

MEMORANDUM

TO: Council, SSC and AP Members
FROM: Clarence G. Pautzke
Executive Director
DATE: November 20, 1995
SUBJECT: Final Gulf of Alaska Groundfish Specifications for 1996

ESTIMATED TIME
8 HOURS
(for all D-1 items)

ACTION REQUIRED

- (c) Approve Final Stock Assessment and Fishery Evaluation (SAFE) report for Gulf of Alaska (GOA) groundfish fisheries for 1996.
- (d) Approve Final 1996 Acceptable Biological Catch (ABC) limits and Total Allowable Catch (TAC) limits for GOA groundfish, and set PSC specifications and apportionments for halibut.
- (e) Recommend preliminary discard mortality rates for halibut in the groundfish fisheries.
- (f) Report on State of Alaska groundfish management.

BACKGROUND

At this meeting, the Council will finalize specifications of groundfish ABCs, TACs, and bycatch allowances for 1996. The 1996 SAFE report, groundfish specifications, and bycatch allowances need to be adopted. A final recommendation for halibut discard mortality rates also needs to be approved. The State of Alaska will report on proposed management of State groundfish fisheries.

Approve GOA SAFE Document

The Gulf of Alaska (GOA) Groundfish Plan Team met November 13-17, 1995 in Seattle to prepare the final 1996 SAFE document which contains the Plan Team's estimates of biomass and ABCs for all groundfish species covered under the FMP and information concerning halibut bycatch to provide guidance to the Council in establishing PSC apportionments. The draft minutes of the Gulf Team meeting are included as Item D-1(c)(1). Tables 1 - 3 from the SAFE summary chapter (Items D-1(c)(2), D-1(c)(3), and D-1(c)(4)) list the 1995 ABCs, TACs, and catches through October 28, 1995, and the Plan Team's recommended 1996 ABCs and corresponding overfishing levels for each of the species or species complexes. None of the Plan Team's recommended ABCs exceeds the corresponding overfishing level. The Council's September 1995 initial recommendations for the 1996 fishing year are included as Item D-1(c)(5).

Final ABCs, TACs, and Apportionments for the 1996 GOA Fisheries

Tables 1-3 provide the biomass, ABC, overfishing level and stock status of 17 GOA groundfish management groups compared to 1995. The Plan Team's sum of recommended ABCs for 1996 is 478,660 mt. The sum of 1995 ABCs was 492,780 mt and TACs were set at 279,463 mt. Groundfish catch through October 28, 1995

totaled 212,696 mt. The SSC and AP recommendations will be provided to the Council during the week of the Council meeting.

The Team and the SAFE authors recommend that dusky rockfish be given a separate ABC and TAC from the other species in the pelagic shelf assemblage, since it may be inappropriate to include dusky rockfish in the same assemblage as these species due to their different habitat preferences. The Plan Team noted that localized over-exploitation of black rockfish and other near-shore species continues to be a potential problem as a result of the rockfish jig fishery in the Central area of the GOA. The fishery for black rockfish in Federal waters is essentially unrestricted because its catches comprise part of the relatively large and underutilized TAC for pelagic shelf rockfish in the Central area. The Team has submitted a revised amendment proposal for alternative management for the nearshore component of the assemblage (Attachment 1 to Plan Team minutes).

Set Final PSC Limits for Halibut

The PSC limits for halibut in the Gulf of Alaska are set by gear type and may be apportioned seasonally over the fishing year (Amendment 21). In recommending any seasonal allocations, the Council will consider its objective to promote harvest of as much of the groundfish optimum yield as possible with a given amount of halibut PSC.

Halibut PSC mortality applied only to the bottom trawl fisheries and to the hook-and-line fisheries in 1995. The sablefish hook-and-line fishery was exempted from halibut PSC with implementation of the sablefish IFQ fishery. The midwater trawl fishery (targeting pollock) has been exempt from bycatch-related closures. The pot fishery (primarily for Pacific cod), was again exempted from the fixed gear PSC limit due to minimal bycatch mortality.

For 1995, the Council recommended these halibut PSC apportionments for the GOA groundfish fisheries:

Trawl gear		Hook and Line*	
1st quarter	600 mt (30%)	1st trimester	80 mt (26.7%)
2nd quarter	400 mt (20%)	2nd trimester	200 mt (66.7%)
3rd quarter	600 mt (30%)	3rd trimester	20 mt (6.7%)
4th quarter	400 mt (20%)		
2,000 mt		300 mt	

*includes 10 mt for demersal shelf rockfish

Beginning in 1994, PSC limits for trawl gear were further apportioned by specific fishery. The Council may apportion PSC limits by fishery during the annual specification process. Apportionments of the overall cap may be made to a 'Shallow water complex' and a 'Deep water complex.' Species in the shallow water complex are: pollock, Pacific cod, shallow water flatfish, Atka mackerel, and other species. Deep water complex species include: deep water flatfish, rockfish, flathead sole, sablefish, and arrowtooth flounder. The following apportionments were made for 1995:

Quarter	Shallow water	Deep water	Total
	Complex	Complex	
1	500 mt	100 mt	600 mt
2	100 mt	300 mt	400 mt
3	200 mt	400 mt	600 mt
4	No apportionment between shallow and deep for the 4th quarter.		

Discard Mortality Rates

Pacific halibut bycatch discard mortality rates in the Alaskan groundfish fisheries are routinely estimated from viability data collected by NMFS observers. These data are analyzed by staff of the International Pacific Halibut Commission (IPHC) and the National Marine Fisheries Service (NMFS), which results in recommendations to the Council for managing halibut bycatch in the upcoming season. Table 4 (Item D-1(e)(1)) lists the IPHC and GOA and BSAI plan teams' recommendations for setting discard mortality rates for the 1996 fishery.

State of Alaska Management of Groundfish Fisheries

Alaska Department of Fish & Game has expressed interest in managing the Prince William Sound pollock fishery, Cook Inlet Pacific cod fishery, and nearshore pelagic shelf rockfish species. A revised amendment proposal from the GOA Plan Team describes possible alternatives for State management of pelagic shelf rockfish (Attachment 1 to item D-1(c)(1)). State management also will be discussed at the Council-Board consultation meeting in January.

GULF OF ALASKA PLAN TEAM MEETING NOVEMBER 13-17, 1995

PLAN TEAM MEMBERS

Sandra Lowe, chairman
Kaja Brix
Jeff Fujioka
Jim Hastie
Jim Ianelli
Farron Wallace
Gregg Williams

Jane DiCosimo, plan coordinator
Rich Ferrero
Lew Haldorsen
Jon Heifetz
Tory O'Connell
Bill Bechtol

The GOA Plan Team met beginning on Monday afternoon, November 13, 1995, to review the GOA stock assessments. New members Tory O'Connell and Bill Bechtol were welcomed to the Team.

Thornyheads There was no change to the thornyhead assessment presented by the author in September. The Team recommended an ABC of 1,560 mt. This is down from 1,899 in 1995 and is attributed to including a revision in the size at maturity, slower growth estimates used in the model, new data for 1982 and 1983, and correcting 1978 and 1979 data that were previously specified as from trawl gear when, in fact, it was from longline gear. The Team concurred with using $F_{40\%}$.

The Team discussed at length the high level of thornyhead discards. Prior to 1995, most thornyhead discards (62%) occurred in the sablefish longline fishery. Now under the IFQ program, IFQ fishermen are required to retain all rockfish; however, once thornyheads reach PSC, they are limited to retaining only 15%. Some fishermen have been cited for landing rockfish in excess of the 15% PSC. Others may have discarded rockfish at sea to avoid the penalty but are then in violation of IFQ requirements. The 15% directed fishing standards for all rockfish species in aggregate is set low to prevent targeting, but may cause wastage if set too low. If the rate is set too high, fishermen may be targeting thornyheads by topping off. A comparison of natural and incidental bycatch rates from survey and observer data would help clarify appropriate DFS rates for rockfish.

Atka Mackerel There was no change from the September Atka mackerel assessment. The Team used the natural mortality rate of 0.3 to calculate an ABC of 6,480 mt. The Team discussed the authors' decision to maintain their use of the 1995 Aleutian Islands phase-in rate of 0.20 resulting in an ABC of 4,320 mt and the SSC's recommendation of $M/2$ and abandonment of stair-stepping for an ABC of 3,240 mt.

The Team noted that the differences in setting ABC reflected procedural differences given uncertain stock data and trends and ecosystem concerns. The Team is concerned about the high levels of fishery removals in the last three years (80-99%) that have occurred within 20 nm of important Steller sea lion habitat. Most removals have occurred from November to March, a sensitive period for juveniles and recently weaned pups. Increases in Atka mackerel harvests have occurred during a period of decreasing pollock abundance in the GOA which could exacerbate efforts to recover the Steller sea lion population. The Team supports a TAC lower than ABC, but was unable to come to a consensus with a specific biologically justified value. The Team discussed in-season adjustments that would allow a small (1-2 day) Atka mackerel fishery prior to the Pacific ocean perch fishery to allow minimum biological data to be collected. The stock assessment authors will provide a suggested minimal harvest level to provide for fishery samples to help the Advisory Panel and Council with their TAC deliberations.

Demersal Shelf Rockfish Tory O'Connell presented the assessment for this species assemblage. She described changes and technical problems in the recent survey. Line transects were conducted in East Yakutat and Central Southeast Outside in 1995. Density estimates from 1994 for Northern and Southern Southeast Outside were reanalyzed with new line length estimates. A front mounted video camera was used to observe the 3 foot wide transect line to include counts of fish forward of the sub, increasing the density estimates for 1995. The Team concurred with authors' recommendation to set ABC based on the lower 90% confidence limit for the biomass estimate, as was done prior to the 1995 SAFE. The ABC is recommended at 945 mt, applying $F=M=0.02$ and adjusting upwards for the 10% of other DSR species.

The Team also discussed unreported mortality associated with the halibut IFQ fishery. The estimate for unreported mortality of demersal shelf rockfish was 122 mt for 1995, significantly lower than the 1994 estimate of 353 mt. This decrease is attributed to increased halibut landings from combined IFQ sablefish/ halibut trips with lower bycatch rates of DSR and more halibut trips in internal waters.

Pollock Chris Wilson presented updated information on the 1995 Shelikof Strait echo integration trawl survey. The Team discussed that the 1995 survey indicated an order of magnitude increase from 1 billion to 10 billion 1-year old pollock.

Anne Hollowed presented updated pollock stock assessment information based on the Plan Team requests in September for short-term stock projections out to the year 2000, initialized with the current age composition and then random recruitment selected from the range of values of the 1982-1993 year classes. The Team requested projections assuming an average as well as a strong 1994 year class. The Team noted in September that while fairly strong evidence exists from the hydroacoustic survey of a strong 1994 year class, it is only one source of information which has not yet been corroborated by other data sources, e.g., FOCI larval survey data. The Team requested projections made for fishing mortality rates other than 0.2 and 0.3, with the goal of evaluating potentially revised optimal and minimal probability rates. The Team also expressed interest in an evaluation of uncertainty in current stock size.

The results of the short-term projections indicated that if the 1994 year class is strong and subsequent year classes are random, there is less than a 0.1% chance that spawning stock threshold will fall below the threshold by 2000 under any of the F s tested. If the 1994 year class is average or random and subsequent year classes are random, there is a 50% chance that the spawning stock will fall below the threshold by 1998.

The Team recommended that the optimal fishing mortality rate that simultaneously maximized yield and minimized risk was 0.3 (full selection value). This fishing mortality rate was associated with a yield of 52,000 mt, which is also the stock assessment authors' recommended ABC. The Team noted that this ABC is based on the presumption that the 1994 year class is strong and will maintain the spawning stock biomass above threshold through 2000. Should the 1994 year class not meet projections, the more conservative fishing mortality rate of $f=0.2$ might not be sufficient to maintain the stock above the threshold by 1998.

The Plan Team recommended that the ABC be apportioned according to the most recent distribution of biomass from the 1993 bottom trawl survey: 49% in the Shumagin area (25,500 mt), 24.7% in the Chirikof area (12,850 mt), and 26.3% in the Kodiak area (13,750 mt). The Team noted that the current distribution has shifted relative to the 1990 distribution, in which most of the biomass was found in the Kodiak area, and that the increase in Shumagin biomass may be due to the presence of Bering Sea fish. However, until the degree of mixing and the regularity with which this occurs can be determined, the Team felt it most appropriate to apportion ABC according to the most recent distribution of survey biomass. The recommended Eastern Gulf ABC is 2,800 mt.

The Team had considerable discussion on the management of the Prince William Sound (PWS) pollock fishery. Landings from the first year of a fishery in the Sound in 1995 totaled 2,900 mt and were applied to the Eastern

Gulf TAC. The Team debated whether landings from this fishery would be more appropriately applied to the Central Gulf TAC, whether landings from this fishery should be applied to a Federal TAC at all, and then if not, what method should be recommended to the State to calculate a separate PWS quota. ADF&G surveys indicate a resident population estimated at 24,350 mt exists in PWS, although its relationship to the Gulf stock is unknown. The Team recognizes that the triennial Gulf survey does not sample this area and does not incorporate this biomass in its Gulf population estimates and concurred with the State of Alaska's interest in monitoring a PWS winter fishery. Two issues were discussed relative to the PWS survey: it was determined that the nets used in the ADF&G and NMFS surveys were comparable; and the timing of the surveys should coincide to determine distribution and mixing rates. The Team debated the merits of alternative methods to determine a PWS quota and recommended applying a biomass ratio of PWS relative to the Western Central Gulf, which would result in a 1996 PWS TAC of approximately 1,400 mt.

Slope Rockfish

Pacific Ocean Perch Jon Heifetz presented the Pacific ocean perch (POP) stock assessment. The Team briefly discussed Fritz Funk's (ADF&G) memo on the status of the stock and the Council's rebuilding plan amendment. Jon reported that many of the recommendations were already incorporated in the model or will await changes to the stock assessment based on 1996 survey results. The Team agreed that it was within the Council's purview to set TACs based on social and economic information and recommended an option within Alternative 2 of the rebuilding plan amendment, to allow TAC reductions by area. The Team noted that should the Council lower the Eastern Gulf TAC, they could shift the remainder to the Western or Central areas. They concurred that reducing the Eastern Gulf TAC and/or placing it on bycatch status would be preferable to lowering the entire Gulfwide TAC.

The recommended ABCs are 1,460 mt for the Western area, 3,860 mt for the Central area, and 2,740 mt for the Eastern area. The TAC for Pacific ocean perch is determined from the rebuilding plan in the GOA FMP. This results in a TAC for Pacific ocean perch for the 1996 fishery of 6,960 mt with apportionments of 1,260 for the Western area, 3,335 in the Central area, and 2,365 in the Eastern area.

The Team discussed the implications of a preliminary analysis presented on the use of alternative age of maturity, alternative measures of reproductive value, and updated stock-recruitment data. The effect of using a higher age of maturity, fecundity instead of spawner biomass, or updated stock-recruitment data is a greater estimated resiliency of the stock to a reduction in reproductive potential than was previously estimated. This result is because good recruitment arose from relatively fewer units of reproductive output than originally estimated and the relatively strong recent recruitment levels. An additional effect is a shift in current levels of reproductive value relative to a target level. The Team agreed with the SAFE authors that determination of ABC based on this preliminary analysis is not appropriate at this time. Updated age of maturity data currently being collected and further verification of the strength of recent recruitment will help resolve whether a different F level should be used to determine ABC and TAC.

The Team also discussed the possibility of doing separate assessments by management area for Pacific ocean perch. Differences among areas in life history characteristics suggest that groups of Pacific ocean perch may constitute separate populations at the adult stage, but genetically Pacific ocean perch are similar throughout their range. Further analysis of biological characteristics by area will help resolve the stock structure of Pacific ocean perch.

The recommended ABCs for shortraker and rougheye rockfish, northern rockfish, and other slope rockfish in 1996 is the same as that recommended for 1995.

The Team noted that the proportion of catch of slope rockfish that is discarded has apparently dropped considerably since 1994 for all subgroups except other slope rockfish. One reason for the drop is that there was a directed fishery for POP during 1995. Restrictions placed on retention of POP during 1993-94 were the result of "bycatch only" status during much of this time period. For other slope rockfish, discard rates have remained high (73%), since northern rockfish were removed from the group. Many of the remaining species in this group, such as harlequin and sharpchin rockfish, are small in size and of lower economic value, and there may be less incentive for fishermen to retain these fish. As long as these fish are being accurately accounted for, this discard does not represent a conservation problem. However, the Team is concerned that some of the larger sized species in the subgroup may be caught disproportionately to their estimated abundance.

Pelagic Shelf Rockfish

No new information on Pelagic shelf rockfish was available this year. However, the Plan Team noted that localized over-exploitation of black rockfish and other near-shore species continues to be a potential problem in the Central area as a result of the rockfish jig fishery in that region. Most of this fishery's catch in 1995 was concentrated off the south shore of the Kenai Peninsula. State waters there have been closed to commercial rockfish fishing since May, when the annual guideline harvest level was exceeded. Following such closures, jig fishing has shifted farther offshore to the Federal zone. The fishery for black rockfish in Federal waters is essentially unrestricted because its catches comprise part of the relatively large and under-utilized TAC for pelagic shelf rockfish in the Central area. The Team has submitted a revised amendment proposal to recommend alternative management for the nearshore component of the assemblage, contingent upon Magnuson Act reauthorization and changes to the existing gap in extending authority of State managed fisheries into the EEZ (Attachment 1).

In light of the above information, the Team and the SAFE authors recommend that dusky rockfish be given a separate ABC and TAC from the other species in the pelagic shelf assemblage. The current ABC and TAC is derived almost entirely from trawl survey data for dusky rockfish; abundance of black rockfish and other species in the assemblage is not taken into account. It may be inappropriate to include dusky rockfish in the same assemblage as these species because of different habitat preferences. The Team calculated separate ABCs and apportionments for dusky rockfish based on $F=M$ applied to the average of the 1987, 1990 and 1993 dusky rockfish biomass estimates, and average catch from 1991-95 for the remaining PSR species. In order to provide a buffer between overfishing and ABC for the remaining PSR species, the average catch is adjusted by the ratio of $F_{35\%}/F_{30\%}$ (calculated for dusky rockfish). The adjusted ABC for the remaining PSR species is apportioned according to the 1995 catch distribution.

Flatfish Only 1995 catch data was included in this year's stock assessment and the Team recommended ABCs rolled over from 1995. The assessment will address survey and fishery catchability and include a treatment of $F_{40\%}$ after the 1996 survey. Flatfish are one of two species assemblages for which ABCs are currently above $F_{40\%}$.

Tom Wilderbuer presented a preliminary stock synthesis approach for arrowtooth flounder, resulting in an ABC of 220,000 mt, slightly higher than the 1996 recommendation of 198,130 mt. The Team approved of developing the model further for arrowtooth flounder and application to other flatfish species.

Pacific cod The Team supports the continued refinements in the data analyses described by Grant Thompson. Major improvements to the modeling included separating the catch and size composition data into different fishery categories (gear), the use of mean size-at-age data within the model, and investigations on sensitivity to different natural mortality rates, trawl survey selectivities, and survey catchability coefficients.

The Team supports the author's recommendation of an $F_{40\%}$ strategy, giving a 1996 ABC of 110,000 mt. The Team recognized that the current stock size estimate appears to be about 50% of the value expected under

average conditions with no fishing. Furthermore, the magnitude of stock decline may be due to higher than normal abundance levels observed during the mid-1980's. However, due to uncertainties in model specification, the Team felt that a lower harvest level would be prudent because of a continuing decline in stock abundance below any level previously estimated and because recent recruitment levels appear to be below average.

The Team noted the model's poor ability to estimate catchability when several key parameters are estimated simultaneously. The likelihood was flat over a range of catchability coefficient values suggesting a greater degree of uncertainty in current stock size than previously estimated. Given this uncertainty, the Team was less confident that an ABC value of 110,000 mt (which is about 50% higher than any annual harvests recorded in the Gulf) would be risk averse. Consequently, the team recommended an ABC value of 65,000 mt for 1996 corresponding to the lower 95% confidence bound as presented during the September meeting. The Team agreed that this harvest level is similar to historical values both prior to and after the peak abundance levels of the mid 1980s; stock abundance is declining below any level previously estimated and recent recruitment levels appear to be below normal; based on a model the Team considers reasonable, this harvest level represents a conservative interpretation of statistical confidence bounds; and preliminary analyses on the survey catchability coefficient suggest that the absolute abundance *may* be significantly lower than previously assumed.

The Plan Team encouraged further analyses of survey catchability and the continued progression of configuring the Bering Sea/Aleutians region and Gulf cod models to be similar. Other issues that might improve future assessments include: analyses or examination of ADF&G data (as was done for pollock) to see if large Pacific cod are common in near-shore areas (they are largely absent from NMFS trawl surveys); investigations of changes in growth over time (as has been noted for Pacific halibut which are found in similar habitats); possible differences in growth by sex; analyses on the impact migration may have on fishery dynamics; and considering threshold levels and appropriate management policies.

The Team discussed the treatment of Pacific cod discards in the IFQ halibut fishery. The author had suggested lowering the ABC by 4,000 mt from a discard rate estimated from the longline survey conducted during the derby fishery. The Team recommended this be addressed as a TAC consideration and recommended that the NMFS Regional Office ensure that total bycatch mortality is estimated and counted against the TAC consistent with the treatment of bycatch reserves in other fisheries. One way of estimating bycatch mortality could be through analysis of longline survey data where Pacific cod discard mortality in the longline fishery prior to IFQ fishing was estimated at 4,000 mt.

Sablefish Jeff Fujioka reported on the 1995 sablefish survey and stock assessment results. The recommended 1996 ABC is 17,100 mt. This value, down 22 percent from 1995, is the result of a 10 percent decrease in the adjusted exploitation rate and a projected 1996 biomass (193,300 mt) which is 14 percent lower than the 1995 projected value (225,000 mt). The 1996 biomass projection results from a continued decrease in the longline survey from 1994 to 1995 (8 percent) and the more conservative predictions of recruitment. The author noted that an alternative approach for determining an ABC, based on replacement fishing rates, results in an ABC of 13,500 mt. A re-evaluation of appropriate fishing rates for sablefish is planned in time for the 1996 assessment.

Mike Sigler presented an age-structured approach to modeling sablefish abundance. The Team discussed with the author the implications of how growth is treated in the model.

The Team also discussed the timing of the sablefish longline survey and fishery interactions. Because of the importance of the survey index in determining ABC, the sablefish longline fleet was asked to avoid the survey areas for a few days before the area was to be sampled. The survey encountered little longline activity in the western and central Gulf. Some activity was observed in the eastern Gulf, in the Cape Spencer/Cross Sound area and the area off of Sitka. The survey also encountered trawl activity targeting fish on the slope in early July in the Chirikof area. Cooperation from the fleet was good in 1995 and is expected to improve in the future. The

1996 longline survey schedule has been modified to provide more opportunity for fishing activity to avoid the survey. The survey is scheduled to start earlier and be halfway through the central Gulf before the July trawl opening, providing more area that has already been surveyed and need not be avoided. The survey would not reach the West Yakutat area until about July 18 hopefully allowing the area to rest after a short rockfish opening. The survey is also scheduled to be as far south as the Sitka area before the traditional salmon troll closure around August 13, allowing more area for troller/longliners to fish north of the survey vessel.

The Team encouraged further development and incorporation of results from the age-structured model, analysis of appropriate fishing mortality rates, specifically $F_{40\%}$, and continued analysis of survey trends and standardization factors between the cooperative and domestic surveys.

Research Priorities The Team prepared a list of additional research priorities for SSC and Council review (Attachment 2).

Adjourn The Gulf of Alaska Groundfish Plan Team meeting was adjourned on Friday, November 17, at noon.

GROUND FISH FISHERY MANAGEMENT PLAN AMENDMENT PROPOSAL

Name of Proposer: GOA Plan Team

Brief Statement of Proposal: Remove all species of Pelagic Shelf Rockfish except dusky rockfish from the GOA FMP and transfer management responsibilities in both State and Federal waters to the State of Alaska.

Objective of Proposer: To ensure effective management of the nearshore pelagic rockfish fishery to prevent localized depletion in the Central Gulf, allow controlled development of this fishery in the Eastern and Western gulf and prevent preemption of the dusky rockfish fishery by the nearshore jig fishery.

Need and Justification: Currently the nearshore pelagic group includes rockfish, for which there is a large TAC. "Light" dusky rockfish are generally targeted by trawl gear occur in offshore, hard bottom areas. Two problems exist with the current management regime. 1) Nearshore pelagic rockfish, a component of which are reef-specific as adults, could easily be over-fished in local areas give the extremely large TAC for the PSR assemblage. Although ADF&G has implemented quotas and harvest closures in state waters there is no comparative management available in adjacent federal waters. The second problem occurs in the Eastern and Western Gulf where there is a new developing jig fishery for nearshore rockfish. This fishery is largely prosecuted in the summer, and its possible that the trawl fishery for dusky rockfish could preempt the developing jig fishery.

Foreseeable Impacts of Proposal: This should provide positive benefits for both the dusky rockfish trawl fishery and the nearshore jig fishery. The state is better able to manage fisheries such as black rockfish that require small area quotas and intensive management. This approach allows for full utilization of both resources while reducing the risk of localized depletion of nearshore pelagic rockfish.

Are there alternative solutions: (1) Separate black rockfish from PSR and remove that species from the FMP. This would allow ADF&G to manage black rockfish without the constraints imposed by federal overfishing regulations. (2) Separate dusky rockfish from the PSR assemblage but leave the other species in the FMP. If dusky rockfish is removed from the PSR assemblage and managed under federal regulations we would be forced to set overfishing levels for PSR equal to average catch history. This level is very low and could easily result in the early closure of other fisheries once the overfishing level is reached. (3) Status quo.

Gulf of Alaska Plan Team Statement of Additional Research Priorities/Concerns

The Team strongly supports the ongoing development of alternative survey efforts in the GOA, which may yield more reliable information for species such as Atka Mackerel and some rockfish that are not sampled particularly well by the current bottom trawl survey. Nearshore rockfish, which are currently unsurveyed, should be a focus of attention.

Additional survey efforts in lower Cook Inlet around the time of the bottom trawl survey would be particularly useful in evaluating the effect of increased fishing effort in that area in recent years. As the State of Alaska is already operating a crab survey in portions of the southern inlet, the possibility of having the State cover Federal waters in that part of the inlet more extensively should be explored.

The Team strongly supports expansion of the bottom trawl survey to deep-water locations (> 500 m) so that adult thornyhead rockfish and other deep-water species can be better sampled. The last GOA sampling of this depth strata, which contains the primary thornyhead habitat, occurred in 1984. Because recent assessments have recommended that ABCs and overfishing mortality levels be set at low values, with little cushion between them, there is a continuing threat that reaching the overfishing level will force closure of other GOA fisheries which intercept thornyheads. If such closures are to occur, their need should be established on the basis of recent survey data from thornyhead habitat.

Evaluation of Pacific cod tagging information by Shimada and Kimura (1994) indicates a dynamic pattern of seasonal migration for fish tagged in the Bering Sea. The Team feels that additional tagging effort, particularly in the GOA, may provide some insights into divergent age-composition patterns observed between the survey and fishery. Better migrational information is also a key requirement for the development of an integrated BSAI/GOA stock assessment model for Pacific cod.

The Team noted the problem with unreported bycatch mortality of rockfishes, Pacific cod and other groundfishes in the unobserved sector of the fleet. Currently unreported mortality of demersal shelf rockfish is estimated by ADFG, but no information is available for estimating unreported mortality of other rockfishes. Bycatch mortality estimates advanced for Pacific cod in the halibut fishery, which were formulated when halibut were harvested during a derby opening, may not accurately represent conditions in the existing IFQ fishery. The Team was informed that the Halibut Commission has been advised that it cannot currently collect information on groundfish bycatch through its logbook program for halibut. Given the lack of observer coverage in the halibut fishery, the Team requests that NMFS explore arrangements for collection of bycatch information for groundfish in the halibut fishery. Additional research should be focused on documenting landings of Pacific cod on halibut trips during the 1995 fishery.

In order to better understand sablefish recruitment variability, the Team would like more effort directed towards questions pertaining to the geographical distribution and movement of juvenile sablefish.

For many species/assemblages, Team and Council discussion of management alternatives would benefit from the additional information regarding "natural" rates of coincident catch across species and the relationship of these rates to observed bycatch and discard information. In cases where discard rates are particularly high, the Team requests that chapter authors attempt to document for the species in question, rates/amounts of discard by gear and target fishery, and also by season if there are noteworthy seasonal swings in discard rates. Where possible, documentation of the reason for discard (e.g., trip limit, TAC closure, market consideration) would also be useful. Knowledge of background bycatch rates by gear and area are also needed to evaluate whether directed fishing standards are set at appropriate levels with respect to discard objectives.

Table 1. Gulf of Alaska groundfish 1995 and 1996 ABCs, 1995 TACs, and 1995 catches reported through October 28, 1995. MSY is unknown for all species.

SPECIES	1995	ABC (mt)		TAC	CATCH
		1995	1996	1995	1995
Pollock	W (61)	30,380	25,480	30,380	30,221
	C (62)	15,310	12,840	15,310	12,895
	C (63)	16,310	13,680	16,310	24,661
	E	3,360	2,810	3,360	3,464
	TOTAL	65,360	54,810	65,360	71,241
Pacific Cod	W	20,100	18,850	20,100	22,247
	C	45,650	42,900	45,650	44,654
	E	3,450	3,250	3,450	1,172
	TOTAL	69,200	65,000	69,200	68,073
Deepwater flatfish ¹	W	670	670	460	96
	C	8,150	8,150	7,500	1,894
	E	5,770	5,770	3,120	221
	TOTAL	14,590	14,590	11,080	2,211
Rex sole	W	1,350	1,350	800	220
	C	7,050	7,050	7,050	3,633
	E	2,810	2,810	1,840	174
	TOTAL	11,210	11,210	9,690	4,027
Shallow water flatfish ²	W	26,280	26,280	4,500	359
	C	23,140	23,140	12,950	5,065
	E	2,850	2,850	1,180	7
	TOTAL	52,270	52,270	18,630	5,431
Flathead sole	W	8,880	8,880	2,000	587
	C	17,170	17,170	5,000	1,558
	E	2,740	2,740	2,740	29
	TOTAL	28,790	28,790	9,740	2,174
Arrowtooth flounder	W	28,400	28,400	5,000	1,416
	C	141,290	141,290	25,000	15,469
	E	28,440	28,440	5,000	928
	TOTAL	198,130	198,130	35,000	17,813
Sablefish	W	2,600	2,200	2,600	1,665
	C	8,600	6,900	8,600	7,313
	WY	4,100	3,040	4,100	3,779
	SEO	6,200	4,950	6,200	5,149
	TOTAL	21,500	17,090	21,500	17,906
Other Slope rockfish	W	180	180	55	31
	C	1,170	1,170	370	928
	E	5,760	5,760	1,810	521
	TOTAL	7,110	7,110	2,235	1,480

(Table 1 continued)

SPECIES	1995	ABC (mt)		TAC	CATCH
		1995	1996	1995	1995
Northern rockfish	W	640	640	640	112
	C	4,610	4,610	4,610	5,530
	E	20	20	20	47
	TOTAL	5,270	5,270	5,270	5,689
Pacific ocean perch	W	1,180	1,460	1,014	1,422
	C	3,130	3,860	2,702	2,665
	E	2,220	2,740	1,914	1,707
	TOTAL	6,530	8,060	5,630	5,794
Shortraker/rougheye	W	170	170	170	210
	C	1,210	1,210	1,210	1,250
	E	530	530	530	833
	TOTAL	1,910	1,910	1,910	2,293
Pelagic shelf rockfish	W	910	40	910	107
	C	3,200	250	3,200	2,282
	E	1,080	50	1,080	584
	TOTAL	5,190	340	5,190	2,973
Dusky rockfish	W		810		
	C		3,210		
	E		1,070		
	TOTAL		5,090		
Demersal shelf rockfish	SEO	580	950	580	180 ³
Atka mackerel	GW	3,240	6,480		
	W			2,310	326
	C			925	368
	E			5	2
	TOTAL	3,240	6,480	3,240	696
Thornyhead rockfish	GW	1,900	1,560	1,900	1,107
Other Species	GW		NA	13,308	3,608
TOTAL		492,780	478,660	279,463	212,696

1/ Shelikof Strait pollock is included within the W/C ABC range.

2/ "Shallow water flatfish" means rock sole, yellowfin sole, butter sole, starry flounder, and other flatfish not specifically defined.

3/ This number does not include at-sea discards. Demersal shelf rockfish catch includes 97 mt of unreported mortality from halibut fisheries.

NOTE:

ABCs and TACs are rounded to nearest 10, except for Pacific ocean perch.

GW means Gulfwide.

Catch data source: NMFS Blend Reports.

Redbanded rockfish was removed from DSR and combined with other slope rockfish for 1995.

Dusky rockfish was separated from the pelagic shelf rockfish complex for 1996.

Table 2. Gulf of Alaska exploitable biomasses, 1996 ABCs, and estimated trends and abundant for Western, Central, Eastern, Gulfwide, West Yakutat, and Southeast Outside regulatory areas.

SPECIES	Exploitable Biomass (mt)		1996		Abundance ² Trend
			ABC	Overfishing Level	
Pollock	574,000	W (61)	25,480		Below declining
		C (62)	12,840	82,000	
		C (63)	13,680		
		E	2,810	4,400	
		TOTAL	54,810	86,400	
Pacific Cod	314,000	W	18,850		Above declining
		C	42,900		
		E	3,250		
		TOTAL	65,000	88,000	
Deepwater flatfish ¹	116,574	W	670		Unknown, Unknown
		C	8,150		
		E	5,770		
		TOTAL	14,590	17,040	
Rex sole	89,665	W	1,350		Unknown, ³ Stable
		C	7,050		
		E	2,810		
		TOTAL	11,210	13,091	
Shallow water flatfish ³	355,590	W	26,280		Unknown, ³ increasing
		C	23,140		
		E	2,850		
		TOTAL	52,270	60,262	
Flathead sole	198,470	W	8,880		Unknown, ³ stable
		C	17,170		
		E	2,740		
		TOTAL	28,790	31,557	
Arrowtooth flounder	1,585,040	W	28,400		Above, stable
		C	141,290		
		E	28,440		
		TOTAL	198,130	231,416	
Sablefish	169,500	W	2,200		Low, declining
		C	6,900		
		WYK	3,040		
		SEO	4,950		
		TOTAL	17,090	22,800	
Other Slope rockfish	112,812	W	180		Unknown, unknown
		C	1,170		
		E	5,760		
		TOTAL	7,110	8,395	

(Table 2 continued)

SPECIES	Exploitable Biomass (mt)		ABC	1996 Overfishing Level	Abundance Trend
Northern rockfish	87,845	W	640	9,926	Unknown, unknown
		C	4,610		
		E	20		
		TOTAL	5,270		
Pacific ocean perch	163,219	W	1,460	10,165	Below, increasing
		C	3,860		
		E	2,740		
		TOTAL	8,060		
Shortraker/ roughey	71,811	W	170	2,925	Unknown, Unknown
		C	1,210		
		E	530		
		TOTAL	1,910		
Pelagic shelf rockfish		W	40	411	Unknown, Unknown
		C	250		
		E	50		
		TOTAL	340		
Dusky rockfish	42,552	W	810	8,532	Unknown, Unknown
		C	3,210		
		E	1,070		
		TOTAL	5,090		
Demersal shelf rockfish	26,093	SEO	950	1,702	Unkown, unknown
Atka mackerel	21,600	GW	6,480	9,800	Unkown, unknown
Thomyhead rockfish	26,244	GW	1,560	2,200	Unknown, stable
Other species	NA				TAC = 5% of the sum of TACs.

1/ Biomass estimates includes only Western and Central Gulf area.

2/ Abundance relative to target stock size as specified in SAFE documents.

3/ Historically lightly exploited therefore expected to be above the specified reference point.

NOTE:

ABCs are rounded to nearest 10.

Overfishing is defined Gulf-wide, except for pollock and POP.

Northern rockfish were separated from slope rockfish in 1993.

Rex sole was part of deepwater flatfish until 1994.

Redbanded rockfish removed from DSR for 1995 and combined with other slope rockfish.

Dusky rockfish was separated from the pelagic shelf rockfish complex in 1996.

Table 3. Summary of fishing mortality rates for the Gulf of Alaska, 1996.

Species	ABC Rate ¹	FABC ²	OFL Rate ³	F _{OFL}
Pollock	0.30	F _{ABC}	0.50	F _{30%}
Pacific cod	0.40	F _{40%}	0.57	F _{30%}
Deepwater flatfish	0.125	F _{35%}	0.146	F _{30%}
Rex sole	0.125	F _{35%}	0.146	F _{30%}
Flathead sole	0.145	F _{35%}	0.159	F _{30%}
Shallow water flatfish	0.145-0.149 ⁵	F _{35%}	0.159-0.175 ⁶	F _{30%}
Arrowtooth	0.125	F _{35%}	0.146	F _{30%}
Sablefish	0.112	F _{35%} ⁴	0.153	F _{30%}
Pacific ocean perch	0.052	F _{44% adjusted}	0.065	F _{MSY}
Shortraker/rougheye	0.03/0.025	F=M	0.03/0.046	F _{mix} ⁷
Rockfish (other slope)	0.04-0.10	F=M	0.04-0.10	F _{mix} ⁸
Northern rockfish	0.060	F=M	0.113	F _{30%}
Dusky Rockfish	0.090	F=M	0.151	F _{30%}
Other Pelagic Shelf Rockfish	9		10	
Demersal Shelf Rockfish	0.020	F=M	0.040	F _{30%}
Thornyhead rockfish	.06	F _{40%}	0.09	F _{30%}
Atka mackerel	(.30)	F=M	0.45	F _{30%}

- 1/ Maximum 1993 catch level allowable under overfishing definition.
- 2/ Fishing mortality rate corresponding to acceptable biological catch.
- 3/ Maximum fishing mortality rate allowable under overfishing definition.
- 4/ Adjusted by ratio of current biomass to B_{35%} and ratio of F_{35%} to F_{30%}.
- 5/ Shallow water flatfish; yellowfin sole 0.149, rocksole 0.147, others 0.145.
- 6/ Shallow water flatfish; yellowfin sole 0.175, rocksole 0.172, others 0.159.
- 7/ F_{30%} for rougheye, F=M for shortraker.
- 8/ F_{30%} for sharpchin, F=M for other species.
- 9/ ABC = average 1991-1995 catch adjusted by Dusky rockfish F_{35%}/F_{30%} ratio.
- 10/ Overfishing = average 1991-1995 catch.

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TABLE 3. GULF OF ALASKA GROUND FISH ABCs and TACs						
Initial 1996 North Pacific Fishery Management Council Specifications (mt)						
Species	Area	1995			COUNCIL 1996 ABC	COUNCIL 1996 TAC
		ABC	TAC	Catch*		
Pollock	W (61)	30,380	30,380	22,239	24,500	24,500
	C (62)	15,310	15,310	11,928	12,500	12,500
	C (63)	16,310	16,310	12,265	13,000	13,000
	E	3,360	3,360	3,353	2,700	2,700
	Total	65,360	65,360	49,785	52,700	52,700
Pacific Cod	W	20,100	20,100	22,204	18,850	18,850
	C	45,650	45,650	40,683	42,900	42,900
	E	3,450	3,450	1,121	3,250	3,250
	Total	69,200	69,200	64,008	65,000	65,000
Flatfish, Deep Water	W	670	460	48	670	460
	C	8,150	7,500	1,713	8,150	7,500
	E	5,770	3,120	190	5,770	3,120
	Total	14,590	11,080	1,951	14,590	11,080
Rex Sole	W	1,350	800	217	1,350	800
	C	7,050	7,050	3,311	7,050	7,050
	E	2,810	1,840	121	2,810	1,840
	Total	11,210	9,690	3,649	11,210	9,690
Flathead Sole	W	26,280	2000	569	26,280	2000
	C	23,140	5000	1,267	23,140	5000
	E	2,850	2740	13	2,850	2740
	Total	52,270	9,740	1,849	52,270	9,740
Flatfish, Shallow Water	W	8,880	4,500	336	8,880	4,500
	C	17,170	12,950	3,377	17,170	12,950
	E	2,740	1,180	3	2,740	1,180
	Total	28,790	18,630	3,716	28,790	18,630
Arrowtooth	W	28,400	5,000	1,344	28,400	5,000
	C	141,290	25,000	12,526	141,290	25,000
	E	28,440	5,000	670	28,440	5,000
	Total	198,130	35,000	14,540	198,130	35,000
Sablefish	W	2,600	2,600	1,309	2,600	2,600
	C	8,600	8,600	6,124	8,600	8,600
	W. Yakutat	4,100	4,100	3,148	4,100	4,100
	E. Yak./SEO	6,200	6,200		6,200	6,200
	Total	21,500	21,500	10,581	21,500	21,500
Pacific Ocean Perch	W	1,180	1,014	1,420	1,460	1,260
	C	3,130	2,702	2,433	3,860	3,333
	E	2,220	1,914	966	2,740	2,366
	Total	6,530	5,630	4,819	8,060	rebuilding 6,959
Shortraker/Rougheye	W	170	170	196	170	170
	C	1,210	1,210	1,162	1,210	1,210
	E	530	530	508	530	530
	Total	1,910	1,910	1,866	1,910	1,910
Rockfish, Other Slope	W	180	57	28	180	180
	C	1,170	368	564	1,170	1,170
	E	5,760	1,810	368	5,760	5,760
	Total	7,110	2,235	960	7,110	7,110
Rockfish, Northern	W	640	640	111	640	640
	C	4,610	4,610	3,746	4,610	4,610
	E	20	20	32	20	20
	Total	5,270	5,270	3,889	5,270	5,270
Rockfish, Pelagic Shelf	W	910	910	65	910	910
	C	3,200	3,200	1,573	3,200	3,200
	E	1,080	1,080	355	1,080	1,080
	Total	5,190	5,190	1,993	5,190	5,190
Rockfish, Demersal Shelf	SEO	580	580	168	580	580
Thornyhead	Gulfwide	1,900	1,900	905	1,560	1,560
Atka Mackerel	W		2,310	320	2,310	2,310
	C		925	85	925	925
	E		5	0	5	5
	Total		3,240	405	3,240	3,240
Other Species	Gulfwide	NA	13,308	3,240	NA	NA
GULF OF ALASKA	TOTAL	492,780	279,463	168,324	477,110	248,200

* Catch through August 25, 1995

Recommendations for 1996 Preseason assumed Discard Mortality Rates for halibut bycatch (based on Table 4 in Appendix C).

Region/Target	1990	1991	1992	1993	1994	1995	1993-94 Average	Used in 1995	Recommendation for 1996
BSAI TRAWL									
MWT Pollock	81	81	87	90	85	n/a	88	89	88
Atka mackerel	69	73	62	56	69	n/a	63	59	63
Rock sole/Oflats ¹	58	68	78	72	73	n/a	73	75	73
Pacific cod	68	60	67	62	64	n/a	63	65	63
BT Pollock	65	59	76	78	78	n/a	78	77	78
Rockfish	62	54	59	78	71	n/a	75	69	75
Yellowfin sole ¹	73	74	77	75	71	n/a	73	76	73
Arrowtooth	57	41	-	-	-	n/a	49 ²	49	49
Grnld. turbot	58	38	-	-	59	n/a	49 ²	48	49
GOA TRAWL									
MWT Pollock	63	74	69	63	81	n/a	72	66	72
Atka mackerel	-	-	-	55	41	n/a	48	--	48
Rockfish	61	65	69	62	52	n/a	57	66	57
BT Pollock at-sea	65	56	67	81	-	n/a	74	74	74
BT Pollock shrbsd	65	56	72	54	54	n/a	54	63	54
Shallwtr flatfish	62	61	62	66	67	n/a	67	64	67
Pacific cod	61	55	59	56	55	n/a	56	58	56
Dpwtr fitfsh spr/sum ³	(57)	(52)	(59)	63	56	n/a	60	59	60
Dpwtr fitfsh fall/win ³	(57)	(52)	(59)	56	48	n/a	52	59	52
BSAI H&L									
Pacific cod	17	21	18	18	15	11.5 ⁴	13 ²	11.5	11.5
Sablefish	13	18	19	14	35	n/a	25	17	17 ⁵
Rockfish	18	29	-	-	-	n/a	24 ²	24	24
Grnld. turbot	-	-	17	21	23	n/a	22	19	22
GOA H&L									
Pacific cod	13	17	30	9	15	n/a	12	20	12
Sablefish	11	28	23	26	19	n/a	23	25	23 ⁵
Rockfish	15	20	-	-	16	n/a	18 ²	18	18
BSAI POT									
Pacific cod	7	3	12	4	10	n/a	7	8	7
GOA POT									
Pacific cod	10	5	16	20	13	n/a	17	18	17

¹During 1990 and 1991, "Other flatfish" was grouped with yellowfin sole. Since 1992, the target has been grouped with rock sole.

²Average of the two most recent years.

³Figures shown for 1990-1992 represent the annual discard mortality rate, i.e., across all seasons.

⁴From Williams and Sadorus (1995).

⁵Plan Team recommendation. For the BSAI fishery, this is an average of 1992 and 1993; the GOA fishery uses and average of 1993 and 1994.