MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke
Executive Director

DATE: November 22, 1991

SUBJECT: Gulf of Alaska Groundfish

ACTION REQUIRED

A. Review 1992 Final Stock Assessment and Fishery Evaluation (SAFE) document.

B. Set 1992 Acceptable Biological Catch (ABC) limits and Total Allowable Catches (TAC) limits for all groundfish.

C. Set 1992 Prohibited Species Catch (PSC) limits for halibut.

BACKGROUND

A. SAFE Document

In September, a preliminary SAFE document was provided which formed the basis for the preliminary groundfish specifications for the 1992 fishing year. The groundfish Plan Teams met in Seattle during the week of November 12-15, 1991 to prepare the final SAFE document provided at this meeting. The individual species or species complex stock assessments contained in the final SAFE may represent changes from the preliminary SAFE. These changes may be based on incorporation of updated stock survey information (such as the annual longline survey), updated catch information, inclusion of discard estimates, or refinement of stock modeling parameters.

This final SAFE for the Gulf of Alaska contains the Plan Team's estimates of biomass and ABCs for all groundfish species covered under the Gulf FMP and information concerning bycatch of halibut to provide guidance to the Council in establishing PSC apportionments. Item D-2(b)(1) is the introductory chapter from the SAFE document which summarizes the Plan Team's recommendations for 1992 ABCs. Table 2 of this introductory SAFE chapter shows the recommended ABCs and the corresponding overfishing levels (in metric tons) for each of the species or species complexes. None of the Plan Team recommended ABCs exceeds or is equal to the overfishing level.

B. Set Initial ABCs, TACs, and Apportionments for the 1992 Fisheries

Item D-2(b)(2) in your notebook is a table describing the 1991 ABCs, TACs, and catch statistics (through November 3) as well as the Plan Team's recommendations for 1992 ABCs for all groundfish species. During the week of this Council meeting, the SSC and AP recommendations will be filled in and supplemental handouts provided to the Council. In 1991, all TACs were apportioned to Domestic Annual Processing (DAP). Under Amendment 21, 25% of the initial specifications for groundfish (from September) will go forward as interim specifications for the 1992 fisheries until superseded by publication of the Council's recommended final specifications in the FEDERAL REGISTER, sometime in early 1992.

For pollock in the Gulf of Alaska, the 1992 ABC recommendation of 111,400 mt (108,000 in the W/C areas and 3,400 mt in the Eastern Gulf) is below the original ABC set for 1991, but above the final 1991 ABC which was set in mid-year. Relative to the 1991 assessment, the current assessment incorporates two major changes: (1) changes in the fishing power correction factors resulted in the revision of the 1984, 1987, and 1990 bottom trawl survey biomass estimates, and (2) historical estimates of discards from the domestic fishery (1986 - present) were incorporated in the stock synthesis (SS) model. Relative to the preliminary 1992 estimates (from September) several new sources of information have become available: (1) biomass estimates from the 1991 hydroacoustic survey, (2) estimates of catch-at-age from the spring 1991 fishery, (3) annual estimates of weight-at-age from the hydroacoustic survey, (4) revised estimates of maturity-at-age, (5) updated estimates of discards and catch, (6) historical length-frequency data, and (7) an estimate of biomass from the Chirikof area in 1975 that was expanded to provide a Gulf-wide estimate.

The ABC estimate of 63,500 mt for Pacific cod is down somewhat from the preliminary estimate for 1992 of 67,900 mt and down considerably from the 1991 ABC of 77,900. Incorporating a revised natural mortality rate and accounting for estimated discards, the stock reduction analysis (SRA) estimates a decline in the biomass for this species which may continue in subsequent years.

For flatfish species, the only change since September in the recommended ABCs comes as a result of the way in which the biomass is calculated for Dover sole (part of the deepwater complex). The result is a decrease in the overall biomass estimate for this complex and a reduction in the ABC of 7,137 mt. The other flatfish groups remain the same as in the preliminary recommendations from September; the final 1992 ABC recommendations are as follows: deepwater flatfish - 39,282 mt; shallow water flatfish - 50,484 mt; Flathead sole - 48,282 mt; Arrowtooth flounder - 303,889 mt. These ABC recommendations are all below the 1991 ABCs for these species; however, they are still considered to be high in abundance and stable.

For sablefish, the results of the 1991 domestic longline survey and the 1991 cooperative longline survey have been incorporated in the stock assessment since the preliminary recommendations in September. The preliminary recommendation was for an ABC of 22,500 mt, the same as for the 1991 fishing year. The final recommended ABC for the 1992 fishing year is down somewhat, to 20,800 mt. The same percentage distribution across management areas is recommended for 1992.

The Plan Team used the mean of the 1987 and the 1990 trawl surveys to estimate exploitable biomass for the slope rockfish species. Lacking an appropriate recruitment scenario, fishing rates equal to natural mortality rates were applied to arrive at the following ABCs: Pacific Ocean Perch (POP) - 11,460 mt; shortraker/rougheye - 1,970 mt; and 'other' slope rockfish - 14,060 mt. The difference between these and previous ABCs is due to the application of new estimates of natural mortality. For POP, the Plan Team again used the F30% rule when determining the overfishing level because

it felt that the calculated B_{msy} and F_{msy} levels could not be adequately defended. This accounts for the large difference between the recommended ABC for 1992 and that established for 1991 when the SSC utilized a different methodology for calculating overfishing.

For pelagic shelf rockfish, the Plan Team used the averages of the 1984, 1987, and 1990 triennial trawl surveys to estimate biomass due to the wide divergence between these trawl surveys. Applying a newly derived natural mortality rate (.09) to the biomass estimate results in a recommended ABC for 1992 of 6,760 mt. This is considerably higher than the 1991 ABC due to the new natural mortality rate. This is partially offset by the fact that the biomass estimate is lower due to inclusion of the 1984 trawl survey. The Plan Team recommends breaking out black rockfish from the pelagic shelf complex beginning in 1992 and managing this species separately (90% of the pelagic shelf complex sampled consists of Dusky rockfish). Because black rockfish are caught in very nearshore waters and are presently managed under the overall pelagic shelf quota, potential overharvest and localized depletions could occur. The Plan Team recommends a 1992 ABC of 400 mt distributed as follows: Western Gulf - 70 mt; Central Gulf - 190 mt; Eastern Gulf - 140 mt. Lacking biomass information on this species, the Plan Team is recommending that the overfishing level be established equal to the 1991 known harvest of this species - 551 mt.

For demersal shelf rockfish, the Plan Teams recommend setting ABC for the Southeast Outside district at the average level of harvest from 1982 to 1989, which is 448 mt. The rationale is that the directed fishery for this species did not legitimately begin until 1982 and, the harvests in 1990 and 1991 were constrained due to PSC closures. New survey information from the East Yakutat area has resulted in a biomass estimate of demersal shelf rockfish for that area. Applying an F=M fishing strategy results in an ABC recommendation for that area of 104 mt. Because Amendment 22 to the Gulf of Alaska FMP effectively will combine the East Yakutat area with the Southeast Outside district, the Plan Team recommends combining this ABC estimate with the 448 mt for a total ABC recommendation for 1992 of 552 mt.

For thornyheads, the 1992 ABC recommendation of 1,280 mt differs from the preliminary recommendation (from September) because the Plan Team utilized an age at recruitment of 16 years and an F50% = .05 rate for calculating ABC (the rate which would reduce the biomass per recruit ratio to 50% of its pristine value).

C. Set Initial PSC Limits for Halibut

Amendment 21 clarifies the halibut PSC framework to permit the Council to specify PSC limits by season and by gear type. For the 1991 fishing year the PSC limits were apportioned as follows:

	Trawl Gear		Hook and Line Gear
1st quarter	600 mt (30%)	1st trimester	200 mt (26.6%)
2nd quarter	600 mt (30%)	2nd trimester	500 mt (66.6%)
3rd quarter	400 mt (20%)	3rd trimester	50 mt (6.8%)
4th quarter	400 mt (20%)		
TOTALS	2000 mt		750 mt

Appendix I of the 1992 final SAFE report contains information on halibut bycatch in the 1991 groundfish fisheries in the Gulf of Alaska. The information in this section details the occurrence of halibut bycatch by time, area, and fishery.

All hook-and-line fisheries were prohibited on July 8 for the remainder of 1991 when the total halibut PSC apportionment to that gear group was achieved. Pot fisheries were exempt from PSC-related closures in 1991.

In 1991, the second quarter trawl halibut PSC apportionment lasted only five weeks, with the bottom trawl fisheries closing on May 8, and reopening on July 1 when the third quarter apportionment became available. All bottom trawling was closed on October 14 when the total annual PSC limit was reached. With the season delays adopted for the 1992 trawl fisheries the seasonal requirements of halibut PSC in the trawl fisheries will likely be altered. The amount needed for the first quarter might be less than in 1991 if all fishing seasons are delayed until January 20. However, the total amount of halibut mortality in bottom trawl fisheries during the first three weeks of 1991 was only about 17 mt.

A much larger reapportionment may be necessary to accommodate a change in the opening date of the directed rockfish trawl fisheries to July 15. Approximately 605 mt of halibut mortality was attributed to the directed rockfish fishery in 1991, primarily executed in March and April, but with significant amounts of the harvest occurring in July, August, and September (most of the total halibut mortality occurred during the March and April fisheries, about 530 mt). Bycatch rates after the beginning of July were only one fourth as high as bycatch rates during March and April (2% vs 8.6%). If we assume that these rates would hold in the 1992 fisheries, then it would not be necessary to reallocate the entire 530 mt from the first and second quarters into the third and fourth quarters. Simply using the bycatch information from the 1991 fisheries would suggest that about 140 mt would need to be reallocated from the first and second quarters (50% from each) to the third and fourth quarters.

INTRODUCTION

This Stock Assessment and Fishery Evaluation (SAFE) report for the Gulf of Alaska groundfish resources is applicable for management of the 1992 groundfish fishery under the Fishery Management Plan for Groundfish of the Gulf of Alaska (FMP). The SAFE presents the best available information on the biological status of groundfish stocks, and recommendations for acceptable biological catches (ABCs), and calculated levels of overfishing for each target species category. As required by the Magnuson Fishery Conservation and Management Act, the North Pacific Fishery Management Council will use these recommendations, as well as socioeconomic information, to determine total allowable catches (TACs) and other management strategies for the 1992 groundfish fisheries in the Gulf of Alaska.

The SAFE report is organized by topic. The first part is the biological section, which presents a Plan Team review of the condition of each target species or species group and recommendations for acceptable biological catch (ABC). The second part is the bycatch section which provides information needed to support development of prohibited species catch (PSC) mortality limits for Pacific halibut.

The third part is an overview of the economic condition of the various Gulf of Alaska groundfish fisheries. This overview, which is bound separately but is part of this SAFE, also includes a detailed description of all groundfish fisheries in the Gulf of Alaska and also in the Bering Sea and Aleutian Islands area.

The Plan Team for the Fishery Management Plan for Groundfish of the Gulf of Alaska met in Seattle on November 12-15, 1991 to review the status of stocks of thirteen species or species groups that are managed under the FMP. The Plan Team review and discussions were based on technical papers from the Alaska Department of Fish and Game and from the Alaska Fisheries Science Center, results from the NMFS 1990 Gulf of Alaska trawl surveys, the 1991 longline survey, and presentations by NMFS scientists. Attendance at the November Plan Team meeting included:

Plan Team Members:	B. Bracken, R. Berg, J. Fujioka, J. Hastie, H. Lai, S. Lowe, C. Oliver, G. Williams.
AFSC scientists/: staff	L. Fritz, A. Hollowed, J. Terry, T. Wilderbuer, J. Pearce, R. Baldwin
Public Attendance:	D. Fredette (Profish International), H. Hartman (Aquatic Resources Conservation Group), C. Blackburn (Alaska Groundfish Databank) F. Matthews (Aquatic Resources Conservation Group) S. Gross (HANA), A. Thomson (Alaska Crab Coalition) P. Pagels (Greenpeace) G. Anderson (Fishing Company of Alaska) T. Smith (Freezer/Longliner Group), B. Larkins (American Factory Trawlers Association)

The 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 minimal mixing of other species occurs in the targeted catch. In the Gulf of Alaska, Pacific cod, pollock, sablefish, Pacific ocean perch, flathead sole and arrowtooth flounder have been managed as single species. Other groundfish species that are usually caught in groups have been managed as complex assemblages. For example, shortraker and rougheye rockfish, other slope rockfish, pelagic shelf rockfish, demersal shelf rockfish, thornyhead rockfish, deepwater flatfish, shallow water flatfish, and other groundfish have been managed as complexes. The FMP, however, authorizes splitting species, or groups of species, from the complexes for purposes of promoting the goals and objectives of the FMP. Acceptable biological catches (ABCs) for a species complex represent potential total yields for the species comprising that complex.

Fishermen 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, or they may be more valuable. Consequently, the implicit risk in species complex management is that one or more of the species in the complex may be over or underharvested. Recognition of this risk is important. Alternative management strategies can be imposed to limit the risk including removing a species from a complex and managing as a single species, or reducing the quota of the complex to protect the more vulnerable species. The Plan Team gave close scrutiny to the species composition of the catch from the species complex management units and made recommendations for adjustments as required.

Except where the State of Alaska manages separate groundfish harvests quotas specified in 5 Alaska Administrative Code (AAC) 28.160, all groundfish catches in waters of the State of Alaska, including internal waters, are managed against TAC specifications. The exceptions pertain to guideline harvest ranges for sablefish and demersal shelf rockfish in the inside substricts of the southeast subdistrict as defined at 5 AAC 28.105 Description of Districts, Subdistricts, and Sections.

NEW INFORMATION

Since the 1991 Stock Assessment and Fishery Evaluation Report (SAFE) was issued (NPFMC 1990), the following new information has become available:

1. For pollock: data from the 1991 spring hydroacoustic survey in Shelikof Strait conducted by the Alaska Fisheries Science Center; estimates of catch-at-age from the spring 1991 fishery; annual estimates of weight-at-age from the hydroacoustic survey; revised estimates of maturity-at-age; updated estimates of catch.

2. For groundfish, generally: data from the NMFS Observer Program Office for 1991; revised estimates of biomass from the 1990 bottom trawl survey in the Gulf of Alaska.

MARINE MAMMAL CONSIDERATIONS

NORTHERN SEA LIONS

Declines in Alaskan northern sea lion numbers as determined from surveys conducted through 1990 were sufficient to lead to a final listing on 26 November 1990 of the species as threatened throughout its range under the Endangered Species Act (ESA). Regulatory measures instituted in 1990 as part of this listing included the designation of 3 nm no-entry zones around all major Alaskan sea lion rookeries west of 150°W longitude. Subsequent emergency regulations instituted in June 1991 prohibited trawling within 10 nm of rookeries in the Gulf of Alaska and eastern Aleutian Islands. In addition, the Gulf of Alaska walleye pollock TAC was split in half between the western and central Gulf of Alaska (at 154°W longitude) to minimize potential localized depletion of walleye pollock stocks.

The northern sea lion recovery team submitted a draft recovery plan for public comment in February 1991. Comments were incorporated into a draft final revision by August 1991, and a final draft is currently under review at NMFS Headquarters, D.C.

1991 Surveys

Aerial surveys of adult and juvenile northern sea lions were conducted during June 1991 at all rookeries and most haul-outs in southeast Alaska, Gulf of Alaska, Band Aleutian Islands. A total of 36,989 animals were counted at trend sites in Alaska (Table 1), a 70% decrease since the 1970s. Numbers at sites in the Kenai to Kiska trend area were 5% lower in 1991 than in 1990. Within this area, the eastern Aleutian Islands numbers increased by 11%, while numbers in the central Gulf of Alaska decreased by 11%. Numbers also decreased in the eastern Gulf of Alaska by 13%. Numbers in the western Aleutian Islands declined by 30% since 1989. Elsewhere numbers remained relatively unchanged since 1990. None of the changes between 1989/90 and 1991 were statistically significant at the 0.05% level.

Counts of pups were made at 13 rookeries in the area from Southeast Alaska through the eastern Aleutian Islands and Bering Sea during July 1991. Pup numbers at all sites other than Forrester and Akun Islands have dropped more than 50% since the mid-1980s (Table 2). However, in the past year pup numbers decreased only at sites in the central Gulf of Alaska (Outer and Marmot Islands). Counts at other sites remained relatively stable or increased. This pattern generally followed the trends in adult numbers, except at Seal Rocks (Prince William Sound) where pup numbers increased somewhat (+15%) while adult numbers decreased by 17%.

Juvenile Survival at Marmot Island

During 1987-88 a total of 800 northern sea lion pups were marked at Marmot Island in a long term study of northern sea lion dispersal, survival, and reproduction. Calkins and Pitcher (1982) found that most of the pups surviving from cohorts marked in the mid-1970s returned to their island of birth by the time they were four to five years old. Life tables they had constructed from mid-1970s collections indicated that 41% of females and 22% of males survived to age four. Based on that study, 50 or survivors of the 400 pups

tagged in 1987, plus some animals from the 1988 cohort were expected to return to Marmot Island in the summer of 1991. A field team was placed on the island during June-July 1991 to count returnees. A maximum of seven tagged animals (of 800) were resighted during the month of observations. These low returns point towards either increased dispersal or some change in life history characteristics (e.g., declining juvenile survival or delayed age of first reproduction). Field teams will return to the island in subsequent field seasons to evaluate these hypotheses.

1990-91 Foraging Studies

Satellite linked radio tags were attached to adult female sea lions (with pups) at rookeries and haul-outs in the Gulf of Alaska and Aleutian Islands during 1990-91. In summer, animals studied remained close to the rookeries (< 30 km), made brief trips (<= 2 days), and made shallow dives ($\bar{x}$ < 30 m). Deepest dive was 120 m. This seems to be characteristic of animals at all of the five sites studied (Chirikof, Ugamak, Ulak, Seguam, and Kiska islands). The short trip durations recorded (and as a result short trip lengths) are confirmed by previous on-land observations of females with pups at Ugamak and Marmot Islands (Merrick 1987; NMFS unpubl. data). However, these on-land observations also noted that females without pups stayed at-sea longer, and as a result, probably forage further away from the rookeries.

Results from the fall and winter studies (again using females with pups at Marmot and Chirikof Islands) indicated that winter trips are much longer in time (up to 4 months) and distance (up to 450 km offshore), and animals dive deeper ($\bar{x}$ up to 84 m with deepest dives at least 273 m).

Aside from the areas immediately around rookeries, areas identified where Gulf of Alaska animals appear to forage in winter include:

- Marmot Island (1 animal tagged) - Portlock Bank and Marmot Bay
- Chirikof Island (3 animals tagged) - Albatross Bank/Barnabus Gully (2 animals), Marmot Gully (1 animal) and Gilbert/Patton Seamounts (3 animals).

Two animals tagged at Puale Bay, Shelikof Strait in winter 1991 foraged within the strait during the one to two weeks they were tracked--one stayed at the southern end and the other foraged on the west side of Kodiak Island. An animal tagged at Marmot Island in January 1990 also visited the northern end of the strait on one trip.

Physiological Studies

One element of the summer 1991 fieldwork was measurement of the physiological condition of 1-2 month old pups. Blood was drawn from 58 pups at 9 sites in the area from southeastern Alaska through the eastern Aleutian Islands to study pup condition. Pups were also weighed at two sites--Ugamak and Atkins Island. Ugamak Island pups were heavier than pups weighed in 1990. While there were no 1990 data for Atkins Island, pups weighed there in 1991 were similar in size to the 1991 Ugamak Island pups. These preliminary results indicate pups in all areas generally appeared healthy without signs of anemia or malnourishment.

Weights of pups measured in the 1989-91 in Alaska were compared to measurements from the 1970s. These data indicate that pups in 1989-91 are at least as large as those tagged in the Gulf of Alaska in the 1970s. Foetal weights from the 1980s were compared to 1970s weights and again no differences were found. These data further support the hypothesis that pups today are as healthy as were Gulf of Alaska pups in the 1970s.

Genetic Studies

Stock differentiation studies using MtDNA analysis were begun during summer 1991. Blood (white blood cells) was collected from adults and pups at sites from southeastern Alaska, the Gulf of Alaska, the Aleutian Islands, and the Pribilof Islands. Analysis of these samples is presently underway.

Incidental Take

Northern sea lions continue to be taken, albeit at low levels, in the groundfish fishery. Thirteen northern sea lions were observed taken through August 1991.

NORTHERN FUR SEALS

A new population estimate of northern fur seals is not available for 1991. In 1990 fur seal numbers on St. Paul Island were stable while those on St. George Island were declining (York 1990, Kajimura and Sinclair in press). The overall Bering Sea population is considered to be depleted but stable.

PACIFIC HARBOR SEALS

NMFS began a comprehensive population assessment of harbor seals in Alaska during 1991. Surveys will continue through the late summer; however, preliminary results are available from 1991 breeding season surveys conducted in the Bristol Bay area (NMFS unpubl. data). These data indicate numbers there have not changed significantly since 1990; however, numbers in the area are still less than half of that observed in 1976. The generally low abundance recorded in recent surveys in the Bristol Bay and Kodiak areas had led NMFS to begin a status review of the Alaskan population of harbor seals. Results of this review should be available in early winter.

KILLER WHALE

Since 1986, NMFS has been conducting investigations of the nature and magnitude of killer whale interactions with sablefish fisheries. Depredation by killer whales on longline catches of sablefish has been documented in the southeastern Bering Sea and Prince William Sound areas (Dahlheim, 1988). Results of dockside interviews conducted in the winter of 1988 with domestic Bering Sea longline fishermen suggested that depredation occurred on 20% of the sets. In Prince William Sound, a 25% predation rate was reported based on interviews conducted with fishermen. Data collected from the Japan/U.S. cooperative longline research surveys operating in the Aleutian Islands and Bering Sea indicate that interactions may be increasing (Yano and Dahlheim, 1991). Probably as a consequence of these interactions, there have been numerous reports of fishermen shooting at whales. Photographs of Alaskan

killer whales show evidence of bullet wounds. Reports have also been received of fishermen using high-powered explosives to frighten whales away from their boats during fishing operations.

Various methods have been tried to reduce or eliminate whale depredation on commercially valuable fish. A Saltonstall-Kennedy grant to Hubb's Research Institute has been used to investigate possible methods to reduce interactions. No consistently effective technique has been developed to date.

Population estimates of killer whales are not available for most Alaskan waters. Prince William Sound is an exception. Based on photo-identification studies that have been ongoing there since 1984, 233 individuals have been identified representing 9 resident pods and 8 transient pods. The pod responsible for most of the fishery interactions in Prince William Sound (AB pod) has experienced a high level of mortality (Matkin et al., 1987). Since 1986, 20 whales (out of a pod of 37 individuals) are missing and considered dead. Prior to being listed as missing, many of these whales showed evidenced of bullet wounds.

Photographs collected from fisheries observers working in the Bering Sea have been submitted to NMFS since 1986. These photographs have also documented bullet wounds on killer whales. In 1991, in addition to the numerous sightings and photographs, NMFS was notified (by domestic observers) of at least four separate records of dead Bering Sea killer whales.

In 1991, NMFS received numerous reports from angry fishermen about problems they are having once again with killer whales in the Bering Sea. The whales are becoming increasingly tolerant of fishing vessels and will follow vessels at extremely close range feeding off discard for days at a time. The close proximity of killer whales to vessels, continued fishery interaction problems, and the suggestion of associated mortality of whales in Alaska make it necessary to obtain Bering Sea/Aleutian Island population estimates of killer whales. As a result, NMFS proposes to assess the population of killer whales in coastal Alaskan waters westward from Kodiak Island. Subject to funding, this project will begin in 1992.

HARBOR PORPOISE

NMFS began a three year assessment of the Alaskan harbor porpoise population during 1991. Vessel surveys were conducted in Southeast Alaska in spring, summer, and fall of 1991, and aerial surveys of Cook Inlet and Bristol Bay during late summer 1991. Initial results indicate high densities of harbor porpoise exist in southeastern Alaska, with low numbers in Bristol Bay and Cook Inlet. Additional surveys will be conducted during 1992-93 in Southeast Alaska, Prince William Sound, Kodiak, and the southside of the Alaska Peninsula.

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Table 1.--Counts of adult and juvenile Steller sea lion observed at trend rookeries and haul-outs in Alaska from the 1970s through 1991.

Area	Count 1970s	Count 1990	Count 1991	Percent change 1970s-91	Percent change 1990-91
Southeast	5,079	6,591	6,992	+38%	+ 6%
Eastern Gulf	7,086	5,545	4,849	-32%	-13%
Trend sites					
Central Gulf	24,678	7,050	6,270	-75%	-11%
Western Gulf	8,311	3,915	3,732	-55%	- 5%
Eastern Aleutians	19,743	3,801	4,230	-79%	+11%
Central Aleutians	36,632	7,988	7,494	-80%	- 6%
Total	89,364	22,754	21,726	-76%	- 5%
Western Aleutians	23,120	4,857[a]	3,422	-85%	-30%
Alaska Total	124,649	39,747	36,989	-70%	- 7%

[a] 1989 count

Table 2.--Counts of northern sea lion pups observed at selected rookeries in the Gulf of Alaska and Aleutian Islands during June and July surveys from 1985 to 1991.

Area or island	Counts			Percent change	
	1984-87	1989-90	1991	1985-91	1990-91
Southeast Alaska					
White Sisters	nc	30+	95	-	+216
Hazy	nc	641	808	-	+ 26
Forrester	1,954	3,016	3,261	+ 67	+ 8
Gulf of Alaska					
Seal Rocks	nc	571	657	-	+ 15
Outer	933	363	180	- 81	- 50
Marmot	4,266	2,199	1,611	- 62	- 27
Chirikof	1,913	607	656	- 66	+ 8
Atkins	2,093	433	505	- 76	+ 16
Pinnacle	2,748	nc	845	- 69	-
Aleutian Islands					
Ugamak	1,635	851	811	- 50	- 5
Akun	60	63	63	+ 5	0
Bogoslof	1,109	461	501	- 54	+ 9
Bering Sea					
Walrus	114	nc	50	- 57	-

CURRENT STATUS OF STOCKS AND ACCEPTABLE BIOLOGICAL CATCHES

Tables 1 and 2 provide a summary of the current status of the groundfish stocks, including estimated maximum sustainable yields, catch statistics, 1991 TACs, final ABCs for 1991, and recommendations for ABCs for 1992. Catch statistics, 1991 TACs, and ABCs are divided among the Gulf of Alaska regulatory areas. These areas are illustrated in Figure 1.

The abundances of Pacific cod, deep-water flatfish, shallow-water flatfish (except rock sole), flathead sole, arrowtooth flounder, and sablefish are high. The abundance of pollock is medium. The abundances of slope rockfish, demersal shelf rockfish, and thornyheads are low.

The sum of the 1992 ABCs is 674,090 mt, which is within the FMP-approved optimum yield (OY) of 116,000-800,000 mt for the Gulf of Alaska. The team notes that because of halibut bycatch mortality considerations in the high-biomass flatfish fisheries, an overall OY for 1991 will be considerably under this upper limit. For perspective, the sum of the TACs was 299,589 mt in 1991.

Figure 1

Regulatory and reporting areas of the Gulf of Alaska

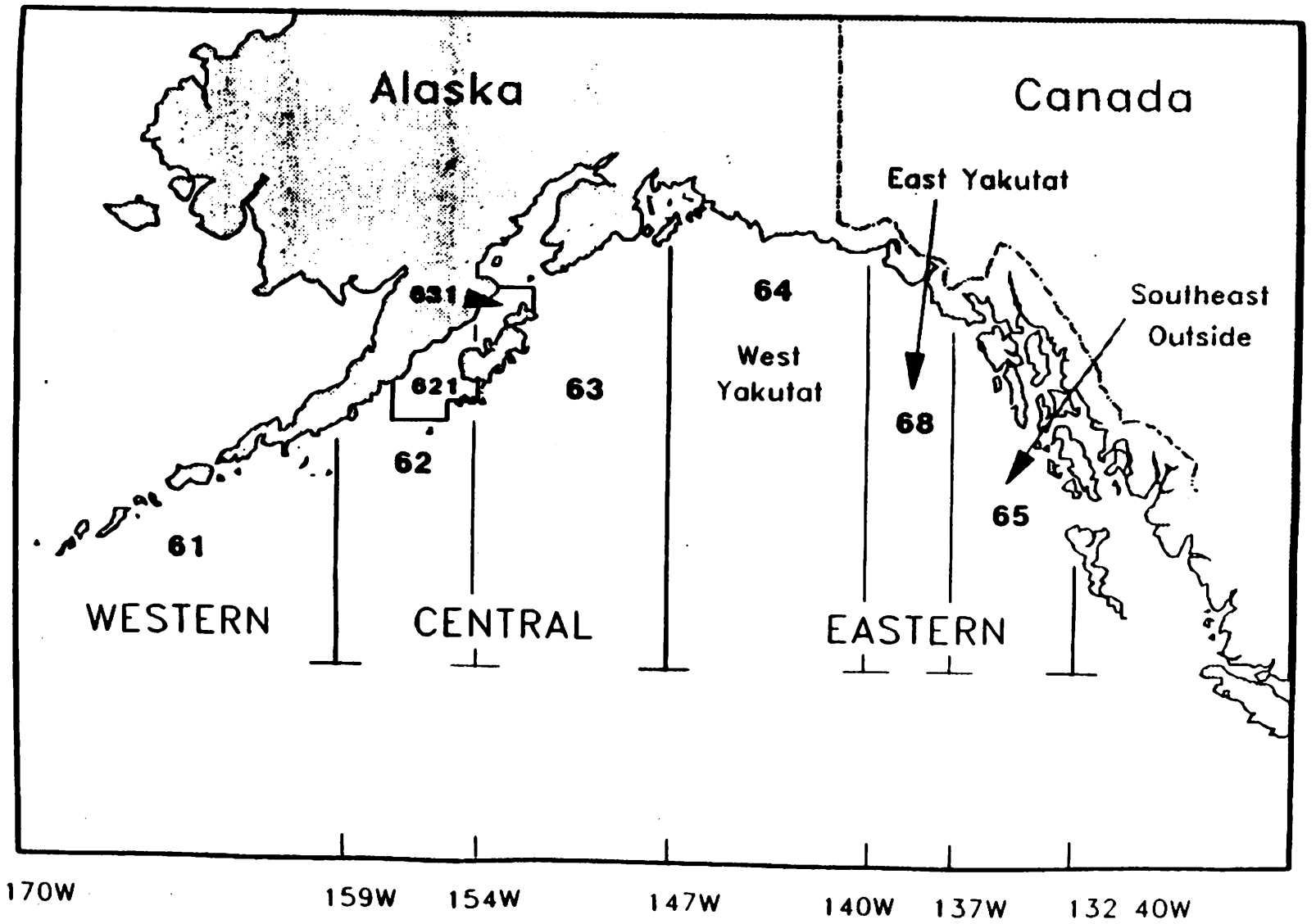

Table 1. Groundfish maximum sustainable yields (MSYs), 1991 and 1992 ABCs, 1991 TACs, and 1991 catches through November 3, 1991.

Species	MSY		ABC (mt) 1991	ABC (mt) 1992	1991 TAC	1991 Catch
Pollock	176,000	W/C	100,000	108,000	50,000	42,302
					50,000	48,115
		E	3,400	3,400	3,400	3,563
		Total	103,400	111,400	103,400	93,980
Pacific cod	39,100	W	30,000	20,900	30,000	29,212
		C	45,000	39,400	45,000	40,421
		E	2,900	3,200	2,900	253
		Total	77,900	63,500	77,900	69,886
Flatfish** (deep water)	13,692	W	2,000	1,740	2,000	1,223
		C	38,900	33,550	10,000	8,842
		E	9,600	3,990	3,000	148
		Total	50,500	39,280	15,000	10,213
Flatfish*** (shallow water)	28,254	W	48,800	27,480	3,000	1,449
		C	22,200	21,260	7,000	3,015
		E	3,000	1,740	2,000	6
		Total	74,000	50,480	12,000	4,470
Flathead sole	16,589	W	12,600	12,580	2,000	110
		C	32,700	31,990	5,000	882
		E	5,000	3,710	3,000	1
		Total	50,300	48,280	10,000	993
Arrowtooth flounder	110,042	W	40,800	38,880	5,000	2,455
		C	272,100	253,320	10,000	13,044
		E	27,200	11,680	5,000	320
		Total	340,100	303,880	20,000	15,819

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Table 1 (cont.) Groundfish maximum sustainable yields (MSYs), 1991 and 1992 ABCs, 1991 TACs, and 1991 catches through November 3, 1991.

Species	MSY (mt)		ABC (mt) 1991	ABC (mt) 1992	1991 TAC	1991 Catch
Sablefish	26,900	W	2,925	2,500	2,925	1,815
		C	10,575	9,570	10,575	10,820
		WYK	4,050	3,740	4,050	3,577
		SEO	4,950	4,990	4,950	5,890
		Total	22,500	20,800	22,500	22,102
Slope rockfish (other) (MSY for all species)	15,000-27,700	W	1,212	1,390	1,212	847
		C	5,454	6,510	5,454	5,130
		E	3,434	6,160	3,434	519
		Total	10,100	14,060	10,100	6,496
Pacific Ocean Perch		W	1,624	3,240	1,624	1,397
		C	1,798	3,440	1,798	2,763
		E	2,378	4,780	2,378	1,971
		Total	5,800	11,460	5,800	6,131
Shortraker/Rougheye		W	100	100	100	73
		C	1,320	1,290	1,320	868
		E	580	570	580	410
		Total	2,000	1,960	2,000	3,563
Pelagic shelf rockfish	Unknown	W	800	1,180	800	215
		C	3,100	4,320	3,100	1,146
		E	900	1,260	900	932
		Total	4,800	6,760	4,800	2,293
Black rockfish	Unknown	W		70		
		C		190		
		E		140		
		Total		400		
Demersal shelf rockfish	Unknown	SEO	Unknown	550	425	382

(continued on next page)

Table 1 (cont.) Groundfish maximum sustainable yields (MSYs), 1991 and 1992 ABCs, 1991 TACs, and 1991 catches through November 3, 1991.

Species	MSY (mt)		ABC (mt) 1991	ABC (mt) 1992	1991 TAC	1991 Catch
Thornyhead rockfish	3,750	GW	1,798	1,280	1,398	1,071
Other species	NA	GW	NA	NA	14,266	4,833
Totals			743,198	674,090	299,589	240,020

* Shelikof Strait pollock is included within the W/C ABC range.
** "Deep water flatfish" means rex sole, Dover sole, and Greenlan turbot.
*** "Shallow water flatfish" means rock sole, yellowfin sole, butte sole, starry flounder, and other flatfish not specifically defined
GW means Gulfwide

Table 2. Exploitable biomasses, 1992 ABCs, and estimated trends and abundances of groundfish.

Species	Exploitable Biomass (mt)		1992 ABC	Overfishing level	Abundance, trend
Pollock	838,000	W/C	108,000	134,000	Medium, stable
		E	3,400		
		Total	111,400		
Pacific cod	363,000	W	20,900	28,830	High, decreasing
		C	39,400	54,350	
		E	3,200	4,420	
		Total	63,500	87,600	
Flatfish (deep water)	169,132	W	1,740	2,280	High, stable
		C	33,550	43,960	
		E	3,990	5,230	
		Total	39,280	51,470	
Flatfish (shallow water)	257,338	W	27,480	38,830	High, stable
		C	21,260	29,490	
		E	1,740	2,600	
		Total	50,480	70,920	
Flathead sole	240,615	W	12,580	16,490	High, stable
		C	31,990	41,700	
		E	3,710	4,860	
		Total	48,280	63,050	
Arrowtooth flounder	1,787,583	W	38,880	54,660	High, stable
		C	253,320	356,140	
		E	11,680	16,420	
		Total	303,880	427,220	
Sablefish	179,000	W	2,500	3,380	High, decreasing
		C	9,570	12,950	
		WYK	3,740	5,060	
		SEO	4,990	6,750	
		Total	20,800	28,150	

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Table 2. (cont.) Exploitable biomasses, 1992 ABCs, overfishing leve and estimated abundances and trends of groundfish.

Species	Exploitable Biomass (mt)		1992 ABC	Overfishing level	Abundance, trend
Slope rockfish (Other)	230,480	W	1,390	2,050	Low, unknown
		C	6,510	9,590	
		E	6,160	9,070	
		Total	14,060	20,710	
Pacific Ocean Perch	229,100	W	3,240	6,810	Low, unknown
		C	3,440	7,220	
		E	4,780	10,030	
		Total	11,460	24,060	
Shortraker/ Rougheye	72,960	W	100	150	Low, unknown
		C	1,290	1,900	
		E	570	850	
		Total	1,960	2,900	
Pelagic shelf rockfish	75,110	W	1,180	1,980	Relative abundance unknown
		C	4,320	7,250	
		E	1,260	2,110	
		Total	6,760	11,360	
Blackrock rockfish	Unknown	W	70		Relative abundance unknown
		C	190		
		E	140		
		Total	400		
Demersal shelf rockfish (SE Outside district)	Unknown		552	730	Depressed, stable
Thornyhead rockfish	25,700	Gulfwide	1,280	2,440	Depressed, decreasing
Other species	NA	Gulfwide	NA		TAC = 5% of the sum of TACs

$\Sigma = 4,468,018$

Pollock

	ABC	Exploitable Biomass	Catch
1990	73,400	1,050,000	77,700
1991	103,400	1,088,000	82,700
1992	111,400	838,000	

The exploitable biomass estimates from 1990 and 1991, are from the stock synthesis (SS) model as determined in previous years. The estimated 1992 biomass is 838,000 mt, which is based on a projection from this year's estimate of 1991 biomass (which is now estimated at 843,000 mt) from stock synthesis.

The current assessment incorporates two important changes relative to the 1991 SAFE. First, the 1984, 1987, and 1990 gulf-wide bottom trawl survey biomass estimates were revised. This was due to changes in the fishing power correction factors applied to bottom trawl data. Second, historical estimates of discard from the domestic fishery (1986-present) were accounted for in the SS model. These changes were introduced in the preliminary 1992 SAFE.

Relative to the preliminary (September) 1992 SAFE, several new sources of information have become available: a) biomass estimates from the 1991 hydroacoustic survey; b) estimates of catch-at-age from the spring 1991 fishery; c) annual estimates of weight-at-age from the hydroacoustic survey; d) revised estimates of maturity-at-age; e) updated estimates of discard and catch; f) historical length-frequency data; and g) an estimate of biomass for the Chirikof area in 1975 that was expanded to provide a gulf-wide estimate.

The addition of the varied pieces of new information required that several configurations of the model be explored. The relative impact of several factors were examined including: a) utilization of a composite model (all data components weighted equally); b) imposing 1, 2 or 3 fishery partitions; c) incorporation of historical length-frequency data or the estimated age composition data; and d) estimation of selectivity vectors for the surveys.

The 1991 hydroacoustic data continue to confirm that the 1988 year class will be above average. The fishery catch-at-age data for both 1990 and the spring of 1991 are dominated by the strong 1984 year class. In addition, the spring 1991 fishery age data showed a dominant 1982 year class which had not previously shown up in any other data sets. This may be attributed to aging error. Exploratory runs with SS were not able to provide a reasonable fit to the 1991 fishery age-composition. Because these data may not represent catch at age for the entire year, it was not included in subsequent runs.

Based on the exploratory runs, the following determinations are made: a) a priori assumptions regarding the information content of survey data are necessary, and b) 3 partitions of the fisheries data and the exclusion of the preliminary 1991 fisheries age-composition data are justified. With these considerations, three configurations of the stock assessment model were then presented. All 3 versions incorporated hydroacoustic data as indices of abundance and the only absolute biomass estimate was from the 1990

bottom trawl survey. This configuration was introduced in the preliminary SAFE, but is different relative to the previous year. Previously, the model was tuned to either the hydroacoustic biomass estimate or the bottom trawl biomass estimate, as these pieces of information were contradictory and could not be simultaneously fit in the model. Recent estimates of biomass from hydroacoustic surveys have been much lower than gulf-wide bottom trawl estimates. Weighting the hydroacoustic time series equally to the fisheries data provides a mechanism for accounting for the large population estimates observed in Shelikof Strait during the early 1980s. Tuning to the 1990 bottom trawl biomass estimate adjusts the ending biomass to a level that was observed in the recent gulf-wide bottom trawl survey. The Plan Team concurs that this is the most appropriate way to incorporate the hydroacoustic and bottom trawl data.

The 3 configurations of the model with survey data incorporated as above, differed as follows: Model A did not incorporate the estimate of 1975 biomass and let the model estimate survey selectivity; Model B incorporated the 1975 biomass estimate and also let the model estimate survey selectivity; Model C incorporated the 1975 biomass estimate, but survey selectivity was fixed. The first two models (A and B) showed a linearly declining selectivity with increasing age for the hydroacoustic survey. This selectivity did not seem to appropriately represent what would be expected selectivity for the hydroacoustic survey. Therefore, in model C, the selectivity was fixed to provide a more reasonable trend for the hydroacoustic survey. The Team concurred with the assessment, that this was the most appropriate configuration of the SS model.

Predicted 1991 mid-year biomass was 843,000 mt. The 1992 mid-year biomass was projected to be 838,000 mt. A Beverton-Holt recruitment relationship was fit to the estimated recruitments and spawning stock biomass. Although the Team had reservations about the assumed stock-recruitment relationship, they utilized the estimated F_{msy} from the analysis to estimate ABC. It was felt that there was utility in using the recruitment information, and that using the stock-recruitment relationship did provide conservatism as opposed to utilizing an $F_{0.1}$ level from yield-per-recruit. The yield-per-recruit analysis does not have any density-dependence which would lower recruitments at low spawning stock biomasses. The F_{msy} is 0.16. Harvesting at this level for 1992-94 (assuming weak recruitments) provided an average yield of 108,000 mt which is the recommended ABC.

The Team notes that harvesting at the F_{msy} level would drop the spawning stock biomass below the lowest observed level. This may be a pessimistic projection, as it does assume weak recruitments from the 1989-92 year classes. The Team would also like to note that the ABC assumes uniformly distributed harvests of the exploitable biomass across ages, whereas, harvests could be concentrated disproportionately on different age classes. We do not know the affect of differential harvests on future productivity.

Current biomass is predicted to be above the B_{msy} level. Therefore, pollock are not considered to be overfished if the fishing mortality does not exceed F_{msy} (equal to 134,000 mt). There is

sufficient concern with the stock-recruitment relationship, that a more appropriate level of overfishing may be the fishing mortality rate that results in the biomass to recruit ratio falling to 30% of the pristine level. This rate was estimated at 0.283, which corresponds to a harvest of 219,000 mt. The recommended ABC is 108,000 mt, therefore, pollock are not considered overfished.

Pacific cod

	ABC	EXPLOITABLE BIOMASS	CATCH
1990	90,000	467,100	74,647
1991	77,900	418,000	78,314*
1992	63,500	363,000	

* (PacFIN as of 8/20/91)

The 1990 bottom trawl survey of the Gulf of Alaska provided data for estimation of biomass of Pacific cod by management area. Incorporating the bottom trawl results from 1984, 1987 and 1990, a new estimated natural mortality rate of 0.27, and the discard rate of 3%, the SRA model estimated exploitable biomass for 1992 at 363,000 mt. This is a decline in biomass from previous years and the projection model estimates that the decline may continue.

The $F_{0.1}$ rate (0.177) applied to the projected 1992 exploitable biomass of 363,000 t provides an estimate of ABC of 63,500 t. This should be distributed by management area approximately as the biomass is distributed: 33% (20,900 t) in the western area; 62% (39,400 t) in the central area; and 5% (3,200 t) in the eastern area.

The fishing mortality rate that would constitute overfishing would be 0.245. This is the fishing mortality rate that would result in the equilibrium biomass-per-recruit ratio falling below 30% of its pristine value. The estimated 1992 catch at overfishing level is 87,600 t. Hence, the recommended ABC, with an associated fishing mortality rate of 0.177, does not violate the Council's overfishing policy.

Flatfish

		ABC	EXPLOITABLE BIOMASS	CATCH
1990	Deep Water	108,400	541,618	6,696
	Shallow Water	84,500	424,856	4,584
	Arrowtooth	194,600	1,144,242	4,132
	TOTAL	87,500	2,110,716	15,412
1991	Deep Water	50,500	169,132	10,213
	Shallow Water	74,000	257,338	4,470
	Arrowtooth	340,100	1,787,583	15,819
	Flathead sole	50,400	240,615	993
	TOTAL	515,000	2,454,668	31,495 *
1992	Deep Water	39,282	196,289	
	Shallow Water	50,484	257,338	
	Arrowtooth	303,889	1,787,583	
	Flathead sole	48,282	240,615	
	TOTAL	441,937	2,481,825	

* Catch through November 3, 1991

The 1992 exploitable biomass for each category is the same as the absolute abundance estimated from the 1990 triennial trawl survey, with the exception of the deepwater flatfish complex. These estimates have changed from the values presented in the 1991 SAFE document as the result of new analyses based on improved Fishing Power Corrections (FPC). The table above includes these changes for 1991 and 1992. The large decrease in biomass of the deep water group between 1990 and 1991 is due primarily to the removal of flathead sole from that category beginning in 1991. The current 1992 biomass estimates for the deepwater category are also changed due to revisions in the way the biomass is calculated for the Dover sole component of that group. CPUE information from comparable haul stations completed in 1987 and 1990 (less than 500 meters) indicate the biomass declined in 1990 to 41% of its 1987 level. Biomass was recalculated assuming that the 1990 biomass also declined by this same proportion at the unsampled depths greater than 500 m. The decrease in shallow water flatfish between 1990 and 1991 is due mainly to decreasing abundance of rock sole.

The ABCs for the four flatfish categories were determined by applying the $F_{0.1}$ fishing mortality rates determined from yield-per-recruit analysis, to the exploitable biomass estimates. The 1992 ABCs were calculated using the same fishing mortality rates as 1991; however, the 1992 ABCs differ from 1991 because the estimates of exploitable biomass have changed and are now lower than the biomass values presented in the 1991 SAFE document.

The plan team recommends that ABCs for each group be apportioned among the three regulatory areas in proportion to biomass distributions in the 1990 trawl survey. The resulting distributions are:

	WEST	CENTRAL	EAST	TOTAL
Deep Water	1,738	33,554	3,990	39,282
Shallow Water	27,481	21,262	1,741	50,484
Arrowtooth	38,881	253,325	11,683	303,889
Flathead sole	12,584	31,988	3,710	48,282
TOTAL	80,684	340,129	21,124	441,937

Gulf of Alaska flatfish are not considered overfished so long as the fishing mortality rate remains below the level that would result in the spawning biomass-per-recruit ratio falling to 30% of its pristine value. These fishing mortality rates are 0.239 for arrowtooth flounder, 0.262 for flathead sole, 0.263 for rock sole, and 0.296 for yellowfin sole. The $F_{0.1}$ values for these species are at or below 0.20, therefore flatfish are not considered overfished.

Sablefish

	ABC	EXPLOITABLE BIOMASS	CATCH
1990	26,200	226,000	25,570
1991	22,500	194,000	19,580
1992	20,800	179,000	

Beginning in 1990 the cooperative longline survey and the domestic longline survey provided divergent estimates of the level and trend in exploitable sablefish biomass in the Gulf of Alaska. In 1991 the cooperative survey estimate for RPW along the continental slope is 30% less than the corresponding value from the domestic survey.

To compute an ABC for the 1992 fishery, these relative biomass values are averaged and expanded with a scaling factor, and then input into a delay difference equation model to project biomass to the beginning of 1992. Assuming zero recruitment, this value is calculated to be 179,000 mt. Using the $F_{0.1}$ exploitation rate of .116 results in an ABC for 1992 of 20,800 mt.

The 1988 to 1990 TACs were distributed in proportion to distribution of biomass in the 401-1000m biomass distribution as estimated from the 1987 longline survey. The 1991 TAC was apportioned as the 401-1000m biomass distribution obtained from the 1990 longline survey. The corresponding RPW distribution obtained from the 1991 survey compares to the average 1988-91 RPW proportions and the 1988-91 TAC apportionments as follows:

	1991 RPW	1988-91 RPW	1991 TAC	1988-90 TAC
Western	.09	.12	.13	.145
Central	.45	.46	.47	.45
W. Yakutat	.19	.18	.18	.175
E. Yak/S.E.	.27	.24	.22	.23

The Team feels apportioning the ABC by either scheme or moderate variations of them would be satisfactory. The 1992 ABC recommendation divided in proportion to the 1988-91 RPW would be: 2,500 mt to the Western, 9,570 mt to the Central, 3,740 mt to West Yakutat, and 4,990 mt to East Yakutat/Southeast Outside.

The Team discussed the potential problems of apportioning ABC under an area specific ITQ system, which could be highly contentious as result of the immediate financial impact. Using an average of past survey results such as presented above could reduce some of the impact, but any changes in the survey methodology would be met with inordinate scrutiny because of the financial interest involved.

The $F_{0.1}$ fishing rate is below the estimated F_{msy} level of 0.27, as well as the fishing rate, F=0.18, that would drive biomass per recruit to 30% of its unexploited value. Therefore, the recommended ABC does not exceed that allowed by the overfishing definition.

Slope rockfish

		ABC	EXPLOITABLE BIOMASS	CATCH
1990	Slope complex	17,600	729,000	21,114
1991	Pacific ocean perch	5,800	231,900	5,372
	shortraker/rougheye	2,000	72,500	1,306
	other slope species	10,100	201,100	4,707
1992	Pacific ocean perch	11,460	229,100	6,091
	shortraker/rougheye	1,970	72,960	1,350
	other slope species	14,060	230,480	6,477

The 1990 trawl survey estimates of slope rockfish indicated an inexplicable decrease in exploitable biomass of slope rockfish from 1987 estimates (729,000 mt to 336,000 mt). Because of lack of significance in fitting the model to the two points, the mean of the two surveys are used to estimate exploitable biomass rather than using model projections.

Because an appropriate recruitment scenario could not be determined, fishing rates equal to natural mortality rates are applied to the exploitable biomass to obtain ABC. The ABC for Pacific ocean perch is 11,460 mt, for shortraker/rougheye, 1,970 mt, and other slope rockfish, 14,060 mt. The difference from the September preliminary recommendation for other slope rockfish is due to the application of new estimates of natural mortality rates for some of those species.

The Plan Team did not reach a consensus on what version of the overfishing definition should apply to Pacific ocean perch. At least one member felt that the Bmsy and Fmsy levels calculated in table 5-11 should be used in some manner, such as that used by the SSC. Others felt that the assumptions made in calculating those values could not be defended, and therefore the proper application of the overfishing definition called for use of the F30% rate. While emphasizing that the resulting overfishing limit is not a desirable harvest rate and the harvest should not exceed the ABC, the Team computes the overfishing limit to be 24,060 mt, using an F30% =0.105.

An F30% value of 0.046 was calculated for rougheye rockfish, which if applied to the rougheye rockfish biomass estimate of 44,468 mt results in an overfishing level of 2,046 mt. An F30% for shortraker has not been computed because of a lack of growth data, therefore F=M was applied, and the two overfishing levels were summed to obtain an overfishing limit for shortraker/ rougheye of 2,900 mt. This value was apportioned to the regulatory areas in proportion to the ABC.

For other slope rockfish, the rate of overfishing would be determined by applying F30% values of 0.113 and .080, for northern and sharpchin rockfish respectively, and natural mortality rates for the remaining species. This results in an overfishing limit of 20,710 for the other slope rockfish, which were applied to areas in proportion to the ABC.

The low ABC value of shortraker/rougheye in the western Gulf has led to a Gulf-wide pooling of 1991 ABC and overfishing limits to avoid severe bycatch consequences. Because it is believed the rate of movement between adult concentrations is minimal for slope rockfish, area-by-area specification of TAC's, ABC, and overfishing levels would be most appropriate for slope rockfish, in comparison to other species, such as sablefish, for eg. Ie, the slope rockfish would be one of the least appropriate species to have a Gulf-wide pooling of ABC or overfishing limits. It is recognized, however, that the current management areas do not have a biological basis, nor in fact, is there solid proof, as yet, that slope rockfish do not move extensively, nor can we really specify the ABC and overfishing limits without a great deal of uncertainty. Nevertheless, the Plan Team at this time does not recommend exceeding the current estimates of area specific ABC's without further consideration.

The magnitude of the decrease observed from the 1987 to the 1990 trawl survey casts uncertainty as to the validity of at least one or both of the survey results, or to the fishing mortality reported during the period between the surveys. The Team points out that, while the survey data indicates a dramatic decrease and the stock should be watched carefully, they are not comfortable with the

capability of the present survey methods to accurately assess the abundance of rockfish. They recommend that innovative new techniques and approaches be attempted to better determine the distribution and abundance of slope rockfish. A survey approach that can utilize the capabilities of successful rockfish operations should be considered. The AFSC has developed a rockfish assessment working plan which contains plans to evaluate new survey approaches and explore experimental management schemes to test a range of harvest levels.

The Team discussed a number of factors to consider in setting TAC. The high historical abundance of Pacific ocean perch and the former rebuilding considerations of the Council in setting the Pacific ocean perch complex OY's in the past were mentioned. It was also noted that the current population seems to be made up mostly of relatively young fish, with two larger than average year classes. The potential for the stock of these relatively longlived species to grow into a much larger stock with a greater proportion of older fish was discussed. The Team also noted the possibility that the 1990 survey was providing the correct estimate of biomass, and the average of the 87 and 90 survey results results in a possible overestimate of current biomass.

Pelagic shelf rockfish

	ABC	EXPLOITABLE BIOMASS	CATCH
1990	8,200	164,000	1,647
1991	4,800	95,284	950
1992 revised complex (black rockfish deleted)	6,760	75,110	

Recent increases in the harvest of black rockfish has led the team to recommend separate quotas for black rockfish from the rest of the pelagic shelf rockfish (see the following black rockfish summary section).

The trawl survey biomass estimates in 1984, 87, and 90 for the revised pelagic shelf rockfish complex varied greatly. Because the validity of the large difference in the surveys is questionable, the mean of the estimates is used as exploitable biomass for computing the 1992 ABC. The team differs from the approach of the chapter authors and the preliminary SAFE by including the 1984 dusky rockfish estimate in the average. The authors and the preliminary team estimate used only 1987 and 90 results. The Team noted that the 87 survey was exceptionally high compared to the 84 and 90 surveys, and felt that using the 84 survey would temper any potential errors in the 87 survey. The section authors felt that the 1984 survey was less comparable to the other surveys because of fishing power corrections.

A fishing rate rate equal to an estimated natural mortality rate of 0.09 was used to compute an ABC of 6,760 mt. The recommended distribution of the ABC is: 1,180 mt in the Western area, 4,320 mt in the Central area, and 1,260 mt in the Eastern area.

The overfishing definition for this complex is based on the fishing rate that would reduce the Dusky rockfish exploitable biomass per recruit ratio to 30% of its unexploited value. This is estimated to be 0.151. Distributing the overfishing limit for the revised complex in proportion to the ABC, results in 1,980 mt, 7,250 mt,

and 2,110 mt, for the western, central, and eastern GOA respectively.

The Team points out the doubtful validity of bottom trawl surveys' ability to assess pelagic species.

BLACK ROCKFISH

The Plan Team noted that the harvest of black rockfish has increased dramatically over the past year to a total Gulf-wide harvest through October of 531 mt. The increase was particularly noticeable in the Central Area where 375 mt of harvest was reported. The total harvest is approximately 30% of the entire biomass of this species as estimated by the 1990 Triennial Survey. However, most of this harvest occurred in near-shore waters which were shallower than the area included in the Triennial surveys and the survey is not considered to be an adequate indicator of black rockfish biomass.

The Team is concerned that since the biomass of black rockfish is unknown, continued high harvest levels may pose a risk to this resource. Because of this, the Team recommends separating black rockfish from the pelagic group and establishing separate TACs for this species. The Team further recommends that the 1992 overfishing level be set equal to the 1991 preliminary harvest level of 531 mt.

No data is available to calculate near-shore biomass, MSY, or ABC for this species and very little data is available with which to determine an appropriate TAC. The recommended values shown below were derived through team discussion and are based on limited knowledge of the distribution and abundance of this species. The resulting recommendation is admittedly more qualitative than quantitative in nature.

AREA	1991 HARVEST[1]	1992 TAC
WESTERN GOA	70 mt	70 mt
CENTRAL GOA	403 mt	190 mt
EASTERN GOA	57 mt	140 mt

[1] Preliminary harvests through October, 1991.

DEMERSAL SHELF ROCKFISH

	ABC	EXPLOITABLE BIOMASS	CATCH
1990	470	?	323[1]
1991	445[2]	?	284[1]
1992	552[2]	7,086[3]	

[1] Through October, 1991
[2] For S.E. and E. Yakutat as combined under Amendment 22
[3] Applies to E. Yakutat only. Biomass is currently unknown for the S.E. Outside District

Harvest of demersal shelf rockfish in the Southeast Outside (SEO) District through October 1991 totalled 284 mt, which is 33% below the annual TAC of 425 mt. It should be noted, however, that for the second year the harvest of DSR has been constrained by halibut PSC closures to all hook and line gear in the GoA and was further constrained by the trawl closure in the Eastern Gulf. Harvest in the E. Yakutat area totalled 209 mt which is substantially higher than the 36 mt reported for all of 1990 and the 39 mt average over the preceding six years.

No new information was presented with which to calculate MSY or ABC for DSR in the SEO District using conventional analytical methods. For 1991 the Council adopted the default overfishing definition which establishes the threshold at the average harvest over since implementation of the MFCMA when biological data are lacking. The fishery did not begin until 1982 and so the average harvest during the period between 1982 and 1989 was used to estimate the threshold level. The resulting overfishing threshold level of 445 mt was presumed to be equal to ABC for 1991. Using this same method results in an overfishing threshold of 448 mt for 1992. This is based on the average landings of DSR in the SEO District between 1982 and 1989 as listed in table 7.2 of the 1992 SAFE chapter on DSR. ABC is assumed to be equal to the 448 mt overfishing threshold. Both 1990 and 1991 were excluded from the calculation because the fishery was curtailed during both of those years when the halibut PSCs were reached and the Team did not feel it was appropriate to include the resulting reduced harvest levels when calculating the average harvest of DSR.

Survey information was presented from the E. Yakutat area which resulted in a total biomass estimate of 7,087 mt of DSR. However, it was pointed out that yelloweye rockfish make up over 96% of the DSR harvest from that area and so the biomass estimate of 5,275 mt of yelloweye rockfish was used to calculate the ABC for the assemblage. This was done to avoid a differentially high harvest of yelloweye. Because of the vulnerability to overexploitation, the conservative value of F=M was used to calculate an ABC estimate of 104 mt for the E.Yakutat area.

The overfishing value for the E. Yakutat area was set at the value which results in the yield-per-recruit ratio falling to 30% of its pristine level. A value of $F_{overfishing} = 0.04$ would define the overfishing level for DSR. This results in an overfishing level of 284 mt for the E. Yakutat area.

Amendment 22 combines the S.E. Outside and E. Yakutat areas into one management district. Blending the numbers from the two areas would result in an ABC for DSR of 552 and an overfishing level of 732 mt for the single expanded S.E./E.Yakutat management area.

Thornyhead rockfish

	ABC	EXPLOITABLE BIOMASS	CATCH
1990	3800	98,670	1646
1991	980	25,697	769*
1992	1,280	25,697	

* Catches through July

Based on results of the 1990 trawl survey the best estimate of current exploitable biomass for 1992 is 25,697 t. The estimate has been adjusted upward to account for the lack of survey stations in 1990 at depths greater than 500 m. To adjust the 1990 estimate for the unsampled depths, the average proportion of the total biomass found deeper than 500 m in 1987 and 1984 (33 %) was assumed to be the same proportion of the total that would have been found in 1990. The estimated 1990 trawl survey CPUE represents a large decrease from that of 1987. The 1987 survey biomass estimate was not used because of extremely high CPUE's observed. These high CPUE's may have been caused by fishing power corrections applied to the deepwater observations. Also, the cooperative longline survey shows that thornyhead relative abundance has declined since 1988. Therefore, the 1990 trawl survey biomass estimate was used as an estimate of current biomass. Length-frequency distributions from the 1984 and 1987 surveys do not indicate any incoming strong year classes.

The Team recommends that $F_{50\%} = 0.05$, the rate which would reduce the biomass per recruit ratio to 50% of its pristine value, estimated from the natural mortality rate of 0.07 and age at recruitment of 16 yrs, be used for estimating ABC for 1992. At the current exploitable biomass of 25,697 t, the ABC for 1992 is 1,280 t.

The fishing mortality rate that would constitute overfishing would be 0.095. This is the fishing mortality rate that would result in the biomass-per-recruit falling below 30% of its pristine value. The estimated 1992 catch at overfishing level is 2,441 t.

PROHIBITED SPECIES CATCH SUMMARY FOR HALIBUT

The GOA Plan Team recommends continued evaluation of both bycatch rates and mortality estimates for incidentally caught and released halibut from all Gulf of Alaska groundfish fisheries. The Team has reviewed bycatch rates and mortality estimates gathered from the 1991 Domestic Observer Program. Actual bycatch rates from the Domestic Observer Program should be used by the Council and NMFS to monitor cumulative halibut mortality during 1992. The Team notes further that the bycatch information in this SAFE report may be helpful to the Council in examining possible halibut mortality implications when setting final groundfish TAC's for 1992.

The team recommends that halibut bycatch in 1991 should be managed using actual observed bycatch rates. In addition, the team recommends that observers in the 1991 Domestic Observer Program collect information concurrently on the condition factors and size of halibut caught as bycatch in all fisheries. The timing of observations relative to the return of fish to the ocean should also be recorded.

In 1991, Gulf of Alaska fisheries were managed with the following discard mortality rates by gear group: Trawl - 50%; Longline - 16%; Pot - 12%. The Plan Team recommends the following discard mortality rates for the 1992 fishery: Trawl - 65%; Longline - 16%; Pot - 10%. For trawl fisheries, this represents a considerable change from the previous assumed mortality rate of 50%. Appendix III of this SAFE report discusses in detail the basis of this recommended change by the Plan Team. The International Pacific Halibut Commission (IPHC) analyzed condition data collected by observers during the entire 1990 fishing year. The results indicate a halibut mortality rate in the trawl fisheries which is higher than previously assumed (65% vs 50%). Analysis of data for longline fisheries indicate that the 16% assumed mortality rate is still valid for monitoring the 1992 fisheries. For pot gear, the IPHC report recommends adopting an assumed mortality rate of 10%, down slightly from the previously assumed 12%. The Plan Team recommends adoption of these revised mortality rates for managing the 1992 fisheries.

For purposes of evaluating existing PSC cap levels, estimates of the halibut mortality associated with anticipated groundfish TACs were made for longline and trawl gear (pot gear was exempted from PSC cap closures in 1991 and was not included in this analysis). Results are detailed in the halibut PSC chapter (Part B) of this SAFE document. Part B also contains additional information to assist the Council in its framework process for establishing PSC limits for the coming year. This includes bycatch rates by fishery (species), gear type, management zone, week, and processing mode. A review of the 1991 fishery is included with a description of bycatch related closures and effects on other directed groundfish fisheries. Seasonal distributions of both halibut and target groundfish species are discussed with guidelines for seasonal distribution of the halibut PSC caps.

ECONOMIC OVERVIEW

Economic developments in the Gulf of Alaska (GOA) groundfish fishery

Landings data presented in the economic section was extracted from PacFIN on August 23, 1991. This data may differ from catch data presented elsewhere in the SAFE, due to lags in processing fish tickets and the presence of discards. Caution should be used in judging reductions in harvest during 1991 because of the incomplete data. No joint-venture or foreign harvest has occurred in the GOA since 1988. Domestic landings of all groundfish increased from 143,800 mt in 1988 to 219,800 mt in 1990. Year-to-date GOA landings for 1991 are 180,000 mt. Longline landings have held relatively stable since 1988, at just over 30,000 mt. Longline sablefish landings fell by about 1,800 mt (7%) between 1988 and 1990, while Pacific cod rose by 2,600 mt (67%). Year-to date Pacific cod landings have increased the 1990 total by another 1,300 mt. GOA trawl landings increased from 144,000 mt in 1980 to 220,000 mt in 1990. Over this period trawl landings of Pacific cod increased from 26,000 mt to 61,000 mt (135%), and pollock landings increased from 56,000 mt to 78,000 mt (39%). Trawl landings of flatfish also rose by 8,400 mt (122%).

The ex-vessel value of domestic landings (excluding the value added by at-sea processing) fell slightly during both 1989 and 1990, primarily because of lower sablefish revenue. For all gears, sablefish revenue fell from $65.4 million in 1988 to $42 million in 1990. This drop in revenue resulted from a substantial drop in sablefish prices. Between 1988 and 1990, the round-weight equivalent, ex-vessel price of longline-caught sablefish in the GOA fell from an annual high of $0.98/lb to $0.70/lb. The drop in trawl price was somewhat less, from $0.82/lb to $0.67/lb. Because of the relatively small relative take of sablefish, the trawl fleet experienced an overall increase in earnings over this period, from $37 million to $49 million. With its heavier dependence on sablefish, longline earnings fell from $61 million to $42 million. With longline prices for sablefish back above $0.90/lb in 1991, year-to-date revenue from that species has eclipsed the 1990 total. The only other noteworthy change in earnings for the longline fleet occurred in the Pacific cod fishery, where revenue rose from $1.9 million in 1988 to $3 million in 1990, with the 1991 total currently near $5 million. Pacific cod has also figured prominently in the trawl fishery, rising from $8.3 million in 1988 to $20.2 million in 1990, and continuing to nearly $29 million thus far in 1991. Although earnings in the trawl rockfish fishery increased by roughly 50% between 1988 and 1989, 1990 saw them fall back below the 1988 level.

GOA prices for Pacific cod changed little between 1988 and 1990 for either gear, but 1991 prices are 33% higher in the longline fishery and 50% higher for trawlers. Trawl flatfish price also increased by more than 50% between 1990 and 1991, with pollock price up roughly 70%. On the other hand, trawl rockfish prices fell to $0.18/lb, a 40% drop since the annual high in 1989, and the lowest value since 1986. Rockfish prices in the longline fishery have also been on the decline since 1988.

GULF OF ALASKA GROUNDFISH
1992 Plan Team, SSC, and AP recommendations and apportionments (metric tons)

24-Nov-91

		1991			Plan Team	SSC	Advisory Panel	
Species	Area	ABC	TAC	Catch**	ABC - 1992	ABC - 1992	TAC	DAP
Pollock	W/C	100,000	100,000	90,417	108,000			
	Shelikof *	0	0	n/a	0			
	E	3,400	3,400	3,563	3,400			
	Total	103,400	103,400	93,980	111,400			
Pacific Cod	W	30,000	30,000	29,212	20,900			
	C	45,000	45,000	40,421	39,400			
	E	2,900	2,900	253	3,200			
	Total	77,900	77,900	69,886	63,500			
Flatfish, Deep	W	2,000	2,000	1,223	1,740			
	C	38,900	10,000	8,842	33,550			
	E	9,600	3,000	148	3,990			
	Total	50,500	15,000	10,213	39,280			
Flathead sole	W	12600	2000	110	12,580			
	C	32,700	5,000	882	31,990			
	E	5,000	3,000	1	3,710			
	Total	50,300	10,000	993	48,280			
Flatfish, Shallow	W	48,800	3,000	1,449	27,480			
	C	22,200	7,000	3,015	21,260			
	E	3,000	2,000	6	1,740			
	Total	74,000	12,000	4,470	50,480			
Arrowtooth	W	40,800	5,000	2,455	38,880			
	C	272,100	10,000	13,044	253,320			
	E	27,200	5,000	320	11,680			
	Total	340,100	20,000	15,819	303,880			
Sablefish	W	2,925	2,925	1,815	2,500			
	C	10,575	10,575	10,820	9,570			
	W. Yakutat	4,050	4,050	3,577	3,740			
	E. Yak./S.E. Out.	4,950	4,950	5,890	4,990			
	Total	22,500	22,500	22,102	20,800			
Pacific Ocean Perch	W	1,624	1,624	1,397	3,240			
	C	1,798	1,798	2,763	3,440			
	E	2,378	2,378	1,971	4,780			
	Total	5,800	5,800	6,131	11,460			
Shortraker/Rougheye	W	100	100	73	100			
	C	1,320	1,320	868	1,290			
	E	580	580	410	570			
	Total	2,000	2,000	1,351	1,960			
Other Slope	W	1,212	1,212	847	1,390			
	C	5,454	5,454	5,130	6,510			
	E	3,434	3,434	519	6,160			
	Total	10,100	10,100	6,496	14,060			
Rockfish	W	800	800	215	1,180			
(Pelagic Shelf)	C	3,100	3,100	1,148	4,320			
	E	900	900	932	1,260			
	Total	4,800	4,800	2,293	6,760			
Black Rockfish	W	1991 catch is		70	70			
	C	also counted		403	190			
	E	in pelagics		57	140			
	Total	above		530	400			
Rockfish (Demersal Shelf)	S.E. Out.	0	425	382	550			
Thornyhead	G W	1,798	1,398	1,071	1,280			
Other Species	G W	0	14,268	4,833	0			
GULF OF ALASKA TOTAL		743,198	299,589	240,550	674,090			

* Eliminated beginning in 1992

** Catch through November 3, 1991

Alaska Groundfish Data Bank

November 24, 1991

Rick Lauber, Chairman
North Pacific Fishery Management Council
P.O. Box 103136
Anchorage, Alaska 99510

SENT BY FAX: 4 PP

RE: 1992 GROUNDFISH SPECIFICATIONS - CENTRAL GULF OF ALASKA

IN SUMMARY

QUOTAS:
- Pollock: 108,000 MT C/W GULF -- Plan Team Recommendation
- Deep Flats: 30,000 MT TAC Central Gulf -- less than PT Recommendation
- Arrowtooth: 15,000 MT TAC - Central Gulf

TRAWL HALIBUT BYCATCH:
1. 2000 MT Cap
2. Same quarterly apportionment as in 1991.

I. CENTRAL GULF GROUNDFISH TAC'S

In General

1. We understand that not all the catch at age and survey data was available for incorporation into the preliminary groundfish specifications for the Gulf of Alaska. In general we support whatever ABC's are developed by the Gulf Plan Team during November.

2. TAC's for the flatfish complexes should be set to meet industry's anticipated needs (within the limits of the ABC's).

Selected Species

Pollock: We support the Plan Team's recommendation of 108,000 MT ABC for Central/Western Gulf pollock. We feel that the NMFS staff has gone to exceptional effort and analyses to arrive at the best scientific number.

The industry notes a strong showing of the 1988 year class, a fairly strong showing of the 1989 year class and indications that the 1990 year class may be strong also. Because industry avoids small fish concentrations, little catch at age data for the 1988 year class is available for the model and no data for 1989 and 1990 year classes will be available to NMFS until the 1993 triennial survey.

The projected 1993 and 1994 biomasses assume weak year classes entering the fisheries. The definition of a weak year class is such that when back to back weak year classes are assumed, the projection will show a declining stock. In reality there is no information on the 1989 and 1990 year classes and the projected future stock biomass is a "worst case" scenario.

Chris Blackburn • Director • P.O. Box 2298 • Kodiak, Alaska 99615 • (907) 486-3033 • FAX (907) 486-3461

Since pollock is a recruitment driven stock and the smaller biomasses have been the biomasses which produced the largest recruitments, we see no reason not to set the TAC = ABC.

Flatfish Deep: We support the preliminary Central Gulf TAC of 30,000 MT in view of the Plan Team's recommended ABC of 33,554 MT. Until there has been more research on age class structure, distribution of catch, catch composition and more complete surveys of the deep water flatfish complex, holding the TAC at around 90% of the ABC seems a prudent conservative measure.

As Pacific cod declines, the flatfish complex becomes more important to the industry and an increased quota is justifiable. The actual catch will be limited by the halibut cap.

In the future it may be desirable to set separate quotas for Rex Sole and Dover Sole -- this should be examined by Plan Team.

Flatfish Shallow: We support the preliminary Central Gulf 7000 MT TAC. This is the same as the 1991 quota. Only 3,015 MT was taken in 1991, so the 7000 MT quota allows room for growth.

Arrowtooth Flounder: We support increasing the Central Gulf TAC from the preliminary recommendation of 10,000 MT to 15,000 MT. The ABC is 253,325 MT. In 1991 the actual catch was 13,044 MT. The TAC was reached in early October and vessels were forced to discard arrowtooth at sea.

We feel the halibut cap will hold the total 1992 groundfish catch near 1991 levels. The increase in the arrowtooth TAC is to assure that there is sufficient arrowtooth to meet bycatch needs.

II. TRAWL HALIBUT CAP

GULF OF ALASKA TRAWL FISHERIES

We support the current quarterly apportionment of the trawl halibut bycatch cap in the Gulf of Alaska

We strongly urge the Council to keep the Gulf of Alaska Trawl halibut cap at its historic 2000 MT.

We recommend that the same quarterly apportionment scheme - 600 MT each 1st and 2nd quarters and 400 MT each 3rd and 4th quarters -- used in 1990 and 1991 be used again for 1992.

Maintaining the cap at its historic level is an incentive program of sorts -- the fleet can look forward to additional flounder and eventually harvesting the substantial arrowtooth flounder biomass simply by staying clean. To reduce the Gulf of Alaska trawl cap is to punish a clean fleet -- which has not been the council's philosophy to date.

A. SHOREBASED BOTTOM TRAWL OPERATIONS

COMPARATIVE CATCH AND BYCATCH RATES - THRU OCT. 7, 1991
SHOREBASED OPERATIONS - GULF OF ALASKA

GEAR	POT	BOTTOM TRAWL	LONGLINE
GROUNDFISH MT	9573	61104	25435
HALIBUT BYCATCH MT	36.71	1348.57	4590.13
HALIBUT BYC RATE (PERCENT)	.38	2.21	18.05
MORTALITY FACTOR	.16	.50	.16
HALIBUT MORTALITY MT	5.87	674.24	734.42
HAL BYC MORT RATE (PERCENT)	.06	1.11	2.89

Through Oct. 27, 1991, the shorebased fleet took 61,104 MT of groundfish with bottom trawls (this figure does not include pelagic caught fish). Halibut mortality was 674 MT. Average bycatch mortality rate was 1.11%.

Shorebased operations showed unacceptable bycatch rates in two fisheries:
Deep Flats - 7% bycatch rate, 212 MT halibut mortality;
Rockfish - 15.7% bycatch rate; 21 MT halibut mortality.

At its 1991 shorebased halibut bycatch rate, the shorebased Gulf trawl fleet could have harvested 180,180 MT of bottom trawl groundfish. The bottom trawl fleet's next avenue for increasing its groundfish catch under the halibut cap is to find dependable methods to lower the estimated halibut mortality -- a project now ongoing with the IPHC.

B. FACTORY OPERATIONS

COMPARATIVE CATCH AND BYCATCH RATES - THRU OCT. 27, 1991
FACTORY OPERATIONS - GULF OF ALASKA

GEAR	BOTTOM TRAWL	LONGLINE
GROUNDFISH MT	55216	3371
HALIBUT BYCATCH MT	2644.55	519.33
HALIBUT BYC RATE (PERCENT)	4.79	15.41
MORTALITY FACTOR	.50	.16
HALIBUT MORTALITY MT	1322.28	83.09
HAL BYC MORT RATE (PERCENT)	2.40	2.47

Overall halibut bycatch rates in the factory trawl operations were more than double those seen in the shorebased bottom trawl operations.

Factory trawl operations showed unacceptable bycatch rates in three target fisheries:
Rockfish - 7% halibut bycatch rate, 587 MT mortality;
Bottom trawl pollock - 6% halibut bycatch rate, 285 MT mortality;
Deep water flatfish - 5.8% halibut bycatch rate, 336 MT mortality.

The overall performance of the factory trawl operations in these fisheries during 1991 badly hurt both shorebased operations and the responsible factory trawl operations in the Gulf of Alaska by reducing fishing time and the amount of fish taken.

C. MITIGATION MEASURES

The following measures expected to be in place for 1992 should reduce, and hopefully eliminate, the excessive halibut bycatch seen in the Gulf of Alaska operations during 1991:

1. Inshore/offshore -- will eliminate factory trawlers from targeting pollock and therefore eliminate the high halibut bycatch in the factory trawl bottom trawl pollock operations.
2. Delay of the rockfish fishery until July 15 - expected to reduce halibut bycatch.
3. Bringing the flatfish fisheries under the bycatch incentive program - expected to eliminate dirty operators, shorebased and at-sea. Unacceptably overall high halibut bycatch rates are shown for both at-sea and shorebased operations in the deep flat fishery during 1991.
4. Hotspot authority for the Regional Director

ENFORCEMENT OF THE INCENTIVE PROGRAM IS IMPERATIVE. THE GULF OF ALASKA ROCKFISH FISHERY HALIBUT BYCATCH LIMIT FOR 1991 WAS 4%, YET THE OVERALL RATE SHOWN BY NMFS IS WELL ABOVE THIS -- WHICH INDICATES A NUMBER OF OPERATORS SHOULD BE CITED AND HANDED SUBSTANTIAL FINES. WE HOPE TO SEE THESE CASES MADE PRIOR TO THE OPENING OF THE 1992 SEASON.

FAILURE TO ENFORCE THE INCENTIVE PROGRAM COMPLETELY UNDERMINES ALL VESSELS WHICH MADE EFFORTS TO FISH CLEAN.

III. POT HALIBUT CAP - GULF OF ALASKA

We see no valid reason for bringing the pot groundfish fishery under a halibut cap.

During 1991 the pot groundfish fishery had an estimated 5.87 MT of halibut mortality and a mortality rate of .6%.

The pot halibut mortality has been estimated at 16%; and new analyses by the International Pacific Halibut Commission indicates 10% may be the correct mortality factor.

Even with the current mortality estimate, the effort and cost of monitoring a cap for 5.87 MT does not seem worthwhile.

We thank the Council members for their consideration of our comments.

Sincerely,

Chris Blackburn, Director
Alaska Groundfish Data Bank