

TECHNICAL FISHERY REPORT 93-12



Alaska Department of Fish and Game
Division of Commercial Fisheries
P.O. Box 25526
Juneau, Alaska 99802-5526

August 1993

Review of the 1990 Central Region Groundfish Fisheries

by

William R. Bechtol

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ABSTRACT

The Central Region includes all state waters west of Cape Suckling and north of Cape Douglas; it includes Prince William Sound, Cook Inlet, and what is referred to as the North Gulf. In 1990, 213 fishermen delivered 2.4 million pounds of groundfish in 796 landings from this region. This was the second largest harvest in recent years and generated an exvessel value of \$763,580. By weight, Pacific cod composed 63%, rockfish 23%, and sablefish 9% of the 1990 harvest. Species caught primarily as bycatch (incidentals) included flounders, lingcod, and "other" groundfish. Longline vessels delivered 89%, trawl vessels 5%, jig vessels 3%, and pot vessels 3% of the 1990 harvest. The 1990 Prince William Sound harvest was the largest since 1987. The Cook Inlet harvest was the second largest since 1987, while the North Gulf was the second smallest since 1987. A small number of local fishermen have historically pursued Central Region groundfish stocks. These fisheries have been loosely regulated and effort fluctuations were related to market conditions. However, increased effort in 1990 generated concerns over the status of rockfish stocks, and a more conservative management approach was adopted. With the exception of Prince William Sound sablefish, management actions for groundfish stocks in state waters of Cook Inlet and the Central Gulf of Alaska (i.e., the North Gulf) followed openings and closures in the adjacent federal waters. If salmon and shellfish resources continue to be biologically or economically depressed, effort in Central Region groundfish fisheries should continue to increase, provided that markets remain viable for groundfish resources.

KEY WORDS: Groundfish, Central Region, harvest, Prince William Sound, Cook Inlet

INTRODUCTION

Groundfish, or bottomfish, includes 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 resources in Alaska coastal waters. The ADF&G has management jurisdiction for groundfish stocks in territorial seas, or state waters, which extend 3 miles from shore. The state management areas are described in the Alaska fishing regulations (ADF&G 1991). Management regulations for state waters are established by the Alaska Board of Fisheries with inseason adjustments made through Emergency Order by the ADF&G.

Federally managed waters of the Exclusive Economic Zone (EEZ¹) extend from 3 to 200 miles offshore (NMFS 1990). Fishery management plans (FMP's) for the EEZ were developed by the North Pacific Fisheries Management Council with final approval by the United States Secretary of Commerce. Inseason management was implemented by the NMFS. Federal managers change the status of a fishery from *open*, to *bycatch*, to *closed*, or prohibited species catch or PSC. Depending upon the intensity of the fishery, a bycatch status is assigned when 90–95% of the Total Allowable Catch (TAC) is harvested. When the TAC is fully harvested, the fishery is closed. For the territorial seas, state management actions generally coincided with federal actions in the adjacent EEZ.

This report presents data on the commercial harvest of groundfish from all waters of state jurisdiction in the Central Region, which includes waters between Cape Suckling (144° W. longitude) and Cape Douglas (58°52' N. latitude), and from the adjacent federal waters. The data presented herein as harvests from federal waters was limited to activities by Central Region processors.

METHODS

Fish Ticket Reporting System

As part of a cooperative agreement between the NMFS and the ADF&G, groundfish harvest data reported by Central Region processors were entered into the statewide groundfish database. Processors, buyers, and fishermen were responsible for recording each groundfish landing on an ADF&G fish ticket and submitting that fish ticket to the ADF&G. An ADF&G representative reviewed the fish ticket data for incomplete or inaccurate information, then entered the data into an electronic database (ADF&G 1991b). Groundfish data were electronically transferred to the NMFS Management Division office in Juneau, Alaska, for compilation of statewide harvest data. NMFS used this database for harvest verification and inseason implementation of the fishery management plans for the Gulf of Alaska and the Bering Sea/Aleutian Islands. Data was later transferred to the ADF&G Computer Services office in Juneau.

¹Previously referred to as the Fishery Conservation Zone (FCZ).

Fisheries contributing data included (1) longline, trawl, jig, pot, and sunken gillnet fisheries for sablefish and miscellaneous groundfish in Prince William Sound, Cook Inlet, and the North Gulf; and (2) longline, trawl, jig, and pot fisheries in the EEZ of the Gulf of Alaska, Bering Sea, and Aleutian Islands Management Areas.

Reporting Areas

Central Region groundfish harvest data were summarized for state waters and for federal waters of the EEZ. Harvests from state waters of the Central Region were further summarized according to the three geographic areas described below (Figure 1):

- (1) Cook Inlet, or all waters, including federal waters, 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, or 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, or 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 fishermen and processors were generally expressed as dressed weight. The dressed weight and the product value were converted to round weight equivalents using product recovery rates (PRRs) which were specific to species and delivery condition codes (Appendix A; ADF&G 1991). Groundfish harvest data, expressed in pounds of round weight, were summarized into fish groups that described the primary groundfish fisheries in the Central Region. These groups were rockfish *Sebastes* and *Sebastolobus*, sablefish *Anoplopoma fimbria*, Pacific cod *Gadus macrocephalus*, lingcod *Ophiodon elongatus*, and other groundfish. Pollock *Theragra chalcogramma* were included in the "other groundfish" category. Unless indicated otherwise, summaries were for Central Region harvests only.

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

The price paid to the fishermen for sablefish depended on the size increment (approximate 1-lb increments dressed weight), delivery condition (e.g., bled), and quality at the time of delivery. Sablefish are generally delivered to the processor either in the round or as headed-and-gutted, either eastern or western cut (Figure 2). Fish size categories generally reported were 0–1, 2, 3, 4, 5–6, >6 lb. Fish ticket reports reflected the size composition of each sablefish delivery as sorted into these size classes. These data were summarized to estimate the proportional contribution of each size class to the total landed weight from the Prince William Sound sablefish fisheries during 1987–1990. For each size class, the total dressed weight was also divided by the size class to estimate the relative numbers of sablefish and the proportional contribution of each size class to the total number landed. Changes in the number of sablefish in each size class and in the proportional contribution to the total biomass for the years 1987–1990 were examined using chi-square analysis.

RESULTS

Management Actions in 1990

Groundfish fisheries in state waters of the Central Region have been loosely managed. Management actions in state waters of the Central Region usually coincided with actions in the adjacent federal waters (Appendix B). Groundfish fisheries in the federal waters generally closed when the harvest of species quotas or bycatch limits were met. With the exception of sablefish, all groundfish fisheries in state waters of the Central Region and the adjacent federal waters were opened for directed fishing on 1 January 1990. Sablefish was opened on 1 January to bycatch-only allowances in federal waters of the Central Gulf. In Prince William Sound, where sablefish management strategies are well established, sablefish may not be retained outside of the directed fishery. Sablefish were opened to directed fishing in the central Gulf and Prince William Sound on 1 April.

Commercial fishing with hook-and-line and trawl gear was closed on 29 May in federal waters of the Gulf of Alaska as the PSC mortality limits for halibut *Hippoglossus stenolepis* were reached. At that time, federal regulations interpreted hook-and-line as any gear with hooks attached to line(s). On 14 September, the federal government exempted hand troll and jig gear from PSC limits and, effectively, from the hook-and-line closure. The exemption was extended on 9 November. To maintain consistency with federal actions, the state closed hook-and-line, hand troll, and jig gear on 29 May in Cook Inlet and the North Gulf and then reopened hand troll and jig gear on 14 September in Cook Inlet. Prince William Sound was not closed to hook-and-line gear.

To allow retention and prevent unnecessary waste of species caught incidentally during the directed halibut fisheries, the NMFS issued a federal emergency rule on 29 May which allowed fishermen in federal waters to retain, within existing bycatch and prohibited species limits, groundfish incidentally caught by longline gear during other directed fisheries. Unless prohibited by other regulations, state regulation 20 AAC 05.120 provides that up to 20% of the round weight of the total on-board product may be an incidental

bycatch of the directed fishery, provided that the incidentally caught species are currently open to directed fishing (ADF&G 1991). ADF&G issued emergency orders to open Cook Inlet to longline gear during the 24-h halibut openings beginning on 5 June and 20 August so that Cook Inlet fishermen could legally retain groundfish species caught incidentally during the halibut fishery.

To protect depressed crab stocks, portions of Cook Inlet were closed to non-pelagic trawl gear on 25 March. The closed waters were east of a line from Point Pogibshi to Anchor Point and west of a line running from Cape Douglas to a point at 59°20' N, 152°40' W, then north to a point intersecting the west side of Cook Inlet at 59°58'30" N (Figure 3). Because these areas are important for crab rearing, the Alaska Board of Fisheries acted in November 1990 to permanently close these waters to non-pelagic trawl gear. Because a shift in effort from longline to trawl and pot gear could exacerbate handling mortality and inhibit rebuilding of crab stocks, Cook Inlet was closed on 29 May to all groundfish fishing. Cook Inlet was reopened to pots on 27 July under a permit that encouraged pot designs intended to minimize the catch of non-target species and was reopened to hand troll and jig gear on 22 August.

Area Registrations and Permits

In addition to other licensing requirements (Appendix C), commercial groundfish fishermen were required to obtain an area registration for each vessel prior to operating commercial groundfish gear in state waters of the Central Region. The area registration specified the area to be fished, the gear to be used, and the target species. A vessel may have been registered for only one area at a time within a given calendar year, but the area may have been changed at any time. At the end of 1990, 187 vessels were registered for Central Region waters: 102 registered for Cook Inlet; 73 registered for Prince William Sound; and 12 registered for the North Gulf. Gear types listed on the registrations were longline (81%), jig (4%), pot (4%), trawl (3%), or a combination of gears (8%).

Fishermen were required to obtain a Prince William Sound Sablefish Fishery Permit prior to commercially fishing for sablefish in Prince William Sound. Fishermen participating in the Prince William Sound sablefish fishery were encouraged to obtain a groundfish area registration for Prince William Sound in addition to the sablefish permit. Fishermen possessing a Prince William Sound area registration and a Prince William Sound sablefish permit, as well as a sablefish interim use (CFEC permit) card and a miscellaneous finfish interim use card (CFEC permit), could retain both sablefish and miscellaneous groundfish in excess of the state's 20% incidental catch limits, thereby reducing resource wastage.

Central Region Harvest

The 1990 harvest of groundfish from state waters of the Central Region peaked in late spring and again in late fall (Table 1). By the end of 1990, 213 fishermen made 796 landings, delivering nearly 2.4 million pounds of groundfish. Most of the 1990 harvest occurred in fisheries for Pacific cod (1,433,679 lb, or 63% of the 1990 total), rockfish (538,131 lb, or 23% of the total), and sablefish (317,889 lb, or 9% of

the total). Additional groundfish species, primarily caught as bycatch, included lingcod (13,998 lb), flounders (72,986 lb), and other groundfish (12,226 lb).

The 1990 harvest was the second largest in recent record for state waters of the Central Region (Table 2). During 1987–1990, the groundfish harvest from Central Region waters has ranged from 449,366 lb in 1989 to 2,825,019 lb in 1987; the size of the harvest reflected increased effort, both in number of vessels and landings.

A single vessel may fish several gear types within a season or at the same time if all applicable licenses and permits are obtained; however, most vessels fished a single gear type. In 1990, 201 longline vessels made 689 landings totaling 2.1 million pounds, or 89% of the total groundfish harvest from state waters of the Central Region (Tables 3). Nine jig or hand troll vessels made 16 landings totaling 67,641 lb or 3% of the region total. Five trawl vessels made 79 landings for a total of 120,641 lb or 5% of the region total; six pot vessels made 12 landings totaling 70,757 lb or 3% of the Region total. Since 1987, longline gear has accounted for 87–95% of the annual harvest (Table 4).

Central Region Product Value

Product value was calculated using round weight equivalents. The 2.4 million pounds for groundfish harvested from state waters of the Central Region in 1990 generated an estimated exvessel value of \$763,580 (Table 5). Pacific cod, at an average of \$0.26/lb, generated the greatest exvessel value at \$397,440. Sablefish deliveries were paid the highest price, \$.67/lb (or \$1.00/lb dressed), and generated an exvessel value of \$149,370. Rockfish, priced at \$0.36/lb, generated an exvessel value of \$193,730, whereas lingcod generated \$4,900, flounders generated \$16,060, and other groundfish generated \$2,080.

Harvest by Reporting Area

Prince William Sound Harvest

Prince William Sound Sablefish. In 1990, 108 fishermen obtained permits, more than any other year. The Prince William Sound sablefish fishery opened by regulation on 1 April and closed by Emergency Order on 7 August. The 208,819 lb (Table 6) of sablefish harvested from Prince William Sound in 1990 was within the harvest guideline range of 88,200 to 308,700 lb (40–140 tonnes; R. Morrison, Alaska Department of Fish and Game, Homer, personal communications). The 1990 sablefish fishery resulted in 258 landings by 70 vessels. This record number of landings probably indicated better harvest reporting by fishermen and processors, especially landings with small amounts of sablefish, such as those made during the directed halibut fisheries. The estimated exvessel value was \$139,910 for the 1990 sablefish harvest.

No age data were available for Prince William Sound sablefish. However, the proportional contribution of the size classes has changed significantly between the 1987–1990 fisheries, whether examined by

biomass composition ($X^2 = 63,417$, $P < 0.01$, 15 df; Figure 4) or by numerical composition ($X^2 = 30,183$, $P < 0.01$, 15 df; Figure 5). The most substantial annual changes in both the biomass and the numerical composition data occurred with the 2-lb size class. Additionally, the 5- to 6-lb size class in 1989 and the 1-lb size class in 1990 were substantially disproportionate from other years and sizes. The contribution by the 1-lb size class in 1990 may indicate recruitment of a strong year class into the fishery.

Other Prince William Sound Groundfish. A total of 1.9 million pounds of groundfish were harvested from state waters of Prince William Sound during 1990 (Table 2). Monthly harvest levels peaked at 315,197 lb in April because of high effort in the sablefish and Pacific cod fisheries, followed by a second peak of 311,503 lb in October because of increased effort in the Pacific cod fishery. Pacific cod composed 58% (1,103,414 lb) of the Prince William Sound groundfish harvest, reflecting the favorable market for Pacific cod. Rockfish, caught primarily in conjunction with sablefish and Pacific cod, composed 26% (490,189 lb) of the Prince William Sound groundfish harvest. Other species that were primarily harvested as a bycatch to Pacific cod or sablefish included lingcod (8,117 lb), flounders (72,973), and other groundfish (9,740 lb).

The 1990 Prince William Sound groundfish harvest of 1.9 million pounds was the largest in recent record (Table 2), reflected the favorable market conditions for Pacific cod, a large harvest of marketable rockfish caught primarily as bycatch to Pacific cod and sablefish fisheries, and a substantial flatfish harvest.

Cook Inlet Harvest

During 1990, 371,453 lb of groundfish were harvested from Cook Inlet (Table 2). Reflecting a favorable market, Pacific cod composed 98% (365,262 lb) of the Cook Inlet groundfish harvest. Other species harvested primarily as a bycatch to Pacific cod or halibut included sablefish (2,696 lb), rockfish (1,143 lb), lingcod (414 lb), and other groundfish (1,938 lb). Monthly harvest levels of Pacific cod peaked at 181,383 lb in May, then declined sharply following the 29 May closure of hook-and-line fisheries (Table 7). After the 27 July reopening of Cook Inlet to pot gear, a small number of fishermen converted to pot gear and fished for Pacific cod through October and November. The 1990 harvest was the second largest in recent record due primarily to the Pacific cod fishery (Table 2).

North Gulf Harvest

During 1990, 58 vessels made 77 landings totaling 124,204 lb of groundfish harvested from state waters of the North Gulf (Table 2). Pacific cod composed 48% (59,954 lb) and rockfish composed 38% (46,799 lb) of the harvest. The remainder of the harvest was composed of sablefish (11,423 lb), lingcod (5,467 lb), and other groundfish (548 lb). The 1990 harvest was only 12% of the historical high (Table 2). Fishing in the North Gulf was subjected to winter storms and little effort occurred prior to March or after August (Table 7).

Central Region Processor Activity

Deliveries of Central Region Companies

The groundfish tickets processed by the ADF&G Homer office reflected the increased domestication of EEZ fisheries during recent years (Bechtol 1991; Megrey and Weststad 1990; Schroeder and Morrison 1989). In 1990, groundfish landings reported by Central Region companies totaled 83.7 million pounds, which is a 36% increase over the 1989 harvest of 61.8 million pounds and an 82% increase over the 1988 harvest of 46.0 million pounds (Table 8). The greatest increase over the 1989 Central Region landings was in Pacific cod (107%) and may have indicated more accurate catch reporting. Harvests of other "groundfish" (60%), flounder (22%), and sablefish (25%) also increased, whereas rockfish harvest decreased by 13%. An additional 18.3 million pounds of groundfish were reported as "discarded-at-sea" and represent discard due to species-closures or a low value species.

Deliveries by Port for Central Region Companies

Companies with offices located within the Central Region processed fish from both within and outside of Central Region state waters, and from the EEZ of the Gulf of Alaska, the Bering Sea, and the Aleutian Island management areas. Of the 83.7 million pounds of groundfish processed in 1990 by Central Region processors or vessels, 74% (61.9 million pounds) was processed by floating domestic processors (FLDs; catcher-processor or mothership-processor vessels) operating primarily in the EEZ (Table 9). Landings by FLDs were composed primarily of Pacific cod (41%), sablefish (23%), rockfish (25%), flounders (13%), and other groundfish (10%). In 1990, Central Region shore-based processors received 21.8 million pounds of groundfish with 72% delivered to Seward, 15% to Cordova, 7% to Homer, 6% to Whittier, and <1% each to the ports of Valdez, Seldovia, and the Kenai area. The 2.4 million pounds of groundfish harvested from state waters (including state waters outside of the Central Region) by vessels of Central Region companies were composed primarily of Pacific cod (64%), rockfish (22%), sablefish (9%), and flatfish (3%). Groundfish products harvested by FLDs differs from those delivered to shorebased processors in having a greater composition of sablefish, flatfish, and other groundfish, particularly pollock.

GROUND FISH FISHERIES OUTLOOK

Fisheries for groundfish, including Pacific cod, should continue to develop as long as market conditions remain favorable. A major marketing factor is product quality, and fishermen and processors will need to deliver a high quality product to maintain a market share. In some cases, this will involve the installation of refrigeration systems, better icing, or other methods to maintain and enhance product quality between the time fish are removed from the water and the time they are delivered to the processor. Processors currently pay a reduced price for deliveries of sub-premium quality and often refuse all or

portions of deliveries containing poor quality fish. Processors will need to process fish into a marketable product as soon as possible after delivery by the fishermen and maintain fish quality (e.g., frequent re-icing) until marketed. Efforts to maintain product quality need to be established throughout the fishing industry so that consumers can be assured of an acceptable quality in the marketplace.

Historical participation in most Central Region groundfish fisheries has been limited and largely driven by short-term increases in market prices and the availability of alternative fisheries. A decline in Atlantic cod stocks has increased the market demand for Pacific cod. Shellfish fishermen have increasingly participated in groundfish fisheries as Central Region shellfish stocks have declined.

As groundfish fisheries continue to evolve, management of groundfish stocks will reflect stock status, migration patterns of these stocks, and impacts of groundfish fishermen on non-groundfish resources. Central Region groundfish resources which actively migrate between state and federal waters will continue to be managed consistently with federal inseasons adjustments. However, for resources which primarily reside in state waters, area- or species-specific management plans will be developed. Until a sufficient database on stock composition and production parameters is developed, openings and closures of groundfish fisheries in state waters of the Central Region will continue to reflect actions in the adjacent federal waters of the Gulf of Alaska. The major exception will be the Prince William Sound sablefish fishery, which is actively managed by the state of Alaska for an established harvest quota.

In 1990 prohibited species catch limits resulted in closures of hook-and-line fisheries in the Gulf of Alaska. In the future, the fishing industry and resource managers will examine means to reduce the mortality of prohibited species by altering fishing gear, methods, and areas. For example, fishermen have already increased their use of groundfish pots, modified with halibut exclusion devices, to reduce halibut bycatch during Pacific cod fisheries. Additionally, the 1990 Alaska Board of Fisheries prohibited the use of non-pelagic trawl gear in critical crab habitats of Cook Inlet.

As fishing technology has continued to develop, fishermen have increased both the capacity and potential to overharvest a species or stock. For example, rockfish are a problem because they are typically long-lived, slow-growing, late-maturing, highly susceptible to harvest, and most species embolize and die when brought to the surface. Management of rockfish stocks will require extensive cooperation between managers and fishermen in order to understand the distribution and life history patterns of individual species or rockfish species complexes. Fishermen will need to be familiar with both the identification characteristics and the distribution patterns of individual species to target on specific rockfish complexes. As catch allocations for individual species complexes are taken, fishermen will need to adjust their fishing strategies to avoid unnecessary discard mortality. Fisheries managers will need to coordinate seasons and bycatch allowances to provide fishing access to this resource while reducing potential overharvest problems and waste of the resource through unnecessary discards.

Fishing strategies in both federal and state waters may be severely modified if the North Pacific Fisheries Management Council adopts Individual Transferrable Quotas (ITQs) for the Gulf of Alaska sablefish and halibut fisheries and, subsequently, for other groundfish fisheries. The ITQ system allocates a fixed share

of the total allowable catch for a fishery to an individual fisherman and serves to limit entry into the fishery. However, problems encountered in previous ITQ programs include (1) catch higrading or retention and reporting of only a selected portion of the catch; (2) a reduction of the overall economic base supported by the fishery because of a consolidation of the number of share holders and the number of fishery participants, including vessel operators and deckhands; and (3) the costs to administer and enforce an ITQ system (e.g., Clark and Duncan 1986). As ITQ systems are established in federal waters, fishing effort can be expected to increase in those state waters where fishery entry is not limited.

Groundfish fisheries are continuing to evolve as concerns such as bycatch, marine mammal mortality, and gear efficiency are addressed. It will take cooperative efforts between the industry and management agencies to develop gear that is cost-effective to operate and minimizes bycatch. While managers develop a better understanding of stock production, the future will also involve a greater role of the public in allocative decisions, including the determination of acceptable bycatch levels. Ultimately, fishermen will need to deliver a quality product at a price that will maintain and expand groundfish markets, both foreign and domestic.

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Table 1. Monthly groundfish harvest and effort from state waters of the Central Region during 1990.

Month	Vessels	Land-ings	Round Weight (lb)					Total	
			Rockfish	Sablefish	Pacific Cod	Flatfish	Other Groundfish		Lingcod
January	9	19	63		94,951		269		95,283
February	4	6	8,828		59,940		528		69,296
March	22	38	33,203		98,588	40	722	4,267	136,820
April	59	158	64,792	78,955	205,397	496	7,937	3,407	360,984
May	101	186	62,846	58,234	301,400	258	2,664	4,192	429,594
June	76	131	60,595	48,174	35,090	215		543	144,617
July	22	69	77,543	24,400	69,912	266			172,121
August	38	70	49,579	13,175	107,241	1,968		677	172,640
September	21	37	75,275		57,600	1,233	106	676	134,890
October	17	41	51,537		233,549	65,130			350,216
November	10	19	26,973		128,312	3,380		236	158,901
December	13	22	26,897		136,650				163,547
Total	213	796	538,131	222,938	1,528,630	72,986	12,226	13,998	2,388,909

Table 2. Annual groundfish harvest and effort from Cook Inlet, Prince William Sound, and the North Gulf during 1987-1990.

Year	Vessels	Land-ings	Round Weight (lb)						Total
			Rockfish	Sablefish	Pacific Cod	Flounders	Other Groundfish	Lingcod	
Prince William Sound									
1987	101	232	98,342	186,940	411,618	27,113	8,040	594	732,647
1988	84	283	112,878	219,719	321,018	15,457	13,655	1,338	684,065
1989	41	146	93,214	186,303	66,399	11	4,499	1,280	351,706
1990	115	566	490,189	208,819	1,103,414	72,973	9,740	8,117	1,893,252
Cook Inlet									
1987	173	713	12,879	872	886,069	135,059	56,776	138	1,091,793
1988	58	169	4,193	86,087	216,469	50	275	127	307,201
1989	6	7	166	687	7,662	0	234	0	8,749
1990	66	154	1,143	2,696	365,262	0	1,938	414	371,453
North Gulf									
1987	109	294	168,895	35,925	763,819	867	4,559	25,522	999,587
1988	75	193	199,918	109,893	302,773	2,368	2,467	25,016	642,435
1989	23	54	49,953	3,052	30,789	0	389	7,026	91,209
1990	58	77	46,799	11,423	59,954	13	548	5,467	124,204
Central Region Total									
1987	321	1,239	280,116	223,737	2,061,506	163,039	69,375	26,254	2,824,027
1988	179	645	316,989	415,699	840,260	17,875	16,397	26,481	1,633,701
1989	60	207	143,333	190,042	104,850	11	5,122	8,306	451,664
1990	213	797	538,131	222,938	1,528,630	72,986	12,226	13,998	2,388,909

Table 3. Monthly groundfish harvest and effort by gear type from state waters of the Central Region during 1990.

	Groundfish Round Weight (lb)					Total
	Longline	Jig/Troll	Pot	Trawl	Other	
January	95,283	0	0	0	0	95,283
February	69,296	0	0	0	0	69,296
March	103,824	32,796	0	200	0	136,820
April	326,297	17,379	4,351	12,957	0	360,984
May	391,995	211	2,327	35,061	0	429,594
June	120,259	17,255	0	7,103	0	144,617
July	165,518	0	0	6,603	0	172,121
August	167,132	0	0	5,508	0	172,640
September	115,977	0	18,913	0	0	134,890
October	259,967	0	38,713	51,536	0	350,216
November	150,775	0	6,453	1,673	0	158,901
December	163,547	0	0	0	0	163,547
Total	2,129,870	67,641	70,757	120,641	0	2,388,909

	Number of Vessels and Landings					Total
	Vessels	Landings				
Vessels	201	9	6	5	0	213
Landings	689	16	12	79	0	796

Table 4. Annual groundfish harvest and effort by gear type from state waters of the Central Region from 1987 to 1990.

Year	Percentage of Annual Harvest					Vessels	Land-ings	Round Weight (lb)
	Longline	Jig/Troll	Pot	Trawl	Other			
1987	87.2%	3.1%	0.6%	9.1%	0.8%	322	1,240	2,825,019
1988	90.8%	6.2%	1.3%	1.7%	0.0%	175	637	1,614,919
1989	94.5%	4.2%	0.2%	1.1%	0.0%	59	201	449,366
1990	89.2%	2.8%	3.0%	5.1%	0.0%	213	796	2,388,909

Table 5. Exvessel value for the groundfish harvest from state waters of the Central Region during 1990.

<u>Fish Group</u>	<u>Round Weight (lb)</u>	<u>Average \$/lb</u>	<u>Value^a</u>
Rockfish	538,131	\$.36	\$193,730
Sablefish	222,938	\$.67	\$149,370
Pacific cod	1,528,630	\$.26	\$397,440
Flounders	72,986	\$.22	\$16,060
Lingcod	13,998	\$.35	\$4,900
Other Groundfish	12,226	\$.17	\$2,080
- - - - -			
Region Total	2,388,909		\$763,580

^a Exvessel values have been rounded to the nearest \$10.00.

Table 6. Annual harvest, effort, and exvessel values for the Prince William Sound sablefish fishery from 1985 to 1990.

Year	Round Wt. (lb) ^a	Ves- sels	Landings	Price (\$/lb)	Exvessel Value	Permits Issued ^b
1985	383,290	29	108	ND	ND	
1986	189,850	32	36	ND	ND	88
1987	205,350	71	120	\$0.66	\$135,530	116
1988	219,720	53	147	\$0.99	\$217,520	76
1989	186,300	26	98	\$0.80	\$149,040	86
1990	208,820	70	258	\$0.67	\$139,910	108

^a Annual harvests have been rounded to the nearest 10 lb.

^a Permits were not required for the Prince William Sound sablefish fishery prior to 1986.

Table 7. Monthly groundfish harvest and effort in Central Region reporting areas during 1990.

Month	Vessels	Land-ings	Round Weight (lb)						Total	
			Rockfish	Sablefish	Pacific Cod	Flatfish	Other Groundfish	Lingcod		
<u>Prince William Sound</u>										
January	4	4	63		56,493			269		56,825
February	<4	<4	8,727		55,903			403		65,033
March	7	9	3,898		42,533	40		178	293	46,942
April	49	129	63,883	78,248	161,226	496	7,937		3,407	315,197
May	48	93	51,868	47,186	99,352	258	847		3,899	203,410
June	38	89	56,346	45,810	20,053	202			46	122,457
July	22	69	77,543	24,400	69,912	266				172,121
August	28	60	47,383	13,175	105,674	1,968				168,200
September	19	34	75,071		38,687	1,233		106	472	115,569
October	15	36	51,537		194,836	65,130				311,503
November	9	18	26,973		122,095	3,380				152,448
December	13	22	26,897		136,650					163,547
Total	115	566	490,189	208,819	1,103,414	72,973	9,740	8,117		1,893,252
<u>Cook Inlet</u>										
January	5	15			38,458					38,458
February	<4	<4			2,134					2,134
March	9	18	67		50,337			264		50,668
April	9	19	85		39,189					39,274
May	37	71	133	2,410	177,066		1,674		100	181,383
June	18	19	612	286	12,427				231	13,556
July	0	0								0
August	5	5	246		1,314				83	1,643
September	<4	<4			18,913					18,913
October	<4	4			25,424					25,424
November	0	0								0
December	0	0								0
Total	66	154	1,143	2,696	365,262	0	1,938	414		371,453
<u>North Gulf</u>										
January	0	0								0
February	<4	<4	101		1,903			125		2,129
March	7	11	29,238		5,718			280	3,974	39,210
April	3	10	824	707	4,982					6,513
May	21	22	10,845	8,638	24,982			143	193	44,801
June	23	24	3,637	2,078	2,610		13		266	8,604
July	0	0								0
August	5	5	1,950		253				594	2,797
September	<4	<4	204						204	408
October	<4	<4			13,289					13,289
November	<4	<4			6,217				236	6,453
December	0	0								0
Total	58	77	46,799	11,423	59,954	13	548	5,467		124,204

Table 8. Annual groundfish harvest from state and federal waters which was landed to Central Region based processors from 1981 to 1990.

Year	Round Weight (lb)					Total
	Rockfish	Sablefish	Pacific Cod	Flatfish	Othera Groundfish	
1981	134,444	2,204	11,020	72,732	88,160	308,560
1982	22,040	130,036	26,448	132,240	70,528	381,292
1983	37,468	304,152	22,040	28,652	136,648	528,960
1984	94,772	3,193,596	8,816	11,020	15,428	3,323,632
1985	3,920,916	6,012,512	68,324	74,936	185,136	10,261,824
1986	2,129,064	9,406,672	189,544	59,508	26,448	11,811,236
1987	8,028,832	12,004,742	2,999,334	881,985	166,578	24,081,471
1988	21,110,677	15,447,243	5,793,211	2,085,354	1,582,905	46,019,390
1989	20,258,691	14,401,718	13,343,056	6,851,114	6,901,238	61,755,817
1990	17,631,821	19,099,038	27,577,299	8,379,681	11,045,709	83,733,548

a "Other groundfish" differs from uses of this category elsewhere in the text and graphics; in this case it includes lingcod.

Table 9. Port of landing and harvest source for groundfish processed by Central Region companies or vessels during 1990.

Port	Harvest Source ^a	Ves-sels	Land-ings	Round Weight (lb)							Total
				Rockfish	Sablefish	Pacific Cod	Flatfish	Other Groundfish	Lingcod		
Cordova	State	35	87	53,430	49,801	161,650	0	0	4,225	269,106	
	EEZ	44	95	63,946	2,905,542	4,490	0	0	1,258	2,975,236	
	Total	75	182	117,376	2,955,343	166,140	0	0	5,483	3,244,342	
FLD ^b	State	3	13	702	688	17,688	0	0	0	19,078	
	EEZ	29	267	15,175,228	2,069,368	25,554,211	8,204,471	10,893,674	0	61,896,952	
	Total	30	280	15,175,930	2,070,056	25,571,899	8,204,471	10,893,674	0	61,916,030	
Homer	State	55	136	3,882	4,887	328,536	0	2,081	939	340,325	
	EEZ	68	113	11,063	109,640	782,607	240,863	0	18	1,144,191	
	Total	112	249	14,945	111,268	787,494	569,399	2,081	957	1,484,516	
Kenai	State	18	25	0	748	43,700	0	0	0	44,448	
	EEZ	4	8	2,377	8,621	13,509	0	0	158	24,665	
	Total	22	33	2,377	9,369	57,209	0	0	158	69,113	
Seldovia	State	5	5	598	167	1,426	0	0	218	2,409	
	EEZ	7	7	76	1,131	946	0	0	0	2,153	
	Total	12	12	674	1,298	2,372	0	0	218	4,562	
Seward	State	38	87	57,331	58,489	350,112	13	985	467,319	934,249	
	EEZ	189	536	1,835,485	13,048,263	224,332	102,224	11,284	15,223,569	14,756,639	
	Total	207	623	1,892,816	13,106,752	574,444	102,237	12,269	2,370	15,690,888	
Valdez	State	20	23	9,317	12,990	29,894	0	0	358	52,559	
	EEZ	5	8	1,249	40,550	11,469	0	0	0	53,268	
	Total	23	31	10,566	53,540	41,363	0	0	358	105,827	
Whittier	State	68	415	411,414	94,153	594,473	72,973	9,160	7,869	1,190,042	
	EEZ	12	18	5,723	21,033	0	0	0	1,472	28,228	
	Total	75	433	417,137	115,186	594,473	72,973	9,160	9,341	1,218,270	
Central Region Total											
	State	242	791	536,674	221,923	1,527,479	72,986	12,226	13,998	2,385,286	
	EEZ	358	1,052	17,095,147	18,877,115	26,049,820	8,306,695	11,014,598	4,887	81,348,262	
	Total	455	1,843	17,631,821	19,099,038	27,577,299	8,379,681	11,026,824	18,885	83,733,548	

^a State - Harvest from waters of state management jurisdiction.

EEZ - Harvest from the Exclusive Economic Zone, or waters of federal management jurisdiction.

^b FLD - Floating domestic processor.

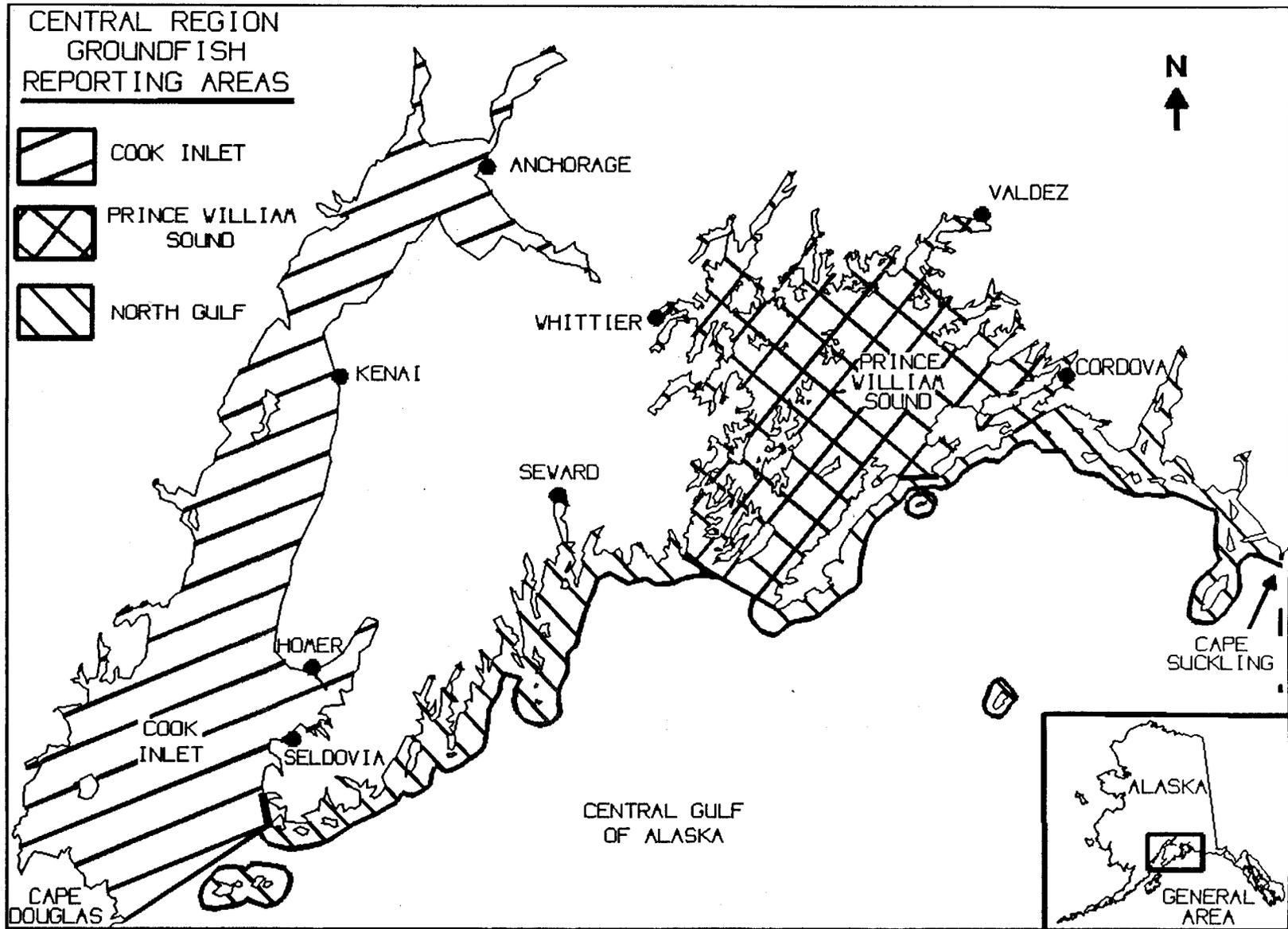


Figure 1. Data summary areas for the reporting of groundfish harvested from State waters of the Central Region.

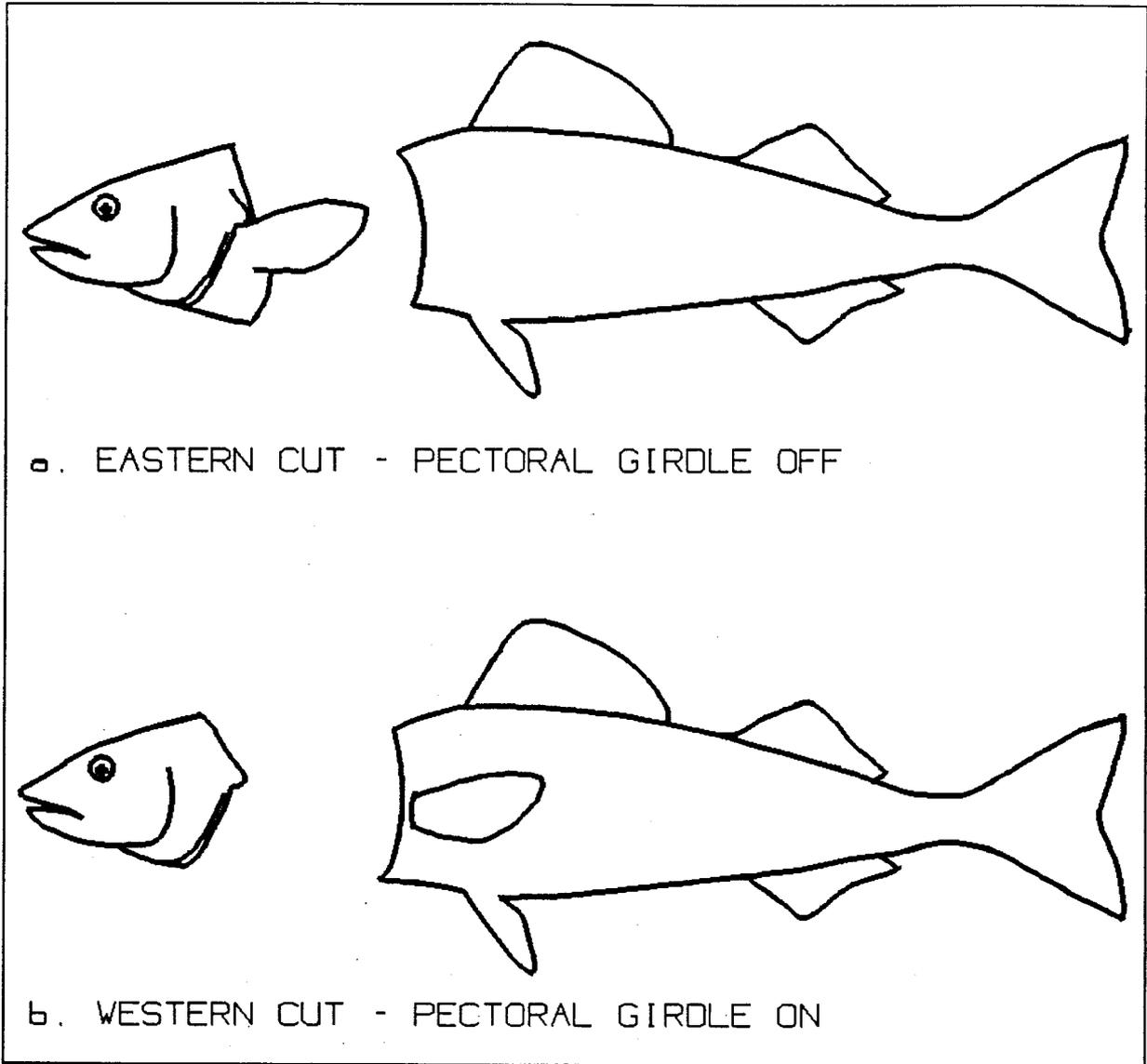


Figure 2. Example of eastern cut (a) and western cut (b) sablefish.

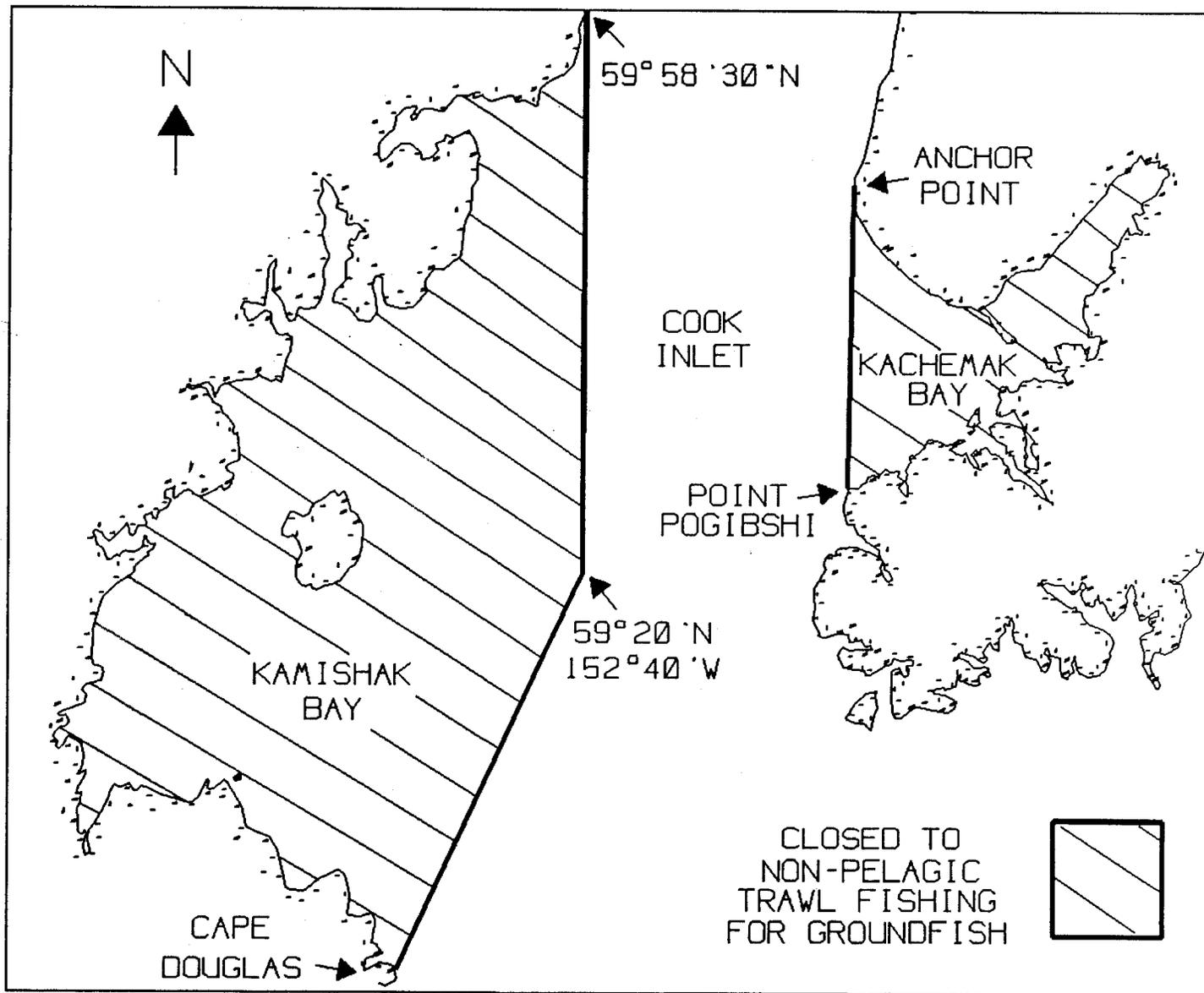


Figure 3. Areas of Cook Inlet closed to the use of non-pelagic trawl gear for harvesting groundfish.

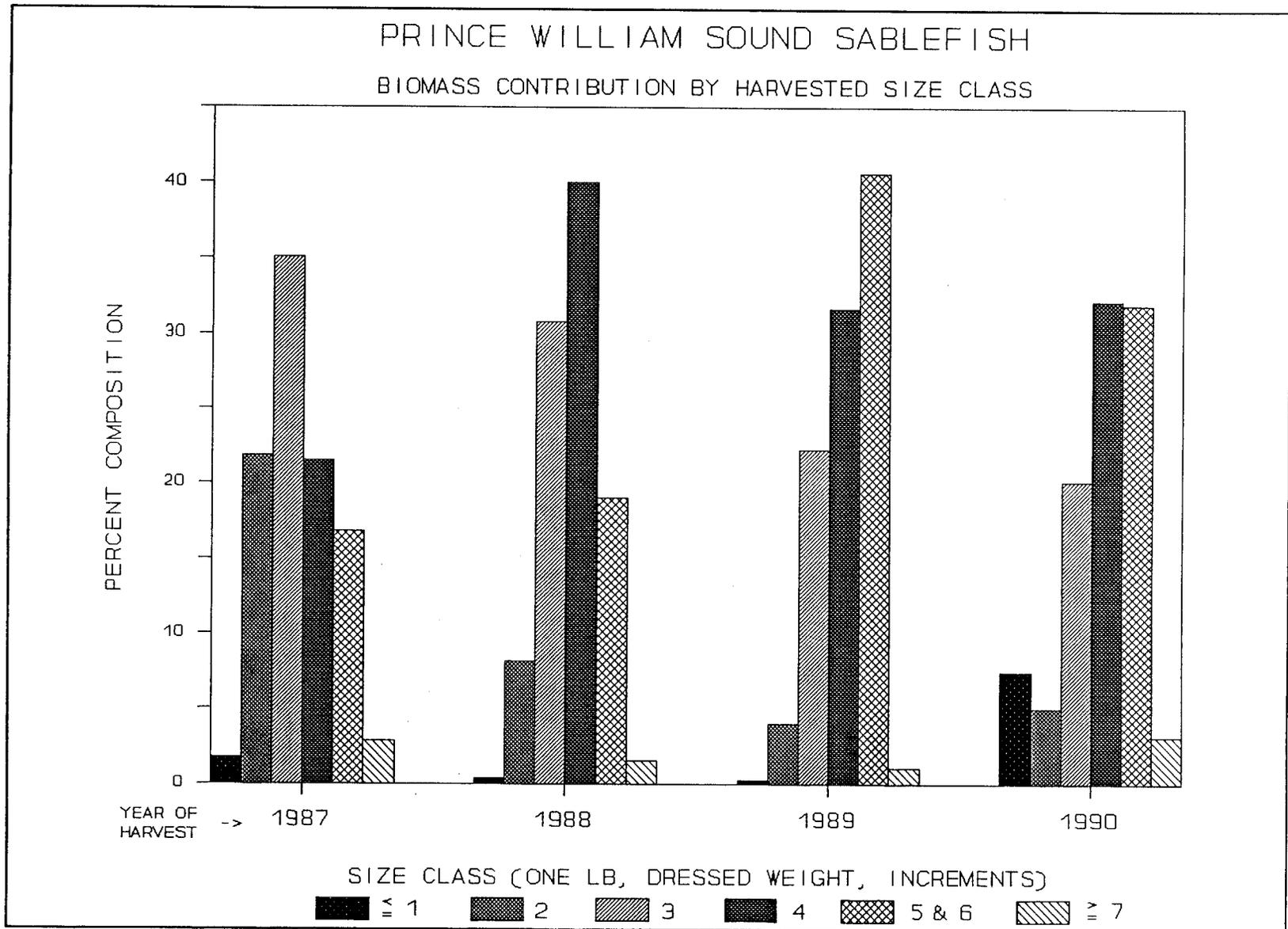


Figure 4. Proportional contribution of each sablefish size class (dressed weight in pounds) to the total biomass harvested in Prince William sablefish fisheries during 1987-1990.

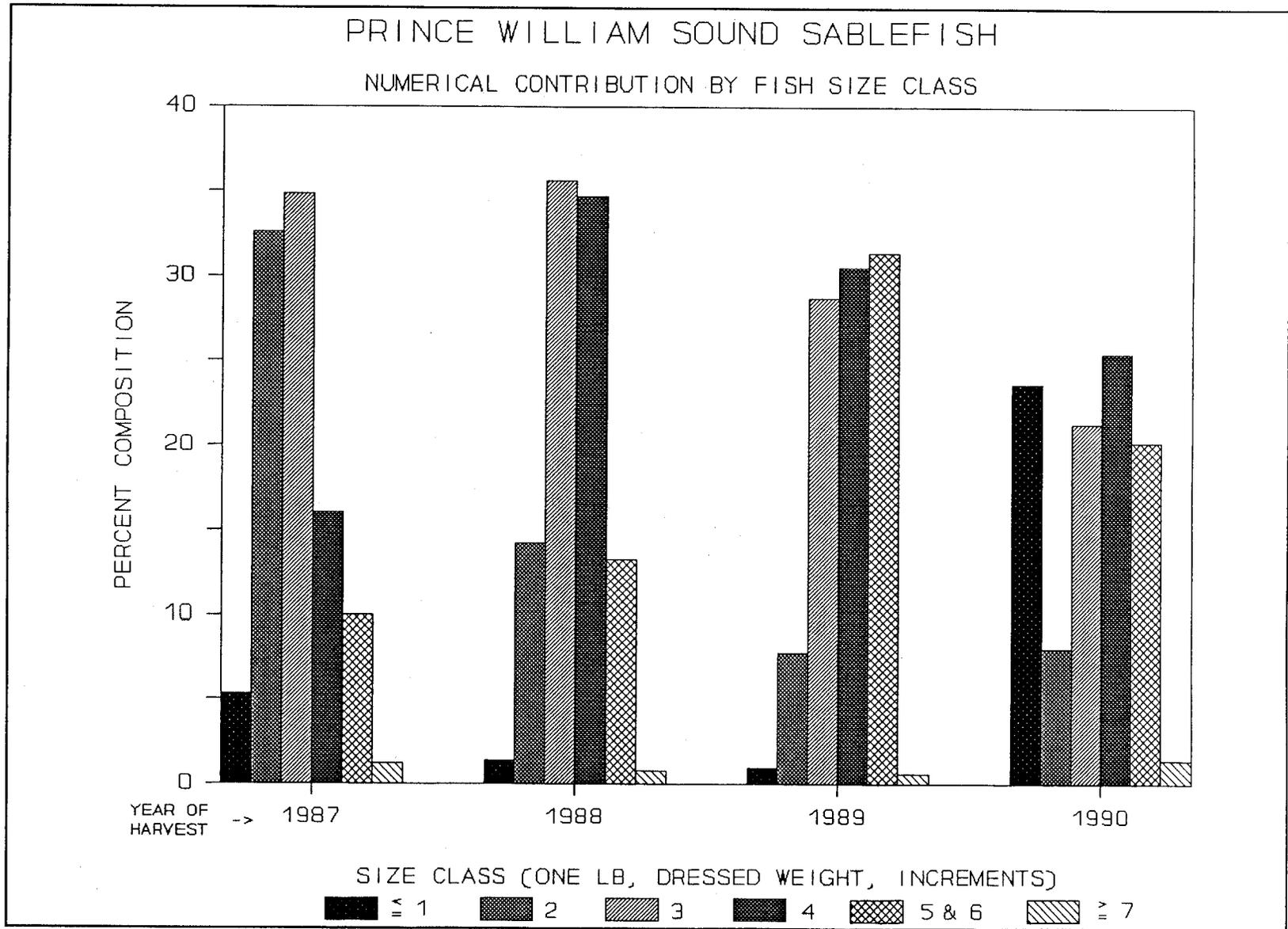


Figure 5. Proportional contribution by each sablefish size class (dressed weight in pounds) to the total number of fish harvested in Prince William sablefish fisheries during 1987-1990.

APPENDIX

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 ^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" for ancillary products.

Appendix B.1 Federal openings and closures of groundfish fisheries affecting Central Region fishermen during 1990.

DATE	WATERS	FISHERY	GEAR ^a	ACTION ^b
1/1	GULF OF ALASKA	GROUND FISH, EX. SABLFSH	ALL	OPENED
1/1	CENTRAL GULF	SABLEFISH	ALL	BYCATCH
1/15	GULF OF ALASKA	SABLEFISH	TRAWL	CLOSED
1/26	WESTERN/CENTRAL GULF	POLLOCK	ALL	CLOSED
2/15	GULF OF ALASKA	HALIBUT PSC LIMITS	H&L, TRAWL	ESTABL.
2/16	ALASKAN WATERS	POLLOCK	ROE-STRIPPING	PROHIBITED
2/28	SHELIKOF STRAIT	POLLOCK	ALL	CLOSED
4/1	WESTERN/CENTRAL GULF	POLLOCK	ALL	OPENED
4/1	GULF OF ALASKA	SABLEFISH	ALL	OPENED
4/9	OUTER ISLAND	SEA LION ROOKERY -	VESELS	PROHIBITED W/N 3 MI.
4/9	SUGARLOAF ISLAND	"	"	"
4/9	MARMOT ISLAND	"	"	"
4/9	CHIRIKOF ISLAND	"	"	"
4/16	WEST YAKUTAT	SABLEFISH	H&L	BYCATCH
4/20	EAST YAKUTAT	SABLEFISH	H&L	BYCATCH
4/28	WESTERN GULF	PACIFIC COD	ALL	BYCATCH
5/29	EASTERN GULF	SABLEFISH	H&L	CLOSED
5/29	WEST YAKUTAT	SABLEFISH	TRAWL	CLOSED
5/29	CENTRAL GULF	SABLEFISH	H&L	BYCATCH
5/29-6/30	GULF OF ALASKA	GROUND FISH	H&L, BOT. TRAWL	CLOSED
5/30	WESTERN GULF	PACIFIC COD	ALL	CLOSED
5/29-6/30	GULF OF ALASKA	GROUND FISH	H&L	BYCATCH
6/30	EASTERN GULF	OTHER ROCKFISH	ALL	CLOSED
7/1	GULF OF ALASKA	GROUND FISH	H&L	CLOSED
7/12	CENTRAL GULF	SABLEFISH	H&L	CLOSED
7/20	CENTRAL GULF	OTHER ROCKFISH	ALL	CLOSED
7/30	CENTRAL GULF	SABLEFISH	TRAWL	CLOSED
8/3	EASTERN GULF	OTHER ROCKFISH	ALL	OPENED
8/3	WESTERN GULF	OTHER ROCKFISH	ALL	CLOSED
8/14	GULF OF ALASKA	GROUND FISH	POTS AND JIGS EXEMPTED FROM HALIBUT BYCATCH LIMITS	
8/14	EASTERN GULF	OTHER ROCKFISH	ALL	CLOSED
8/16	WESTERN GULF	OTHER ROCKFISH	ALL	OPENED
8/31	WESTERN GULF	OTHER ROCKFISH	ALL	CLOSED
9/27	WESTERN GULF	OTHER ROCKFISH	NON H&L	OPENED
9/27	WESTERN GULF	SABLEFISH	TRAWL	OPENED
10/1	ALL - - -	PELAGIC TRAWL DEFINITION	CLARIFIED	
10/5	WESTERN GULF	OTHER ROCKFISH	ALL	CLOSED
10/17	CENTRAL/WESTERN GULF	POLLOCK	ALL	CLOSED
11/9	GULF OF ALASKA	EXTENSION OF 8/14/90	EXEMPTIONS	
11/21	GULF OF ALASKA	ALL	BOT. TRAWL	CLOSED

^a H&L - Hook-and-line gear.

^b BYCATCH - Means that a fishery is open only to bycatch allowances.

Appendix B.2. Primary openings and closures of groundfish fisheries in state waters of the Central Region during 1990.

DATE	WATERS	FISHERY	GEAR ^a	ACTION ^b
1/1	ALL	GROUND FISH, EX. SABLEFISH	ALL	OPENED
1/1	CENTRAL GULF	SABLEFISH	ALL	BYCATCH
1/26	WESTERN GULF	POLLOCK	ALL	CLOSED
1/26	NORTH GULF (EXCEPT SHELIKOF STRAIT)	POLLOCK	ALL	CLOSED
2/28	SHELIKOF STRAIT	POLLOCK	ALL	CLOSED
3/25	KAMISHAK BAY/KACHEMAK BAY	ALL	TRAWL	CLOSED
4/28	WESTERN GULF	PACIFIC COD	ALL	CLOSED
5/29	CENTRAL/WESTERN GULF	ALL	H&L, BOT. TRAWL	BYCATCH
5/29	NORTH GULF	SABLEFISH	H&L	BYCATCH
5/29	COOK INLET	ALL	ALL	CLOSED
5/29	EAST/WEST YAKUTAT	ALL	H&L, TRAWL	BYCATCH
5/30	WESTERN GULF	PACIFIC COD	ALL	CLOSED
6/5-6/6	COOK INLET	ALL	ALL	OPENED
7/1	CENTRAL/WESTERN GULF	ALL	H&L, BOT. TRAWL	BYCATCH
7/12	NORTH GULF	SABLEFISH	H&L	CLOSED
7/20	NORTH GULF	OTHER ROCKFISH	ALL	CLOSED
7/27	COOK INLET	ALL	POT	OPENED
7/30	NORTH GULF	SABLEFISH	TRAWL	CLOSED
8/3	WESTERN GULF	OTHER ROCKFISH	ALL	CLOSED
8/7	PRINCE WILLIAM SOUND	SABLEFISH	ALL	CLOSED
8/16	WESTERN GULF	OTHER ROCKFISH	ALL	OPENED
8/21	CENTRAL/WESTERN GULF	ALL	JIG	OPENED
8/22	COOK INLET	ALL	JIG/HAND TROLL	OPENED
8/30-8/31	COOK INLET	ALL	ALL	OPENED
8/31	WESTERN GULF	OTHER ROCKFISH	ALL	CLOSED
9/27	WESTERN GULF	OTHER ROCKFISH	NON H&L	OPENED
9/27	WESTERN GULF	SABLEFISH	TRAWL	OPENED
10/5	WESTERN GULF	OTHER ROCKFISH	ALL	CLOSED
10/17	CENTRAL/WESTERN GULF	POLLOCK	ALL	CLOSED
11/21	CENTRAL/WESTERN GULF	ALL	BOT. TRAWL	CLOSED
11/22	COOK INLET	SEASONS COINCIDE W/NMFS	INSEASON ADJUSTMENTS	
11/22	CENTRAL/WESTERN GULF	SEASONS COINCIDE W/NMFS	INSEASON ADJUSTMENTS	

^a H&L - Hook-and-line gear.

^b BYCATCH - Means that a fishery is only open to bycatch allowances. For state waters, bycatch is only allowed when the incidentally caught species are also open for directed fishing.

Appendix C. Licenses, permits, and registrations required of Central Region groundfish fishermen in 1990.

All Fisheries

1. Coast Guard vessel documentation number (AK No.).
2. 1991 vessel license (ADF&G No.)
3. 1991 interim-use card (CFEC card) applicable to fishery and gear type.
4. 1991 Marine mammals exemption, as required by fishery, gear type, and area.

State Waters (0-3 miles from shore)

1. 1991 groundfish area registration applicable to fishery and management area.
2. 1991 ADF&G fishery-specific permits; these permits complete registration requirements as specified above. Central Region permit fisheries include:
 - a. Sunken gillnet fisheries;
 - b. Prince William Sound sablefish

Fed Waters (3-200 miles from shore)

1. Federal groundfish fishery permit.

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