

**REVIEW OF 1993
GROUND FISH FISHERIES IN
PRINCE WILLIAM SOUND**

**REPORT TO THE ALASKA
BOARD OF FISHERIES**



by
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ABSTRACT

During 1993, 87 vessels delivered 1.4 million lb (645 metric tonnes) of groundfish in 303 landings from the Prince William Sound management area. This harvest, the fourth largest on record, generated an exvessel value of \$559,207. Pacific cod comprised 72%, sablefish 22%, and rockfish 5% of the harvested biomass. Species caught primarily as bycatch included flounders, lingcod, and "other" groundfish. Longline vessels delivered 74% of the harvest, pot vessels 23%, trawl vessels 3%, and jig vessels <1% of the 1993 harvest. Seasons for many groundfish species coincided with fisheries in the adjacent federal waters of the Central Gulf of Alaska. Despite favorable groundfish markets, particularly for Pacific cod, fishing seasons were generally shorter than in previous years due to reduced quotas, higher catch rates, and bycatch mortality limits for halibut being achieved relatively early in the year. More conservative management strategies adopted by the Alaska Board of Fisheries during the 1992-1993 meeting cycle included rockfish trip limits, lingcod size and season restrictions, and the statewide elimination of sunken gillnet as a legal gear type for groundfish. Groundfish fisheries, particularly for Pacific cod, should remain strong for several years. Better stock assessment is urgently needed, particularly for rockfish, lingcod, and sablefish resources in the nearshore areas. Given the increased fishing effort, more intensive management is anticipated in the future.

KEY WORDS: Prince William Sound, groundfish, harvest

INTRODUCTION

Groundfish, or bottomfish, includes all marine finfish excluding halibut, herring, salmonids, and osmerids. Groundfish harvests from Prince William Sound have continued to provide either primary or supplemental income to a wide variety of gear types fished primarily by Alaska-based vessels. The Alaska Department of Fish and Game (ADF&G) has management jurisdiction for groundfish resources in Prince William Sound. This report presents data on the commercial groundfish harvest from waters of Prince William Sound during 1993, a comparison of the 1993 harvest to previous years, and the anticipated management strategies for the near future.

METHODS

Reporting Areas

Prince William Sound includes all waters enclosed by lines from Point Whittshed (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; Figure 1).

Fish Ticket Reporting System

Harvests from Prince William Sound were delivered to a variety of ports in southcentral Alaska. Processors, buyers, and fishermen were responsible for recording each groundfish landing on an ADF&G fish ticket and submitting that fish ticket to 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 1989). For compilation into statewide harvest data, groundfish data were electronically transferred to the ADF&G Computer Services office in Juneau and then to the NMFS Management Division office in Juneau, Alaska. Fisheries contributing to the data compiled herein primarily included longline, pot, jig, trawl, and (historically) sunken gillnet fisheries for sablefish and miscellaneous groundfish in Prince William Sound, as well as groundfish caught incidentally during directed halibut and shrimp trawl fisheries. Historical harvest data for these fisheries was derived from Blackburn et al. 1983 and R. Morrison (Alaska Department of Fish and Game, Homer, Alaska, unpublished data).

Groundfish harvests reported on ADF&G fish tickets were expressed as dressed weight. The dressed weight and the product value were converted to round weight equivalents using Product Recovery Ratios (PRR's) which are specific to species and delivery condition codes (Appendix A; ADF&G 1989). Groundfish harvest data, expressed in pounds (lb) or tonnes (1 tonne = 2,205 lb) of round weight, were summarized into the fish groups of rockfish (*Sebastes* and *Sebastolobus* species), sablefish (*Anoplopoma fimbria*), Pacific cod (*Gadus macrocephalus*), flounders (order Pleuronectiformes), lingcod (*Ophiodon elongatus*), and "other groundfish". Unlike the extensive pollock fisheries found in federal waters, pollock (*Theragra chalcogramma*) comprised <0.4% (5,627 lb) of the 1993 catch from Prince William Sound waters, and was included in the "other groundfish" category. Octopus (*Octopus* species), landed and reported as groundfish bycatch, comprised 4,500 lb of the 1993 groundfish harvest and was also included in the "other groundfish" category.

Exvessel values were also calculated as round-weight equivalents. Because product value was not always available for each landing report, the price-per-pound for individual species was averaged across all Central Region landings for which product values were reported. This average price was then applied to Prince William Sound landings and summed within fish groups.

RESULTS

Management Actions in 1993

The Alaska Department of Fish and Game (ADF&G) and the National Marine Fisheries Service (NMFS) coordinate management responsibilities for groundfish fishing in coastal waters off Alaska. ADF&G has management jurisdiction for groundfish stocks in territorial waters extending 0-3 miles from shore. Federally managed waters of the Exclusive Economic Zone (EEZ; previously referred to as the Fishery Conservation Zone) extend from 3-200 miles offshore. Fishery management plans (FMP's) for the EEZ are developed by the North Pacific Fisheries Management Council with inseason management implemented by NMFS. Management regulations for state waters are established by the Alaska Board of Fisheries with inseason adjustments made through emergency order by ADF&G. Unless different regulations have been established by the Alaska Board of Fisheries, ADF&G management authority is generally limited to time and area closures for resource conservation. For state groundfish fisheries which lack established research programs or management strategies, state inseason management actions often coincided with inseason adjustments as announced by NMFS for the adjacent federal waters of the Central Gulf of Alaska. This strategy: (1) provided consistent management of fisheries which harvested the same groundfish stocks in adjacent state and federal waters; (2) facilitated enforcement of regulations; and (3) provided some measure of stock conservation measures in cases where the ADF&G lacks sufficient data to actively manage nearshore groundfish.

populations. An example is Pacific cod which opened January 1 and, similar to federal waters, was changed to bycatch-only on March 24. The majority of the Pacific cod harvest in recent years has occurred directly adjacent to the federal waters suggesting that the Prince William Sound biomass is not independent of federal water cod stocks. Adopting the federal season for Pacific cod provided some stock conservation for a resource which migrates across the state-federal boundary. In contrast, more intensive state management was implemented for sablefish, rockfish, and lingcod.

A brief synopsis of management actions affecting the groundfish fleet during 1993 is provided below and in Appendix B. In an effort to keep the public informed, news releases detailing the status of various groundfish fisheries were periodically sent to Central Region groundfish processors and harbormasters.

With the exception of sablefish, lingcod, and trawl gear, all groundfish fisheries in Prince William Sound were opened for directed fishing on 1 January 1993. Groundfish trawl fisheries were delayed until 20 January, then opened with bycatch-only restrictions for rockfish until July. The North Montague and Orca Bay areas of Prince William Sound were closed to groundfish pots from for the duration of 1993 to protect depressed crab stocks. A shift of the Pacific cod fishery to bycatch-only on 24 March reduced much of the Prince William Sound groundfish effort. The commercial lingcod fishery was closed from 15 April through 30 June to protect depressed lingcod populations during the critical nest-guarding phase (Vincent-Lang and Bechtol 1992). Sablefish opened to all gears in Prince William Sound from 17 to 20 May; then reopened during the 24-hour halibut fishery on 10-11 June. To provide for an orderly and enforceable fishery during the 10 June halibut opening, all groundfish fishing in Prince William Sound was closed for the 72-hours preceding the halibut opening. Following the halibut fishery, longline gear was changed to bycatch-only through the remainder of 1993. Non-pelagic trawl gear was placed on bycatch-only from 3 August to 4 October and on bycatch-only for deepwater flatfish and rockfish from 4 October through the end of the year.

Harvest and Effort Summary

During the 1993 season, 87 vessels made 303 landings, delivering 1.4 million lb of groundfish from Prince William Sound (Table 1). Most of the 1993 harvests occurred in fisheries for Pacific cod (1.0 million lb, or 72% of the 1993 total), sablefish (331,626 lb, or 22% of the total), and rockfish (74,879 lb, or 5% of the total). Additional groundfish species, primarily caught as bycatch, included lingcod (245 lb), flounders (275 lb), and other groundfish (12,042 lb). Monthly harvests from Prince William Sound peaked at 661,700 lb in March (Table 2). The 1993 groundfish harvest was the fourth largest on record, but the smallest since 1989 (Table 2). Large groundfish harvests in recent years may be attributed to favorable markets, particularly for Pacific cod. The harvest decline in 1993 relative to recent years probably reflected a closure of the directed Pacific cod fishery relatively early in the year.

Harvest Value

The 1.4 million lb of groundfish harvested from Prince William Sound in 1993 generated an estimated exvessel value of \$559,207 (Tables 1 and 3). Sablefish, at an average of \$0.97/lb (or \$1.54/lb dressed as headed-and gutted), generated an exvessel value of \$302,277. Pacific cod was priced at \$0.22/lb and generated \$224,960, rockfish was priced at \$0.34/lb and generated an exvessel value of \$24,459, lingcod generated \$88, flounders generated \$41 and other groundfish generated \$6,382. The relatively high value and price for other groundfish primarily resulted from \$1.00/lb paid for 4,500 lb of octopus caught incidentally in groundfish fisheries. Since 1987, the average price paid for sablefish has been variable, but generally increased. Pacific cod prices have generally declined in recent years, while prices for lingcod and rockfish have remained moderately stable.

Harvest by Gear type

A single vessel may fish several gear types within a season or even at the same time if all applicable licenses and permits are obtained. However, most vessels fished a single gear type. During the 1993 season, 80 longline vessels made 242 landings totaling 1.1 million lb, or 74% of the total groundfish harvest from Prince William Sound (Table 4). Five pot vessels reported 34 landings totaling 324,100 lb, or 23% of the total. The portion of the annual harvest from longline gear, while similar to the 1992 level, was well below historical levels and reflected the increased use of groundfish pots for Pacific cod in recent years (Table 4, Figure 2). While five trawl vessels reported 22 landings totaling 41,700 lb, or 3% of the area total; much of the trawl harvest was bycatch to shrimp trawl fisheries. Trawl gear has produced less than 5% of the annual groundfish harvest since 1987; the 1993 trawl portion was only slightly greater than the historical average. Other gear types landed 4,740 lb, <1% of the Prince William Sound harvest. There has been some public interest in expanding the use of jig gear, particularly for Pacific cod.

Individual Fisheries

Sablefish

Fishermen must obtain a Prince William Sound Sablefish Fishery Permit prior to commercially fishing for sablefish in Prince William Sound. Eighty-two fishermen obtained permits for the 1993 sablefish season (Table 5). Fishermen participating in this fishery were also encouraged to obtain a miscellaneous finfish interim use card (CFEC card) in addition to a sablefish interim

use card and permit. Fishermen licensed to fish both sablefish and miscellaneous finfish in the Prince William Sound area may retain both sablefish and miscellaneous groundfish in excess of the state's 20% incidental catch limits (see Alaska statute 5 AAC 05.120), thereby reducing waste of the resource and allowing fishermen to maximize potential income.

The Prince William Sound sablefish fishery is managed for a harvest guideline range of 97,020 to 385,875 lb (44-175 tonne; Bechtol and Morrison *under review*). This fishery has historically opened in conjunction with the sablefish fishery in the 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 in recent years have made it increasingly difficult to manage the Prince William Sound fishery for the guideline harvest range. For the first time in 1993, the management strategy involved 72-hour fishing periods, from noon on Mondays to noon on Thursdays. The first period opened on 17 May, the first Monday following the sablefish opening in federal waters, and ended on 21 May. Preliminary processor reports indicated a first period harvest of 252,112 lb. Since this exceeded the midpoint of the guideline harvest range, sablefish fishing was then closed. Because the sablefish resource in Prince William Sound appeared to be healthy, the sablefish fishery was reopened for the duration of the 24-hour halibut fishery from noon on 10 June through noon on 11 June. During the 96 hours of fishing time allowed during 1993, 311,626 lb of sablefish were landed by 55 vessels in 87 deliveries (Table 5). The 1993 sablefish harvest was the fourth largest on record, but generated the second highest exvessel value. Despite the short duration of the 1993 fishery, the pounds of sablefish delivered per landing was the fourth highest on record. As a factor contributing to high delivery rates, permit holders reported that sablefish loss to killer whales was low in 1993 relative to previous years. Based on the results of the 1993 season, a management strategy involving 72-hour openings will tentatively be applied to the 1994 sablefish fishery.

Pacific Cod

The Pacific cod fishery has produced the bulk of the Prince William Sound groundfish landings since 1987 (Table 2). The 1993 directed fishery for Pacific cod lasted from 1 January until 24 March. The 1993 harvest of 1.0 million lb of Pacific cod was the fourth largest on record, but the smallest since 1990. Although the price paid by processors for Pacific cod has been relatively stable over time, demand for Pacific cod, particularly in terms of the willingness of processor to purchase cod, has increased (Table 3). Therefore, interest in this fishery has continued to increase. Because ADF&G has not maintained research programs for Pacific cod in Prince William Sound, and because the majority of the Pacific cod from Prince William Sound are typically harvested directly adjacent to federal waters, the Prince William Sound fishing season for cod coincided with the cod season in the adjacent federal waters of the Central Gulf of Alaska.

The increased use of groundfish pots in Prince William Sound since 1991 has primarily resulted from efforts to produce high yields of Pacific cod while minimizing the incidental catch of non-

target species, particularly halibut (Table 3). Crab resources in the eastern portion of Prince William Sound continue to be depressed. Since groundfish pot gear which reduces crab bycatch to acceptable levels has not been developed, and the use of groundfish pots would have resulted in incidental handling and mortality of crabs, the Orca Bay and North Montague areas of Prince William Sound have been closed to groundfish pots by emergency order since 1991. Because of continued concerns about depressed crab resources, areas of known crab distribution have been proposed for permanent closure to groundfish pots by regulation.

Rockfish

Rockfish are typically slow-growing, slow to reach sexual maturity (7-17 yrs old), long-lived (50-80+ yrs), and have localized distributions. These fish are highly susceptible to overfishing. Once rockfish stocks are depleted, they are difficult to rebuild without curtailing non-rockfish fisheries. Because of concerns over the long-term yield from rockfish resources, the Alaska Board of Fisheries adopted new regulations in 1992 to establish a rockfish management plan for Prince William Sound. The plan specifies 5-day trip limits of 3,000 lb for the aggregate of all rockfish species. An annual harvest of 150,000 lb, or conservation concerns, in Prince William Sound would cause a bycatch-only fishery to be implemented.

In 1993, a rockfish harvest of 74,900 lb was reported from Prince William Sound. This was the smallest reported harvest and the smallest harvest value since 1987 (Table 2 and 4). Virtually all of the reported rockfish harvests occurred as bycatch in other fisheries. While any directed fishing for rockfish was probably minor during 1993, the actual resource removal was probably much higher based on catch sampler observations of unreported rockfish landings that were retained as "homepack."

Lingcod

New regulations implemented in 1993 for lingcod in Prince William Sound established: (1) the open season for lingcod as July 1 to December 31; and (2) a minimum size of 35 inches as measured from the snout to the tip of the tail (or 28 inches from the insertion of the dorsal fin to the tip of the tail). Both these regulations are intended to maximize potential reproduction by prohibiting the retention of sexually immature fish and by protecting lingcod during the egg-laying, nest-guarding season (Vincent-Lang and Bechtol 1992). Similar regulations were adopted for the sport fisheries. Since the federal fisheries management does not include lingcod, these regulations also apply in the adjacent federal waters.

The 1993 commercial harvest of lingcod was the smallest annual harvest reported since 1972. This low reported harvest probably resulted from lingcod retention being prohibited during the

first half of the calendar year when the primary commercial groundfish fisheries in Prince William Sound occurred.

Flounders and Other Groundfish

Deliveries of flounders and other groundfish have typically been market driven; many deliveries involve experimental efforts by vessel operators and processors to develop markets. A significant portion of the 1993 harvests of other groundfish was the result of octopus caught incidentally by groundfish fisheries, particularly the groundfish pot fisheries.

GROUNDFISH FISHERIES OUTLOOK

Proposed Groundfish Regulation Changes

Fisheries regulations establish a framework within which resource managers, enforcement agents, and the fishing industry work to provide for long-term sustained yield for a variety of user groups. As resource use intensifies, resource managers must address both short- and long-term conservation concerns. If demand for a resource exceeds the potential resource production, the resource must be allocated among user groups. For resources managed by the State of Alaska, the Alaska Board of Fisheries adopts regulations to govern resource conservation and utilization. Following is a list of the most significant groundfish regulation proposals for Prince William Sound to addressed by the Alaska Board of Fisheries during the 1993-1994 meeting cycle:

Proposal 455 - This staff proposal would establish a regulatory pot closure area that has been implemented by emergency order since 1991 to protect crab resources. Based on public input, the Department may recommend that a clause be added which allows the Department to issue an emergency order to modify the closure area with the intent of allowing, on an experimental basis, non-crab areas to remain open within the proposed closure area.

Proposal 456 - This staff proposal would prohibit longlining of groundfish pots and clarify marking of buoys on groundfish pots in the Prince William Sound Area. The proposed regulations are listed as 5 AAC 28.230 (c) and 5 AAC 28.230(d) and were addressed by the Board in 1992 for Cook Inlet and the Central Gulf of Alaska but not for Prince William Sound. The proposed regulations are submitted to serve public notice.

Proposal 457 - This advisory committee proposal requests that Area E be established as a superexclusive registration area for groundfish vessels. The proposal apparently intends that a

vessel registered to fish any gear for groundfish vessel in Area E would be prohibited from fishing groundfish in any other registration or non-registration area during that registration year.

Proposal 458 - This public proposal would prohibit the use of non-pelagic trawl gear to harvest groundfish in Prince William Sound.

Proposal 459 - This public proposal would prohibit the use of trawl gear to target groundfish in Prince William Sound and restricts the retention of groundfish incidentally caught by any trawl gear to not exceed 20 percent of the gross round weight of all fish species.

This is similar to Proposal 458, but: (1) addresses all trawl gear; and (2) provides for a limited retention of groundfish caught incidentally in non-groundfish trawl fisheries such as shrimp fisheries.

Proposal 460 - This staff proposal would modify an existing closure area to encompass known crab concentrations, to coincide with a groundfish pot closure area that has been implemented annually by Emergency Order, and to remove the reference to a season for the herring food and bait trawl fishery.

During the 1993-1994 meeting cycle, the Alaska Board of Fisheries will consider regulation changes for finfish, including groundfish, in the Southeast, Yakutat, and Prince William Sound areas.

Management Strategies for 1994

Historical participation in most Central Region groundfish fisheries, including Prince William Sound, has generally been increasing, but also highly variable, since it has been driven largely by a combination of short-term market fluctuations and declines in non-groundfish fisheries (e.g., salmon or crab; Bechtol 1992a, 1992b, 1993). Intensified groundfish fisheries in recent years, combined with uncertainties over resources impacts from the EXXON Valdez oil spill, have increased conservation concerns for some groundfish resources (McBride et al. 1993; Bechtol 1992a, Vincent-Lang and Bechtol 1992). As groundfish fisheries continue to develop, the currently available knowledge will be applied to area- or species-specific management strategies to maintain long-term yield from these resources. For example, a rockfish management plan was established for Prince William Sound (Bechtol 1992a). It is anticipated that this plan will be modified as knowledge of the rockfish resources increases. However, for most groundfish fisheries, data on stock composition and production parameters are limited. To provide some resource protection in the absence of stock production data, openings and closures in many groundfish fisheries will continue to coincide with actions in the adjacent federal waters of the Central Gulf of Alaska. A primary exception will be the Prince William Sound sablefish fishery, which is actively managed by the State of Alaska for an established harvest quota. The Pacific

cod fishery will also be monitored more closely and harvest limits may be based more on historical harvest levels than on federal seasonal quotas.

Future Industry Changes

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 a high quality product will be needed in order to maintain a market share. In an effort to maximize financial returns, several fishermen have developed smaller specialized markets for selected species. These fishermen 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. If constant rates are to be maintained, it may be necessary for the public to propose or develop strategies to limit access into these nearshore fisheries. Managers will need to carefully establish and monitor fishing seasons and areas that provide access to target species, reduce the potential for overharvest, and avoid resource waste through unnecessary discards. ADF&G currently has very limited resources with which to assess groundfish stocks. Additional research is needed to understand temporal and areal changes in groundfish composition and the impact of different fisheries and gears on those resources.

Permit holders have already started to reduce interactions with prohibited species by altering fishing gear, methods, and areas. For example, groundfish pots equipped with halibut exclusion devices and biodegradable panels have proven effective for harvesting Pacific cod, reducing halibut bycatch, and limiting ghost fishing problems. However, groundfish pot gear which reduces crab bycatch to acceptable levels has not been developed, and groundfish pot fisheries still result in incidental handling and mortality of crab. Therefore, groundfish pot fishing will continue to be closed in areas that are prime crab habitat.

Future fishing strategies in both federal and state waters may be severely modified as Individual Fishing Quotas (IFQ's) are adopted for the Gulf of Alaska sablefish and halibut fisheries. The IFQ system will allocate a fixed share of the total allowable catch for these fisheries to an individual permit holder and will subsequently limit entry into these fisheries. The effect of an IFQ system upon management strategies for state waters has not been determined at this time.

Groundfish fisheries will continue to evolve as issues such as bycatch, marine mammals, gear efficiency, and catch allocation are addressed. It will take cooperative efforts between the industry and management agencies to develop gear that is cost-effective to operate, yet minimizes bycatch. As managers develop a better understanding of stock production, the users will play an increasing role in the resolution of these issues.

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Table 1. Monthly groundfish effort and harvests from Prince William Sound during 1993.

	Vessels	Landings	Rockfish	Sablefish	Pacific Cod	Flounders	Other Groundfish	Lingcod	Total
January	2	3			57,214				57,214
February	18	50	2,047	81	283,208		1,694		287,030
March	28	96	9,889	61	648,935		2,806		661,691
April	4	15	10,861		1,657	108	6,542		19,168
May	46	67	33,526	256,149	3,693	80	1,000		294,448
June	35	53	11,943	55,330	17,542	87			84,902
July	2	3	1,643		82			28	1,753
August	1	3	881		164			32	1,077
September	10	10	1,756	5	9,424				11,185
October	1	3	2,333		627			185	3,145
November									0
December									0
Totals	87 ^a	303	74,879	311,626	1,022,546	275	12,042	245	1,421,613
Avg. Price/Lb. (\$)			0.34	0.97	0.22	0.15	0.53	0.36	
Exvessel Value(\$)			25,459	302,277	224,960	41	6,382	88	559,207

^aTotal number of individual vessels reporting groundfish landings. This is less than the sum of the vessels fishing each month since some vessels fished more than one month.

Table 2. Annual groundfish harvest from Prince William Sound during 1969 to 1993.^a

Year	Vessels	Landings	Pounds						Total
			Rockfish	Sablefish	Pacific Cod	Flounders	Other Groundfish	Lingcod	
1969	1	1	220						220
1970	18	37		450	39,830				40,280
1971	14	19	5,370	1,010	3,820			70	10,270
1972	36	81	42,540	6,410				390	49,340
1973	56	131	76,580	610	24,920	1,580	660		104,350
1974	33	95	74,040		1,420				75,460
1975	21	61	430			300		23,960	24,690
1976	25	112			5,130			77,900	83,030
1977	24	120		3,310	2,810			77,590	83,710
1978	34	122	330	1,420	11,650	300		137,570	151,270
1979	27	60	222,330	13,820	36,740	35,080	680	180,520	489,170
1980	26	109	6,690	18,720	7,890	76,230	160	35,520	145,210
1981	26	74	7,900	1,450	3,450	52,670	300	26,430	92,200
1982			DATA INCOMPLETE	-> -> ->					
1983			DATA INCOMPLETE	-> -> ->					
1984			10,040	109,920	DATA INCOMPLETE	-> -> ->			
1985			12,510	383,290	DATA INCOMPLETE	-> -> ->			
1986			42,580	189,850	DATA INCOMPLETE	-> -> ->			
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	19,357	1,104	2,728,940
1992	170	684	177,933	438,301	1,853,657	1,169	7,500	2,357	2,480,917
1993	87	303	74,879	311,626	1,022,546	275	12,042	245	1,421,613

^aLandings for 1987-1993 are reported as round weight, while landings for 1969-1986 are reported as dressed weight (Blackburn, et al. 1983; ADF&G fish ticket records).

Table 3. Annual groundfish harvest, price, and exvessel value, from Prince William Sound during 1987-1993.

	Rockfish	Sablefish	Pacific Cod	Flounders	Other Groundfish	Lingcod	Total
	<u>1987 Harvest</u>						
Pounds	97,923	190,024	444,094	27,113	8,141	594	767,889
\$/lb	\$0.31	\$0.64	\$0.24	\$0.28	\$0.25	\$0.45	
Value	\$30,356	\$121,615	\$106,583	\$7,592	\$2,035	\$267	\$268,448
	<u>1988 Harvest</u>						
Pounds	111,903	222,206	325,860	15,457	13,655	1,338	690,419
\$/lb	\$0.33	\$0.99	\$0.24	\$0.35	\$0.28	\$0.34	
Value	\$36,928	\$219,984	\$78,206	\$5,410	\$3,823	\$455	\$344,807
	<u>1989 Harvest</u>						
Pounds	93,047	190,633	67,825	11	4,487	1,280	357,283
\$/lb	\$0.41	\$0.89	\$0.21	\$0.10	\$0.16	\$0.36	
Value	\$38,149	\$169,663	\$14,243	\$1	\$718	\$461	\$223,236
	<u>1990 Harvest</u>						
Pounds	489,169	213,974	1,153,538	72,973	9,725	8,117	1,947,496
\$/lb	\$0.38	\$0.69	\$0.24	\$0.22	\$0.12	\$0.36	
Value	\$185,884	\$147,642	\$276,849	\$16,054	\$1,167	\$2,922	\$630,519
	<u>1991 Harvest</u>						
Pounds	153,869	331,314	2,218,911	4,385	19,357	1,104	2,728,940
\$/lb	\$0.28	\$0.91	\$0.28	\$0.23	\$0.46	\$0.37	
Value	\$43,083	\$301,496	\$621,295	\$1,009	\$8,904	\$408	\$976,195
	<u>1992 Harvest</u>						
Pounds	177,933	438,301	1,853,657	1,169	7,500	2,357	2,480,917
\$/lb	0.32	0.93	0.24	0.19	0.35	0.29	
Value	\$56,939	\$407,620	\$444,878	\$222	\$2,625	\$684	\$912,967
	<u>1993 Harvest</u>						
Pounds	74,879	311,626	1,022,546	275	12,042	245	1,421,613
\$/lb	0.34	0.97	0.22	0.15	0.53	0.36	
Value	\$25,459	\$302,277	\$224,960	\$41	\$6,382	\$88	\$559,207

Table 4. Annual groundfish harvest by gear type from Prince William Sound during 1987-1993.

Year	Longline	Pots	Trawl	Jig/Troll	Other	Total Lbs
<u>Pounds (round weight) of groundfish harvested annually by each gear type</u>						
1987	716,795		32,572		18,522	767,889
1988	674,198		16,221			690,419
1989	346,305		4,997	5,981		357,283
1990	1,809,902	7,067	93,571	37,956		1,948,496
1991	1,692,561	965,506	22,797	35,524	12,544	2,728,932
1992	1,854,851	563,127	35,751	10,959	16,229	2,480,917
1993	1,053,024	324,087	39,650	4,852		1,421,613
<u>Percent of total annual groundfish harvest taken by each gear type</u>						
1987	93.3		4.2		2.4	
1988	97.7		2.3			
1989	96.9		1.4	1.7		
1990	92.9	0.4	4.8	1.9		
1991	62.0	35.4	0.8	1.3	0.5	
1992	74.8	22.7	1.4	0.4	0.7	
1993	74.1	22.8	2.8	0.3		
Average	<u>78.4</u>	<u>17.9</u>	<u>2.4</u>	<u>0.9</u>	<u>0.5</u>	

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

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	311,626	141	0.97	\$302,277	5,666	3,582	5/17	6/12 ^a

^aTotal fishing time during the 1993 season was 96 hours.

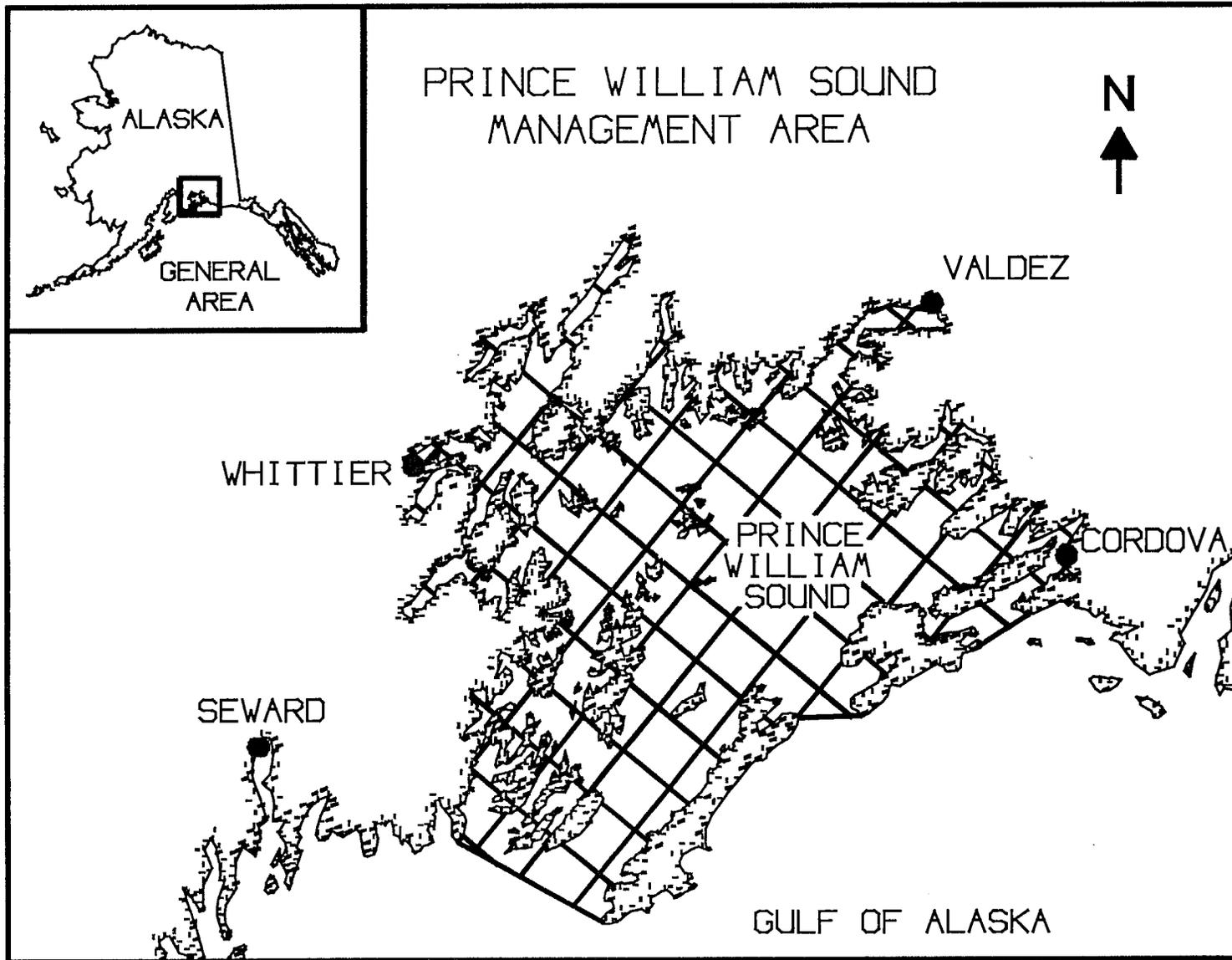


Figure 1. Prince William Sound management area.

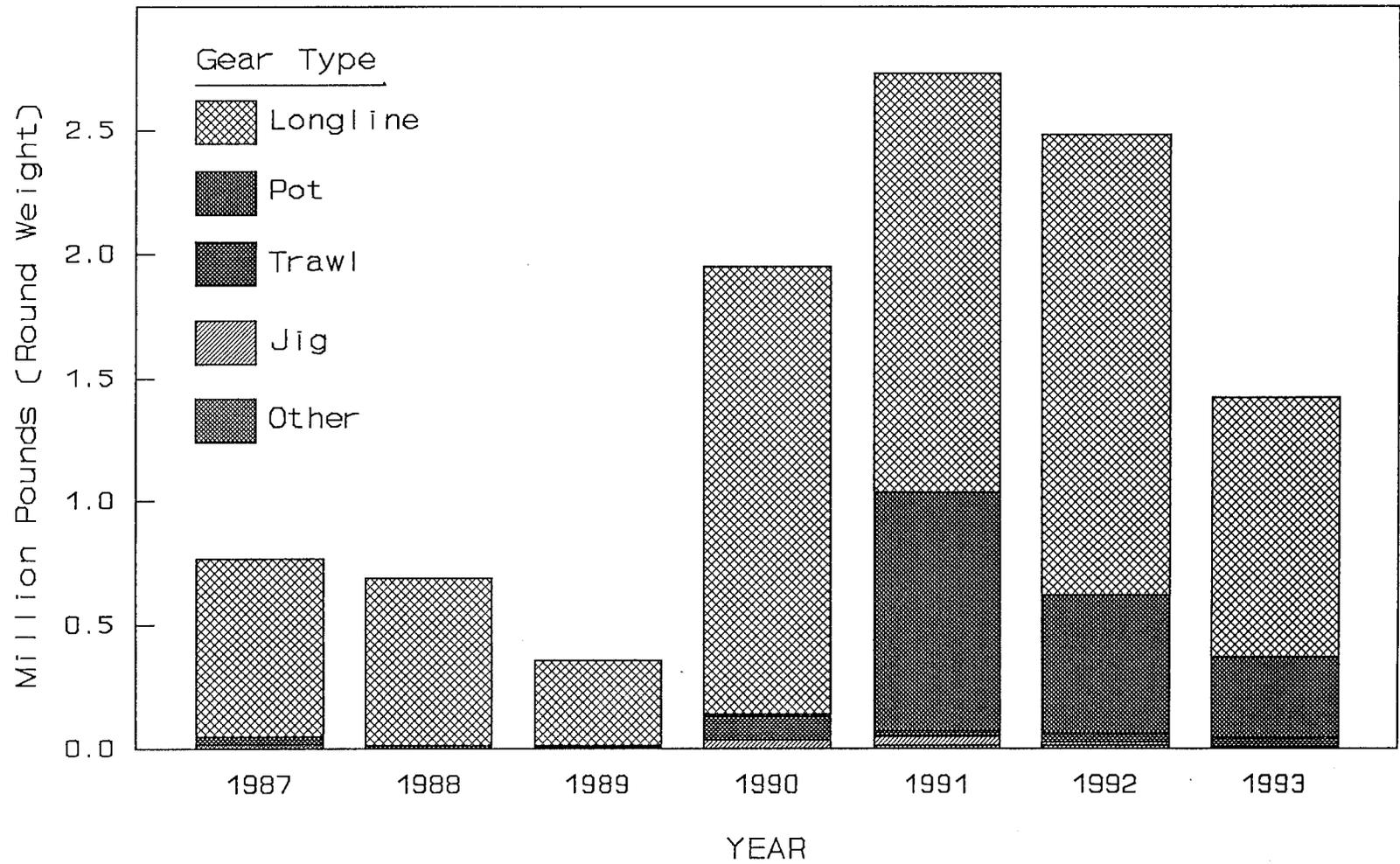


Figure 2. Annual groundfish harvest by gear type from Prince William Sound during 1987 to 1993.

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

CONDITION CODE	FISH PRODUCT ^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

^aIn 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 Prince William Sound during 1993.

DATE	SPECIES	GEAR	ACTION ^a
1/01	ALL EXCEPT SABLEFISH	ALL EXCEPT TRAWL	OPENED
1/01	ALL	POT IN N. MONTAGUE & ORCA BAY	CLOSED
1/20	ALL	TRAWL	OPENED
1/20	ROCKFISH	TRAWL	BYCATCH
2/07	POLLOCK	ALL	BYCATCH
2/15	LINGCOD	ALL	CLOSED
3/24	ALL	NON-PELAGIC TRAWL	BYCATCH
3/24	PACIFIC COD	ALL	BYCATCH
3/29	ALL	NON-PELAGIC TRAWL	OPENED
4/20	ALL	NON-PELAGIC TRAWL	BYCATCH
5/17	SABLEFISH	ALL	OPENED
5/20	SABLEFISH	ALL	CLOSED
5/22	ALL	ALL	CLOSED
5/30	NON-SABLEFISH	ALL	OPENED
6/07	ALL	ALL	CLOSED
6/10	SABLEFISH	ALL	OPENED
6/10	HALIBUT	LONGLINE	OPENED
6/11	SABLEFISH	ALL	CLOSED
6/11	HALIBUT	LONGLINE	CLOSED
6/11	ALL	LONGLINE	BYCATCH
6/28	ALL	NON-PELAGIC TRAWL	OPENED
7/01	LINGCOD	NON-LONGLINE	OPENED
8/03	ALL	NON-PELAGIC TRAWL	BYCATCH
8/08	HALIBUT	LONGLINE	OPENED
8/09	HALIBUT	LONGLINE	CLOSED
10/04	DEEPWATER FLATFISH, ROCKFISH	NON-PELAGIC TRAWL	BYCATCH

^a"BYCATCH" means that a fishery was only open to bycatch allowances. For State waters, bycatch is legal only when a fishery is open.

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