TABLE 1.--GULF OF ALASKA GROUNDFISH 1988 ABC, TAC, DAP, JVP, TALFF, AND PSC ADJUSTED TO REFLECT RESERVES (IN METRIC TONS). 12/16/87

Species	Area	ABC	TAC	RESERVES 1/ 20% TAC	DAP	JVP	TALFF
Pollock	W/C	90,000	90,000	18,000	72,000	0	0
	E	3,000	3,000	0	3,000	0	0
	Total	93,000	93,000	18,000	75,000	0	0
Pacific Cod	W	19,000	19,000	3,800	13,000	2,200	0
	C	73,000	60,800	12,160	48,640	0	0
	E	7,000	200	0	200	0	0
	Total	99,000	80,000	15,960	61,840	2,200	0
Flounders	W	142,650	1,600	320	1,280	0	0
	C	538,280	21,300	4,260	14,300	2,740	0
	E	86,770	100	0	100	0	0
	Total	767,700	23,000	4,580	15,680	2,740	0
Sablefish	W	5,075	4,060	-	4,060	0	0
	C	15,680	12,540	-	12,540	0	0
	W. Yakutat	6,125	4,900	-	4,900	0	0
	E. Yak./S.E. Out.	8,120	6,500	-	6,500	0	0
	Total	35,000	28,000	-	28,000	0	0
Rockfish (Slope)	W	4,850	4,850	-	4,850	0	0
	C	7,100	7,100	-	7,100	0	0
	E	4,850	4,850	-	4,850	0	0
	Total	16,800	16,800	-	16,800	0	0
Rockfish (Pelagic Shelf)	W	550	550	-	550	0	0
	C	2,350	2,350	-	2,350	0	0
	E	400	400	-	400	0	0
	Total	3,300	3,300	-	3,300	0	0
Rockfish (Demersal Shelf)	S.E. Out.	n/a	660	-	660	0	0
Thornyhead	GW	3,750	3,750	-	3,700	50	0
Other Species	GW	n/a	12,426	2,485	9,940	0	0
GULF OF ALASKA TOTAL		1,018,550	260,936	41,025	214,920	4,990	0

1/ Reserves are only used in managing the pollock, Pacific cod, flounder, and other species categories in the Western and Central Regulatory Areas. Releases from reserves can be made as DAP or JVP needs arise.

HALIBUT SUMMARY (2,000 mt mortality goal)

Halibut PSC (Catch)

DAP	JVP
4,240	240

BYCATCH REQUIREMENTS (Gulfwide)

		Rockfish		
JVP -	Sablefish	Pel. Shelf	All Other	Pollock
	188	0	432	100

SSC GULF OF ALASKA ABC RECOMMENDATIONS 1989

SPECIES		ABC (mt)	TAC (mt)
Pollock	Western	0 — 50,000	50,000
	Central		
	Jan 15 - April 15	---	50,000 (no more than 5,000 may be taken in Shelikof Strait)
	April 16 - Aug. 31	No directed fishing	
	Sept 1 - Dec 31	To be determined	
	Eastern	3,375	
Pacific cod	Western	18,810	
	Central	73,260	
	Eastern	6,930	
	Total	99,000	
Flounders	Western	69,000	
	Central	239,000	
	Eastern	37,000	
	Total	345,000 — Range w/PT	
Sablefish	Western	5,075	
	Central	15,500	
	Eastern	14,425	
	Total	35,000	
Slope rockfish	Western	6,800	
	Central	12,200	
	Eastern	9,200	
	Total	28,200 — Range w/PT	
Pelagic Shelf	Western	1,100	
	Central	4,700	
	Eastern	800	
	Total	6,600 — Range w/PT	
Demersal Shelf		---	
Thornyhead rockfish		3,750	
Other species		---	

Chris BLACKBURN

GULF OF ALASKA POLLOCK
BOTTOM TRAWL SURVEY DATA
1961 - 1984

YEAR	BOTTOM TRAWL STANDING STOCK ESTIMATE - MT	AVERAGE ANNUAL RATE OF CHANGE	CATCH MT	EXPLOITATION RATE - %
1961	48,042			
↓	↓	+19-22 %/yr		
1973-75	522,222		75- 38,000 74- 61,000 75- 48,000	6.9 % 11.1 % 8.7 %
↓	↓	+8-10 %/yr		
1984	1 201 941		306,600	25.5 %
↓		−11 %/yr		
1997	846,761		62,000	7.3 %

BOTTOM TRAWL SURVEY + 1977 ESTIMATE

1973-75	522,222		[redacted]	
↓	↓	+10-21 %		
1977 EST	770,000		120,400	15.6 %
↓	↓	+7 %		
1984	1 201 941		306,600	25.5 %

NOTE: BOTTOM TRAWL SURVEY BELIEVED TO UNDER ESTIMATE STOCKS

AGENDA D-3
SEPTEMBER 1988
SUPPLEMENTAL

ALASKA PACIFIC SEAFOODS, INC.

HOME OFFICE: 2155 N. NORTHLAKE WAY • P.O. BOX 31179 • SEATTLE, WASHINGTON 98103 • (206) 632-9900
PROCESSING PLANT: P.O. BOX 1126 • KODIAK, ALASKA 99615 • (907) 486-3234

September 23, 1988

ACTION	ROUTE TO	INITIAL
	Exec. Dir.	
	Deputy Dir.	
	Admin. Off.	
GIS), D.L	Dept. Dir.	
	Staff Asst. 1	Len
	Staff Asst. 2	
	Staff Asst. 3	
	Editor/PIO	
	Sec. [illegible]	
	Sec. Typist	

North Pacific Fishery Management Council
ATTN: John Peterson, Acting Chairman
P.O. Box 103136
Anchorage, Alaska 99510

Re: 1989 Groundfish Utilization

Dear N.P.F.M. Council members,

On behalf of Alaska Pacific Seafoods, I would like to update you on our firm's projected utilization of Pollock for the 1989 fishing period.

During the first, third and fourth quarters of 1989 we plan to utilize 25,000 to 27,000 metric tons of the groundfish harvest. Based on our previous experience, Alaska Pacific Seafoods has the capacity to process over 181 MT of Pollock a day. This figure has proved to be a realistic one. In the first quarter of 1988, Alaska Pacific Seafoods processed over 10,500 MT of Pollock and 1000 MT of Cod in a seven week period.

Alaska Pacific Seafoods employs over 350 people when processing at full capacity. Other processors as well employ a substantial amount of people. It is my hope that you will consider the benefit to the community that we as a company represent in all allocation decisions. Thank you for your attention to this matter.

Sincerely Yours,

John Sevier
Plant Manager
Alaska Pacific Seafoods.

Processors of Quality Alaska Seafoods

AGENDA D-3
SUPPLEMENTAL
SEPTEMBER 1988

DRAFT

ENVIRONMENTAL ASSESSMENT

AND

REGULATORY IMPACT REVIEW/INITIAL REGULATORY FLEXIBILITY ANALYSIS

FOR AMENDMENT 17A

TO THE FISHERY MANAGEMENT PLAN FOR

GROUNDFISH OF THE GULF OF ALASKA

(Including Changes to the FMP)

Prepared by the Plan Team for the
Groundfish Fishery of the Gulf of Alaska
and the Staff of the
North Pacific Fishery Management Council

Anchorage, Alaska

September 1988

TABLE OF CONTENTS

1.0 INTRODUCTION

The domestic and foreign groundfish fishery in the fishery conservation zone (3-200 miles offshore) of the Gulf of Alaska is managed under the Fishery Management Plan for Groundfish of the Gulf of Alaska (FMP). The FMP was developed by the North Pacific Fishery Management Council (Council) under the Magnuson Fishery Conservation and Management Act (Magnuson Act). It was approved by the Assistant Administrator for Fisheries, NOAA, (Assistant Administrator) and implemented December 11, 1978 (43 FR 52709, November 14, 1978). Amendments 1-11 and 13-16 to the FMP have been approved by the Assistant Administrator. Amendment 12 was adopted initially by the Council at its July and December, 1982 meetings but was later rescinded by the Council at its September, 1984 meeting without having been submitted formally for Secretarial review.

At its April 13-15, 1988 meeting, the Council reviewed the status of the FMP and certain problems that have been identified, either through experience gained from 10 years of fishery management or through situations unforeseen as the domestic fishery has developed. It received recommendations from the Plan Team (PT), the Advisory Panel (AP), and the Scientific and Statistical Committee (SSC) on alternative management measures that could be adopted, as Amendment 17 to the FMP, to resolve the problems. The Council adopted an Amendment 17 "public hearing" package for consideration by the public, the fishing industry, and management agencies that analyzes the biological, ecological, and socioeconomic effects of these management measures. At its June 21-24, 1988 meeting the Council chose to separate the two elements of the amendment, taking affirmative action on the proposed permit reporting requirements (Amendment 17) and delaying action on sablefish seasons (Amendment 17a) until its September meeting.

1.1 List of the Management Measures

The Council is considering one management measure needed to resolve problems in the current management regime. The management measure is:

(1) Establish an additional sablefish longline fishing season with an opening date of September 1, and apportion the quota 25/75, 50/50, or 75/25 percent between the two seasons.

1.2 Purpose of the Public Hearing Package

1.2.1 Environmental Assessment

One part of the package is the environmental assessment (EA) that is required by the National Oceanic and Atmospheric Administration in compliance with the National Environmental Policy Act of 1969. The purpose of the EA is to analyze the impacts of major federal actions on the quality of human environ-ment. It serves as a means of determining if significant environmental impacts could result from a proposed action. If the action is determined not to be significant, the EA and resulting finding of no significant impact (FONSI) would be the final environmental documents required by NEPA. An EIS must be prepared if the proposed action may be reasonably expected: (1) to jeopardize the productive capability of the target resource species or any related stocks that may be affected by the action; (2) to allow substantial damage to the ocean and coastal habitats; (3) to have a substantial adverse impact on public health or safety; (4) to affect adversely an endangered or threatened species or a marine mammal population; or (5) to result in cumulative effects that could have a substantial adverse effect on the target resource species or any related stocks that may be affected by the action. Following the end of the public hearing, the Council could determine that Amendment 17a will have significant impacts on the human environment, and proceed directly with preparation

of an EIS required by NEPA. This EA is prepared to analyze the possible impacts of management measures and their alternatives that are contained in Amendment 17a.

Certain management measures are expected to have some impact on the environment. Such measures are those directed at harvests of stocks and may occur either directly from the actual harvests (e.g. removals of fish from the ecosystem) or indirectly as a result of harvest operations, (e.g. effects of bottom trawling on the benthos (animals and plants living on, or in, the bottom substrate). Environmental impacts of management measures may be beneficial when they accomplish their intended effects (e.g. prevention of overharvesting stocks as a result of quota management). Conversely, of course, such impacts may be harmful when management measures do not accomplish their intended effects (e.g. overharvesting occurs when quotas are incorrectly specified). The extent of the harm is dependent on the amount of risk of overfishing that has occurred. For purposes of this EA, the term "overfishing" is that, which is described in the "Guidelines to Fishery Management Plans" (48 FR 7402, February 18, 1983). It is a level of fishing mortality that jeopardizes the capacity of a stock(s) to recover to a level at which it can produce maximum biological yield or economic value on a longterm basis under prevailing biological and environmental conditions. Environmental impacts that may occur as a result of fishery management practices are categorized as changes in predator-prey relations among invertebrates and vertebrates, including marine mammals and birds, physical changes as a direct result of on-bottom fishing practices, and nutrient changes due to processing and dumping of fish wastes. If more or less groundfish biomass is removed from the ecosystem, then oscillations occur in the ecosystem.

1.2.2 Regulatory Impact Review

Another part of the package is the Regulatory Impact Review (RIR) that is required by NMFS for all regulatory actions or for significant DOC/NOAA policy changes that are of public interest. The RIR: (1) provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; (2) provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems; and (3) ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost effective way.

The RIR also serves as the basis for determining whether any proposed regulations are major under criteria provided in Executive Order 12291 (E.O. 12291) and whether or not proposed regulations will have a significant economic impact on a substantial number of small entities in complicance with Regulatory Flexibilty Act (P.L. 96-354, RFA). The primary purpose of the RFA is to relieve small businesses, small organizations, and small governmental jurisdictions (collectively, "small entities") of burdensome regulatory and recordkeeping requirements. This Act requires that if regulatory and recordkeeping requirements are not burdensome, then the head of an agency must certify that the requirement, if promulgated, will not have a significant effect on a substantial number of small entities.

This RIR analyzes the impacts that Amendment 17a alternatives would have on the Gulf of Alaska groundfish fisheries. It also provides a description of and an estimate of the number of vessels (small entities) to which regulations implementing Amendment 17a would apply.

1.3 Description of the 1988 Domestic Halibut and Groundfish Fishing Fleet Operating in the Gulf of Alaska and in the Bering Sea/Aleutians Islands Area.

The domestic fleet is made up of vessels targetting on several species of fish, including halibut and groundfish. The halibut fleet is larger than the groundfish fleet. Some of the halibut vessels fish groundfish and some of the groundfish vessels fish halibut.

Halibut Fleet

Information obtained from the International Pacific Halibut Commission shows that 3,893 U.S. vessels reported halibut landings in 1987, which is an increase of 14% from 1986. Increases by area within the Gulf of Alaska were 10% in Area 2C, 19% in Area 3A and 4% in Area 3B. In 1987, about 63% of the fleet was larger than 5 net tons and 23% were larger than 20 net tons, which represented only slight increases from 1986.

Groundfish Fleet

As of April 16, 1988, NMFS has issued 1,775 permits to fish groundfish in the Bering Sea and Gulf of Alaska in 1988 (Table 1.1). This number includes vessels that engage only in harvesting operations (catcher vessels), vessels that harvest and process their catches (catcher/processor vessels), vessels that will only process fish (motherhip/processor vessels), and support vessels that will engage in transporting fishermen, fuel, groceries, and other supplies.

Seven percent of the total vessels, or 131 vessels, are less than 5 net tons. Ninety-three percent, or 1,644 vessels are 5 net tons or larger.

They are located in non-Alaska ports, including Seattle, and Alaska ports, including Sitka, Kodiak, and Dutch Harbor, and others (see Table 1.2). The numbers of vessels that come from Alaska is 1,120; the number from the Seattle area is 399 and the number from other areas is 256.

The total number of catcher vessels (harvesting only) and catcher/processor vessels (harvesting/processing) is 1,582 and 167, respectively. Most catcher vessels employ three types of gear: hook-and-line (longline), trawls, or pots. The predominant gear type is hook-and-line (Table 1.3). Hook-and-line vessels are the generally small vessels in the fleet, having average capacities of 27 net tons and average lengths of 45 feet.

Most catcher/processor vessels also employ hook-and-line, trawls, or pots. The predominate gear type is hook-and-line gear (Table 1.4). They are the smallest of the catcher/processor vessels, having average capacities equal to 61 net tons and average lengths of 56 feet, but are larger than the catcher vessels using hook-and-line gear.

The next most numerous catcher/processor vessel are trawl vessels, which number 55 vessels and have average capacities of 375 net tons and average lengths of 148 feet. Pot vessels number 9 and have capacities of 428 net tons and average lengths of 143 feet. Other catcher/processor vessels that may have combinations of other gear may exist but have not registered with NMFS as of April 16, 1988 to be found in the data base.

Table 1.1 Numbers of groundfish vessels that are less than 5 net tons or 5 net tons and larger that are Federally permitted in 1988 to fish off Alaska.

	Number of Vessels		
	Less than 5 net tons	5 net tons or larger	Total
HARVESTING ONLY	123	1,459	1,582
HARVESTING/PROCESSING	8	159	167
PROCESSING ONLY	0	8	8
SUPPORT ONLY	0	18	18
Total vessels	131	1,644	1,775

Table 1.2 Numbers of groundfish vessels Federally permitted to fish off Alaska in 1988 from the Seattle area, Alaska, and other areas.

	Number of Vessels			
Mode	Seattle Area	Alaska	Other Areas	Total
HARVESTING ONLY	316	1,038	228	1,582
HARVESTING/PROCESSING	68	80	19	167
PROCESSING ONLY	8	0	0	8
SUPPORT ONLY	7	2	9	18
Total	399	1,120	256	1,775

Table 1.3 Numbers and statistics of catcher vessels by gear type that are Federally permitted to fish off Alaska.

	Number	Average Net Tons	Average Length (ft)
HOOK-AND-LINE	1,321	27	45
POTS	19	117	87
TRAWL	226	121	91
OTHER GEAR[1/]	16	17	37
TOTAL	1,582		

Table 1.4 Numbers and statistics of catcher/processor vessels by gear type that are Federally permitted to fish off Alaska.

	Number	Average Net Tons	Average Length (ft)
HOOK-AND-LINE	102	61	56
POTS	9	428	143
TRAWL	55	375	148
OTHER GEAR[1/]	1	6	30
TOTAL	167		

1/ Other gear includes combinations of hook-and-line, pots, trawls, jigs, troll gear, and gillnets.

2.0 ESTABLISH AN ADDITIONAL SABLEFISH LONGLINE FISHING SEASON WITH AN OPENING DATE OF SEPTEMBER 1, AND APPORTION THE QUOTA 25/75, 50/50, OR 75/25 PERCENT BETWEEN THE TWO SEASONS.

2.1 Description of and Need for Action

Halibut are caught incidentally in the sablefish longline fishery. The incidental rate of capture of halibut varies by season and depth as halibut move into deeper waters (greater than 200 m) for spawning in November-March, and up into shallow waters (less than 200 m) for feeding during May-September. Adult sablefish have a wide depth distribution, but are generally found at depths greater than 200 m. During the winter and early spring seasons, the depth distributions of sablefish and halibut overlap. March appears to be a transitional period for halibut as they begin moving to shallow waters. Sablefish and halibut are more discretely separated in the summer and fall. Currently, the sablefish longline fishery in the Gulf of Alaska opens April 1. In 1987 the first halibut season opened May 1, and in 1988 the first Alaska halibut season opened May 23. During the April sablefish fishery, halibut are caught incidentally and must be discarded. Establishing an additional sablefish longline fishing season later in the year and apportioning some of the quota to the later season, may reduce the incidental catch and mortality of halibut discarded in the domestic fishery.

Prior to enactment of the Gulf of Alaska Groundfish FMP, sablefish fishing was closed by regulation during the winter and spring months. This regulation was first enacted by the Federal Government in 1945 to halt the observed decline in sablefish CPUE, to protect the sablefish stocks during the spawning period, and to minimize the incidental catch of halibut which were encountered in overlapping depth ranges with sablefish during the winter months (Bracken, 1983). Inferior quality of flesh and viscera during and after spawning was also cited as a reason for the winter closure. During 1945-46 the closure was in effect from December 1 through March 15. In 1947 the closure was extended to April 30 since the shorter closure failed to halt the observed decline in sablefish CPUE. Because the same vessels fished both sablefish and halibut, the directed sablefish fishery did not actually start until after the International Pacific Halibut Commission (IPHC) Area 2 closure, usually mid to late August. This in effect restricted the sablefish fishery to the summer and fall seasons. The winter closure (December 1-April 30) regulation was adopted by the state of Alaska in 1959 and remained in effect until 1977. It was rescinded then to allow U.S. vessels to fish year-round to compete effectively with the foreign fleet that was operating off the coast of Southeastern Alaska at that time. Management memoranda and letters written during the mid-1940s indicated that a substantial decline in incidental halibut catch was directly attributed to the winter closure. In 1985 the fishing industry requested and the Council approved an April 1 opening date for the sablefish pot and hook and longline fisheries. Amendment 14 to the FMP established the April 1 opening date, and the season was put into effect in 1986. Reasons stated by the NPFMC for the delay of the sablefish season included: (1) resource allocation, (2) vessel and crew safety, and (3) fish quality.

A quantitative study of bycatch rates for halibut and other species in the DAP sablefish longline fishery has recently been initiated and a very limited amount of data is available. Bycatch data of a sufficient sample size or from a wide range of areas in the Gulf of Alaska have not been collected. Halibut bycatch data were collected by U.S. observers aboard Japanese longline vessels fishing sablefish from 1977 to 1984 (there has been no sablefish TALFF since 1984). Because fishing patterns and gear types differ between the Japanese and domestic longline fisheries and resource conditions have changed, it is not clear that historic Japanese bycatch rates should be applied to the current domestic longline fishery. Limited available data suggest that bycatch rates in the domestic longline fishery are much greater than rates observed in the Japanese fishery. While rates observed in the Japanese fishery may not

be directly applicable to the present domestic longline fishery, they do suggest seasonal trends of halibut bycatch rates which may provide some guidelines.

2.2 The Alternatives

2.2.1 Alternative 1: Maintain the status quo.

Under this option, a single sablefish longline season with an April 1 opening date would remain in effect. The retention of halibut caught in the domestic fisheries prior to the opening of the halibut season would continue to be prohibited.

2.2.2 Alternative 2: Establish an additional sablefish longline fishing season with an opening date of September 1, and apportion the quota 25/75, 50/50, or 75/25 percent between the two seasons.

This alternative is proposed to take advantage of the differences in the depth distributions of halibut and sablefish during September. Other considerations include weather and fish quality which are discussed in Section 2.4. Under this alternative, a portion of the sablefish longline fishery would occur during the time when sablefish and halibut are most likely to have different depth distributions, thereby potentially reducing the halibut bycatch and mortality in the sablefish longline fishery.

2.3 Environmental Impacts of the Alternatives

2.3.1 Background data

The halibut resource in the Gulf of Alaska is in good condition (IPHC Annual Report 1986). An IPHC news release (February 2, 1988) notes that the halibut resource is rebuilt throughout much of its range, particularly in the Gulf of Alaska. The incidental catch of halibut in foreign fisheries targeting on other species has decreased, contributing to the stock improvement.

National Marine Fisheries Service (NMFS) observers collected halibut incidence rates and also size data from subsamples of the catches in the Japanese sablefish longline fishery, conducted in the Gulf of Alaska during 1977-1984. The foreign longline fishery was prohibited from fishing sablefish at depths less than 500 m during these years. Due to differences in regulations, gear types, and fishing patterns in the foreign longline fishery and the current domestic longline fishery, it is not clear that historic halibut bycatch rates can be applied to the present fishery. Historic halibut bycatch rates may only suggest possible values and trends, but cannot be relied upon to accurately represent rates in the domestic sablefish longline fishery.

Table 2.1 shows the Japanese longline sablefish catches for the years 1977-1984. The significantly lower catch in 1984 also represented a large decline in effort compared to earlier years. For this reason, data collected from the Japanese longline fishery during the years 1977-1983 are considered to be the most comparable. Tables 2.2-2.3 and Figure 2.1 show the average incidental catch rates and sizes of halibut caught in the Japanese sablefish longline fishery by month and INPFC areas. The average sizes of halibut shown in Table 2.3 are extremely variable, and data are lacking in several months and areas. Therefore, the overall average size of halibut of 7.3 kg is thought to be the most useful size information from this data set, and is used in the following analyses. Table 2.4 shows the number of years of data used to calculate the average incidental rates. The data is sparse due to regulations and lack of sampling in certain areas and months. Again it is noted that these fishery data represent different conditions than encountered in the domestic longline sablefish fishery. Foreign

Table 2.1 Japanese longline sablefish catches (mt) in the Gulf of Alaska, 1977-84.

Year	Catch
1977	13,767
1978	6,104
1979	5,449
1980	4,097
1981	6,244
1982	4,505
1983	3,997
1984	735

Table 2.2 Average number of halibut per mt of catch from the Japanese longline sablefish fishery in the Gulf of Alaska, 1977-1983.

	INPFC Area					
Month	Shumagin	Chirikof	Kodiak	Yakutat	Southeastern	Average
1	--	0.0	0.0	0.0	--	0.0
2	--	--	17.910	--	--	17.910
3	0.0	2.084	4.590	0.507	--	1.795
4	0.0	0.494	0.200	0.704	--	0.349
5	2.039	0.119	0.086	4.283	--	1.632
6	0.444	0.0	0.0	0.056	--	0.125
7	0.0	0.627	0.0	0.251	--	0.219
8	0.0	0.0	0.014	0.0	--	0.003
9	0.060	0.0	0.0	0.073	0.0	0.026
10	0.208	0.0	0.990	2.459	0.0	0.731
11	0.220	2.688	1.543	3.525	--	1.994
12	9.064	5.414	6.486	1.751	--	5.679

Table 2.3 Average weight (kg) of halibut caught in the Japanese longline sablefish fishery in the Gulf of Alaska, 1977-1983.

	INPFC Area					
Month	Shumagin	Chirikof	Kodiak	Yakutat	Southeastern	Average
1	--	--	--	--	--	--
2	--	--	3.00	--	--	3.00
3	--	4.71	4.20	9.30	--	6.07
4	--	18.70	6.82	8.10	--	11.21
5	4.90	11.01	2.60	4.07	--	5.65
6	8.66	--	--	20.00	--	14.33
7	--	6.82	--	9.19	--	8.00
8	--	--	12.63	--	--	12.63
9	9.66	--	--	5.84	--	7.75
10	6.50	--	4.83	8.94	--	6.75
11	4.26	5.66	5.28	5.87	--	5.27
12	4.82	4.89	4.58	5.41	--	4.93

Average over all months and areas = 7.3 kg/fish

Table 2.4 Number of years of data available to calculate halibut incidence rates in the Japanese longline sablefish fishery, 1977-1983.

	INPFC Area				
Month	Shumagin	Chirikof	Kodiak	Yakutat	Southeastern
1	0	1	1	1	0
2	0	0	1	0	0
3	1	1	1	1	0
4	5	5	3	2	0
5	5	3	3	1	0
6	5	3	3	2	0
7	5	3	5	3	0
8	4	4	3	3	0
9	6	2	4	4	1
10	6	3	6	4	1
11	3	3	3	2	0
12	3	2	4	2	0

Ave. incidence of halibut in the Japanese longline fishery >500m 1977-83

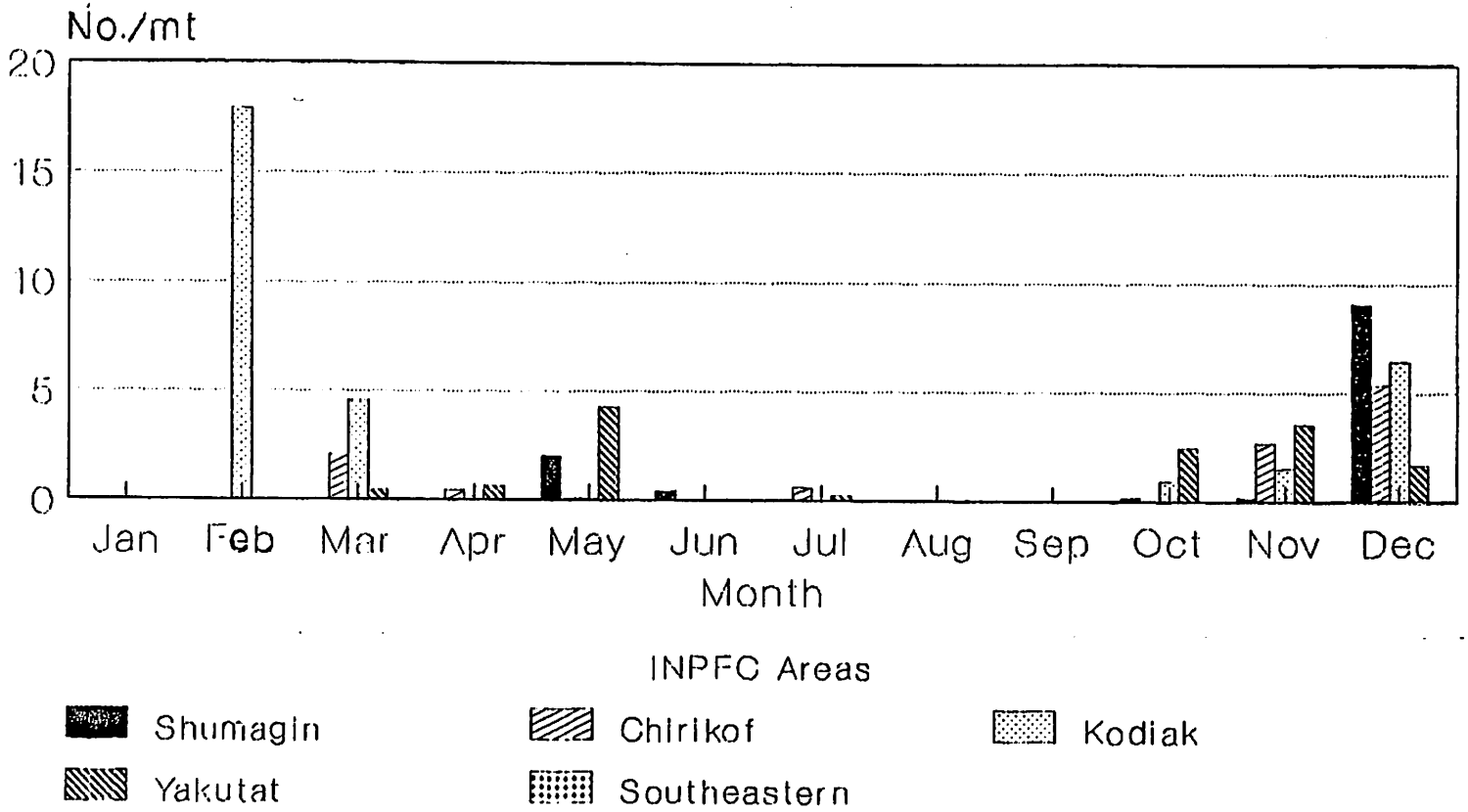

Figure 2.1

longline vessels were prohibited from fishing for sablefish at depths less than 500 m from 1977-1984. In 1978 they voluntarily withdrew from fishing in the Southeastern and east Yakutat areas, and after 1978 they were prohibited from fishing in these areas. For these reasons, no attempt was made to weight the data to account for different sablefish quotas or the lack of data in various areas or months.

In a letter to the Council (November 12, 1987), the IPHC noted the following regarding the foreign fishery rates:

(a) Halibut bycatch rates from the foreign fishery are probably lower than rates in the DAP fishery, as the foreign fishery was regulated with time/area closures to decrease the bycatch.

(b) Sablefish gear used in the foreign fishery was generally lighter weight than that in use in the DAP fishery. The average size is likely to be larger in the DAP fishery as the gear retains the larger fish which would have escaped the lighter gear of the foreign fishery.

Therefore, the average incidental rates and sizes of halibut caught in the Japanese longline fishery may represent minimum estimates of what may occur in the present domestic fishery.

The collection of bycatch data from the domestic longline fishery has recently been initiated but is very limited. Data were collected from the sablefish longline fishery in the Kodiak area from two vessels during June-August 1984, and three vessels during April-May 1987. The data are shown below:

Halibut Incidence

Month/Year	(no./mt)	Source
6/84-8/84	0.40	ADF&G Inf. Leaflet #257
4/87-5/87	20.60	ADF&G News Release-May 27, 1987

The average weight of halibut in the 1984 samples was 25 kg or 55 lbs (rd. wt). Observers were not able to collect size information in 1987. The average weight of 25 kg may be high, as halibut remaining in deep waters in the summer when observations were taken were likely to have been larger fish. The rates of 20.6 and 0.40 halibut per mt, and 25 kg per fish were applied in the first analysis of this proposal presented to the Council at the June meeting. Subsequently, additional data have become available:

Halibut Incidence

Month/Year	(no./mt)	Source
6/88	199.1	ADF&G Kodiak, AK
5/88	14.4	ADF&G Southeastern survey

Three longline vessels fishing sablefish in the Kodiak area during June of 1988, were observed to have an average bycatch rate of 199 halibut per mt of landed catch, with an average weight of 12 kg per fish (pers. comm. Peter Craig, ADF&G Kodiak, Ak) This bycatch rate is extremely high compared to values observed in the summer of 1984. Preliminary data from the NPFMC pilot domestic observer program indicated that there were sablefish longline vessels fishing in April-May of this year which had average observed rates similar to the rates observed in April-May of 1987 (pers. comm. Janet Wall, NMFS, Seattle, WA). An ADF&G survey conducted in the

southern portion of the Southeastern area during May 1988, had a halibut incidence rate of 14.4 halibut per estimated mt of sablefish (pers. comm. Barry Bracken, ADF&G Petersburg, AK). The recently observed halibut bycatch rates show the extreme variability which is occurring in the DAP fishery. Relative indices of halibut incidence are available from the U.S.-Japan cooperative longline surveys for the years 1980-87 (Table 2.5). Although these data are only relative indices and are not from the fishery, they show the variability of the halibut incidence rates among years and areas. The Team has no basis to choose any of the observed rates as being representative of the DAP fishery. Approximately 1,300 hook and line catcher vessels have federal permits to fish in the Gulf of Alaska in 1988. The observer data represent extremely small sample sizes and are only from the Kodiak area. The Team chose to continue to apply the rates of 20.6 in April-May and 0.40 halibut/mt in June, and 25 kg per fish for this analysis, although they may not be representative of the DAP fishery. These values were applied in the previous analysis presented to the Council in June.

In a memorandum to the Council (October 12, 1987), Mark Hutton provided halibut incidental catch rates collected in telephone interviews of 8 longline fishermen. These data, which are presented in Appendix 1, suggest that current rates are considerably higher than those observed in the Japanese longline fishery and fall within the range observed in the DAP fishery. These data do not represent a scientifically collected or verifiable sample, and the Team chose not to apply these rates in the analysis. The IPHC also provided additional information on halibut bycatch mortality (Appendix 2). These data are based on information from fishermen interviews conducted by IPHC staff during the 1988 May 23-24 halibut opening. A rough estimate of the potential magnitude of the halibut bycatch made by the IPHC, is higher than would be suggested by using foreign bycatch rates, but not as high as rates observed in the DAP fishery. The IPHC intends that this data be used to indicate the scale of the problem and emphasizes that it does not represent a precise estimate. The Team members consider the foreign and domestic rates collected by observers to represent the best available information to apply to the DAP fishery, although they recognize that the DAP data are opportunistic samples from the fishery.

Halibut catch quotas are determined by the IPHC after reducing the available removals by estimated bycatch mortality, wastage from the directed fishery, and recreational catch. The impact of the current uncertainty of the halibut incidence and mortality rates affects the halibut quotas and PSC limits for the groundfish fishery. The halibut biomass is expected to remain at high levels over the next several years, but declining recruitment may lead to reduced abundance and harvest in the near future. Halibut bycatch in the groundfish fisheries is not believed to have a detrimental effect on the halibut stocks, but it directly reduces the quota and catch in the halibut fishery which affects revenue.

2.3.2 Alternative 1: Maintain the status quo.

With this alternative, a single sablefish longline season with an April 1 opening date would remain in effect. There would be no specific management measure implemented with this alternative for the reduction of halibut bycatch and mortality in the sablefish longline fishery. Incidental halibut catches and subsequent discard mortality would continue to occur whenever halibut are encountered in the sablefish fishery.

There has been no quantitative study of a sufficient scope to determine incidental halibut catches occurring in the DAP sablefish longline fishery. Therefore, it is not possible to accurately quantify the loss in halibut biomass due to halibut caught and discarded in the sablefish longline fishery.

In 1988 the sablefish longline fishery opened April 1 in the Gulf of Alaska. The fishery closed in the Southeast Outside/East Yakutat and West Yakutat areas on May 2, on June 12 in the

Table 2.5 Relative indices of halibut incidence[1/] from the Japan-U.S cooperative longline surveys 1980-1987.

	Halibut RPN (>200 m)/Sablefish RPW (>200 m)				
	Shumagin	Chirikof	Kodiak	Yakutat	Southeastern
1980	3.7	2.7	2.2	30.4	13.9
1981	1.6	2.4	5.8	16.5	6.7
1982	1.2	6.0	4.7	13.3	9.1
1983	0.7	6.9	10.7	35.5	32.5
1984	0.7	3.4	4.7	10.9	9.6
1985	0.8	1.2	3.8	9.9	7.2
1986	1.9	1.9	2.9	7.3	5.3
1987	5.2	6.4	6.4	11.3	22.9

1/ These indices represent the halibut catch relative to the sablefish catch from the surveys.

Central area, and on July 8 in the Western area. The average incidental rates of halibut bycatch from the Japanese longline fisheries during April-June, and the observed rates from the DAP fishery are applied to the 1988 sablefish longline catches. The monthly Japanese rates are averaged over all areas in the Gulf of Alaska. It was determined that the data was not sufficient to provide information by area. As noted before, the average size of halibut in the Japanese fishery over all years and areas (7.3 kg) is used in conjunction with the Japanese incidence rates. The following analysis shows a potential range of halibut bycatch mortality which may be occurring in the DAP sablefish longline fishery:

1988 DAP sablefish longline catches (mt)

April	May	June[1]/	
12,149	6,317	4,634	Total = 23,100 mt

Low estimate: Applying average foreign observed incidence rates and size

April: 12,149 mt X 0.349 fish/mt X 7.3 kg/fish = 30,952 kg (31 mt)

May: 6,317 mt X 1.632 fish/mt X 7.3 kg/fish = 75,258 kg (75 mt)

June: 4,634 mt X 0.125 fish/mt X 7.3 kg/fish = 4,228 kg (4 mt)

Total April-June bycatch mortality = (31 + 75 + 4 mt) X 0.25 = 27.5 mt

High estimate: Applying observed DAP incidence rates and size

April: 12,149 mt X 20.6 fish/mt X 25 kg/fish = 6,256,735 kg (6,257 mt)

May: 6,317 mt X 20.6 fish/mt X 25 kg/fish = 3,253,255 kg (3,253 mt)

June: 4,634 mt X 0.40 fish/mt X 25 kg/fish = 46,340 kg (46 mt)

Total April-June bycatch mortality = (6,257 + 3,253 + 46 mt) X 0.25 = 2,389 mt

This example shows that halibut bycatch mortality in the 1988 DAP sablefish longline fishery could have ranged as much as 27 mt to 2,389 mt. The Team notes that the range of halibut bycatch mortality may be even larger, given the variability in the observed DAP rates (0.40-199.0). These numbers are presented to illustrate the uncertainty and wide range of values of halibut mortality possible in the DAP fishery. With the limited amount of data available, it is difficult to assess how likely these values portray current conditions. However, based upon limited information from the DAP fishery which is not regulated by any depth restrictions, it is likely that bycatch mortality was much greater than 27 mt.

To estimate bycatch mortality in the DAP fishery, the Team developed a spreadsheet for Council use which assumes a 1.2% halibut incidence rate (mt halibut/mt sablefish) and a 25% mortality rate in the sablefish longline fishery. The incidence rate of 1.2% is from the 1983 Japanese sablefish longline fishery, which is the most recent year with a significant TALFF for sablefish. The bycatch as a percentage of the longline catch in the above example ranges from 0.10%-10%. The estimate of a 25% mortality rate is from data collected by NMFS observers on

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1/ Source: Ron Berg, NMFS AKR, Juneau, AK. June catch data are incomplete so April and May catches were subtracted from the quota and the remainder attributed to June.

the condition of over 100,000 halibut caught by the foreign and joint venture fisheries in 1982 (Williams et al. 1988). Terry and Hoag (1983) examined incidental mortality in the foreign longline fishery and used a range of 10% to 50%, due to the difficulty in assessing mortality in the varied conditions in which halibut are incidentally caught. If the halibut mortality rate is as high as 50% in the DAP fishery, this would double the estimate of bycatch mortality presented above from 2,389 to 4,778 mt.

Sablefish yield and flesh quality may be reduced due to a fishery conducted mainly in April. A study conducted by Norris et al. (1987) off the Washington-Oregon-California coast, suggests that sablefish yields might be increased by harvesting near the end of the summer feeding season rather than in the early spring after the spawning season. Sablefish in the Gulf of Alaska spawn in the winter season, but there are no quantitative estimates of the affects on yield and flesh quality. Historical memoranda and letters regarding winter closures in the Gulf of Alaska, discuss the lean and soft flesh of sablefish harvested in the winter and early spring seasons.

2.3.3 Alternative 2: Establish an additional sablefish longline fishing season with an opening date of September 1, and apportion the quota 25/75, 50/50, or 75/25 percent between the two seasons.

Seasonal halibut bycatch data to evaluate this alternative are available from the Japanese longline fishery. Although the rates are not representative of the current fishery, the monthly changes in the rates are assumed to be applicable to the DAP fishery. Table 2.2 shows the average monthly incidence rates of halibut from the Japanese longline sablefish fishery. Halibut and sablefish are more discretely separated in September than in April, and it is expected that the incidental catch of halibut would be less in a September fishery. DAP incidence rates are only available from spring and summer fisheries, and do not provide information about halibut bycatch in the fall.

During the 1988 sablefish longline season, approximately 50% of the quota was taken in the month of April. The following analysis assumes that if 25% or 50% of the quota is allocated to the first season, it would be taken in a one month period. However, a 75% allocation of the quota to the April season is assumed to be taken over a two-month period (April-May) in the same proportion observed in the 1988 fishery. During the September 1987 reopening of the sablefish longline fishery in the Eastern area, catch rates were extremely high. Given no other information regarding possible season lengths for a fall fishery, it is assumed that a portion of the quota (25%, 50%, or 75%) allocated to the September season would be taken in a one month period. It is possible that a portion of the quota would be taken in a season lasting longer than 1 month in the Western area in the fall. This could have an affect on halibut bycatch as the Japanese bycatch rates increase in October.

As shown in Alternative 1, the estimated bycatch mortality in an April-June fishery is estimated at 27.5 mt with the foreign rates. Using the foreign observed rates (Table 2.2), the following example shows the possible percent reduction in halibut bycatch mortality under this alternative.

25/75 Season Split

April - 25% of quota
Quota: 23,100 mt X 0.25 = 5,775 mt
5,775 mt X 0.349 fish/mt X 7.3 kg/fish = 14,713 kg (15 mt)
Bycatch mortality - 15 mt X 0.25 = 3.75 mt

September - 75% of quota
Quota: 23,100 X 0.75 = 17,325 mt
17,325 mt X 0.026 fish/mt X 7.3 kg/fish = 3,288 kg (3 mt)
Bycatch mortality - 3 mt X 0.25 = 0.75 mt

Total bycatch mortality for 25/75 season split = 4.5 mt (84% reduction).

50/50 Season Split

April - 50% of quota
Quota: 23,100 mt X 0.50 = 11,550 mt
11,550 mt X 0.349 fish/mt X 7.3 kg/fish = 29,426 kg (29 mt)
Bycatch mortality - 29 mt X 0.25 = 7.25 mt

September - 50% of quota
11,550 mt X 0.026 fish/mt X 7.3 kg/fish =2,192 kg (2 mt)
Bycatch mortality - 2 mt X 0.25 = 0.50 mt

Total bycatch mortality for 50/50 season split = 7.7 mt (72% reduction)

75/25 Season Split

75% of quota - 50% taken in April, 25% taken in May

April - 50% of quota
11,550 mt X 0.349 fish/mt X 7.3 kg/fish = 29,426 kg (29 mt)

May - 25% of quota
5,775 mt X 1.632 fish/mt X 7.3 kg/fish = 68,801 kg (69 mt)

April-May bycatch mortality - (29 + 69 mt) X 0.25 = 24.5 mt

September - 25% of quota
5,775 mt X 0.026 fish/mt X 7.3 kg/fish = 1,096 kg (1 mt)
Bycatch mortality - 1 mt X 0.25 = 0.25 mt

Total bycatch mortality for 75/25 season split = 24.7 mt (10% reduction)

Halibut bycatch mortality estimated with the foreign rates were reduced by 84%, 72%, and 10% for 25/75, 50/50, and 75/25 season splits, respectively. If halibut bycatch rates increase in October, and the season extends into this month in some areas, the possible reductions in halibut bycatch mortality would be less. Again it is noted that these estimates do not represent actual values from the DAP fishery, but are illustrative of the expected trend in halibut bycatch mortality due to apportioning some of the quota to a later season. Applying these percent reductions in halibut mortality to the bycatch mortality estimated with the DAP rates (2,389 mt), results in bycatch mortalities of 382, 669, and 2,150 mt for 25/75, 50/50, and 75/25 season splits, respectively. Table 2.6 summarizes the estimated halibut bycatch mortality for Alternatives 1-2.

A fishery conducted in September would be harvesting fish that were not in spawning condition, which might result in improved flesh quality and yield compared to the harvest from an April fishery. Sablefish are a low-TAC species and the existing fleet is capable of

Table 2.6. Halibut bycatch mortality as estimated using average observed foreign and DAP incidence rates and sizes.

	Halibut Bycatch Mortality (mt)	
	Historical foreign data	DAP data[1/]
Status quo	27	2,389
25/75 season split	4	382
50/50 season split	8	669
75/25 season split	25	2,150

1/ The values for the season splits were estimated by applying the same proportional reductions in halibut bycatch mortality estimated with the foreign observed rates.

harvesting the TAC at any time of the year in a relatively short period. Consideration of the low quality of flesh associated with spawning periods is logical and should be pursued.

A possible result of apportioning some of the sablefish longline quota to a season opening in September 1, is that some fishermen who normally fish Pacific cod in the summer may choose to fish cod earlier in the season. A shorter sablefish longline season in April could allow for an extended Pacific cod fishery. Data were collected from the DAP Pacific cod longline fishery in the Kodiak area from four vessels during September 1986-April 1987. An ADF&G news release (May 27 1987) summarizing this data shows that the average incidental rate of halibut bycatch was 79.8 fish/mt. The variability in observed rates from the DAP sablefish fishery may also be occurring in the Pacific cod fishery. The small sample sizes used to estimate the incidence rates make it difficult to establish how representative these rates are. Halibut bycatch rates in the Pacific cod fishery are generally expected to be higher than in the sablefish fishery, particularly in the summer when the depth ranges of halibut and Pacific cod overlap.

Incidental rates of halibut are available from the Japanese Pacific cod longline fishery and are presented in Table 2.7. These data provide a biased view of halibut incidence rates, because Japanese longline fishermen were prohibited from fishing for Pacific cod deeper than 500 m and during the halibut fishing seasons. The life history of Pacific cod would suggest that higher halibut incidence rates would occur in the summer Pacific cod fishery, but the foreign data do not show this trend. Although these data do not accurately reflect the true rates, they do show much higher rates in April-June compared to the sablefish fishery. It is possible that the reduction in halibut bycatch mortality realized by apportioning some of the sablefish quota to a later season, could be partially or completely offset by increased halibut bycatch mortality in the Pacific cod fishery if it stimulates an increase in this fishery during the spring.

2.3.4 Ecological Impacts

Under the status quo, incidental halibut catches and subsequent bycatch mortality would continue to occur in the sablefish fishery. As a result, fewer halibut would be left in the system as a predator on other fish. Also, more nutrients as a result of discarded halibut would be introduced, which would be assimilated by marine life. Changes in predator/prey relationships would result, which would impact other fish species, other marine vertebrates and invertebrates, and also marine birds. The extent of the changes to the ecosystem as a result of halibut mortality induced by the sablefish fishery cannot be quantified but are believed to be insignificant, given the small amount of halibut discarded relative to the overall halibut biomass in the Gulf of Alaska. Under Alternative 2, fewer halibut would be discarded. Impacts of this alternative would be the same types as described above but would be lesser in scope. Again, these changes cannot be quantified but are believed to be insignificant.

2.4 Socioeconomic Impacts of the Alternatives

2.4.1 Introduction

This section presents an assessment of the socioeconomic impacts of an alternative to the status quo which may reduce the incidence of halibut bycatch in the sablefish longline fishery in the Gulf of Alaska. This alternative involves shifting a portion of the longline sablefish fishery from spring to fall. The economic costs and benefits resulting from a reduction in halibut bycatch are associated primarily with the response of: (1) the International Pacific Halibut Commission (IPHC), in terms of the quota set for the directed halibut fishery in the Gulf of Alaska (Gulf), and with that of (2) the NMFS regional director (RD) and the North Pacific Fishery Management Council (NPFMC), in terms of restrictions which might be placed on Gulf groundfish fisheries in an effort to keep halibut bycatch mortality under a desired cap.

Table 2.7 Average number of halibut per mt of catch from the Japanese longline Pacific cod sablefish fishery in the Gulf of Alaska, 1977-1986.

	INPFC Area					
Month	Shumagin	Chirikof	Kodiak	Yakutat	Southeastern	Average
1	14.570	14.435	169.388	--	--	66.131
2	8.268	15.565	44.160	--	--	22.664
3	8.621	13.422	24.107	--	--	15.383
4	18.682	25.008	25.522	112.000	--	45.303
5	34.069	15.553	27.649	--	--	25.757
6	38.542	9.580	--	--	--	24.061
7	6.468	7.362	--	--	--	6.915
8	9.769	11.048	12.038	--	--	10.952
9	6.992	12.643	8.916	24.659	--	13.302
10	10.653	16.821	63.333	--	--	30.269
11	11.666	18.605	18.557	6.818	--	13.911
12	8.621	17.729	26.765	26.893	--	20.002

Additional costs and benefits may accrue to the sablefish fishery itself as regulations governing the timing of that fishery are changed.

The current NPFMC limit for halibut bycatch mortality in other Gulf groundfish fisheries is 2,000 metric tons (mt). IPHC staff estimate the amount of halibut bycatch mortality in other fisheries using available historical bycatch rates and current harvest levels in the other fisheries. This information is then placed at the disposal of the IPHC for their determination of the amount of halibut which should be subtracted from the following year's quota. Additionally, the NPFMC makes recommendations to the RD concerning the reduction of bycatch of halibut in other Gulf fisheries. In recent years, the IPHC has chosen to reduce the quota available to halibut fishermen in the coming year by the current year's estimated bycatch mortality times a factor of 1.58. Use of this multiplier is designed to account for the loss in potential growth associated with mortality on juvenile halibut.

In this context, a reduction in the current year's estimated halibut bycatch would affect economic values through the facilitation of: (1) larger halibut harvests next year, due to a smaller subtraction from that quota, and/or (2) increased harvest of other species, for which a limit on halibut bycatch mortality has become the binding constraint on fishing activity.

The rapidly changing nature of the domestic sablefish fishery, in conjunction with a lack of recent observer data, adds a considerable amount of difficulty and speculation to the task of assessing possible bycatch implications of a change in the sablefish season. The current estimates of bycatch used by the NPFMC are based on observations from the Japanese longline sablefish fishery operating in the Gulf from 1977-1984. The incidence of bycatch in this fishery was very low, and is regarded by many as being considerably less than that in the current domestic fishery. Until higher domestic bycatch rates are documented through an observer program or become more widely accepted throughout management circles, however, these Japanese bycatch values are likely to continue as the basis for the IPHC's adjustments of the halibut quota.

The proposed alternative to the status quo considered in this document utilizes an additional opening of the sablefish longline season on September 1 as a means for reducing halibut bycatch. Resulting halibut bycatch impacts associated with the implementation of this alternative may also be accompanied by a variety of economic impacts within the sablefish fishery. These impacts would involve such factors as the scheduling of harvesting and processing activities for other Gulf fisheries, seasonal changes in the demand for sablefish in domestic and international markets, the quality of the sablefish harvested, and weather conditions during the sablefish harvest.

2.4.2 Overview of Fishery Cost and Benefits Relating to Halibut Bycatch

It is certainly in the nation's interest to take all steps possible to reduce the bycatch mortality of halibut in other fisheries when doing so can be accomplished without reducing the benefits obtained from those other fisheries. At some point, though, the reduction of bycatch within a fishery, such as the directed sablefish fishery, involves tradeoffs, either in the form of fewer sablefish which can be caught or in increased costs associated with sablefish harvest. A brief and general illustration of the value of halibut as bycatch in the sablefish fishery may provide a useful point of reference in considering the benefits and costs of the alternatives considered below.

The following calculations are based upon a preliminary 1987 exvessel round weight price for halibut of $1.09/lb (Trumble, IPHC, pers. comm.). The number of halibut which represent an equivalent exvessel value to one metric ton of sablefish is calculated using two different assumptions about the average size of halibut caught in the sablefish fishery. A size of 10 kg

is used to represent small halibut and one of 25 kg for large halibut. These values are then multiplied by the 1.58 growth factor that the IPHC uses across all bycatch fisheries, regardless of the size of halibut taken, in determining the appropriate reduction in the halibut quota. Hence, the operative halibut bycatch sizes considered are 15.8 and 39.5 kg per halibut. At the 1987 price of $0.67/lb, the value of 1 metric ton of sablefish is equal to $1,480 (1000 kg * $1.48/kg). The number of halibut, given each size assumption, which would yield a comparable value in the directed halibut fishery are:

For halibut weighing 10 kg,

15.8kg/halibut * $2.40/kg = $37.9/halibut, with
$1,480/mt(sab) / $37.9/halibut = 39 halibut/mt(sab); and

For halibut weighing 25 kg,

39.5kg/halibut * $2.40/kg = $94.8/halibut, with
$1,480/mt(sab) / $94.8/halibut = 16 halibut/mt(sab).

Thus, if 16 halibut, weighing 25 kg each, were killed per metric ton of sablefish, the lost exvessel revenue of the foregone halibut harvest would just offset the revenue obtained from the sablefish. Assuming a bycatch mortality rate of 0.25, this would translate into a break-even bycatch rate of 64 halibut (@ 25 kg) per metric ton of sablefish. This comparison is not intended as a justification for current bycatch levels, but to provide additional information which may be of use in weighing tradeoffs between the two fisheries. In a more complete analysis of this kind, the tradeoffs might be expressed in terms of producer and consumer surplus measures or perhaps industry profits, rather than just harvest sector revenue. But available time, data and funding are not currently adequate for such an extension of this analysis.

In assessing the economic consequences of changes in bycatch rates, it is quite important to distinguish between the rate of bycatch that is used in the Council spreadsheet model and the actual rate of bycatch in the sablefish fishery. While it is desirable for the values used in policy analysis to be accurate, limited management resources may lead to a high degree of uncertainty regarding actual bycatch rates. If a discrepancy exists between the bycatch rates used in the allocation process and the actual rates occurring in the fishery, the short-term economic impacts will follow from the rates that are used by agencies in reallocating the halibut resource, and not from the actual rates of bycatch.

If the current estimates of halibut bycatch rates in the sablefish fishery continue to be used by the IPHC to adjust the Gulf halibut quota, there is not likely to be a significant economic impact in the halibut fishery from any of the alternatives. As described in Section 2.3, the observations from the Japanese fleet, which currently form the basis of the IPHC's adjustments to the halibut quota, indicate an estimated 27.5 mt of halibut bycatch mortality in the Gulf sablefish longline fishery with the status quo. Three options for apportioning the quota between the April and September openings are considered: 25/75%, 50/50%, 75/25% splits. The halibut bycatch associated with these three options is estimated to be 4.5 mt, 7.7 mt, and 24.7 mt.

Using these Japanese figures, then, the savings in incidentally caught halibut achieved by assigning 75% of the quota amount to a September opening would be 23 mt. If this savings were, in fact, converted into an additional 36.3 mt of directed halibut catch allowed in the following year, the exvessel value of the additional halibut would be roughly $87,200, using the preliminary 1987 halibut price of $1.09/lb (round wt.). This would represent a very insignificant addition to the roughly $76 million of exvessel revenue generated by the Gulf

halibut fishery in 1986 (IPHC, Annual Report, 1986). Similar calculations for the 50/50% and 75/25% options show bycatch mortality reductions of 19.8 mt and 2.8 mt, respectively. Using the same transformation as above, these reductions would facilitate additional halibut revenues of $75,194 and $6,726, respectively. These changes in value could be expected to continue in subsequent years, ceteris paribus.

If the actual rates of bycatch are significantly higher than those currently in use by the IPHC, there is potential for some long-run depletion of the halibut resource. But such a circumstance would require not only that the level of total allowed mortality be set with a very small margin of error for preserving the stock's ability to replenish itself, but also that the actual mortality be consistently greater than this amount. If bycatch mortality is really as great as the high estimate presented in Section 2.3, then actual fishing-induced mortality will surpass current expectations.

On a yearly basis, this sort of underestimation could lead to overharvest of the halibut population, though there is no evidence that this has occurred since the mid-1970s. The estimated exploitable halibut biomass in the Gulf has increased steadily throughout the past decade (see Table 2.8), giving little reason to suspect that these conditions for stock depletion have thus far been met. On the other hand, the potential for a serious bycatch problem in the Gulf sablefish fishery is considerably greater now than has been the case throughout most of the previous 10 years. From 1985 to 1987, for example, annual domestic longline sablefish production in the Gulf rose from 9,400 mt to more than 19,000 mt, and has surpassed 23,000 mt in 1988. Hence, the scale of the domestic sablefish fishery may, only recently, have escalated to the point where underestimated halibut bycatch in the sablefish fishery poses a problem to halibut management.

Estimating the economic impacts that would occur if higher rates of bycatch were actually occuring and if these rates were also being used by the IPHC is extremely speculative. As noted in Section 2.3, the observations showing higher bycatch rates do not constitute a very reliable sample of the Gulf sablefish fishery and do not include the September time-frame. Additionally, the values are aggregated in such a manner that monthly bycatch rates must be derived from multi-month averages. Nevertheless, these domestic data provide an opportunity to gauge the general magnitude of the impacts that might result, given high rates of bycatch in the fishery and in management calculations.

There are other factors which add to the uncertainty of impacts under a high bycatch scenario. Not the least of these is that the revised bycatch mortality estimate for the longline sablefish fishery alone would exceed the bycatch limit of 2,000 mt adopted by the NPFMC for all groundfish fisheries in the Gulf. Even if the management agencies were presently in possession of indisputable evidence of higher bycatch rates, there is little basis for determining whether their response would be to revise the bycatch limit upward, or to reduce total halibut bycatch by placing tighter restrictions on the sablefish longline and/or other Gulf fisheries. Clearly, there is little that can be reliably said concerning the impacts of a change in policy if the initial conditions of a scenario are not well-defined.

Despite these uncertainties, the economic consequences of Alternatives 2 and 3 are computed using the high estimates for bycatch from Section 2.3 and assuming that all of the change in bycatch from the status quo is converted into directed halibut catch. Because of the lack of observations from fall DAP fisheries, the same percentage reduction in bycatch calculated using the Japanese data is applied to the status quo for evaluating the impact of these options with the high bycatch rates. Given these assumptions, the bycatch reduction of 84%, or 2007 mt, associated with shifting 75% of the quota to September would facilitate an additional $7.6 million per year of harvest in the directed halibut fishery (once again using the growth factor of 1.58 and the price of $1.09/lb referenced above). Similarly, the 50/50% apportionment would

Table 2.8 Exploitable Biomass Estimates for Halibut in Gulf of Alaska Areas (millions of pounds)

Year	Area 2C	Area 3A	Area 3B	Total
1975	24.5	46.8	11.8	83.1
1976	23.4	48.6	12.6	84.6
1977	23.4	51.2	13.0	87.6
1978	25.8	56.6	13.3	95.7
1979	28.9	61.3	15.6	105.8
1980	31.7	64.8	19.0	115.5
1981	35.6	68.9	23.6	128.1
1982	40.6	77.0	31.4	149.1
1983	44.9	86.9	33.8	165.6
1984	46.4	99.6	33.5	179.5
1985	49.0	112.0	34.6	195.6
1986	45.7	123.2	30.8	202.4
1987	45.7	128.6	29.5	203.7

Source: IPHC, Annual Report, 1986

reduce bycatch by 72%, or 1,720 mt, which could provide an additional $6.5 million of directed halibut catch. Finally, shifting 25% of the quota amount to September would reduce bycatch by 10%, or 239 mt, which could translate into an additional $900,000 of directed halibut revenue.

While these value estimates do not include any adjustment for quantity-related price changes, it is not likely that price would be greatly affected by the magnitude of increased harvest considered here. Lin et al. (1987), for example, observed Pacific halibut price response to be quite inelastic, with a 10% increase in harvest decreasing exvessel price by only about 1.8%.

These estimates illustrate that there may be a considerable difference among the impacts of these options, depending on 1) the percentage of harvest which is delayed till fall, 2) the halibut bycatch rates that actually exist in the Gulf sablefish fishery, and 3) the rates which are assumed by management agencies. If a domestic observer program designed to ascertain current levels of bycatch is not likely to be implemented in the near future, then assigning 50% or more of the quota to a September season would appear to offer a desirable degree of protection to the halibut stock and fishery. Additionally, an active fall fishery would more easily facilitate an improved understanding of the trade-offs between spring and fall harvest of sablefish.

If the IPHC continues to utilize the lower bycatch rates in conjunction with its setting of the quota, there will be very little difference in the directed halibut harvest achieved with any of the alternatives. If higher rates of bycatch become more accepted throughout management circles, as seems likely, the IPHC can be expected to begin utilizing higher bycatch rates in the quota process. This would, as indicated in the examples above, tend to increase the benefits associated with a fall opening.

2.4.3 Overview of the Economic Impacts Relating to the Sablefish Industry

In addition to the economic impacts stemming from a reduction in bycatch, a fall sablefish opening is likely to have economic consequences within the sablefish industry. These coincident economic impacts fall into four major groups: (1) scheduling of harvesting and processing activities, vis-a-vis other Gulf fisheries, (2) seasonal changes in the demand for sablefish in domestic and international markets, and (3) quality of the flesh, and 4) changes in weather conditions. In general, there are insufficient data to quantify the magnitude of such impacts individually, but the issues that are involved in each are discussed, and an attempt is made to quantify a changes in price that might accompany a season change due to all of them, together.

The longline fishery for sablefish in the Gulf, as shown in Table 2.9, is currently characterized by a progression of fishing effort from the southeastern portion of the Gulf westward, with a portion of the fleet continuing to fish for sablefish in the Bering Sea/Aleutian Islands. In 1987, following the April 1 opening, the Southeast/E. Yakutat district was closed initially after nine days, with subsequent closures on April 15 and May 29 for the W. Yakutat and Central areas, respectively. In addition to the openings in the spring, the longline fisheries were reopened in the Southeast and E. Yakutat districts in September, adding roughly 50% to the April landings. In 1988 the closure dates for the three districts were May 2, June 2, and July 8, respectively.

The current sablefish longline season coincides primarily with the short roe-herring fishery in the southeastern Gulf and with the first halibut opening in some western portions of the Gulf. The halibut fishery in the Gulf during 1988 has included two-day openings in late May and in June, with openings also anticipated in September and October. It is likely that, with any of the alternatives for a reduced spring sablefish season, conflict between it and a late-May halibut opener would be avoided. Naturally, the less of the quota apportioned to the spring,

Table 2.9 1987 Hook-and-line Catches by Month and District in the Gulf of Alaska (in metric tons)

	S.E. Outside/ E. Yakutat	W. Yakutat	Central	Western
January	0	0	0	4.7
February	5.9	67.0	0	0
March	1.7	0	0	0.9
April	3,570.3	2,834.0	4,598.3	686.4
May	0.4	8.0	4,049.1	1,388.5
June	0	0.1	2.5	260.6
July	1.5	94.8	15.5	44.1
August	0	26.2	0	0.5
September	2,006.2	820.6	0	24.3
October	16.0	5.3	0	1.0
November	0	0	0	0.7
December	0	0	0	0
Total	5,602.0	3,856.0	8,665.4	2,411.7

Source: NMFS, Alaska Region

the greater would be the chances of avoiding conflicts should the halibut opener be set earlier in May. Similarly, some conflicts with the roe-herring fishery, particularly at the processor level, might be lessened if the spring allotment were cut by 50% or more.

A second sablefish opening in September is not expected to coincide with any other major fisheries, with the exception of halibut and the fall (inside) sablefish season in the northern portion of the Southeastern Gulf, managed by the State of Alaska. The 1988 halibut opening in September is scheduled to begin on the seventh of the month. Particularly with the current halibut fishery requirement of gear removal from the grounds for three days prior to the opening, there would be a greater overlap between these fisheries in the fall, given these dates, than has recently been the case in the spring. This situation would tend to reduce the combined harvest by fishermen typically participating in both of these fisheries.

The state-managed fall sablefish season has been conducted since 1945, averaging roughly 1550 t of annual production over the past five years. Under current regulations, the opening date for this limited-entry fishery is set to avoid conflict with the September halibut opening. Having an FCZ sablefish season in the fall, as well, would increase potential conflicts among current longline alternatives, with the likely result of lower sablefish harvests by some participants in the existing fall fishery (presuming they were forced to choose between the two). If held concurrently, some participants in the State fishery would likely opt for fishing under the larger FCZ quota. This could facilitate a larger catch per vessel within the limited State fishery, while those boats switching to the FCZ could be expected to receive a higher price for the amount of fish they would have previously harvested during the spring (see discussion below). These compensatory factors make it difficult to estimate the change in overall sablefish revenue which would accrue to vessels participating in the current State fishery in conjunction with establishing a fall FCZ fishery.

Given the absence of other competing longline fisheries between late August and early October, it would appear feasible that the potential conflicts identified here could be minimized through cooperative scheduling of seasons by the agencies involved. On the other hand, fishery managers may view overlapping seasons as a mechanism for assisting in the control of effort in these intensive fisheries. Naturally, longliners who currently fish sablefish in the spring and either halibut or (State-season) sablefish in September would be at greatest risk of being hurt by the presence of scheduling conflicts between these fisheries and a new fall FCZ sablefish season.

An alternative method for scheduling two of these fisheries would be to allow halibut to be landed as a non-directed bycatch in a September FCZ sablefish season. While the limitations of the bycatch data are justifiably noted again, it may be useful to illustrate with them the possible magnitude of halibut catch in such a joint September fishery. Table 2.6 shows that, using the higher DAP estimates of bycatch and percentage reductions in bycatch mortality comparable to those observed in the foreign fisheries, a total 382 mt of halibut would be killed as bycatch with a 75% allotment of the sablefish quota to a September season. Further assuming that the percentage of seasonal bycatch mortality occuring in this scenario would be the same as in the example using the foreign data (0.75 mt/4.5 mt, or 16.7% occuring in the fall), the amount of halibut killed in a 25/75% September season would be 63.7 mt. Since this number represents a 25% mortality rate, the total amount of halibut caught would be 254 mt, or 560,000 lb, roughly 1% of the halibut taken in the Gulf during 1986. Since 15 million lb of the 1988 halibut quota have been carried over to the September/October openings this approach might not generate sufficient poundage to replace the usual September opening. As better data become available, possibilities for assigning a portion of the halibut quota to sablefish fishery as bycatch, in either fall or spring, should be considered as an additional means of reducing wastage of halibut.

In addition to bycatch considerations, an argument that has traditionally been made in support of delaying the opening of the sablefish season until at least April 1 has been the that flesh quality is improved by allowing greater recovery time following spawning. It is difficult to estimate (1) how much additional improvement in flesh quality might be obtained by postponing much of the quota harvest until the fall and, in turn, (2) the degree to which this improvement would be translated into increased market value.

Quality data at the processing level can be somewhat misleading. Fluctuations in the percentage of #2-grade sablefish a plant encounters, for example, can be affected as much by the pace of the fishery, reflected in the quality of at-sea handling and the plant's ability to process landings in a timely manner, as by the quality of the fish at the time of catch. The 1985 season is, perhaps, the most recent season in which deliveries were distributed throughout the year in such a way that capacity limitations were not often exceeded. During that year, one processor experienced a #2 rate of 5.0% in April and of 3.7% in September (Harold Thompson, Sitka Sound Seafoods, pers. comm.). Even in more recent years, when fall #2 rates have been relatively higher, flesh quality of most fall sablefish was described as "remarkably better" than in the spring.

If the sablefish fishery and its principal destination demand were uniformly active throughout a greater portion of the year, the timing of harvest would be less important. But the Gulf sablefish fishery has become one of short duration. And, even though the Japanese have succeeded in stimulating greater year-round consumer use of sablefish, demand remains highest during the winter months (Bill Atkinson, fisheries/market consultant, per.comm.). The strength of the ties between Japanese markets and Alaskan harvest is reflected in the increase in the proportion of Alaskan sablefish exported to Japan from roughly 60% in 1981 to nearly 90% currently [NWAFC, IMEX (import-export) and PacFIN data bases].

Despite the strength of Japanese consumer demand for sablefish during the winter months, U.S. exports to Japan, as depicted in Table 2.10, have tended to peak in early summer, shortly after harvest and processing have taken place. This means that the price being paid by Japanese importers is likely to be discounted by at least a portion of their cost of storing fish inventories until peak winter consumption arrives. Even if American wholesalers or exporters are inclined to hold inventories, with expectations of higher prices in the fall, the costs of storage will still reduce the profitability of delaying export sales. Thus, harvest in the spring fails to take maximum advantage of several possible months of free "storage" of the resource in the ocean, implying that additional storage costs will be born by the industry, either through direct payment of storage costs or through reduced prices from Japanese importers. Retaining 25% of the sablefish quota for spring harvest would seem sufficient to provide a reliable supply of exports to Japan in time to meet early winter demand.

While the degree to which any of these factors has influenced recent fall prices is not easily identifiable, it may at least be said that fall prices have been significantly higher than those in the spring. During September of 1987, the EEZ sablefish longline fishery was reopened in the Southeast/E. Yakutat district of the Gulf. Along with harvests in state waters during that and previous years, a comparison can be made of spring and fall prices. In 1987, the April longline price in the Southeastern INPFC region was $0.63/lb. In contrast, the average price for sablefish harvested in Federal and State waters in that region during September was $0.93/lb, nearly 50% higher. In 1986, the prices in this region were $0.65 in April and roughly 20% higher at $0.78 in September. And a similar differential, in the 20% to 25% range, is present between the spring and fall prices in 1985.

An additional component of the market timing influence that has likely contributed to the higher fall prices may be thought of in terms of panic buying. In recent years, September has often been the last month in which sizable amounts of sablefish were landed in EEZ or state

Table 2.10 Average Monthly Sablefish Exports from Anchorage and Seattle Districts, 1984-86 (metric tons).

January	134	July	997
February	224	August	811
March	266	September	845
April	402	October	818
May	1197	November	315
June	986	December	223

Source: IMEX data base, NWAFC

waters. Those Japanese buyers who perceive their holdings to be insufficient for upcoming winter demand will tend to bid up prices during this period. It is not easy to determine what portion higher fall prices have been influenced by this phenomenon. To the extent they have, recent fall prices will tend to overstate prices accompanying the allotment of greater harvest to the fall. The evidence from 1986-87 suggests, however, that this factor is not likely to exert a significant downward influence on prices associated with a larger fall season. Between 1986 and 1987, the percentage of longline catch from state and federal waters that was landed in September rose from 10.4% to 17.7%, but as noted above, September average price rose relative to that in April. The positive price influences relating to quality and storage costs are not expected to be eroded by moving up to 75% of the harvest to the fall. One further qualification is that, since the Japan-U.S. exchange rate has fallen considerably throughout this period of study, some of the increase in fall price may be attributable to adjustments in the exchange rate between the spring and fall seasons.

If this year's harvest of roughly 23,000 mt were valued at the 1987 spring price of $0.63/lb, the total ex-vessel value would be $31.9 milllion. If three quarters of the quota were transfered to the fall and valued at a conservative $0.85/lb, the total value would be $40.3 million, a difference of $8.4 million. Similar calculations for 50/50 and 75/25 apportionments of the season indicate additional revenue of $5.6 million and $2.8 million, respectively. With April prices in the $1.00/lb range in 1988, a similar percentage increase in fall prices would, naturally, result in an even greater revenue advantage for the fall fishery (roughly $13 million). Changes in the level of future Gulf quotas will also affect the magnitude of additional revenues accruing to a fall fishery, with a reduction in the quota lowering the potential gain from a fall fishery.

The final area of concern for rescheduling the sablefish fishery is the weather component. Consideration of weather (ie. high seas, frequency of storms, icing of the vessel, high winds) is important when managing fisheries because poor weather can lead to reduced safety of vessels and crew, as well as increase the costs of fishing operations. Fishermen on any vessel, regardless of size, are subject to danger during periods of adverse weather. Fishermen on small vessels are at greater risk due to their inability of the vessel to weather storms. The added complications of fishing during bad weather may also reduce the crew's ability to properly care for catch, which may lead to (1) lower-quality landings of sablefish, and (2) higher mortality rates for halibut bycatch.

An examination of National Oceanic and Atmospheric Administration, National Weather service records show that in general the storm period in the Gulf of Alaska occurs from September through April. Major storms are most common during this period. However, weather experts recognize that serious storms can occur at any time.

When reviewing weather patterns in each of the three groundfish regulatory areas, it may be observed that none of the areas have a higher incidence of storms during September than in April (Table 2.11). And in the Central and Western areas, the number of September storms is not appreciably higher than the mid-summer lows. And, while wave height aacross the Gulf generally runs slightly higher in September than in the late spring, September air temperatures are consistently higher than any month prior to June. The mid-summer months clearly offer the best circumstances for fishing from the standpoint of weather hazard. But if the operative choice is between April and September openings, the latter option would appear to offer better overall weather conditions.

In general, then both April and September lie at opposite ends of the year's period of best weather. In the Southeastern region, it may be slightly safer to retain a larger portion of the quota in April, as the window of best weather occurs slightly earlier. In the central portions

Table 2.11 Selected weather variables that are most likely to effect commercial fishing, as observed in the Gulf of Alaska since 1967.

	Eastern Regulatory Area			Central Regulatory Area			Western Regulatory Area		
Month	Average No. of Storms	Average Maximum Wave Ht.	Average Air Temp. Range	Average No. of Storms	Average Maximum Wave Ht.	Average Air Temp. Range	Average No. of Storms	Average Maximum Wave Ht.	Average Air Temp. Range
Jan	45	9.0 mt	-8,10°C	50	10.5 m	-12,8°C	25	13.0 m	-12,8°C
Feb	31	13.0	-4,10	51	11.0	-13,8	41	9.0	-13,8
Mar	48	7.0	-4,10	50	11.0	-13,9	35	12.5	-13,9
Apr	45	7.5	-1,11	56	12.5	-6,11	44	10.0	-6,11
May	24	6.0	3,16	45	8.5	0,12	52	8.0	-2,12
Jun	27	5.0	5,18	38	8.0	3,16	34	7.5	3,16
Jul	16	4.5	8,20	35	5.0	6,20	31	8.0	4,18
Aug	25	3.5	10,20	47	7.5	10,20	40	6.5	8,18
Sep	25	8.0	8,18	39	10.5	6,18	36	7.0	5,16
Oct	46	10.0	3,14	59	11.0	0,14	54	10.0	0,14
Nov	39	10.0	-2,11	47	10.0	-6,11	40	10.0	-6,11
Dec	38	8.0	-8,9	58	12.5	-10,9	49	9.5	-10,9

Source: NOAA, National Weather Service, Alaska Ocean Service Center, Anchorage, AK.

of the Gulf, the window is shifted a bit later and would suggest a greater portion of the quota be delayed until September.

2.4.4 Management Costs

Management and enforcement costs are not expected to vary dramatically across Alternatives 1 and 2.

2.4.5 Consumer Impacts

Consumers of halibut may benefit from reduced bycatch in the sablefish fishery. Since roughly 90% of the sablefish harvested in Alaska is exported, there will not be any significant U.S. consumer effects stemming from changes in sablefish management. While appropriate consumer benefits are, thus, likely to be far greater in halibut markets, an undetermined amount of this difference may be offset by benefits received by U.S. exporting sectors.

2.4.6 Impacts on Small Businesses

Alternatives 1 and 2 are not expected to have a significant effect on the operation of small vessels. As some of the season for sablefish is shifted to the fall, the weather during the fishery's execution may improve slightly in the central Gulf and may worsen slightly in the southeastern portions of the Gulf. In general, the longline sablefish fleet is comprised of relatively small vessels. In every year from 1981 to 1985, at least 60% of the vessels in this fleet were less than 50 feet in length, with over 90% being less than 75 feet.

2.4.7 Review of Impacts for Each Alternative

2.4.7.1 Alternative 1

This alternative represents the status quo and therefore has no different impacts associated with it.

2.4.7.2 Alternative 2

The economic impact of a change in halibut bycatch resulting from a May 1 opening of the Gulf sablefish season is estimated by evaluating the change in bycatch as it would affect allowed harvest in the directed fishery, according to current IPHC procedures. Two polar assumptions regarding the bycatch rates used by management agencies are employed to identify a range of possible outcomes. If bycatch rates based on Japanese longline data continue to be used, the decrease in estimated bycatch associated with shifting 25%, 50%, or 75% of the sablefish harvested to a fall season could increase exvessel revenue in the directed halibut fishery by $6,700, $75,200, or $87,200, respectively. If bycatch rates were to be estimated using available data from the domestic fishery, the decrease in bycatch, for the same apportionments of the sablefish harvest, could increase exvessel revenue in the directed halibut fishery by $900,000, $6.5 million, or $7.6 million. In addition, shifting sablefish harvest to a September opening could improve fish quality and reduce storage costs which would likely result in higher exvessel prices. Based on differences in spring and fall prices during 1987, shifting 75% of the 1988 quota to September could increase exvessel revenue by as much as $8.4 million, with the 50/50 and 25/75 splits offering $5.6 million and $2.8 million, respectively, in additional sablefish revenue.

3.0 EFFECTS ON THE ALASKA COASTAL ZONE

For the reasons discussed above, each of the alternatives would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Zone Management Program within the meaning of Section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

4.0 OTHER EXECUTIVE ORDER 12291 REQUIREMENTS

Executive Order 12291 requires that the following three issues be considered:

(a) Will the Amendment have an annual effect on the economy of $100 million or more?

(b) Will the Amendment lead to an increase in the costs or prices for consumers, individual industries, Federal, State, or local government agencies or geographic regions?

(c) Will the Amendment have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of U.S. based enterprises to compete with foreign enterprises in domestic or export markets?

Regulations do impose costs and cause redistribution of costs and benefits. If the proposed regulations are implemented to the extent anticipated, these costs are not expected to be significant relative to total operational costs.

These amendments should not have an annual effect of $100 million, since although the total value of the domestic catch of all groundfish species is about $100 million, these amendments are not expected to alter the amount or distribution of this catch.

The amendment will not have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of U.S. based enterprises to compete with foreign enterprises in domestic or export markets.

The amendment should not lead to a substantial increase in the price paid by consumers, local governments, or geographic regions since no significant quantity changes are expected in the groundfish markets. Where more enforce-ment and management effort are required, the cost to state and federal fishery management agencies will increase.

5.0 IMPACT OF THE AMENDMENT RELATIVE TO THE REGULATORY FLEXIBILITY ACT

The Regulatory Flexibility Act (RFA) requires that impacts of regulatory measures imposed on small entities (i.e., small businesses, small organizations, and small government jurisdictions with limited resources) be examined to determine whether a substantial number of such small entities will be significantly impacted by the measures. Fishing vessels are considered to be small businesses. A total of 1,421 vessels may fish for groundfish off Alaska in 1988, based on Federal groundfish permits issued by NMFS through March 12, 1988. In addition, 3,893 U.S. vessels landed Pacific halibut in 1987. While these numbers of vessels fishing groundfish or Pacific halibut are considered substantial, regulatory measures may only affect a small number of them.

Changing the sablefish season for the hook and longline fishery however, is significant within the meaning of the RFA due to the number of small vessels involved in both the sablefish and halibut fisheries. This conclusion is based on the preceding analysis which is summarized below:

With respect to halibut bycatch, the scale of the economic impact from a sablefish season change varies considerably between available measures of bycatch. If bycatch values from the Japanese longline fishery in the Gulf are used throughout the analysis, the values added to the halibut fishery by 25/75, 50/50, and 75/25 splits of the sablefish season between April and September are estimated to be $87,200, $75,200, and $6,700, respectively. If bycatch rates based on higher, but less systematic, observations from the domestic fleet are used, the values added to the halibut fishery using these three apportionments are estimated to be $7.6 milllion, $6.5 million, and $900,000, respectively. Regardless of which bycatch rates are applicable, additions to the value of sablefish harvest, in terms of quality and timely access to markets, are estimated to be $8.4 million, $5.6 million, and $2.8 million, respectively, for the these season alternatives, based upon 1987 quantities and prices.

6.0 FINDINGS OF NO SIGNIFICANT ENVIRONMENTAL IMPACT

For the reasons discussed above, neither implementation of the status quo nor any of the reasonable alternatives to that action would significantly affect the quality of the human environment, and the preparation of an environmental impact statement on the final action is not required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

_____

Date

7.0 COORDINATION WITH OTHERS

The Gulf of Alaska Groundfish Plan Team consulted extensively with representatives of the Alaska Department of Fish and Game, National Marine Fisheries Service, members of the Scientific and Statistical Committee and Advisory Panel of the Council, and members of the academic and industrial community.

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9.0 REFERENCES

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Williams, G. H., C. C. Schmitt, and S. H. Hoag. In press. Incidental catch and mortality of Pacific halibut through 1986. IPHC Tech. Rep. No. 23.

10.0 CHANGES TO THE GULF OF ALASKA GROUNDFISH FMP

10.1 Summary

Amendment 17a will make the following changes to the FMP:

(a) Establish an additional sablefish longline fishing season with an opening date of September 1, and apportion the quota 25/75, 50/50, or 75/25 percent between the two seasons.

10.2 Changes to Relevant Sections of the FMP

A. In Section 1.0, Introduction, page 1-1, first paragraph, third sentence, replace the word fourteen with the word fifteen.

B. The two sablefish fishing season alternatives would require the following changes to the FMP:

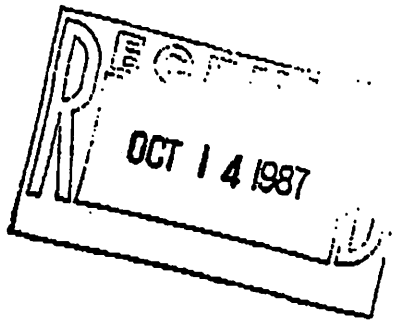
Alternative 1. Maintain the status quo. (i.e., no change to current FMP language). In Section 4.3.1.2.1, Sablefish fishing seasons, page 4-13, reads as follows:

> "The sablefish trawl fishery shall open January 1 of each year, and the directed pot longline (when permitted) and hook and longline fisheries shall commence on April 1 of each year.
>
> The Regional Director of NMFS shall use inseason adjustments to regulate the taking of sablefish to provide for the full achievement of the TACs for sablefish and other groundfish species. The use of inseason adjustment authority may include the designation of sablefish as a bycatch-only in any groundfish fishery once a specified fraction of the sablefish TAC has been taken in that fishery. The Regional Director is authorized to take any other measures necessary to prevent the achievement of the sablefish allocation for a particular gear from closing other fisheries with the same gear which depend on incidental amounts of sablefish."

Alternative 2. Establish an additional sablefish longline fishing season with an opening date of September 1, and apportion the quota 25/75, 50/50, or 75/25 percent between the two seasons. In Section 4.3.1.2.1, Sablefish fishing seasons, page 4-13, replace the first paragraph with the following paragraph:

> "The sablefish trawl fishery shall open January 1 of each year, and the directed pot longline (when permitted) and hook and longline fisheries shall commence on April 1 and September 1 of each year."

Appendix 1



MEMO TO: Jim Branson, Executive Director
North Pacific Fishery Management Council

FROM: Mark I. Hutton

SUBJECT: Background information and data supporting request for an emergency change in the sablefish season, to conserve halibut stocks.

DATE: October 12, 1987

The incidental catch of halibut during the early (April) sablefish fishery is far greater than reported and continues to pose a serious conservation threat to halibut stocks if not addressed immediately. The solution is simple, and in fact reaches into pages of our management past where the sablefish fishery followed the halibut openers and started around May 1.

The purpose of this memo is to present and explain the data which supports the emergency request to change the sablefish season to reduce the incidental catch of halibut. This memo is organized into six (short) sections:

1. Fishing data; telephone interviews, highest incidental halibut catch rates, average incidental halibut catch rates;
2. Halibut abundance by area;
3. Supporting literature;
4. Important depth data relative to sablefish and halibut stocks;
5. Other contributing factors and potential conflicts and
6. Recommendations

SECTION 1 Boat Data

In all, 8 longline boats were interviewed by telephone. The boat names will be given to Jim Branson, but identified here as boats A-H.

Boat	Area	Most Halibut/Skate	Avg Halibut/Skate
A	W/Y	570/ 10 skates	1-3
B	W/Y	20,000 lbs/ day	1-2
C	W/Y	10,000 lbs/ 20 skates	1-2
D	W/Y	10,000 lbs/ 20 skates	1-2
E	W/Y	5,000 lbs/ day	0-1
F	W/Y	100/ skate	1-3
G	1/	high	no estimate
H	1/	high	no estimate

1/ No numerical data. Stated they "sifted" through the halibut to catch large sablefish in W/Y, Central and Western areas.

The council document shows that the percent of halibut caught during the sablefish fishery was 1.2%. This is ridiculous. That assumes only 400,000 lbs. of halibut were caught during the sablefish fishery. Based on a phone conversation with Greg Williams, IPHC (October 8) he said the 1.2% was based on foreign observer data and 1 sample from Kodiak. If you consider the following average or conservative multipliers it leads you into numbers that are unacceptable.

1-2 halibut/skate @ 30 lbs/halibut
50-60 skates hauled / day
500 boats (300 Central, 200 Eastern)
14-20 days actual fishing

low
30 lbs/skate x 50 skates/day x 500 boats x 14 days = 10,500,000 lbs.

high
60 lbs/skate x 60 skates/day x 500 boats x 20 days = 36,000,000 lbs.

SECTION 2 Halibut Abundance

Most of the above data is from the West Yakutat area. Post season halibut catch analyses showed improved catches and CPUE for halibut as you move Westward. Boats G & H experienced this in the incidental catch of halibut while fishing sablefish Westward. The point is, the incidental catch of halibut during the sablefish fishery seems to increase in the Western and Central areas, more so than in the Yakutat districts.

SECTION 3 Literature

Marsh and Cobb (1907) first acknowledge that sablefish and halibut in the early spring inhabit the same grounds. Data from the 1910's reveals several longline trips of 50% sablefish and 50% halibut.

Bracken (1983) cited a 1950 Fish and Wildlife Service memo which recommended closing sablefish until May 1 to "afford protection to sablefish stocks during the winter/spring spawning season and reduce the destruction of halibut taken inadvertantly on sablefish gear during the early spring period."

Bracken goes on to report "that subsequent to this action the incidental catch of halibut declined significantly as a result of this action." The May 1 date remained through the time of the FCMA of 1976 at which time the council opened the domestic fishery year round to afford equal treatment between foreign and domestic longliners. Next the 140 degree foreign prohibition was passed.

Kollen (1944) further correlated the high incidence of halibut or sablefish gear to the co-mingling of stocks in late winter and early spring. His analysis of a large collection of log books revealed that "in March considerable" quantities of halibut are taken during sablefish trips. He states the injury to halibut results in a high mortality. Kollen also states that most of the fishermen he talked to thought sablefish shouldn't be fished until May 1. He concludes by stating that the destruction of halibut or sablefish gear during the early spring months is a serious conservation problem.

SECTION 4 Depth Data

Interviews and personal observations indicate that in April both sablefish and halibut are caught at 250-280 Fathoms. In May the halibut move into shallower waters with sablefish deeper. The separation is not complete but does occur.

SECTION 5 Other Data

Conservation of halibut stocks seems related to their seasonal and spatial characteristics, which are similar to halibut in April. Another consideration is weather. All fishermen accept the weather, whatever it is, but during the April sablefish fishery there was a storm every 3 days which meant gear could not be tendered every day. Gear not serviced every day greatly contributed to sablefish and halibut mortality. One-third to one-half of the season (days gear was fishing) was spent jogging on the set, not fishing. So while weather isn't a complaint, it is a conservation factor. It appears that the entire sablefish quota can be taken in May well in advance of any other conflict with any other fishery. Effort will be greater in 1988 than it was in 1987.

SECTION 6 Recommendations

Establish an opening date for the sablefish fishery, all areas, of May 1 or concurrent with the first halibut opener or immediately following the first halibut opener. Anything less, such as allowable incidental quotas will not be effective.

The issue is so important it cannot wait for the 1989 fishery. It must be implemented by the 1988 fishery...6 months away. At stake is a further loss of halibut approaching an amount equal to the directed fishery and an unecessary loss of sablefish.

Appendix 2

INTERNATIONAL PACIFIC HALIBUT COMMISSION

DIRECTOR
DONALD A. MC CAUGHRA

P.O. BOX 95009
SEATTLE, WA 98145-2009

TELEPHONE
(206) 634-1838

FAX:
(206) 632-2983

ESTABLISHED BY A CONVENTION BETWEEN CANADA
AND THE UNITED STATES OF AMERICA

AGENDA D-3
JUNE 1988
SUPPLEMENTAL

June 13, 1988

Clarence Pautzke
North Pacific Fishery Management Council
PO Box 103136
Anchorage, AK 99510

Dear Clarence:

The IPHC staff has collected information that helps determine the scale of halibut bycatch mortality in the Gulf of Alaska sablefish fishery. This information may be useful to the Council as you decide the season beginning date for sablefish fishing.

The IPHC field staff interviewed fishermen during the May 23-24 halibut opening in the ports of Sitka, Petersburg, Excursion Inlet, Seward, and Kodiak.

Fishermen were asked if they had participated in the 1988 sablefish fishery; if so, what region (Southeast, Gulf, or Bering Sea); and how much halibut they may have incidentally caught. Fishermen were asked to estimate their bycatch as one of six categories:

1. none
2. less than 1,000 pounds
3. between 1,000 and 5,000 pounds
4. between 5,000 and 10,000 pounds
5. between 10,000 and 20,000 pounds
6. more than 20,000 pounds.

The operators of over 700 vessels were contacted and about 75 percent indicated they did not fish for sablefish. We recorded 174 occurrences of sablefish fishing and the results are shown in Table 1. The number of responses is probably slightly greater than the actual number of halibut vessels that fished sablefish because some boats may have fished both areas, thus being recorded twice. Also, vessels fished varying amounts of time, thereby representing differing levels of effort. In any case, most of the sablefish fishermen (74 percent) indicated less than 5,000 pounds of halibut had been incidentally caught. The distribution of numbers of vessels, estimated bycatch, and estimated mortality for each bycatch category is presented in Figures 1, 2, and 3.

We estimated the magnitude of halibut bycatch represented by this sample by multiplying the number of responses in each category times the midpoint for that category range, e.g. the midpoint of 0 to 1,000 pounds

is 500 pounds, the midpoint of 1,000 to 5,000 pounds is 2,500 pounds, the midpoint of 5,000 to 10,000 pounds is 7,500 pounds, the midpoint of 10,000 to 20,000 pounds is 15,000 pounds, and for 20,000+ pounds, 25,000 pounds was used. The resulting estimate of halibut bycatch is 835,000 pounds. We emphasize that this procedure is designed to indicate the scale of the problem, not to provide a precise estimate.

Using a 25 percent mortality rate, the estimated mortality is 209,000 pounds (net wt.) or 126 mt (rd. wt.). If it is assumed that this sample represents 150 vessels and that there are 500 to 700 vessels fishing sablefish, then a 1:4 expansion of the mortality estimate would indicate 500 mt of halibut mortality. Thus, it appears that halibut bycatch in the sablefish fishery is neither as low as has been assumed by using foreign bycatch rates, not as high as has been recently suggested using the meager domestic observer program bycatch rates.

Please let me know if you have any questions concerning this data set.

Sincerely,

Bob Trumble

Robert J. Trumble
Senior Biologist

jdf

enc

Table 1. Number of responses of halibut bycatch by bycatch category.

Category (000's lbs)	Southeast	Gulf	Total
None	11	10	21
< 1	28	31	59
1 - 5	12	36	48
5 - 10	6	12	18
10 - 20	6	9	15
20 +	3	10	13
Total	66	108	174

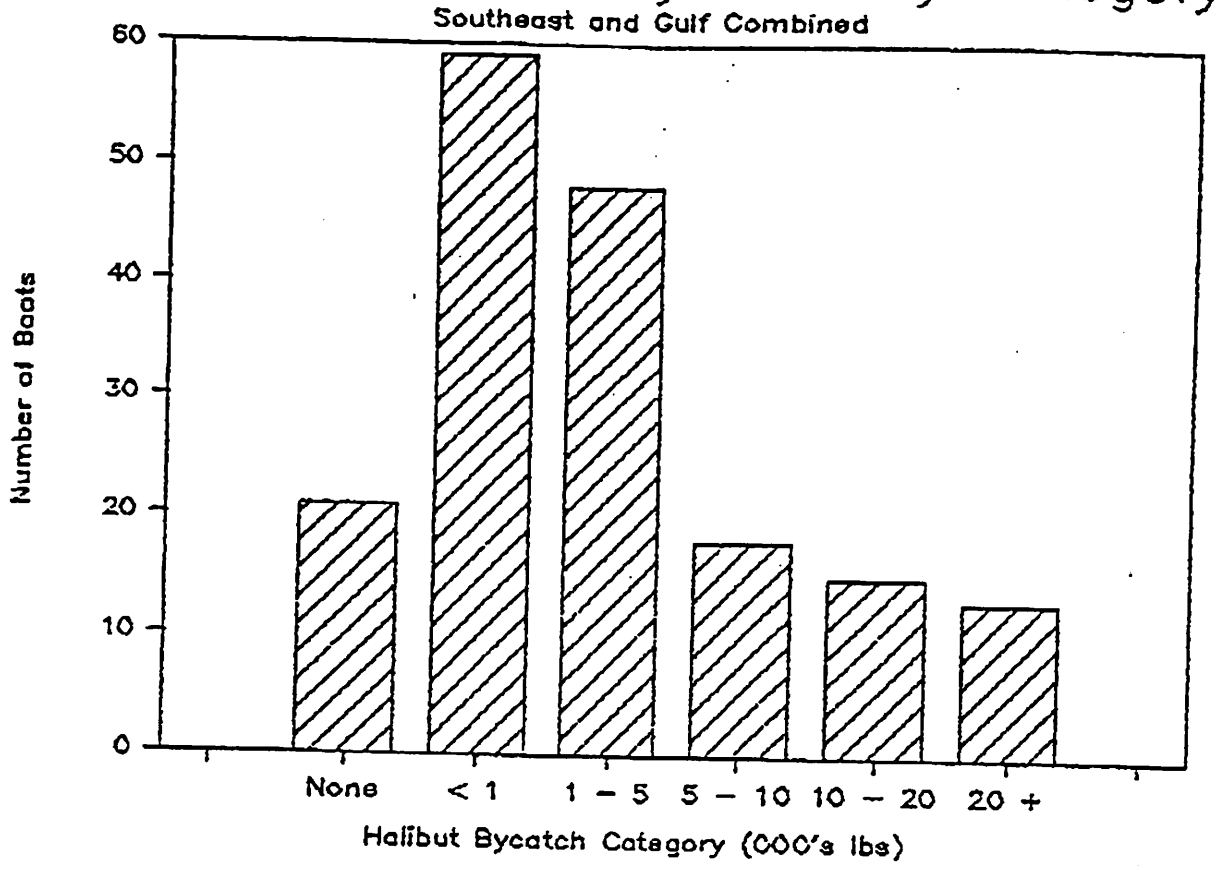
Table 2. Estimated bycatch (000's lbs, net) by bycatch category.

Category (000's lbs)	Southeast	Gulf	Total
None	0	0	0
< 1	14	16	30
1 - 5	30	90	120
5 - 10	45	90	135
10 - 20	90	135	225
20 +	75	250	325
Total	254	581	835

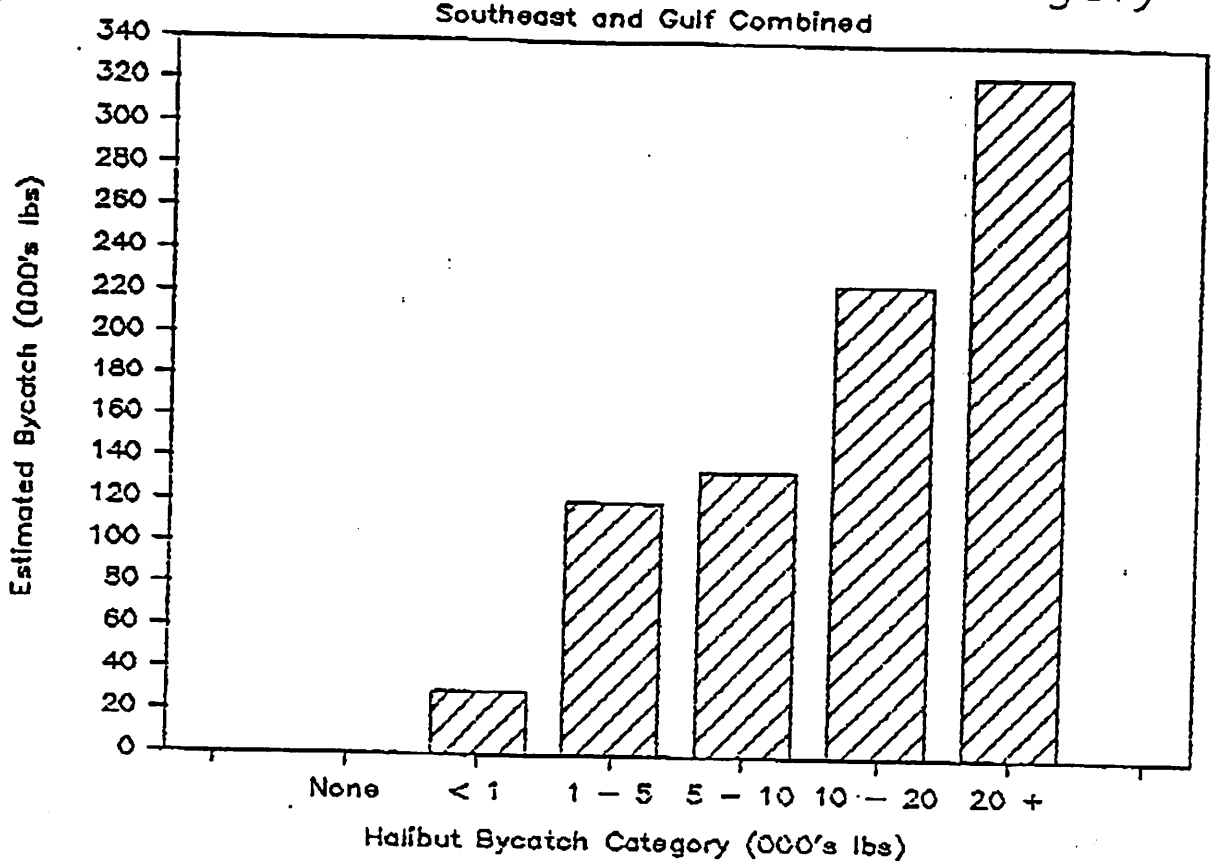
Table 3. Estimated mortality (000's lbs, net) by bycatch category.

Category (000's lbs)	Southeast	Gulf	Total
None	0	0	0
< 1	4	4	7
1 - 5	8	23	30
5 - 10	11	23	34
10 - 20	23	34	56
20 +	19	63	81
Total	64	145	209
mt (rd)	38	88	126

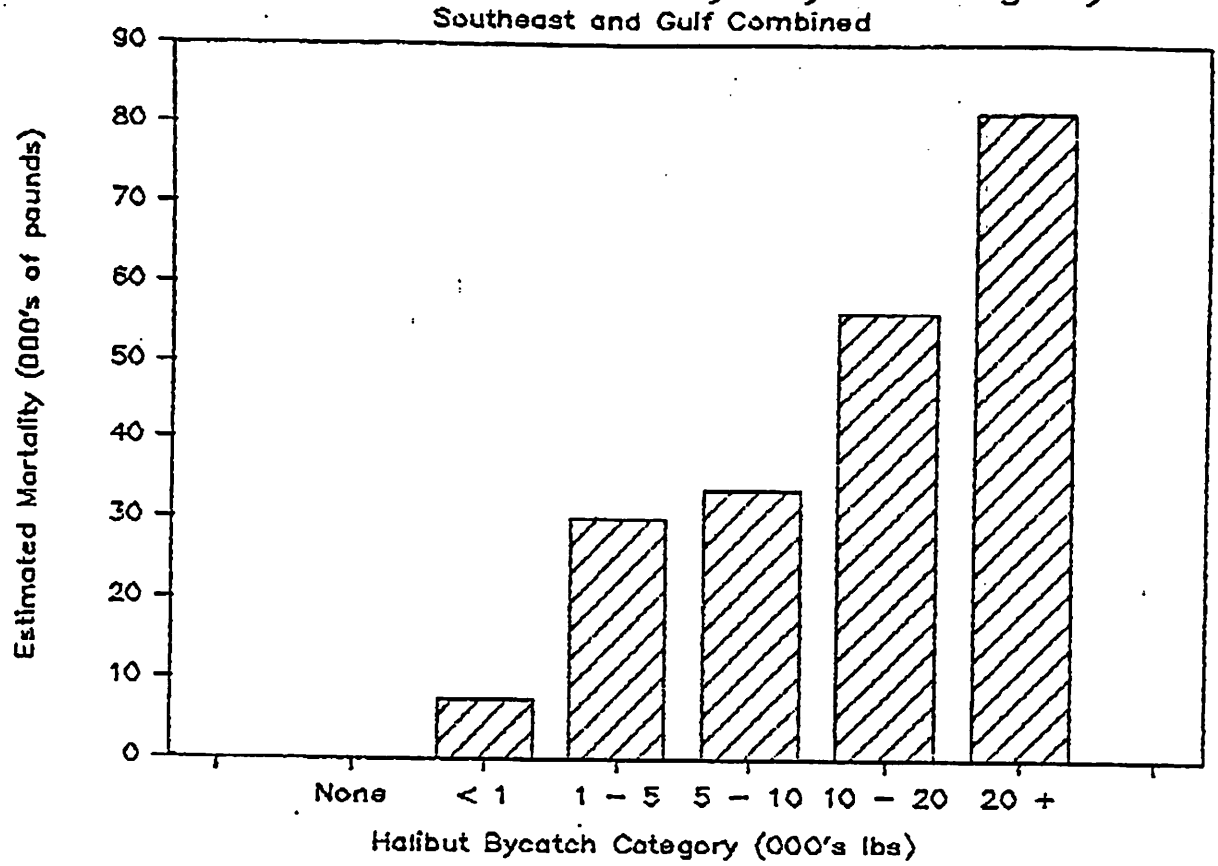
No. of Boats With Bycatch By Category



Estimated Bycatch Within Category



Estimated mortality by category.



MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke
Executive Director

DATE: September 16, 1988

SUBJECT: Gulf of Alaska Groundfish Fishery Management Plan

ACTION REQUIRED

1. Final approval of Amendment 17a (sablefish season dates).

2. Review draft Resource Assessment Document and plan team recommendations for initial Acceptable Biological Catch.

3. Set initial Total Allowable Catches and apportionments for 1989.

BACKGROUND

Amendment 17a

In June the Council reviewed Amendment 17 to the Gulf of Alaska Groundfish FMP which included several alternatives for changes in the longline sablefish season. These alternatives ranged from opening the fishery on April 1 (i.e., status quo) to June 1 by plan amendment or framework procedure. Based on public comments and recommendations of the Advisory Panel, the Council rejected these alternatives and directed the plan team to analyze a new split season alternative as Amendment 17a to the FMP.

Specifically, Amendment 17a presents two alternatives:

1. Maintain a single season beginning April 1;
2. Implement a split season, with openings on April 1 and September 1, with 25%, 50%, and 75% of the directed longline sablefish quota being apportioned to the fall season.

Following the June Council meeting the plan team prepared a new amendment package including an Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR) which was available for public review from August 1 through September 5. The six comments received, along with a summary, are provided in Item D-3(a). Comments received more recently will be included under D-3 Supplemental. Though none of the comments required revisions of the draft EA/RIR analyses, several editorial changes have been made and a final amendment package is included with this agenda item.

Final action on Amendment 17a is scheduled for this meeting. These documents (the EA/RIR, Changes to FMP, and draft regulations) will constitute most of the formal Amendment 17a package submitted to the Secretary. The remaining transmittal documents will be prepared as soon as possible. The amendment should be implemented by March 1989.

Review Status of Stocks and Set Preliminary 1989 TACs and Apportionments for Public Review

This meeting begins the Council's annual groundfish cycle with review and release to the public of preliminary estimates of 1989 groundfish total allowable catch (TAC), their apportionment to domestic annual processed catch (DAP), joint venture processed catch (JVP), total allowable level of foreign fishing (TALFF), halibut prohibited species catch limit (PSC) or rates, and preliminary PSC limits or rates for fully U.S.-utilized groundfish species.

The Gulf of Alaska Groundfish Plan Team met on September 6-9 to prepare this year's draft Resource Assessment Document (RAD) which was sent to you on September 15. Item D-3-(b) summarizes the team's findings and has a table listing the harvest levels and apportionments for 1988. A summary of the RAD is provided as Item D-3(c). The RAD, a key element in the OY framework approved in Amendment 15, presents status of stocks information, the plan team's initial Acceptable Biological Catch (ABC) recommendation and information necessary to utilize the halibut PSC and OY frameworks (i.e., halibut bycatch and mortality rates, status of halibut resource, sablefish bycatch rates, etc.).

The big surprise this year is pollock. Preliminary results from the 1988 Shelikof hydroacoustic survey produced an estimate of 330,000 mt which indicates a continued decline in pollock biomass and is substantially below the most pessimistic projection from 1987. The team noted that the biomass estimate from the 1987 bottom trawl survey in the Gulf of Alaska (593,000 mt) provides a different view of current stock conditions, but could not determine which is more accurate. Regardless of what biomass estimate is believed correct, only optimistic recruitment scenarios lead to an increasing biomass projection above the 700,000 mt threshold. As a result, the team has recommended an initial ABC of zero but recognizes that it is important to consider a small fishery in 1989 for purposes of collecting population dynamics data. A report on the Shelikof survey results will be available from the Northwest and Alaska Fisheries Center.

For the remaining groundfish species in the Gulf, there is little change from 1987. Pacific cod, flounders, sablefish, and most rockfish continue to remain healthy and either stable or increasing in abundance. The exception is shelf demersal rockfish in the eastern Gulf where it appears that the 1989 ABC should be set lower than the approximate 1988 catch of 600 mt. There is little scientific information available to allow an independent determination of ABC.

Item D-3(b) provides current TAC and 1988 catch-to-date statistics. Comparing these numbers with the plan team's initial 1989 ABC recommendations will aid in determining initial 1989 TAC projections for public review. The Council will want to keep in mind the potential bycatch of halibut and fully U.S.-utilized groundfish species as you set the TACs. The FMP requires that initial DAP and JVP, PSC limits for halibut, and JVP PSC limits of fully utilized species (i.e., sablefish, rockfish) also be sent out to public review.

As a starting point, the Council may want to use 1988 TACs, PSCs, etc., as its initial 1989 figures with the exception of pollock and sablefish. Pollock TAC should likely be reduced from 90,000 mt given the Shelikof survey results. Management of sablefish however, while currently healthy, should be discussed with the plan team. The team notes in the RAD that sustained harvests of 28,000 mt (the 1988 TAC) by the foreign fleets in the early 1970s led to a significant population decrease which later required rebuilding measures. The team requests advice from the Council on preferred harvest strategies.

AMENDMENT 17a: OVERVIEW OF COMMENTS

Implement a split season for management of the longline sablefish fishery.

Alternative 1: Maintain a single sablefish season (i.e., status quo).

Under this option, there would be no change in the April 1 opening date for the sablefish longline fishery in the Gulf of Alaska.

[NO COMMENTS RECEIVED]

Alternative 2: Implement a split season, with openings on April 1 and September 1, with 25%, 50%, and 75% of the directed longline sablefish quota being apportioned to the fall season.

Linda Kozak, Kodiak Longline Vessel Owners' Assn. - Supports this alternative with the quota apportioned 75% in April, and 25% in September. Recommends allocating no more than 25% to the fall season since data are lacking to clearly demonstrate the advantages of a fall fishery.

Earl Owen, Chef, Seattle - supports a split season as an interim measure until an IFQ system is implemented. He prefers to see sablefish harvested at their peak in quality, therefore recommends that 75% of the quota be allocated to a fall fishery.

Jon Rowley, FishWorks!, Seattle - supports split seasons with 75% of the quota reserved for the fall period. He cites a west coast sablefish quality study that showed average yield of sablefish taken in a fall fishery to be 9% greater than sablefish taken in April. He also feels that a split season will provide the opportunity to record comparative spring and fall length/weight ratios.

Oliver Holm, Kodiak Longliners' Assn. - supports a split season with 75% of the longline sablefish quota being apportioned to the April fishery and 25% to the September fishery. He added that any loss of halibut bycatch savings due to a shifting of the cod fishery to spring would be small. He says the best catch rates for Pacific cod occur in February and March, a time when fishermen would be harvesting cod regardless of when the sablefish fishery opens.

Don McCaughran, International Pacific Halibut Commission - recommends adoption of split seasons with 75% of the quota being apportioned to the fall period. He cites high halibut bycatch rates in the spring as rationale for moving most of the sablefish harvest to the fall.

Thomas Hoffman, Booth Fisheries Corp., Seattle - supports split sablefish seasons with 75% of the quota reserved for a fall fishery. He cites increased yield as the basis for his recommendation.

KODIAK LONGLINE VESSEL OWNERS ASSOCIATION

HALIBUT, SABLEFISH AND PACIFIC COD

P.O. BOX 135, KODIAK, ALASKA 99615 TELEPHONE [907] 486-3781

September 1, 1988

Dr. Clarence Pautzke
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
P. O. Box 103136
Anchorage, Alaska 99510

RE: Amendment 17A

Dear Clarence,

The members of the Kodiak Longline Vessel Owners Association have reviewed the EA and RIR prepared by NPFMC staff on Amendment 17A.

We are in support of Alternative #2 which establishes an additional opening date of September 1st. We suggest that the quota be set at 75% for the April 1st opening and 25% for the September 1st opening.

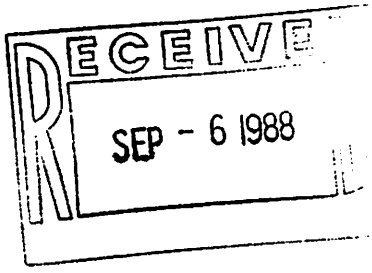
The EA/RIR speculates that a more extreme change (25% for April and 75% for September) might reduce halibut bycatch significantly and improve marketing conditions. However, we recommend caution.

Some of the factors to consider in establishing an opening date are bycatch, product quality, product demand, processing capabilities, and safety. Since the data is lacking which could clearly show the advantages or disadvantages with a September opening date, it might be appropriate to take a small portion of the quota (25%) as a test fishery. At the time when better information is available, then a permanent change may be needed.

Sincerely,

Linda Kozak

Linda Kozak



September 6, 1988

Clarence Pautzke, Executive Director
North Pacific Fisheries Management Council
P. O. Box 103136
Anchorage AK 99510

Dear Mr. Pautzke:

This letter is to support split seasons (Alternative 2) for the Alaska black cod fishery. We would prefer a system of individual fishing quotas which would maximize the availability of fresh black cod, but for the purposes of the 1989 season, we support the concept of split seasons, with 75% of the catch taken in the September fishery.

If it is necessary to use frozen black cod because of the limited availability of fresh, we prefer to use fish which have been harvested and frozen at their peak of quality in the late summer and early fall.

For the record, our restaurants use longline black cod over 5 lbs.

Sincerely,

Earl Ovens
Corporate Chef

Steve

Fish Works!

Fishermen's Terminal
C-10 Building
Seattle, Wa 98119
(206) 283-7566

September 5, 1988

Chairman
North Pacific Fishery Management Council
P. O. Box 103136
Anchorage, AK 99510

Dear Mr. Chairman:

In 1986-1987, I participated in a study (Analysis of Four Factors Affecting the Sablefish Soft Fish Problem; Norris, Rowley, Matthews, 1987) designed to gain an understanding of the factors which may be contributing to the persistent inconsistencies in sablefish quality which have been detected in the market place. This study shows that sablefish taken in the fall fishery have an average yield increase of 9% over sable fish taken in April.

From a quality standpoint, I support Alternative 2 on the sablefish season issue with 75% of the quota to be taken in the September fishery. A split season presents the Council with the opportunity to record comparative spring and fall length/weight ratios. This data could be used to verify or modify the findings in the aforementioned study.

Sincerely,

Jon Rowley

Jon Rowley

September 5, 1988

Kodiak Longliner's Assoc.
Box 3406
Kodiak, Alaska 99615

TO: N.P.F.M.C.

RE: Comments on G.O.A.--proposed Sablefish split season management

On behalf of the Kodiak Longliner's Assoc., I would like to support the sablefish split season proposal with a 25% Sept. and 75% spring division. While this doesn't maximixe the halibut savings, it certainly should provide an opportunity to demonstrate a decreased bycatch rate. Also, the sablefish catch should be worth more money. K.L.A. orginally made this proposal over a year ago during the Council's special sablefish management proposal cycle.

I have some specific comments concerning the Draft Environmental Assessment and the R.I.R. Any loss of halibut bycatch savings that would occur due to shifting of cod longlining effort to spring would be small. The best catch rates for cod longliners around Kodiak occur during February and March, so if cod prices are high enough to fish in September the same boats would be even more likely to fish in February and March anyway. Cod longlining in February and March might be assumed to displace trawl cod fishing with a similar bycatch mortality. Many of Kodiak's longline pacific cod fleet is too small to target sablefish out on the continental slope. Sablefish catches for a significant portion of Kodiak's longline fleet are likely to be as a bycatch in the pacific cod fishery. The highest bycatch rates of sablefish for the cod fishery appear to be in August, September and October. The R.I.R. draft makes assumptions about displacing cod longlining effort without considering the effects of the option of sale of sablefish bycatch during the fall pacific cod fishery. In the Kodiak area if a September sablefish season were the only legal way to sell sablefish bycatch in the pacific cod fishery, having a September season could be expected to increase September cod longlining rather than shifting effort to February and March.

The drafting team made the assumption that underestimating the halibut mortality in the sablefish fishery wouldn't make much difference to the directed halibut fishery. The figures cited for this include the increasing biomass of halibut, Historically, poor recruitment into the halibut population has occurred during times of high population abundance. Since recruitment of halibut into the fishery is very poorly forecasted by surveys conducted by the I.P.H.C. at ages less than 8 years, it is conceivable that underestimating sablefish bycatch could contribute to a precipitous decline of halibut stocks when recruitment worsens.

Respectfully,

Oliver N Holm

Oliver N. Holm, President
Kodiak Longliner's Assoc.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

ESTABLISHED BY A CONVENTION BETWEEN CANADA
AND THE UNITED STATES OF AMERICA

DIRECTOR
DONALD A. MC CAUGHRAN

P.O. BOX 95009
SEATTLE, WA 98145-2009

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(206) 634-1838

FAX:
(206) 632-2983

September 1, 1988

Dr. Clarence Pautzke
North Pacific Fishery Management Council
P.O. Box 103136
Anchorage, Alaska 99510

Dear Clarence:

The staff of the Halibut Commission has reviewed the draft EA/RIR for Amendment 17a (sablefish seasons) to the Gulf of Alaska Fishery Management Plan. The draft document provides material not previously available which suggests that bycatch rates of halibut in the sablefish fishery are higher than currently assumed. If so, maintaining the 2,000 mt bycatch limit for halibut will be difficult unless halibut bycatch can be reduced in the sablefish or other fisheries.

Therefore, we support Alternative 2 which would split the sablefish season into April and September components. The projected halibut bycatch will be reduced to 382 mt with a 25/75% quota apportionment, and would allow more groundfish to be harvested within the halibut bycatch limit. Split seasons are similar in concept to the seasons used for halibut, and are familiar to most sablefish fishermen.

Thank you for the opportunity to comment on the sablefish season.

Sincerely yours,

Donald A. McCaughran
Director

RJT:ps

Booth Fisheries Corporation
Western Division
814 Sixth Avenue South
Seattle, WA 98134-1304
(206) 623-1011

September 14, 1988

North Pacific Fishery
Management Council
605 W. 4th Avenue
Anchorage, Alaska 99510

Dear Council:

I am writing in regard to the five sablefish management alternatives for which the public comment period closes at 5:00 pm on September 16, 1988.

Booth Fisheries Corporation strongly supports the individual fishing quotas, with a season from May through October. The advantages of this method are:

1. A continuous supply of fresh sablefish, which is in much demand from May through October.

2. An opportunity for the fishing industry to maximize the quantities of frozen sablefish produced, by targeting the bulk of the fishing in September, when the fish are at their maturity, thereby producing the greatest edible weight yield into the frozen market.

As an interim alternative, we would support the alternative providing for 25% of the quota to be caught in May and 75% to be caught in September.

Booth Fisheries is the largest distributor of fresh and frozen seafood in the United States. I am writing on behalf of our tablecloth restaurant and retail supermarket customers who continually express concern over the unevenness in supply of fresh sablefish.

From the consuming public's point of view, it is an environmental waste that we are permitting sablefish to be caught and put in freezers before they have grown to full maturity.

Please contact me at (206) 382-4624 if you have any questions about our position in this matter, or if Booth Fisheries Corporation can assist in expanding the supply of top quality fresh and frozen sablefish.

Sincerely,

Thomas Hoffman
Vice President
Distributor Operations
Western Division
TH/jh

AGENDA D-3(c)
SEPTEMBER 1988

DRAFT

RESOURCE ASSESSMENT DOCUMENT

FOR THE

1989

GULF OF ALASKA GROUNDFISH FISHERY

EXECUTIVE SUMMARY

Prepared by

Gulf of Alaska Groundfish Plan Team
North Pacific Fishery Management Council
P.O. Box 103136
Anchorage, Alaska 99510

September 1988

INTRODUCTION

This Resource Assessment Document (RAD) for the Gulf of Alaska groundfish resources is applicable for management of the 1989 fishery under the Gulf of Alaska Groundfish Fishery Management Plan (FMP). In this RAD, the rationale and management recommendations are presented mainly from a biological perspective. These recommendations, together with socioeconomic considerations, will be used by the North Pacific Fishery Management Council to determine total allowable catch (TAC) and other management strategies for the fishery under the Magnuson Fishery Conservation and Management Act.

The RAD is organized by topic. The first part is the biological section which presents a Plan Team (PT) review of the condition of each target species or species groups and recommendations for acceptable biological catch (ABC). The second part is the bycatch section which provides information needed to support the halibut and fully utilized species PSC frameworks. The Team requests that the industry submit to the Council, any pertinent information regarding bycatch rates.

The Plan Team for the Gulf of Alaska Groundfish FMP met in Seattle on September 6-9, 1988 to review the status of stocks of eight species or species groups which are managed under the plan. The Team review and discussions were based on ADF&G and NWAFC technical papers, results from the NMFS 1987 Gulf of Alaska trawl and longline surveys, and presentations by NMFS scientists. Attendance at the September Plan Team meeting included:

Plan Team Members:	J. Balsiger (Team Chairman), R. Berg, B. Bracken, P. Craig, S. Davis, J. Fujioka, L. Haldorson, J. Hastie, S. McDevitt, J. Tagart, R. Trumble
NMFS Scientists:	E. Brown, P. Dawson, B. Megrey, E. Nunnallee, J. Terry, G. Thompson, J. Traynor, T. Wilderbuer, N. Williamson, H. Zenger
ADF&G Scientists:	D. Carlile
IPHC Scientists:	G. Williams
Public Attendance:	M. Atterbery, Alyeska Ocean Limited J. Sevier, Alaska Pacific Seafoods, Kodiak

The Gulf of Alaska FMP recognizes single species and species complex management strategies. Single species management is recommended for stocks which are easily targeted by the harvesting sector, and for which there is a minimal mixing of other species in the targeted catch. In the Gulf of Alaska, Pacific cod, pollock and sablefish are managed as single species. Species complex management is recommended for stocks that are unlikely to be easily

targeted by the harvest sector; for example, multiple species catches are anticipated for any set of the gear. Rockfish, including thornyheads, flatfish, and other groundfish are all managed as complexes. Acceptable biological catches for a species complex represent potential yield for the species comprising that complex. Harvesters do not always catch species in a complex in proportion to the species composition, i.e., certain segments of the complex may be more easily harvested than others. Consequently, the implicit risk in species complex management is that one or more of the species in the complex may be over or underharvested. It is important to recognize this risk. Alternative management strategies can be imposed to limit the risk including removing a species from a complex and managing as a single species. The Plan Team will give close scrutiny to the species composition of the catch from the species complex management units and make recommendations for adjustments as required.

NEW INFORMATION

Since the 1987 RAD was issued (NPFMC 1987), the following new information has become available:

1. Data from the 1988 hydroacoustic survey in Shelikof Strait conducted by the Northwest and Alaska Fisheries Center.

2. Data collected by U.S. observers aboard foreign fishing vessels participating in joint-venture fisheries,

3. Data and analyses provided by Japan at a workshop in 1988.

CURRENT STATUS OF STOCKS AND ACCEPTABLE BIOLOGICAL CATCHES

Tables 1-2 provide a summary of the current status of the groundfish stocks, including estimated maximum sustainable yields, catch statistics, the 1988 TACs, and the recommended ABCs for 1989. The 1989 ABCs should be considered preliminary estimates, and are subject to revision for the final RAD should more information become available. Pacific cod, flounders, sablefish, and slope rockfish remain in good condition. The biomass of pollock and demersal shelf rockfish appears to be at low levels. The sum of the preliminary 1989 ABCs IS 926,775 mt. The sum of the TACs (260,936 mt for 1988) is equal to the optimum yield (OY) for the entire groundfish complex.

Table 2-1. Maximum sustainable yields (MSYs), comparisons of acceptable biological catches (ABCs) for 1988 and 1989, and catches through Aug. 20 for groundfish in the Gulf of Alaska.

Species	MSY (mt)		ABC (mt) 1988	ABC (mt) 1989	1988 Catch	1988 TAC
Pollock	Unknown	W/C	90,000-120,000	0	20,558	90,000
		E	3,375	3,375	64	3,000
		Total	93,375-123,375	3,375	20,622	93,000
Pacific cod	Unknown	W	19k-35k	18,810	3,393	19,000
		C	73k-137k	73,260	21,160	60,800
		E	7k-13k	6,930	73	200
		Total	99k-185k	99,000	24,627	80,000
Flounders	477,900	W	142,650	152,800	478	1,600
		C	538,280	531,400	13,377	21,300
		E	86,770	83,500	837	100
		Total	767,700	767,700	14,692	23,000
Sablefish	34,000-46,000	W	5,075	30,000-	3,321	4,060
		C	15,500	40,000	12,611	12,540
		E	14,425		6,438	11,400
		Total	35,000	30,000-40,000	22,725	28,000
Slope rockfish	12,900-25,500	W	4,850	3,400	1,775	4,850
		C	7,100	6,100	7,028	7,100
		E	4,850	4,550	4,749	4,850
		Total	16,750	14,050	13,552	16,800
Pelagic shelf rockfish	Unknown	W	550	550	166	550
		C	2,350	2,350	402	2,350
		E	400	400	173	400
		Total	3,300	3,300	741	3,300
Demersal shelf rockfish (SE Outside district)	Unknown		660	<600	625	660
Thornyhead rockfish	3,750	Gulf-wide	3,750	3,750	2,162	3,750
Other species	NA		NA	NA	618	12,426
			1,077,535 !	926,775 *		260,936

! Summed, using 108,375-mt and 142,000-mt midpoint of the respective pollock and cod ABC ranges.
* Summed, using 35,000-mt midpoint of the sablefish ABC range.

Table 2-2. Exploitable biomasses, 1989 acceptable biological catches (ABCs), and estimated trends and abundances of groundfish in the Gulf of Alaska.

Species	Exploitable Biomass (mt)		ABC	Abundance, trend
Pollock	330,000-593,000	W/C	0	Depressed, stable
		E	3,375	
		Total	3,375	
Pacific cod	449,300	W	18,810	High, decreasing
		C	73,260	
		E	6,930	
		Total	99,000	
Flounders	2,110,854	W	152,800	High, increasing
		C	531,400	
		E	83,500	
		Total	767,700	
Sablefish	460,000		30,000-40,000	High, decreasing
Slope rockfish	702,200	W	3,400	Good, increasing
		C	6,100	
		E	4,550	
		Total	14,050	
Pelagic shelf rockfish	164,350	W	550	Stable
		C	2,350	
		E	400	
		Total	3,300	
Demersal shelf rockfish (SE Outside district)	Unknown		<600	Depressed, decreasing
Thornyhead rockfish	98,700	Gulf-wide	3,750	Increasing
Other species	NA	Gulf-wide	NA	
			926,775 *	

* Summed, using 35,000-mt midpoint of the sablefish ABC range.

PART A. STATUS OF STOCKS AND DETERMINATION OF 1989 ABCs

Pollock - The 1988 hydro/acoustic survey in Shelikof Strait produced a biomass estimate of only 330,000 mt. This is substantially below the most pessimistic projection from 1987. The Team noted that the biomass estimate from the 1987 bottom trawl survey in the Gulf of Alaska (593,000 mt) provides a different view of current conditions, but could not determine which is more accurate. ABC, determined as production above the threshold level, would be 0 if the lower biomass estimates are correct. Optimistic recruitment schedules accompanying the higher biomass estimates would allow a fishery to take place in 1989. Even under the most pessimistic analyses, the Council may wish to allow a fishery in 1989 for the collection of gathering population dynamics data to update the stock assessment models.

The team has no new information for pollock stocks in the Eastern Gulf of Alaska and suggests the 1989 ABC be set at the 1988 level of 3370 mt.

Pacific cod - Pacific cod stocks in the Gulf of Alaska are currently healthy, although stock size appears to be decreasing. Best estimates of current exploitable biomass is 449,300 mt. Fishing mortality which maximizes yield is estimated from yield-per-recruit analysis such that $F_{0.1}$ = 0.26 and F_{MSY} = 0.55. The resulting estimates of ABC are 93,900 to 175,500 mt. The Council set the 1988 ABC at 99,000 mt and the Plan team finds no compelling reason to recommend a change in 1989.

Flounders - The flounder complex appears to be in good condition. Biomass estimates from 1984 and 1987 bottom trawl surveys show the resource to be stable, with a slight (about 3%) increase between 1984 and 1987. ABC for this complex was estimated by applying the $F_{0.1}$ level to the 1987 biomass estimate, resulting in a yield of 767,700 mt. Gulfwide flounder catches in 1987 were only 1.3% of this ABC. For 1989, the PT recommends an ABC of 767,700 mt, apportioned to the individual management areas as follows: 152,800 mt to the Western Area, 531,400 mt to the Central Area, and 83,500 mt to the Eastern Area. Major revision in next RAD because of an expansion method used(?)

Sablefish - Sablefish biomass peaked in 1985 and has declined slightly as determined by the cooperative longline survey as of 1987. The 1988 survey will be available for final ABC considerations. Strong year-classes have not recruited to the population since the 1980 year-class recruited in 1985. Old potentially change quite a bit—

The PT's preliminary recommendation of ABC is between 30,000 and 40,000 mt. At these catch levels, the population is projected, under pessimistic biomass and recruitment assumptions, to remain above historic low levels until after 1990. The longterm equilibrium yield as projected under the estimated average recruitment is 30,000 mt.

Slope rockfish - The PT recommends a gulfwide ABC of 14,000 mt for the slope rockfish assemblage. This ABC is based on stock reduction analysis using biological parameters from POP and biomass estimates from areas deeper than 100 m in the 1987 trawl survey. A recommendation to apportion ABC by regulatory areas is also included.

Pelagic shelf rockfish - The Team applied the fishing mortality rate determined for POP to the biomass estimates from the 1987 trawl survey, with the resulting gulfwide ABC of 3,300 mt. The Team also recommends that the ABC be apportioned among regulatory areas based on the distribution of this assemblage in the 1987 trawl survey.

Demersal shelf rockfish - Very little is known about demersal shelf rockfish in the Gulf of Alaska compared to other groundfish species. Estimates of absolute abundance, exploitable biomass, MSY, and ABC are not available for this species group. What is known about the biology of demersal shelf rockfish indicates that all species in this group are very long-lived and slow growing with low natural mortality rates.

Information collected by the Alaska Department of Fish and Game indicates that length and age distributions and catch rates in the Southeast Outside District have continued to decline at current recommended harvest levels. While an estimate of ABC is not available, continued declines in fishery performance at the current level of harvest indicates that the current harvest is above the recruitment rate into this fishery. This suggests that ABC is likely to be below the 1988 harvest level of approximately 600 mt.

Based upon that information, ADF&G is submitting a recommendation to the Alaska Board of Fisheries to set a harvest range for the directed fishery in the Southeast Outside District of 300 mt to 420 mt which represents 50% to 70% of the 1988 harvest.

Thornyhead rockfish - Longline survey indices and mean lengths in trawl surveys have shown recent declines. DAP catches of thornyheads have continued to increase with the 1988 year-to-date catch being the highest on record. Estimates of ABC range from 3,280-4,650 mt. The PT recommends that the ABC remain at 3,750 mt.

Other species - No recommendations were made by the PT for this group. FMP procedures define the reasonable quota for this category to be set at 5% of the sum of the TACs established for the other species categories.

PART B. BYCATCH SUMMARY

Halibut

Preliminary data including limited ADF&G and NMFS observer data suggests that bycatch of halibut in the domestic pollock, cod, flounder, and rockfish fisheries may be greater than the rates which were previously estimated from foreign fisheries observer data. If very high bycatch rates regularly occur in the longline and trawl fisheries, then substantial discard wastage will occur. This is because the current management system requires that bycatch species be discarded if the seasons are not concurrent. Under the present halibut PSC limits, higher halibut bycatch rates may result in further reduction in the TACs for other groundfish species. The plan team is concerned that any management scheme which promotes discard in a mixed species fishery or constrains directed harvests to protect concurrently caught species may be wasteful. The plan team encourages the Council to continue their efforts in addressing this issue.

At its November 1988 meeting, the plan team intends to reevaluate the bycatch rate and mortality rate assumptions used in estimating halibut and fully utilized species bycatch. It is likely that some changes will be made following an examination of domestic observer data and other relevant information. The plan team requests the fishing industry to provide any information which may be useful in determining the best rate assumptions for use in managing the 1989 groundfish fisheries.

Estimates of halibut bycatch for foreign and joint venture fisheries are provided by the NMFS Foreign Observer Program, and are provided in Table B-1 for 1977 through August 20, 1988. The table also includes estimates for the resulting halibut mortality based on discard mortality rate assumptions in the trawl and longline fisheries of 100% and 25%, respectively.

Similar estimates are not available for the fully domestic groundfish fisheries (DAP) because there is not a comprehensive domestic observer program in place. In the absence of domestic observer data, the team in the past has believed that the best available information is from the foreign and joint venture observer data in the Gulf of Alaska. The estimates of halibut bycatch rates are presented in Table B-2. These estimates may no longer be valid. The recent increasing trend in DAP harvest makes the lack of bycatch data critical if accurate estimates are to be obtained. The DAP fishery took 33,176 mt of groundfish in 1985, 44,072 mt in 1986, 110,132 mt in 1987, and 98,096 mt through August 20, 1988. Using the bycatch rate assumptions presented in Table B-2 and applying them to current DAP catch results in a DAP halibut bycatch and mortality estimate of 1,800 mt and 748 mt, respectively.

Table B-1.--Estimated halibut bycatch and mortality in the foreign and joint venture groundfish fisheries in the Gulf of Alaska, 1977-1988.

(metric tons)

Year	Bycatch				Bycatch Mortality		
	Foreign Trawl	Foreign Longline	Joint Venture	Total	Foreign	Joint Venture	Total
1977	2200	0	0	2200	2200	0	2200
1978	1217	72	0	1289	1235	0	1235
1979	2065	210	21	2296	2118	21	2139
1980	2086	1119	48	3253	2366	48	2414
1981	1192	1307	5	2504	1519	5	1524
1982	1175	1515	4	2694	1554	4	1558
1983	772	2463	356	3591	1388	356	1744
1984	517	989	590	2096	764	590	1354
1985	24	217	300	541	78	300	378
1986	0	347	81**	428	87	81	168
1987	0	0	656	656	0	656	656
1988*	0	0	242	242	0	242	242

*January through August 20, 1988.

**Excluding the longline joint venture

Table B-2.--Assumed rates used in estimating 1988 Gulf of Alaska halibut bycatch by gear.

	Bottom Trawl - All Areas	Midwater Trawl - All Areas
DAP	2.53%	0.06%
JVP	2.53%	0.06%
TALFF	2.53%	0.06%

	Pacific Cod Longline			Sablefish Longline		
	Western	Central	Eastern	Western	Central	Eastern
DAP	5.23%	9.15%	9.15%	1.20%	1.20%	1.20%
JVP	5.23%	9.15%	9.15%	1.20%	1.20%	1.20%
TALFF	1.49%	4.97%	4.97%	1.20%	1.20%	1.20%

Source: NMFS Foreign Observer Program Data 1982-1986.

Fully Utilized Species

For 1989, it is anticipated that bycatch of fully utilized species will again be an issue before the Council. At the time of the plan team meeting there were no estimates available for DAP, JVP, and TALFF groundfish requirements for 1989. Relying on the 1988 TAC and apportionments, the team assumes that the same species identified as fully utilized in 1988 will remain fully utilized in 1989. (Note that beginning in 1988, Pacific ocean perch complex and other rockfish have been combined into one species category, "rockfish"). In 1988 the Council provided small amounts of fully utilized species to JVP fisheries. No bycatch amounts were specified for TALFF since there were no groundfish allocations made to foreign fisheries in 1988. Since these incidentally caught fish come from outside the TAC and OY, they are treated as a prohibited species and retention is prohibited. For 1988 the team recommended that the bycatch rates shown in Table B-7 be used in estimating joint venture and foreign bycatch requirements following a review of 1983-87 foreign observer data. For purposes of public review, the team again recommends using these same rates. During its next meeting, the team will review observer data from the 1988 joint venture fishery and revisions to these initial rates are possible. In instances where there is no observed bycatch, the team recommends that some nominal PSC (e.g. 10 mt) be provided to assure that the fishery won't close due to an inadvertent bycatch.

Table B-7.--Estimated Gulf of Alaska bycatch rates for fully utilized species that will be used in managing the 1988 groundfish fisheries.

	Bottom Trawl - All Areas		Midwater Trawl - All Areas		
	Sablefish	All Rockfish	Sablefish	Slope	Pelagic Shelf
JVP	1.99%	4.57%	0.04%	0.09%	0.02%
TALFF	1.99%	4.57%	0.04%	0.09%	0.02%

	W. Gulf Pacific Cod Longline		C. Gulf Pacific Cod Longline	
	Sablefish	All Rockfish	Sablefish	All Rockfish
JVP	6.91%	0.39%	8.41%	0.23%
TALFF	0.05%	0.02%	0.01%	0.02%

PART C. ECONOMIC SUMMARY

Domestic groundfish fisheries of all major species groups in the Gulf of Alaska produced higher exvessel revenues during 1987. These increases resulted from a combination of favorable economic conditions (higher prices and a lower Japanese exchange rate) and increased harvests by the domestic fleet. With the exception of the flatfish fishery, all of the Gulf joint venture fisheries saw continued declines in harvest during 1987, which dampened the effects of rising prices within those fisheries.

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		Total	14,050	
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