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**COMMERCIAL GROUND FISH FISHERIES
IN THE CENTRAL REGION, 1994**



by

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ABSTRACT

The Central Region reporting area includes waters of Prince William Sound and Cook Inlet, as well as the North Gulf, here defined as state waters west of Cape Suckling and north of Cape Douglas. During the 1994 fishing season, 204 vessels delivered 6.0 million lb (2,719 tonnes) of groundfish in 900 landings from Central Region waters. Although only the fourth largest harvest on record, the 1994 landings generated the second largest exvessel value at \$2.2 million. Pacific cod comprised 87%, sablefish 7%, and rockfish 5% of the harvested biomass. Species caught primarily as bycatch included flounders, lingcod, and "other" species, particularly octopus. Pot gear yielded 58%, longline gear 38%, jig gear 3%, and other gears <1% of the 1994 harvest. This was the first year that pot gear yielded more of the Central Region groundfish harvest than any other gear type, reflecting increased industry effort to avoid fisheries closures due to the bycatch of prohibited species. Although groundfish markets remained favorable, a 14% decline in groundfish harvests from 1993 to 1994 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 coincided with Federal inseason actions in the adjacent offshore waters; primary exceptions included rockfish, lingcod, Prince William Sound sablefish, and state actions to minimize unnecessary discards during limited-duration sablefish and halibut openings. Increased fishing effort in recent years has generated concerns over the status of some nearshore resources, particularly rockfish and lingcod. In addition, limited access programs are being considered for Prince William Sound sablefish. 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. This need will be exacerbated by limited access programs in the federal waters, but few access limitations in the state groundfish fisheries. Improved stock assessment programs are urgently needed to ensure that nearshore groundfish resources are harvested at sustainable levels.

KEY WORDS: Groundfish, Central Region, North Gulf, Prince William Sound, Cook Inlet, Pacific cod, sablefish, 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, must be approved by the U.S. Secretary of Commerce, and are implemented with inseason management actions by NMFS. Management regulations for state waters are established by the Alaska Board of Fisheries, with inseason adjustments by ADF&G Emergency Orders. State inseason management actions often coincide with federal actions implemented in the adjacent EEZ. Unless specific management actions have been established in regulation 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, 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 permit holders 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 waters of Prince William Sound, Cook Inlet, and the North Gulf, and in federal waters of the Gulf of Alaska. Harvests from federal waters external to the reporting areas defined below are not included in data summaries for Prince William Sound, Cook Inlet, or the North Gulf but are included in federal water summaries. Harvests of species for which the state has implicit or deferred management authority in federal waters are summarized as trans-jurisdictional state-managed fisheries.

Reporting Areas

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

- (1) Cook Inlet, defined as all state and federal waters of Cook Inlet enclosed by lines 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 on ADF&G fish tickets by commercial fishers and processors 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 *Ophiodon 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% (7,069 lb; 3 tonne) of the catch from Central Region state waters and was included in the "other species" category. Octopus *Octopus dofleini* landed and reported as groundfish bycatch comprised 20,904 lb (9 tonne) of the 1994 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 (Deweese and Ueber 1990; Pacific Associates 1994). 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 or landed discards (Appendix A; ADF&G 1989). Landed discards typically result from fish harvested for sale but refused by the processor. Having been removed from the fishing grounds and suffering 100 percent mortality, landed discards are included in the total harvest summaries.

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 ADF&G fish ticket records. Due to inconsistent and limited reporting by processors and vessel operators, at sea discards were not estimated for years prior to 1991. To obtain minimum estimates of at-sea discards from Central Region waters during 1991 to 1994, I summarized all reported at-sea discards and calculated the average discards per landing by management area and year. This average discard rate, stratified by management area and year, was then applied to the total number of groundfish landings. No at-sea discards were reported for Cook Inlet in 1994. Therefore, the 1994 Cook Inlet discards were estimated by averaging discard rates from 1993 with preliminary 1995 data (unpublished data). Because Pacific cod, the predominate Cook Inlet groundfish species, is mainly taken from January through March, averaging 1993 and preliminary 1995 data should encompass any annual trend in discard rates.

RESULTS

Management Actions in 1994

An emergency regulation, effective from 1 January through 31 December 1994, 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 1994). Lingcod and rockfish were excluded from this emergency order because explicit management strategies existed for these species. 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. To provide for stock conservation and fishery manageability, an emergency order effective 14 January established longline and trawl seasons in Prince William Sound as coinciding with seasons for these gears in the adjacent federal waters of the Central Gulf of Alaska. An emergency order effective 9 March established that seasons for Pacific cod in Prince William Sound would similarly coincide with cod seasons in the adjacent federal waters.

With the exception of lingcod, sablefish, and directed trawl fisheries, all groundfish fisheries in state waters of the Central Region and in the adjacent federal waters opened for directed fishing on 1 January 1994 (Appendix B). Groundfish trawl fisheries were delayed until 20 January. An emergency regulation, effective 1 January, 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.

Several Central Region groundfish fisheries were restricted or closed to protect depressed or prohibited species. Waters around several marine mammal rookeries were closed throughout 1994. The Kamishak Bay and inner Kachemak Bay areas of Cook Inlet were closed to groundfish pot gear for all of 1994 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 1994 to protect depressed crab stocks. The commercial lingcod fishery was closed by regulation from 1 January through 30 June to protect depressed lingcod populations during the critical spawning and nest-guarding phase (Vincent-Lang and Bechtol 1992). Lingcod fishing has remained closed in Resurrection Bay since February 1993 to protect depressed stocks. A closure of the directed Pacific cod fishery on 9 April reduced much of the Central Region groundfish effort. Rockfish species were restricted to bycatch-only allowances on 28 May in the North Gulf and on 11 June in Cook Inlet.

Sablefish was opened in Cook Inlet and the North Gulf from 18 to 28 May; and in Prince William Sound from 23 to 26 May and again from 6 to 7 June. To provide a fair start in the Prince William Sound sablefish and halibut fisheries, all groundfish fishing was closed from 15 May to 7 June, except during open sablefish or halibut periods. Since halibut bycatch mortality caps were exceeded, directed longline groundfish fishing in the Gulf of Alaska and Prince William Sound was closed from 28 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 21 to 31 March, 19 May to 30 June, and 15 August to 30 September for shallow water species; from 22 April to 30 June and 29 August to 30 September for deep water species; and from 29 October to 31 December for all species.

Central Region Summary

During the 1994 season, 204 vessels made 900 landings and harvested 6.0 million lb of groundfish from Central Region waters (Table 1). Most of the 1994 harvest occurred in directed fisheries for Pacific cod (5.2 million lb, 87% of the 1994 total), sablefish (408,518 lb, 7% of the total), and rockfish (319,184 lb, 5% of the total). Lingcod (27,580 lb), flatfish (608 lb), and other species (27,580 lb) were landed primarily as bycatch. The 1994 harvest, although a 14% decline from the 1993 harvest level, continues a trend of annual harvests which meet or exceed 6.0 million lb (Table 2; Bechtol 1994). Delivery rates, measured as pounds-per-landing, declined from 7,527 lb/landing in 1993 to 6,662 lb/landing in 1994. Harvests were similar between areas as the North Gulf yielded 34%, Prince William Sound produced 34%, and Cook Inlet produced 31% of the 1994 region total (Figure 2). Monthly harvests from the Central Region peaked at 2.1 million lb in February (Table 3).

Due to fishing closures for Pacific cod in March, sablefish in May, and longline for groundfish in June, 97% of the 1994 groundfish harvest was achieved by mid-June. Most groundfish deliveries from July through December resulted from jig fishing for rockfish and groundfish bycatch in halibut longline and trawl shrimp 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.

The 1994 lingcod harvest from state waters increased 80% over the 1993 harvest. While the 1994 harvest is only a third of the record harvest observed in 1991, a substantial amount of lingcod harvests occur in federal waters, possibly indicating a decline in resource abundance within state waters. Lingcod may only be retained during July 1 to December 31, and fish must be 35 inches (889 mm) or longer to be retained during the open season. The season closure prevents harvests during the spawning and nest-guarding period, and the minimum size allows all lingcod to grow to a spawning size prior to recruitment to the fishery (Vincent-Lang and Bechtol 1992). Similar season and size restrictions were established for the recreational lingcod fisheries (Meyer 1993).

The 1994 rockfish harvest of 319,184 lb from the Central Region was nearly double the 1993 harvest. This increase likely resulted from more consistent markets, vessel operators using rockfish to complement their directed catch of other species, and better reporting of "home pack" fish. Relative to previous years, rockfish trip limits decreased harvest rates and reduced the potential for localized, depletions of these long-lived, slow-growing, late-maturing species (Leaman and Beamish 1984; Leaman 1991; Bechtol 1992).

Harvests of other species decreased slightly from the 1993 level, but remained well above historical levels. Other species deliveries primarily reflected retention of non-target species such as octopus, pollock, shark (Tables 2). The 20,904 lb of octopus, composing 73% of the other species landed in 1994, was similar to the 1993 harvests (Table 4). Additional octopus harvests occurred in groundfish fisheries, but may have been reported as shellfish landings. Increased octopus landings in groundfish fisheries during 1993 and 1994 are notable because directed commercial efforts to harvest octopus in the Central Region have been largely unsuccessful (Kimker 1994; Trowbridge 1994). Despite a generally high price paid for octopus, most reported commercial landings of octopus in recent years are the result of incidental catches in groundfish fisheries.

Although a single vessel can obtain licenses and permits to fish several gear types over the course of a year or at the same time within a year, over 90% of the vessels fished a single gear type in 1994. During the year, 171 longline vessels made 482 landings and harvested 2.3 million lb of groundfish (38% of the total groundfish harvest from state waters of the Central Region; Table 3). Twenty pot vessels made 311 landings and harvested 3.5 million lb of groundfish (58% of the region total). Twenty-eight jig (both mechanical jig and hand troll) vessels made 96 landings and harvested 206,101 lb of groundfish (3% of the region total). Other gear types landed 4,212 lb of groundfish (<1% of the region total). The portion of the total harvest landed by longline vessels was the lowest on record, reflecting a trend toward greater use of groundfish pots for Pacific cod over the last three years. Monthly harvests by longlines peaked in March, by pots in February, and by jigs in April.

Trans-jurisdictional State-managed Species

Lingcod and octopus are species of unique interest to the state because no management plan has been established in federal waters. To provide for resources conservation and long-term yield, management is deferred to the state.

The state has implemented regulations to protect lingcod during the spawning and nest guarding season when these species are particularly vulnerable. Regulations have also been implemented to prevent any lingcod harvests prior to a size of sexual maturity. Lingcod are not recognized as a groundfish species under the federal fisheries management plan. In an effort to provide conservation measures for lingcod resources in the federal waters, state lingcod regulations have been extended to the adjacent federal waters. Lingcod are primarily associated with rocky, nearshore areas (Cass et al. 1990). However, in 1994 an additional 62,633 lb of lingcod were harvested from federal waters adjacent to Central Region waters (Table 4; Figure 3). Only during the last two years has the majority of the aggregate lingcod harvest occurred in federal waters. This may reflect greater jig effort in federal waters during the latter half of the year as rockfish closures have been implemented in the North Gulf management area.

Octopus has become a high valued incidental catch in many groundfish fisheries, particularly the groundfish pot fisheries targeting Pacific cod. Because the state has generally been authorized to manage shellfish species in both state and federal waters, octopus, being recognized as a shellfish, is of concern to the state in state and federal water fisheries. In 1994, a record 20,904 lb of octopus was harvested from the Central Region groundfish fisheries. Some incidental catch is also reported from federal waters immediately adjacent to the Central Region. However, in contrast to the state removals, the 50 lb of octopus reported from the federal waters in 1994 was the smallest reported since 1991 (Table 4).

Central Region Product Value

Product value was calculated using round weight equivalents. The 6.0 million lb of groundfish harvested from state waters of the Central Region in 1994 generated an estimated \$2.2 million in exvessel value (Table 5). Although nearly a million fewer pounds of groundfish were harvested in 1994 than in 1993, the 1994 harvest generated \$288,000 more in exvessel value, reflecting a general increase in groundfish prices. Pacific cod, with an average delivery value of \$0.25/lb, generated the greatest exvessel value, nearly \$1.3 million. Sablefish, at \$1.82/lb (\$2.89/lb dressed as headed-and gutted), had the greatest per-pound value in 1994 and was nearly double the 1993 price. Sablefish generated an exvessel value of \$743,503. Rockfish, with an average delivery price of \$0.39/lb, generated an exvessel value of \$125,421. Finally, lingcod generated \$9,929, flatfish generated \$304, and other species generated \$22,895 in exvessel values. In recent years, sablefish and rockfish prices have generally increased, but no definite trends have emerged for other prices. The high price paid for other species in 1994 relative to other years primarily reflected the average of \$1.00/lb paid for the 20,904 lb of octopus harvested as bycatch in groundfish fisheries.

Harvest by Reporting Area

North Gulf

During 1994, 115 vessels made 311 landings and harvested 2.1 million lb of groundfish from the North Gulf (Table 1, Figure 4). Pacific cod composed 83% (1.7 million lb), rockfish 11% (221,374 lb), and sablefish 5% (105,369 lb) of the North Gulf harvest. The remaining harvest was composed of lingcod (22,325 lb), other species (1,330 lb), and flatfish (608 lb). Monthly harvests from the North Gulf in 1994 peaked at 997,961 lb in February. Although the 1994 North Gulf harvest was the third largest on record, annual production has declined by 37% in each of the past two years (Table 2). This decline largely reflects more conservative management strategies for lingcod and rockfish, and seasons for sablefish and Pacific cod which coincide with the adjacent federal waters. The North Gulf sablefish harvest was the smallest since 1990.

The 1994 rockfish harvest was the second greatest on record. An estimated two-thirds of the 1994 harvest occurred in directed longline and jig fisheries, the remaining harvest resulted from incidentally catch during non-rockfish fisheries such as Pacific cod, sablefish, and halibut. Most rockfish deliveries were less than the five-day landing limits of 4,000 lb established in regulation. Based on the North Gulf District Rockfish Management Plan (regulation 5 AAC 28.465), the directed rockfish fishery was closed in May 1994 and rockfish retention was limited to a bycatch allowance of 20 percent of the total onboard catch. While the reported catch of North Gulf rockfish declined following this seasonal closure, there were several instances of state water rockfish harvests being misreported as coming from federal waters. State and federal regulatory enforcement agents will be monitoring these fisheries more closely in the future. The 1994 lingcod harvest from the North Gulf, was a 48% increase over 1993 harvest but well below the record 1991 harvest. Lingcod continues to be managed with an open season of July through December and a minimum retention size of 35 in (889 mm). Lingcod resources in some North Gulf areas, particularly around Resurrection Bay, continue to be depressed without any evidence of recruitment (Doug Vincent-Lang, ADF&G, Anchorage, per. comm.).

Prince William Sound

Prince William Sound Sablefish. A Prince William Sound Sablefish Fishery Permit is required for each vessel prior to commercially harvesting sablefish in Prince William Sound. Eighty-three vessels were issued permits for the 1994 season. Typically, a third of the vessels annually permitted failed to fish a given season (personal observation). Each individual harvesting sablefish must also have possessed a sablefish interim use card. Individuals validly licensed to participate in the sablefish fishery were also encouraged to 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. A greater allowable retention would potentially reduce unnecessary resource waste and increase vessel operator 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 opened in conjunction with the sablefish fishery in adjacent federal waters, and closed by emergency order when the midpoint of the guideline harvest range has been reached. High catch rates, relatively high participation, and delayed catch reporting have made this fishery increasingly difficult to manage for the guideline range in recent years (Bechtol 1994; Bechtol and Morrison *in press*). Beginning in 1993, the sablefish management strategy shifted to the use of weekly fishing periods in an effort to better control harvests. In 1994, an initial fishing period of 72 hours opened at noon on 23 May. Preliminary processor reports following this period indicated the harvest was only slightly below the 241,000 lb midpoint of the guideline range and a second 72-hour fishing period was not justified. However, the sablefish resource appeared healthy, and the Prince William Sound fishery was reopened for 24 hours during the 6-7 June halibut fishery. During the total 96 hr of fishing allowed in 1994, 55 vessels made 92 deliveries and harvested 279,292 lb of sablefish worth an estimated \$508,311 (Table 6). The average delivery of 3,036 lb/landing in 1994 was a slight decline from 1993 average deliveries.

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 1994 however, Prince William Sound permit holders reported that sablefish loss to killer whales was very limited; the short duration of the fishery may have prevented killer whales from "orienting" to this foraging opportunity.

The Prince William Sound sablefish fishery is an open-access fishery that has become more difficult to manage as sablefish prices have increased and alternative fishing options have declined. In addition, the implementation of an Individual Fishing Quota (IFQ) program for sablefish in federal waters will exacerbate management difficulties in the open access, Prince William Sound fishery. In anticipation of a drastic increase in fishing effort, the Alaska Commercial Fisheries Entry Commission (CFEC) received several petitions during 1994 to implement a limited entry system for Prince William Sound sablefish. A summary report of catch, effort, value, and participation histories was initiated in late 1994. Once completed, likely in 1995, the report will be reviewed by CFEC Commissioners for consideration of limitation options.

Other Prince William Sound Groundfish. Nearly 2.1 million lb of groundfish were harvested from Prince William Sound during 1994 by 84 vessels making 299 landings (Table 1). Monthly harvest levels peaked at 876,875 lb in February, due to early year fishing effort for Pacific cod. Pacific cod composed 81% (1,670,769 lb) of the 1994 harvest and was the third largest cod harvest on record (Table 2; Figure 5). Rapid development of the Pacific cod pot fishery since 1991, combined with concerns about depressed crab resources in Prince William Sound, led to pot gear exclusions in areas of known crab distribution (Bechtol 1994). Species caught primarily as bycatch in the Pacific cod and sablefish fisheries included rockfish (97,365 lb), other species (10,913 lb), and lingcod (5,255). The other species harvest in 1994 was the third greatest on record and primarily reflected market improvements and retention of 5,319 lb of octopus from the Pacific cod fishery and 5,594 lb of walleye pollock from various fisheries.

Cook Inlet

During 1994, 1.9 million lb of groundfish were harvested from state and federal waters of Cook Inlet by 45 vessels making 290 landings (Tables 1). The 1994 harvest was the third largest on record (Table 2; Figure 5). Similar to previous years, Pacific cod composed virtually all (98%) of the Cook Inlet groundfish harvest. Other species (15,800 lb) and sablefish (23,857 lb) accounted for most of the remaining harvest. The majority of the other species harvest was octopus (14,727 lb) taken as bycatch in the Pacific cod fishery. Monthly harvests from Cook Inlet peaked at 0.7 million lb in February.

Reported Discards

An estimated 414,155 lb of groundfish were discarded at sea in 1994, similar to 1993 discards (Table 7). The estimated average discard rate of 460.2 lb/landing for 1994 was similar to discard rates in 1992 and 1993. As in previous years, most reported discards were other species (375,877 lb, or 91% of all discards) and were primarily shark and skate. Significant discards of flatfish (26,250 lb), Pacific cod (6,495 lb), and lingcod (3,580 lb) were also reported.

Deliveries to Central Region Ports

Total groundfish landings from both state and federal waters to Central Region ports in 1994 increased 5% over 1993 landings. Increased groundfish landings were observed at Cordova, Valdez, and Kenai area ports; while total landings to Homer, Seward, and Whittier decreased (Table 8). In many instances, landings to many traditional, larger capacity, processors have decreased while deliveries to smaller, more diverse, processors and catcher-sellers have increased. This trend may continue as the federal IFQ fisheries are anticipated to generate a larger number of small deliveries.

DISCUSSION

Management Strategies

Participation in most Central Region groundfish fisheries has been extremely variable, appearing to be driven by a combination of short-term market fluctuations and declines in other fisheries (e.g., salmon, crab; Bechtol 1993, 1994). Management actions, in the face of continually evolving groundfish fisheries, have focused on protecting groundfish resources from over-exploitation. For example, regulatory management plans have been developed for Central Region rockfish (Bechtol 1992), and harvest guidelines were developed for Prince William Sound sablefish (Bechtol and Morrison *in press*). Management strategies may be modified in response to increased resource knowledge or changes in fishing patterns or effort levels. For example, increased fishing power in the Prince William Sound sablefish fleet made it necessary to reduce total fishing time to 96 hours in both 1993 and 1994 to avoid exceeding the preseason harvest guidelines (Table 6). The 1995 fishery will employ a 48-hour fishing period because even greater effort is anticipated. In contrast to rockfish and Prince William Sound sablefish, accurate stock assessment data or historical harvest patterns for other Central Region groundfish species remain limited. Interest continues to be expressed in developing a shark fishery in Prince William Sound during the summer months. Although market conditions, particularly on

the east coast, may be receptive to such a venture, there has been no indication that a major shark fishery would be sustainable. Also, since most shark are observed during the summer additional concerns exist over salmon interception. 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.

Research and Stock Assessment Surveys

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, 1992; Kruse and Kimker 1993). Crab bycatch in groundfish pots is a particular concern because of the delayed crab mortality induced by on-deck exposure to cold temperatures in the winter months (Carls and O'Clair 1995). Because 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).

Despite the lack of a dedicated groundfish research budget, ADF&G has continued to collect resource assessment data on an opportunistic basis (Bechtol and Yuen *in press*). Since 1989, the primary component of this research has involved sampling rockfish collected by trawl during crab and shrimp surveys of Kachemak and Kamishak Bays in Cook Inlet and Orca Bay and the Montague Island areas in Prince William Sound (Kimker 1994; Trowbridge 1994; unpublished data). In 1994, rockfish, sablefish, Pacific cod, and pollock were sampled from trawl surveys and from halibut and sablefish deliveries. Data collection included age, size, sex, and maturity (unpublished data). In addition, several other assessments programs have evolved in cooperation with industry interests. For example, lower Cook Inlet was surveyed in 1994 to assess the distribution and abundance of Pacific sandfish (*Trichodon trichodon*; J. McDonald, Institute of Marine Science, Seward, AK, per. comm.). A survey to compare jig and longline catch when targeting Pacific cod and pollock in Prince William Sound was initiated in November 1994.

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 to 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 anticipated production, the resource must be allocated among user groups. For fish 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, declines in the reported harvests of both lingcod and rockfish probably resulted from more restrictive regulations adopted in 1992 (Table 2). ADF&G is primarily concerned with establishing regulations to address 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. Some of the regulation changes considered by the Alaska Board of Fisheries during 1994 included Prince William Sound groundfish (Appendix C).

Discard and Catch Reporting

Bycatch and discards complicate the conservation and economic goals of fishery managers and the fishing industry (Deweese and Ueber 1990). Species such as sablefish and skate at sea suffer relatively low mortality when discarded at sea if these species are not retained by 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 groundfish management (Pacific Associates 1994). 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, fishing mortality of these species may be similar to past years when catch and discards were not accurately reported. A similar situation may develop when species traditionally retained for personal use (often referred to as "home-pack"), such as rockfish, are marketed in subsequent years. As new markets develop, and new fisheries emerge, initial management strategies often rely on estimates of previous fishing mortalities, including retained catch and at-sea discards. 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 should continue to develop in the Central Region, although market emphasis may vary both seasonally and by area. The IFQ system, by slowing the pace of the

sablefish and halibut fisheries, will result in more extensive groundfish seasons and allow markets to develop for a wider array of species that have previously been discarded. 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 decreased from 66,423 lb in 1993 to 13,631 lb in 1994 (unreported ADF&G fish ticket data). Some of the landed discards resulted from processors not being equipped to process certain species. However, similar to past years, 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.

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.

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Table 1. Monthly commercial groundfish harvest and effort from the North Gulf, and Prince William Sound, and Cook Inlet during 1994.

Month	Vessels	Landings	Round Weight (lb)						Total	
			Rockfish	Sablefish	Pacific Cod	Flatfish	Other	Lingcod		
North Gulf										
January	11	14	13,022	393	69,014			132		82,561
February	36	69	42,490	398	512,287			619	110	555,904
March	46	91	30,715	455	965,705	581		505		997,961
April	26	61	113,425	2	149,597			74	543	263,641
May	16	18	10,685	23,994	12,313					46,992
June	10	14	2,608	7,425	1,007	27				11,067
July	<4	<4	584							584
August										0
September	32	33	2,053	72,702	3,262					78,017
October	5	8	4,873						21,121	25,994
November	<4	<4	623						186	809
December	<4	<4	296						365	661
Total	115	311	221,374	105,369	1,713,185	608	1,330	22,325		2,064,191
Prince William Sound										
January	10	21	1,387		268,854			1,244		271,485
February	13	62	6,988		866,560			3,327		876,875
March	21	54	8,057	36	491,189			1,870		501,152
April	4	7	9,600		15,543			3,334	48	28,525
May	44	63	33,166	224,085	10,434			1,125		268,810
June	37	51	16,268	55,063	8,224					79,555
July	<4	6	3,840						1,742	5,582
August	<4	8	6,952						1,631	8,583
September	17	18	5,874	108	7,445			13		13,440
October	<4	<4	1,033		2,520					3,553
November	4	5	3,521						1,178	4,699
December	<4	<4	679						656	1,335
Total	84	299	97,365	279,292	1,670,769	0	10,913	5,255		2,063,594
Cook Inlet										
January	18	100			557,077			6,733		563,810
February	21	92	69	114	695,952			5,432		701,567
March	16	83	33	28	571,346			3,635		575,042
April										0
May	<4	<4		9,784						9,784
June	<4	<4		1,201						1,201
July										0
August										0
September	11	11	343	12,730	3,661					16,734
October										0
November										0
December										0
Total	45	290	445	23,857	1,828,036	0	15,800	0		1,868,138
Central Region Total										
Total	204	900	319,184	408,518	5,211,990	608	28,043	27,580		5,995,923

Table 2. Commercial groundfish harvest and effort from the North Gulf, Prince William Sound, and Cook Inlet during 1987 to 1994.

Year	Vessels	Landings	Round Weight (lb)						Total
			Rockfish	Sablefish	Pacific Cod	Flatfish	Other	Lingcod	
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	767	350,519	162,959	4,685,596	1,056	3,428	28,442	5,232,000
1993	121	345	77,050	172,238	3,020,757	31	1,908	15,087	3,287,071
1994	115	311	221,374	105,369	1,713,185	608	1,330	22,325	2,064,191
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
1994	84	299	97,365	279,292	1,670,769	0	10,913	5,255	2,063,594
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
1994	45	290	445	23,857	1,828,036	0	15,800	0	1,868,138
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	354	1,796	528,973	601,365	8,205,549	2,225	17,416	30,799	9,386,327
1993	224	922	165,668	486,361	6,239,067	766	32,518	15,332	6,939,712
1994	204	900	319,184	408,518	5,211,990	608	28,043	27,580	5,995,923

Table 3. Central Region commercial groundfish harvests (A) by gear type and month during 1994 and (B) by gear type and by year from 1987 to 1994.

A. Monthly harvests during 1994

Month	Round Weight (lb)				Total
	Longline	Pot	Jig	Other	
January	134,171	771,213	12,472		917,856
February	632,805	1,467,867	33,674		2,134,346
March	960,408	1,100,830	12,171	746	2,074,155
April	57,439	147,389	87,338		292,166
May	304,131	12,313	8,378	764	325,586
June	86,274		5,549		91,823
July			6,166		6,166
August			8,583		8,583
September	108,191				108,191
October	2,579		25,994	974	29,547
November			3,780	1,728	5,508
December			1,996		1,996
Total	2,285,998	3,499,612	206,101	4,212	5,995,923

	Number of Vessels and Landings				Total
	Longline	Pot	Jig	Other	
Vessels ^a	171	20	28	2	204
Landings	482	311	96	6	895

B. Annual harvests during 1987 to 1994.

Year	Percentage of Total Weight Landed				Effort		Total Lbs
	Longline	Pots	Jig	Other	Vessels	Landings ^a	
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	9,386,327
1993	54.0%	44.5%	0.8%	0.7%	225	922	6,939,712
1994	38.1%	58.4%	3.4%	0.1%	221	834	5,995,923

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

Table 4. Commercial harvests of (A) octopus during 1991 to 1994 and (B) lingcod during 1987 to 1994 reported from groundfish fisheries in the Central Region and in the adjacent federal waters of the Central Gulf of Alaska.

A. Octopus retained during 1991 to 1994.

Year	State Waters				Adjacent Federal Waters	Combined Waters
	North Gulf	Prince William Sound	Cook Inlet	State <u>Total</u>		
1991	159	0	340	499	376	875
1992	96	984	1,636	2,716	560	3,276
1993	877	4,500	14,932	20,309	5,960	26,269
1994	858	5,319	14,727	20,904	50	20,954

B. Commercial lingcod harvests reported during 1987 to 1994.

Year	State Waters				Adjacent Federal Waters	Combined Waters
	North Gulf	Prince William Sound	Cook Inlet	State <u>Total</u>		
1987	25,557	594	103	26,254	0	26,254
1988	25,176	1,338	127	26,641	0	26,641
1989	7,026	1,280	0	8,306	5,236	13,542
1990	5,467	8,117	414	13,998	3,663	17,661
1991	65,256	19,357	0	84,613	4,335	88,948
1992	28,442	2,357	0	30,799	18,544	49,343
1993	15,087	245	0	15,332	106,189	121,521
1994	22,325	5,255	0	27,580	62,633	90,213

Table 5. Landings and exvessel value of Central Region groundfish harvests during 1987 to 1994.

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	30,799	9,386,327
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	\$8,932	\$2,713,322
1993 Harvest							
Round Weight (lb)	165,668	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	\$59,640	\$462,043	\$1,372,595	\$166	\$17,235	\$5,826	\$1,917,507
1994 Harvest							
Round Weight (lb)	319,184	408,518	5,211,990	608	28,043	27,580	5,995,923
Price (\$/lb)	\$0.39	\$1.82	\$0.25	\$0.50	\$0.82	\$0.36	
Value	\$125,421	\$743,503	\$1,302,998	\$304	\$22,895	\$9,929	\$2,205,049

Table 6. Annual effort, harvest, and exvessel value of the commercial sablefish fishery in Prince William Sound during 1984 to 1994.

Year	Vessels	Landings	Harvest		Price \$/lb	Exvessel Value	Pounds/ Vessel	Pounds/ Landing	Fishing Season	
			Pounds	Tonnes					Opened	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
1994	55	92	279,292	127	1.82	\$508,311	5,078	3,036	5/23	6/07 ^a

^a Total fishing time was 96 hours during each of the 1993 and 1994 seasons.

Table 7. Minimum estimates of at-sea discards of groundfish from Central Region waters during 1991 to 1994.

Year	Round Weight (lb)						Total	Landings	Average Lb/Landing
	Rockfish	Sablefish	Pacific cod	Flatfish	Other	Lingcod			
North Gulf									
1991	725	0	5,800	1,740	16,820	0	25,085	261	96.1
1992	1,739	167	16,694	64,677	252,264	12,417	347,959	767	453.7
1993	0	29	19,413	38,199	168,859	1,864	228,364	345	661.9
1994	246	175	560	14,462	130,319	3,580	149,342	311	480.2
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	920	175,352	0	176,272	322	547.4
1994	0	0	4,271	10,892	194,478	0	209,642	299	701.1
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
1994	1,516	15	1,663	896	51,081	0	55,171	290	190.2
TOTAL									
1991	3,844	57	34,175	17,419	216,234	10,056	281,785	1,129	249.6
1992	24,384	375	22,651	154,658	598,560	12,459	813,085	1,797	452.5
1993	0	260	21,649	40,649	356,949	1,864	421,371	922	457.0
1994	1,763	190	6,495	26,250	375,877	3,580	414,155	900	460.2

Table 8. Groundfish caught commercially in both state and federal waters and delivered to Central Region ports during 1987 to 1994.

Year	Round Weight (lb)								Total
	Cordova	Homer	Kenai Area ^a	Seldovia	Seward	Valdez	Whittier	Other	
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	6,516,281	48,259	0	12,339,481	2,328,994	306,002	72,722	26,231,095
1994	6,705,705	5,257,500	135,212	0	9,186,651	5,999,988	246,243	1,855	27,533,154
Avg.	3,529,527	3,120,804	78,862	762,541	12,149,534	1,337,834	385,926	170,539	21,101,804

^a Includes all Cook Inlet ports north of Homer.

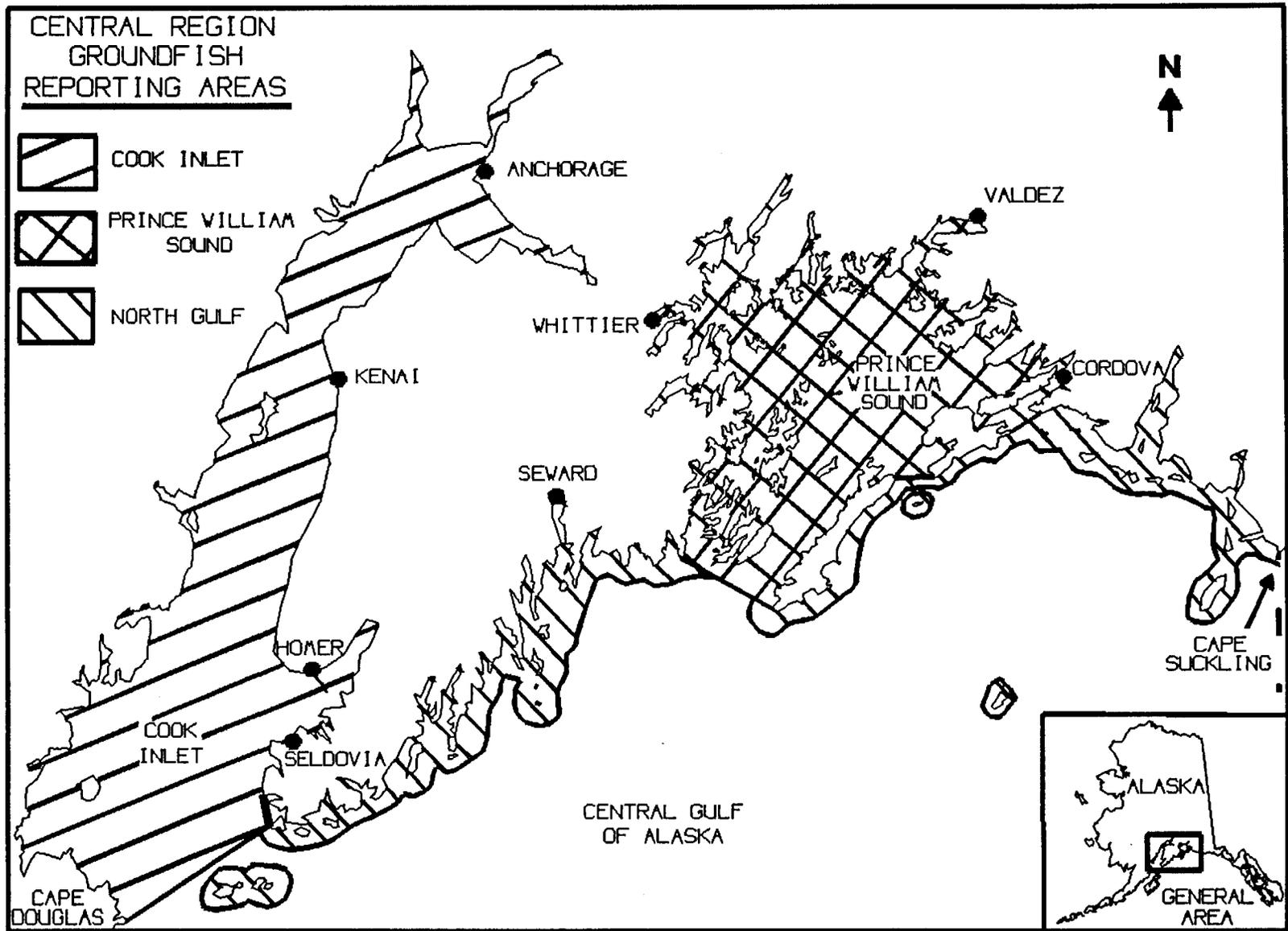


Figure 1. Groundfish harvest reporting areas of the Central Region.

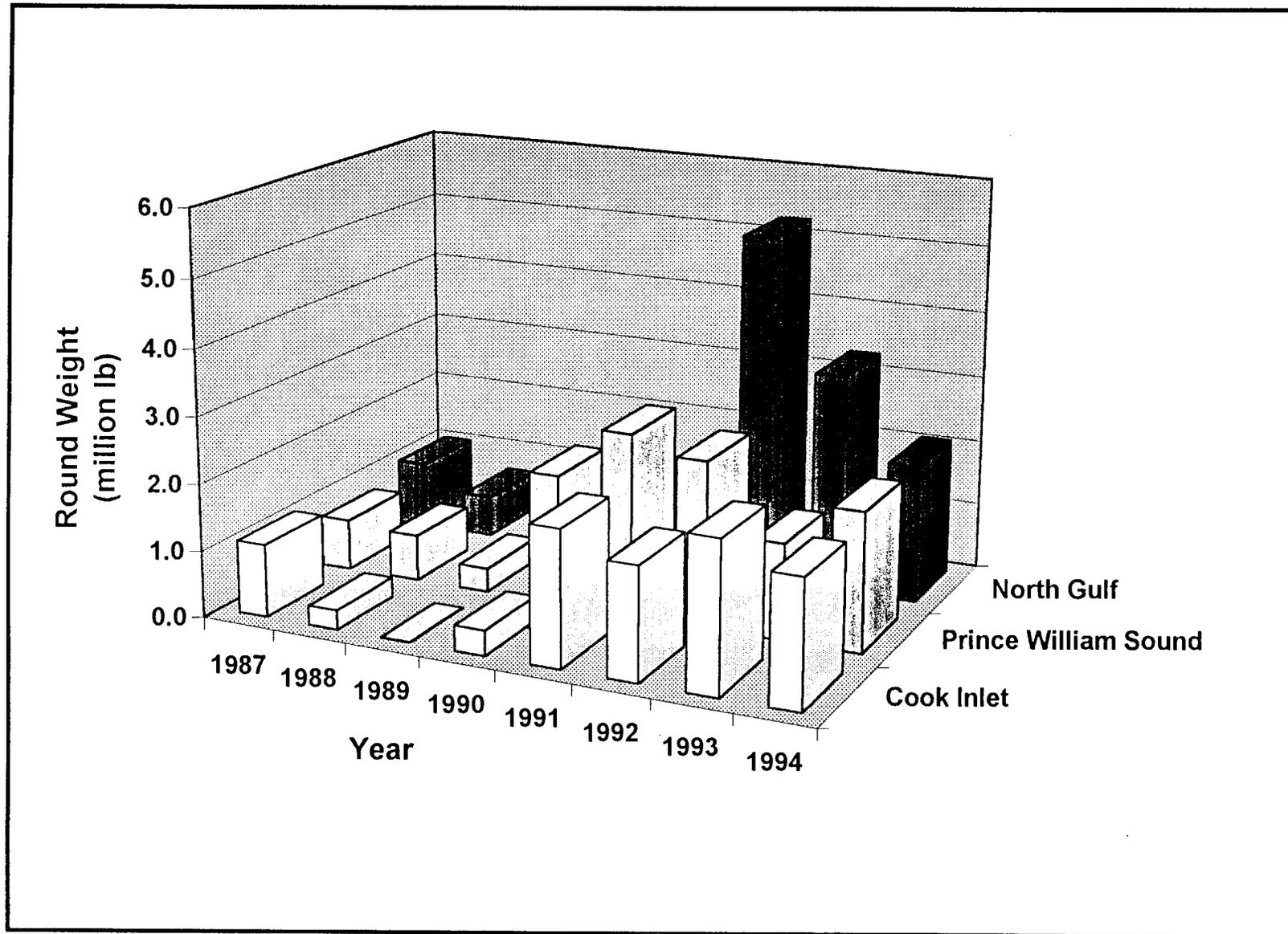


Figure 2. Groundfish harvests from the North Gulf, Prince William Sound and Cook Inlet during 1987 to 1994.

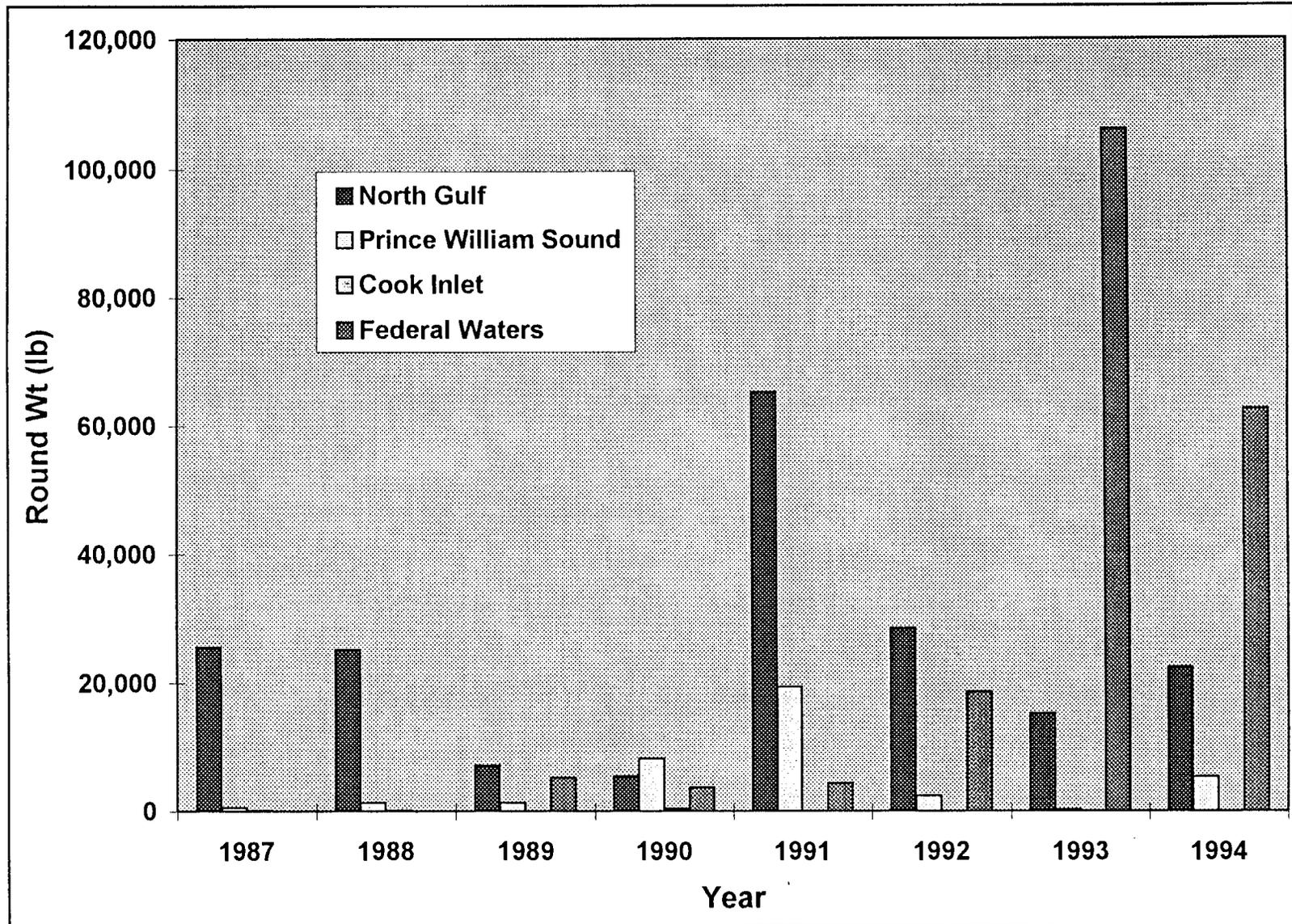


Figure 3. Lingcod harvests from the North Gulf, Prince William Sound, and Cook Inlet, and from the adjacent federal waters during 1987 to 1994.

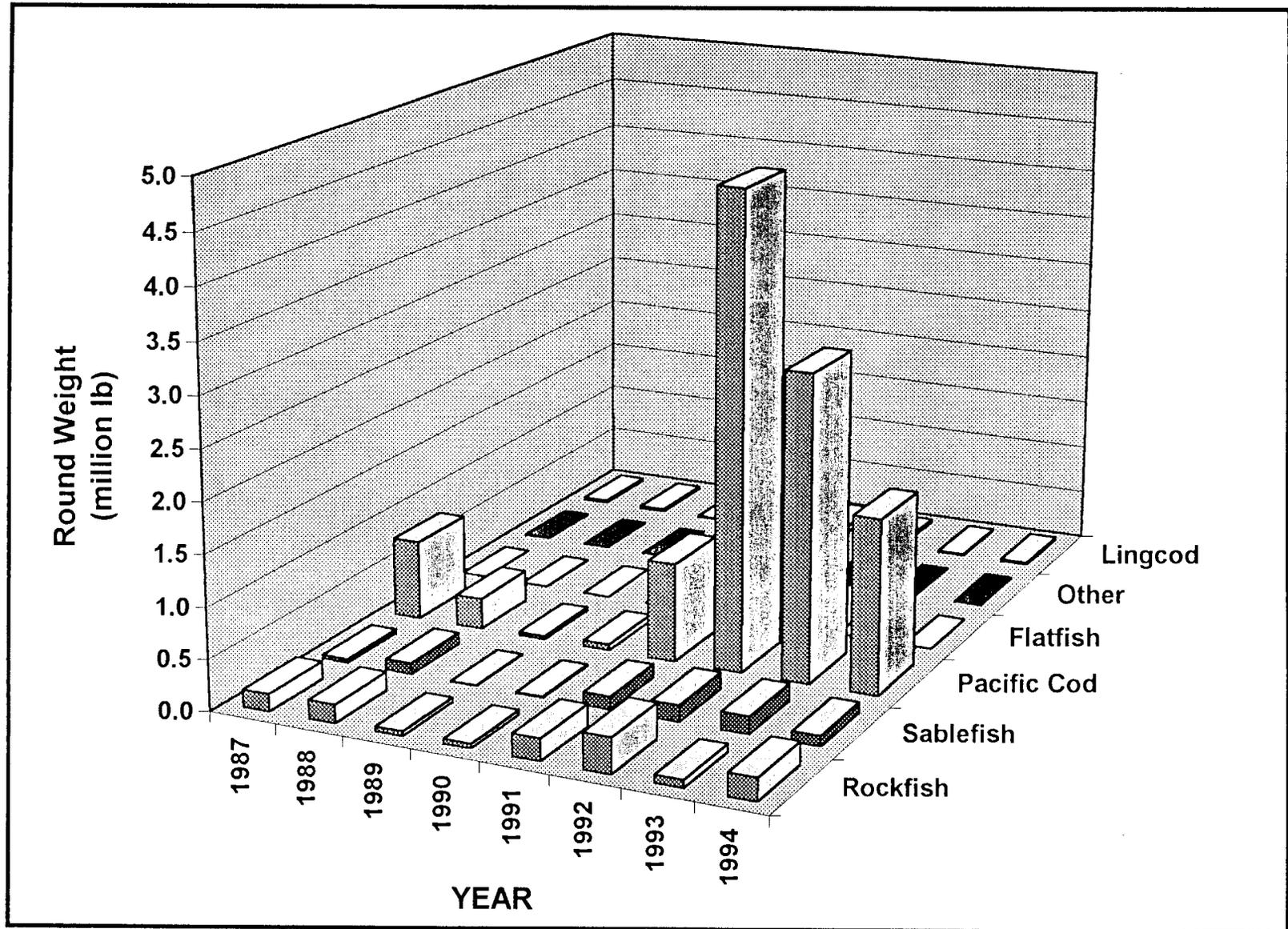


Figure 4. Groundfish harvests from the North Gulf during 1987 to 1994.

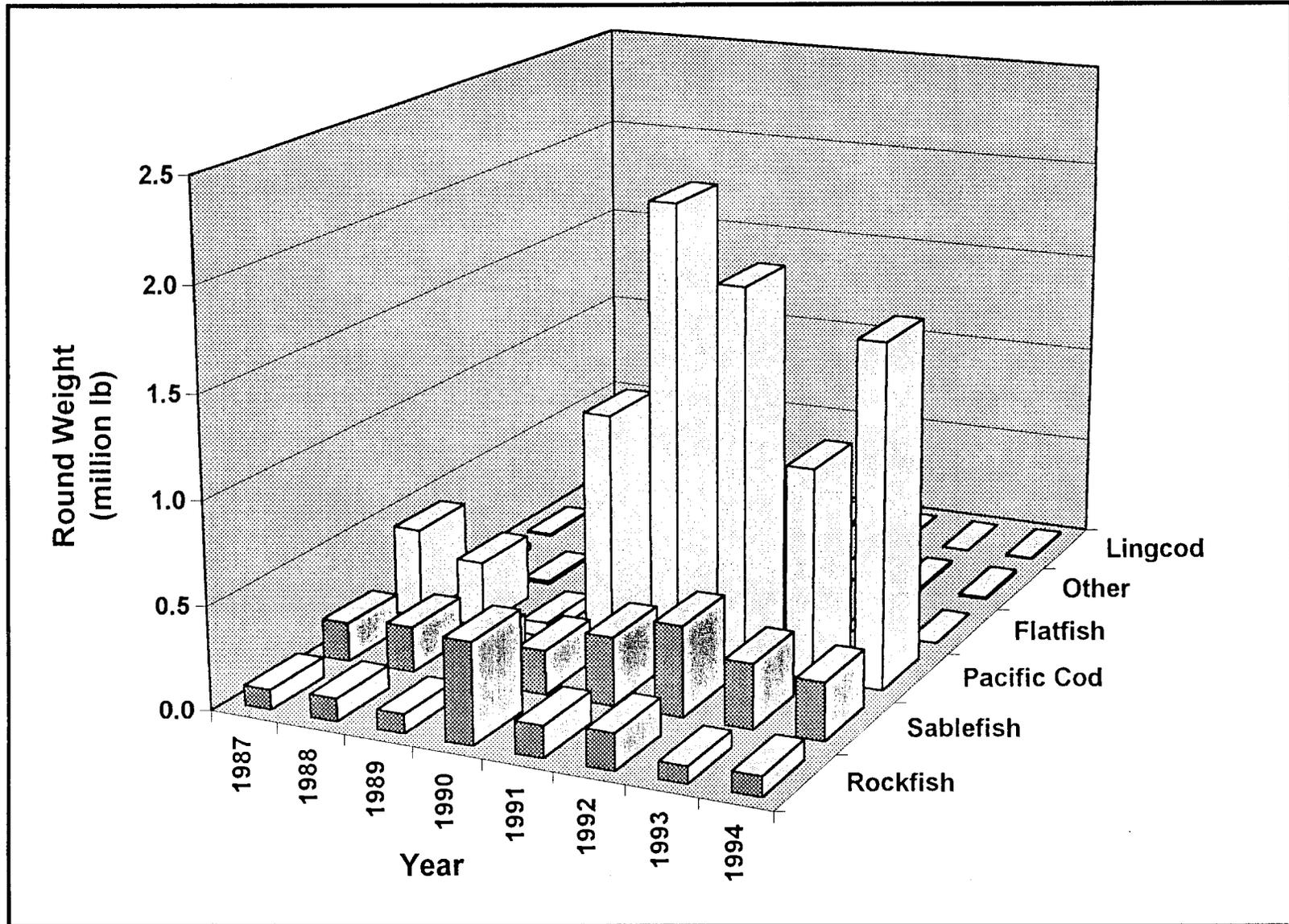


Figure 5. Groundfish harvests from Prince William Sound during 1987 to 1994.

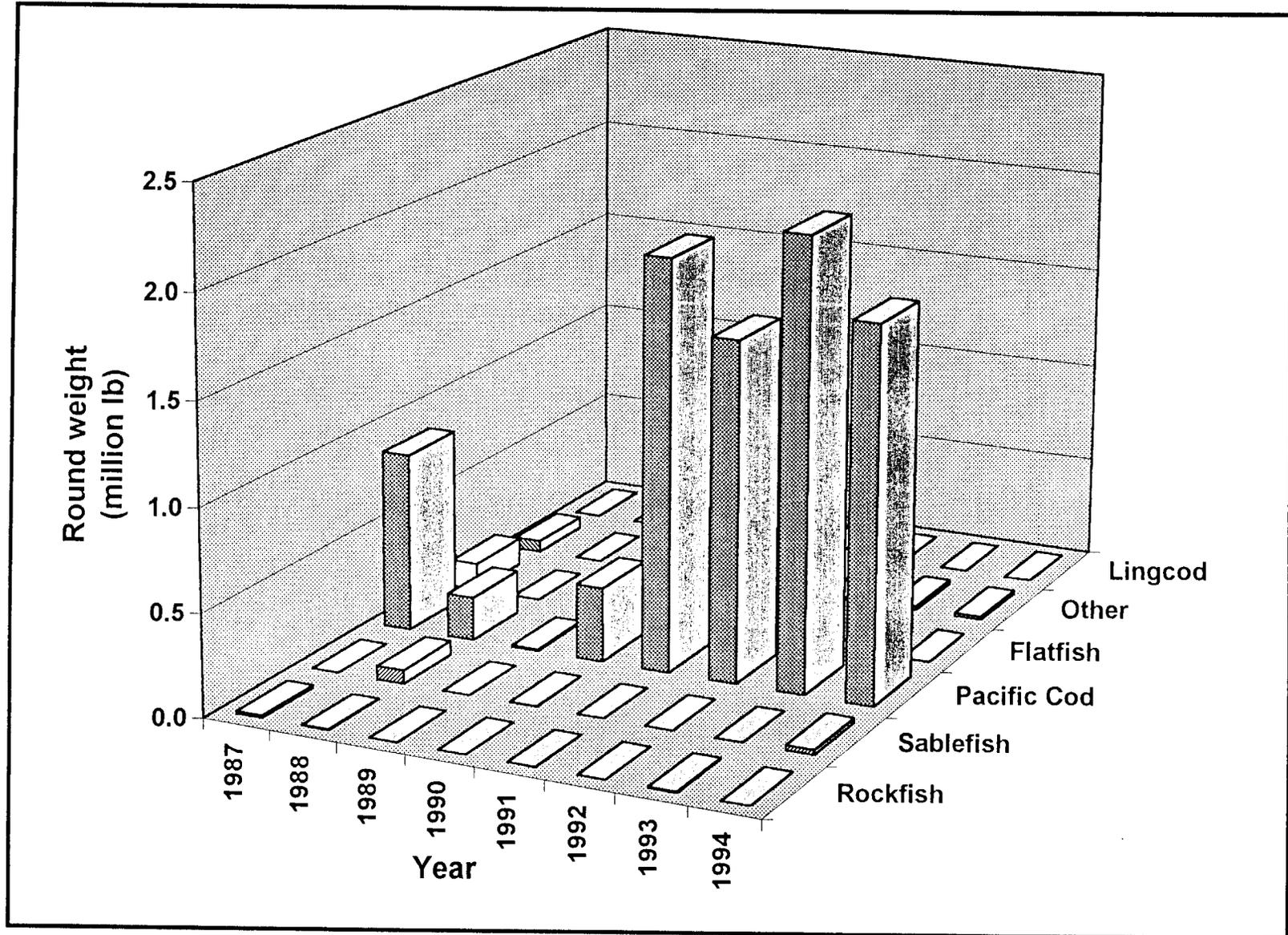


Figure 6. Groundfish harvests from Cook Inlet during 1987 to 1994.

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

Condition Code	Fish Product ^a
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

^a 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 1994.

Date	Waters ^a	Fishery	Gear	Action ^b
1/01	AROUND MARINE MAMMAL ROOKERIES	ALL	ALL	CLOSED
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	PWS	SABLEFISH	ALL	CLOSED
1/01 ^c	CI, NG	SEASONS COINCIDE W/NMFS	SEASONS	
1/01	CI, NG	ALL	TRAWL	CLOSED
1/01	CI, NG	SABLEFISH	ALL	CLOSED
1/01 ^c	CI, NG, PWS	LINGCOD	ALL	CLOSED
1/14 ^c	CI NORTH OF ANCHOR PT	ALL	N.P. TRAWL	CLOSED
1/14 ^c	PWS	HOOK-AND-LINE & TRAWL	SEASONS COINCIDE W/NMFS	SEASONS
1/20	CI, NG	ALL	TRAWL	OPENED
1/20 ^c	N MONTAGUE & ORCA BAY	ALL	TRAWL	MODIFY
2/18	CI, NG	POLLOCK	ALL	OPENED
3/09 ^c	PWS	PACIFIC COD	SEASON COINCIDES WITH NMFS	SEASONS
3/16	CI, NG	POLLOCK	ALL	CLOSED
3/21	CI, NG, PWS	SHALLOW WATER SPECIES	TRAWL	CLOSED
4/01	CI, NG, PWS	SHALLOW WATER SPECIES	TRAWL	OPENED
4/09	CI, NG, PWS	PACIFIC COD	ALL	CLOSED
4/15 ^c	NG - WEST YAKUTAT	LINGCOD	ALL	CLOSED
4/22	CI, NG, PWS	DEEP WATER SPECIES	TRAWL	CLOSED
5/15 ^c	PWS	ALL	ALL	CLOSED
5/18	CI, NG	SABLEFISH	HOOK-AND-LINE	OPENED
5/19	CI, NG, PWS	SHALLOW WATER SPECIES	TRAWL	CLOSED
5/23 ^c	PWS	SABLEFISH, ALL	ALL	OPENED
5/26 ^c	PWS	SABLEFISH, ALL	ALL	CLOSED
5/28 ^c	NG	ROCKFISH	ALL	BYCATCH
5/28	CI, NG	SABLEFISH	HOOK-AND-LINE	CLOSED
5/28	CI, NG, PWS	ALL	HOOK-AND-LINE	CLOSED
5/28 ^c	PWS	SABLEFISH, ALL	ALL	CLOSED
6/01	CI, NG	POLLOCK	ALL, EXC. H&L	OPENED
6/06 ^c	PWS	SABLEFISH, ALL	ALL	OPENED
6/06 ^d	CI, NG, PWS	HALIBUT	HOOK-AND-LINE	OPENED
6/07 ^d	CI, NG, PWS	HALIBUT	HOOK-AND-LINE	CLOSED
6/07 ^c	PWS	SABLEFISH, ALL	ALL	CLOSED
6/07 ^c	PWS	ALL, EXC. SBLFSH & PCOD	ALL, EXC. H&L	OPENED
6/11 ^c	CI	ROCKFISH	ALL	BYCATCH
6/22	CI, NG	POLLOCK	ALL	CLOSED
7/01 ^c	CI, NG, PWS	LINGCOD	ALL, EXC. H&L	OPENED
7/01 ^c	RESURRECTION BAY	LINGCOD	ALL	CLOSED
7/01	CI, NG, PWS	SHALLOW WATER SPECIES	ALL, EXC. H&L	OPENED

Appendix B (continued).

Date	Waters ^a	Fishery	Gear	Action ^b
7/01	CI, NG, PWS	DEEP WATER SPECIES	ALL, EXC. H&L	OPENED
7/01	CI, NG	POLLOCK	ALL, EXC. H&L	OPENED
7/15	CI, NG	POLLOCK	ALL	CLOSED
8/15	CI, NG, PWS	SHALLOW WATER SPECIES	TRAWL	CLOSED
8/29	CI, NG, PWS	DEEP WATER SPECIES	TRAWL	CLOSED
9/12 ^c	PWS	ALL, EXC. SABLEFISH	HOOK-AND-LINE	OPENED
9/12 ^c	CI, NG	ALL, EXC. ROCKFISH	HOOK-AND-LINE	OPENED
9/12 ^d	CI, NG, PWS	HALIBUT	HOOK-AND-LINE	OPENED
9/14 ^d	CI, NG, PWS	HALIBUT	HOOK-AND-LINE	CLOSED
9/14 ^c	PWS, NG, PWS	ALL	HOOK-AND-LINE	CLOSED
9/14 ^c	CI, NG	ALL	HOOK-AND-LINE	CLOSED
9/30	CI, NG, PWS	SHALLOW WATER SPECIES	ALL, EXC. H&L	OPENED
9/30	CI, NG, PWS	DEEP WATER SPECIES	ALL, EXC. H&L	OPENED
10/01	CI, NG	POLLOCK	ALL, EXC. H&L	OPENED
10/10	CI, NG	POLLOCK	ALL	CLOSED
10/29	CI, NG	ALL	TRAWL	CLOSED

^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 may be restricted to bycatch allowances only if authorized by the Alaska Board of Fisheries.

^c Management actions involving the Alaska 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 actions on groundfish proposals during the 1994 meeting cycle.

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. This amendment allows the department and the fishing community to determine whether viable and enforceable groundfish pot fishing **without** crab bycatch can be conducted in shallow waters of the closure area located between Montague Island and Hinchinbrook Island.

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. The Board felt that superexclusive registration would inhibit the ability of vessel owners to diversify their fishing effort.

Proposal 458 - Failed; to prohibit the use of non-pelagic trawl gear to harvest groundfish in Prince William Sound. Given the lack of directed trawl effort for groundfish and concerns that precluding any retention of groundfish by non-pelagic trawls would unnecessarily impact shrimp trawls, the Board opted to focus on the similar Proposal 459.

Proposal 459 - Failed; to prohibit the use of trawl gear to target groundfish in Prince William Sound and restrict the retention of groundfish incidentally caught by any trawl gear to not exceed 20 percent of the gross round weight of all fish species. Given the lack of directed trawl effort for groundfish to date, the Board felt that there was not a current need to prohibit groundfish trawling in Prince William Sound.

Proposal 460 - Adopted; to (a) **modify** an existing trawl closure area to encompass known crab concentrations, and (b) **remove** the calendar date reference for the herring food and bait trawl fishery. This modification provides for consistency with the closure area adopted under Proposal 455.

Groundfish Tunnel Openings - Adopted at the Kodiak portion of the 1993 to 1994 meeting cycle; to modify regulations for tunnel eye openings on groundfish pots. This modification specifies that individual tunnel eye openings on groundfish pots must have a perimeter of 36 inches or less (previously listed as less than 30 inches) and provides consistent state and federal requirements for tunnel eye perimeters on groundfish pots.

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