AGENDA D-1(a-b)
DECEMBER 2005

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Chris Oliver
Executive Director

ESTIMATED TIME
12 HOURS
(all D items)

DATE: November 30, 2005

SUBJECT: Final GOA Groundfish Specifications for 2006 and 2007

ACTION REQUIRED

(a) Final action to approve the EA/IRFA for BSAI and GOA Harvest Specifications for 2006-2007.

(b) Approve GOA Final Stock Assessment and Fishery Evaluation (SAFE) report, and approve final GOA groundfish specifications for 2006 and 2007 including:
   1. Acceptable Biological Catch (ABC), and annual Total Allowable Catch (TAC).
   2. TAC considerations for the State Pacific cod fishery.
   3. Prohibited Species Catch Limits.

BACKGROUND

At this meeting, the Council makes final recommendations on groundfish and bycatch specifications as listed above to manage the 2006 and 2007 Gulf of Alaska (GOA) groundfish fisheries.

TAC Specifications EA

The Environmental Assessment (EA) and Initial Regulatory Flexibility Analysis (IRFA) for the BSAI and GOA harvest specifications were mailed to you on November 25th. This document analyzes the potential impacts of the 2006-2007 harvest specifications for the groundfish fisheries of the BSAI and GOA. NMFS staff will review the structure of the analysis and the analytical findings. Final action to approve this annual analysis will occur at this meeting in conjunction with the specifications process.

GOA SAFE Document

The groundfish Plan Teams met in Seattle November 14-18 to prepare the final SAFE reports and to review the status of groundfish stocks. The GOA SAFE report forms the basis for the recommended GOA groundfish specifications for the 2006 and 2007 fishing years. Note that there are three volumes to the SAFE report: a stock assessment volume, a fishery evaluation volume ("economic SAFE"), and an ecosystems considerations volume. These three volumes, together with the BSAI SAFE, are incorporated into the Environmental Assessment for the 2006 and 2007 groundfish total allowable catch specifications. The SAFE reports and the EA were mailed to you November 25th. The Joint Plan Team and GOA Plan Team minutes are attached as Items D-1(b)(1) and D-1(b)(2), respectively.

Two year OFL and ABC Determinations

Amendment 48 to the GOA groundfish FMP made two significant changes with respect to the stock assessment process. First, since new data during years when no groundfish surveys are conducted are limited, annual assessments are no longer required for long-lived GOA species. These species include the rockfishes, flatfishes, and Atka mackerel. However, because a GOA groundfish survey was conducted in 2005, full assessments for all species are presented in this year's SAFE report. The second significant change is that the proposed and final specifications can be specified for a period of up to two years. This requires providing ABC and OFL levels for 2006 and 2007. The projection model was modified this year to better accommodate likely mortalities for future OFL and ABC calculations.

In September of this year, preliminary projections of ABC and OFL for 2006 and 2007 were made on the basis of last year's stock assessments. In this SAFE report, the Plan Team has revised most of those projections. Such revisions are typically due to the development of new models; collection of new catch, survey, age composition, or size composition data; or use of new methodology for recommending ABC.

ABCs, TACs, and Apportionments

At this meeting, the Council will establish final catch specifications for the 2006 and 2007 fisheries. The SSC and AP recommendations will be provided to the Council during the meeting. Item D-1(b)(3) lists the 2005 specifications and catch (through November 6, 2005) and GOA Plan Team recommendations for OFLs and ABCs for 2006 and 2007. The sum of the GOA Plan Team's recommended ABCs for 2006 is 512,125 mt. The sum of the ABCs decreased 5% compared with last year. The ABC levels increased in Pacific cod (+37%), deep water flatfish (+27%), other slope rockfish (+6%), Pacific ocean perch (+5%), shortraker rockfish (+12%), pelagic shelf rockfish (+19%), thornyhead rockfish (+14%), Atka mackerel (+683%), longnose skates (+3%) and other skates (+22%). The species with ABCs that declined relative to 2005 are pollock (-6%), sablefish (-7%), rex sole (-27%), shallow water flatfish (-1%), flathead sole (-16%), arrowtooth flounder (-18%), rougheye rockfish (-2%), and Big skates (-11%).

The abundances of Pacific cod, Dover sole, flathead sole, arrowtooth flounder, Pacific ocean perch, rougheye rockfish, northern rockfish, and dusky rockfish are above target stock size. The abundances of pollock and sablefish are below target stock size. The relative abundances of other deep-water flatfish, shallow-water flatfish, rex sole, shortraker rockfish, demersal shelf rockfish, other pelagic shelf rockfish, other slope rockfish, thornyhead rockfish, Atka mackerel, and skates are unknown. None of the groundfish stocks are overfished nor are they approaching an overfished condition.

In June of 2005, the Council took final action to implement a calculation change to the other species complex in the GOA under amendment 69 to the GOA FMP. The 5% TAC calculation was modified such that the Council may recommend a TAC at or below 5% of the sum of the target species TACs during the annual specifications process. The Council's intent was to establish a TAC level which would meet incidental catch needs in other directed fisheries with the potential to establish this TAC at a higher level, which could allow for directed fishing on the complex (but still be placed low enough to prevent excessive harvest of a single targeted species or on the complex as a whole). This interim measure is intended to provide additional flexibility in responding to potential conservation concerns as they arise, until more comprehensive management changes can be made to the other species complex (i.e., analysis of individual species level assessments).

The regulations to promulgate this amendment are anticipated to be finalized by June of 2006. Thus, during this specifications process, the Council will recommend a TAC level for the other species complex at or below 5% of the sum of the target groundfish TACs. Once the regulations for amendment 69 are finalized, the other species TAC recommended by the Council at this meeting will supersede the current other species TAC established as 5% in regulations. In order to provide the Council information to establish a TAC for the other species complex, the Plan Team discussed the incidental catch needs for directed fisheries. Information regarding these incidental catch needs is contained in the summary section of the introduction to the GOA SAFE Report.

TAC Considerations for State Pacific Cod Fishery

Since 1997, the Council has reduced the GOA Pacific cod TAC to account for removals of not more than 25% of the Federal P. cod TAC from the state parallel fisheries. The relative percentage in the Central GOA was increased by the Board of Fisheries (in March 2005) from 24.25% in 2004 to 25%. Using the area apportionments of the 2006 and 2007 P. cod ABC recommended by the Plan Team, the federal TAC for P. cod would be adjusted as listed below.

Table Replaced D-1(b) Suppl.

Proposed 2006 Gulf of Alaska Pacific cod ABCs, TACs and state Guideline Harvest Levels (GHLs) (mt).

Specifications	Western	Central	Eastern	Total
ABC	31,051	43,790	4,777	79,618
State GHL	7,763	10,948	478	19,189
(%)	25	25	10	24.1
Federal TAC	23,288	32,842	4,299	60,429

Proposed 2007 Gulf of Alaska Pacific cod ABCs, TACs and state Guideline Harvest Levels (GHLs) (mt).

Specifications	Western	Central	Eastern	Total
ABC	19,292	27,206	2,968	49,466
State GHL	4,823	6,802	297	11,922
(%)	25	25	10	24.1
Federal TAC	14,469	20,404	2,671	37,544

Given the concerns noted in the SAFE Report summary regarding yield stability in 2006 and 2007 for Pacific cod, the Plan Team recommended that TAC be set below the recommended ABC (prior to the deduction for the state GHL).

Prohibited Species Catch Limits

In the GOA, Prohibited Species Catch (PSC) limits are established for halibut. Since 1995, total halibut PSC limits for all fisheries and gear types have totaled 2,300 mt. This cap was reduced from 2,750 mt after the sablefish IFQ fishery was exempted from the halibut PSC requirements in 1995. The halibut PSC apportionments recommended based upon the 2005 apportionments for the Gulf of Alaska groundfish fisheries are shown below.

GOA Pacific halibut PSC Limits

2006 Trawl			2006 Hook and Line		
Jan 20 - Apr 1		550 mt	1st trimester	Jan 1 - Jun 10	250 mt
Apr 1 - Jul 1		400 mt	2nd trimester	Jun 10 - Sep 1	5 mt
Jul 1 - Sep 1		600 mt	3rd trimester	Sept 1 - Dec 31	35 mt
Sept 1 - Oct 1		150 mt			
Oct 1 - Dec 31		300 mt	DSR	Jan 1 - Dec 31	10 mt
TOTAL		2,000 mt			300 mt

Trawl fishery categories

Season	Shallow Water	Deep Water	Total
Jan 1 - Apr1	450 mt	100 mt	550 mt
Apr 1 - Jul 1	100 mt	300 mt	400 mt
Jul 1 - Sep 1	200 mt	400 mt	600 mt
Sep 1 - Oct 1	150 mt	any rollover	150 mt
Oct 1 - Dec 31	no apportionment		300 mt
TOTAL	900 mt	800 mt	2,000 mt

Joint Plan Team minutes

November 14-18, 2005
Alaska Fisheries Science Center
Seattle, WA

The Joint meeting of the BSAI and GOA groundfish Plan Teams convened Monday, November 14th at 1pm at the Alaska Fisheries Science Center in Seattle, WA.

Members of the Plan Teams present for all or part of the meeting included:

Loh-Lee Low	AFSC REFM(BSAI chair)
Mike Sigler	AFSC (BSAI vice chair)
Kerim Aydin	AFSC REFM
David Carlile	ADF&G
Bill Clark	IPHC
Jane DiCosimo	NPFMC
Theresa Tsou	WDFW
Brenda Norcross	UAF
Andy Smoker	NMFSAKRO
Grant Thompson	AFSC REFM
Ivan Vining	ADF&G
Dan Lew	AFSC
Jim Ianelli	AFSC REFM (GOA co-chair)
Diana Stram	NPFMC (GOA co-chair)
Sandra Lowe	AFSC REFM
Jeff Fujioka	AFSC ABL
Jon Heifetz	AFSC ABL
Robert Foy	UAF
Nick Sagalkin	ADF&G
Tory O'Connell	ADF&G
Tom Pearson	NMFS AKRO
Ken Goldman	ADF&G
Sarah Gaichas	AFSC REFM
Bill Clark	IPHC
Theresa Tsou	WDFW

Plan Team members unable to attend were Lowell Fritz, Kathy Kuletz, and Ward Testa.

Members of the public and state and agency staff in attendance included: Tom Wilderbuer (AFSC), Chris Rooper (AFSC), Jennifer Boldt (AFSC), Chris Lunsford (AFSC), Kalei Shotwell (AFSC), Dana Hanselman (AFSC) Phil Rigby (AFSC), Paul Spencer (AFSC), Pat Livingston (AFSC), Anne Hollowed (AFSC), Scott Miller (NMFS-AKR), Greg Cashen (AK DOC), Beth Stewart (AEB), Mary Furuness (NMFS-AKR), Dean Courtney (AFSC), Buck Stockhausen (AFSC), Heui Chun An (AFSC), Jennifer Ferdinand (AFSC), Lisa Butzner (NPLA), Liz Conners (AFSC), Joe Childers (WGDAF), Julie Bonney (AGDB), Ben Muse (NMFS-AKR), John Gauvin, Arne Fuglvog, Ed Richardson (ASPA), Farron Wallace (WDFW), Martin Dorn (AFSC), Jack Tagart (Tagart Consulting), Bill Atkinson (AFCO), Eric Eisenhardt (WDFW), and Mike Symanzski.

The Teams reviewed changes to the agenda, noting that Pacific cod would be reviewed by the Joint Teams on Wednesday afternoon and that Forage Fish had been added to the GOA agenda. Jane DiCosimo requested clarification as to why forage fish was included as a chapter in the GOA SAFE Report since it was not a TAC category and why it was not included as an assessment chapter for the BSAI. Liz Conners noted that MACE data is available currently in the GOA but not for the BSAI survey thus it is currently feasible to do a preliminary assessment of forage fish only in the GOA.

Research Priorities

The Teams reviewed results of break-out groups assigned to review and revise the research priorities. The Teams discussed the need for a fully revised list for February 2006 SSC meeting. Each assigned group leader reviewed progress on revising the list of priorities by subject heading. The Teams agreed that additional work needs to be done to finalize and prioritize (as necessary) the lists. Each break-out group will meet separately to review and finalize their priorities. The group leaders will meet to review all of the research priorities to identify redundancies or move priorities to more appropriate categories. The revised list will be presented for the SSC to review in February. The Teams agreed that a hierarchical approach for organizing within categories (as with the revised bycatch priorities) represents a good approach for synthesizing overviews.

The Teams agreed to merge catch monitoring and bycatch into one comprehensive category. Andy Smoker noted that priorities related to bycatch should not be limited to PSC species but should reflect issues with all incidental catch and that staff working on catch monitoring protocols should be consulted in addition to Plan Team members.

Jennifer Ferdinand commented on the observer program's role in responding to research priorities. She noted that the observer program needs not only a list of priorities, but also a quantitative description of the data that is being requested. Such prioritization of research data is required since if the observer program is to provide additional data, it will likely be at the expense of current data collection programs.

There are current initiatives to improve sampling and data collection to obtain within-haul variance estimates. The program is working to improve the method of PSC bycatch estimation. Under current observer program protocols PSC sampling for some sectors occurs at the delivery level and is back-calculated to the number of hauls. The haul-by-haul information would represent a major improvement.

She cautioned the Plan Teams that if data needs are different from what is currently in the protocol for observers, the observer program would need detailed information immediately for changes to take place by the 2007 fishing seasons. There is a significant time delay between submitting a request and implementation. If the requests are for enhanced levels of data already collected (e.g., length measurements of a particular species), the observer program requests that the amount of additional information be specified.

ABC/TAC Specifications Process

Ben Muse presented an overview of new specifications process (implemented in 2004) and methodology for stock projections. He explained that for the 2006 specifications process they are working to involve stock assessment authors and Plan Team members earlier in the process for better review of the projections prior to the September Plan Team meeting. The Teams discussed the overall goals of projecting ABCs as close as possible to those that will be implemented in the final rule for those specifications. However, there is limited guidance on an appropriate threshold (high or low) for differences between proposed specifications and final specifications that would merit publication of a second proposed rule. This is notably more problematic for the GOA and AI, where survey estimates are only available every other year. Some ABC projections (especially for Tier 5 stocks) may change dramatically with new information from the most recent survey. The Teams expressed concern that, ironically, the level of confusion is greater under the new process while the intent was to improve the level and extent of public review.

The Teams suggested using an error bar or range around the projection estimates in order to better inform the public that the actual specification numbers are more likely to fall within an expected range.

Species of Concern

Rebecca Reuter reviewed changes to the species assessment of concern (formerly species of concern) handouts since the September Plan Team and subsequent SSC review in October.

Tom Wilderbuer reviewed related work on an alternative catch estimation method for sensitive or rare species managed as part of a complex. He compared survey and observer reported catch by management area, looking specifically for matches and mismatches in observed reported versus survey catch.

Team members questioned how changes due to seasonality were evaluated, noting that observed catch by season should be quantified. Spatial mapping could also be used to evaluate this further. Uncertainty in the estimates should also be quantified since this will vary greatly by species. Team members cautioned that while the questionnaires appear to be useful, a more rigorous approach (e.g., statistical) should be used for formal impact assessments.

Other suggestions by Team members included highlighting data deficiencies by stocks, which could also assist in identifying research priorities. It was cautioned that this approach allows for the use of proxy

species when information is lacking and noted that it should be clear when data from outside of Alaska are being used. Also some species may be categorized as data deficient when they are actually just rare. The form includes identification of the species range but perhaps could be more specific in characterizing rare species due to range extension.

Anne Hollowed provided an overview of why the SSC requested that these questionnaires be completed. She noted that just characterizing a species as vulnerable and long-lived does not indicate that there is necessarily a need for Council action. Further examination could be provided by the information included in these questionnaires as to which species would be elevated for Council action as necessary. Stock assessment authors will complete these forms for presentations at the February Council meeting.

Jane DiCosimo provided an overview of the schedule for the other species breakout amendments for the BSAI and GOA. As part of that analysis, the SSC will review preliminary assessments for GOA other species, and GOA and BSAI grenadiers in February.

Ecosystem Chapter/Ecosystem Assessment

Jennifer Boldt provided an overview of the updates to the Ecosystem Considerations chapter since the September Plan Team meeting and reviewed the SSC comments following the October Council meeting.

Kerim Aydin provided an update on the ecosystem assessment section and modeling work since the September Plan Team meeting. In September, the Plan Teams recommended that stock assessment authors continue to work on incorporating ecosystem assessment information into their chapters as much as possible, and that the ecosystem modelers also try to work with specific stock assessments each year to better incorporate the information to the assessments. The Teams specifically requested that focus be given to the following species: GOA pollock, BSAI pollock, BSAI Pacific cod. Substantial progress on these species was made and was included in these assessments.

Kerim noted that feedback is difficult between September and November Plan Team meetings and that if priorities were set for the following year in advance that would greatly enhance the ability to incorporate the information into the individual assessments. The Teams agreed and noted that the following priorities for next year might be useful: GOA arrowtooth, AI Pollock, AI Pacific cod. The Teams also noted that the ecosystem modeling has shown excellent potential to evaluate the status of some data-deficient stocks (e.g., squid) and that this may be useful for other species (e.g., BSAI sculpins).

September meeting: planning

The Teams discussed some ideas for joint assessment and research topics for the September 2006 Plan Team meeting. These included the following:

- Presentations on gadids (given the Wakefield 2006 symposium focus on gadid and response to climate and fishing effects)
- Grenadiers
- Arrowtooth flounder bioenergetics modeling in the Kodiak area (research by some of Bob Foy's students)
- Halibut assessment presentation, especially on how tag data are used

The Teams also discussed the utility of having the ecosystem assessment information for individual stock assessments presented in September. This would serve to give the Teams a chance to review the information prior to it being incorporated into the stock assessments.

Sablefish

Dana Hanselman provided the Teams an overview of the joint sablefish assessment.

The Teams discussed the new methodology employed to reevaluate catch rates and the impact this has on apportionments. In particular, the use of "sablefish targets" to filter data was questioned since this may result in biases. The bias from defining a target has always been an issue. The new methodology results

were very similar to the old methodology in the GOA where sample sizes are high and target is generally easy to define but differed in the Bering Sea where target is confusing and sample sizes are very small. The suggestion was to simply use gear depth instead of species targets. Team members noted the difficulty in determining depth in observer data, given that the depth of the entire set is generally unknown. It was suggested that determining the target species of any set be improved by requesting information directly from the skippers. The Teams discussed the potential utility of having that additional data. Arne Fuglvog noted that mixed targets of halibut and sablefish tend to be more common in GOA. Questions were posed to the public regarding the extent to which vessels must change their location of fishing or bait if they are not targeting sablefish. Members of the public commented that they are usually able to utilize the same bait and gear and can catch turbot and sablefish together.

The Teams discussed the continuing shift towards pot fishing in the Bering Sea. Since 2001 pot fishing has accounted for up to 50% of the fixed gear quota in the Bering Sea. This represents a large switch in gear and also decreases the sample size for fishery data. Pot fishing is more common in the Bering Sea than the Aleutian Islands. Vessels are converting to pot fishing due to whale depredation. The potential difference in depth and size distribution between pot and longline gear was evaluated in the assessment and no meaningful size distribution differences were noted.

The differences in depredation from sperm whales versus killer whales was discussed, with the assessment authors noting that sperm whale depredation is sporadic but killer whale depredation consistent and therefore potentially more problematic. Killer whales segregate geographically from sperm whales. Arne Fuglvog noted that killer whale depredation is also present in the GOA in particular areas.

Pot fishing (both single pots and longline pots) is allowed in the BS and AI but not in the GOA. Members of the public commented that there is interest in sablefish fishing by pot gear in the GOA, however, this would raise grounds preemption issues given that pot fishing tends to be done by larger vessels.

The Teams discussed the use of split sexes and length frequencies in the model. Some of the data are split by sex but the underlying model combines both sexes assuming a 50:50 ratio (the longline survey sex ratio is approximately 55:45). Differences in growth between sexes is allowed since the transition matrices are specified by sex (and hence used to fit the sex-specific length frequency data). Spawning biomass is calculated using average maturity over both sexes and the Teams noted that this is unique to the sablefish assessment. The senior author stated that he will use the more standard approach of female spawning biomass in the future.

Team members questioned to what extent the aging error matrix may be specified as overly imprecise. The authors noted that aging error for sablefish is uniquely based on true ages rather than reader agreement, therefore represents a rigorously estimated aging error matrix. Some Team members noted that aging errors alone may fail to capture the process of age-determination. E.g., the tendency for age-readers to classify uncertain readings to ages that are common within the current sampling year can cause age frequencies to be higher than expected given age-reading errors alone. Such mis-specification can dramatically impact assessments and year class estimates.

The Teams noted that there is a systematic residual pattern apparent in Figure 3.8 and that a more complete evaluation of the trade-off with other data was difficult due to the lack of presentation (figures were omitted to reduce document size). It may be possible to summarize residuals from the length-frequency data. The assessment author responded that they will present residual patterns more fully in future assessments.

There was a noticeable lack of fit to observed spikes in 1985 and 1987 but better fits in earlier years. Jon Heifetz and Jeff Fujioka commented that the earlier fits might be due to errors in catch reporting and sampling during those time periods. Suggestions to evaluate this included adding a factor to account for unknown catch levels and allowing selectivity to be variable over time.

Martin Dorn commented that since most of the fluctuation in stock appears natural and not due to fishing mortality, the author could examine decadal scale forcing rather than just fishery effects. Sarah Gaichas noted that fishing does not appear to drive the observed changes over time in the ecosystem model. However, others noted that the current data may not represent true fishing mortality rates based on problems noted with underreporting of catches in the late 1980s.

The Teams questioned the senior author on including the slope survey biomass estimate into the model. They noted that there is a fair amount of consistency between the total biomass estimates obtained from estimates without using bottom trawl estimates and the sum of trawl survey estimates. In general, the trawl survey estimates are thought be low compared to the population level. Studies to include these data were included in the research priorities, particularly to cover depths between 0-200m.

The Teams discussed the apportionment scheme utilized for sablefish. The data used in the apportionment calculations include the survey data from 2001-2005 with the fishery data from 2000-2004. The survey data has more influence than the fishery data do, because it is given twice the weight in the apportionment than the fishery data to approximate their respective variances.

The same protocol was followed this year as in previous years. The average weighting is used to provide stability. The Teams reviewed the rationale for incorporation of fishery CPUE data. Arne Fuglvog commented that these data were initially incorporated to address potential bias by geographic and seasonal fishing patterns relative to the survey. Also, the fishery spatial and temporal distribution has changed since implementation of IFQ management which may affect relative abundance levels. It was felt that more data were needed than just the survey given the limited timing of the survey compared to the length of the fishery. Fleet CPUE was determined as being appropriate for consideration provided logbooks could be checked by the observer program and stock assessment authors to ground-truth the data. This is still incorporated in this manner provided the Plan Team and the authors are comfortable that these biases are being appropriately acknowledged.

A problem was noted by Team members that while the data and coverage are good for the GOA, the situation is not the same in the Bering Sea and Aleutian Islands. Public comments focused upon the weighting scheme utilized in the western AI. Bob Alverson noted that the north side of the western AI seems to produce more sablefish catch than the south side and, if weighted by depth, these are not equal habitats. The authors commented that biomass distribution within a regulatory area is aggregated for the apportionment scheme. Members of the public commented that the estimates in the GOA are consistent with their perceptions but question the estimates from the BSAI. They specifically noted concerns over increases in quotas in the BS and AI where they are unable to catch the quota, even after switching to pot and pot longline gear. Concerns were raised regarding the decline in the GOA ABC and it was clarified that the increase in the AI is not at the expense of the GOA. Arne Fuglvog noted that there is a problem with the lag in fishery data compared to observer data, as the fishery is no longer seeing a decline in catch rates.

Plan Team discussion focused on the declining catch rates in some subareas of the AI, but that the overall areas are large and biomass is consequently summed over the entire regulatory area. While it is less economically efficient to fish in the AI, there are large areas available to fish and catch rates are magnified by large areas. The Teams noted that changing the apportionments to be more economically efficient is a Council decision. The Teams considered that the current apportionment system is adequate given biological considerations and is consistent with the methodology used in the past. The Teams do not necessarily endorse the scheme itself for sablefish but noted that it was recommended by the SSC and adopted by the Council. The ABC apportionment scheme as prescribed does not appear to have adverse biological implications for the stock.

The Teams agreed with the assessment authors' ABC and OFL recommendations for 2006 and 2007, including the adjustment to the ABC in the EGOA to account for the trawl ban in SEO, with 5% of the EGOA added to the WYAK.

Other suggestions for the assessment included:

- Consistent presentation of catch estimates (for all assessments)
- Explicit presentation of catch information (e.g., Table 3.10) in order to determine pre-specified catch
- Include estimates of incidental catch of halibut (retained and discarded) in the ecosystem effects section
- Unidentifiable shark catch could be updated with recent information on shark identification. Should also note in the assessment where information is available for updating and/or due to the inability to identify some sharks when they fall off a longline before they are identified by an observer.

Members of the public commented that the fishery database is beginning to be affected by the lack of observer coverage on vessels less than 60ft. It was noted that this is a problem in all fleets, not just for sablefish, and should be raised to the Council regarding relative observer coverage on this sector.

Pacific cod:

Grant Thompson provided an overview of new BSAI and GOA assessment models for Pacific cod. Given the similarity in the BSAI and GOA assessment model changes this year with the use of Stock Synthesis 2, the Teams decided to initially address the model in the Joint Plan Team session, and then adjourned to individual Teams for discussion of ABC considerations.

Maturity and biological issues

The issue of modeling time and/or sex specific differences in life-history characteristics was presented. Differences in life history characteristics appear to be minor over time or between sexes and data to justify the use of a split sex model at this point are limited.

New maturity information, based upon a 2005 analysis by Jim Stark, was incorporated into the new model. Maturity, age, and length data collected together can be expressed as maturity-at-age or maturity-at-length. The Team had a lengthy discussion of the new maturity schedule with Jim Stark. The Teams discussed the problems associated with use of the 1995 study and the justifications for the use of the new (Stark 2005) study for both BSAI and GOA maturity schedules.

Mike Sigler posed several questions to Stark to assist the Teams in justifying its validity and use in the assessment (questions and answers below):

1- When a gonad was classified as mature in a young fish, did it have to have certain percentage of developed eggs to be classified as mature?

Stark classified a sample as mature if a single yolked oocyte or postovulatory follicle was present (using preferential staining). Smaller fish have about same percentage of yolked oocytes as older fish. Jon Heifetz noted that the presence of oocytes in rockfish were sometimes observed, but were later found to have been reabsorbed and hence not fertilized. He recommended that a follow-up study be conducted throughout the season to determine maturity.

2- There has been some evidence in other species (e.g., Atlantic cod) of younger fish eggs being less viable, is this also applicable for Pacific cod in this study?

Egg diameters in smaller fish are smaller (with less yolk) compared to larger fish for Atlantic cod. Plan Team members and other stock assessment authors commented on known or on-going studies of relevance to this topic. Martin Dorn commented that he looked at egg diameter information for pollock, and that Olaf Ormseth is currently evaluating this for cod. This information could be included in next year's SAFE report. Reproductive output by age or length would be a more sophisticated approach than using maturity. Most research to this effect has been focused on North Pacific rockfish.

3- Is there any evidence that only the fastest maturing fish by length were in the sampled areas at the time of the study? Is it possible that immature fish were outside the area at the same time but not sampled?

Spawning was dispersed over a large area and several seasons (winter, spring, and summer). The EBS data collection was from a 4 X 8 nmi area near Cape Sarichef in January and March (during REFM study). Sampling occurred over several seasons, both spring and summer, and pre-spawning and early spawning periods were evaluated. He did not believe there was an apparently sampling bias that could have missed the presence of nearby immature fish.

Team members questioned if the time period for sampling is representative of the population? Grant Thompson noted that while this is a valid concern, the concern is likewise valid for all species. The only way to sample non-spawning fish is to fish for them, which may not be economically viable. There are some observer program data available throughout the year which might be useful.

The Teams have previously noted many issues with the old maturity schedule, specifically the reliance on visual scans which tend to be more uncertain. The histological approach of this study represents an improvement. Criteria associated with the 1995 study made it difficult to classify fish with small gonads as mature: a) detecting maturity macroscopically is inherently difficult if gonads are small; b) small ovaries don't stretch much when eggs are yolked; c) it's hard to see transparent objects through an opaque wall; and d) there is some evidence that observers classified maturity on the basis of length alone in difficult cases. The new histological schedule reported the length at 50% maturity to be 58 cm, compared with 61 cm from the previous maturity schedule and 67 cm from 1995-2004 scans. Generally, length at 50% maturity is expected to be "low" based on estimates of maximum age and natural mortality.

The Teams discussed the egg viability issue, noting that if the Teams used this as a rationale for not endorsing the new maturity schedule it would be the first time the Teams had modified a decision based upon this. The Teams also discussed the relatively minor effect lower viability for smaller eggs would practically have on stock productivity estimates. It might be possible to groundtruth older samples with new histological methods. The Teams recommended including investigations of measures of egg viability as a method for determining whether spawning potential per unit body weight is less for smaller fish in the research priorities.

The Teams noted that impacts to results due to the use of the new maturity schedule are more drastic in the GOA than the BSAI, but that the use of GOA-specific data is seen as a vast improvement over the use of BSAI data as a proxy for the GOA.

The Teams concluded: a) the analyst (Jim Stark) has lots of experience; b) the new schedules seem more likely to be accurate; c) there are plausible explanations for why the old schedule may have been too conservative; and d) the new study would provide a GOA schedule based on GOA data. Therefore, the Teams endorsed the use of the new maturity schedule for both the GOA and BSAI assessments.

Models

Discussions of the three models presented for Pacific cod ensued. Model 1 is identical to last year's model, and includes: 1) fixed M and q (selectivity); 2) start year is 1978; 3) finite difference algorithm (original FORTRAN stock synthesis); 4) simultaneous estimation; and 5) difficulty estimating confidence intervals. Model 2 is a revised stock synthesis model (SS2), and includes: 1) fixed M and q; 2) start year is 1964 because SS2 must initiate with an equilibrium year; 3) developed in ADMB; 4) phased estimation; 5) estimated confidence intervals; and 6) prior distributions for selectivity and growth. Model 3 is the same as Model 2 but M and q are estimated, and q is linked with temperature.

The authors' model evaluation criteria included: 1) Fit to size compositions, age compositions, and surveys; 2) Overall reasonableness of parameter values; 3) whether model estimates of total biomass achieve a reasonable relationship with the survey's estimates of biomass; and 4) whether the model appropriately reflects the uncertainty associated with key outputs. All 3 models fit the size composition data well, but age composition data poorly. All three had about equal survey biomass estimates. Models

2 and 3 gave the most believable estimates of size (Lmax). Models 2 and 3 gave age 3+ biomass much closer to the survey than model 1. Model 3 gave the most realistic confidence intervals, M and q estimated (not assumed) for the EBS.

The Teams discussed the choice of different models and the relative benefits of model 2 over the author's recommendation of model 3. For the GOA, model 2 seemed to meet more of the criteria than model 3 with the exception of the confidence intervals. The Teams discussed the utility of a consistent choice (between areas) of model formulations, although the Teams may choose different models.

Model 3

- Author recommended model
- Comfort level with greater uncertainty
- For the Bering Sea, model 3 fit the criteria better

Model 2

- Authors were divided between models 2 and 3
- More like status quo for M and q parameters (more stability with previous modeling formulations)
- Does not include a freely estimated M and q , consistent with treatment of other stocks (although has been done for some flatfish stocks)
- M is estimated from a similar model with fewer data in past
- Consistency with Bering Sea and GOA

The Teams reached consensus after much discussion on the choice of model 2. The Teams convened separately to discuss ABC recommendations.

For future assessments, the Teams recommend that the authors present a model where q is estimated (and/or prior is provided) and M is fixed. The Teams recommend exploring estimation of natural mortality from existing mark-recapture data.

Research Priority: The Teams support continued study of egg viability and expanded geographic and temporal sampling.

Gulf of Alaska Plan Team Minutes

The meeting of the Gulf of Alaska groundfish Plan Team convened on November 15th at 1pm at the Alaska Fishery Science Center, Seattle, WA.

Members of the GOA plan team in attendance included:

Jim Ianelli	AFSC REFM (GOA co-chair)
Diana Stram	NPFMC (GOA co-chair)
Sandra Lowe	AFSC REFM
Jeff Fujioka	AFSC ABL
Jon Heifetz	AFSC ABL
Robert Foy	UAF
Nick Sagalkin	ADF&G
Tory O'Connell	ADF&G
Tom Pearson	NMFS AKRO
Ken Goldman	ADF&G
Sarah Gaichas	AFSC REFM
Bill Clark	IPHC
Theresa Tsou	WDFW

Plan team members that were not able to attend the meeting were Ward Testa (NMML) and Kathy Kuletz (USF&W). Approximately 15 state and agency staff and members of the public also attended. Names of attendees are included in the Joint Plan Team minutes.

The Team discussed the contents of the GOA SAFE report introduction. Two new sections were added to the introduction this year, a summary section on Ecosystem Considerations, and a section on other species. The Team discussed what to include in the ecosystem section for this year, understanding that it will be expanded upon in future years. The general trends for the GOA region as noted in the ecosystem considerations chapter will be summarized as well as a table showing the treatment of ecosystem effects by stock assessment chapter. In the future more specific information by assessments may be summarized and included in this section.

GOA Pollock

Martin Dorn presented an overview of the pollock assessment.

Kerim Aydin presented details on the ecosystem considerations section for the assessment. Food habits data from the NMFS bottom trawl surveys from 1984-2005 was used but the bulk of the data are from 1990-2005 (with the exception of 2003 data which has not yet been processed). Martin Dorn inquired about the quality of shipboard sampling (done for the first time in 2005). Kerim responded that the quality control on shipboard stomach-content processing has been as good as those processed in the lab (which is excellent). He noted they are also moving toward genetic identification when they are not positive about identification of the collected samples.

Ecosystem modeling results indicated that arrowtooth flounder are a major predator of juvenile and adult pollock, but pollock is not a major component of the arrowtooth flounder diet (representing approximately 14% of their diverse diet). Halibut have a large component of pollock in their diets. Arrowtooth consume juvenile pollock (<30cm) but larger pollock represent an important component by weight. Halibut and Pacific cod eat larger sizes of pollock. Results for Steller sea lions were similar to halibut. These data are important in considering reasons that pollock abundances have declined more

than expected in recent years. Catch by the fishery appears to be a minor component of pollock compared to the combined effects of predation.

Trends in consumption of small pollock (<30 cm) indicate that years of low abundance correlate to low consumption, while high biomass shows a leveling off in consumption, possibly indicating some sort of satiation. Martin Dorn noted that the only survey independent variables are the estimates of ration and that ration is the biggest unknown in the analysis. Kerim noted that this may be a problem in the assumptions for the analysis and this could possibly be resolved in an iterative analysis.

Plan Team members questioned the use of trawl survey biomass for predators rather than biomass estimates from stock assessments. The authors commented that they could refine the analysis by using stock assessments estimates. This could be an issue particularly for Pacific cod where model estimates have been very different from the survey biomass estimates in previous years. Other predators (e.g., salmon) which are caught in the trawl survey are incorporated in an "other" category in the current modeling framework. The authors also noted a potential problem with the arrowtooth flounder assumption in the model that q=1

Pacific cod and halibut results show a steady declining trend in consumption by year. The authors speculate that there could be some constant effective rate of predation regardless of the stock decline until it reaches some critical threshold then it dramatic drops (for all but arrowtooth flounder where it increases). This needs further investigation.

Perturbation analysis results showed that a 10% decline in natural mortality variation caused a larger perturbation than a 10% change in fishing mortality. Changes due to fishing effort related primarily to trawl bycatch species while the impact on Steller sea lion abundance was negligible. This gives further indication that Steller sea lion response may be more related to small scale (localized) effects and not broad scale food availability. Perturbations to the pollock population do not have a strong effect on the arrowtooth flounder population.

Martin Dorn mentioned the possibility of further analyses to compare empirical correlations between species abundance trends to correlations produced by ecosystem model runs. The Team discussed the inverse relationship/negative correlation between Steller sea lions and arrowtooth flounder and suggested that smaller scale modeling (looking at localized effects) might be appropriate. Bob Foy commented on work they are doing with a bioenergetics model in the Kodiak region. This model is designed to evaluate spatial effects of diet composition and impacts of migration on diet. He noted the importance of capelin moving through the Kodiak region and hence the model duration of the capelin presence in the area could be an important factor.

Team members suggested the possibility of looking at co-occurring perturbation (i.e., two perturbations in combination) and investigate how this impacts the trends. Kerim noted that specific hypotheses could be incorporated and tested in the model.

Diet data was noted to be seasonal in that there is more diet data from the summer data thus the ration data is more dependant on results of the summer data.

Bob Foy commented as to whether the energy content of species is related to decreases in consumption in order to incorporate seasonal components. Kerim noted that the wet weight consumption component could be decreased and evaluated to investigate that aspect.

The authors solicited feedback and comments from Plan Team on the scope of the analysis included and the utility of incorporating this information into the assessment.

The Team discussed the timing of the availability of this type of information for useful integration into assessment. Martin Dorn noted that there is no explicit connection between this type of information and the assessment itself at this point. However if this type of information is to be included into the assessment model then the timing of availability of that information becomes much more important, similar to the availability of survey data. It was not clear at this point whether or not this is to be

explicitly included in assessment model. The Team discussed how this type of information would be included in the assessment. Ideas included an MSE context for development of hypotheses to test control rules in relation to potential ecosystem effects. If for example, natural mortality was specified to be variable over time, this could imply incorporation into the harvest policy and therefore an adjustment to the harvest policy over time. This could represent a major change to NPFMC harvest policies which are not now explicitly based upon ecosystem assessment information.

The Team discussed information included in the assessment including the reported bycatch of other species such as squid and sharks. Prohibited species are not currently included in the ecosystem model. No information is included currently on salmon bycatch in the GOA by the pollock fleet. Observer coverage in the fleet was noted to be variable by area, with less than two percent of the fleet below 60ft in the central GOA but nearly 70% of the western GOA harvest taken by vessels below 60ft.

The assessment author provided an overview of survey results, noting that the first sign of an upcoming year class was observed in the 2005 EIT survey, representing the first indication in several years. The Team discussed the sampling protocol of the 2005 summer bottom-trawl survey and the impact of the additional stations done near Kodiak at the end of the survey. The size compositions shown in Figure 1.5 showing a change in length frequency mode (age 1) apparently represents growth through the season.

Julie Bonney inquired about the extent that the EIT survey covers the range of one-year old fish. Chris Wilson commented that in the GOA they tend to observe them in the water column and not on bottom. The summer acoustic survey could track them in the water column and there is the possibility of investigating further in future surveys. The new sampling gear (multiple-opening mid-water trawl) will allow for discrete samples to be taken throughout the water column enabling samples from different depths.

The author noted that the extent of fishery observer sampling seems to be declining. This may be due to observer coverage issues or a change in the prioritization by observers. Members noted that this could be a result of the trend towards harvest by the under 60ft fleet in the western GOA. It was noted that port samplers are collecting data in Sand Point so the fishery is partially sampled, i.e., samples are obtained upon delivery. Beth Stewart commented that they have offered to subsidize additional plant observers because of the data problems and the short fishery. This appears to be a problem overall in the GOA with declining observer coverage. The Team requested that NMFS endeavor to ensure adequate sampling continues for this species.

The Team discussed aspects of the models presented. A key result is that the magnitude of the 2000 year class has increased compared to previous assessments and that the magnitude of the 1999 year class estimate has declined slightly. Recent patterns in fishery selectivity reflect a shift towards younger fish. The previous cautionary treatment of the 1999 year class estimates (in projections) appears to have been warranted. While the early data indicated that the 1999 year class was quite abundant, it is likely that some sort of unaccounted process error (e.g., predation) actually affected the current abundance of this year class.

The author showed figures (not included in the document) of fishery length at age data indicating the same size fish from 1999 and 2000 year classes. The 2000 year class appears to be growing faster than the 1999 year class. Jim Ianelli commented that this was also observed (for the same year classes) in the Bering Sea. It was determined not to be an artifact of reader error.

ABC recommendations

The author recommendation is based on the use of the constant buffer control rule resulting in an ABC less than the max permissible. Plan Team members suggested that the assessment should distinguish between the use of "adjusted" as one indicates an adjustment for Tier 3b while the other is the author's constant buffer adjustment.

The Team agreed with the author's recommendation to establish ABC below the maximum permissible given that the stock remains below $B_{40\%}$, and in fact is slightly below $B_{35\%}$, and that the stock is projected to decline in the next few years.

The Plan Team recommends the ABC be reduced by 910mt to account for the deduction for the Prince William Sound portion of the stock that is assessed (consistent with previous years action). Ken Goldman noted that the state may update the PWS assessment soon which may affect this value. The Plan Team continues to recommend that area apportionment be based on percentages provided by the author using the methods developed in previous assessments.

An appendix for the southeast pollock assessment reports a slightly smaller ABC and OFL for 2006 (based on a Tier 5 calculation using 2005 survey bottom-trawl survey results).

The author noted that the F recommended this year would be lower than last year. Plan Team members expressed reservations with the projections that the ABC could decline to 65,000 in 2007 under these recommendations. The author commented that the indications are that the stock will decline in next few years and the 2007 results are consistent with this estimated trend. The 2007 ABC assumed that the 2006 ABC would be taken.

The Team questioned the potential impact on model projections if arrowtooth predation were included. The author commented that the model currently assumed constant natural mortality rates. If the mortality rates were closer to the indications of including increased predation mortality the resulting biomass would be lower. He noted that it is also possible that the model is already in some way compensating for some predation mortality by maintaining a consistent natural mortality for ABC recommendations.

The Team noted that a number of factors included in model provide extra precaution for assessment and ABC recommendations. These include:

- Bottom-trawl survey q is estimated at 0.77 but a value of 1.0 was adopted (~15% more conservative)
- The ABC value is ~10% below the maximum permissible using author's recommendation
- Ecosystem concerns: fishing mortality appears to be a small component of the total mortality compared to predation mortality estimates.

Based on the concerns noted and the precautions built into model, the Plan Team approves the author's recommendation for ABCs and OFLs for 2006 and 2007.

The Team notes that ecosystem concerns are being evaluated in an upcoming MSE for GOA Pollock by Teresa A'mar). Additional multi-species modeling work for the GOA ecosystem is on-going by Sarah Gaichas and Terry Quinn's graduate student, Kray Van Kirk. The Team is encouraged by the developments of these projects and look forward to evaluating these results relative to future ABC recommendations.

The Shelikof EIT survey report is now available as an AFSC Process Report. This report used to be included as an appendix to the SAFE report and is now available as a stand-alone document.

Pacific cod

(see Joint Plan Team minutes for assessment discussion)

The Team discussed the author's rationale for choosing an ABC recommendation based on 50% of max permissible under model 3. The Teams preferred model 2 (see Joint Plan Team minutes for rationale). The Team was very concerned about the relative increase and subsequent decline in the ABC under both models. The Team discussed other options including either dropping the stock down a Tier level, or choosing model 2 for the assessment but recommending a rollover from the 2005 ABC given the concerns raised with yield stability.

Julie Bonney commented that it would be useful to see information for model 2 which is similar to that presented in Table 2.26. The model projection indicates a continued decline in 2006, but the survey appears to show increases. She noted that the TAC in the central GOA was taken by late January and it seems that the biomass levels there are higher than estimated. She requested that the authors evaluate state survey results for cod in that area, understanding that there may be difficulties comparing results from different survey areas (state and federal).

The Team noted that while there are concerns regarding the model and the potential for the stock assessment authors to elect a different model next year, the differences in model estimated biomass relative to last year (regardless of model choice) are predominantly due to the new maturity schedule.

The Team accepts the model (model 2) as an improvement over last year's model (i.e., model 1). The Team recommends the maximum permissible ABC from the model but notes that this ABC is considerably higher than the 2005 ABC. The Team strongly recommends that the Council consider a TAC adjustment downwards from this ABC in order to provide yield stability. The Plan Team did not feel that it was biologically justified to use a stair-step approach on incremental changes to the cod ABC this year (as per the GOA pollock ABC in 2005) given that the changes are largely driven by improved maturity information. However, the Team has reservations over the potential for a lack of stability in the catch.

Flatfish

Jack Turnock provided an overview of the Flatfish Chapter. The Team notes that the structure of the flatfish chapters could be better organized in the future and recommends separate chapters for deep water flatfish and shallow water flatfish, with Dover sole contained within the deep water flatfish chapter (similar to the current organizational structure for pelagic shelf rockfish and dusky rockfish).

The Team suggested that in addition to the Tier 5 calculations for the remaining members of the deep water flatfish complex, it would be useful to include a table showing the overall ABCs and OFLs for the complex (which includes Dover sole). The Team also reiterated previous comments regarding the necessity of cross-checking the numbers included in the draft assessment prior to distribution to the Plan Teams, in order to facilitate better understanding by the Plan Team of the assessment results.

The author noted that the majority of the catch in the shallow water flatfish complex is made up of northern and southern rock sole.

The Team suggested the author check for the availability of additional age data for updating mortality rates per December 2004 SSC comments.

The Team approved the author's recommended ABCs and OFLs for both complexes for 2006 and 2007.

Sarah Gaichas noted that complex management such as for shallow and deep water flatfish is pertinent to non-target management discussions (and analyses) currently underway. Consideration should be given to the species in the assemblage and to what extent they are appropriately grouped together. She noted that this becomes particularly important should a species within the complex be broken out as a target species. Tom Pearson noted that if a species in the complex were broken out, it would most likely be rock sole as separate target fishery.

Rex sole

Jack Turnock presented a review of the rex sole assessment. The age-structured model for rex sole was first used in 2004. The Team noted the continued problems with a large $F_{40\%}$ calculated by the model, and the difference in selectivity between the survey and the fishery. The Team questioned to what extent the fishery is selecting specifically for size. Julie Bonney commented that it is a trawl gear fishery primarily targeting arrowtooth flounder but also catching some rex sole. The fishery tends to be prosecuted by catcher processors. Market conditions were favorable for rex sole this year.

The Team appreciated the author's inclusion of depth-related information from both the survey and fishery, noting that larger fish in the survey are not present in deeper water.

The Team noted that table 4.11 should be updated for 2005 data.

The Team discussed the SSC comments on rex sole from both the October 2004 meeting and the December 2004 meeting and encouraged the author to address these comments in the assessment.

The Team discussed modeling results which project a large decrease in the 2007 ABC. The Team suggested using expected catch instead of the ABC to avoid such large fluctuations. This was implemented and presented in a separate table.

The Team discussed the effect of selectivity on model projections and the unresolved issues inherent in using the model for ABC estimation. The author was commended for providing several alternative scenarios of selectivity and the related effects on projected biomass and catch. The Team was uncomfortable with the Tier 3 for this species, acknowledging that $F_{40\%}$ was reliable for the purposes of the analysis but not for projecting ABCs. The Team approved of the author's recommended approach of using the model for projecting the biomass and applying a Tier 5 approach to that biomass for calculating ABCs and OFLs. Other options considered were to use a simple Tier 5 approach on survey biomass estimates, or to use the model for both projected biomass and projected ABC (Tier 3). The Team was comfortable that the model projected biomass captured the fishery selectivity (and preferential targeting of adults) better than use of the survey biomass estimate alone. The Team felt that this modified approach was justified given the difference between the survey and fishery selectivity.

Julie Bonney commented on the area apportionments based on the 2005 survey. The fishery occurs in the western and central GOA and if 2006 and 2007 apportionments are based upon the 2005 survey this could constrain the fishery in these areas. She commented that it would be productive to have a dialog with the catcher processors to see if they agree with the observed selectivity in the fishery. The Team also questioned to what extent rex sole is predominant in the mixed flat fishery. The Team encourages the author to investigate these issues further.

The Team questioned if there are any plans to increase data on maturity, noting the need for better sampling for maturity. This should be highlighted for observer program priorities. The Team notes that the ability to move forward with the use of this model (as opposed to defaulting to a Tier 5 calculation) depends upon the availability of additional maturity information and a clear understanding that selectivity estimates are reliably estimated.

The Plan Team agrees with the author's recommended ABCs and OFLs for 2006 and 2007.

Dover sole

Buck Stockhausen presented an overview of the Dover sole assessment. An age-structured model has been developed for Dover sole. It is managed as part of the deep water flatfish complex.

The author noted a high discard rate in 2003 and 2004, with 2003 at approximately 50%.

There are continuing problems with assessing the biomass of Dover sole deeper than 500m given that not all surveys have sampled to these depths. This is a problem both for calculating biomass as well as for obtaining age and length composition data. Older, larger fish are missing from the shallow water surveys. The author also noted some apparent discrepancies in the 2003 survey age data and did not include these data in the model. This discrepancy appears limited to Dover sole age readings only and did not affect other species.

The Team questioned why length composition data were limited to 1991-2004. The co-author agreed to look into why additional data were not included.

The author compared the 2003 and 2005 SAFE assessment results. Total biomass is higher in the 2005 model. There is an apparent disconnect between the 2004 and 2005 survey length data, with the resulting

large uncertainty likely a result of trying to fit an apparent recruitment event in 2002. The author noted that additional survey length data and age composition data in the future may help resolve this.

The Team commended the author on investigating the constrained versus the unconstrained models but given that the results were similar, the Team recommended continuing to use the unconstrained model for assessment purposes.

The Team encouraged the author to continue to explore unresolved selectivity issues regarding why the curve is asymptotic given the difference between shallow and deep water selectivity in the survey. The author noted that a dome-shaped selectivity was attempted but that different selectivity curves are being investigated further. The author is considering the development of a multi-area model to evaluate potential problems with survey coverage. Also, the possibility of using different selectivity curves for deep and shallow water may be useful. Team members cautioned that the author would need to account for migration and the degree of stock mobility.

Collection of Dover sole age composition data and additional fishery length data should be prioritized.

The Team commended the author on the improvements to the assessments this year. The Team notes that the structure of the flatfish chapters could be better organized in the future and recommends separate chapters for deep water flatfish and shallow water flatfish, with Dover sole contained within the deep water flatfish chapter (similar to the current organizational structure for pelagic shelf rockfish and dusky rockfish).

Arrowtooth flounder

Jack Turnock presented an overview of the assessment.

Plan Team members asked about the catch of arrowtooth flounder and market status. It was noted that some are sold as frozen fillets to Asian markets as well as blended with pollock in surimi. Members of the public commented that there would be more interest in catching arrowtooth but they are currently constrained by the halibut bycatch limits. Asian markets are presently strong and with the apparent declines in Kamchatka flounder production, the demand for arrowtooth flounder has improved.

The Team discussed the potential changes in fishing practices if comprehensive GOA groundfish rationalization were to occur. Presumably any rationalization program would result in a savings of halibut and/or a lifting of the existing halibut constraints. This would likely result in increased targeting of arrowtooth. There are areas where it is possible to fish cleanly for arrowtooth (without catching halibut) but these areas tend to be further away and travel time may preclude economic viability. Under rationalization this would likely change.

The Plan Team suggested that there be some economic analysis of the arrowtooth flounder fishery given that it is developing into a target fishery and is no longer simply discarded. In the GOA retention rates are approximately 50%. The Team noted a number of discrepancies in the percent retained table and requested that the author correct these for the version presented to the Council.

The Team discussed the merits of including abundance estimates from earlier periods in the model. The author noted that it may be useful to include for reference points but is unlikely to influence recent abundance estimates. The Team requested that the author look at how the trend changes with and without data from the early years.

Plan Team members questioned the potential herding component leading to the catchability coefficient of 1.3. Bill Clark noted that this appears to be based on triennial survey gear estimates. The author commented that additional information for the survey gear is lacking. The Team requested that the author review the numbers included in this section to see if they still represent an unresolved issue.

The Team requested clarification on the availability of any updated information on age composition. The author noted that growth over time appears to be unchanged or possibly slightly increased and referred to the GOA pollock assessment for additional information (e.g. treatment of arrowtooth flounder in the

pollock ecosystem considerations section). A suggestion from Team members was to look at selectivity by size to see if those were similar for males and females. Males appear smaller at age than females but the model is forcing the selectivity to be the same around age 12 due to the fixed catchability value of 1.0.

Other suggestions for the author on the assessment:

- References included (especially in the Maturity section) should have the updated citations (e.g., Zimmerman in review has now been published)
- The assessment should explicitly state that the values utilized for maturity are from the Zimmerman study
- Information presented in some sections seems dated and more recent information should be included.
- Numbers should be cross-checked prior to distribution to the Plan Team
- The presentation (esp. OFLs and ABCs) should be improved to conform with the the format specified in the guidelines. This would improve the Plan Team's ability to review the assessment results

Flathead Sole

Buck Stockhausen presented an overview of the flathead sole assessment. He noted that catch has been historically below the TAC and well below the ABC.

Team members inquired about the availability of age data from the survey. The author noted that the quantity of available data is marginal.

Catch history in the model is included though 1984, and prior to that it was assumed that there was no catch. The maturity parameters have been updated based on Stark (2004). The author summarized the differences in maturity schedule from the 2003 assessment, noting that in general the fish are maturing later. This maturity study was not based on new data but a reanalysis of the old data.

Results were compared with the 2003 assessment results. The 2005 biomass assessment results were lower than the 2003 estimates for biomass. Some changes in recruitment were noted, as well as the additional factors of the added age data as well as the change in maturity schedule.

For projections of catch in the assessment, the author assumed the 2005 catch was taken. The 2005 catch was the largest in several years (but still well below the TAC). For 2006 the author assumed the same level of catch as in 2005 in order to project the model forward and obtain 2007 OFL and ABC estimates. The fact that the projection was not based on fishing at ABC in 2006 was considered most appropriate given recent catch levels and trends.

The ABC apportionment was based on the relative proportion of biomass in each area from the most recent survey. The flatfish apportionment policy has been to use the most recent survey estimate. The rationale for this scheme is that flatfish are thought to be relatively stationary with little large-scale movements. They are also considered to be well surveyed with relatively precise survey estimates.

Julie Bonney also noted that there is a socio-economic aspect to the apportionment in that ABCs are not widely varying from one year to the next, however for flatfish the TAC is set below the TAC and the fleet does not usually take even the TAC so variations are not considered a problem.

As for arrowtooth, under proposed rationalization, more flexibility in halibut bycatch constraints would allow the fleet to take more of the allowed TAC for flatfish and confer economic benefits to the fleet

Bob Foy questioned to what extent it would be possible to evaluate the changes in halibut bycatch on a year-to-year basis. Tom Pearson commented that for flatfish this tends to be more opportunistic fishing effort depending upon what species the vessel comes upon. He noted that bycatch rates included in the

assessment would need to be aggregated for the entire flatfish fishery in order for those numbers to be meaningful given the opportunistic nature of the fishery.

Julie Bonney noted that there has been some experimental work on halibut excluders in the flatfish fleet with some limited success. This experimental work is continuing.

Other Plan Team comments on the assessment:

- Questions were raised on the reference for the natural mortality rate (reference to the 2003 assessment but no reference to where it came from before that)

Bill Clark commented on a recent paper by Lester et al on predicting natural mortality rates. He offered to send this to Plan Team members and the assessment author.

The Plan Team commends the assessment author on an excellent and very readable assessment.

Pacific Ocean Perch

Dana Hanselman provided an overview of the Pacific ocean perch assessment. The survey biomass estimates increased in 2005 and was also more precise than previous estimates. The biomass of Pacific ocean perch was apparently more uniformly distributed among hauls, also the 2005 survey included more stations than in the past.

The author recommended the maximum permissible ABC for the stock, noting that it is above $B_{40\%}$ and indications are for increases in spawning biomass through 2007. The projected ABC will increase in 2006 and 2007 and then level off. The Team discussed precautionary elements in the assessment which would support the choice of the maximum permissible ABC for this stock. The total biomass estimate appears conservative and is less than the survey biomass estimate. The stock is above $B_{40\%}$ with survey biomass and model projected biomass both increasing. The TAC for this stock is not reached due to the trawl restriction in the EGOA.

The magnitude of incoming year classes is uncertain but biomass remains high. The authors noted concerns that a single tow in the Shumagins may have too much influence on the age composition estimates. The Team discussed that situations in which increasing survey biomass trends cannot be reconciled with the observed level of recruitment. This may be an artifact of the patchy distribution of this species. This conflict between data may result in survey catchability estimates being greater than 1.0 (as is the case here). The author noted that he is interested in addressing more spatial aspects in the future given the difficulty in assessing stocks with patchy distributions. The author noted that an external review on rockfish stock assessments may occur in the coming year.

The Plan Team agreed with the author's recommendation for OFLs and ABCs in 2006 and 2007.

Rougheye Rockfish

Dana Hanselman presented the overview of the rougheye rockfish assessment. The model was first presented to the Team in 2004 and used this year for ABC recommendations.

The Team agreed with the authors' recommendation for use of model 3 which includes a new ageing error structure and methodology for estimating catch data. The Team discussed the more realistic catch estimation in the projections given that recent catches have apparently been low. Tom Pearson noted that while catch was unusually low in 2005 it is expected to increase. The low catches in 2005 could be an artifact of splitting out rougheye from the shortraker/rougheye complex for the first time. The Team recommended the use of the maximum permissible ABC to generate the resulting projection for 2007. The Team inquired about the different trends between the longline survey and the trawl survey. The authors noted that the model trend may stabilize if the longline survey pattern continues, but that the model currently tends to follow the increases in trawl survey estimates (even though the two surveys are equally weighted).

The Plan Team approves the author-recommended OFLs and ABCs for 2006 and 2007.

Shortraker and other slope

Dana Hanselman presented an overview of the shortraker and other slope rockfish assessment.

Bottom-trawl survey estimates from 2003 and 2005 indicate an increase in abundance while the longline survey suggests a decrease in the abundance of shortraker rockfish. The abundance of silvergrey rockfish and harlequin rockfish is apparently increasing based on bottom-trawl survey data. However, relative changes to the overall ABC were minor.

The Team discussed to what extent minor species in the other slope rockfish complex are caught. Tom Pearson commented that there has been a problem with harlequin rockfish being misidentified as POP and northerns when delivered to Kodiak. Whole haul sampling in comparison to plant reporting indicated that other slope rockfish catch may be underreported. Alan Kinsolving has been working on this project and will likely have a report released next year that details the extent of these problems.

An industry group, ALFA (represented by Dan Falvey), presented a discussion paper at the September Plan Team meeting on the idea of developing a target silvergrey rockfish fishery. This presentation reported on preliminary results of an EFP to use shrimp fly troll gear to target silvergrey rockfish. The Team encouraged an additional EFP rather than endorsing a request to allow for directed fishing on the complex at this time.

Tom Pearson commented that the quotas for other-slope rockfish are very low and thus the complex is on bycatch only status from the beginning of the year. Even so, the "other-slope rockfish" TAC in the western and central GOA is often exceeded. As a Tier 5 complex, the ABC is specified based upon survey estimates which are highly uncertain. The Team is concerned with the perception that exceeding the TAC is a potential conservation concern where in this instance it may actually be more related to survey variability. The stocks within this assemblage are not well surveyed. The Team is concerned however with anecdotal reports of the underreporting of catch which may be exacerbating the problem of exceeding the TAC in these areas. However, the Team notes that the complex does not appear to be targeted at this time and catch is incidental to other fisheries. The Team suggested that the assessment author reevaluate the weighting scheme utilized in the assessment to further investigate what is driving the observed changes.

The Plan Team approves the author-recommended OFLs and ABCs for 2006 and 2007.

Northern rockfish

Dean Courtney presented an overview of the northern rockfish assessment. New data was available this year and the authors presented 5 different model configurations. The 2005 survey results showed the highest biomass on record for northern rockfish. The 2005 estimate was more precise than previous high biomass estimates (albeit still fairly uncertain). The author reviewed the models included in the assessment noting that he was willing to present the models again in September 2006 for further Plan Team review given that these numerous models were being presented for initial review in November 2005 and were not available for the September Plan Team meeting.

Team members questioned the location of sampling for length and age data relative to where catch was taken. The fishery characteristics appear to be changing with more deliveries to Kodiak. In 2004 there were 942 fish aged from 308 hauls but the author did not have a breakdown of the number of fish from each of these hauls, thus there could be a disproportionate amount from certain hauls which could bias the data in the model.

Additional age data were available for this year's analysis. Natural mortality is estimated within some of the models. Models 1-3 fit the overall recent biomass trend poorly. The authors developed some alternative hypotheses about why the fit was poor. One of these was to include an historical fishing

mortality term (Model 4). Model 5 also includes this parameter and allows natural mortality to be estimated. Also new this year (facilitated by the additional age data), separate selectivities were estimated for the survey and the fishery.

The Plan Team discussed the *M* values used in the models. Bill Clark questioned the impacts of freeing *M* under this model. The Team was concerned that the model trend is still showing decreasing biomass with strong recruitment and is thus not scaling the biomass estimate upwards as anticipated. Jon Heifetz noted that the precision in earlier biomass estimates is weighting the trend downward. Team members questioned whether the author had ever put additional weight on recent survey estimates. The author commented that he tried this in a sensitivity analysis and while it fits the biomass estimates better the relative fits to other data were much worse. The lead author has more confidence in the available age data than in the survey biomass estimates.

The author reviewed his approach to estimating an historical F rate noting that it only applies to first year numbers-at-age. There is some historical information available in the observer data base but for earlier years the observer database does not have northern rockfish catch broken out so the author used an estimated ratio. Other possible approaches include either starting the model back further with an estimate of catch from those years or using two time series of catch (one estimated historical with less data, one more recent with better data).

The author initially recommended model 5 but was not firmly committed. Results from the model showed an increase in abundance although the fit to the overall biomass doesn't improve due to changes in *q*. However, the trend in biomass starts to respond to the higher 2005 biomass estimate. With the inclusion of the historical F, the model started out at a more fished state (possibly depleted) and then increased which tends to be more consistent with survey, age composition and the history of the fishery given the historical prevalence of foreign fishing.

The Team had an extended discussion of the inclusion of the historical *F* parameter and resulting model formulations. Some technical issues related to the model (e.g., that recruitment likelihoods are negative in models 4 and 5, Table 9.8) led the Plan Team to concur with the authors that further explorations are needed. The author will look at different scenarios for addressing historical fishing and alternative model formulations for next assessment. Other items to be addressed in the next assessment include estimates of maximum age and selectivity patterns. The author noted a number of sensitivity analyses he would like to pursue (e.g., changing selectivity) for next year.

The Plan Team discussed the relative merits of the different model formulations. Model 1 was rejected due to substantive improvements of the other models (e.g., separate survey and fishery selectivity curves). The Team appreciates the efforts the author has made to explore freely estimating natural mortality. However, Model 4 was more consistent with previous results and overall trends in abundance and was most suited for ABC and OFL recommendations. The Plan Team encourages the author to further investigate model development. The Team recommends the use of model 4 with a strong recommendation that an updated assessment be done for next year (a non-survey year). There was some concern that the stock could be at lower levels than the survey biomass indicates. Members of the public commented that in some areas fishermen are finding it difficult to locate northern rockfish.

The Plan Team recommended model 4, but was uncomfortable with such a large increase in ABC resulting from the model. The Team thus accepts the model for the maximum permissible ABC level but chose the ABC from the past year as the ABC recommendation for 2006. The biological concerns noted above with respect to the actual status of the stock and model fits led the Team to recommend a lower ABC than the maximum permissible. The Plan Team and the stock assessment authors were concerned that Models 2-5 need additional validation to insure that results are reliable. In particular the effect of including historic fishing mortality on model results needs to be more fully explored. Thus, the Plan Team recommends that the ABC from 2005 be used for 2006. Since the model 4 maximum permissible values were accepted (but not recommended) the Team was comfortable with the OFLs for 2006 and

2007 as specified from model 4. The apportionments were recommended based on the accepted rockfish weighting scheme with percentages listed on page 21.

The Team notes the problems with new survey biomass estimates trending upwards while model results predict a decline. The assessment author was commended for examining these various models in an attempt to further evaluate this dichotomy in model versus survey trends. It was noted that next year there may be a new maturity schedule available for use in the assessment. This model should be presented again in September with new formulations and new information included.

Sandra Lowe commented that the model fit to survey data is problematic due to the high variability in survey biomass estimates and artificially forcing the model to fit the high points may be inappropriate. One problem is in the confidence intervals associated with the biomass estimates which is why the models have trouble fitting these survey estimates. The variance in the early surveys may also be artificially low.

The author noted further difficulties in assessing this stock is that northern rockfish are associated with hard to trawl areas. The Team discussed the issue of trawlable versus untrawlable grounds. It was noted that areas that are classified once as untrawlable for the survey are never sampled again. This clearly biases the estimates of certain fish on untrawlable grounds.

Members of the rockfish working group provided an update on some submersible work last year on the snakehead area. Using the submersible they evaluated an area that was thought to be trawlable and was then established as untrawlable for the survey. The Team discussed requesting the rockfish working group to report on survey issues related to rockfish possibly at the September 2006 meeting.

Kalei Shotwell presented an overview of the map grid of trawlable versus untrawlable grounds from the GOA survey. She noted that this grid is used to pick stations in the survey design. The Team discussed the methodology of picking stations and excluding those marked in red areas as untrawlable. It was noted that this methodology usually results in more trawling occurring in known areas than unknown due to efficiency requirements during the survey.

Pelagic Shelf Rockfish

Chris Lunsford presented an overview of the pelagic shelf rockfish assessment. The Council initiated an analysis to remove dark rockfish from FMP and transfer management to the state. Analysis for this amendment was delayed until the 2005 survey and stock assessment were available for incorporation into the analysis. The amendment analysis is currently scheduled for initial review by the Council in February 2006.

The 2005 survey showed a large increase in biomass for dusky rockfish and dark rockfish. The observed increase in dark rockfish however was due primarily to one tow off Kodiak. All of the other tows had much lower relative biomass of dark rockfish.

An age-structured model is used for ABC and OFL recommendations for dusky rockfish while remaining members of the pelagic shelf complex are assessed at Tier 5 for ABC and OFL. Dusky and the remaining Tier 5 species are added together to form the complex-level ABC and OFLs.

New information on the maximum age for dusky rockfish was incorporated into the model this year. A poster was presented at AFS by Liz Chilton which indicated that natural mortality for dark rockfish may be 0.07. Using this revised estimate the natural mortality was changed for both dusky rockfish in the model as well as for the remaining Tier 5 species in the complex.

The team suggested that next year the assessment chapter include more summary tables in the executive summary section so that all information utilized in the assessment including catch and projections for both dusky and Tier 5 species are more obvious.

Jon Heifetz noted that the incorporation of historic catch is problematic with this stock as with northern rockfish. The team encourages the authors to explore a model formulation which incorporates historic catch.

The Plan Team approves of the ABC and OFL recommended from the authors.

The team further notes that the format of the chapter (as a model for complex-level chapter including an age-structured stock together with Tier 5 species) is well laid out and readable. This chapter should be used as a template for the shallow water flatfish chapter which incorporated age structured modeling of Dover sole together with the remaining Tier 5 species in the SWF complex.

The assessment author noted that the data collection (in number of samples per haul) in 2004 was better than previous data from 2000. He commented that in 2004 they obtained 458 ages out of 84 hauls and averaged 2-19 samples per haul. Sarah Gaichas suggested that similar information be requested of all stock assessment authors regarding the trend in data collection for their species given that the relative trend in data collection has been varied depending upon the species assessed.

Thornyheads

Sarah Gaichas presented an overview of the thornyhead rockfish assessment. The authors recommend removing broadfin thornyhead from the GOA assemblage.

Bycatch of thornyheads is primarily in the rockfish and sablefish fisheries with some incidental catch in the flatfish fisheries (there is no directed fishery for thornyheads). There were more discards in the flatfish fishery in 2003 than 2004. Shortspine thornyhead dominate the assemblage with longspine located at deeper depths representing a minor species for biomass.

A new section on ecosystem considerations was added this year. Food habits data show that greatest proportion of juvenile mortality is predation by adult thornyheads. There is limited thornyheads food habits data. Thornyheads consume primarily shrimp.

Catch has been decreasing recently possibly due to early trawl gear closures from halibut bycatch in the trawl fishery. The Plan Team approved the Tier 5 recommendation for 2006 and 2007 for ABCs and OFLs. The Team noted that adequate age data is still lacking to support the use of the age-structured model presented in previous years. The stock remains in Tier 5 until additional data supports the use of an age-structured model in the future.

Demersal Shelf Rockfish

Tory O'Connell presented an overview of the demersal shelf rockfish assessment.

The author reviewed species composition for adjusting yelloweye density to the overall DSR complex. Using the last 5 years of commercial landings from the SEO, yelloweye represents approximately 96% of the overall catch.

The author also evaluated sportfish and subsistence mortality. Based on 2004 sportfish data and the large increases noted in the sportfish sector, there was more than a 54% increase in landed yelloweye rockfish in the Sitka area from 2002-2004. The author noted that this could begin to start constraining fisheries as the sportfish numbers are rapidly increasing.

Subsistence harvest estimates were difficult to obtain and extrapolations were made from the halibut survey data. Thus, the quality of data used to estimate subsistence harvest was poor.

The assessment author noted that total mortality will never be fully captured given the amounts taken by the sportfish fishery as well as unknown bycatch in the halibut fishery. The mortality associated with the halibut fishery is estimated. It appears as though only 50% of the TAC is taken, but this is an underestimate because it only captures landed catch and not at-sea discards or sport fish catch. Team

members reiterated that unaccounted bycatch in the commercial halibut fisheries is a problem for many species, especially skates.

The author noted an increase in landed overages of DSR in recent years because of full retention policies. There is a difference in the ability to sell overages depending on whether it is caught in state versus federal waters. If the fish is caught in state waters, overages can be sold with proceeds going to the state if it is over the 10% level. If the fish is caught in federal waters however commercial sales are not allowed. The full retention requirement in federal waters was implemented mid-season and some fishermen are not yet aware of it. Because of the differences in state and federal full retention regulations, catch may be reported as landed in state waters when it was actually taken in federal waters.

The directed fishery will not open in 2006 in SEO because it is estimated that the combined mortality in the halibut fishery and the sport fishery will be over the ABC. While ADF&G is not supposed to enter into allocation, by closing the directed fishery but not the sport fishery for DSR, it is effectively allocating the quota to sport fishing. This issue will be raised at the BOF in February 2006.

The Team discussed the bag limits used to restrict the fishery. However reaching the bag limit does not stop fishing but rather dictates that DSR must be released which does not reduce mortality. There are several proposals before the BOF in February discussing this issue. A query was raised as to the extent observed CPUE trends in the fishery are a true indication of the catch. The author noted that she did a catch curve analysis and results indicated that total mortality estimates were as twice as high as would be expected in CSEO. CPUE has been level in that area, but logbook data is limited as the directed quota has been small and fishery very short in duration. Given that the fishery is managed on an area-wide (SEO) basis, the potential exists for localized depletion of the stock. Additionally, unaccounted catch may have a severe impact on the stock.

Team members questioned the reliability of the available age data. The author confirmed that there appears to be a considerable degree of aging error in these data and that the data are not used in an age-structured model.

This stock is in Tier 4. The Team agreed with the author's recommendation of an ABC below the maximum permissible ($F_{ABC} = M$), noting that the author has consistently recommended this harvest strategy for the reasons laid out in the assessment.

Atka mackerel

Sandra Lowe presented an overview of the Atka mackerel assessment. Changes include updated catches, and the bottom trawl survey estimates from 2003 and 2005. The 2003 and 2005 biomass estimates were relatively high, and the 2004 and 2005 catches exceeded TACs (which were set to be sufficient for bycatch needs). The Team discussed Tier 5 recommendations and noted that biomass estimates are highly variable. The author recommended Tier 6 which would give a maximum permissible ABC=4,700mt and OFL=6,200mt. If Tier 5 were adopted, the maximum permissible ABC=22,700 mt and OFL=30,270 mt. The Team felt that prudent management was warranted and that a target Atka mackerel fishery should be limited.

Tom Pearson noted that most bycatch occurs in the western GOA. Increased rockfish ABCs in western GOA may lead to higher incidental catch of Atka mackerel. POP, northerns and PSR fisheries have the highest bycatch of Atka mackerel. Tom suggested that an alternate ABC of 1500 mt would be sufficient. This amounts to about 20% of rockfish fishery ABCs for the western GOA.

Mike Szymanski commented that catch reports by vessels indicate Atka mackerel in western GOA are favorable (abundant). He thinks the survey coverage for Atka mackerel is spotty and suggests that a small directed fishery for Atka mackerel in western GOA could provide age structure data and better indicate stock status. If the TAC is set to bycatch levels, then observer sampling protocol would need to change to increase Atka mackerel data collection.

The Team recognizes that Atka mackerel are an important prey species for Steller sea lions so that warrants additional caution in raising ABC. Also, there are concerns that localized depletions could occur under directed fishing. The possibility of an EFP was raised to address the issue of uncertainty and the need for more data. It was noted that the AFSC vessel of opportunity program could get scientists on board fishing vessels and that this would be more expedient than working within the constraints of the observer program (for EFP purposes). The Team encouraged the development of an EFP.

The Team discussed the need to provide enough for realistic incidental catch levels which appear to be around 1,500 mt. For an EFP to be considered, the ABC must allow for both incidental catch and an EFP. Therefore the Plan Team recommends the maximum permissible Tier 6 ABC of 4,700 tons with an associated TAC recommendation of 1,500 mt to meet increased incidental catch needs. The Team recommended this TAC for a bycatch only fishery but noted that the max ABC would allow for the opportunity for an experimental fishery for purposes of data collection. The ABC and OFL levels are the same for 2006 and 2007.

Skates

Sarah Gaichas presented an overview of the skate assessment. A major change in the assessment is the incorporation of corrected data indicating that skate bycatch in the directed halibut fishery exceeds the catch of skates in the directed groundfish fishery.

The survey biomass decreased for big skates in 2005 but remained stable for longnose skates and the Bathyraja complex. Big skates in Alaska may be potentially more productive than previously thought based on preliminary age and growth information from AFSC. The natural mortality estimate may increase slightly when age data become available (possibly as early as next year). More fishery samples will be useful for determining the maximum age. Currently this is estimated using the oldest observed age. There are on-going reproductive and aging studies and more data will be available soon.

The author noted problems with previous estimates of skates caught as bycatch in the halibut fisheries. A mathematical error in the calculation for 2003 was corrected this year, with the result that the bycatch of skates in the halibut fishery was roughly five times the amount estimated in the previous assessment. Estimates of skate bycatch in halibut fisheries are extrapolated from the species composition in the halibut surveys but it was noted that the methodology for determining this species composition was flawed in that the survey only samples the first 20 hooks without randomization. Tory O'Connell noted that commercial catch data is available in smaller areas which allows for improved extrapolation to federal areas. In the directed fishery, the skate catch is approximately 70-90% big skates which based on size are likely predominantly female. Larger big skates are predominant in shallower waters which is coincident with the fishery. The author does not recommend any targeting of skates in GOA. This is due primarily to the corrected estimate of the magnitude of halibut fishery bycatch of skates. In the assessment the author retrospectively analyzed 2003 data, and depending upon the bycatch level in the 2003 halibut fishery, established that the OFL for big skates may have been exceeded. The authors noted that the vital rate estimates for the skate species are going to change in the coming year and indications are that they may be less conservative than those currently used for ABC and OFL determinations.

The Plan Team recognizes the continuing problems associated with extrapolating information on bycatch from the halibut survey and fishery. The Team recommends that a request be made to the Halibut Commission to reevaluate their protocol for collecting bycatch information on their surveys and in the fisheries. The Team recognizes that the halibut fishery may have substantial impacts on other groundfish stocks and that data collection programs should be improved.

The author noted continued problems in the directed skate fishery in that there is still no standard observer coverage. Additionally port sampling is declining due to lack of funding.

An ecosystem section was added to the analysis. The author noted that diet data needs to be updated. Bob Foy commented on evidence that skates appear to be consuming Tanner crabs in Kodiak area.

The Team discussed the actual mortality of skates in fisheries. The author noted that if carefully released skate survival could be high, but currently in the longline fisheries skates are generally gaffed through the body cavity. Trawl fisheries probably have higher survival of skates.

The Team discussed constraints on the halibut fishery to mitigate skate bycatch and other incidentally caught species. Tom Pearson noted that it would be very difficult to close the halibut fishery for skate bycatch. While exceeding the ABC for a species leads to moving the species to PSC status, in-season management cannot take realistic action on the halibut fishery for exceeding the OFL. There is a 20% MRA for skates on the halibut fishery. The author-extrapolated estimates from the halibut fishery alone could put longnose skates over the OFL but those estimates are highly uncertain. The Team noted that the halibut fishery has also increased in recent years. The author further noted that skate mortality has likely been constant in the halibut fishery (in relative terms). The main difference in recent years has been the target fishery on large big skates which will require close monitoring.

The Team inquired about genetic stock structure studies on skates. Ken Goldman provided an overview of studies on Atlantic skates and noted that some additional work is being done on species from the Bering Sea shelf. The assumption is that skates are not highly migratory and exhibit limited movement.

The author recommended area-specific ABCs and OFLs, citing the importance of maintaining specified measures for big and longnose and combined bathyraja skates.

The Team discussed the merits of continuing a GOA wide OFL for Big and longnose skates, noting that it will not unnecessarily shut down other target fisheries based upon dubious stock structure and catch information. The Team recommended the similar structure for ABCs by areas and species and maintained the recommendation from the previous year for a gulfwide OFL by species. The ABCs and OFLs recommended by the author (using the sum of the OFLs by area for each species) were approved by the Team for 2006 and 2007.

The Team discussed a weighting scheme for skates but after discussion felt that an unweighted average represented the reasonable apportionment scheme for this species and was consistent with the authors' recommendation.

Other species

Tom Pearson and Diana Stram provided an overview to the team of the amendment 69 action by the Council to set TAC for the other species complex at or below 5% of the sum of the target TACs. Tom provided tables to the team from the amendment 69 EA showing incidental catch through 2004. The aggregate catch for the complex so far in 2005 has been approximately 2,232 mt. There have been anecdotal reports of large amounts of spiny dogfish harvested in the halibut fishery this year which could represent a significant amount. These have not been landed but caught and discarded.

Recognizing that the Council will have the ability to establish TAC for the other species complex below the 5% sum, and in the absence of a stock assessment for this complex, the team decided to add a short summary section to the SAFE report introduction which conveys available information on the incidental catch needs in other groundfish fisheries for 2006. The estimated level of incidental catch in other groundfish fisheries would establish a threshold for meeting incidental catch needs. The Team notes that because there is only a TAC and not an ABC for the complex, if the TAC is exceeded there is no other species OFL that constrains other fisheries.

Tom Pearson noted that limited markets exist for sharks but there is the potential for a market to develop. Ken Goldman noted that a state opened directed fishery is under an application process right now. There was limited directed fishing for octopus in 2005, with a small amount of directed catch. It primarily represented an exploratory effort. Multiple markets in several ports in the GOA exist for octopus and interest in this fishery appears to be increasing. Liz Conners noted that regulatory changes have led to an excess of cod and crab pots that are no longer in use, but which could be converted for targeting octopus. There has been increased retention of octopus in both the BS and GOA.

There has also been some directed fishing on grenadiers this year. Grenadiers are a non-specified species and not contained in the other species complex. Approximately 70-80 tons were harvested in this exploratory fishery. A limited market for grenadiers exists.

A federal fishery for sharks has not yet been pursued.

Ken Goldman provided an overview of the BOF proposals for directed fishing for dogfish to be considered by the state. These will be considered at the Valdez BOF meeting in December.

An estimate of the incidental catch needs in other groundfish fisheries in 2006 is approximately 4000mt. If the TAC were set at 4000mt then NMFS would put the complex on bycatch status from the beginning of the year. Some exploratory fishing opportunities would still be provided under the existing MRAs. Any TAC level set above 4000mt may allow for directed fishing within the complex. The Plan Team reiterates their concerns over the possibility for directed fishing up to the TAC for the complex to be taken on a single species within the complex.

Forage Fish

Liz Conners provided an overview of an updated forage fish assessment. This assessment is included as an appendix to the GOA SAFE similar to the treatment of it in 2003 when it was first included as an assessment. The author noted that data from the EIT survey may provide biomass estimates for capelin in the near future. She noted that the majority of the incidental catch of forage fish in the GOA is eulachon. However, the ability to use EIT surveys to evaluate the biomass of eulachon is unlikely in the near future.

The Council has already prohibited the catch of forage fish under the FMP thus neither ABC nor OFLs are established for these species. Catch estimates do not seem to indicate that catch of forage fish is approaching the allowed 20%. Estimates of exploitation rates are roughly 2% of the total biomass estimates and could be much less depending upon improved biomass estimates for these species. There is continued interest in the ecological importance of these species which is why the assessment for these species is being updated.

The Plan Team commends the author on the work and the importance of highlighting the assessment information for forage fish. The Team notes that it is also important to try to assess the overall importance of these species to managed species in the GOA as well as to marine mammals and seabirds.

The Team notes that it should set priorities for which appendix-type assessments should be updated and on what schedule.

The author noted that as these species become elevated in importance for assessing their biomass, the timing of the survey is increasingly important for accurate assessments of biomass. There are times of the year when the majority of the biomass is in state versus federal waters, thus ascertaining the appropriate timing for the survey in relation to spawning will greatly impact the ability to accurately assess the biomass of these species.

Gulf of Alaska groundfish Plan Team recommended 2006 - 2007 OFLs and ABCs, 2005 OFLs, ABCs, TACs, and 2005 catches reported through November 5, 2005.

		2005				2006			2007		
Stock/Assemblage	Area	OFL	ABC	TAC	Catch	OFL	ABC	TAC	OFL	ABC	TAC
Pollock	W (61)		30,380	30,380	31,116		29,187			23,291	
	C (62)		34,404	34,404	27,838		30,775			24,558	
	C (63)		18,718	18,718	19,348		18,619			14,858	
	WYAK		1,688	1,688	1,879		1,809			1,443	
	Subtotal	144,340	85,190	85,190	80,181	110,100	80,390		89,500	64,150	
	EYAK/SEO	8,690	6,520	6,520	0	8,209	6,157		8,209	6,157	
	Total	153,030	91,710	91,710	80,181	118,309	86,547		97,709	70,307	
Pacific Cod	W		20,916	15,687	12,208		31,051			19,292	
	C		33,117	25,086	21,241		43,790			27,206	
	E		4,067	3,660	14		4,777			2,968	
	Total	86,200	58,100	44,433	33,462	95,500	79,618		59,100	49,466	
Sablefish	W		2,540	2,540	1,892		2,670			2,360	
	C		7,250	7,250	6,602		6,370			5,630	
	WYAK		2,580	2,580	1,825		2,280			2,014	
	SEO		3,570	3,570	3,335		3,520			3,116	
	Total	19,280	15,940	15,940	13,654	17,880	14,840		15,800	13,120	
Deep-water flatfish[1]	W		330	330	3		420			421	
	C		3,340	3,340	395		4,139			4,145	
	WYAK		2,120	2,120	4		2,661			2,665	
	EYAK/SEO		1,030	1,030	4		1,445			1,446	
	Total	8,490	6,820	6,820	406	11,008	8,665		11,022	8,677	
Rex sole	W		1,680	1,680	576		1,159			1,096	
	C		7,340	7,340	1,576		5,506			5,207	
	WYAK		1,340	1,340	0		1,049			992	
	EYAK/SEO		2,290	2,290	0		1,486			1,405	
	Total	16,480	12,650	12,650	2,152	12,000	9,200		11,400	8,700	
Shallow-water flatfish[2]	W		21,580	4,500	108		24,720			24,720	
	C		27,250	13,000	4,516		24,258			24,258	
	WYAK		2,030	2,030	0		628			628	
	EYAK/SEO		1,210	1,210	6		1,844			1,844	
	Total	63,840	52,070	20,740	4,630	62,418	51,450		62,418	51,450	
Flathead sole	W		11,690	2,000	611		10,548			10,932	
	C		30,020	5,000	1,904		25,195			26,111	
	WYAK		3,000	3,000	0		2,022			2,096	
	EYAK/SEO		390	390	0		55			57	
	Total	56,500	45,100	10,390	2,515	47,003	37,820		48,763	39,196	
Arrowtooth flounder	W		26,250	8,000	2,531		20,154			21,011	
	C		168,950	25,000	16,681		134,906			140,640	
	WYAK		11,790	2,500	23		15,954			16,632	
	EYAK/SEO		9,910	2,500	29		6,830			7,120	
	Total	253,900	216,900	38,000	19,264	207,678	177,844		216,500	185,403	

Stock/Assemblage	Area	2005 OFL	2005 ABC	2005 TAC	2005 Catch	2006 OFL	2006 ABC	2006 TAC	2007 OFL	2007 ABC	2007 TAC
Other slope[3]	W		40	40	93		577			577	
	C		300	300	565		386			386	
	WYAK		130	130	70		317			317	
	EYAK/SEO		3,430	200	36		2,872			2,872	
	Total	5,150	3,900	670	764	5,394	4,152		5,394	4,152	
Northern rockfish[3]	W		808	808	570		1,483			1,483	
	C		4,283	4,283	4,208		3,608			3,608	
	E		0	0	0		0			0	
	Total	6,050	5,091	5,091	4,778	7,673	5,091		7,618	5,091	
Pacific ocean perch	W	3,076	2,567	2,567	2,340	4,931	4,155		4,997	4,290	
	C	10,226	8,535	8,535	8,145	8,806	7,418		8,923	7,660	
	WYAK		841	841	872		1,101			1,137	
	SEO		1,632	1,632	0		1,587			1,639	
	E(subtotal)	2,964				3,190	2,688		3,232	2,776	
	Total	16,266	13,575	13,575	11,357	16,927	14,261		17,152	14,726	
Shortraker	W		155	155	70		153			153	
	C		324	324	224		353			353	
	E		274	274	203		337			337	
	Total	982	753	753	497	1,124	843		1,124	843	
Rougheye	W		188	188	52		136			133	
	C		557	557	122		608			596	
	E		262	262	122		239			235	
	Total	1,531	1,007	1,007	296	1,180	983		1,161	964	
Pelagic shelf rockfish	W		377	377	120		1,438			1,463	
	C		3,067	3,067	1,845		3,262			3,318	
	WYAK		211	211	215		301			306	
	EYAK/SEO		898	898	3		435			443	
	Total	5,680	4,553	4,553	2,183	6,662	5,436		6,779	5,530	
Demersal rockfish	SEO	640	410	410	289	650	410		650	410	
Thornyhead rockfish	W		410	410	189		513			513	
	C		1,010	1,010	388		989			989	
	E		520	520	134		707			707	
	Total	2,590	1,940	1,940	711	2,945	2,209		2,945	2,209	
Atka mackerel	Total	6,200	600	600	882	6,200	4,700		6,200	4,700	
Big skate	W		727	727	26		695			695	
	C		2,463	2,463	758		2,250			2,250	
	E		809	809	60		599			599	
	Total	5,332	3,999	3,999	844	4,726	3,544		4,726	3,544	
Longnose skate	W		66	66	15		65			65	
	C		1,972	1,972	947		1,969			1,969	
	E		780	780	135		861			861	
	Total	3,757	2,818	2,818	1,097	3,860	2,895		3,860	2,895	
Other skates	Total	1,769	1,327	1,327	663	2,156	1,617		2,156	1,617	
Other Species	Total	NA	NA	13,871	2232	NA	NA			NA	
Total		**713,667**	**539,263**	**291,298**	**182,957**	**631,293**	**512,125**		**582,477**	**473,000**	

[1] "Deep water flatfish" includes Dover sole, Greenland turbot and deepsea sole.

[2] "Shallow water flatfish" includes rock sole, yellowfin sole, butter sole, starry flounder, English sole, Alaska plaice, and sand sole.

[3] The EGOA ABC of 2 mt for northern rockfish has been included in the WYAK ABC for other slope rockfish.

Proposed 2006-2007 Gulf of Alaska Pacific cod ABCs, TACs and state Guideline Harvest Levels (GHLs) (mt).

Based on SSC's recommendations for 2006 ABC

2006 Gulf of Alaska Pacific cod ABCs, TACs and state Guideline Harvest Levels (GHLs) (mt).

Specifications	Western	Central	Eastern	Total
ABC	26,855	37,873	4,131	68,859
State GHL	6,714	9,468	413	16,595
(%)	25%	25%	10%	24.1%
Federal TAC	20,141	28,404	3,718	52,264

2007 Gulf of Alaska Pacific cod ABCs, TACs and state Guideline Harvest Levels (GHLs) (mt).

Specifications	Western	Central	Eastern	Total
ABC	19,292	27,206	2,968	49,466
State GHL	4,823	6,802	297	11,922
(%)	25%	25%	10%	24.1%
Federal TAC	14,469	20,405	2,671	37,545

Update on groundfish stock trends for the Gulf of Alaska

Gulf of Alaska Groundfish
Plan Team
December 2005

GOA Plan Team Members

James Ianelli (co-chair)	AFSC
Diana Stram (co-chair)	NPFMC
Ken Goldman	ADFG
Tory O'Connell	ADFG
Nick Sagalkin	ADFG
Bob Foy	UAF
Bill Clark	IPHC
Theresa Tsou	WDF
Jeff Fujioka	AFSC
Sarah Gaichas	AFSC
Jon Heifetz	AFSC
Tom Pearson	AKR
Ward Testa	NMML
Kathy Kuletz	USFWS

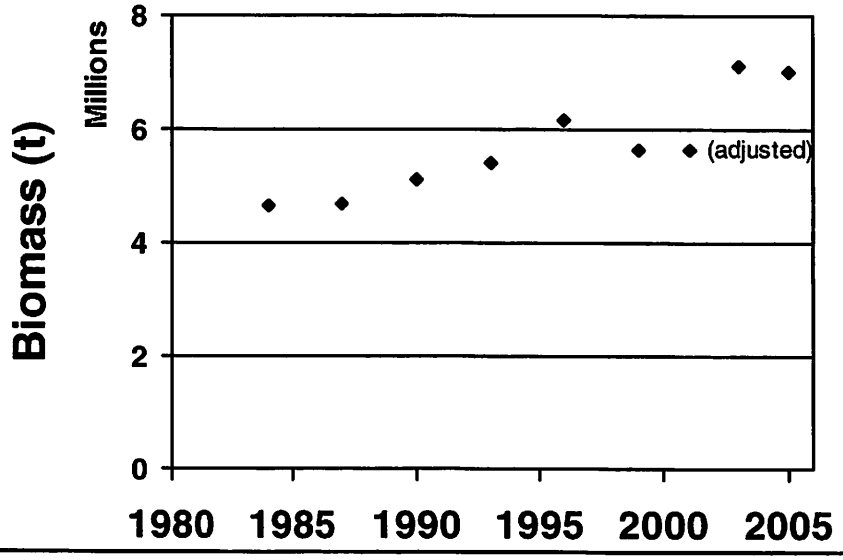
Main events in the GOA

- **NMFS 2005 Summer bottom trawl survey**
  - Gulf-wide this year (2001 excluded the EGOA)
  - Depths to 700m
- **17 assessment sections**
  - 20 species or assemblages with ABC/OFLs
  - 65 area-specific ABC recommendations
- **Projection model updated**
  - Allows better calculation of actual mortality

2005 data collection efforts

- **NMFS bottom-trawl survey**
  - Summer, most species
- **Shelikof survey**
  - Winter, mainly pollock
- **Longline survey data**
  - Summer, mainly sablefish, IPHC (in some assessments)
- **Submersible surveys (DSR)**
- **Scientific observer program**
- **Logbook**
- **Landings e.g., ADFG Fish-ticket, catch accounting system**

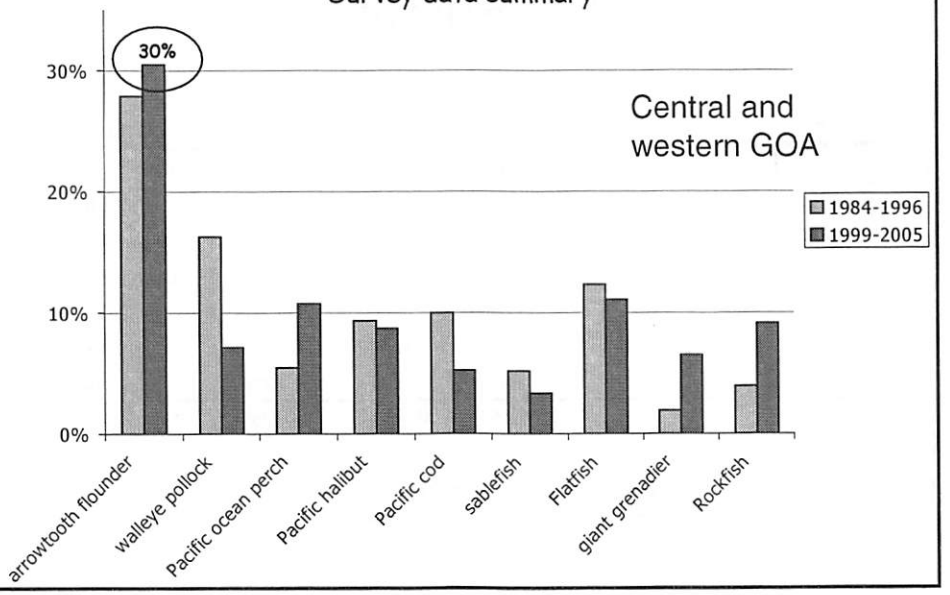
NMFS GOA Summer bottom trawl survey—all groundfish



Gulf of Alaska Groundfish Plan Team

Change in relative abundance

Survey data summary



Gulf of Alaska Groundfish Plan Team

Assessment summaries

- **By management group**

ABC Summary

Species	2005 Catch	2005 ABC	2006 ABC	Change	
Pollock	80,181	91,710	86,547	down 5,163	(6%)
Pacific Cod	33,462	58,100	79,618	up 21,518	(37%)
Sablefish	13,654	15,940	14,840	down 1,100	(7%)
Flatfish	9,703	116,640	107,135	down 9,505	(8%)
Arrowtooth flounder	19,264	216,900	177,844	down 39,056	(18%)
Rockfish	20,875	31,229	33,385	up 2,156	(7%)
Skates	2,604	8,144	8,056	down 88	(1%)
Total	179,743	538,663	507,425	down 31,238	(6%)

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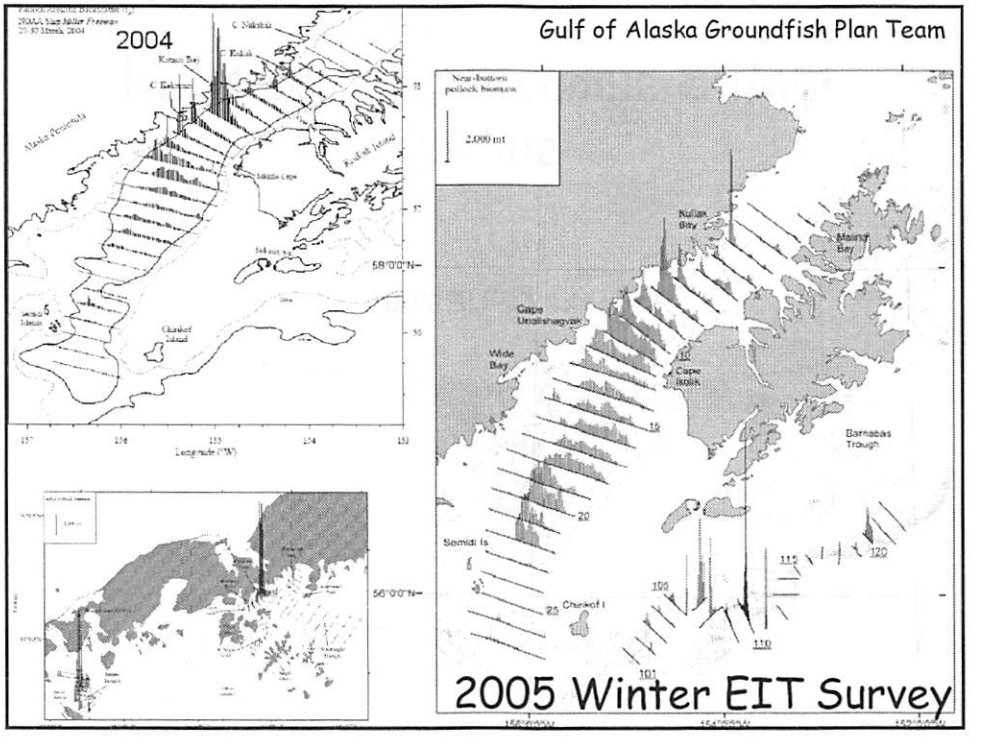
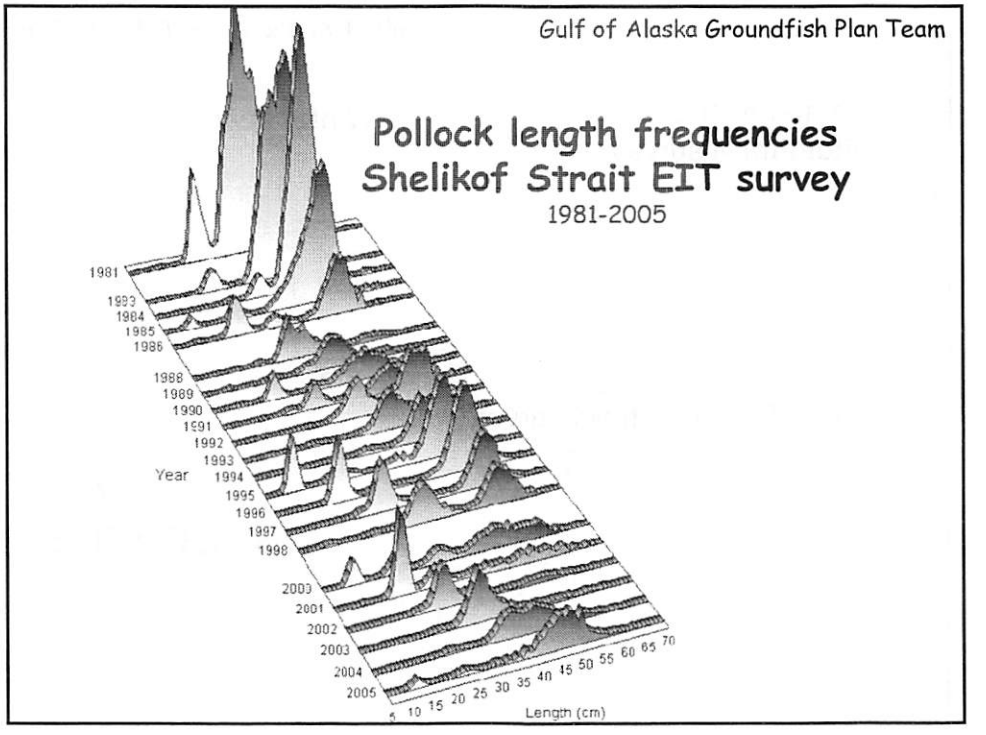
Gulf of Alaska Groundfish Plan Team

GOA Pollock assessment features

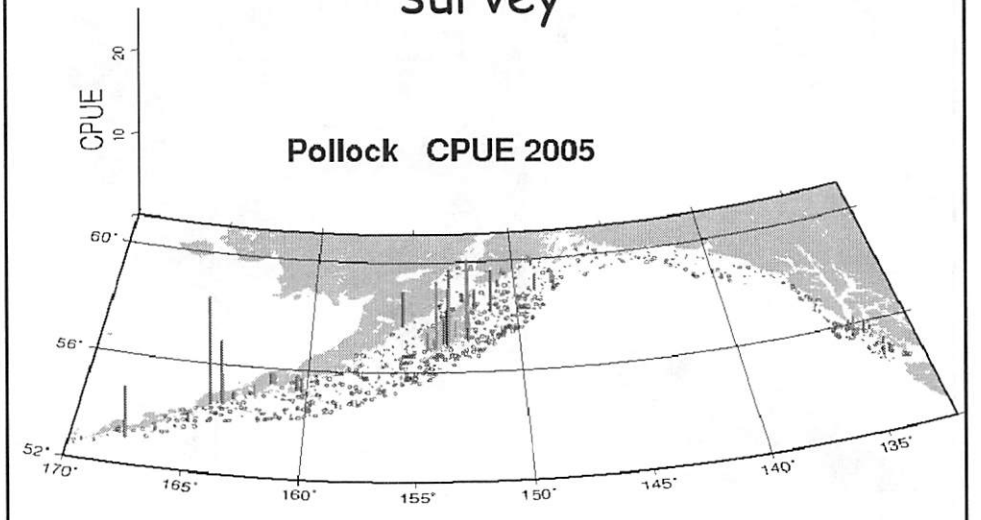
- **2005 Winter EIT (acoustic) survey**
  (NMFS/AFSC processed report)
- **Environmental indices**
- **Predator prey evaluation**
- **2005 summer bottom-trawl survey**
- **2005 summer EIT survey (partial)**


Gulf of Alaska Groundfish Plan Team
2004
2005 Winter EIT Survey


Gulf of Alaska Groundfish Plan Team
Pollock length frequencies
Shelikof Strait EIT survey
1981-2005
Year
Length (cm)

Gulf of Alaska Groundfish Plan Team

NMFS summer bottom-trawl survey



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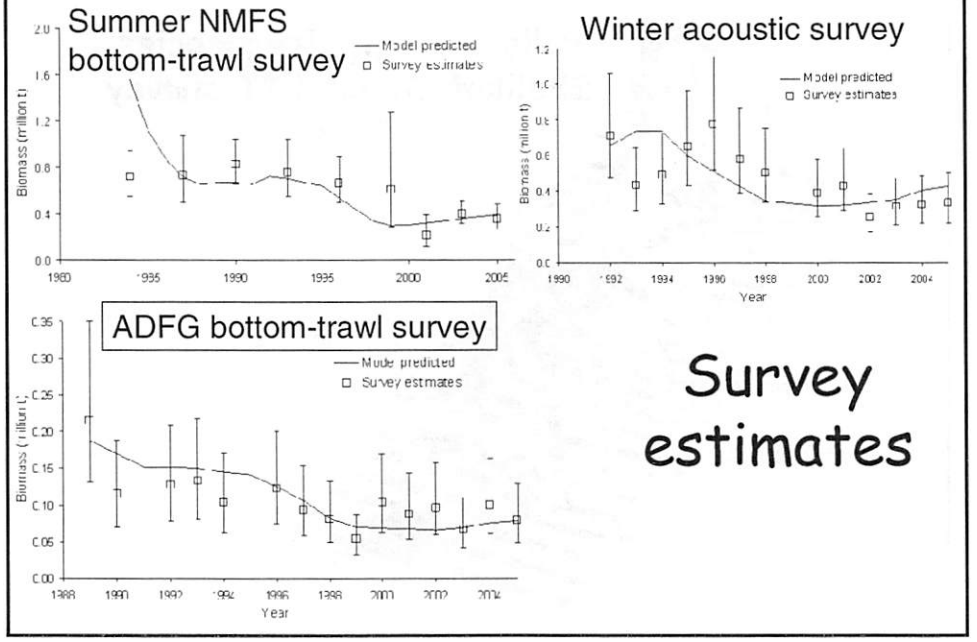
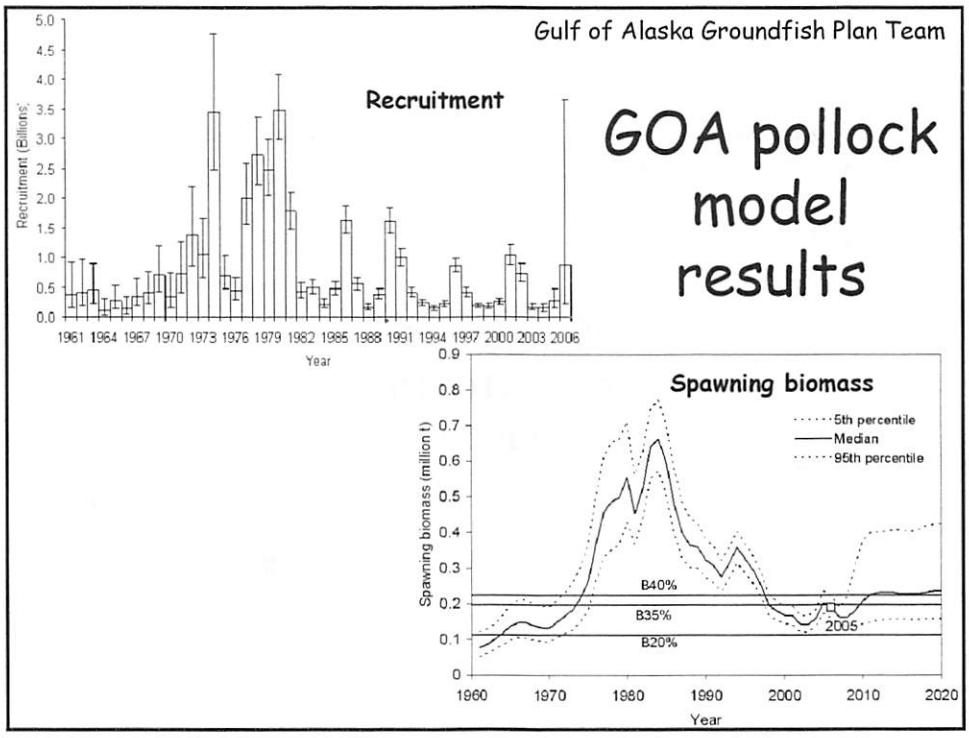
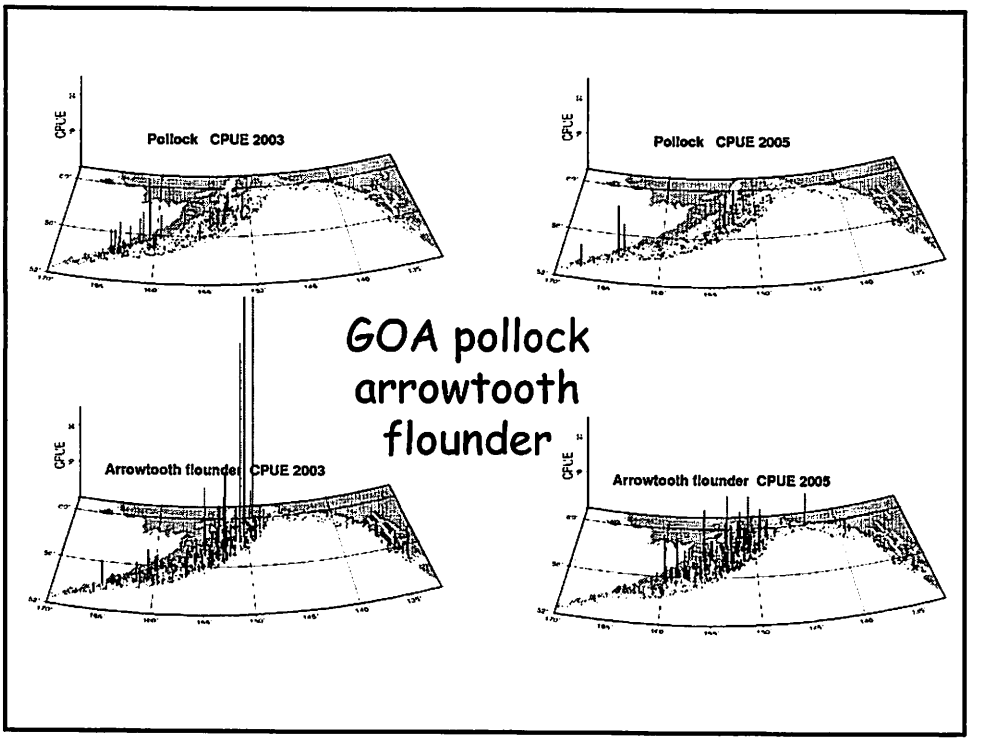



Gulf of Alaska Groundfish Plan Team
GOA pollock model results
Recruitment
Recruitment (Billions)
Year
Spawning biomass
5th percentile
Median
95th percentile
Spawning biomass (million t)
B40%
B35%
B20%
2005
Year


Gulf of Alaska predato
Arrowtooth flounder



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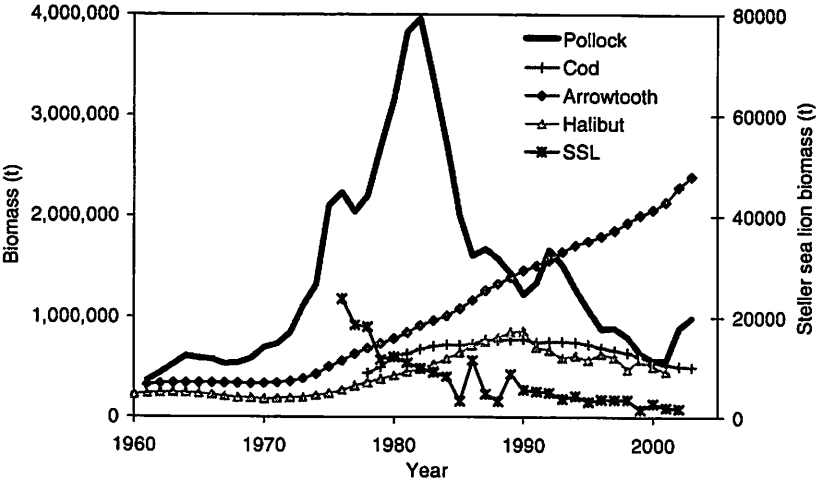
Trends in pollock predators



A number of additional conservation measures were considered in selecting a model for ABC recommendations

ABC Summary
Pacific cod

Species	2005 Catch	2005 ABC	2006 ABC	Change	
Pollock	80,181	91,710	86,547	down 5,163	(6%)
Pacific Cod	33,462	58,100	79,618	up 21,518	(37%)
Sablefish	13,654	15,940	14,840	down 1,100	(7%)
Flatfish	9,703	116,640	107,135	down 9,505	(8%)
Arrowtooth flounder	19,264	216,900	177,844	down 39,056	(18%)
Rockfish	20,875	31,229	33,385	up 2,156	(7%)
Skates	2,604	8,144	8,056	down 88	(1%)
Total	179,743	538,663	507,425	down 31,238	(6%)

Summary: Page 13
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Pacific cod

Data update

- 2004 catch and length comp updated
- Preliminary 2005 catch and length comp added
- 2005 survey data included (~4% increase from 2003)

Maturity schedule

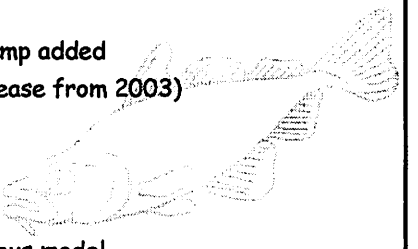
New model software

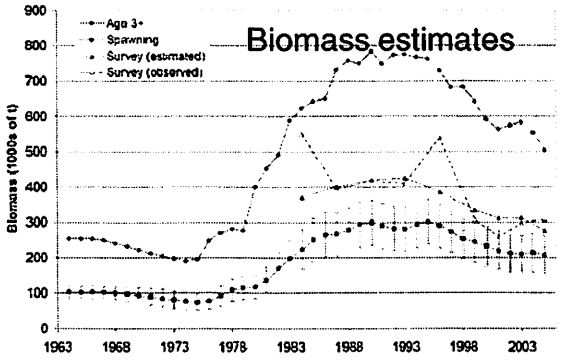
Results

- Spawning biomass up 80% from previous model
  Primarily due to maturity schedule, not model or survey

Maximum permissible ABC recommended

- Selected model an improvement
- Note that this ABC is considerably higher than the 2005 ABC
- The Team recommended that Council set TAC below ABC



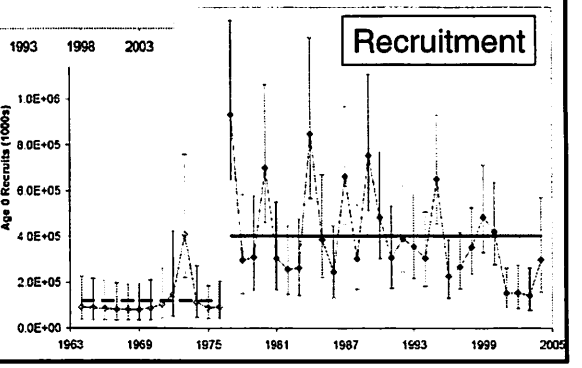


GOA Pacific cod

Female spawning biomass

2006 = 116,600

$B_{40\%}$ = 106,800



ABC Summary Sablefish

Species	2005 Catch	2005 ABC	2006 ABC	Change	
Pollock	80,181	91,710	86,547	down 5,163	(6%)
Pacific Cod	33,462	58,100	79,618	up 21,518	(37%)
Sablefish	13,654	15,940	14,840	down 1,100	(7%)
Flatfish	9,703	116,640	107,135	down 9,505	(8%)
Arrowtooth flounder	19,264	216,900	177,844	down 39,056	(18%)
Rockfish	20,875	31,229	33,385	up 2,156	(7%)
Skates	2,604	8,144	8,056	down 88	(1%)
Total	179,743	538,663	507,425	down 31,238	(6%)

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Sablefish

Survey abundance decreased ~3% from 2004 estimate

Status "moderate"

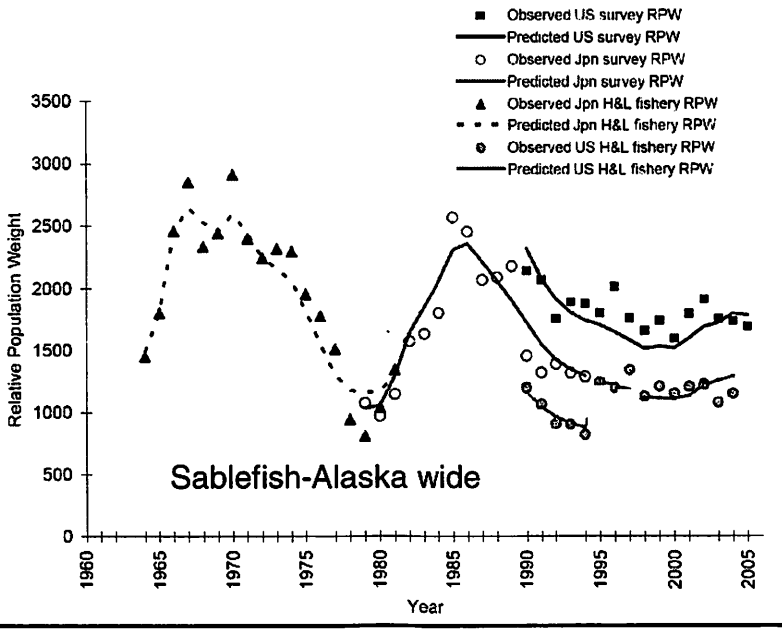
- 2005 survey abundance is about 6% higher than 2000 level
- Below the $B_{40\%}$ level (~91%)

Spawning biomass (1,000's tons)

2006 = 199.3

$B_{40\%}$ = 211.0

Abundance indices



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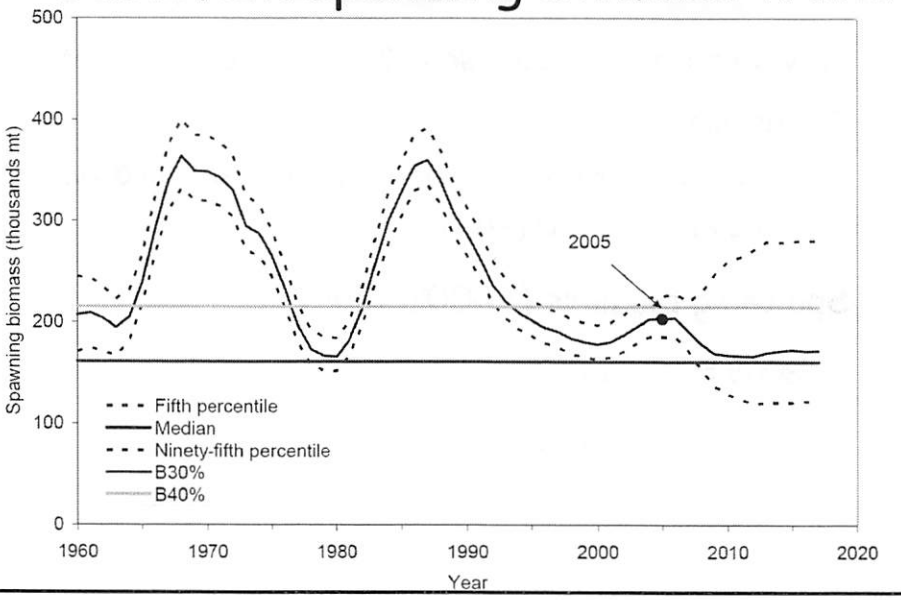
Sablefish spawning biomass trend



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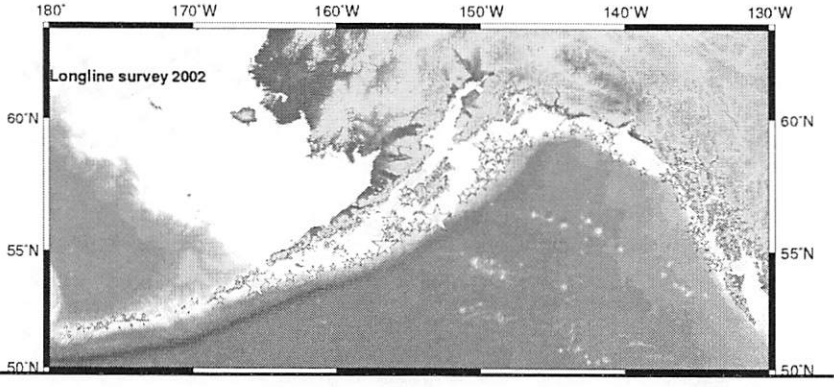
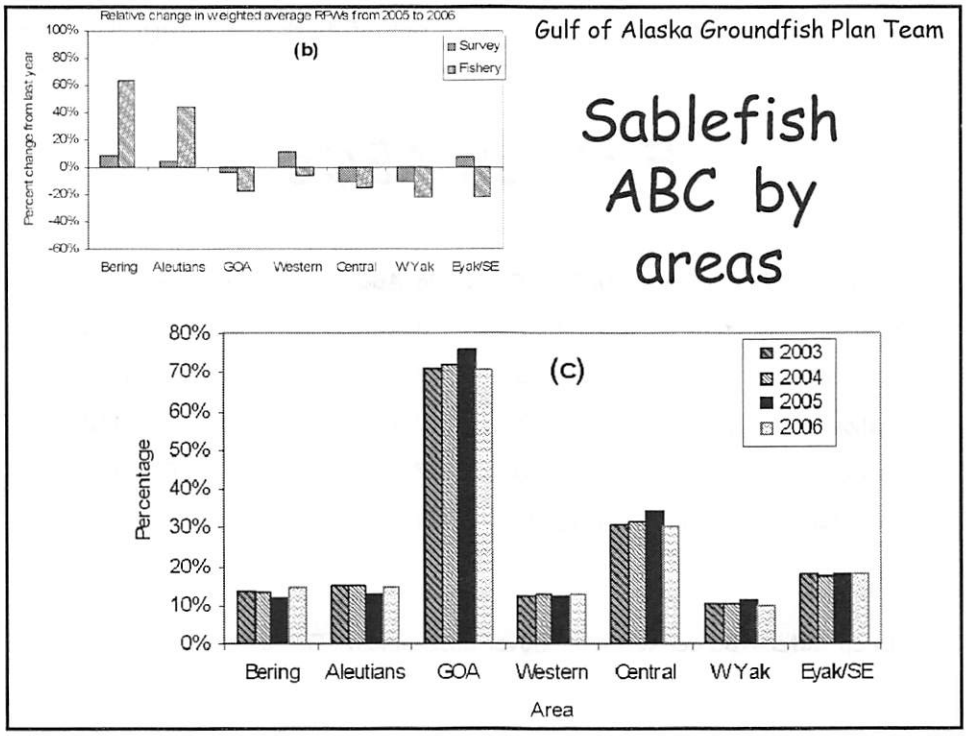
Sablefish apportionment

- **Originated from the SSC and adopted by the Council**
- **Plan Team:**
  - Agreed with current method
  - Cautioned that methodological changes may warrant further review





Gulf of Alaska Groundfish Plan Team

ABC Summary

Species	2005 Catch	2005 ABC	2006 ABC	Change	
Pollock	80,181	91,710	86,547	down 5,163	(6%)
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Sablefish	13,654	15,940	14,840	down 1,100	(7%)
Flatfish	9,703	116,640	107,135	down 9,505	(8%)
Arrowtooth flounder	19,264	216,900	177,844	down 39,056	(18%)
Rockfish	20,875	31,229	33,385	up 2,156	(7%)
Skates	2,604	8,144	8,056	down 88	(1%)
Total	179,743	538,663	507,425	down 31,238	(6%)

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Gulf of Alaska Groundfish Plan Team

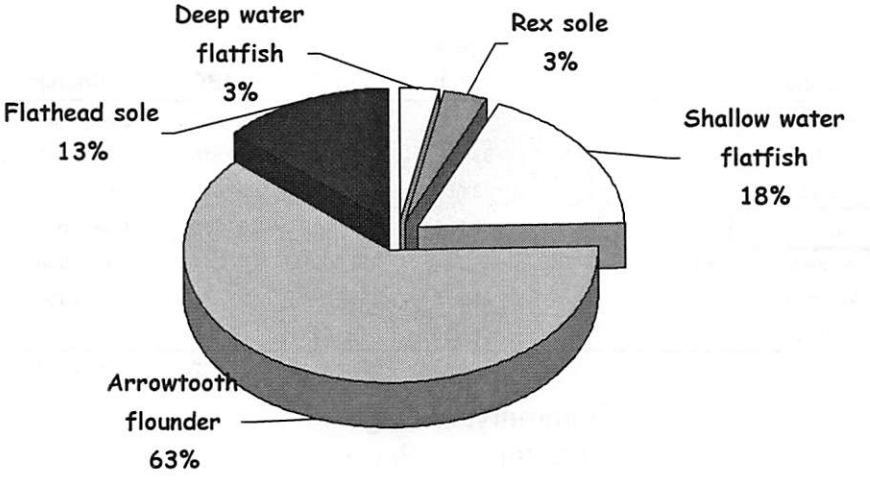
Flatfish ABC's

Species	2005 ABC	2006 ABC	Change
Deep water flatfish	6,820	8,665	up 1,845 (27%)
Rex sole	12,650	9,200	down 3,450 (27%)
Shallow water flatfish	52,070	51,450	down 620 (1%)
Flathead sole	45,100	37,820	down 7,280 (16%)
Arrowtooth flounder	216,900	177,844	down 39,056 (18%)

Deep-water ABC derived from Dover assessment (Tier 3) + others (Tier 5)

Gulf of Alaska Groundfish Plan Team

Flatfish 2006 ABC's
247,160 tons total



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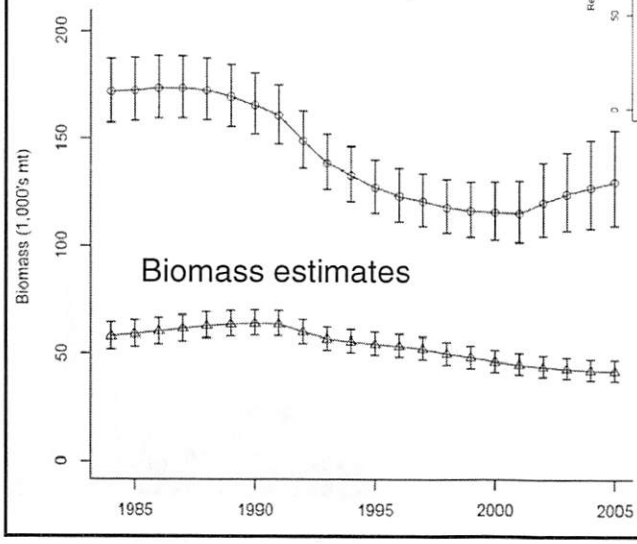
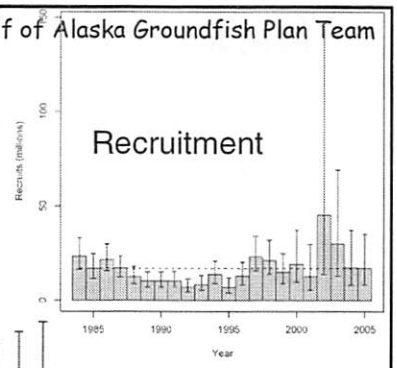
Dover sole

Main deepwater flatfish component





Female spawning biomass
2006 = 41,900
B40%= 21,600

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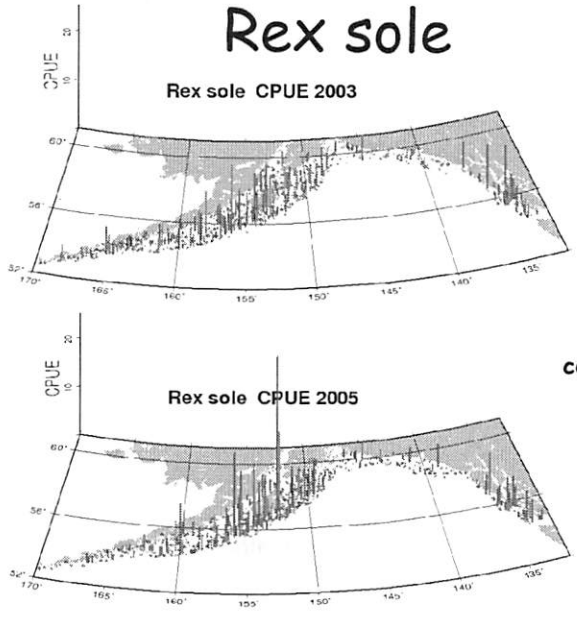
Rex sole



Split from deep-water complex in 1993

Rex sole

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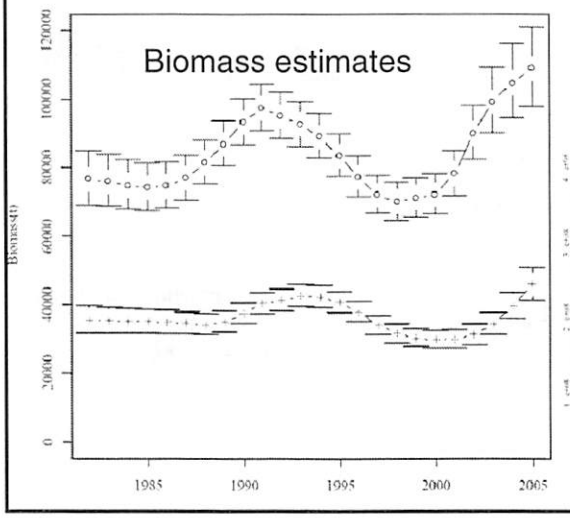
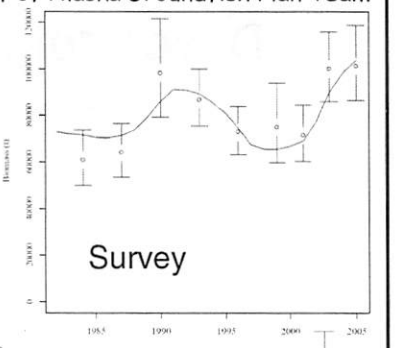
Female spawning biomass (tons)

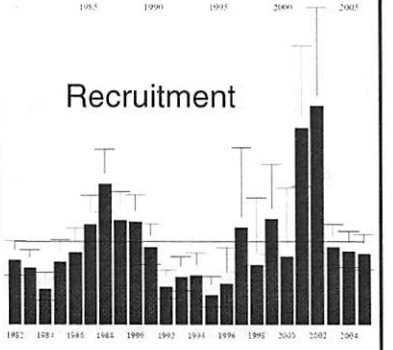
- 2006 = 49,200
- $B_{40\%}$ = 20,700

Tier 5 ABC calculation

But applied to model estimate of biomass







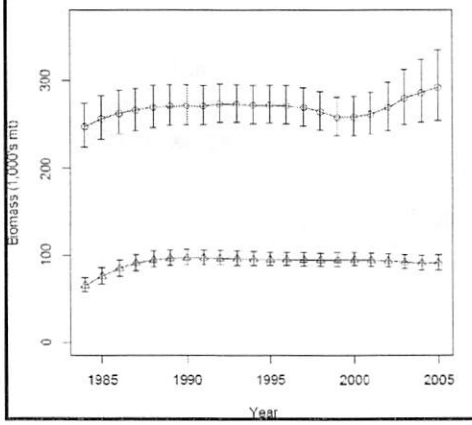
Gulf of Alaska Groundfish Plan Team

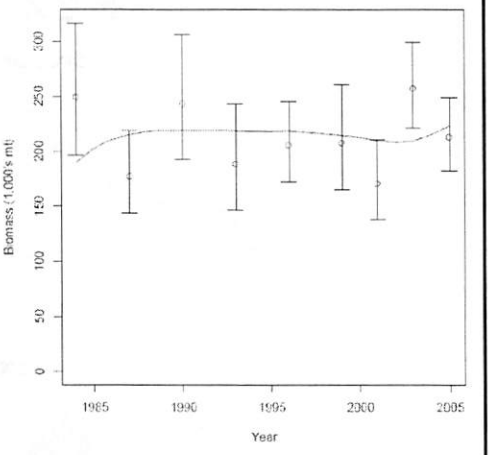
Flathead sole biomass

Female spawning biomass (tons)

2006 = 93,100

B40% = 42,250





Flathead sole catch < 1% of biomass

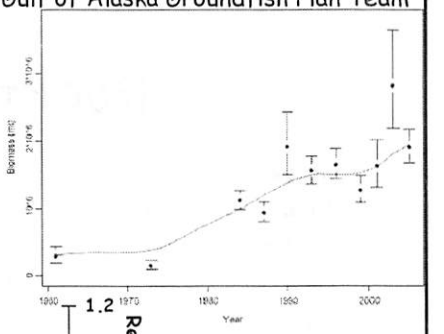
Arrowtooth flounder

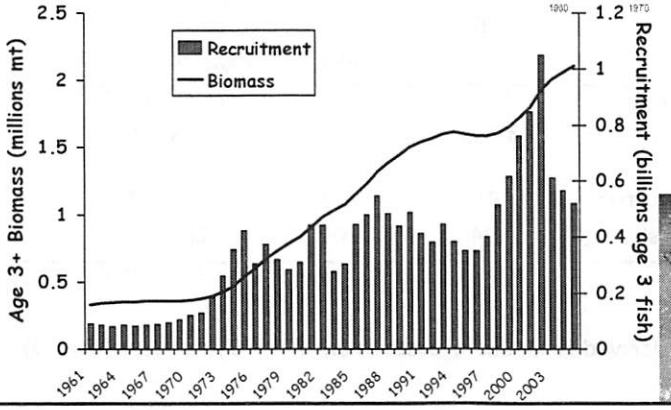
Gulf of Alaska Groundfish Plan Team

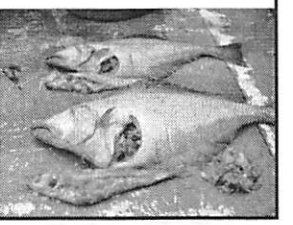
Female spawning biomass (tons)

2006 = 1,173,000

$B_{40\%}$ = 545,900







Gulf of Alaska Groundfish Plan Team

ABC Summary

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Rockfish	20,875	31,229	33,385	up 2,156	(7%)
Skates	2,604	8,144	8,056	down 88	(1%)
Total	179,743	538,663	507,425	down 31,238	(6%)

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Gulf of Alaska Groundfish Plan Team

Rockfish ABC's

Species	2005 ABC	2006 ABC	Change
Other Slope rockfish	3,900	4,152	up 252 (6%)
Northern rockfish	5,091	5,091	same (0%)
Pacific ocean perch	13,575	14,261	up 686 (5%)
Shortraker	753	843	up 90 (12%)
Rougheye	1,007	983	down 24 (2%)
Shortraker/ rougheye	1,760	1,826	up 66 (4%)
Pelagic shelf rockfish	4,553	5,436	up 883 (19%)
Demersal Shelf Rockfish	410	410	same (0%)
Thornyhead rockfish	1,940	2,209	up 269 (14%)
Total	32,989	33,385	up 396 (1%)

Pelagic shelf ABC derived from dusky assessment (Tier 3) + others (Tier 5)

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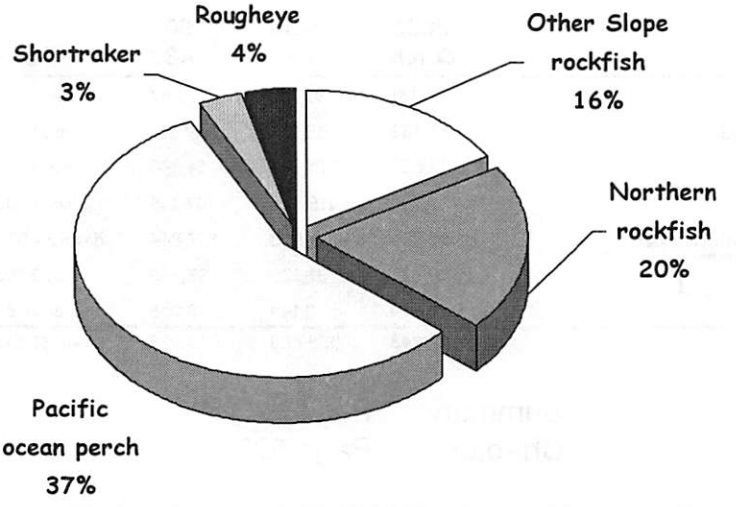
Slope Rockfish 2006 ABC's 27,156 tons total



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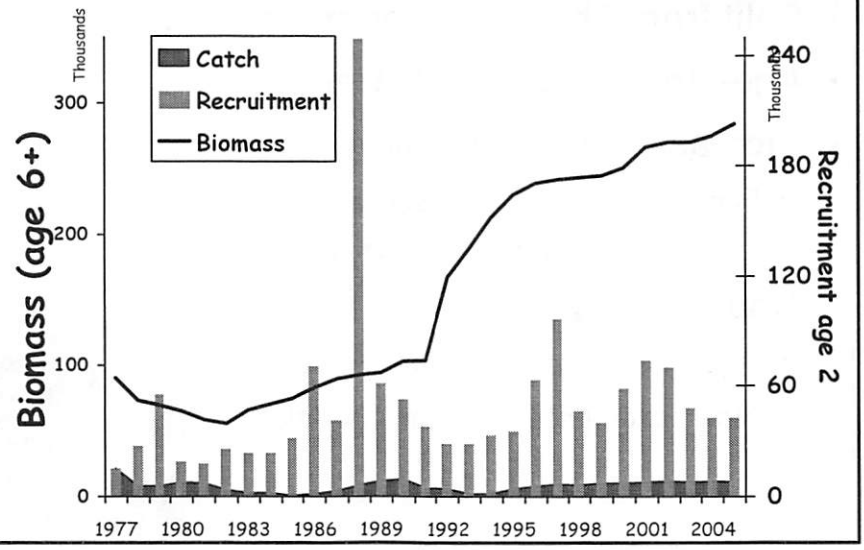
POP spawning biomass

2006 = 93,100 mt

$B_{40\%}$ = 90,000 mt



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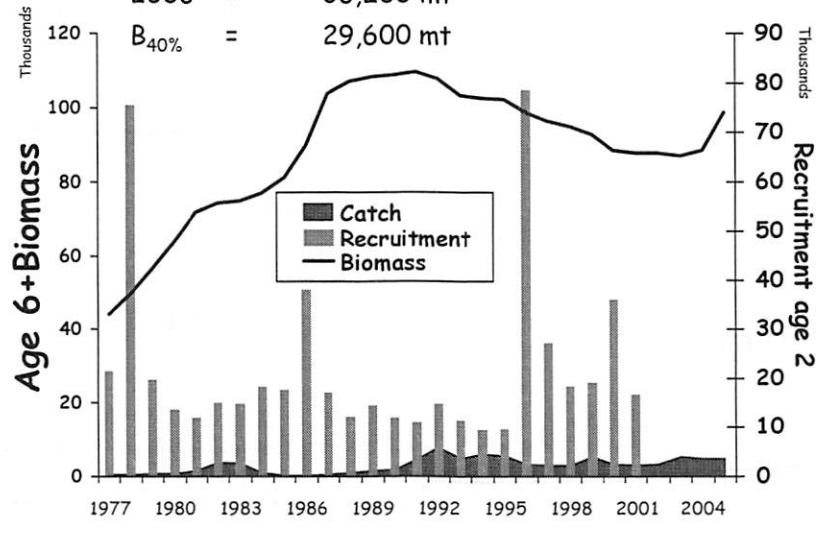
Northern rockfish

Spawning biomass

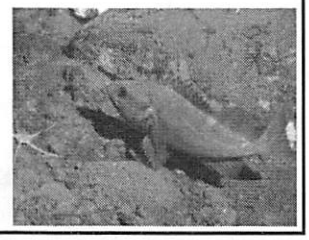
2006 = 36,200 mt

$B_{40\%}$ = 29,600 mt



Rougheye rockfish

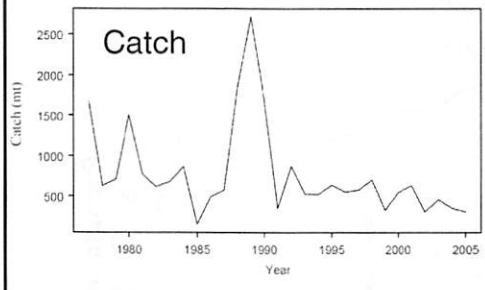
- **Split from Shortraker for management**
- **Age-structured model (Tier 3a)**
- **Biomass appears stable**
  - For trawl and longline survey
    - But 2005 longline survey estimate down
- **Model changes:**
  - Age-error matrix (rougheye based)
  - New catch proportion methodology

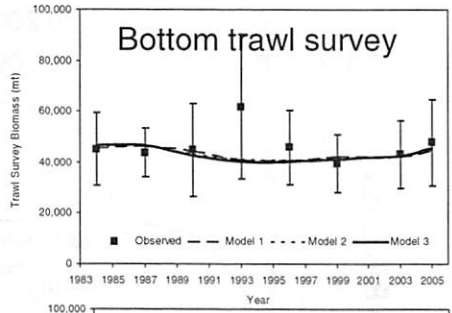


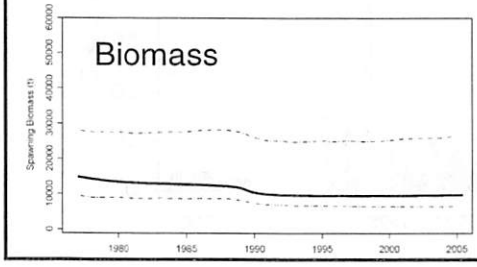
Rougheye assessment

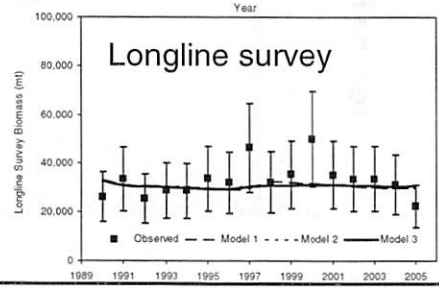
2006 spawning biomass = 10,000 mt

$B_{40\%}$ = 8,400 mt









Shortrakers and other slope rockfish

Managed separately

Other slope: Tier 5 complex (except sharpchin—Tier 4)

- Biomass used average of last three surveys

Overall complex abundance increased

Shortraker increasing in trawl surveys

- But lower in 2005 longline survey

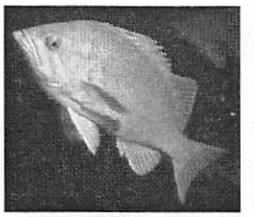
Area-specific TACs exceeded in some areas (WGOA, CGOA)

Shortraker rockfish and other slope ABC calculations

Species	Tier	Biomass	F_{ABC}	ABC
Sharpchin	4	20,815	0.053	1,103
Redstripe	5	11,717	0.075	879
Harlequin	5	15,321	0.045	689
Silvergrey	5	38,463	0.030	1,154
Redbanded	5	5,138	0.045	231
Minor species	5	2,067	0.045	93
Combined other		93,552	0.044	4,150
Shortraker	5	37,461	0.044	1,124

Units: metric tons

Pelagic Shelf rockfish



Dusky: Age-structured model

- Large increase in biomass from 2003 to 2005 trawl survey
- Model selected with updated data and new size-age, natural mortality

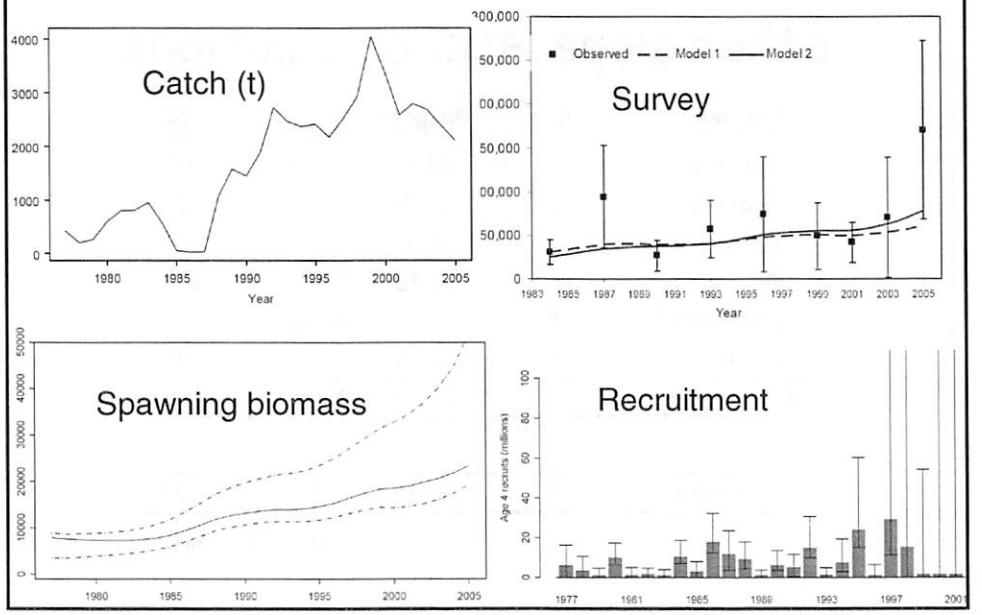
Two-tier management:

Dark, widow, yellowtail Tier 5

Survey biomass based

Dusky model results

2006 spawning biomass: 24,700 mt, $B_{40\%}$=18,300 mt



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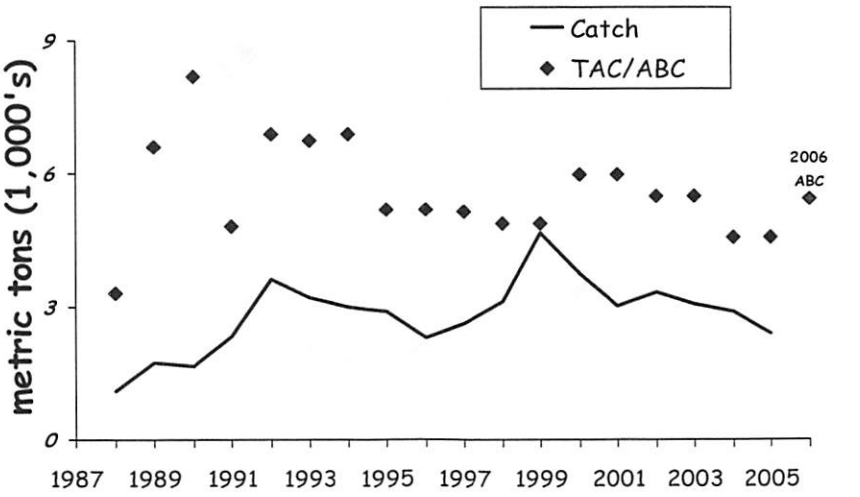
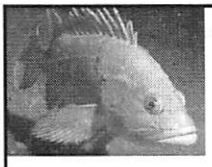
Pelagic shelf rockfish: catch & TAC



Dusky, widow, & yellowtail



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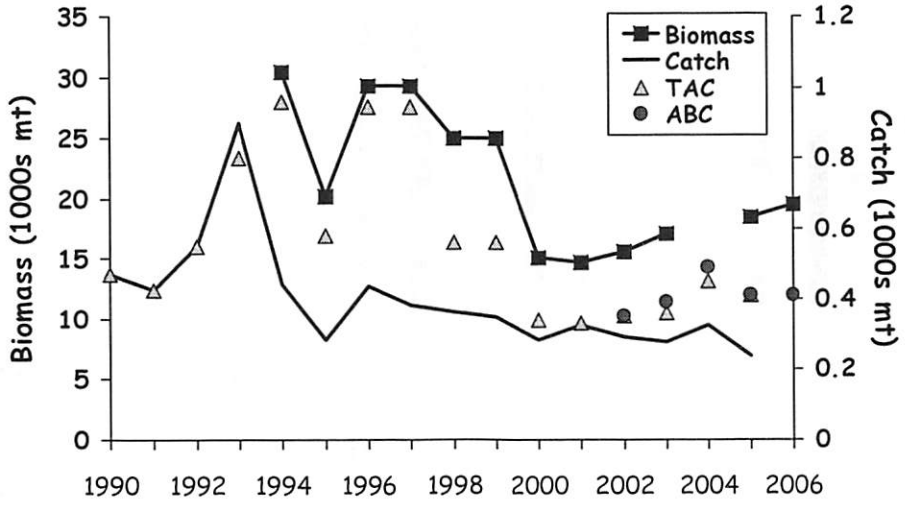
Demersal shelf rockfish



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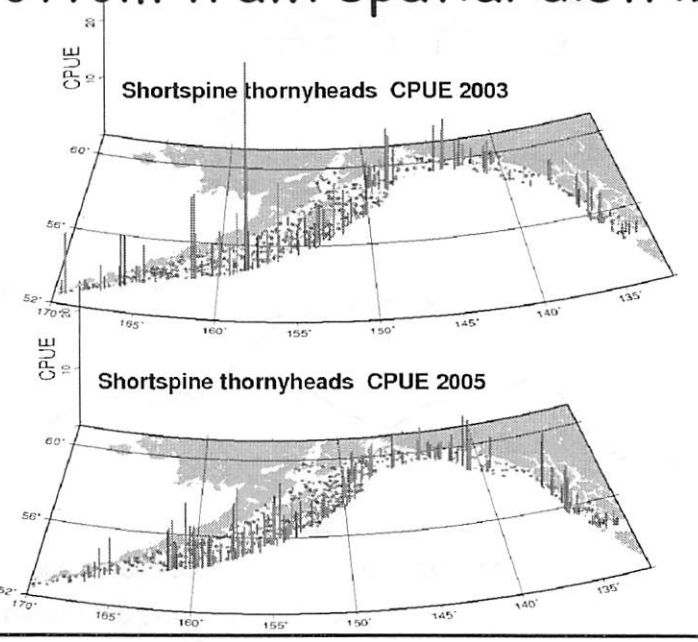
Bottom trawl spatial distribution



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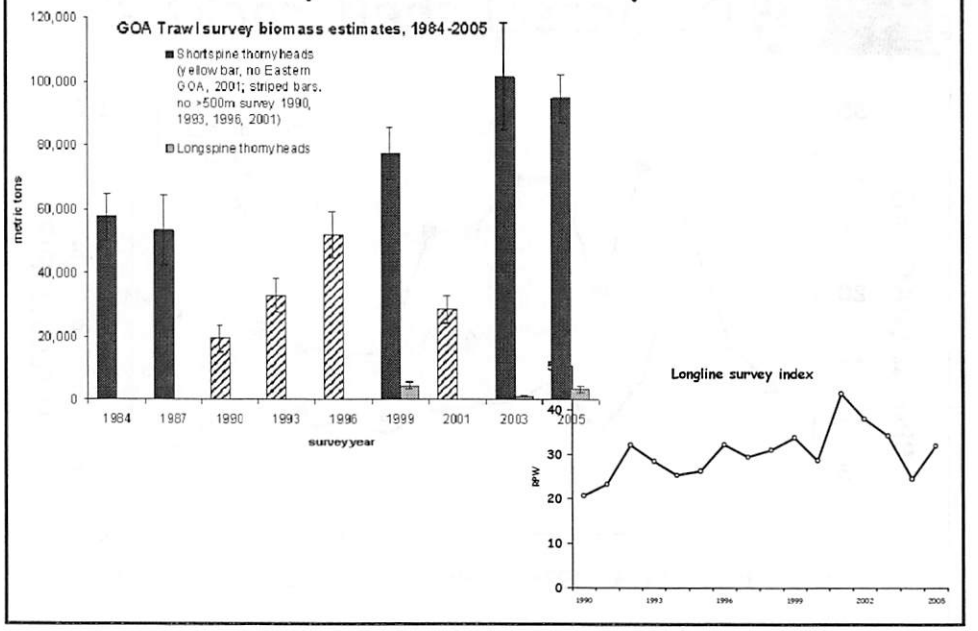
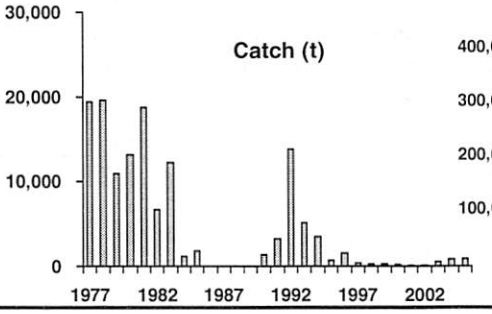
Thornyhead surveys

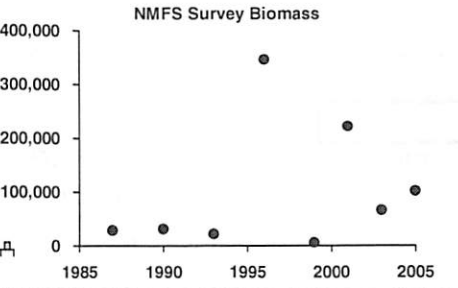


Gulf of Alaska Groundfish Plan Team

Atka mackerel

- **Abundances up**
  - Influx of a strong year classes from the Aleutians?
  - Evidence of nesting sites
- **Catch**
  - TAC exceeded in recent years (by about 30%)
  - No directed fishery
- **Tiers 5 & 6 presented as options**
  - Plan Team adopted Tier 6





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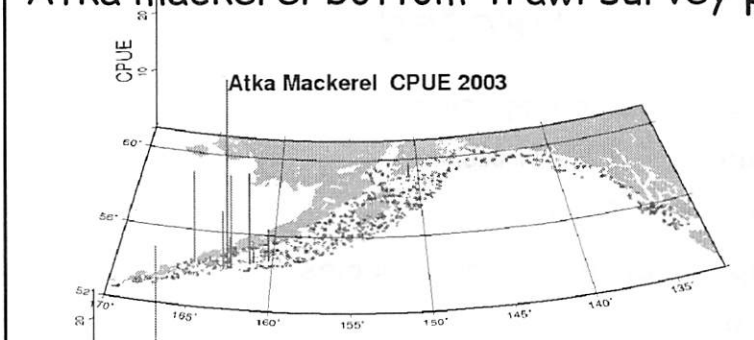
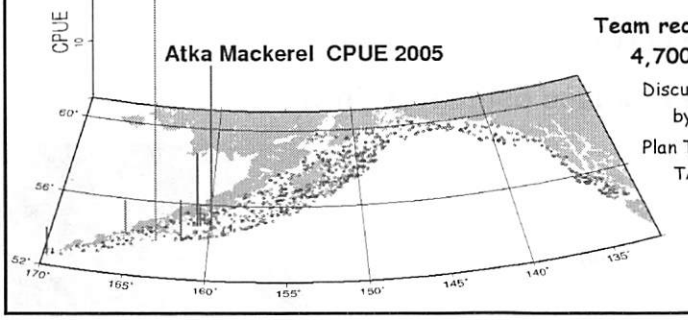
Atka mackerel bottom-trawl survey patterns





Team recommended an ABC 4,700 mt

Discussed directed fishery versus bycatch needs

Plan Team strongly encouraged TAC 1,500 t

ABC Summary

Species	2005 Catch	2005 ABC	2006 ABC	Change	
Pollock	80,181	91,710	86,547	down 5,163	(6%)
Pacific Cod	33,462	58,100	79,618	up 21,518	(37%)
Sablefish	13,654	15,940	14,840	down 1,100	(7%)
Flatfish	9,703	116,640	107,135	down 9,505	(8%)
Arrowtooth flounder	19,264	216,900	177,844	down 39,056	(18%)
Rockfish	20,875	31,229	33,385	up 2,156	(7%)
Skates	2,604	8,144	8,056	down 88	(1%)
Total	179,743	538,663	507,425	down 31,238	(6%)

Summary: Page 15
Chapter: Page 317

Skates

- **In GOA, 2 main target species**
  - Big skate (*Raja binoculata*)
  - Longnose skate (*Raja rhina*)
- **3rd group composed of many species**
  - *Bathyraja spp.*
  - not targeted to date

Rough relative biomass estimates (in GOA)

Big skate ~50%,

longnose about 32%,

~18% to *Bathyraja spp.*

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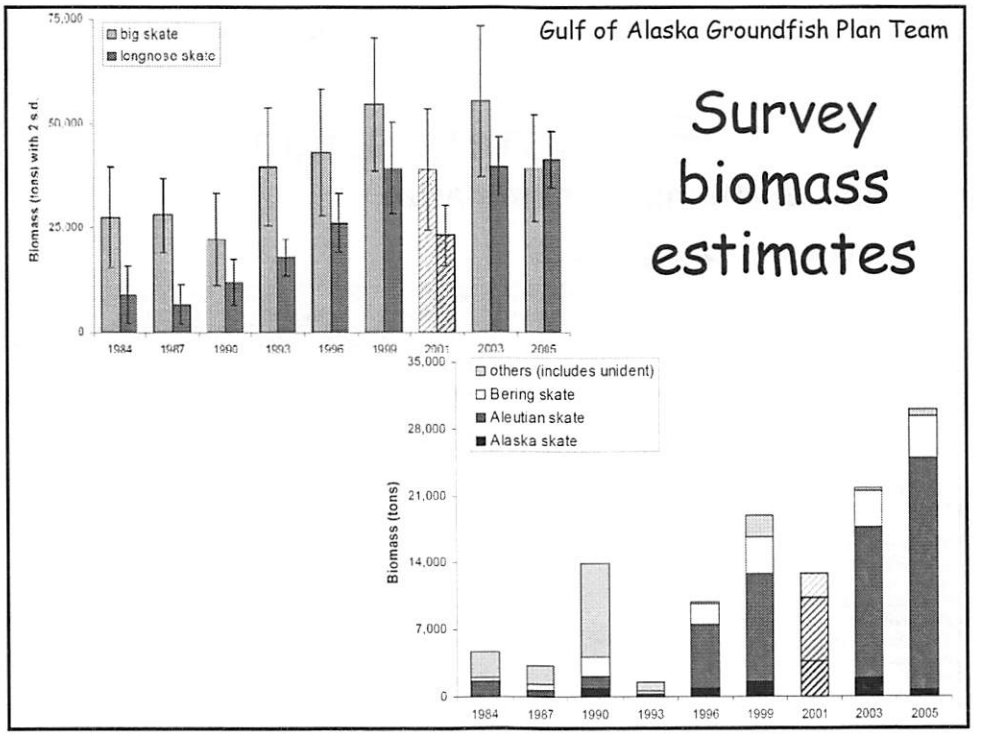
Survey biomass estimates



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Skate issues

Skate catch estimates

- Requires expansion using sparse data
- Halibut fishery skate bycatch significant

ABC/OFL

- Author recommended area-specific OFL—Team disagreed
- Plan Team recommended that a directed skate fishery not be allowed

Species	2005 catch*	2005	2006	Change
Big skate	844	3,999	3,544	down 455 (11%)
Longnose skate	1,097	2,818	2,895	up 77 (3%)
Other skate	663	1,327	1,617	up 290 (22%)
All skates	2,604	8,144	8,056	down 88 (1%)

*not including author's estimated adjustments

Ecosystem summary

- **Initial attempt to summarize**
- **Work in progress...**

	Ecosystem Effects on Stock						Fishery Effects on Ecosystem					
	Prey		Predator		Ablota		Bycatch		Discard		Ablota	
Species/Assemblage	Desc.	Quant.	Desc.	Quant.	Desc.	Quant.	Desc.	Quant.	Desc.	Quant.	Desc.	Quant.
Walleye pollock		model		model				model		model		
Pacific cod	briefly		briefly					spp comp				
Sablefish	eval.		eval.		briefly		eval.	spp comp	eval.		briefly	
Deep water flatfish complex	briefly		briefly				briefly		briefly			
Shallow water flatfish complex	briefly		briefly				briefly		briefly			
Rex sole	briefly		briefly				briefly		briefly			
Arrowtooth flounder	briefly		briefly				briefly					
Flathead sole	briefly		briefly				briefly		briefly			
Pacific ocean perch	eval.		eval.		briefly		eval.		eval.		briefly	
Northern rockfish	briefly		briefly				eval.	average				
Shortraker and Other slope	eval.		eval.				eval.				briefly	
Rougheye rockfish	eval.		eval.		briefly		eval.		eval.		briefly	
Pelagic shelf rockfish	eval.		eval.		briefly		eval.		eval.		briefly	
Light dusky rockfish												
Demersal shelf rockfish	eval.		eval.		briefly		eval.		eval.		briefly	
Thornyhead rockfish		model		model	briefly		eval.		eval.		briefly	
Atka mackerel	briefly											
Skates		model		model	briefly		eval.		eval.		briefly	
Forage fish												

Other issues

Other species TAC specifications

- Change "other species" TAC to ≤ 5% of combined GOA groundfish
- Goal to specify ABCs individually (non-target initiative)
- Plan Team recommends 4,000 mt to meet incidental catch needs

Dark rockfish removal from the FMP initiated in 2005

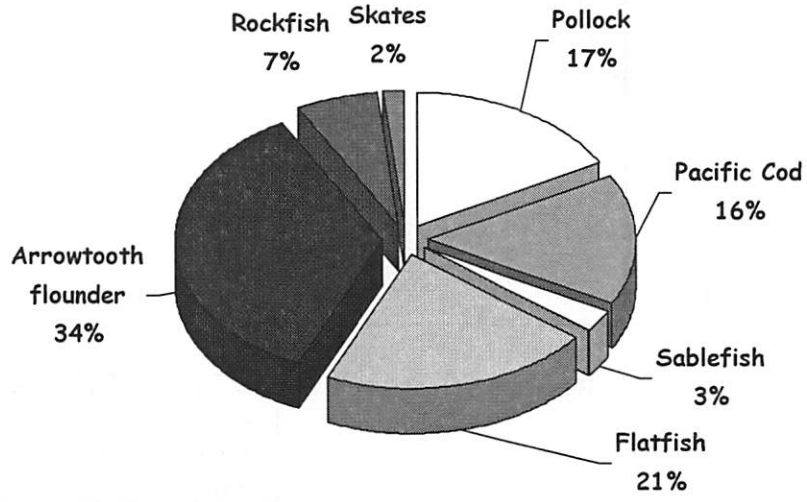
- Initial Council review will occur in Feb 2006

Forage fish assessment included

- Unique application of ecosystem model for abundance estimates

Gulf of Alaska Groundfish Plan Team

GOA 2006 Plan Team ABC's
512,125 mt



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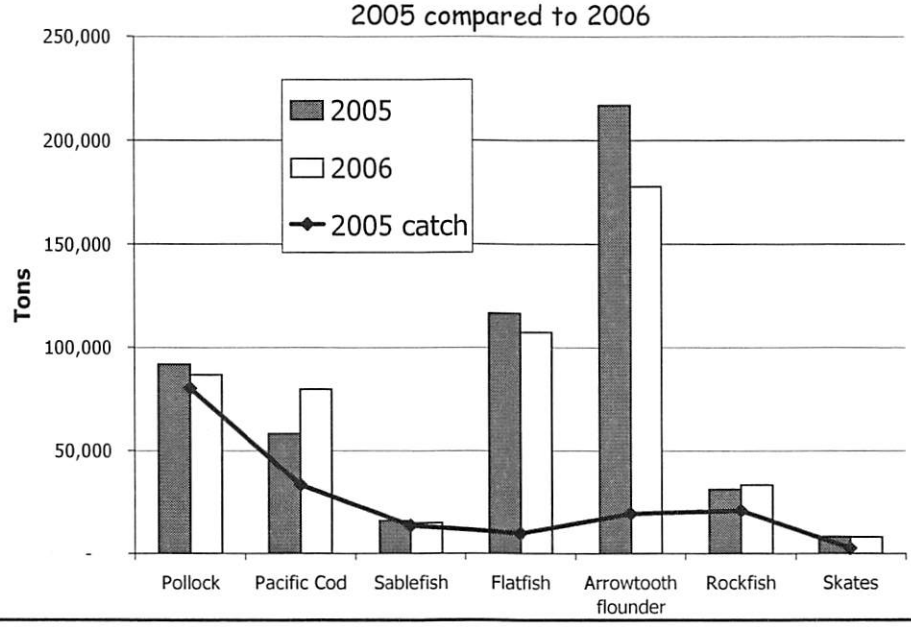
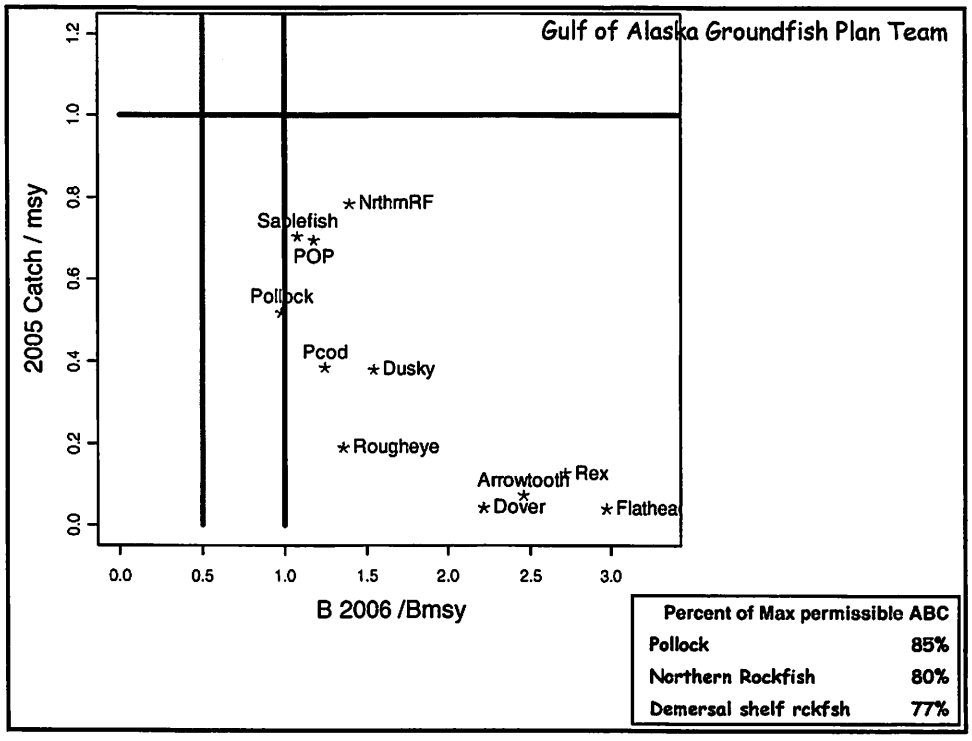
GOA Catch and ABC levels
2005 compared to 2006

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2005 Catch / msy
B 2006 /Bmsy
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0.0
0.5
1.0
1.5
2.0
2.5
3.0
NrthmRF
Sablefish
POP
Pollock
Pcod
Dusky
Rougheye
Arrowtooth
Rex
Dover
Flathea
Percent of Max permissible ABC
Pollock 85%
Northern Rockfish 80%
Demersal shelf rckfsh 77%

Supplemental

BSAI Groundfish Plan Team
AFSC- Seattle, WA
November 15-18, 2005

Loh-Lee Loh (AFSC), Chair
Mike Sigler (AFSC), Vice Chair
Grant Thompson (AFSC), Rapporteur
Jane DiCosimo (NPFMC), Coordinator
Dave Carlile (ADF&G)
Andy Smoker (AKRO)
Dan Lew (AFSC)
Brenda Norcross (UAF)
Ivan Vining (ADF&G)
Kerim Aydin (AFSC)
Bill Clark (IPHC)
Lowell Fritz (NMML), absent
Kathy Kuletz (USFWS), absent

The BSAI Groundfish Plan Team met at the Alaska Fisheries Science Center from the afternoon of November 15 to November 18, 2005. The main agenda items were to review the 2005 stock assessments and to recommend OFLs and ABCs to the Council (Attachment). In September 2005, preliminary projections of ABC and OFL for 2006 and 2007 were made on the basis of 2004 stock assessments. At this meeting, the Plan Team revised most of those projections. Plan Team recommendations for final specifications differ from proposed specifications due to the development of new models; collection of new catch, survey, age composition, or size composition data; or use of new methodology for recommending ABCs.

AI pollock Steve Barbeaux, AFSC, presented a revised age-structured stock assessment for AI pollock. Since preparation of the chapter, Steve and other AFSC staff have been developing an experimental fishing permit with Adak Fisheries for a multi-stage, long term project for improving AI survey estimates. A first step would investigate whether a survey could be conducted by a small catcher vessel in January/February. The second step would then design a survey. The third step would investigate alternative management strategies to address temporal/spatial TAC-setting.

The Plan team noted that the assessment did not differ significantly from the 2004 assessment, i.e., Model 1b in 2004 is the same as Model 2 in 2005. After some discussion, the Team recommended an OFL and ABC based on Tier 5. The Team discussed whether another model could be developed based on Eastern Bering Sea pollock migration into the AI.

Bogoslof pollock Jim Ianelli, AFSC, reviewed the revised assessment for Bogoslof pollock. This assessment was first reviewed in September. The Team concurred that the model is a step forward because it begins to provide a context for the 2 million mt reference point, but felt that adoption of a model would be premature at this time. The Team generally discussed how to tie together the survey data; how pollock may be recruiting into the area; and how the time series of data could be modeled. The Team recommended setting OFL and ABC under Tier 5.

Eastern Bering Sea pollock Jim Ianelli, AFSC, reviewed the assessment for EBS pollock. The Team concurred with the authors' recommendation of Model 1, though the Team's ABC recommendation of 1,930,000 mt was slightly higher than the authors' recommended value of 1,880,000 mt. This is the same model that was accepted last year, except for incorporating new data from the 2005 bottom trawl survey, the 2004 fishery, and revised estimates of the age composition observed during the 2004 EIT survey. The 2005 bottom trawl survey biomass estimate of 5,130,000 mt is up 37 percent from last year. The author and Team agreed that pollock is managed appropriately under Tier 1. This year's assessment includes an expanded "Ecosystems Considerations" section. Results indicate that EBS pollock exhibit a high level of cannibalism, which tends to stabilize the stock. This year, the 2000 year class appeared strong in the 2005 bottom trawl survey and the revised age composition from the 2004 EIT survey.

Pacific cod New models for assessing Pacific cod were presented by Grant Thompson, AFSC, at the joint team meeting. The Team's comments on the new length maturity schedule and assessment models are provided in the Joint Team minutes. The BSAI Team discussed the OFL and ABC recommendations in its meeting. The Team agreed with the author's recommendations to set specifications at the maximum permissible, but selected a different model for calculating these values. While not explicitly discussed at this meeting, the Team previously has supported separate ABCs for the Bering Sea and Aleutian Islands.

Sablefish The sablefish model was presented by Dana Hanselman, AFSC, at the joint team meeting (see Joint Team minutes for comments on the assessment).

Flatfish The Team agreed with the authors' recommendations for OFLs and ABCs for all the flatfish assessments, except Greenland turbot. *Greenland turbot* continues to be the only flatfish species that remains low in abundance; the author and Team recommended reducing ABC to about 24 percent of its maximum level. The Team opted to continue using the 5-year average fishing mortality (2,740 mt for 2006) for determining the ABC to maintain the current exploitation rate while abundance is declining, rather than use the author's recommended constant catch value of 3,000 mt.

Because of uncertainty whether a good fit of post-1976 *flathead sole* data to a Ricker stock-recruit model was a coincidental effect of a 1989 regime shift, the Plan Team agreed with the authors that those results not be used for managing flathead sole until the fit could be better clarified. The Team recommended that Alaska plaice otolith samples be analyzed and the new age data be incorporated into the model next year.

Rockfish Beginning this year rockfish assessments will be conducted on a 2-year cycle, timed to coincide with the Bering Sea slope and Aleutian Island trawl surveys. The Team agreed with the authors' recommendations for OFLs and ABCs for all rockfish stocks. The assessments were updated from the previous year, with minor changes due to the addition of new catch data. The Team attached an appendix prepared by Paul Spencer, Dana Hanselman and Martin Dorn to the *Pacific Ocean perch* chapter. The appendix responded to an SSC request to investigate the management consequences of maternal effect on fecundity and implications for stock productivity. The authors found that reduced effectiveness of younger spawners would result in reduced reproductive output per recruit for a given fishing mortality, but this tended to be counteracted by increased resilience in the stock recruitment relationship due to an equivalent number of recruits being associated with reduced reproductive output.

The Team had a lengthy discussion of separation of ABCs between the Bering Sea and Aleutian Islands, specifically regarding *shortraker and rougheye rockfishes* but the discussion broadened to include all BSAI groundfish stocks (including Pacific cod). In response to an SSC request, the authors summarized existing genetic analyses, which suggest that the BS and AI represent separate spawning populations for rougheye rockfish (although the BS fish may be part of a larger group including fish from the Western GOA), but the results are unclear for shortraker rockfish due to lack of sampling in the Bering Sea. The Team also discussed potential management complications that might arise from area-specific quotas for these species. Most of the stocks are on prohibited status from the start of the fishing year and the incidental catch is more likely to be discarded due to regulatory requirements. The MRAs are established at very low levels. Separate trawl and longline MRAs for shortraker and rougheye rockfishes were set closer to their intrinsic bycatch rate. It is unclear if separate ABCs would be an effective management tool by discouraging topping off and would result in closing CDQ fisheries.

Given the information available, the Team could not reach consensus on whether to split ABC or OFL by region. At this point, the primary data gaps are less related to biology than to the distribution of fishery catches by area/target and the ability of the management system to deal with very small, area-specific TACs. The Team therefore requested that the authors present additional information on the distribution of fishery catches at the September 2006 Plan Team meeting and that a full discussion of this issue for all groundfish stocks be scheduled then. The Team recommended no changes in area apportionments for any stocks this year.

Atka mackerel The Team concurred with the authors' assessment and OFL and ABC recommendations.

Other species The Team agreed with the authors' recommendations for setting group-specific ABCs and OFLs but recognized that the FMP does not currently allow such an action. The Team continues its support for an FMP amendment to break all groups out of the other species category and provides recommendations for OFLs and ABCs in support of that amendment. Specific chapter comments follow.

Squid. Sarah Gaichas presented the squid assessment. There continues to be no reliable biomass estimate for squid, but it is assumed to be huge and concentrated largely in the unsurveyed Bering Sea basin waters. Calculations indicate that 1,000,000 mt are consumed as prey. Fishery removals are incidental. The Team reviewed the relationship between foraging areas and breeding sites of northern fur seals in the eastern Bering Sea as reported by Robson (2004). Fur seals in the Pribilof Islands, foraging in two canyons, could be dependent on pollock and squid. The fishery could interfere with this foraging if foraging occurs at the same time as the fishery. Fur seals were found to forage in discrete directions from each of the major Pribilof rookeries, so some colonies of fur seals may be more dependent on squid than others.

Skates. Sarah also presented the skate assessment. She recommended separate area specifications based on different species composition and relative abundances between the Bering Sea and Aleutian Islands, and the presence of endemic skate species found only in the Aleutian Islands. Jerry Hoff reviewed results of his skate nursery investigation. He found four cohorts developing for each nursery area. It is unclear if the cohorts are from the same females. The Alaska skate population has been expanding into Bristol Bay. A few key spots could be identified as EFH. Beth Matta summarized her work on skate reproductive biology, maturity, and age compositions for the GOA and BSAI. The best information exists for Alaska skates which dominate the Bering Sea shelf. From ecosystem modeling, skate mortality is much higher from fishing and unexplained sources, particularly for the Aleutian Islands, than from predation. Large proportions of Alaska skate mortalities (80% in the BS and 46% in the AI) are from unexplained sources. Data are rather imprecise for skate mortalities in all areas until very recently, so this requires further evaluation. The ecosystem models are based on early 1990s data, which is some of the lowest quality data for skates, as the data quality improved and will be re-examined in the future.

Sculpins. Rebecca Reuter presented the sculpin assessment chapter, as revised since previewed in September. Sculpin biomass is second to skates in comprising the biomass associated with the other species complex.

The Team does not agree with author recommendations to break out skates or sculpins between the Bering Sea subarea and Aleutian Islands subarea at this time (see above discussion). The Team asked the authors to provide additional information next year from the fisheries and surveys regarding the spatial concentration of the primary species that constitute the skate and sculpin categories.

Octopus. M. Elizabeth Conners presented the octopus assessment chapter, as revised since previewed in September. The Team concurred with the authors concerns regarding Tier 5 or 6 calculations. For Tier 6, incidental catch rates could result in an OFL that is artificially low. Tier 5 numbers are based on trawl survey biomass estimates: sampling variability, seasonal differences, and gear selectivity adversely affect the quality of these estimates for octopus. The Team concurred on the use of the sum of ten-year averages for survey biomass from the BS shelf, BS slope, and AI surveys as the basis for Tier 5 calculations. Species identification and spatial separation of the species is unknown. The Team noted that there is good survival from pot and longline gear. Catch comes mostly out of regulatory area 519, possibly in SSL closure areas because of the no trawl zones. The Team discussed the possibility of a directed fishery on octopods and concluded that a pot fishery was unlikely, but it could be a viable addition to cod potting. Cod pots predominate in Areas 517, 519, and 508; longliners are fishing in Area 528. The author suggested that a size limit may be a viable future management tool, to restrict harvest to the larger giant Pacific octopus. Species other than giant Pacific octopus have lower fecundity and benthic larvae and may be more susceptible to fishing. She noted that the State of AK is investigating directed fishing efforts and may need to be involved in future management.

Sharks. Dean Courtney presented the shark assessment for the complex and Pacific sleeper shark using Tier 6. The authors recommended not using natural mortality rates from other shark species. A rate should be available for use under Tier 5 next year, based on work by Ken Goldman. The Team is encouraged by the current efforts of the shark assessment authors to estimate the value of M for certain shark species.

Pacific Halibut Discard Mortality Rates The Team concurred with the IPHC staff recommendations for halibut discard mortality rates for the 2006 CDQ fisheries, and recommended that they be used to start the 2007 fisheries until updated next year by the IPHC staff.

General recommendations to authors. Authors should follow the guideline to authors for consistency in presentation style of their chapters, particularly in the introductory section. A table that summarizes all the needed information for the introductory chapter of the BSAI SAFE Report for the *next two years* should be included. The Plan Coordinator will communicate this request to the AFSC, in the hope that the SAFE chapter guidelines can be amended accordingly.