROCKFISH	TRAWL	BYCATCH

[a] CI = Cook Inlet (5 AAC 28.300), NG = North Gulf (5 AAC 28.405(c)), PWS = Prince William Sound (5 AAC 28.200)

[b] BYCATCH - A fishery is only open to bycatch allowances. For state waters, bycatch is legal only when a fishery is open.

[c] Management actions involving Board of Fisheries regulations or ADF&G Emergency Orders specific to waters of State jurisdiction.

[d] Halibut fisheries are regulated by the International Pacific Halibut Commission.

Appendix C. Alaska Board of Fisheries action on groundfish proposals during 1993 meeting cycle.

Groundfish Tunnel Openings - During an April 1993 meeting, regulations were adopted which modified the individual tunnel eye openings on groundfish pots must have a perimeter of 36 inches or less (previously listed as less than 30 inches). This modification provides consistent state and federal requirements for tunnel eye perimeters on groundfish pots.

West Yakutat Lingcod - During a November 1993 meeting at Sitka, the Alaska Board of Fisheries adopted measures to establish an open season of July 1 to December 31 for lingcod in the West Yakutat District of the Eastern Gulf of Alaska Management Area. Regulation 5 AAC 28.105(c) defines the West Yakutat District as all territorial waters of the Eastern Gulf of Alaska extending from 140°W.long. to 147°W.long., excluding waters of Prince William Sound. Because the National Marine Fisheries Service defers lingcod management to the State of Alaska, these lingcod regulations are also in effect for the adjacent federal waters, Area 640 of the Eastern Gulf of Alaska Regulatory Area. This closure complements other regulations established to protect lingcod resources during the spawning and nest guarding season in the Central Gulf of Alaska, Cook Inlet, and Prince William Sound.

During a meeting of the Alaska Board of Fisheries during February 1994 in Cordova, Alaska, the following actions were taken on the indicated Prince William Sound groundfish proposals:

Proposal 455 - Adopted to establish a regulatory pot closure area that has been implemented by emergency order since 1991 to protect crab resources. The Board amended the proposal to allow the department to modify the closure area by emergency order.

Proposal 456 - Adopted to prohibit longlining of groundfish pots and clarify buoy marking requirements for groundfish pots in the Prince William Sound Area.

Proposal 457 - Failed to establish Area E as a superexclusive registration area for groundfish vessels.

Proposal 458 - Failed to prohibit the use of non-pelagic trawl gear to harvest groundfish in Prince William Sound.

Proposal 459 - Failed to prohibit the use of trawl gear to target groundfish.